Chapter – 6

REASONABLE ROYALTIES

6.0. Introduction

Generally, participants in a SSO aim at contributing their technology to solve an issue and disclose the patent assets that cover their technology as essential to practice the technology selected as a standard. Participation in an SSO is a voluntary choice made by the participant and they are bound by obligations of the SSO's policies including IPR policy thereafter. As a fact, the participants, voluntarily, agree to licnese their patent assets on FRAND terms and it is well understood that FRAND licensing is about licensing SEPs at reasonable royalties. The SEP holders agreee to waive monopoly in return for a fair compensation[1]. This chapter focuses on discussing the existing menas by which reasonable royalties are determines, issues with such an approach, and possible solutons to determining FRAND or reasonable royalty. De facto, determination of reasonable royalties is the essence of the FRAND licnesing in SSOs and arriving at a technique to determine reasonable royalty will lead to a major enhnacement in which SSOs operate. This major step has a bearing on the SEP holders, SEP implementers, consumers, competition, innovation, adaption of technology, and the economy itself.

6.1. SEP Licensing Practices - Critical Analysis

6.1.1. Level of Licensising and the pertinent Issues

The level at which licensing is made is an important factor, which leads to either (1) a balanced system in which FRAND is truly practiced; or (2) an unbalanced system in which at least one of the parties to the negotiation receives a raw deal. See FIG. 6.1, a smartphone or a tablet device may comprise several components such as central processing unit, memory, baseband processor, Wi-Fi processor, image processor, power management unit, and several software components. A 3GPP standard such as 2G, 3G, or a Long Term Evolution (LTE) standard may be implemented by a baseband (BP) or a communication processor (CP). Some portions of the 3GPP standard may be implemented in a RF transceiver as well.

[1] Supra note 145 at 13

How would it be possible to arrive at a reasonable royalty value if the SEP holder expects a royalty to be paid as a percentage (or rate) of the cost price of the entire smart phone when only the baseband processor embodies the SEPs? What is the contribution of a SEP embodied in a baseband processor to a NOR Flash or a 3-axis gyroscope or a 3-axis accelerometer or a FM stand-alone radio or an application processor? If the contribution of the SEPs embodied in the baseband processor to the application processor or a NOR flash is zero, then why would a royalty rate fixed on the cost price of the smartphone (or at the level of the smart phone) become a reasonable royalty? There is a view that a component adds to the overall functionality of the end product even though SEPs are embodied in a component and thus, the royalty should be sought at the level of the end product. There is a view that a smartphone user uses a camera to capture pictures and upload it to social media websites or share the captured images or videos with others, basically, because of the features offered by the baseband processor, thus, the SEPs embodied in the baseband processor contribute to other portions of the smartphone and are therefore entitled to a royalty rate calculated at the level of the smartphone. Such a view has a major flaw because different generations of the baseband processors are available at different price points and the difference in the price points may be attributed to the inventions embodied in the different generations of the baseband processor, thus the SEP holders are already compensated for their contribution and the return on investment is already factored into the pricing. But, expecting an additional royalty, which is inclusive of the price of the other components in the smartphone even though when the SEP holders' contribution to such other components is zero is glaringly unreasonable and will lead to unjust enrichment. Thus, considering an end product (smart phone) as basis for ascertaining royalty rates is not fair.

