

**ISSUES OF TRANSBOUNDARY TRADE IN THE REMANUFACTURING
INDUSTRY: A CRITICAL ANALYSIS**



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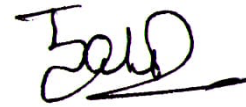
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SUPERVISOR CERTIFICATE

It is to certify that Niharica Chaudhury is pursuing Master of Laws (L.L.M) from National Law University and Judicial Academy, Guwahati, Assam and has completed her dissertation Titled '**Issues of Transboundary Trade in the Remanufacturing Industry: A Critical Analysis**' under my supervision. The research work is found to be original and suitable for submission.

Date: 16th August 2020

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DECLARATION

I Niharica Chaudhury pursuing Master of Laws (L.L.M) from National Law University and Judicial Academy, Guwahati, Assam do hereby declare that the presentation titled '**Issues of Transboundary Trade in the Remanufacturing Industry: A Critical Analysis**' is an original research work and has not been submitted either in part or full anywhere else for any purpose academics or otherwise to the best of my knowledge.

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PREFACE

There is a rise in manufacturing industries, especially in the developing countries such as China and India, along with a constant inflow of scrap waste from developed to developing countries for intentions of repurposing them. Such countries are flourishing in the spaces of fast paced innovation with the intention to be on the same par in the sphere of R&D as the developed countries. However, what is often overlooked is how weak to non-existent IPR laws have created a lacunae in the waste handling capacity of aforementioned developing countries. Currently developing countries the likes of India does not have any stringent laws that would facilitate legal remanufacturing of patented products, which if effectively done, is likely to fetch huge profits for India in return for our manpower. Such aforementioned countries have kept a regime of weak IPR laws on purpose to facilitate easy technological spill over through reverse engineering, knowledge diffusion etc. However weak laws also create issues of legal grey areas in terms of zero laws that refuse to deal with upcoming issues in the present context. Thus, lack of effective laws have stopped developing countries' economic growth as these countries are barred from using its resources to repurpose remanufactured goods due to reasons of stringent patent laws (international or otherwise). Moreover developing countries are suspicious of enacting proper laws in that regard as developed countries have a tendency of using developing countries as a dumping ground for their waste. This paper does a critical analysis of the various lacunae in different patent regime and trade laws of a selected few countries associated with effective remanufacturing of patented products. This paper does a comparative analysis of the patent and trade law regime of developed countries such as USA, UK and upcoming developing countries such as China, Japan. It further makes a review of the best possible legal implementations that should be introduced to benefit both parties of developed and developing countries in the aforementioned regard. This paper also deals with the essence of how much developing countries lack in acknowledging the presence of a circular economy and how they could strike a balance between keeping deliberate weak IPR and implementing strong patent and trade laws in certain aspects to facilitate the end goal of boosting the developing country.

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I feel highly elated to work on the topic **‘Issues of Transboundary Trade in the Remanufacturing Industry: A Critical Analysis’**.

I take this opportunity to thank my teacher and project guide Dr. J.S. Patil Sir for his very significant guidance in the completion of this project. I take this responsibility to thank the University for providing extensive database resources in the Library through which I could complete my project.

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TABLE OF ABBREVIATIONS

1.	APRA	Automotive Parts Remanufacturers Associations
2.	ASSOCHAM	Associated Chambers of Commerce and Industry of India
3.	CRR	Centre for Remanufacturing & Reuse.
4.	CRIMKIIT	Center for Resources Information and Management of Korea Institute of Industrial Technology.
5.	CE	Circular Economy
6.	EASA	European Aviation Safety Agency.
7.	ETIRA	European Aviation Safety Agency.
8.	FTP	Foreign Trade Policy
9.	GCSM	Global Conference on Sustainable Manufacturing
10.	HCDCS	Harmonized Commodity Description and Coding System.
11.	ICRRA	Indian Cartridge Remanufacturers and Recyclers Association
12.	KATS	Korean Agency for Technology and Standards.
13.	MRO	Maintenance, Repair & Overhaul
14.	OEM	Original Equipment Manufacturers
15.	PERA	Production Engine Remanufacturers Association.
16.	RIC	Remanufacturing Industries Council.

17.	TRIPS	Trade Related Aspects of Intellectual Property Rights
18.	USITC	United States International Trade Commission.
19.	WEEE	Waste Electrical and Electronic Equipment.
20.	WTO	World Trade Organisation

Chapter I

1.1 Research Background/ Introductory

Issues of Transboundary Trade of Remanufactured Products.

We have arrived in an era of industrialized surplus and waste. We are facing a problem of fast paced mass produce and the incapacity to deal with said products sustainably when they reach their End-Of-Life Cycle (EOL). To counteract the effects of such wasteful production with sustainability, many business models under the Circular-Economy are made. The CE minimizes the consumption of finite resources in the manufacture of products and promotes reusability of products by maximising the circulation of the content of EOL products.¹ The Remanufacturing industry lessens such aforementioned burdens by adhering to the business models of the CE. The industry ensures that products which have reached their EOL stage would be remanufactured and sold instead of adding to the carbon footprint. This industry is helpful in times of depleting resources. However, loopholes have marred this procedural jumpstart from its initial stages.²

We live in a globalised world and countries depend on each other for their mutual benefits. One such interdependence concentrates on convenient exporting and importing. A conversation needs to be held in large part on how the remanufacturing industry stands to profit from exportation and importation of its products. Transboundary trade is an inevitability, but increasing carbon footprints during such a process do not have to be so. Such a form of trade can thus be done with a transition towards a relevant CE Model. Thus Remanufacturing- if varying laws allow for it to be carried out effectively- can increase profits for transboundary traders with a transitory route to CE.

The Remanufacturing industry of a nation is affected by its trade and IP laws. It can be noticed in the international forum that developed and developing countries have stark differences in their standards of national trade laws and IPR regimes. I want to carry out an international comparative analysis of such different level of cross country laws that act as hurdles for the trade in remanufacturing industries, and subsequently find solutions to

¹Ellen McArthur Foundation, Towards the circular economy, <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf>, (26 April 2020, 10:02 PM).

² Justas Markus, Manufacturing, <https://www.oberlo.in/ecommerce-wiki/manufacturing>, (13 November 2019, 22:10).

such hurdles. On arriving at the desired outcome, the international community would stand to gain profit from an otherwise untapped industry and its stringent laws.

There are barriers that hamper transboundary trade in the relatively novel scope of Remanufacturing industries. My intention is to address such barriers between developed and developing countries, caused due to different Intellectual Property Rights (IPR) and trade law standards. I shall deal with such resultant barriers that mar the transition towards circular economies between developed and developing countries. I have dealt with this problem in depth under the **“Research Questions” Heading**. The end goal is to facilitate an ease in international trade in the aforementioned industry.

1.2 Statement of Problem

The following areas of problems increases the gap between developed and developing countries in terms of remanufacturing:

- Lack of uniform definitions for what constitutes remanufacturing,
- Lack of proper guidelines between companies and countries in deciding which supply loop to partake in,
- Lack of strong IP laws of patent infringement in developing countries,
- Lack of uniform set of laws in parallel exportation, and
- Confusion among manufacturers as to whom to trust: third party remanufacturers or in house remanufacturers

1.3 Aims

The Aim of this article is to create a dialogue about the weak to non existent patent and trade laws in selected developed and developing countries that fail to form a basic legal outline for refurbishing patented products in the circular economy. The aim is to bring into light how lax patent and trade laws are actually a result of developing countries laws not paying heed to the importance of the circular economy. It is discussed how developing countries can better improve such patent and trade laws to lessen the terms of infringement by

contextualizing its internal current scenario in synchronization with the legal regime of other international entities.³

1.4 Objectives

The aim of this study can be garnered through the objective of actually coming up with a criteria for defining ‘Remanufacturing’ and what categorizes as products to be remanufactured.

Carrying out comparative analyses of different national frameworks who put forth successful remanufacturing laws for the industries would bring forth the lacunae in IP and trade laws that have not been dealt with before.

1.5 Scope and limitation

Since there is limited international judicial or legislative precedence in regarding trade and patent infringement in the remanufacturing industry, the scope of research in this article shall be discussing about the blatant lack of dialogue regarding the aforementioned problem in various connected acts and legal forums between developed and developing countries. In terms of developing and developed nations, a comparative analysis of the various judicial decisions and legal implementations is done for bringing best proposals of legal implementations that would help transboundary endeavours in creating new legal changes in this forum.

1.6 Detailed Literature Review

Recently, an article was published in the International Conference on the Modern Development of Humanities and Social Sciences, being **Research on Patent Infringement of Remanufacturing Industry**. Deli Chang, an Associate Professor of Law School of Tongii University, Shanghai and Chenjun Jia, Doctoral Student of Tongii

³ Hari Vasudevan, Exploring The Potential Of Remanufacturing In Indian Industries For Sustainability And Economic Growth, <http://www.tjprc.org/publishpapers/--1387629724-Exploring.full.pdf>, (13 November 2019, 22:10).

University, Shanghai have remarkably brought the issues of the manufacturing industry to light.

China, a country on the cusp of being a developed nation, has been making remarkable advances in the manufacturing industry and is committed towards formulating better and suitable manufacturing laws. The authors, aptly, have tapped onto the growing need in China to align the laws pertinent to the manufacturing industry which is going to prove beneficial to the Chinese economy.

In addition, the same has set course for the future for the developing countries which are yet to ponder over the issues of the laws in manufacturing industry.

In another article being **Toward a Patent Exhaustion Regime for Sustainable Development**, authored by Benjamin Liu, John Marshall Law School, the current status of the refurbishing industry has been discussed variedly. The article focuses on the hardships encountered for bringing technological advancement and the sustainability to be achieved in the manufacturing industry and the way thereof.

Having read the aforementioned, it has been an enlightening path for me as far as the manufacturing industry in the developing countries is concerned. Different countries have a different perspective and approach towards the remanufacturing industry and the same is claimed to be a vexatious state of affairs as the cross country trade suffers at the whims of these countries at the altar of dissimilar laws placed on the same pedestal.

It cannot be left unmentioned that there are various criteria and plethora of explanations for the different rules and laws of every country. In light of the aforesaid, this article encumbers all such parameters that second the stand of the countries as far as the standards of rule making are concerned.

Nita Choudhury in her article **Remanufacturing in India: Approaches, Potentials & Technical challenges** has been very articulative about the remanufacturing industry specially in India as most of the developing countries are picking up with the need to remanufacture to help the end of life products absorb some strength and be put to use in another industry, which can simultaneously create jobs and can also be a profitable market.

It is imperative that a mass overhaul in the industry needs to be carried out vide a suitable framework which would cater to the ever-growing need of remanufacturing.

W.L Ijomah, through his coveted work **Development of robust design-for-**

remanufacturing guidelines to further the aims of sustainable development specifically mentions the need to counter the issues of sustenance, waste management, pollution, landfill act as a barrier in the remanufacturing industry. The author has left certain first hand excerpts from the industries in UK, in his work wherein he stresses on the need to improve the products being manufactured so as to help remanufacture the product with less efficiency.

We ought to throw some light on the relevant laws that come along with the remanufacturing industry. **Repair and Recycle between IP Rights, End User License Agreements and Encryption**, by Estelle Derclaye speaks about the hurdles that can be found in the way of remanufacturing while refurbishing or repairing a product and one such hurdle is End User License Agreement.

On the same note, Mark D Janis, through his work, **Tale Of The Apocryphal Axe: Repair, Reconstruction, And The Implied License In Intellectual Property Law** advocates for the patent rights that are at stake and needs to be taken care of in the repair industry.

The beauty of this research topic lies in the fragmented works published with respect to the remanufacturing industry. No set framework to guide the industry makes it susceptible to more research in the field. Companies working in close quarters to the manufacturing industry such as FICCI has come up with guidelines such as **Accelerating India's Circular Economy Shift** which provide an insight to the existing framework and the loopholes which can be addressed while preparing a module for the remanufacturing industry.

Different countries have a different perspective and approach towards the remanufacturing industry and the same is claimed to be a vexatious state of affairs as the cross country trade suffers at the whims of these countries at the altar of dissimilar laws placed on the same pedestal. In a nutshell the said paper tends to help the remanufacturing industry whether it be a repair industry or the remanufacturing industry. It cannot be left unmentioned that there are various criteria and plethora of explanations for the different rules and laws of every country. In light of the aforesaid, this article encumbers all such parameters that second the stand of the countries as far as the standards of rule making are concerned.

Available research on the patent barriers to remanufacturing:⁴

Repair-Reconstruction Doctrine- Pre-existing theories and varying court judgements entail that after a product is remanufactured it either falls under the permissible repair category or the impermissible reconstruction category. I shall use all available context to structure a set criteria distinguishing between both.

Repair or Making- The patentees can almost always prove infringement in a prima facie sense, as repurposing a product, parts of which are protected under claims of patent essentially puts the whole refurbished product under a default umbrella patent scrutiny of encroachment. The real issue lies with the procedural satisfaction of the court based upon the evidences produced by the accused if the said refurbishing is within the prescribed limits of repair. Courts have come up with the concept of “akin to repair” or “passable fix” to protect consumer’s rights. Research has shown that consumer friendly courts of developed countries like USA start their investigation from repair and expand it upto “akin to repair” whereas courts of developing countries like China begin their investigation on the aspects of reconstruction and expand upto prohibition of the products under “akin to making”. I shall endeavour to research on the different leanings on selected countries and find a set of patterns which answer the question: what constitutes permissible remanufacturing?

Subject of analysis: Product or Process- A procedure situated principle looks at the nonstop stream from the pre-refurbished state to the post-renovated state (as followed by the courts in developed countries like USA) while the product based analysis (carried out in courts of Japan) see whether the renovated item held its unique character or got another business personality through another creation. I shall endeavour to research such theories’ effects on selected countries choice in determining the validity of remanufactured products.

Content of proof: Physical attributes or totality of circumstances- One argument is that in developed countries (eg:USA) the repair reconstruction quality is tested on the touchstone of the physical attributes and the changes made thereinunder, including the means of rebuilding and the area of replacement. However, various procedures followed in and out of the United States speak of the conclusiveness of the conditions that have impacts beyond the ineligible physical attributes- external conditions such as market’s influence to fabricate or support the product, target proof of the plan of the patentee, etc.

Significance of parts: All elements or essential elements- The ongoing debate rests on the

⁴ Benjamin Liu, Toward a Patent Exhaustion Regime for Sustainable Development 32 Berkeley J. Int'l Law. 330 12, (2014).

premise whether all pieces of a protected article are made equivalent or not. Varying theories worldwide expressed that the patent is for the components and its outcome in total and no independent part is considered as a separate patent. On the other hand, A nation applying the basic component test reports a significant inclination towards those parts that are basic to the development, which in this way can't be supplanted without causing encroachment.

I shall make use of the research (caselaws, Judgements, etc) available on point 4 and 5 to further create a list of various patent infringement hurdles on the remanufacturing industries due to different standards of legal interpretations in different countries.

Available research on the trade barriers to remanufacturing

Even after a remanufacturer may comply with the national exhaustion and repair-reconstruction doctrine, his working abilities may still be limited under post sale contractual limitations such as the condition of single-use doctrine.⁵ Such a quality threatens to sue third party remanufacturers who avail such patented scrap from the garbage who are unaware of such pre-existing contracts. Hence it is argued that such a restriction is only limited to direct purchasers. to protect innocent downstreamers from accidental infringement. I shall carry out extensive research on selected trade agreements (as mentioned below) to identify the various legal impediments and clauses that mar trade processes in the remanufacturing industry.

Existing work and how to link available work with current research- In light of the same and with respect to the proposed research subject, the thesis is going to provide an outline/roadmap for the future transactions in the remanufacturing industry. While there exists some literature centered on the profit making area of the Remanufacturing industries of a selected few developed countries, there is no compiled research on the remanufacturing industries of developing countries.⁶

My area of framework would endeavour to link such pre-existing information (IP and trade laws) with the direct proportionality of ease of trade in the aforementioned industry and its profiteering skills.

⁵ American Cotton-Tie Co. v. Simmons, 106 U.S. 89 (1882) (9-0 decision).

⁶ Remanufactured Goods: An Overview of the US and Global Industries, Markets and Trade, United States International Trade Commission, <https://www.usitc.gov/publications/332/pub4356.pdf>, (6 May 2020, 09:29 AM) ; *and*; A snapshot of the UK Remanufacturing Industry, Remanufacturing in the UK, <http://www.remanufacturing.org.uk/pdf/story/1p342.pdf>, (6 May 2020, 09:29 AM); *and*; Jian Cao, OVERVIEW OF REMANUFACTURING INDUSTRY IN CHINA: GOVERNMENT POLICIES, ENTERPRISE, AND PUBLIC AWARENESS, Scencedirect, 242 Journal of Cleaner Production, (2020), p. 1.

This would help me point out the aforementioned areas of law not dealing with important questions or definitions that would have otherwise helped with the cross country trade in the remanufacturing industries.

Pointing out such flaws after the research would further help me structure a novel set of theoretical framework that would take into account the legal and structural differences between both developed and developing countries.

1.7 Research Questions

The main research question I shall focus on is **‘How can legislative and regulatory barriers to the transition of Circular Economy in the Remanufacturing industries between developed and developing countries be removed? How can removal of aforementioned barriers result in maximization of trade?’**

Other ancillary questions are as follows:

1. What are the problems that arise due to non-uniform definitions of ‘Remanufacturing’, worldwide?

Having no legal definition of Remanufacturing and its entailing criteria, nations use the terms reuse, recycle, repurpose, recondition, refurbish and remanufacture interchangeably, while other nations do not even have an isolated definition for remanufacturing.

A resulting trend shows that developing countries, thus, club remanufactured products as second hand recycled products, the import of which are often banned by the custom laws of such countries.⁷ This unfair umbrella over protective misrepresentation of anti-dumping laws is done so as developing countries are apprehensive of encroachment of imported waste in their territories, justifiably so, owing to precedence.⁸ However often times it is found out such faulty ignorant laws, not only cause economic loss through

⁷ Michikazu Kojim, The 24th CIRP Conference on Life Cycle Engineering Remanufacturing and Trade Regulation, ScienceDirect, https://pdfs.semanticscholar.org/fac1/ca17a230a622a29b1ce27c226ec5d8f9750c.pdf?_ga=2.70058384.1888023749.1589134711-1903708284.1589134711, (6 May 2020, 10:02 PM), *and*, Report of the Panel, Brazil-Measures affecting imports of re-treaded tyres, World Trade Organisation, https://www.wto.org/english/tratop_e/dispu_e/332r_e.pdf, (6 May 2020, 10:08 PM).

⁸ Bradford, M., The United States, China & the Basel Convention on the Transboundary Movements of Hazardous Wastes and their Disposal, Fordham Environmental Law Review, eWaste in China—A Country Report, <http://www.step-initiative.org/index.php/Publications.html>, (April. 29, 2020, 5:34 PM); *and*; Why Vietnam is shutting out scrap plastic, Plastic Recycling Update, , <https://resource-recycling.com/plastics/2018/05/31/why-vietnam-is-shutting-out-scrap-plastic/>, (29 April 2020, 6.33 PM).

bans, but also allow other forms of waste inside the importing country , which further increases illegal dumping. Due to disparity of such definitions a lot of stagnancy and confusion is created between nations from the initial stages of trade as they cannot come to a consensus if trade of remanufactured products can even be allowed between certain nations because what is a remanufactured product in one nation may not be the same in another country. This simple overlook results in a significant portion of economic loss. For the purposes of this research proposal I shall focus on two supply loops. Supply loops are a part of the CE Model which focuses on the local or global route undertaken to help an economy's transition to the CE.

Closed Global Supply Loops- An example of this loop can be found in the instance of Ricoh, which expects to capture an arbitrage opportunity by shipping used plastic residues from their materials recovery sites in Europe and around the world back to their component manufacturing sites in Asia for use in manufacturing new components.⁹

Thus, this loop discusses the benefits and mechanisms of the developing country importing used products for remanufacturing purposes. Discussion on the aforementioned supply loop shall guide me to address the legislative and regulatory issues of different national customs law which decide the criteria for allowing the import of used products in a developing country for remanufacturing

2. Is there a two-way loss in economic value between developing country (importer) and developed nation (exporter)?

Developed countries have stronger forms of IPR laws, safeguarding private rights. Developing countries on the other hand tend to have weaker IPR rights to promote easy dissipation of R&D and jumpstart innovation. However, such disparities in standards of IP law accounts for much in the international scenario due to hurdles in international trade. A few examples are given below:

- a. **Developing country:** Some countries don't allow remanufacturing altogether due to lack in definitions or to protect domestic industries from external competitors. Others allow domestic remanufacturing while others completely ban the import of remanufactured products from outside the country. Sometimes even cores that would have been used in remanufacturing products are also

⁹ Interviews with Philip Hawkins, Towards the Circular Economy: Accelerating the scale up across global supply chains, http://www3.weforum.org/docs/WEF_ENV_TowardsCircularEconomy_Report_2014.pdf, (30 April 2020, 09:54 AM).

disallowed from being imported in the country. Developing countries mostly import products as they are not R&D heavyweights. Developing countries lose out a lot economically because their laws ban the import of readily available remanufactured products, which are incorrectly viewed as inferior due to lack of knowledge/faulty laws.

2. The second supply loop I shall be focusing on is Partially open geographical loops. This shows the importance of local implementation of CE whereby a local third party would locally remanufacture and redistribute the product in the same region to facilitate the use of a product, which would have otherwise been rendered useless and dumped as waste owing to the developing country's restrictive laws on import of used products. Giving the third party the control of local material flows increases product utility. Supply chain logistics can be organized at relatively low transport costs and without having to cross international borders.¹⁰

a. **Developed country:** These countries usually export their goods to dependant countries that cannot come up with their own novel products. If for example a motor car manufacturer/company from a developed country with strong IP laws sets to export its products to a developing country, such company would mostly be ready just to export its already manufactured or remanufactured product. They would be apprehensive to export the trade secret and technical knowhow of how to remanufacture such products to such countries of weak IP laws for fear of state sanctioned piracy and reverse engineering. As already mentioned in the aforementioned point, developing countries steer clear of remanufactured products. As a result, only the manufactured products of the said company gets exported to the developing country and when it reaches it reaches its EOL stage it is dumped as waste when it could have been so easily remanufactured.

b. **Parallel protection:** The various international hurdles caused by different parallel importation laws of different countries should also be comparatively analysed.

¹⁰ Canon responds to customer demand with a new range of remanufactured MFDs The Circular Economy Applied to the Automotive Industry, Ellen MacArthur Foundation, Towards the Circular Economy, Ellen MacArthur Foundation, http://www.canon.co.uk/About_Us/Press_Centre/Press_Releases/Business_Solutions_News/1H13/new_range_remanufactured_MFDs.aspx, (28 April 2020, 03:10 PM).

If a country wants to regulate import of used goods, but want to have international remanufacturing center, it can import cores in bounded area, such as free trade zone. Then factories for remanufacturing process can be operated in bounded area, by getting supply of cores from other countries. I intend to carry out significant research to support this argument.

3. What is more feasible: Original Equipment Manufacturers (OEM's) remanufacturing their own products or using third party contractors?

The following list of problems showcase why a Partially open Geographical loop of the CE Model, which champions the cause for local distribution channels is a viable option for transitioning into the CE. It provides proximity to the points of production and use. Various steps would facilitate an OEM to be less apprehensive about exporting the trade secrets for creating a remanufactured product and the problems that arise due to the varying trade and IP laws of each selected country.

- **Warranty issue-** If an unauthorized third party from a developing country were to sell remanufactured products of an OEM, it would provide limited warranty as compared to the warranty provided by the OEM.¹¹
- **Permission issue-** Due to multiple definitions of 'Remanufacturing', worldwide, if an OEM were to buy remanufactured items exported by third parties, irrespective of whether or not it received prior authorization from the OEM, would it be permissible under the developed country's law to accept such product? ¹²
- If the OEM plans to remanufacture its own products, a mass scale international system of OEM's having specific collection centres for gathering its EOL products and their scraps do not seem feasible.
- In many developing countries, including China, India and Brazil, the collection and recycling of valuable end-of-use materials are often driven by the informal sector as they have not yet fully implemented international

¹¹ Ian Hartwell & James Marco, Management of intellectual property uncertainty in a remanufacturing strategy for automotive energy storage systems, Springer Links, <https://link.springer.com/article/10.1186/s13243-016-0025-z>, (7 May 2020, 02:54 PM).

¹² *Supra.*, at 7.

conventions or established uniform regulations on the re-entry of products and components into global recycling loops. This results in inefficient reprocessing, as well as health and safety hazards for the workers involved.¹³

- A proper balance of just how much know-how is being exported by the OEM should be evaluated. Access-over-ownership business model depends on prioritizing service over product.¹⁴

For maximization of product reuse, verified local third parties of a particular region should be allowed to form local collection centers and local distribution channels for remanufacturing and redistributing such products back to the same region. This offers many benefits such as decreased logistics cost of transport and local job creations.

4. Is it feasible to follow a uniform guideline for the trade in remanufacturing industries?

1.8 Research Methods applied to test the hypotheses

For this paper doctrinal method is being utilised as the researcher makes utilisation of different books, journal, etc. As mentioned in the bibliography. Researcher has utilised essential sources of information collection from primary and secondary sources. Researcher has followed Bluebook 19th version for citation and footnoting all through the researcher paper.

The following methods and types of data shall be taken into consideration during the research:

1. **Critical Doctrinal Analysis/ Black Letter Doctrinal Analysis:** What I want to establish from this line of research is a novel framework of guidelines that would go beyond all legal hurdles and facilitate an ease in cross border trade between developed and developing countries. Choose the required list of developed nations (eg: USA, The UK), G-20 developing nations (India, China), the sectors (automobiles/cartridge etc.) manufacturing companies (Mercedes Benz/ Fujifilms etc.) and their remanufacturing counterparts (Caterpillar/Komatsu) based in the aforementioned list of nations, and other explore other sets of questions to exhaust

¹³ *Id.*, at 4.

¹⁴ Interview with Jean-Philippe Hermine, Towards the Circular Economy: Accelerating the scale up across global supply chains, http://www3.weforum.org/docs/WEF_ENV_TowardsCircularEconomy_Report_2014.pdf, (30 April 2020, 09:54 AM).

my list of central research questions. Carry out **literature survey** of primary and **secondary** sources of legal frameworks of the related field. Carry out a comparative analysis of the national trade and IP framework of the developed countries and to focus on patent rights regime of selective developed and developing countries.

2. Qualitative and Quantitative Method
3. Carry out empirical research on bilateral and multilateral trade agreements governed by WTO amongst selected countries, on other cross border trade agreements-not governed by WTO (eg: OECD)- amongst selected countries which may or not follow WTO guidelines; and on concerned cross border private contracts.
4. Carry out literature survey of primary and secondary sources of the relevant APEC and G-20 agreements.
5. Carry out a comparative analysis of selected relevant international frameworks (BASEL Convention, etc) and bi/multilateral treaties (IP and trade law) between aforementioned countries via empirical research: A detailed study of relevant international IPR frameworks such as TRIPS, the Paris convention and the Madrid Protocol.

1.9 Research Design

Chapter I- this chapter consists of the Research proposal which outlines the introductory part of the paper and lays down various ways in which I am to prove the hypothesis of the dissertation. It lays down various references that formulate and strengthen the cause for working on this dissertation.

Chapter II- This chapter delves into the definition of remanufacturing, its position worldwide and a comparative analysis of patent infringement rights between USA and India in terms of remanufacturing. It also talks about chosen industries such as the automobile and cartridge industry and their relationship with remanufacturing in different countries.

Chapter III- This chapter deals with a comparative analysis of different countries' laws on the remanufacturing industry.

Chapter IV- This chapter deals with the effect of the international trade laws on the remanufacturing industry.

Chapter V- This chapter deals with the role of parallel importation in the international community in dealing with the remanufacturing industry.

Chapter VI- This chapter deals with the Patent infringement that is caused in the remanufacturing industry.

Chapter VII- This chapter deals with what supply loop would be best suited for specific countries in terms of optimum remanufacturing.

Chapter VIII- This chapter concludes the dissertation paper by providing certain remedial measures in the remanufacturing industry.

1.10 Originality of the intended work

There is independent information available on the IP and trade laws of both developed and developing countries sans any substantive linking of such laws which would facilitate cross country trade with regard to the remanufacturing industries. Only fragmented information about certain remanufacturing industries of developed countries is available. There is currently no comparative study that has been carried out in regard to easing laws cross country to facilitate the trade in the remanufacturing industry.

1.11 Impact

The uniform legal framework would endeavor to remove the trade barriers between developed and developing countries. This would benefit the society economically by increasing the profit margins, which were previously diminished by legal lacunae.

CHAPTER II-

2.1 What is the remanufacturing industry?

In the twenty-first century, one has witnessed a rapid global economic growth and it has been a major concern for the harm caused to the natural environment. It is paramount for the sustainable benefit of both, the environment and the people that a circular economy is developed which shall save the resources and the environment.¹⁵

The industries play a major role in the pollution caused to the environment and in particular the manufacturing industry of large mechanical and electrical products and the manufacturing process is growing on a day to day basis at an unstoppable rate. The plight is as such that this development in the name of manufactured products has increased our dependency on the same and has led to a surge in the demand of natural resources which has proportionally depleted the same. It is under the same guise that the remanufacturing industry is born. Remanufacturing industry which depends on the first business fixes and modifies scrap item by utilizing present day innovation.

Remanufacturing process basically transforms an old product into a new product wherein certain changes are made in the product quality-wise.

2.2 Difference in definitions:

- Reuse entails that one would use second hand products or its components without changing its core components or just making minor adjustments to extend its EOL stage. Reuse is making use of a product as it exists (example: reusing old clothes in thrift shops).
- Remanufacture is an extensive method wherein a product which reaches its EOL stage is processed through certain steps so that it can reach back to a stage of “almost as new” warranty stage and resold as a remanufactured product.
- Recycling is the phenomenon where raw materials are sent to a market which is secondary in nature to be reassembled/ reorganised.

¹⁵ What is remanufacturing?, <http://www.remanouncil.org/educate/remanufacturing-information/what-is-remanufacturing>, (10 December 2019, 18:23).

2.3 Manufacturing growth in India

The growth of manufacturing has seemed into one of the biggest developmental projects in India. In fact by the end of 2020, in terms of being the biggest assembling country, India is poised to be ranked 5th and Owing to various initiatives by the Government, India is expected to increase its assemblage sector opening by a 100 million by 2022¹⁶

Boeing, Siemens, Toshiba and other giants have invested in the importance of owning assemblage plants at various sites in India.¹⁷

2.4 Remanufacturing growth in India

Timken India Pvt, a leading manufacturing organisation. Ltd. offers its client the option of remanufacturing. Be that as it may, the car shops in India yet remain elusive of the remanufactured car items and have not yet adopted the practice.¹⁸ The looming question is that why have the Indian car manufacturers not opted for remanufactured car items and what is the reason the automobile industry is not developing in its business of remanufacturing in India? According to the Association ICRRA¹⁹, in India, approximately 10 % of laser toners that are sold are known to be remanufactured and approximately around 20 percent % are remanufactured. The businesses in Cartridge business admittedly prefer topping off the cartridge rather than remanufacturing (Jalihal,2009) and the most important reason behind this is the expenditure behind refilling as compared to remanufacturing.

2.5 Environmental Issue with remanufacturing in India

It can be ascertained that in this era of worldwide environmental change, we are being faced with the obligation of maintaining green belt to lessen the carbon emission and we need to have a better shot at the natural security to the country and the customers. Customary

¹⁶ India expected to be among top 5 manufacturing nations by 2020, https://www2.deloitte.com/in/en/pages/manufacturing/articles/global-manufacturing-competitiveness-index_msm_moved.html, (2 January 2020, 11:24).

¹⁷ James Beresford, Remanufacturing, The circular economy and China, (10 June 2020, 21:11), <https://www.cisl.cam.ac.uk/news/blog/remanufacturing-circular-economy-china>.

¹⁸ Sarvary and Wassenhove, Remanufacturing in India, <https://pdfs.semanticscholar.org/6f45/213c34c0d145c965a18795c9a7325115b67a.pdf>, (2 August 2020, 21:54).

¹⁹ Indian Cartridge Remanufacturers and Recyclers.

assembling is unsustainable as a result of its critical unfavorable natural effects. It is to be noted that any assembling process produces approximately 60% of the non-hazardous waste produced each year and it has led to contamination and deficiencies and has cost a significant amount of landfill.²⁰ (Winifred and Ijomah,2009). On the other hand, remanufacturing process encourages less utilization of materials during creation, and decreases the waste, and in this way helps in adding sound strong waste administration . Remanufacturing lessens raw material use, energy use, usage of water, etc.

2.6 Act of Remanufacturing can significantly help in providing great public benefit as far as a developing country is concerned and it can be achieved by doing the following:

1. Allow for the diffusion of technological aspects via various points of entry,
2. Creating an influence on the environment by means of industrialisation where the resources are conserved and
3. Entrepreneurs facilitated with opportunities.

A. What one learns via repairing:

Licensed items have brought innovation to the repair and restoration business. The repair of these items includes moving implicit information and expertise to creating economies. Proper repair mechanism holds its significance in World Trade Organization (WTO) nations. Remanufacturing tasks moderate the monetary hindrances to innovation. They set up a capital base for future modern updates. Moreover, new business openings associate developing countries to the more extensive innovative biological system, offering their maturing organizations financial open doors through "learning by doing" and examining buyer inclinations.

B. Promoting Resource Sustainability in China

The Chinese Circular Economy (CE) Law, declared in 2008, expressly recognized the natural advantages of empowering remanufacturing. Goliath brands have framed their own policies to counter the e-squander transfer issue and the outcome has mixed variations. For instance, in the first year, just 400 ink cartridges could be gathered by

²⁰ Winifred Ijomah, Design, Manufacturing and Engineering Management, BS 8887-2:2009, (2009).

Canon when they started to collect cartridges of ink that reached their EOL stage in China. Even when there is considerable accumulation, OEMs of ink cartridges for the most part don't top off their cartridges. Thus, instead of reusing, OEMs dismantle their EOL products to only salvage components they can use in other forms of businesses. These projects are commonly inevitable activities, wherein ink cartridges are transformed into bond, or expendable cameras are made into plastic pellets. Proper repair business invariably reduce the danger of unlawful waste transfer and guarantees more noteworthy ecological advantages than an OEM-worked reusing program, which ultimately conclude that recycle and reuse are advantageous to the environment and the resources. Developing countries should draft its own CE friendly regulations.

2.7 Regulatory Authorities in India on Remanufacturing Issues

It has been a decade since the manufacturing industries have come into existence and no strategy has yet been formulated. The industries have not yet established a ground for their existence.²¹ The Indian remanufacturing industry keeps on assuming that the need for its existence to be optional and even after over a time of its reality, it is yet to order itself and chalk out incredible techniques. The manufacturing industries have not yet been able to form associations for the long run and disenchantment of the consumers has been the root cause. It is submitted that remanufactured products are yet to be defined in the Policies of Foreign Trade in India. Import of products that are remanufactured are permitted against valid approved licenses. Light is thrown on the exclusiveness of the government in not being able to promote policies for its goods that are remanufactured. There is no familiarity with Govt. specialists on approaches to identify with remanufactured goods (IWTO, 2009).²² The article captures the methodology about remanufacturing of items but to our dismay it is nothing but a pessimistic approach. It is to be noted here that India is losing enormous resources and work openings because of such methodologies of administrative specialists. Today, top businesses like Caterpillar, GE and Timken and so on are occupied with remanufacturing of items. Car parts, cartridges, hardware, restorative gadgets and so on are significant enterprises in the remanufacturing business, which are being traded on a global scale. They

²¹ Sarvary and Wassenhove, Remanufacturing in India, <https://pdfs.semanticscholar.org/6f45/213c34c0d145c965a18795c9a7325115b67a.pdf>, (23 July 2020, 21:54).

²² IWTO, Market Access For Non-Agricultural Products, TN/MA/W/18/Add.16/Rev.2 (2008).

have secured \$100 billion business in remanufacturing and have extended their manufacturing footprint in Asia, Africa, Europe and Latin America, along with the greatest market being the USA. Developing Nations feel that such exchange of a remanufacturing item means transport of waste from the developed nations to them, which in doing so would shift the ecological and safety burden of these developed countries to the developing nations. India has allowed the import of used goods and merchandise from these developed nations without requiring an import permit. However, the irony is such that the Indian Government requires an import permit if in case the imported item belongs to the remanufactured category. This is because, India's Foreign Trade Policy, which came during October 2011 treats remanufactured merchandise equivalent to recycled items and has not made any separation among remanufactured, renovated, reconditioned and recycled products (FDB, 2011).²³

APRA's views on Remanufacturing Issues in India

The Automotive Parts Remanufacturers Associations (APRA) is one of the biggest entity working in the car remanufacturing industry. Many associations in the remanufacturing business are a part of APRA. The Chairman of APRA has advised the Indian Government to permit the exchange of remanufactured items as if they were new products (Bill Gager, 2011). The APRA President believes that the Indian Government's stand with regard to refusing remanufactured items in India, is equivalent to being against the use of natural arrangements and not giving feasible options in contrast to Indian customers.

options in contrast to Indian customers.

Work done by Associated Chambers of Commerce and Industry of India on Remanufacturing

Associated Chambers of Commerce and Industry of India widely known as ASSOCHAM has held a national workshop on 'Remanufacturing' in 2009 and has come up with various goals in order to attain a sustainable growth.²⁴ ASSOCHAM has also expressed their view

²³Mid Term Review, Foreign Trade Policy, <https://dgft.gov.in/sites/default/files/ft17-051217.pdf>, (12 June 2020, 13:11).

²⁴Nita Choudhry, REMANUFACTURING IN INDIA: APPROACHES. POTENTIAL & TECHNICAL CHALLENGES, Vol 3, 2011, p. 223-227.

that the Government of India should not seek import license for remanufactured items. Unique Equipment Manufacturers (OEMs) have a colossal piece of the overall industry in India and they ought to be permitted to be remanufacturers in the underlying stage. In addition, it has been held that it is because of the fear of new products being cannibalized, and that certain Original Equipment Manufacturers are not thinking of venturing into remanufacturing business (Jindal, 2009). Landfills of End-Of-Life (EOL) products are destructive to soil and water corruption and other unsafe impacts and subsequently remanufactured production is the genuine answer for decrease squander for economical development. For a new consumer, it is feasible to purchase a new remanufactured item as the price of the same would be capped at 30-35% below the market rate as compared to the new item. The item so remanufactured has to give the services at par as compared to the new product.

2.8 Remanufacturing in various sectors

Remanufacturing for Automotive/Earthmoving Sector

As far as remanufacturing is considered, the automobile vehicle business takes away the top position, with its longest conventional history. The automobile sector has given to this world the art of remanufacturing and assembling. Remanufacturing department in the automobile sector represents 66% of all the remanufacturing done and amounts for 53 billion dollar industry in the USA alone and an in any event 100 billion dollar industry all through the world.²⁵ 10% of all trucks require a motor substitution during their life. OEMs and remanufacturers revamp the same exhausted or damaged motors back to their unique gear execution particulars, conceivably in any event. About €120 million worth of remanufactured items were sold in 2005 around the world. What's more, 60 million bits of remanufactured items were delivered (Steinhilper, 1998). Caterpillar is the market chief for remanufacturing of earthmoving types of gear.

²⁵ Defining Remanufacturing, <https://www.melett.com/technicalarticles/defining-remanufacturing/>, (11 June 2020 19:22).

Remanufacturing of Cartridge

It is to be noted that the remanufacturing business in the Cartridge making industry is claimed to be a big business worldwide estimated around \$35 billion and it is estimated to contribute nearly thirty percent to \$115 billion cartridge business globally. HP is the market leader in the area of cartridge remanufacturing. Remanufacturing of Electronic/Electronics Items, Home Appliances Whirlpool is using remanufacturing technology. Many shops/showrooms are being established in India for used electronic/electric equipments like Television, Mobile phones.

2.9 India in line with international endeavours

Remanufacturing can have enormous effect on India as it will influence seriously its thriving industry and huge numbers based shoppers. Before India ratifies and signs off on the WTO based treaties, the accompanying issues should be explained:-

1. A meaning of remanufactured merchandise
2. Aversion of dumping
3. The nearness of different non-duty hindrances (NTBs, for example, import bans, higher levies and expenses, or stringent guideline, accreditation and review prerequisites. It ought not influence move of innovation)
4. Remanufactured merchandise ought to be characterized in the Foreign Trade Policy
5. Impact of remanufacturing on household producing
6. Ecological concern

In Basel Convention, two significant issues were talked about and chosen, for example specialized rules on electronic waste and incorporation of plastic waste in the (PIC) technique.²⁶ The draft specialized rules stipulated the conditions when utilized electrical and electronic gear were bound for direct reuse, fix, repair, or bound to be dumped as waste. India had significant reservations seeing these arrangements for re-use, fix, restoration as there was a plausibility of dumping from the developed nations to the developing nations.

²⁶ Oladele A Ogunseitan, THE BASEL CONVENTION AND E-WASTE: TRANSLATION OF SCIENTIFIC UNCERTAINTY TO PROTECTIVE POLICY, 1(6), (2013), p 313-314.

The Indian dignitaries unequivocally questioned the proposed choice on these rules in its entirety and didn't enable it to be ratified and signed.

2.10 The Patent Statutes with Teeth – USA

The Patent laws in US are governed by the statutes²⁷. The proprietary rights imbibed within a patent grant, the patent infringement is defined through such statutes. On a bare perusal of Section 154 we would understand that a patentee has the right to refuse others from using the patented product.

On the same footing if we read Section 271, it states, that if anyone makes, uses, offers to sell a patented product within United States it would tantamount to patent infringement.

The R's

Any product whether an article or an object, it has to be made, manufactured, produced and the same meaning has been rendered in the statute which in all soundness should be interpreted harmoniously and strictly as 'manufacturing'. With the advent of manufacturing and the laws in place to help the sector, one thing is left bereft and that is remanufacturing. The laws run dry and provide no help to the sector consistently dealing with the remanufacturing industry.

More so, the new era claims to have laid emphasis on the 'Reduce-Reuse-Recycle' cycle thereby encumbering the ever growing need to remanufacture a product. The need to remanufacture and to help set up an industry backed by sanctions and concrete laws has become innately important for the market. Remanufacturing is also termed as the most viable option as it saves the product from being scrapped or dismantling the same. It is also to be kept in mind that certain products have some shell life left which can be efficiently increased after remanufacturing it which is also cost effective and highly profitable at the same time with a sense of being environment friendly.

A Range of Possibilities

²⁷ The United States Patent and Trademark Office, 35 U.S.C §154, (1975); *and*; The United States Patent and Trademark Office, 35 U.S.C §271, (1975)

The life of any product is limited to an extent but the shell life of the same stays intact. The product needs to be revitalised to store the life back into it which is as good as new. In other ways, a product may also become unusable in many other ways which may not necessarily be related to its shell life. With a little servicing and repair the product is good to use. People tend to throw away the products after a hint of glitch but if the same product is reused by way of repairing the same would be more cost efficient and energy efficient. That would technically also help in emitting less carbon pollution. In other circumstances, where the product is sent for repair, it would not constitute to be any infringement if the same is being repaired by the service centre. For example if a mobile phone needs repairing if its battery dies, the service centre cannot be said to have caused an infringement by way of repairing the same.

Now comes the other sector of industries that while conducting any repair might overstep the line of patent infringement and can cause a series of litigation. Medical industry, automotive, large electronic equipment agencies carry huge risk while repairing the products. It is because the said products often require complex and substantial repair wherein something or other can occur thereby causing the same to have been infringed. The line between patent infringement and repair is very thin which might spark any outrage.

In line of the aforementioned arguments advanced one such product that has borne the brunt of being infringed time and again is the most used office product, being ink cartridges. It is for a fact that most OEM's in the printer business have adopted razor and blade business model which basically speaks of the profit market wherein the product is tend to be sold for cheap price and the services along with the supplies are tend to be costlier which is the actual money maker.

It is in light of the same, the remanufacturing industry has come up with sorts of supplies that are used for the printers. This has come as an opportunity for the small businesses that are plainly concerned with the remanufacturing industry which offer services such as refuelling of ink cartridges and replacement of toners which is much cheaper than the actual manufacturing company prices.

In order to subjugate such small business models, the manufacturers have come up with various lawsuits and litigation processes. The patent infringement lawsuits usually target the cartridge refilling, reusing market wherein the OEM's are trying hard to limit their products to one time use only which would initially cut off the dependency of the customers on small business models. Such practice would help the OEM's to an extent and help them retain the customers along with their revenue. But the remanufacturers are determined to fight this

tooth and nail and owing to it they have in turn responded with chips and software to override the programmes, sparking controversies and adding to more litigation.²⁸

The Question

The big question that looms over the manufacturing and the remanufacturing market concerning the patent is that at what degree the refurbishment of a product patented earlier would come within the definition of ‘making’ laid under the statutes. Out of this equation, one principle that comes to the mind is patent exhaustion doctrine.²⁹ The doctrine avers that any patent protected product sold to a customer, would exhaust the patent holder’s right over the patented product can no longer control the actions borne after such sale of a product. In other terms, if the same is to be interpreted along with the recent trend it can be ascertained that the owner of the product who has no say over the patent is the ultimate user of the product and it is they who decide what to do with the product and more importantly. ‘how they do it’. The owner of the product now enjoys all the rights and he can exercise his freedom to choose between reuse, repair or reassemble the item or more so transfer it to another party.

In light of the same, the Supreme Court in its ruling³⁰ has held that any element which forms part of the end product, wherein the end product is not actually patented, such elements can claim patent, irrespective of how important such elements are to the end product and the right to preserve the patented product accrues upon the user.

The Court held that the maintenance of any patented end product by replacing an unpatented spent element of such product would not constitute manufacturing and hence would not be an infringement.

In this context, one thing that comes out of the equation which can be an infringement, is that if the remanufacturer rebuilds the whole patented product and the same would be reconstruction. Patentees have come up with the ‘single use only’ doctrine in order to beat down the remanufacturing industry so as to suppress any interpretation of remaking.

²⁸ Lexmark Int’l v. Static Control Components, 387 F.3d 522

²⁹ Bloomer v. McQuewan 55 U.S. (14 How.) 539, 549, (1853).

³⁰ Aro Mfg. Co. v. Convertible Top Replacement, 365 U.S. 336, 5 L.Ed.2d 592, 81 S.Ct. 599, 128 USPQ 354 (1961).

The above mentioned can be read in light of the 1992 case,³¹ wherein Court of Appeals deciding on a matter involving medical device held that any patent owner enjoys the right to sell his product with a notice to the purchaser which would limit the disposition of such a product. Setting the precedent, now a patentee can sell his product that would also proscribe the repair, replacement or enhancement or modification of the product.

Supreme Court vide its Quanta³² judgment in reaffirmed the patent exhaustion doctrine. Somehow, the said case was not per se concerning any patented product but the settled position was applied in the Static³³ case wherein, the petitioner was a toner cartridge remanufacturer and the defendant was an OEM. The case was thus involving the defendant's application of the one-time use doctrine and the use of the 'shrink wrap' policy and restrictive notices prohibiting the use of the product and thereby not allowing the same to be remanufactured.

In light of the same, the Supreme Court was prudent enough to apply the precedent set in Quanta Computer and ruled in favour of SCC and denying cartridge patents to Lexmark.

A Moving Target

The precedents have a history of evolving with time, because the technology evolves and so do the laws, thereby raising the bar higher every time and producing an all-encompassing precedents. The remanufacturing industry can be said to have caused ripples in the industry and particularly providing an eye to the judicial front to read into the laws more meticulously and setting better precedents.

It is highly advised for remanufacturing business that one should always be aware of the products they tend to remanufacture, the legality of such remanufacturing and the patents involved with the products. It should be always borne in the mind that if any new product is being invented or a new method of remanufacturing is born, it is a valuable patentable invention.

³¹ Mallinckrodt, Inc. v. Medipart, Inc., 976 F.2d 700, Fed. Cir., (1992).

³² Quanta Computer v. LG Electronics, 553 U.S. 617, (2008).

³³ Supra.

2.11 Remanufacturing cartridges- USA

It is necessary to be a better judge and admire the benefits accruing out of the remanufacturing industry as well. The history would not be kinder to those who neglect the emergence, the importance of the industry. The industry was easily promoted during the early 2000's and the cartridges were not a common thing back then with less strict laws. The industry gave a boom of approximately US\$ 8 billion to the economy and was the backbone of the electronic sector.

The benefits are as follows:

ENVIRONMENTAL

- 27 million pounds (12.3 million kgs) industrial grade plastic reused.
- 73 million quarts oil (69.5 million liters) conserved.

CONSUMER CHOICE

- Usually cost between 50 and 90 percent of a new cartridge;
- Often provided free printer service;

SMALL BUSINESSES

- Local remanufacturers were good for local economies;
- 34,000 people employed by the U.S. industry;

It has not been disputed by anyone and at the cost of reiteration, it is stated that remanufacturing industry is by far a cost efficient and a surplus industry that provides an edge to the remanufactured product over the OEM's product. The competition is fair and square and the fight is mostly limited to the technological and marketing impediments.

The market has changed drastically and new players have entered the arena that have caused these OEM's fortune. New Built Cartridges (NBC) have been launched which have captured the market and have forced the OEMs to counter the move with lawsuits. The OEMs are forced and coaxed to put out massive patent infringement suits to stop the NBCs. Epson, HP, Lexmark and others did bring suits, and some imports were blocked. But somehow, more NBC players have entered the market and there has been no opposition from Canon who is

enjoying the laser cartridge patent technology. In the beginning, these remanufactured products were put under the scanner for their quality and the legal lacunae's but overtime, the industry has settled its patent infringement laws and the legal hurdles therein. Some of these products even vetted for international property issues. In my opinion here is why I believe remanufactured cartridges remain the better option.

Quality

The whole story behind the remanufacturing problems has been explained by Luke Goldberg, executive Vice President of Global Sales and Marketing, Clover Imaging Group was that the quality of new molds is quite inferior to that of the molds produced by OEMs and once the molds age, it creates a gap which might tamper the cartridges.

The components of an ink cartridge are one of its kind and provide technological advancement. The domestic market has taken too long to reach the status where it is now and decades have passed before it could even take control of the smaller technologies that form an ink cartridge.

Any US\$3 ink cartridge in US cannot be said to have the same quality as that of the ink cartridges produced by the OEM's and it is also claimed that it cannot be said have complied with all the patent issues circling the ink cartridge. Goldberg claimed that unsolicited third party remanufacturers pitch their business daily and that too patent free products showing us how the remanufacturing has over taken the industry.

In today's time, internet has become a platform for sale of the ink cartridges. While researching for the NBC's listed on these internet markets, one of the products by an OEM had a negative review to it.

The end consumers do need their value for money and they are quite strong headed when it comes to certain products.

Legal Concerns

The remanufacturing industry owes a debt to the doctrine of 'right to repair' which has helped the market survive and let the remanufacturers work without any risk of patent

infringement. It has been settled via various US Court judgments that any person owning a car, computer and cartridge has the right to repair it as he deems fit.

The OEMs have tried their best to keep such remanufacturers at bay and dissuade the consumers from approaching the remanufacturers as and when required and instead they should purchase the concerned component of the cartridge from the certified OEMs. The OEMs have relied on the intellectual property laws to back their sanctions on the said products so as to counter the move. Various lawsuits have also been brought in to fight each other.

It was in 2017 that the issue was finally settled by the US Supreme Court wherein it was held that any patent right accruing on a product and specifically cartridge would cease to exist once the product is sold thereafter.

In 2017, cartridge remanufacturing industry issues were decided by U.S. Supreme Court, which found that patent rights (cartridges, specifically) were exhausted after the first sale made domestically or overseas.

The decision of the court is termed as the masterstroke settling the precedent once and for all in favour of the remanufacturers. As far as the remanufactured cartridges are concerned, almost all of them have resolved the patent issues looming over them but some of them are still in loop with the OEMs.

All the major cartridge producing companies such as Epson, Lexmark and HP have sought to bring in patent infringement lawsuits against the imported cartridges and Canon has also joined the queue and has brought various lawsuits pertaining to patent infringement of its gears. Canon has recently in a lawsuit filed against California based Kostland Inc. for its new process also being used in HP's JetIntelligence Technology.

Experts in the industry feel that Canon now is ready to take on the fight. The JetIntelligence technology is an ever growing component of the HP LaserJet model printers since 2015 and the technology is an ever growing concept which is right now posing threat to the third party cartridges.

Environmental Benefits

In today's time, the customers have become more environmentally aware and are concerned about their surroundings. With the ever looming threat to the environment, the corporate customers in particular have turned to economic friendly cartridges that does not have a long lasting effect on the environment with its carbon footprint. The current dispensation is not as equipped as the remanufacturing industry.

Clover, the biggest cartridge remanufacturing industry pips its product's environmental benefits on its face and sells the same. Goldberg claims that the company consumes less materials and natural resources and therefore have less energy and have lesser impact on the environment. Clover offers total logistic support for remanufacturing and recycling.

With China at the forefront of the environmental pollution, plastic producers are being targeted with NBC manufacturers at the frontline. The company has cast negative environmental impact and given China's pollution rate, the government has been trying its level best to present a more reliable world for the future . The Chinese Government is quite serious about the issues and the same can be ascertained from the fact that many industries are being shut down so as to reduce the pollution, One of the targeted provinces is Guangdong, home to Zhuhai and its host of cartridge-producing manufacturers. Global Sources has said that Chinese ministry of Environment has taken a strong objection to the Chinese factories which are polluting the air and this has led to the shutting down on major companies. The manufacturing growth has taken a toll on the environment. Whosoever is not complying with the environmental laws has to shut down the production immediately.

The question lies in the garb of the future if the Chinese Government is ready to shut down the suppliers or if Canon shoves importation ban on the NBC's. You've locked into the lower-priced cartridges, and as a result, your business' future may hang in the balance.

Chapter III- Global Policies

3.1 National status and policy on remanufacturing industry

A. Korea

With the ever growing need for remanufacturing and then thereafter the need for having solid legislation and sanction has made many first world nations, having a large remanufacturing market, realise that the market has adopted the remanufacturing model and that it need to be protected at all costs. And to achieve this feat the nations need to have a strict guideline, laws, rules etc.

It is to be known that Korea is the first nation in the progressive world that has come up with the exact solution and has drafted the policy in the form of a national guideline that marks the quality of the remanufactured product and thereafter it is certified. This whole process is aimed to enhance the remanufactured product's quality and spark a sense of competitiveness given the growing impact of the remanufactured products. It is also being done with the perspective to set the liability of the remanufacturers if the product fails to work.

The Korean Government is itself promoting the policy pursuant to the remanufactured products and its certification.³⁴ The Government has been preparing the legal framework for the remanufactured industry and its growth since 2005 and the industry has been given the responsibility to restart the remanufacturing market strategy 2011 and the boom up strategy from 2013. It should not come as a surprise to us if the Korean market today stands at around 750 billion Korean Won and it has been growing ever since. Korea is the leader manufacturer in automobiles, phones, and office stationary related electronics and for the same reason it is also the hub to one of the biggest manufacturers of automotive parts, toner cartridge and chemical catalyst.

³⁴ 21, Hong-Yoon Kang, Young-Chun Kim, Il-Seuk Lee. CURRENT STATUS AND PROMOTIONAL MEASURES OF DOMESTIC AND OVERSEAS REMANUFACTURING INDUSTRY, J. of Korean Inst. of Resources Recycling, No. 4, (2012), p. 3-15.

It cannot be overlooked that all most all the remanufacturers belong to the medium or small scale industries and have less than 50 employees and also that the Korean market is smaller than the US and the European market.

The main reason behind this distance is not having the optimum technology and insufficient production and it has an impact on the customer awareness and reliability. The Government of Korea is adamant on resolving such issues and has been promoting the strategy to activate the remanufacturing industry and to drive the customers to a sense of security and reliability over the products.

The legislation is not just aimed at promoting consumer based needs but also setting up a healthy market with competitiveness and weeding out the monopolistic game plan of OEMs. The government has made the certification system mandatory on automotive parts, electrical and electronic items so as to make the products more reliable and increase the scope of quality certification system. The Government is not just aiming to promote remanufacturing by way of such legislations and regulations but also with the help of Universities, Colleges, Association. New courses are being promoted and various studies are being touted to be introduced in the curriculum so as to make people aware about remanufacturing.

CRIMKIIT³⁵ are working closely with Korean Government to promote remanufacturing and it has been appointed as a professional research agency and has also been given the charge of technical developments, remanufacturing and resource circulation. Korean Government has given Korea Automotive Technology Institute with the task of certifying the automobile parts being remanufactured and the same institute conducts various research on sustainable development models.

B. China

In the emergence of technology and its advent, China comes as the biggest promoter and manufacturer of almost all the products existing in the world today. China, by far has the biggest market in the world when it comes to electronic, electrical equipment.

³⁵ Centre for Resources Information and Management of Korea Institute of Industrial Technology.

China has been a hub for remanufacturers and it has come up with an indigenous copy of almost all the products in the world. The Chinese Government has started to realise the worth of the remanufacturing industry and in lieu of the same, the government has been promoting remanufacturing policies. The aim is to reduce the carbon emission and also the industrial waste to an extent. The Government has openly supported the cause of remanufacturing back in 2005 by way of 'Opinions on Accelerating the Development of Circular Economy', a policy presented by the State Council.

In 2001, the department of General Armaments had established 'National Key Laboratory for Remanufacturing Technology', which was specialised to develop core remanufacturing technologies and bring them into existence. China has been prominently promoting the cause of remanufacturing and has actively been trying to motivate the end consumer to purchase remanufactured products that are initially going to help the Chinese economy. In 2009, Chinese Academy of Sciences came up with the roadmap for remanufacturing in key 18 sectors such as health, marine, energy, information and broadcasting and thereafter also chose remanufacturing, reusing, recycling and disassembly as innovative practices which would be impactful and important for the Chinese economy.³⁶

Chinese government passed the Circular Economy Promotion Law back in 2008 to provide teeth to the remanufacturers across the country and to help the consumers buy products with ease and imbibe a sense of security. The law gives a legal basis for the upliftment of the remanufacturing industry and specifies the role of various agencies in revitalisation of market, quality parameter for products and labelling as well.

China's model of economic development circumvents the 5 year plan which lays out the criteria for every move. It is vide the 12th five year plan (2011-2015) that Government resolved to bring the remanufacturers and their business on the map of China. The Government has also brought in the legislation to help remanufacturers and their business by way of economic help, certification, fostering experts in the industry, establishing a proper management system with hassle free channels to help the industry. The Government

³⁶ Li Yong, China's Strategy and Policy of Remanufacturing, China Association of International Trade; (2011).

is adamant on improving public relations and help them understand the benefit of the market of remanufactured goods.

C. Japan

Japan is one of the important players in the remanufacturing industry. Hub to one of the largest automobile sector and the electronic centre, the country is yet to have a proper sanctioned legislation for the remanufacturing industry. Whatever policies exist are not sufficient for the current dispensation and it needs an overhauling of the policies driven around powered under the aegis of such laws.³⁷

In 2012, the reported automobile repair market in Japan alone stood at 238 billion Yen out of which 129 billion Yen went to the reused parts and 109 billion yen for recycling process. Major marketing products in the remanufacturing industry belong to the automotive parts, ink cartridges and photocopier machines. The Japanese market is controlled by private players as far as remanufacturing is concerned and it depends on 3R's being reduction, reuse and recycle. This was done more so to minimise on the waste treatment cost as the Japanese Government

vide its new Environmental Law policy increased the cost of waste disposal and had set for environment friendly products. The same was being done not only to help improve the environmental health but also to increase the wealth of the nation and trigger better economic opportunities.

Such efforts were encouraged to improve welfare and stimulate economic activities.³⁸ Japan's two most talked about environmental policies, Basic Law for Environmental Pollution Control and Nature Conservation Law enacted in 1967 and 1972 provide substance for environment friendly products and depicts the seriousness of the government of the day as far as environment is concerned. Further laws were followed by another bunch of environment friendly laws for Establishing a Sound Material Cycle Society.

The practice of proper usage of a product was by means of remanufacturing, reuse and recycling and it was preached so much so that it would later become a norm. The Home

³⁷ Eric D. Ramsterr, REMANUFACTURING AND THE 3RS IN JAPAN: LESSONS FOR THAILAND, Graduate School of Economics, Kyushu University, Japan; (2011).

³⁸ 1, Mitsutaka Matsumoto, Yasushi Umeda, AN ANALYSIS OF REMANUFACTURING PRACTICES IN JAPAN, JOURNAL OF REMANUFACTURING, (2011).

Appliance Laws³⁹ and EOL Laws⁴⁰ had predicted earlier for the lack of landfill sites. It is still that OEMs have not caved in to help the remanufacturing industry advance.

D. European Union

The European Union market delving in electronic items is most commonly found in Germany and UK. It is also the hub of various other technological advancement such as aerospace, biological equipment, ink cartridges, machines, automobile brands. Even though the market share is not calculated but it looms somewhere close to 2.4 billion Euro.⁴¹

European Union too has realised the worth of remanufacturing industries and its market share and resultantly, European Commission has made several significant contributions to help remanufacturing industry grow and facilitate more revenue. The European Union has never backed out of the fight and in fact has stepped up and sanctioned certain directives and laws so as to recognise the sector and regulate its business such as End-of-Vehicles (ELV) made it more subtle for the consumers to use automotive parts which had been remanufactured, whereas the WEEE⁴² policy made it easy for the people to sell and use waste home appliances. The Government has been innovative and has brought forth the Block Exemption Regulation which brings both OEMs and remanufacturers to the table to increase competition across the spectrum.

In a first, the institutions have also come up to join the cause of promoting the remanufacturing business across Europe through CRR⁴³. It helps in rendering public research and technical information to the students. Bayreuth University, Germany, Linköping University, Sweden, and Delft University of Technology, Netherlands have been the major promoters of the cause but somehow the whole European Union is not on the same page so as to revive the remanufacturing industry across Europe.

³⁹ Home Appliance Recycling Law, (2001).

⁴⁰ End-of-Life Vehicles Recycling Regulations, (2001).

⁴¹ 14 USITC, REMANUFACTURED GOODS: AN OVERVIEW OF THE U.S. AND GLOBAL INDUSTRIES, MARKETS, AND TRADE; Investigation No. 332-525, (2012).

⁴² Waste Electrical and Electronic Equipment.

⁴³ Centre for Remanufacturing & Reuse.

E. USA

Speaking of the remanufacturing business, the only giant that crosses our mind is the United States of America and there can be no other player bigger than this country. Literally, home to the biggest consumer base, the market boasts of a revenue which is more than the collective revenue of the leading remanufacturing nations.

The remanufacturing market in US was created out of spontaneity, wherein the market demand shot the skies. The Government of the day through its various organs vis a vis the Federal Trade Commission, officially had given the permission to its remanufacturers to label their products 'remanufactured in the USA' in 1998, and somehow the US Government was blessed to have its OEMs on board.

The OEMs had actively taken part in remanufacturing process and were actually supporting the cause while helping the remanufacturers by making great contributions to the quality parameter of the product which would imbibe a sense of security in consumers. This was a major step up for the American market as it found an impetus in such support. The US Government was also not behind to enact certain laws that would prompt the facilitation of remanufactured products and their consumption. Out of the 51 states, nearly 20 states have adopted the remanufacturing laws and have supported the market so as to have manifold benefits.

These states by means of such endorsement have aimed at providing tax benefits on the remanufactured products. USITC⁴⁴ is responsible for keeping the tab on remanufacturing and hence is accustomed with all the latest news, data relevant to the remanufacturing industry and foreign trade in United States.

The USITC has classified the remanufacturing industry such as medical device, automobile parts, consumer goods, IT product, restaurant device, treaded tires, office furniture, train, machinery, heavy equipment, electronic, aerospace.

One thing that has come up as a surprise like many other nations, is that the universities, private institutes and the research institutes in US are also promoting the remanufacturing

⁴⁴ United States International Trade Commission.

drive and centrally funded centres such as CRRR⁴⁵ of R.I.T., APRA⁴⁶, PERA⁴⁷, and RIC⁴⁸ are indulged in the process of imbibing the habit of buying remanufactured products amongst the citizens.

3.2 Certification systems for quality assurance activities for remanufactured products

A. Korea

Now coming onto the certification process, the Govt of Korean has prepped itself up and has actually drafted the laws governing the remanufacturing industry and it has been doing so since 2005. The government is busy promoting the remanufacturing market and is making its citizens aware of the remanufactured products and its benefits to the economy and to the environment as well.⁴⁹

In doing so the government has been promoting the cause and along with it they have adopted the quality certification system for the sake of the consumer. In any case, the last person in remanufacturing cycle is the consumer and their satisfaction is the most important aspect of this whole remanufacturing loop. If it is not for the security and a sense of reliability of the consumer on the remanufactured product, the whole market can collapse.

The Act⁵⁰ is the government's way of introducing the competitiveness in the market both technologically and environmentally. The Act promotes the certification scheme and boasts research and developmental efforts. The certification point itself helps the consumer choose wisely while buying a product and helps him place his reliance and trust at the sight of any certification. Any remanufactured product is always at the loss of losing its clientele because the price is comparatively cheaper than the actual product and the same makes any consumer think twice and forces him reason out the price gap as to why the same products made from same materials.

⁴⁵ Centre for Remanufacturing and Resource Recovery.

⁴⁶ Automotive Parts Remanufacturers Association.

⁴⁷ Production Engine Remanufacturers Association.

⁴⁸ Remanufacturing Industries Council.

⁴⁹ Korea Institute of Industrial Technology, Ministry of Trade, Industry and Energy, Korea Institute of Energy Technology Evaluation and Planning. Resource Circulation Technology Roadmap; (2014).

⁵⁰ Promotion of the Conversion into Environmental-friendly Industrial Structure.

It is after attracting the clientele the revenue is tend to go up and with this revenue, the government wants to bring in new investment to the remanufacturers. Korean Agency⁵¹ for helps in ascertaining the quality certificate for remanufactured products.⁵²

B. China

As far as China is concerned, the most important aspect of any business vcenture is to meet the environmental protection and resource preservation criteria. These two policies form the girth and thrust of any venture coming up in China. The Government itself is engaged in the day to day activities so as to conserve energy and reduce waste emissions.

The government has put restrictions on the traditional mass production and the mass consumption and the same needs to be addressed via a virtuous cycle system. The Chinese government has always been on its toes and hence, the Ministry of Industry and Information Technology (MIIT) has come up with the implementation guideline in 2010 to facilitate remanufacturing.

The guidance so issued has hit the markets and it has been enacted so as to help the people. The guidance currently helps take on general machinery. The process is very simple and subtle as far as the product certification procedure is concerned, Ministry generally announces the results after performing examination and evaluation. In china, the remanufacturers have to apply voluntarily for the quality certification and not making every specific item subject to certification. As for the product certification procedure, test result are announced after conducting initial examination and evaluation. The remanufacturing quality certification system of China says that the individual companies will have to voluntarily apply for quality certification. No specific items subject to certification individually.

C. Japan

In Japan has come up with the quality assurance parameter and the review standard in 2011 and it has been resolved to put quality assurance labels on the remanufactured products. Even the OEMs such as Nippon has caved in and has been using remanufactured products

⁵¹ Korean Agency for Technology and Standards.

⁵² Korean Agency for Technology and Standards, Quality certification for remanufactured products, Notification No. 2014-1000 of Korean Agency for Technology and Standards, (2014).

and has been running quality tests and assurances on the products. The Association of Japan Cartridge Remanufacturers have adopted the national policy and runs a quality test and establishes environmental standards for recycled and remanufactured products, an ink cartridge which is being remanufactured in the country is being sold along with quality assurance tag and the same are high quality and easy to use.

As far as the benchmark for achieving such clearances, one has to pass the criteria's concerning environmental management and quality management before even launching the remanufactured product in the market. The Japanese Government has issued guidelines to its Land, Infrastructure, Transport and Tourism departments to provide the quality assurance and to promote use of recycled automobiles products. Not only this, other ministries such as department of economy, trade and industry has started to conduct studies and researches on development of recycling of parts of automobiles and thereafter with the help of the observation made during such research and study these departments provide information to the automobile users about the safety measures, patent infringement and offers worthy information about the product.

With the advent of such futuristic plans and policies, the market is swell and is ripe to introduce remanufacturing as an opportunity and it should be made mandatory for people owning products that can be remanufactured. Remanufactured products if sold with the assurances is expected to be one of the most reliable by product and it would eventually expand the market.

D. European Union

In Europe quality certification authority lies with the ISO, i.e. International Organization for Standardization and most of the countries rely on it to procure the certification of the remanufactured product. The automotive remanufacturers use the same parameters for security, safety and reliability of the products as used in automotive manufacturing market.

British Standard Institution has launched the Design for manufacture, Assembly, Disassembly and end of life process as the set benchmark for remanufacturers to follow while remanufacturing a product. It is also to be known that certification of medical devices along with aerospace products is not conducted in UK but in United States.

The remanufactured products to be used in aerospace industry can be produced by the companies which have complied and granted certification by EASA⁵³. No other agency is certified to produce any product related to aerospace. Now if Germany is taken into consideration, it follows the ISO and VSA 6.1 model, which is run and operated by the German Association of the Automotive Industry (VDA for its automobile industry.⁵⁴ The consumer protection laws there give a minimum of 1 year quality assurance over the remanufactured products. As far as Netherlands is concerned, it depends on a lot of testing and certification agencies such as ISO to obtain certification for their remanufactured products.⁵⁵

E. USA

The hub of the biggest remanufacturing market has its laws and agencies pursuant to remanufacturing and it has one of the most vibrant quality assurance and testing machinery in place. The companies in US perform the quality and assurance tests.

Large companies such as General Electronics, Ford, CISCO, Caterpillar although OEMs at one instance, never shove the lackadaisical approach towards any quality certification and testing of the products. The prudence of such companies has helped US remanufacturing market grow beyond imagination. These companies provide quality assurances even after sale of any product.

It is to be noted here that all the products irrespective of their origin whether manufactured or remanufactured are put through the same tests and trials which helps the company assess the quality of a refurbished product as compared to a newly manufactured product. In aerospace sector, the remanufactured products such as aircrafts are first restored to the existing conditions of a new product done through MRO⁵⁶ and then thereafter are certified by FAA.

⁵³ European Aviation Safety Agency.

⁵⁴ Rolf Steinhilper, REMANUFACTURING: THE ULTIMATE FORM OF RECYCLING, Fraunhofer IRB Verlag, Stuttgart; (1998), p. 43.

⁵⁵ European Toner and Inkjet Remanufacturers Association, <http://www.etira.org>, (9 August 2020, 21:54).

⁵⁶ Maintenance, Repair & Overhaul.

3.3 Discussion

Across the spectrum and the companies that are engaged in the manufacturing business, it can be very vividly observed that remanufacturing is the most suited option when it comes to new products. The industry is the need of the hour and it cannot be substituted with any other product. Even if any new product is manufactured at a lesser cost than remanufacturing it should still not be able to fill the void of the remanufacturing market.

The industry is not just economically balanced but is also environmentally vibrant and sensitive.⁵⁷ The industry is reliant on new products and the products which have a far reaching support amongst the consumers. The industry needs revitalisation of the individual markets and to command cross boundary co-operation. The countries which are delving in the issue themselves need to make sure the government and the private partners are exchanging their policies and the experiences with their counterparts. International remanufacturing is also to be prepared to increase product liability of the remanufactured product.

It is a set tone for all the countries in Europe that remanufacturing country and company has to be discussed so as to remanufacture quality certification and import and exchange issues. Another aspect of this remanufacturing business is to provide reliability to the products so produced. It is touted that a standardised committee to declare the remanufactured product is in place and to help the consumers from being duped.

The experts in the field through the academic exchanges like GCSM⁵⁸ should promote standardisation of remanufactured products and every nation should through the proper channels and it has to provide co-operation method of their country.

International Organization for Standardization (ISO) happens to be a non-governmental front and is spread in almost 163 nations.⁵⁹ Such organisations act as a pool for the members

⁵⁷ 8(3), Hong-Yoon Kang, BENIFITS OF REMANUFACTURING AND ITS PROMOTING POLICY, GEOSYSTEM ENGINEERING, (2005), p 71-74.

⁵⁸ Global Conference on Sustainable Manufacturing.

⁵⁹ ISO, <http://www.iso.org/iso/home/standards.htm>. Table 2. Summary of the various remanufacturing system by country
Country Main Agent Certification System Law System Specialized Organization
Korea Public ·Quality certification notification for remanufactured products ·the Act on the promotion of the conversion into Environmental-friendly Industrial structure ·KITECH
China Public ·The implementation guidance on the measurement and verification for remanufactured products ·Circular Economy Promotion Law ·CAS
Japan Private ·Environmental standards and quality standards of the cartridge recycling products

wherein the advanced nations drop in the guidelines, rules and regulations which can be tapped by other players who are not that technologically sound. Certification of the product is the first step to look into the matter and provide the requisite help needed. Public procurement is also believed to have improved the remanufactured product.

The Korean government has not stopped working tirelessly for the remanufacturing business and through the Product system and products with the best technology and quality.⁶⁰ Korea's public procurement policy looks after the industries world-wide. It is to be seen that remanufactured products with a quality certification with great quality assurance are publicly available. Looking at the same, the remanufacturers have a greater task at their hands as they have to deliver the product as it will bring greater profit with the consumers.

It should be known very well that in order to make this a success, every nation who has been a part of the campaign should have long terms and co-operation with other nations as well. We need more and more case studies along with research in order to assess the quality certification system. It is to be known that the quality of the remanufactured product is of utmost importance as it is the quality that attracts the end consumers. We have enough resources at our end to conduct new researches and studies to help understand the concept and to focus on the undeveloped areas. Projects would help us make the national quality certification systems of remanufactured products.

3.4 Conclusions

Summary remanufacturing system by various country

Throughout this whole paper, one thing that has come out strongly is that countries are promoting remanufacturing with all their zeal and zest. The Korean and Chinese Government have adopted remanufacturing and are working to establish it as an alternative. National strategies have been planned by these governments and it is being promoted by the governmental agencies.

·Home Appliance Recycling Law ·End-of-Life Vehicles Recycling Law ·JAPRA ·AJCR EU Private ·Vendor Self Qualification ·ELV(End-of life Vehicles) ·BER(Block Exemption Regulation) ·CRR ·Bayreuth Univ. USA Private ·Vendor Self Qualification ·State laws for public procurement for remanufactured product, tax benefit etc. ·RIT ·APRA

⁶⁰ Hong-Yoon Kang, Young-Chun Kim, CURRENT STATUS AND TREND OF KOREA'S REMANUFACTURING R&D IN THE FIELD OF AUTOMOTIVE PARTS, Auto Journal, (2012), p 20-24.

The governments are establishing national quality certification standards and it is aimed at expanding the market. It is a given fact that a product would have a far reaching effect on the consumers if the same is backed by the government and protected by sanctions. In light of the same, even the Japanese Government is aimed to promote the remanufacturing model through sanctions and expand its market base amongst the consumers through quality certification models. The government has already started to plan standard development of reuse and recycle policy. More specifically, the automobile industry has been backed by the government to reuse and rebuild parts.

The United States works at the federal and the state level and both have come across the spectrum to encourage the manufacturing industry. It can be seen that many organs of government are aimed at providing help to the manufacturing market with data, statistics and future plans. The trajectory can be set with help of such studies and that would point out where we should focus to resolve the issues cropping up in the remanufacturing market. United States International Trade Commission (USITC), is one such government organisation offers active support.

If we move east we would find that even the European Union is aimed to provide sustenance and support to the remanufacturing industry. With help of research, studies, various data state owned organisations are working closely with remanufacturers and is trying to promote the industry. They are connecting various markets over the globe so as to provide help to remanufacturers by means of supply of raw material, production, packaging, promotion, distribution. The Governmental agencies are keen on the quality assurance parameter.

Korea has a huge range of the remanufactured products but as of now the government is sanctioning quality assurance certification only to the automotive parts and electronic spares.

Chapter IV: Trade Regulations dictating the Remanufacturing industries.

4.1 Introduction

Remanufacturing a product is not just limited to any one nation as it calls for various components that travel across the world to reach the remanufacturer. Companies have set up international offices that procure the raw material and then export the remanufactured products all over the world.

For example, Komatsu and Caterpillar the industry giants have set up international offices and they tend to procure the raw material, basically parts of heavy machinery from such places and send it to their remanufacturing unit and from there they export it to the whole world.⁶¹ However, there appears to be some kind of obstacles as many developing countries are not yet allowing the trade to continue as they have put certain restrictions on second hand goods and waste material.⁶²

This paper provides an insight on cores and the remanufactured goods related trade and the business that accrues out of it. We also discuss the regulations that have been put in place to promote the remanufacturing market. Section 2 and 3 speak of the international trade as well as the restrictions that come with it. Section 4 speaks about the future perspective on trade of remanufactured goods.

4.2 Remanufacturing with regard to International Trade

The following tables showcase how developing countries are biased against the trade of remanufactured items or items that are to be remanufactured.^{63 64}

⁶¹Michikazu Kojim, (ed.), INTERNATIONAL REUSE AND DEVELOPING COUNTRIES: TRANSBOUNDARY TRANSACTION OF USED GOODS. CHINA: Institute of Developing Economies, (2014), p 3-27.

⁶² United States International Trade Commission. Remanufactured Goods: an Overview of the U.S. and Trade. Washiton D.C.: United States International Trade Commission, (2012).

⁶³ UN Comtrade, <https://comtrade.un.org/>, (12 June 2020, 15:34).

⁶⁴Non tariff Measure (NTMs)–Remanufacturing, <http://www.apec.org/Groups/Committee-on-Trade-and-Investment/Market-Access-Group/NTM.aspx>, (12 June 2020, 15:23).

Table 1 Number of countries that did not import retreaded and/or used tires, or both.

Per Capita GDP (US\$)	No. of Countries			
		Without imports of retreaded tires	Without imports of used tires	Without imports of both
-4000	46	Central Africa, Morocco, Armenia	Afghanistan, Pakistan, R. of Moldova, Indonesia	Yemen Solomon Island
4000-15000	49	Maldives, Chile	Albania, Algeria, Iraq, Ecuador, Columbia, Lebanon, Palau	Brazil, Argentina
15000-	50	Cyprus	Bahrain, Greenland	Oman, Saudi Arabia, Kuwait

Table 2 Participation of Pathfinder APEC Member Economies

APEC Economies	Per Capita GDP (2014) ¹	Environmental Performance Index ²	Participation in Pathfinder ³	Laws or regulations related to tariffs and non-tariff measures on goods that are not newly-manufactured. ³
Australia	61,995	87.22	○	None
Singapore	56,007	87.04	○	None
the US	54,398	84.72	○	None
Canada	50,185	85.06	○	None
New Zealand	44,380	88.00	○	None
Brunei	40,979	67.86	○	None
Hong Kong	40,215	n.a.		None
Japan	36,152	80.59	○	None
South Korea	27,989	70.61	○	Restrictions on used medical devices.
Chinese Taipei	22,288	74.88	○	None
Chile	14,565	77.67		N.A.
Russia	13,902	83.62		None
Malaysia	11,307	74.23		Restrictions on old electronic equipment. None on remanufactured goods.
Mexico	10,350	73.59	○	None
China	7,587	65.10		Restrictions on used equipment
Peru	6,549	72.95		N.A.
Thailand	5,969	69.54		Restrictions on old electronic equipment. None on Remanufactured goods.
Indonesia	3,499	65.85		Restrictions on used capital goods
Philippines	2,872	73.70	○	None
PNG	2,108	48.02		None
Vietnam	2,052	58.50		Restrictions on used equipment.

Every remanufacturing business thrives on two most important things being the core and the market. It is to say that one needs to have the raw material and the buyer to make a profit out of remanufacturing.

Just the way any component for remanufacturing a product can be bought from domestic as well as international market, the remanufactured product can be sold internationally and domestically. The list of imported remanufactured product is long. According to HCDCS⁶⁵ for trade statistics one product that has come out of the box with an acclaimed international acceptability is retreaded tyres. In 2014, international trade was reported by 151 countries to the UN Comtrade database and as it turns out, 138 out of it imported retreaded tires and 131 used tires, Germany being the biggest exporter followed by Australia.

Hong Kong exports around 450 thousand units retreaded tires out of which 413 thousand units were re-exports. Around 19 million used tires were traded worldwide out of which only a few might have been used for the purpose of cores but it was not distinguished in the trade statistics.

Now as we speak of remanufacturing, automobile parts are sold off as rebuilt parts and these along with the cores. Shine-Indonesia Abadi an Indonesian based subsidiary of Shine-Etsu Denso Ltd imports raw material from across the world thereafter produces rebuilt starters and alternators and almost 90% of all the rebuilt parts are exported. Similarly Guangzhou Huadu Worldwide Automatic Transmission Co., Ltd. a company in China is a remanufacturer of transmissions. Approximately 70% of the core is imported and 30% is procured domestically. The parts used in remanufacturing products are manufactured internationally. Companies such as Caterpillar and Komatsu have several remanufacturing plants. Plants in Indonesia and Chile are specifically remanufacturing plants.

Electrical and electronic parts also undergo remanufacturing. Companies such as PT Intech Agnugrah Indonesia mostly rely on imported LCD from Japan and then remanufactures it to sell it to other nations. Fuji Xerox, also an international company having its plant in Thailand uses imported toner cartridges, remanufactures into toner cartridges and trades it thereafter.

⁶⁵ Harmonized Commodity Description and Coding System.

With the advent of remanufacturing business, many issues have cropped up which need immediate resolution. Trade restrictions on cores and remanufactured goods is an important issue that was once discussed by the International market holders against the imposition put by Brazil against retreaded tires. European Union brought it to WTO's dispute panel. EU had imported retreaded tires but they were returned by Brazil saying they pose a threat to the environment and hence they cannot permit the use of retreaded tires in their country. Somehow, the WTO was adamant on not accepting Brazil's contention as they were allowing the import of second hand tires. As a result, Brazil had to stop importing second hand tires as well.

Brazilian case is a classic example of intentional restriction but somehow all these bans and restrictions are not intentional. One more reason for the failure of remanufactured goods is lack of recognition. Many countries do not discriminate between second hand goods and remanufactured goods and therefore most countries end up putting unintentional trade restrictions on such products.

Now if we speak about the electronic sector, Conference of Parties of the Basel Convention, has sanctioned guidelines so as to map out the transboundary movement of electrical and electronic waste without causing any stir between waste and non-waste material. The guidelines are very clear so as to define the waste and non waste products. They also tend to describe if the product is shipped to analyse the failure of the product or repair or refurbishment. Guidelines do not allow the import and export of used equipment. Right now, it is not clear if the businesses are going to be affected in the future or not but as far as retreaded tires are concerned, the same is hinted to be restricted.

The data of various countries has come to light wherein 13 countries have not imported retreaded tires, around nineteen countries, including Indonesia, have not imported used tires and seven countries did not buy either of them. It is now proven that people in such countries prefer to buy new tyres for use. In light of the same, US has raised awareness about such incidents by way of bilateral agreements, WTO negotiations etc. These free trade agreements entered into basically throw some light on definitions of cores and remanufactured products with the sole motive to reduce the trade barrier. Japan and Switzerland have backed US when

the latter brought the trade restriction issues on remanufacturers. APEC has conducted workshops worldwide so as to spread awareness about remanufactured goods.⁶⁶

In a sense all of it depends on the income of the people of a country. Remanufactured products are meant to be cheaper than the original products but with the same durability and usage. But somehow, people go for the original item as they believe it to be more genuine and durable. Developed countries are pitched to have less strict import rules and the same is promoted by the governments there. It is also to be noted that some middle income countries lack importation of remanufactured products and the developing countries since have lower manufacturing units allow the import of used products. United States International Trade Commission in its report had reviewed the trade regulations and policies of EU and Brazil. Although EU is encouraging the industry but some restrictions are also in place which have not been revealed. However, Brazil does place certain restrictions on import of remanufactured goods and there is no distinction between remanufactured and reused goods. The same finding has been observed while investigating the APEC Countries. If it is to be summarised it can be said that,

- a. international trade in cores is allowed in high income countries;
- b. trade of second hand items is almost banned in middle income countries;
- c. trade is allowed in lower income countries.

4.3 Future Scenario and Policies

As earlier discussed, middle income nations have placed some restrictions on second hand goods, the reason for such ban is that these goods are expected to expire soon and then thereafter it would end up as waste with no shell life. The government also considers such products of low quality and therefore the import of such remanufactured products and second hand goods is restricted. It is contested that the government is not aware of such remanufacturing business ventures and therefore they tend to believe that such products would fail to serve its purpose. It is also argued that some countries have banned the same owing to the industrialisation process in order to promote their domestic business. These countries regard remanufactured products as competition to their domestic products.

⁶⁶ APEC and US-AID. Remanufacturing–Resource Guide. Washington D.C.: Nathan Associates Inc, (2013).

In a recent development, Mahindra group, one of the biggest automakers in India opposing a government policy of not including batteries in e-vehicles said that OEM's owe the responsibility until the good is sold and everything upto that stage should be handled by such OEM's.⁶⁷

In higher income nations, the trade laws and restrictions are easy on remanufactured products as their major concern is pursuant to the waste management. Even the government promotes its citizens to buy quality products and not go for the price or brand of the same. As the development takes place, the trade laws go soft on trade practices. The remanufacturing factories in such developing nations are going to increase and trade of cores and products is also going to increase. Government plays an important role in spreading awareness among the people and that too shall help ease the trade regulations. The trade barriers should be able to discern between remanufactured goods and used goods. If someone wants to control the trade of cores and still wants to set up a remanufacturing unit, they should be allowed to create free trade zones which would allow them to import cores from other countries and help them run the factory. Awareness and lifting of restrictions would help remanufacturers grow.

4.4 Conclusion

This paper has extensively reviewed the statistics available on retreaded tires, used tires along with the trade regulations in various countries based on their income groups. It is predicted that the remanufacturing market is set to grow in the coming years with more liberal regulations and awareness about laws and products. Key to have a sustainable remanufacturing business is to manufacture environmentally sound products and proper waste disposal of the same after it reaching its shell life.

⁶⁷ Sale of EVs without batteries: Ather, Hero Electric, etc. laud policy but Mahindra has doubts, <https://www.timesnownews.com/auto/features/article/sale-of-electric-vehicles-without-batteries-will-this-model-boost-indias-ev-industry/636553>, (13 August 2020, 12:22).

Chapter V Issues and limitations of remanufacturing

5.1 Patent infringement definition in India

It can be ascertained that Sections 104-114 of the Patents Act, 1970 provide for patent infringement and the consequences thereof.

Burden of Proof

In the circumstance where there is an infringement of a patented product, the onus of proof lies with the plaintiff to ascertain and satisfy the court of the alleged infringement. If there is an alleged encroachment of a protected item the 'onus of verification' lays on the offended party.⁶⁸ Notwithstanding, TRIPS-provoked change embedded by method for Section 104 (A) has 'turned around weight of evidence' if there should arise an occurrence of encroachment of protected procedure. It is upon the discretion of the court that the burden of proof can be shifted on the defendant, under the following circumstances:

1. the topic of the patent is a procedure for acquiring another item; or
2. that there is possibility that somewhat identical product has been produced using the same method and has failed in doing so.

When a party has refused the liability brought upon him under Section 104(A), the court has the discretion to order the party to not reveal the secret pertinent to the manufacture which would be unnecessary.

It has been often shown that the onus however has mostly fallen on the defendant as a patent protection of even a part of a product would call for reasonable patent infringement of the whole product; as alleged by the plaintiff. Hence, this plays as one of the major reasons for a manufacturer's apprehension from dealing with the remanufacture of patented products.

5.2 Identifying patent policy issues that shape how patent law treats remanufacturers around the world

1. **Patent Incentivisation:** If viewed from the eyes of a Patentee, any article which has been revamped lessens the profit margin of the patent upon its sale particularly when

⁶⁸ Process Patents: Burden of Proof, CV-564-United-v-1, (2004).

an outsider business gathers and restores items on a business scale. This practice has proved to be injurious to the patent framework. It is in this light that a stark difference meets the eye when we talk about the patent framework. Weather or not it is to bolster the commercialisation, or help the designers financially for their efforts, one thing remains untested and uncertain: if one item can be reused on various occasions, if another item must be reused once, and if a third item can't be reused. Patents are granted easily for reuseable innovations when it is precluded by law while it is harder to obtain a patent that permits free reuse. It is hard to obtain patents for remanufactured items and their licensed first copy. It is a common myth that remanufactured items are a substitute of the original product and apparently have a lower quality than the original item. The complex holistic relationship of the patentee and remanufacturer is overlooked where they both stand to gain through collaborations in a closed loop market and where the remanufacturer stands to be an innovator in technological progress.⁶⁹

2. **Purchasers' Rights:** In the case of *Wilson v. Simpson*, the absolute first repair case of United States⁷⁰, the Court held that it is permissible for the buyer to supplant a dull sharp edge on the licensed wood planing machine. The remanufacturers getting any respite from the patent law is by way of through their jobs as proprietors and clients of the item. Regardless of whether the hypothesis protects this subset of remanufacturers, there are no principled approach reasons why a hypothesis of depletion will treat these two kinds of remanufacturers in an unexpected way. In accordance to all the aspects, the financial bucket of a remanufacturer does not take a hit if the product is procured from dumpster or from a customer. As long as the refurbished work attracts the merchandise the origin of the product remains immaterial. In spite of our interpretation of the relation between the patentee and remanufacturers, no settled patentee can permit the licensed innovation to an outsider who has not made the purchase from the patentee. Belgium and France have made this differentiation by regarding business repair as encroachment while absolving the private repair.⁷¹ Conversely, as courts in the United States treat buyers

⁶⁹ Noah Sachs, PLANNING THE FUNERAL AT THE BIRTH: EXTENDED PRODUCER RESPONSIBILITY IN THE EUROPEAN UNION AND THE UNITED STATES, 30 Harv. Envtl. L. Rev. 51, (2006).

⁷⁰ *Wilson v. Simpson*, 50 U.S. (9 How.) 109, (1850), p. 123–26..

⁷¹ Estelle Derclaye, REPAIR AND RECYCLE BETWEEN IP RIGHTS, END USER LICENSE AGREEMENTS AND ENCRYPTION, IN SPARES, REPAIRS AND INTELLECTUAL PROPERTY

and outsiders the same; purchaser rights subsequently mould the law administering unique interests in outsider business restoration circumstances.⁷²

This perspective on weariness identifies with, however runs further than, the legitimization of inferred permit, for it anticipates forward with the asset past its underlying proprietor and its resulting privy.

5.3 Technical Challenges

We are faced with certain technical challenges on the way which can be summarised as follows:

1. That there are not enough clients in the market
2. That it is a general perception that remanufactured products are sought as second class by the customers and that the goods remanufactured bear low quality
3. That there is specific market as such for the remanufactured products in India
4. That there is not enough skilled labour in the remanufacturing business in India and the interest charged is exuberant
5. That the market is vulnerable due to lack in planning and the profit received out of the business

5.4 Parallel import and principle of exhaustion

An unhindered clearance of the licensed innovation when produced , the patent holder privileges as for items are depleted is known as Doctrine of Exhaustion or First Sale Doctrine. According to the Doctrine the initial unlimited sale of a protected thing depletes the patentee's authority over that specific thing. At the end of the day, whenever protected item is sold with no confinement, the Patent owner loses his privileges over it.⁷³ For example, A has a patent over a tea producer and he sells this tea producer with no confinement, he loses his rights directly over the tea producer. As it were, tea procurer is allowed to make sales, exchange or disseminate the tea producer and his activities would not mean

RIGHTS, Christopher Heath & Anselm Kamperman Sanders Eds., (2009); *and*; Article L. 613-5 of the French Intellectual Property Code and Art. 28 of the Belgian Patent Act.

⁷²Aro Manufacturing Co. v. Convertible Top Replacement Co. , 365 U.S. 336, 341, (1961).

⁷³ C Cameron, A THEORY OF FATIGUE, Vol 16, (1973).

infringement. The method of reasoning fundamental issues to the exhaustion Doctrine is that the patent owner, who has been compensated cannot be allowed to make profits over it and again on a similar way by controlling its utilization, resale or dispersion. Under this perception, a patent holder's selective right as showed in a patent case closes at the primary sale of licensed products.

Patent exhaustion is classified into International, National and Regional dependent on the degree of exhaustion. As far as worldwide exhaustion is concerned, the patent holder loses his rights for any sale made anywhere in the world.

The standard of exhaustion shows under numerous laws as parallel imports exemption. According to the exemption, importation of a licensed item into a nation after it has been bought in from another nation doesn't add up to patent encroachment.

It is submitted that patented products can be imported into India after purchasing it from a licensed person who is authorised to make the produce, or allow the sale or distribution under the law without infringement liability. It is uncanny how 'authorized under the law' has been the subject of discussion and debate among many groups. Many liberal thought groups argue that once the authorization under the law has been given, it includes both explicit and implicit authorization whereas the conservative groups raise the question over the limitation of such authorisation by the patent holder under Indian Laws.

The liberal elucidation gives way to abuse patent rights by basically putting up an assembling plant in a nation having patent insurance doesn't exist and the traditionalist translation limits the extent of parallel imports to such a degree, that it ends up aimless. A centered way that thinks about the privileges of the patent holder and the privileges of general society to do exercises regarding a protected item after its first deal would be most appropriate. Deciphering the significance of "approved under the law", means approval of the patent law of the nation wherein the imported item would accomplish the aforementioned balance. Under such an understanding, an individual won't be subject for patent encroachment on the off chance that he imports a licensed item subsequent to buying the equivalent from an individual approved under other nation's patent law. Such approval comes from patent holder or the patent office or government. In the event that a patent or patent insurance doesn't exist, there can't be approval and parallel import exhaustion won't have any significant bearing.

This translation guarantees that privileges of the patent owner are depleted after the deal in a nation where patent security exists. It provides for the privilege to utilize the particular item that is the subject of offer without obstacles from the patent owner and his inclinations are likewise sheltered in light of the fact that he gets the privilege to control approval somewhat and keep importation into India from a nation without patent laws.

India follows the pattern of international exhaustion to invite in all forms of FDI which stands to be ironic as at the same time India refuses to deal with the open ended question of importing scrap waste (patented or otherwise) in line with international agreements. It is also easier as there are fewer transactional costs involved due to the extinguishing of first sale doctrine. Such an international exhaustion pattern without any aforementioned protection of laws does little to boost the economy of India as most developed countries have self serving laws. This ends up in developed countries shifting waste dumps in developing countries.

The doctrine of repair-reconstruction when coupled with the stringent doctrine of national exhaustion of USA prevents any third party remanufacturers from profiting in the business of imported remanufactured patent products.⁷⁴ Recent trends of the US SC has shown that there is a likely shift towards accepting the international system of exhaustion.⁷⁵ The patent law in China does not put a bar on remanufacturing infringement or limit to remanufacturing and hence lends a helping hand in the remanufacturing business.⁷⁶

However, seeing the lackadaisical implementation of stringent laws of parallel exportation in India, coupled with most developed countries having stringent self serving laws of national exhaustion it is safe to say that it is of the utmost importance that India makes active laws on what constitutes patent infringement when imported remanufactured goods are dealt with.

5.5 US Supreme Court Clarifies Patent Exhaustion

What Does it Mean for Remanufacturers? Below we briefly summarize the Supreme Court's ruling in *Impression Products, Inc. v. Lexmark, Inc.*¹ (the "Impression Products" decision)

⁷⁴ *Ninestar Technology Co v Intl Trade Commission*. ITC, 09-1549, (2012).

⁷⁵ *Fuji Photo Film Co. Ltd v. Jazz Photo Corp*, 03-1324, 03-1331, (2005).

⁷⁶ *Impression Products v. Lexmark*, No. 15-1189, (2017).

and provide a few practical examples of how this new ruling may affect the remanufacturing industry.

Summary of Ruling

It has been a long stand-off concerning the patent exhaustion question and what it means for the remanufacturers. It is only after the Supreme Court, vide *Inc v Lexmark*⁷⁷ chose to settle the question once and for all. The questions pondered during the hearing were quite intriguing and they had been moved to settle this issue once and for all the concerned and affected people. One of the most important question arising out of this case was if any patent owner may prevent the buyer or the consumer of the patented product from reusing or recycling the concerned product after it is sold.

The case also fondly remembered as the *Impression Products* case held that any patented product once it is sold, can be remanufactured and sold in the market without being sued for patent infringement. It is to be understood that this has been made possible only because of the 'Patent Exhaustion' doctrine. It is held vide this doctrine that once any sale is made, the patent rights are exhausted and in light of the same, any patent owner can no longer enforce the patent rights. With reference to the above quoted, it is to be understood that remanufacturing of any product which claims to have a patent can be done without attracting any litigation.

The *Impression Products* judgment can be categorically summarised in the following points:

1. That the remanufacturers are going to face less noise about the patent infringement.
2. That the *Impression Products* decision helps in strengthening the furthers the 'right to remanufacture in order to repair' decisions as pronounced in the cases of *Aro*⁷⁸ and *Dana*⁷⁹
3. That the law regarding patent exhaustion has been simplified and now it is a settled position of law that after the first sale, anywhere in the world, the patent rights accruing out of it are exhausted in the U.S. and the patent owner cannot sue the person for any

⁷⁷ *Id*, at 76.

⁷⁸ *Aro Mfg Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 346, (1961).

⁷⁹ *Dana Corp. v. American Precision Co.*, 827 F.2d 755, 759 Fed. Cir., (1987).

kind of patent infringement with respect to any kind of remanufacturing being conducted on the product.

There are still several unresolved issues for remanufacturers that should have been settled after the judgement but are still facing the doom:

1. That the judgment has not resolved the issue nor has clarified the question about the risk of copyright infringement. There are certain other vicious problems lying within the Digital Millennium Copyright Act (DMCA) that should have been answered.
2. Both Copyright and Patent belong to the same Intellectual Property genus and hence it should have been resolved while at it. Many issues such as copying, altering, software coding related infringement done during the remanufacturing process. But somehow the impression product judgment is related to the patent issue and does not throw any light on the aspects of copyright infringement.

It is in this regard it should be made clear that both copyright and patent infringement deal with similar kind of issues. Copyright law is usually used to prevent anyone from reproducing the same intellectual property without due care. It also takes copying, distribution into account and for the patents, it is done by covering the method or operation of any kind of product.

That the patent owners have long tried to put certain embargo and contractual limitations on the patented products in order to put a restriction on the sale. However, it is to be understood that such limitations are not practical

5.6 Further Details on Impression Products

In today's world, every electrical or automotive product that we buy has all the patented parts. It is for the patent owner's security and the rights accruing out of it that has to be respected but somehow the misuse led to various infringements that actually smear the patent holder and his product. It is in this reference, even the remanufacturers have also faced the heat of infringement laws that have caused huge losses to the market.

Today, when a consumer buys any product having certain patented components, the doctrine of patent exhaustion is triggered as soon as the purchase is made. In accordance, the doctrine propounds that any patented product loses its character once it is sold to a third party and

moreover, such product owners have the liberty to use, resell and remanufacture the product as per their will without any constraint and fear of causing any patent infringement.

It has been now made clear with the help of the judgment in Impression Products, that the patent owner is discouraged from causing any litigation on his behest against any product owner for remanufacturing, reselling the product. The patent owner is not allowed to interfere with the product owner and his right. It was opined in the judgment that patent owners can enforce any kind of restriction on the product owners by way of any contractual agreement which is bound by the contract law. Somehow, remanufacturing companies are unwilling to join the bandwagon and enter into a contract with the patent owners and therefore there is a high probability that the contracts cannot be enforced against the remanufacturer. In a nutshell, it is ascertained with authority that a patent owner is no longer authorised to assert any kind of litigation against any kind of remanufacturing activity.

It is to be noted that any patented product being remanufactured is sold in the same industry for the same use, it cannot be said to have caused any kind of patent infringement. The decision of Supreme Court brings in a sigh of relief for almost all the remanufacturers that are involved in this business and in particular for those who are involved in the remanufacture business that contain products with multiple patented components

Few Examples of the Ruling's Impact Example

- a. Vehicle Alternator is an Original Equipment manufacturer and has a patent on an internal component that is included in the OE supplier's alternator. The alternator was included in a vehicle sold to a customer through an authorized dealer in the U.S. During the life of the Component Part, the alternator enters the remanufacturing process. What are the impacts of the Impression Products decision as the alternator enters the remanufacturing process?**

The following questions come to our mind on behalf of such situations which now have been settled after the judgment in Impression Products. These questions are as follows:

- b. Can a new Component Part from a seller authorized by the OE supplier be bought by the remanufacturer and then sell the Component Part and use it in remanufacturing?**

The answer is Yes. After the first authorized sale of the Component Part from the OE Supplier to the remanufacturer would exhaust the patent rights in that item.

- c. Can different component parts be used by the remanufacturer that was used earlier in another vehicle in the United States?**

Yes, it is so because the Component Part being used from the second alternator was sold through an authorized U.S. sale, and on application of the exhaustion principle the patent rights are exhausted.

- d. Can the remanufacturer make use of a different Component part that was previously sold to a customer outside of the United States?**

The answer to this question depends if the sale outside U.S. was authorized by the U.S. patent owner for patent exhaustion to apply in the U.S.

- e. Can a remanufacturer create or make a new Component Part to be incorporated into the alternator?**

It is for the sake of the definition that remanufacturers cannot make new component parts because then it would be interpreted in light of the definition of ‘making’ and that would run the risk of patent infringement and patent exhaustion does not exist for new manufactured parts.

- f. Can a remanufacturer, remanufacture Component Parts by way of cleaning and disassembling the Component Part to make it functionally usable?**

This activity cannot be termed as manufacturing as the remanufacturer mainly services the component and not makes any new component out of it.

Antilock Brake System Electronic Control Unit (ECU)

Any vehicle with an antilock brake ECU would have a chip powered by a software, where the chip undertakes certain brake control related functions. The chip and the software both are patented. Under one circumstance, an ECU is put in a car and the car is sold to an authorised dealer in the US for further sale. After some time, the ECU is remanufactured. What are the repercussions that we are looking at and how should we deal with them?

- a. Can a remanufacturer purchase a new chip from an authorised seller to sell it further?**

Yes. The moment the first authorized sale of the ECU is made, it would exhaust the patent rights in the ECU, including the original chip included in the ECU.

b. Can the remanufacturer use a second Chip with functional software from a second ECU that was previously sold on another vehicle by an authorized dealer in the United States?

Yes, as an authorised sale was made for the second chip and the patent rights are exhausted for the second chip and the same can be used without any fear of patent infringement.

c. Can the remanufacturer use a different Chip with functional software from a third ECU that was previously sold to a customer outside of the United States?

The answer to this question depends if the sale outside U.S. was authorized by the U.S. patent owner for patent exhaustion to apply in the U.S. If the chip of ECU is made and sold by the same company then patent rights have been exhausted but if it is done without the authorisation of the patent holder then the remanufacturer maybe facing patent infringement.

d. Can a remanufacturer buy a blank chip and thereafter code it using a different chip on another ECU and put it on another chip which is to be used in a remanufactured ECU, wherein the fourth ECU was sold in US itself?

It is to be noted that this cannot happen as the patent exists for the whole component that is the chip and the software included. Now if the same is separated by the remanufacturer and new software is put on the chip it would result in the ‘making’ of a new chip thereby causing patent infringement. Patent exhaustion has not taken place as the chip was not purchased through an authorised sale. Also, there exists copyright infringement risks as the software was copied from one source to another and this issue of copyright infringement was not decided in the Impression Products decision

e. Can a corrupted code on a chip be removed from a chip and the same properly functioning code be copied on the chip using a fifth ECU?

The code and the chip have exhausted their patent rights but this might attract copyright infringement since the Impression Products decision did not address copyright infringement.

5.7 Indian circular economy: Do developing countries transfer waste to developing countries

Most developing countries have implemented a national circular economy policy where they take note of all viable environmental issues of the 3 R’s. however, due to lack of a

standardized CE system, when such waste (in the name of waste reutilization) is exported out of aforementioned developed jurisdiction to developing countries with less stringent environmental laws, it usually amounts down to pollution transfer.

Due to such grey areas that lead to accountability, developing countries like India are more averse to complying by any such internationally binding agreement for waste transfer. The need of the hour is for India to acknowledge the purpose of the CE and innovate in laws that contextual the proper effectiveness of the CE in the Indian context like many of its competing counterparts such as China has done.⁸⁰

⁸⁰FICCI, ACCELERATING INDIA'S CIRCULAR ECONOMY SHIFT, (2018).

Chapter VI- Patent Barriers

6.1 Patent barriers to remanufacturing

Notwithstanding its excellencies, the matter of restoration can cross paths with patent laws. In principle, patent depletion would liberate buyers of licensed items from encroachment risk. In his patent treatise, Chisum gives an average proclamation of this tenet where he has strongly opined that the patent business model is being depleted when an approved clearance is provided to a protected item. In light of the same, the buyer at the behest of the patent controller may use or exchange the product without any conditions.⁸¹

This concept is otherwise called the "first sale doctrine" in the United States of America, and it covers three legitimate qualifications ruining the possibility of patenting the refurbished products.⁸²

First, a remanufacturer can just repair, not manufacture, an item. Under the main deal, an unlimited clearance of a licensed thing is part of the bargains over that specific thing. In this way, an ensuing proprietor may fix the thing without obstruction from the patentee. In any case, he can't repair a thing so wholly that it adds up to an encroaching of 'making'.⁸³ The qualification between admissible fix and impermissible remaking offers ascend to the fix reproduction teaching.

Second, restoration may likewise be dependent upon topographical points of confinement. Under the national exhaustion doctrine, the goods being sold originally in the USA can be resold in USA without the fear of infringement. In Japan and China where they permit the items which have been previously sold in any country, such items can be resold without attracting infringement.

Third, a patentee can make a conditional sale of the item on a legally binding confinement to use or transfer the same.⁸⁴ Though the enforceability of such limitation is uncertain and

⁸¹54, Donald S. Chisum, CHISUM ON PATENTS, 200-233, (2008).

⁸²Department of Justice, <https://www.justice.gov/jm/criminal-resource-manual-1854-copyright-infringement-first-sale-doctrine>, (June 10 2020, 18:23).

⁸³*Id.* at 78.

⁸⁴ FMC Corp. v. Up-Right Inc., 21 F.3d 1073, 1078, (1994).

differs among purviews. Also, it is not clear if the breach attracts patent remedies alone or along with the remedies that are embodied under the contract law.

6.2 The Repair-Reconstruction Doctrine

The expression "refurbish" is "an advantageous impartial term without lawful hugeness, expected to imply not one or the other 'repair' nor 'reconstruction.'"⁸⁵ It is after the product is refurbished it either falls under the permissible repair category or the impermissible reconstruction category. It is time and again held that there lies a very thin line, distinguishing the difference between repair and reconstruction."⁸⁶

Federal Judge Newman stated that after the product is reconstructed, the amount of 'fix' to be valid would be decided from case to case basis.⁸⁷

Mark Janis, in his original overview of the fix versus remaking law in 1999, basically observed: "Courts sometime in the past relinquished all endeavors to lodge the fix remaking polarity inside an inflexible structure of rules. Rather, they lay their choices on 'the activity of sound presence of mind and a shrewd judgment.'"⁸⁸ According to Janis, the test depends on just one aspect and that is "spentness": As far as remanufacturing is considered, the test of the intention of the remanufacturer would count keeping in view that remanufacturing would be allowed only when the product has kept some element of usefulness.⁸⁹ It is settled that an approach dismissed by one country can be accepted by another country. It might be harrowing to follow the listing of country-wise procedure, and hence the judicial aspect can be thrown into the picture on four aspects:

1. That the inquiry is to prove that repair or reconstruction happened;
2. That the subject to be analysed is actually a part of the process;
3. That the circumstantial evidence has to be sought from the prevailing condition and
4. That the presumption if any physical parts are raised into basic components or not.

⁸⁵ Standard Havens Prods., Inc. v. Gencor Indus., Inc., 953 F.2d 1360, 1376, (1991).

⁸⁶ Mallinckrodt Inc v. International Trade Commission, 264 F.3d 1094, 1098 n.1, (2001).

⁸⁷ Supra, at 86.

⁸⁸ Mark D. Janis, A TALE OF THE APOCRYPHAL AXE: REPAIR, RECONSTRUCTION, AND THE IMPLIED LICENSE IN INTELLECTUAL PROPERTY LAW, 58 Md. L. Rev, (1999), p. 423-426; and; Goodyear Shoe Mach. Co. v. Jackson, 112 F. 146, 150, (1901).

In light of the abovementioned, the more a court focuses on these aspects the more likely it is that a court shall find impermissible reconstruction.

1. The Legal Inquiry: Repair or Making? The patent holders can prove infringement in a prima facie sense, as repurposing a product, parts of which are protected under claims of patent essentially puts the whole refurbished product under a default umbrella patent scrutiny of encroachment. The real issue lies with the procedural satisfaction of the court based upon the evidences produced by the accused if the said refurbishing is within the prescribed limits of repair. Such is the legitimate system that in the Court of Appeals for the Federal Circuit applied in *Jazz Photo Corp. v. U.S. Int'l Trade Commission*,⁹⁰ went through the case of *Fuji Photo Film Co.*⁹¹ In this case, Fuji made a plan to cover its dispensable camera's in the ITC against the remanufacturers based in the USA. To tackle the situation, the remanufacturers came up with an idea to collect these single use cameras and refill it with the film at the back of the tape and thereafter repackage the single-use cameras using another sleeve under their own brand. Federal Circuit opined and went on to hold this particular reloading and repackaging activity qualified as admissible fix in principle. This procedure without a doubt re-established the wrecked or utilized cameras to some similarity to usefulness, and judges looking at this procedure naturally observed "passable fix." U.S. judges conceptualised the idea of "akin to repair" to provide protection to the consumers from any encroachment claims whatsoever.⁹² The "akin to repair" idea, has shown the intent of the U.S Courts in recognising permissible repair as a concept. Conversely, courts in the United Kingdom solicit whether a demonstration from "making" has occurred, as per *United Case*⁹³, throws light on the remanufacturing aspect. It is the case in *United Wire*, the remanufacturer used to repair the screens by connecting the new feature to the casing that was obtained from the patentee's item (similar to remanufacturers putting new film into void camera bodies reused from Fuji's single-use cameras). The preliminary court regarded the case as a fix of the sold screen. The Court of Appeal reversed the judgment and unequivocally

⁹⁰ *Jazz Photo Corp. v. U.S. Int'l Trade Commission*, 264 F.3d 1094, (2001).

⁹¹ Mineko Mohri, REPAIR AND RECYCLE AS DIRECT PATENT INFRINGEMENT?, IN SPARES, REPAIRS AND INTELLECTUAL PROPERTY RIGHTS 59, (2009); *and*; Shubha Ghosh, THE IMPLEMENTATION OF EXHAUSTION POLICIES, ICTSD Issue Paper No. 40, (2013); *and*; AIPPI, <https://www.aippi.org/download/committees/205/SR205English.pdf>, (10 July 2020, 15:23).

⁹² *Wilbur-Ellis Co. v. Kuther*, 337 U.S. 422, 425, (1964); *and*; *Hewlett-Packard Co. v. Repeat-O-Type Stencil Mfg. Corp.*, (1995), 123 F. 3d 1445, 1452, *and*; *Surfco Hawaii v. Fin Control Systems, Ltd*, 264 F.3d 1062, 1066–67 (2001); *Husky Injection Molding Systems Ltd. v. R & D Tool & Engineering Co.*, (2012), 291 F.3d 780, 787–88.

⁹³ *United Wire Ltd. v. Screen Repair Services Ltd. & Others*, RPC 24, (2001).

expressed its dismay and dismissed an investigation based on the contention made in light of repair where no different, free right of fix existed. Lord Bingham summarised before the house, the ambiguous nature of repair: For fix may include close to healing activity to make great the impacts of mileage, including maybe no substitution of parts; or it might include significant remaking of the protected item, with broad substitution of parts. Instead, the apt test in this case would be that "in the case of to the idea of the protected article, it can be said that the litigant has made it." The evidences placed on record go on to prove that the remanufacturers merely combined the parts with the earlier frame and transformed it into a new product, as they would have done had the casing originated from a sections merchant similar to the "akin to making" concept like refilling the liquor bottles vide design patent protection. It is also submitted that the refillers did not repair or reproduced the bottles, and merely collected them, cleaned it and refilled it has to be covered under the "akin to making" concept based on the life of the bottle as discussed earlier thereby infringing the patent right of the manufacturer.⁹⁴ In this context it is imperative to make a comprehensive comparative study of the laws prevalent in the USA and therein distinguished between repair and reconstruction and put such use of doctrine in an indian context. It is necessary to know that the courts in U.S while adjudicating upon such issues start from the concept of repair and expand it upto "akin to repair" whereas Chinese begin their investigation on the aspects of reconstruction and expand upto prohibition of the products under "akin to making". It is upto the judges to find the permissible repair or impermissible repair based on their intuition. The judges in USA somehow are comfortably placed while determining the permissible repair and the judges in United Kingdom and China seek to find the impermissible repair and each would advocate for the choice of their view to be righteous and while dismissing the other.

2. The Analytical Subject: Process or Product? The "repair-reconstruction test" doctrine boasts of a procedure and the US judicial branch has observed through various judgments that procedure based formula is best suited for the cause. Japan and Germany follow a product based test. Along these lines, the "repair/reconstruction test" can be reframed as an item based trial of whether the renovated item held its unique character

⁹⁴ Benjamin P. Liu, REMADE IN CHINA: WHAT DOES RECYCLING TELL US ABOUT THE CHINESE PATENT SYSTEM, UMKC, (2014), L. Rev. 82.

or got another business personality through another creation.⁹⁵ things being what they are, the decision to concentrate on the procedure of restoration or the distinctions in the item before and after remanufacturing can prompt diverse case results. A procedure situated principle looks at the nonstop stream from pre-refurbishing to post-renovatingstate. This strategy for investigation offered help in *Fuji v. Jazz Photo* case where the question arose if the number of steps in remanufacturing mattered. The Fuji court sensibly felt that it didn't, however the answer is pre-appointed by its procedure driven distraction which kept away from the main problem: how can one recognize one consistent repair process from another constant reproduction process? There will never be an unmistakable vital crossroads when one more advance traverses to impermissible recreation. Accordingly, an examination concentrating on the revamping procedure supports the finish of passable repair.

Conversely, a test concentrating on the final end products supports a court finding having impermissible repair and Janis noticed this character test in more seasoned U.S. cases before *Aro I* was there.⁹⁶ In today's time, the item personality approach a case which is marked by the ruling of the Japanese Supreme Court in *Canon Case*,⁹⁷ wherein the case concerns an ink-cartridge patent including an ink framed an air barrier.⁹⁸ In the abovementioned case, remanufacturers refilled the empty printer ink cartridges and conducted restructuring, and also cleared out dried ink particles and penetrating gaps in the ink chambers using proper manufacturing techniques. The Supreme Court perceived encroachment and noted that a new product with a different identity is created with different attributes when an article of the patentee is bought by someone and is supplanted with additional parts. As per Toshiko Takenaka, the investigator in *Canon*, the Supreme Court observed if the reused item is indistinguishable from the patented item legitimately sold in the open by the licensee.⁹⁹

⁹⁵ Amber Hatfield Rovner, PRACTICAL GUIDE TO APPLICATION OF (OR DEFENSE AGAINST) PRODUCT-BASED INFRINGEMENT IMMUNITIES UNDER THE DOCTRINES OF PATENT EXHAUSTION AND IMPLIED LICENSE, 12 *Tex. Intell. Prop. L.J.*, (2014), p. 227.

⁹⁶ *Aro Manufacturing Co. vs Convertible Top Replacement Co.*, 365 US 366, (1961).

⁹⁷ *Canon K.K. v Recycle Assist K K*, 1200 Hanrei Taimuzu 90, (2006).

⁹⁸ Saikō Saibansho Heisei 18 JYU, (2017), p 826.

⁹⁹ Toshiko Takenaka, EXERCISE OF PATENT RIGHTS UNDER JAPANESE ANTI-MONOPOLY PREVENTION LAW: A COMPARATIVE LAW PERSPECTIVE, IN *COMPETITION LAW AND INTELLECTUAL PROPERTY, A EUROPEAN PERSPECTIVE*, Giandonato Caggiano et al. eds, (2012), p. 285-287.

Likewise, in 2005, in the case of *Flügelradzahler*, the German Federal Supreme Court was confined to the issue "whether the measures taken keep up the character of the particular licensed item . . . or on the other hand are what might be compared to the making of another product."¹⁰⁰ This test, based on item propelled the judiciary to make a comparison between pre and post renovated ink cartridges. This along-with other examinations furthers the disparities which as a resultant concluded it as impermissible reproduction. Accordingly, the decision of analyzing the procedure versus the item is based on congruity and break, incrementality and suddenness, and repair and remanufacture. The procedure based "repair reconstruction test" and the item based "personality" test are two proclamations of a similar tenet. By and by, they can prompt various results.

Developing countries should follow the process based test for more leeway regarding permissible repair.

3. **The Content of Proof: Physical Attributes or Totality of Circumstances:** The substance of the evidence required is another hurdle that has to be appreciated to determine the difference between reconstruction and repair. It is in the U.S. courts apparently, that the repair reconstruction quality is tested on the touchstone of the physical attributes and the changes made thereinunder, including the means of rebuilding and the area of replacement. However, various procedures followed in and out of the United States speak of the conclusiveness of the conditions that have impacts beyond the ineligible physical attributes.

In the case of *Fuji v. Jazz*, the Hon'ble Court relied on this particular reasoning and sought the eight-step (or nineteen-step) process as repair inspite of the circumstances where the remanufacturer had to use the patent of film loading process entirely, the price charged by the patentee was calibrated for a single-use, and the product was a single-use camera that the consumer had no expectation of repairing or reusing.

In the case of *Dana v. American Precision*¹⁰¹ and *Fuji v. Jazz*, the courts have upheld remaking for the patentee had they been chosen under the totality of circumstances. Irrespective of it the totality-of-situation test is still prevalent in the United States and is

¹⁰⁰ *Flügelradzähler*, X ZR 48/03, 2004GRUR 758, 36 IIC 963, (2005).

¹⁰¹ *Dana v. American Precision*, 827 F.2 d725, (1987).

used a means to distinguish somewhere else. In spite of the fact that the Aro I, the majority declined to embrace the various factor test, Judge Brennan had the concurring opinion, supporting different figure test¹⁰² It is very pertinent to mention that the Federal Circuit Courts often apply the test. In the case of Sandvik Aktiebolag v. E.J. Co., the subject matter was about the fact that the carbide drill tip which was worn out and repaired constitutes reasonable repair. While arriving at this decision, the court distinguished various elements which include one important aspect, i.e.: "regardless of whether a market has created to fabricated or supported the part . . . what's more, target proof of the plan of the patentee."

In the case of Canon, wherein the Japanese Supreme Court considered it to be a mere business exchange where the patented article was supplanted with additional part keeping in mind the substance of protected innovation and the quality of the licensed article.

Chinese courts have taken the issue of totality of condition in the cases referred earlier in spite of the fact that the jugs didn't experience any physical adjustment, their monetary revival from the refuse load, and their subsequent life as topped off containers, persuaded Chinese judges to control against the jug refillers. It can be summarised that after an article has been utilised to its worth and is of no value, any bi-product being carved out of that article having any pecuniary value would define making of another article or it put otherwise, adding up to more than repair.

4. **The Significance of Parts-All Elements or Essential Elements:** The ongoing debate rests on the premise whether all pieces of a protected article are made equivalent or not. The concurring part of the judgment in Aro I expressed that the patent is for the components and its outcome in total and no independent part is considered as a separate patent.

It is imperative to note that, all components of a protected article are made equivalent and the substitution of one component does not mean production of the whole product.¹⁰³ The Supreme Court has always ironed out the fundamental test and have allowed the closeout of a component which was not patented. However, Federal Circuit

¹⁰² Sandvik Aktiebolag v. E.J. Co., 121 F. 3d 669, (1997).

¹⁰³ Porter v. Farmers Supply Serv., Inc., 790 F.2d 882, 885 (1986); Dawson Chem. Co. v. Rohm & Haas Co., 448 U.S. 176, 217, (1980).

Judge, Gajarsa has noticed the basic component test in restoration cases since the landmark judgment in Aro I. It is invariably held that, a nation applying the basic component test reports a significant inclination towards those parts that are basic to the development, which in this way can't be supplanted without causing encroachment. Toshiko Takenaka sees that the Japanese Supreme Court,

*"concentrating on fundamental components and the upside of the development, has made it simple for patentees to dodge the weariness principle and irrationally confine the privilege of the proprietor for a particular protected product."*¹⁰⁴

It is the case that the ink inside a printer cartridge is considered as a basic component and thus, refiling the ink is considered as a recreation as has been held in the Canon case. This doctrinal contrast among Japan and the United States judicial approach has brought the encroachment obligation forced on camera remanufacturers in Japan and not the United States. It is also put forth that this does not summarise that the fundamental component test consistently holds that encroachment has been caused. In another case of the U.K, the Hon'ble Court in *Schütz v. Werit*, was faced with the juxtaposition that

*"the supplanted part . . . is an unattached thing of property, which does exclude, or identify with, the creative concept."*¹⁰⁵

It is when courts adjudicate upon an issue related to the basic component test depending on the idea so used, it opines that the idea should resonate with the activity so restored after revamping the product. In *Schütz v Werit* courts applying the fundamental component test hold that encroachment has been made in light of the facts so made.¹⁰⁶ In situations where any superfluous piece of innovation is supplied, the court by applying the all-components test is, in all circumstances, going to discover allowed repair in any occasion. To abridge, the centre test for the honesty of renovation under patent law brings forth a huge number of explanatory theories irrespective of the definitive lawful inquiry, the following being: if it concerns repair of reconstruction, or whether the subject of examination is concerning the repair procedure or item

¹⁰⁵ *Schütz v Werit*, UKSC 16, (2013).

personality or whether the proof of restoration inculcates the physical changes or the totality of the conditions, and whether any of the parts of the product are fundamental.

6.3 Right to repair

In the context of repair, the point at which a purchaser purchases an item is immaterial, but what concerns the purchaser is that once he has paid for the said item, the seller loses the right to direct the purchaser for its use. It is solely the right of the purchaser to make any amendments/ changes/ repair in the said item purchased.

It is the case of the makers, that they would not under any circumstance sell their repair products to any free shop not authorised by them. They are determined to place a business model in place wherein they would not sell any new parts to these free shops. Organisations such as Apple and Nikon are already implementing the said plan.

It was only due to a claim that compelled Apple to offer a battery substitution program for the iPod. In 2012, Nikon sent a letter to their autonomous help arrange, expressing that they will never again supply fix parts to anybody aside from Nikon approved fix offices, so as to have a flatout restraining infrastructure over the fix of their items.

6.4 Position abroad

As far as the legislation on repair is concerned, The Motor Vehicle Owners' Right to Repair Act, made by the US congress, makes it mandatory for the automobile companies to provide the same information to the independent car shops as being provided to their authorised dealer shops pertinent to the repairing of the cars. Apparently, the bill has generally been supported by independent repair and aftermarket associations and opposed by auto manufacturers and those having an authorized dealership. It was first passed by Massachusetts's legislature on 31st July, 2012.

6.5 Position in India

The position in India is such that there exists no legislation. However, The Competition Commission of India (CCI) in *Shri. Shamsheer Kataria*¹⁰⁷ in August 2014, delivered a path-breaking judgment, and the Hon'ble Commission was of the view that the 14 automobile manufacturers were liable for the anti-competitive practices and it was also held that these companies were abusing the dominant position, by not making spare parts available in the independent repair shops. It is on behalf of the CCI, that Original Equipment Suppliers (OESs) have formulated a plan to construct a viable framework to sell real extra vehicle parts in the open market and to figure a powerful legislation/ framework to guarantee accessibility of reseller's exchange extra parts, analytic devices and other applicable data in the public domain. Consequentially, the request made by CCI has opened options for the customers to choose between the authorised dealership and independent mechanics, providing reseller's exchange benefits and guarantee solid challenge in the market. Hence, it can be safely assumed that the judgment of the court somewhat was in conformity with the 'Right to Repair' Act.

6.6 Who Can File a Complaint under The Competition Act of India

The Competition Commission of India, vide its act empowers any person who is a consumer of any product, or an association for that matter. Even a statutory authority can also file a formal complaint before the Commission, Central Govt. or the State Govt.

6.7 Contractual limitation on exhaustion

Although a remanufacturer may comply with the national exhaustion and doctrine of repair-reconstruction, his working abilities may still be limited under post sale contractual limitations such as the condition of single-use doctrine.¹⁰⁸ Such a quality threatens to sue third party remanufacturers who avail such patented scrap from the garbage who are unaware of such pre-existing contracts. Hence it is argued that such a restriction is only limited to direct purchasers. to protect innocent downstreamers from accidental infringement.

¹⁰⁷ *Shri. Shamsheer Kataria v. Honda Siel Car India Ltd*, (2014) C-03/2011, (India).

¹⁰⁸ *American Cotton-Tie Co. v. Simmons*, 106 U.S. 89 (1882).

6.8 Summary

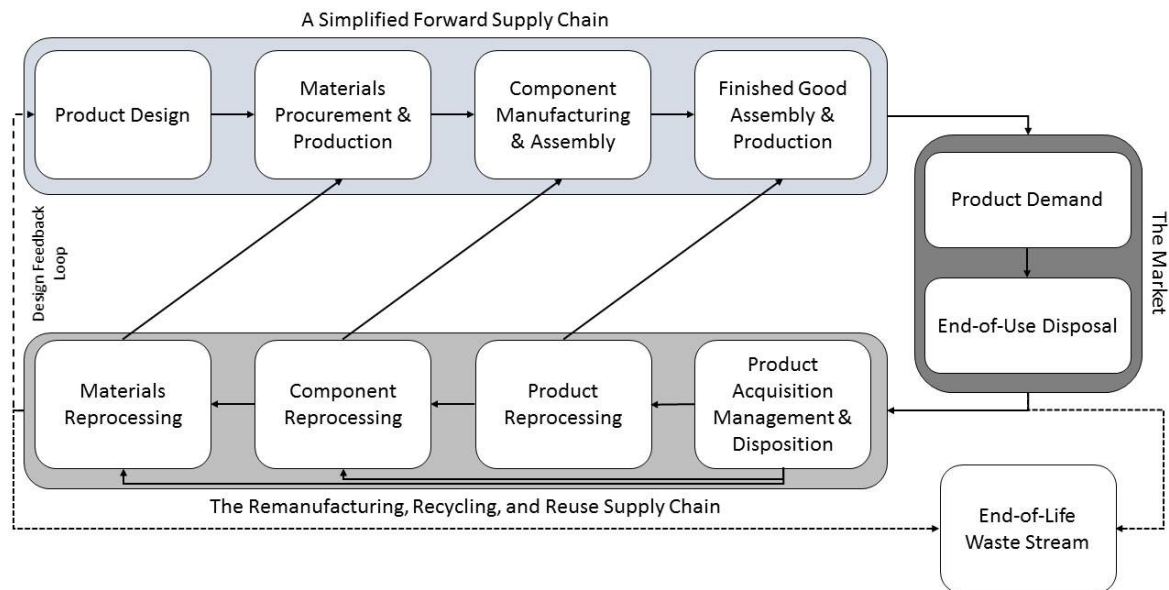
The repair reconstruction test gives a false representation of a scope of methodologies among nations and even among courts inside a similar nation. The courts in the USA are more concerned with the physical aspect of the repair being made to the product and have vide its judgments opiniated their inclination towards the discovery of permissible repair. On the other hand, courts in Japan, the United Kingdom, or China have sought for a strict regime to test the weariness even when there is no physical indication of recreation. Regarding regional points of confinement of depletions, China and Japan received international exhaustion and grant the renovation of items recently sold anyplace on the planet. The standard of regional exhaustion allows the repair of items recently sold in the European Community and European Economic Area in Europe. U.S. courts use household weariness, however the ongoing Supreme Court preferences in Kirtseang and Quanta prefer conceivable move to international exhaustion later on. The probability of single-use confinements additionally takes steps to remove remanufacturers' as of now restricted legitimate safe harbor. Authoritative conditions can deny passable fix in all in the United States or decrease the expansiveness of universal weariness in Japan. To the remanufacturer, the international principle gives with one hand and removes with the other. To manageability everywhere, the exhaustion principle doesn't seem to advance innovative enablement, preservation or monetary improvement area.

Chapter VII-

7.1 Remanufacturing Processes and Flows

Remanufacturing is commonly known as a phenomenon of restoring any used product which has reached its shell life back to its original form or better with added specifications. The products are said to have been remanufactured if they even meet the standards approved by ANSI (2017). In layman terms, any product having reached its end life which has been disassembled and cleaned means refurbishing. Thereinafter, all the worn out or broken parts are replaced and the product is now ready as a remanufactured unit. The same is tested before putting out in the market and once approved it is ready for sale.¹⁰⁹

Even the disassembly can be divided into three or four stages, being the product level, component level and material level, each level having one higher degree of disassembly and they represent recycling more than remanufacturing.¹¹⁰



7.2 Losses due to geographic dispersion

Every product that entails going through the process of remanufacturing has to be broken down into its bare components that make it what it is. What makes the process of

¹⁰⁹ Lund 1984; Guide and Van Wassenhove, (2001).

¹¹⁰ Figure 1 (adapted from Guide and Van Wassenhove 2009; Abbey and Guide, (2012)).

remanufacturing strenuous is that each component has to undergo a series of questions and checklist certain criteria. Examples of such criteria are: Is the component protectable under patent? What form of supply chain would it come under for purposes of remanufacturing by the OEM? Which site would said component be sent to and what are the jurisdictional IP and Trade restrictions of remanufacturing in said site?

Something as simple as an electric toothbrush, when it goes for remanufacturing, has to go through dozens of sites all over the world via many tiers of supply chains, even when it has just 40 small components. On the other hand complex and detailed products such as tool apparatuses from Kingfisher having at least 80 components and 14 raw materials will have to go through multiple remanufacturing sites via three tiered supply chains.

The question often arises as to who should remanufacture? The manufacturer or the supplier of the component of the product? Most manufacturers do not have the know how to remanufacture effectively. Remanufacturing as a whole is not feasible due to factors such as cost, limited cycle of the product etc. Hence it is more feasible to remanufacture products as a component.

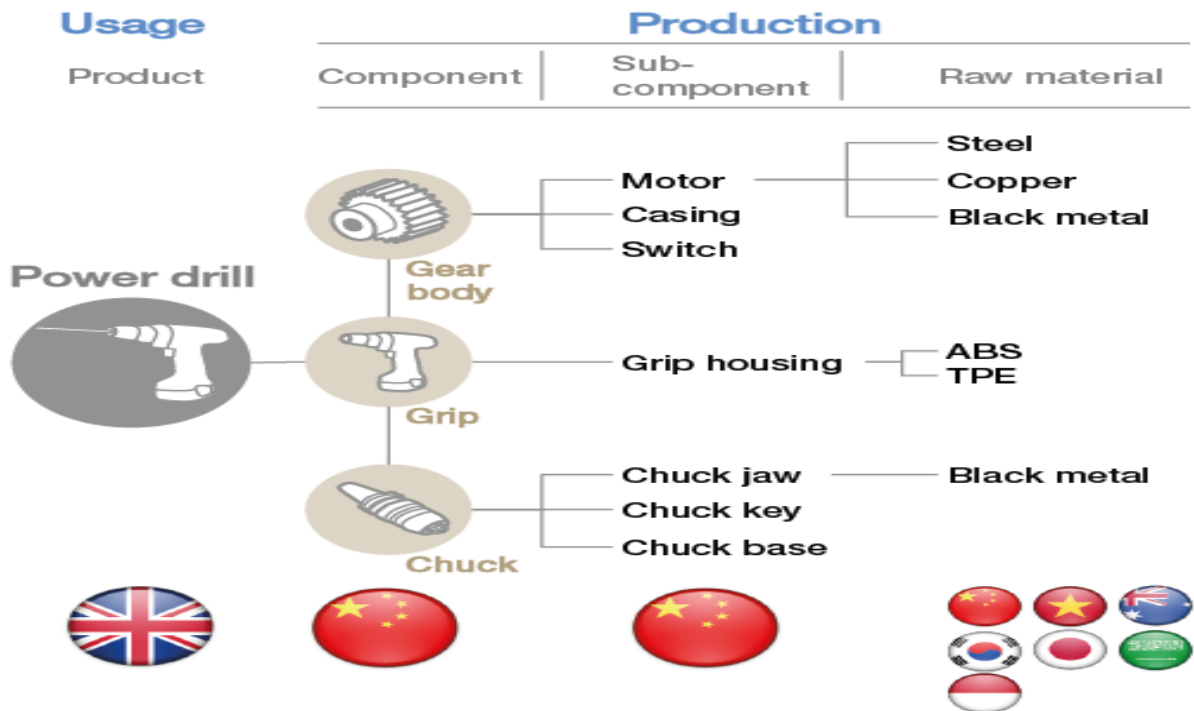
For eg: Products under Caterpillar are remanufactured in the following ways-

The used products collected are broken down into their respective components and each such component is separately remanufactured at separate sites according to the specification guidelines of the manufacturer with regard to warranty. They are finally reassembled and sold off as remanufactured products.

7.3 Which supply chain is better?

Economic arbitrage of such costs for remanufacturing have risen due to globalization. This has increased the global territorial outreach in regard to a supply chain for remanufacturing every component of a product. The loop has become global and open and with regard to how spread out and complex the various phases of remanufacturing globally has become. (expert interview) Fragile geographical dispersion has caused leakage points in the remanufacturing industry. There should however be a closed supply system with regard to the remanufacturing of raw materials, components and sub components.

The following diagram shows a bill of material of a product that is to be remanufactured in different countries worldwide y being stripped into its components, subcomponents and raw



materials.

Circular Economies are valued based on long distance Geographical limitations. A product's cost value is dictated by cover cost of transportation and distance.

An analysis of relevant remanufacturing industries has shown that there are a total of four types of circular supply loops. They are specifically referred to as Loops as products remanufactured usually loop back to their original seller point after being rectified from their EOL stage. Each Loop stage has their own set of situational leakages that can be marred by enablers who use convenient circular arbitrage opportunities, by identification via prioritization and search technique of the said Loop.

7.4 An example of a supply loop

	China ¹	Europe ²	Description	Case examples
1 Closed global/ local/ regional loop			Global closed loops <ul style="list-style-type: none"> End-of-use products or components are collected and returned to the countries where they were manufactured to be used in production of the same or similar products, largely at recycled material level 	Ricoh used plastics return H&M respinning of fibres for jeans Airplane jet engines for reuse
			Regional closed loop <ul style="list-style-type: none"> Products are mostly maintained in countries where usage takes place Some end-of-use/pre-owned products are collected, re-engineered/remanufactured regionally, and sold into local markets 	SAB Miller bottled beer distribution Desso closed-loop carpet tile
2 Partially open local/ regional loop			<ul style="list-style-type: none"> End-of-use products or components are collected and returned to manufacturing facilities in the same regions to be used in the production of the same or similar products 	Renault engine and gearbox refurbishment B&Q power drill repairs
3 Open cascade			<ul style="list-style-type: none"> For some valuable products, end-of-use materials are collected and sold to secondary markets, where material flows/end-of-use are not regulated, resulting in significant leakages 	Brightstar used mobile phone distribution I:CO sale of used clothes
4 Linear			<ul style="list-style-type: none"> End-of-use products are discarded in landfills or incinerators of countries where consumption takes place 	Relevant for 80% of materials used in FMCGs

Closed local supply loops are mostly desired loops as use and production are based on a controlled and closed geographical point. This means that a significant amount of cost for the specific supply loop will be saved up on transportation due to zero international border crossing.¹¹¹ For example: South African Breweries (SAB) sells more than 85% in its returnable/remanufactured volume intake in a closed loop system. Returnable bottles are a favourite example of closed loops. the country's business model would have to double the manufacturing of bottles if the returnable loop supply of the bottle business was converted into a one way system, just to accommodate the demand of beer in the country's economy.

Desso globally sells sports and carpet related facilities. A major part of their products are manufactured with aims of being a part of a closed supply loop. They have certain products that will be looped back to being disassembled and be remanufactured as part of many of their products. They also have products that will be functionally remanufactured into the same product again. Since 2008, the Company has set up collection centres globally on their closed loop supply sites, to collect components from EOL products and generate enough of such materials to remanufacture accordingly.

¹¹¹ Fastmarkets, <http://www.risiinfo.com>, (12 June 2020, 22:06).

Construction materials which are mostly manufactured, sold and used locally attract closed loop supply systems. An Australian company called Leighton holdings, extracts materials of their products in their collection sites in Asia (Phillipines, Japan, China, Thailand etc.) and remanufactures and uses the products over there itself. Either old component of the EOL products are used to remanufacture the same products or the raw material components are used to make new products under the scheme of the same manufacturing company. This further increases the environmental benefits of not using new raw materials.

Closed global supply loops happen rarely. They can only be properly implemented if jet engines and other high value products of the like are used and transported globally via low cost methods of the lowest arbitrage opportunities. The fibre stream remanufacturing of Cardboard and paper production has a global balanced supply loop flow. As it is less expensive to use said remanufactured fibre and not fresh raw material fibre, such used fibre is used in Asia for export products in terms of materials that are to be packaged.

Companies have understood that global supply loops are beneficial for business. Companies need to take advantage of the laws that dictate and negotiate the best profit and cheap prices for them to avail remanufactured products. Different jurisdictions globally dictate different prices and It is upto the company to analyse best which country and which points of transportation to use and for which specific products in order to profit from it. Arbitrage costs can thus be manipulated this way. Ricoh has done its due diligence and has chosen to use the arbitrage opportunity of low shipment and container costs in Asia and China. They are availing used products from their collection sites in Europe and sending it to Asia so that their components can be remanufactured into new products altogether or the same kind of product.⁵⁸ This has resulted in a 30% saving of costs for Ricoh in terms of cost of materials. companies take advantage of current world economies and politics, and creates carefully curated mutli reverse global systems through arbitrage opportunities. For example, arbitrage cost points are low as it is easier to ship scrap components from the US to China (owing to shipment carriers giving out discount rates for transportation as demands for exporting products in China are less and the containments are usually shipped back empty).

Even though many companies and countries take advantage of the economic scales of the global import and exporting regime, non uniform arbitrary laws of each country makes it difficult to keep a track of illegal and undocumented scrap raw materials that are transported world wide. There should be uniform global support to ascertain how such EOL products

and their components are to be reused. A global support would facilitate a proper tracking system of where all such products go and this would lead to a maximum percentage of recovery.

For example, China has banned the import of e-wastes for both indirect and direct use after ratifying the Basel Convention. In addition to that Japan and many EU countries have also ratified the ban of exportation of scrap materials. In spite of all these legal safeguards, a huge chunk of e-wastes are transported from the aforementioned countries, including the US to China through various backdoor routes.¹¹² A prime example of this can be seen at the instance where Hong Kong imports a lot of categories of e-waste via a licence of importation.

Upto 11 million tonnes of e-scrap were a part of China's importation tally in 2010.

Geographically open cascades is a loop system where once a product reaches the end of its initial usage cycle, it is shipped off to different secondary markets mostly in differing geographical destinations for profit. What has been noticed is that the cycle mainly focuses on developed countries shipping off their used products to developing or under developed countries. The US has been a pioneer in profiting at a value of 1.5 billion dollars in 2011 in terms of selling used or second hand electronic devices such as mobile phones. The US has mostly shipped such products to little to no legal protection for remanufactured goods, namely, India, China, Brazil, Hong Kong, Mexico and other Asia-Pacific regions.

Brightstar Corp., being a US based giant took advantage of the EOL, business of remanufacturing and have introduced the trade of buy-back scheme in their business of providing mobile devices worldwide. This has increased their revenue content by 11.4% in 2012.

7.5 Which pattern will win in the circular economy?

Geographically closed loops, out of all the loops discussed, will be able to balance out the fallacies of the leakages caused of the products and its various components.

Also it has been analysed that locally closed loops, more than globally closed loops are more well equipped to donate to sound and effective remanufacturing. This is because of the general rule of thumb that the lesser the distance, the cheaper the costs. However it is worth

¹¹² Bradford, M., THE UNITED STATES, CHINA & THE BASEL CONVENTION ON THE TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL, (2011), Fordham Environmental Law Review.

mentioning that the aforementioned rule is not the same for all. As mentioned before, taking advantage of certain country wise global low shipment costs due to less demand, companies take advantage and choose accordingly when it is cheaper to transport components for remanufacturing globally and when it is not.

Further, what justifies the cheap transport costs are the fact that the residual value of the products and components as demand increases due to limited access to resources (one can attribute heavy legal IP and Trade protections on this aspect). commercial endeavours such as the Triple-E which is the world's largest container ship shows how companies stress on energy efficiency.¹¹³

Excess capacity in containers returning from the US or EU to China is reflected in lower freight rates



7.6 Effects of a closed loop supply remanufacturing

The One product in its lifetime works as long as its shell life allows it then thereafter, it is suggested that an OEM or any third party which is a remanufacturer should acquire the product and this acquisition is usually known as Product Acquisition Management (PrAM).¹¹⁴

¹¹³ Reyes, E., World's Largest Most Eco-Friendly Ship Embarks on Maiden Voyage, Eco-Business, <http://eco-business.cmail2.com/t/r-1-bidpik-jiwtdkhir-j/>, (29 July 2013, 10:22).

¹¹⁴ V Daniel R Guide and Luk N Van Wassenhove, MANAGING PRODUCT RETURNS FOR REMANUFACTURING, (2009), p. 98.

Now after the product has been taken it needs to be evaluated if it has been a false failure, i.e. very sparsely used or never used or if it has been used intensively. This test is very important to the product and the future course that needs to be adopted by the remanufacturer. This discovery reveals the quality of the cores and the type of changes that have to be adopted according to the customer needs.¹¹⁵

The after sale of a remanufactured product has to go through a lot of ups and downs and as revealed by many studies, remanufactured products often face issues as their market value diminishes too quickly.¹¹⁶ Sometimes, people are not invested in buying the product as it has lesser integrity as compared to the original products of the same quality and price.¹¹⁷ This whole conundrum is market driven and it changes from business to business.

It is also the case, as suggested by the research, that consumer is basically driven by the quality of the product and if he is not satisfied with the remanufactured product he might go for a new one.¹¹⁸ This unwillingness to shell out money for remanufactured product can be seen with the consumers and it all pins down to lack of quality assurance, even though remanufactured products are environmentally more safe.

As it can be argued, one more issue that swings in favour of new products is that their markets are owned and controlled by OEMs who happen to be billion dollar company and whereas remanufactured products are being sold with third party remanufacturers who do not enjoy the confidence of the consumer. One of the research shows that sale of new products is always over estimated and the common norms applied to any remanufacturing business module would not necessarily apply to business to consumer market.

As pointed out in various business to consumer and business to business model research papers, it has been observed that there are numerous works on general functions and roadblocks in remanufacturing business. The legislations across the globe are meant to have forced for the evolution in the remanufacturing and reuse model today, particularly in Europe.

¹¹⁵ *Id.* at 118.

¹¹⁶ 41 V. Daniel R. Guide, Jr. Jiayi Li, THE POTENTIAL FOR CANNIBALIZATION OF NEW PRODUCTS SALES BY REMANUFACTURED PRODUCTS, (2010); *and*; James D. Abbey, REMANUFACTURED PRODUCTS IN CLOSED-LOOP SUPPLY CHAINS FOR CONSUMER GOODS, (2015).

¹¹⁷ Joseph D Blackburn, REVERSE SUPPLY CHAINS FOR COMMERCIAL RETURNS, California Management Review 46(2), (2004).

¹¹⁸ Abbey, J.D., and V.D.R. Guide Jr, CLOSED-LOOP SUPPLY CHAINS: A STRATEGIC OVERVIEW, SUSTAINABLE SUPPLY CHAINS, Springer International Publishing, (2017), p. 375-393.

The major aspect which the remanufacturers must figure out is to determine the level of reuse that must be permitted which would eventually help curtail quality based apprehensions of the consumer and that would fetch some returns as people would be willing to pay for such products. The consumer is aware of the product and assesses it based on the quality of the product in the market and its return rate compared to its demand.¹¹⁹

Market is also studying the pattern of reusable parts left in the product that determines the quality that will remain intact in the product after it is exhausted from first use.¹²⁰ Best suited firms to earn bucks out of remanufactured products are the ones making it, and PrAM model is yet to be conquered.¹²¹ And these firms are experts in leaving the product's ownership rights with the manufacturer which is commonly known as servicizing.¹²²

The different kind of texts we have recently discussed outlines the topic about to be discussed hereinafter. Based on design philosophy, and other strategies, the literature focuses on different criteria, different choices as per the need of the consumer the firm makes the changes in the closed loop supply chains and the remanufacturing business. In the succeeding parts, we would discuss over the importance of design philosophy and strategic focus and how it influences the product acquisition system, market control, and profits. Any design philosophy accommodates various ranges such as design for a single shell life through durable production or multiple cycles after being recycled. Product is remanufactured in certain cases only so as to focus on cost minimization but increased profits are only available when products are remanufactured. We would now discuss on the design mix and remanufacturing within closed loop supply chain.

7.7 Profit making skills of such cycles

¹¹⁹ Jia, J., S.H. Xu, and V.D.R. Guide, ADDRESSING SUPPLY-DEMAND IMBALANCE: DESIGNING EFFICIENT, Production and Operations Management, (2016), p. 22.

¹²⁰ Atasu, A., and G.C. Souza, HOW DOES PRODUCT RECOVERY AFFECT QUALITY CHOICE?, Production And Operations Management, 22(4), (2013), p. 991-1010.

¹²¹ Abbey, J.D., and V.D.R. Guide Jr, CLOSED-LOOP SUPPLY CHAINS; *and*; T. Bansal, A. Hoffman, eds. OXFORD HANDBOOK ON BUSINESS AND THE NATURAL ENVIRONMENT, Oxford University Press, (2012), p. 290-309.

¹²² White, A.L., M. Stoughton, and L. Feng, SERVICIZING: THE QUIET TRANSITION TO EXTENDED PRODUCT RESPONSIBILITY, TELLUS INSTITUTE, (1999), Report to U.S. Environmental Protection Agency Office of Solid Waste, Boston.

With the advent of this section we come across the board to discuss how remanufacturing with an intent to have multiple lifecycles integrates design and strategic perspective. Caterpillar, Cummins Diesel, Xerox are one of the major manufacturers who strategically use remanufacturing so as to receive profits, gain market control and to maintain asset control. Amongst the giants, Caterpillar has used the remanufacturing technology to its profit but Xerox stands out to be the biggest example which has been using the remanufacturing model with its selected models such as large high speed imaging equipment for twenty two years now and the same is being sold in Xerox's New York facility.

Remanufacturing products with multiple life cycles has helped Xerox win over the market and has brought various benefits such as easier reparability, faster service, easy to disassemble and reassemble, better environmental aspect and better customer response.¹²³ Xerox has so vigorously invested in the scheme that they acquired DocuTech, a high speed printer, and shipped said remanufactured item. With a line of operations going on, both manufacturing and remanufacturing business is being carried on with ease and it is for the same reason, Xerox has been able to draw profit from the market.¹²⁴ Xerox has made sure to have a sprawling base and it is being done by stepping up the asset control of the government. The company leased out its 80% heavy machinery and rest are monitored thoroughly with regular servicing and maintenance.¹²⁵ The teams assigned the field duty of servicing and maintenance are also patched up with the triadic knowledge flow which helps store the data as per the consumer needs and thus helping Xerox to improve its quality based on the information received. Not only Xerox makes sure that market uses their product only but also that they enter into an agreement to supply cartridges, paper, particular volume of prints for a fixed price.¹²⁶ They are clear with their objective- to provide the customer whatever is needed and curated in accordance with their usage. In simple terms, Xerox has successfully maintained their asset while the client enjoyed the printing services.

As it is shown, big companies are adapting the remanufacturing industry with the help of design, servicing and are keen to extract long term profit. Companies involved in this field

¹²³ Whitmyre, D. Manager, Operational Excellence, Xerox Corporation, Webster, NY. Private communication, (2010).

¹²⁴ Supra, at 24.

¹²⁵ Gamble, A, Vice President, Equipment Supply Chain Operations and Planning, Xerox Corporations, Webster, NY. Private communication, (2010).

¹²⁶ DeBolt, F, Vice President, North American Marketing Operations, Xerox Corporation, Rochester, NY. Private communication, (2009).

firmly believe in the PrAM scheme and try to reacquire the end product at the end of use. These products have rich intrinsic value and are expensive owing to this design-strategy pattern and therefore are feared to leak into the hands of third party remanufacturers, which would dilute the asset share of the company. It is submitted that once the company is done acquiring the product, it needs heavy investment in the remanufacturing business just like Xerox did. The process involves disassembly, inspection, replacement, assembly, testing in remanufacturing line of business. Companies need to have patience as it takes years for any remanufacturer to sway the tales in their favour and start by making more profit. Hence, it is expensive and intrinsic as it will possess challenges to a lot of other companies in the same remanufacturing business.

For any company to accommodate such practice, it needs to cut through the vertically placed products and offer something top of the line in a compact budget.¹²⁷ This remanufacturing venture has cut short the production of newer products for many companies as it is being replaced by high performing products at lower prices.

7.8 Focusing on reparability and durability

This category is keen on developing the literature pertinent to durability and reparability test that comes along with product design and market strategy. Somehow, companies do give very little or no importance to remanufacturing or reprocessing after the first sale. This habit of concentrating on sales rather maintenance is quite bizarre and common in the market as they tend to overlook the customer satisfaction at some point. Instead, companies dealing with shipping and airline manufacturing business do not look for asset building by remanufacturing through multiple lifecycles. Instead, big airliners sell their million dollar products in part to other or smaller companies as the value depreciates.¹²⁸ Sometimes, the companies are not even involved in market research, or product development, product design as compared to the companies involved in remanufacturing ventures.¹²⁹ Boeing, for example has never thought of remanufacturing its products and instead has strategically concentrated

¹²⁷ Debo, L.G., L.B. Toktay, L.N. Van Wassenhove, MARKET SEGMENTATION AND PRODUCT TECHNOLOGY SELECTION FOR REMANUFACTURABLE PRODUCTS, *Management Science* 51, (2015), p. 1193-1205.

¹²⁸ IATA, Airline Disclosure Guide. AIRCRAFT ACQUISITION COST AND DEPRECIATION, International Air Transport Association (IATA), (2010), p. 1-20.

¹²⁹ Arkell, SOUND R&D STRATEGY HAS BOEING POISED FOR COMPETITIVE FUTURE, *Boeing Frontiers*, (2005), p. 4(3).

on selling the aircrafts to the companies who have in house servicing departments, such as Delta Airlines.

Now, manufacturers try to get into the remanufacturing business and incorporate product acquisition, remanufacturing and market research. This sudden interest is both a boon and a bane as establishing a PrAM system and research building would be tough as there are many third party such as Delta, in the market who have been in the remanufacturing line of business for long. Department of defence hires people on ad-hoc basis to do their work including asset management and reuse. In any case, the forward supply chain activities would require proper training and investment. Many firms not investing with the post sale reuse model face a lot of hardships when they try to integrate the remanufacturing process in terms of product acquisition scheme, remanufacturing, processing the knowledge and they also lack market presence. However, these firms do offer third party repairs on their products as their post-sale support. With lack of interest and a plan to mainstream the reuse and remanufacture business the firms cannot recuperate and profit as compared to the firms offering multiple lifecycle produces.

7.9 Products with a single use effect

Firms with business to consumer model face a lot of difficulties as compared to other business to business models. Consumer's need, competition in the market, asset control and fragmented asset acquisition are some of the few issues.¹³⁰

In lieu of the aforementioned, firms are tied up to single life cycle designs instead of multiple lifecycle without considering end of life disposition.¹³¹ This practice has fled the market with more waste product and requires legislation to bring down the environmental impact.¹³² Product acquisition management tends to give better returns as compares to the reverse supply chain, having returns of around \$260 billion. Somehow, OEM's consider PrAM too onerous and mammoth to handle and this has helped third party manufacturers slip in the market who are sheer masters at acquiring old products. Hewlett Packard is one of the OEM's who had contrary views about product acquisition vide consumer returns and that it

¹³⁰ Guide, V.D.R., Jr., L.N. Van Wassenhove. MANAGING PRODUCT RETURNS FOR REMANUFACTURING, PRODUCTION AND OPERATIONS MANAGEMENT, 10, (2001), p. 142-155.

¹³¹ Blackburn, J.D., V.D.R. Guide, Jr., G.C. Souza, L.N. Van Wassenhove, REVERSE SUPPLY CHAINS FOR COMMERCIAL RETURNS, California Management Review 46, (2004), p. 6-22.

¹³² Atasu, A. and L.N. Van Wassenhove, ENVIRONMENTAL LEGISLATION REGARDING PRODUCT TAKE-BACK AND RECOVERY Auerbach Publications: 23-28, (2010).

should be avoided. However, by 2005, HP had integrated customer returns as a natural process and soon they were being linked to proper channels to surrender the product and match the consumers with appropriate HP products.

Consumers have been sceptical about the remanufactured products priced equal to new products which raises concerns in their minds. Quality issue is an important aspect so as to keep the consumers in loop.¹³³ One of the reason for a stunted growth of remanufactured products is because many manufacturers fear that remanufactured products would capture the market of manufactured products, although the same has been an issue of contest. Many consumers do not prefer using the remanufactured product carved out of the same reused parts.¹³⁴ Only some of the consumers are actually concerned by the environmental hazards and rest would negate the ill effects of manufactured products.¹³⁵

7.10 Profit making by remanufacturing done by third parties.

Manufacturers who are third parties are the best placed in the market as they are always ready to yield new products from single use cycle somehow they are not just dependant on products having single life. Asset control is controlled by product's cost. Third party manufacturers know how to extract the profit from OEMs's design decision thereby having little or no input into the original design. ReCellular has been using products which were initially made for single use and all such products are then turned into multiple life cycle products. Ford, though tried to enter the remanufacturing business has yet to make its mark and trails on the market of acquisition of product behind companies such as Cardone Industries. Ford claimed that Cardone stole its product, 'stop me' was the response. The automobile industry thus serves an example for us that if we let remanufacturers enter the market and take OEM products they will put it to use for their profit.

But somehow some companies have control over the market and they have hugely invested in the remanufacturing business and prevent other third party companies to get in the market

¹³³ Oovchinnikov, A, REVENUE AND COST MANAGEMENT FOR REMANUFACTURED PRODUCTS, *Production And Operations Management*, 20, (2011), p. 824-840.

¹³⁴ Abbey, J.D., M.G. Meloy, J. Blackburn, V.D.R. GUIDE, CONSUMER MARKETS FOR REMANUFACTURED AND REFURBISHED PRODUCT, *California Management Review* 57(4), (2015), p. 26-42.

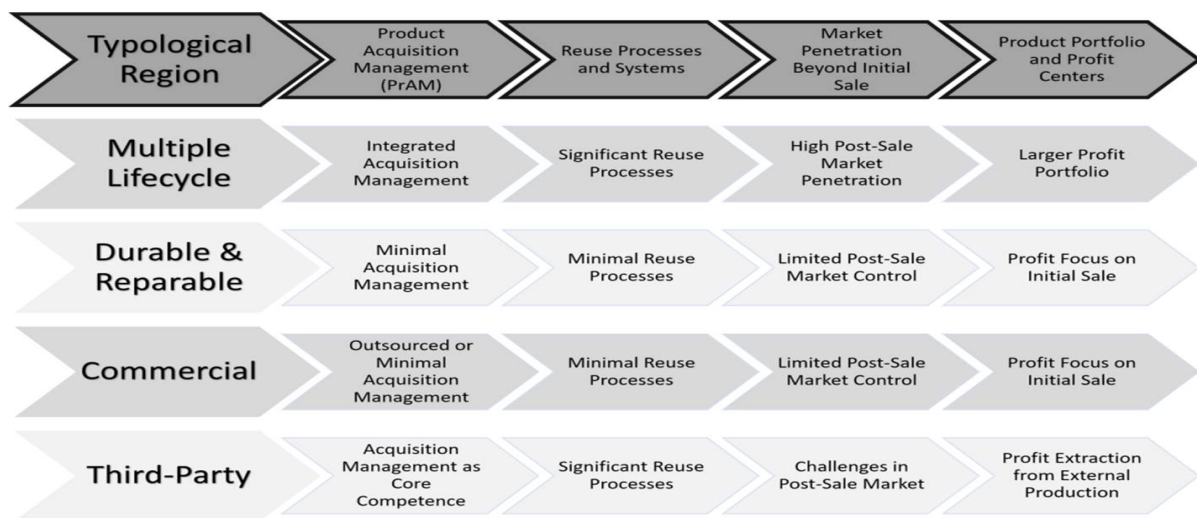
¹³⁵ Griskevicius, V., J.M. Tybur, B. Van den Bergh, GOING GREEN TO BE SEEN: STATUS, REPUTATION, AND CONSPICUOUS CONSERVATION, *Journal of Personality and Social Psychology* 98(3), (2010), p. 392-404.

such as Xerox and it goes the extra mile to keep the consumer happy either by offering up services.

Third parties focus on supply chains with respect to product acquisition management and they end up finding new ways of remanufacturing. Original equipment manufacturers notice the additional cost and capital induced incentives, third party marks profit opportunities only.

7.11 Strategizing the usage of loops

Product acquisition has some or the other typological region traits, upto an extent reuse process, outcome of every such deal



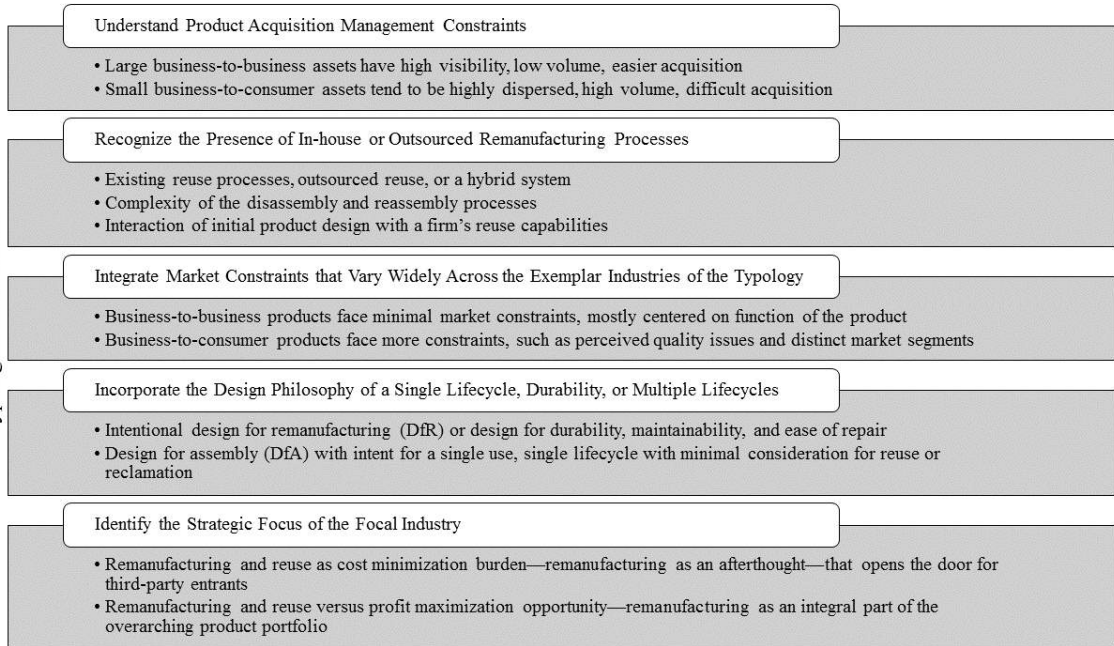
The above figure showcases the Result of mixture of strategy and design

One thing that hold true as anything is that if any original manufacturer does not fill the gap, new third parties are going to fill the gap. Aforementioned example of the automobile industry speaks for itself.

7.12 Conclusion

This paper presents a long history of remanufacturing business based on different aspects governing the market. Although this is not conclusive of the industrial trivialities across the remanufacturing spectrum but all the dimensions discussed stem from the focus and design's philosophy. The last thing that remains is how can a remanufacturer put this strategy to his overall benefit.

Understand the Remanufacturing Environment by Applying the Typological Framework



The diagram helps researchers to delve in the closed loop supply chain. For example, combining leased PrAM and consumer item focus is harder to motivate the industry. At times, when companies receive returned products and find the reuse technology obsolete, the resulting business and profit is also meant to diminish.¹³⁶ On the same hand, if the company is a dedicated manufacturer and believes in tapping the resources, they would have different opinions and better profits.

¹³⁶ Guide, V.D.R., Jr., L. Muyldermans, L.N. Van Wassenhove, HEWLETT-PACKARD COMPANY UNLOCKS THE VALUE POTENTIAL FROM TIME-SENSITIVE RETURNS, *Interfaces* 35(4), (2005), p. 281-293.

Chapter VIII

8.1 Proposal On Enacting Related Rules

In light of the above, it can be ascertained that developing countries' legislation has not been in the best of the interest of the people and it is somehow directly proportional to the economic development of any country. It is submitted that circular economy is the way the world's economic forum is shaping up although there have been less or no signs of such economy. The onus is upon us to help developing countries improve the remanufacturing related laws. We can roughly see the existing problem and improvement direction through above discussion about the Interpretations and the Opinions.

1. We have to pay great attention to the principles of rights exhaustion and since there are few cases in developing countries' judicial practice at present, and we do not have enough experience at hand. It is also the case that there is a plethora of patents existing as of today and each patent varies from each other, therefore the judge has the right to exercise discretion according to the principle of rights exhaustion, and the judiciary can independently apply the principle of fairness and the principle of turning material resources to good account, etc.
2. We should strictly define the scope of remanufacture. Not every user of patent products is able to repair the harmed patent products. In fact, most repairs are done by professional person who is engaged in repair industry. It is not in accordance with the actual and also violates the basic principle of patent law that individual and organization are excluded from the object scope.
3. It is also submitted that in the judicial sphere we lack the importance of the question of repair and remanufacture, and thereby it is imperative on the legislature to take the mantle and make principled provisions at present, and it is upon the developing countries' Supreme Court to look into the matter and pronounce certain judgments that can be earmarked as benchmark in determining the problems faced by the judiciary while interpreting the law. It is submitted that the judges should refer to the judgments cited in the Courts of Japan and USA owing to the complexity and particularity of this kind case. It is imperative to note that in international sphere, the patent law of most countries is similarly placed, and furthermore the internationalization of patent infringement cases has been a trend, so there is no more law barrier referring to their related judgment experience.

4. Patents form a huge chunk of the social wealth. It is commonly known that if any patented product is not repaired after suffering any harm and is discarded, it shall have a bearing on the social wealth. It is imperative to note that we should understand the market better, and should strive to put material resources to use and yield profit from the same.
5. Adopting the Repair Defence with International Exhaustion: As held before, parts of the depletion regulations don't arrange appropriately. The United States by and large allows repair yet raises the issues of national depletion. Japan and China embrace international exhaustion yet implement a stricter repair reconstruction test. In this manner, the low hanging natural product for elevating restoration is to consolidate a liberal repair reconstruction test with worldwide depletion. It is recommended that India should adopt the United States' repair reconstruction test and that they should establish the sheltered harbour for remanufacturers.. Since, right now, the beginning stage in India is to prohibit outsider restoration, receiving the repair-reconstruction convention without a doubt advances protection, innovative learning, and monetary chances.
6. Adjusting the Procedural Burden: It is the case here that with the permissive repair defence being adopted, the doors to the sustainability considerations are opened, which does not bear any fruits owing to the legal and compliance cost. In respect of the same, the costs should be adjusted to promote the activity and the onus of proof should be shifted on the patentee, proving the absence of first sale. In cases of remanufacturing, if a subject successfully proves the evidences, it also simultaneously proves lack of authorisation. This additionally implies the underlying weight of demonstrating non-debilitating remote deals in a national weariness ward should lie with the patentee. It is also submitted that the litigation costs can be controlled and brought down when the burden of proof is put on the patentee since a patentee is better suited to produce evidence for the absence of patent exhaustion after the first sale and also requires the remanufacturer to prove that the remanufacturing process was within the prescribed limits. As discussed, the law places the burden on the remanufacturer which in turn accounts for the loss of the society as the legitimate remanufacturers are mistook for infringers. Simultaneously, with the burden being shifted on the patentee, the remanufacturers get a new life and can readily avail the defence of exhaustion, wherein the remanufacturers use the repair-reconstruction doctrine. The two concepts: absence of exhaustion and infringement doctrine have to be systematically proved. In any case, the errors will spread among real remanufacturers who can't show proof to help passable

fix and meriting patentees who can't counter admissible repair, subsequently upgrading manageability.

8.2 Conclusion

It is very strongly opined that if remanufacturing is permitted, the scope of industrial learning, resource conservation, latest welfare technologies along with a boost to the economy would be widened. Moreover, courts can develop a method or a test by importing the concept behind remanufacturing and to see if the article to be refurbished has any infringing use, since a non-infringing use would provide more economic benefit than remanufacturing. This test of “substantial non-infringing use” is borne out of a well-established test which has ultimately proved to be a cornerstone in ascertaining contributory infringement liability as per US laws. Under Section 35 U.S.C. Section 271(c), contributor of parts would be held liable for patent infringement if that said part is developed for use in a product protected by patent and is not a staple article. In the present case, a remanufacturer ought not be held liable for refurbishing parts that are adapted for use in the covered product. Moreover each country should take into account their economical and political strengths and weaknesses and implement a suitable supply chain to remanufacture its goods in.

It is through this article that a portrait of the difference between patent infringement and socially acceptable remanufacturing is drawn. In this aspect it is imperative to note that in US strong repair defense is adopted, only to keep a tab on the foreign remanufacturers by imposing strict national exhaustion doctrine. In UK and Japan, the construction made by the legal precedents and laws is that a narrow path for the emergence of the repair path is put in place whereas in China, permissible repair is very rarely allowed making it even narrower and it can be safely concluded that a patented product can be infringed even without physical alteration to the article. It is for better incentivisation of the technologies so produced that a proper patent scheme should be in place which shall eventually help in providing a better medium of transporting the technology to the developing nations. The premise taken by the developing countries in evolving a better patent law have not been used to structure other patent laws. The current plight is derogatory to the futuristic development of the industrial growth and the environmental protection by way of remanufacturing.

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