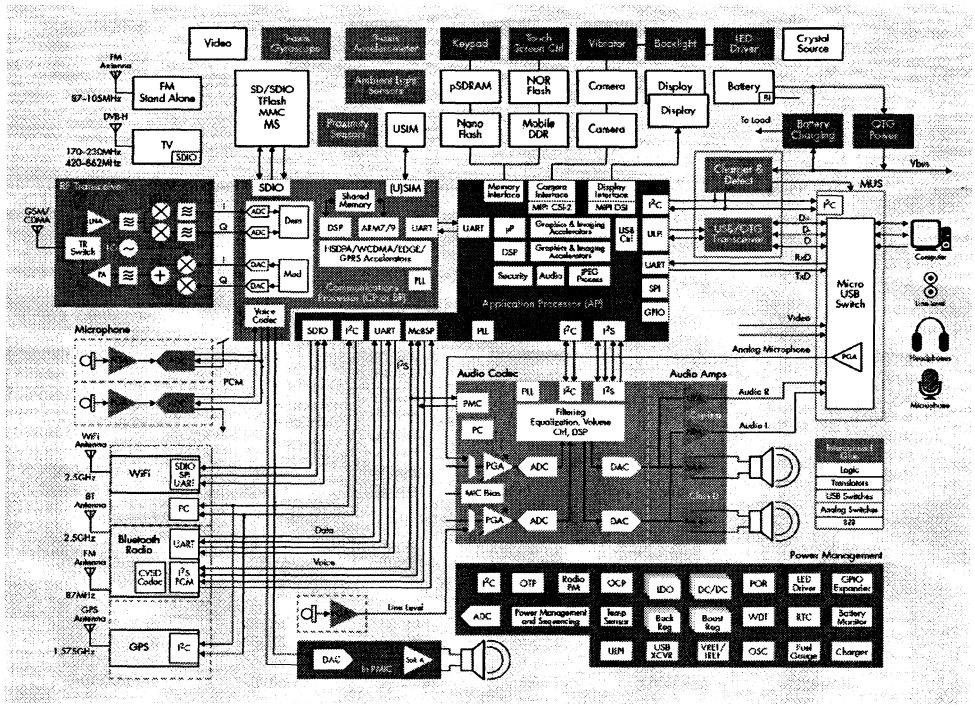

FIG. 6.1: An example block diagram of a smart phone[2]

6.1.2. Current Approaches to Determination of Reasonable Royalties

Fairness and logic implies that the basis for FRAND licensing should be at the level of a patent or a maximum at the level of a component practicing the SEP. For practical purposes, a component such as a base-band processor embodying the SEP may be considered as a basis for determining reasonable royalties. But, contrary to the fairness and logic, at least some SEP holders seek to license only at the end-product level and refuse to license any other implementer of the standard, including component suppliers, even though the standardized functionality is provided by a component (often a processor or chip). SEP holders are likely motivated to license at the end-product level in the hope that they can tax a much larger royalty base than just the price of the component supplying the allegedly infringing functionality. That is, a SEP holder may believe that using the cost of a multifunctional and complex device, such as a smartphone, to determine a royalty will allow it to claim a larger royalty than if the royalty were set on a lower-cost component or device. Similarly, some SEP

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[2] Smart phone Block Diagrams and explanations, available at http://www.power-eetimes.com/images/01-edit-photo-uploads/2010/2010-11-november/aep2177-article-fig1-111910.jpg , last visited on April 14, 2016.

holders seek royalties from ***users*** of such end products. In some cases, SEP holders have even chosen to pursue royalties from the end users of devices rather than even the device suppliers. In one case[3] in the United States, the SEP holder sued numerous coffee shops, restaurants, hotels, supermarkets, retailers, and other commercial users of Wi-Fi networks. The suppliers of the Wi-Fi devices, such as routers, then initiated proceedings against the SEP holder so that the end users would not have to face the infringement claims. Until recently, the approaches to determining reasonable royalty has been mostly dependent on the selling price of the end product.

Another, basis for determining reasonable royalty is based on the comparable licenses. If there has been a license already existing with other parties for the same SEPs and if the royalty rates have been agreed upon in that existing license, then such royalties have to be taken into account. The royalty rates can be determined based on an outcome of a hypothetical negotiations as per the framework developed in Georgia Pacific[4] case. However, for SEPs, it is argued that the framework laid out in Georgia Pacific case has to be modified. The federal court concluded that the district court determined reasonable royalty in CISRO[5] considering the parties' actual licensing discussion, which is not contrary to damages law, however, the federal circuit made an important observation that the district court erred in accounting SEP status of the '069 patent. Thus, comparable licenses based on hypothetical negotiations framework of Georgia as modified for SEPs is one of the methods used to arrive at reasonable royalties.

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[3] Gregory Thomas, a blog titled "Innovatio's Infringement Suit Rampage Expands To Corporate Hotels", available at http://patentexaminer.org/2011/09/innovatios-infringement-suit-rampage-expands-to-corporate-hotels/ , last visited on April 14, 2016.

[4] A 15 factor test established in Georgia-Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116 (S.D.N.Y. 1970). However, for SEPs the test established by Georgia case is modified to suit SEPs.

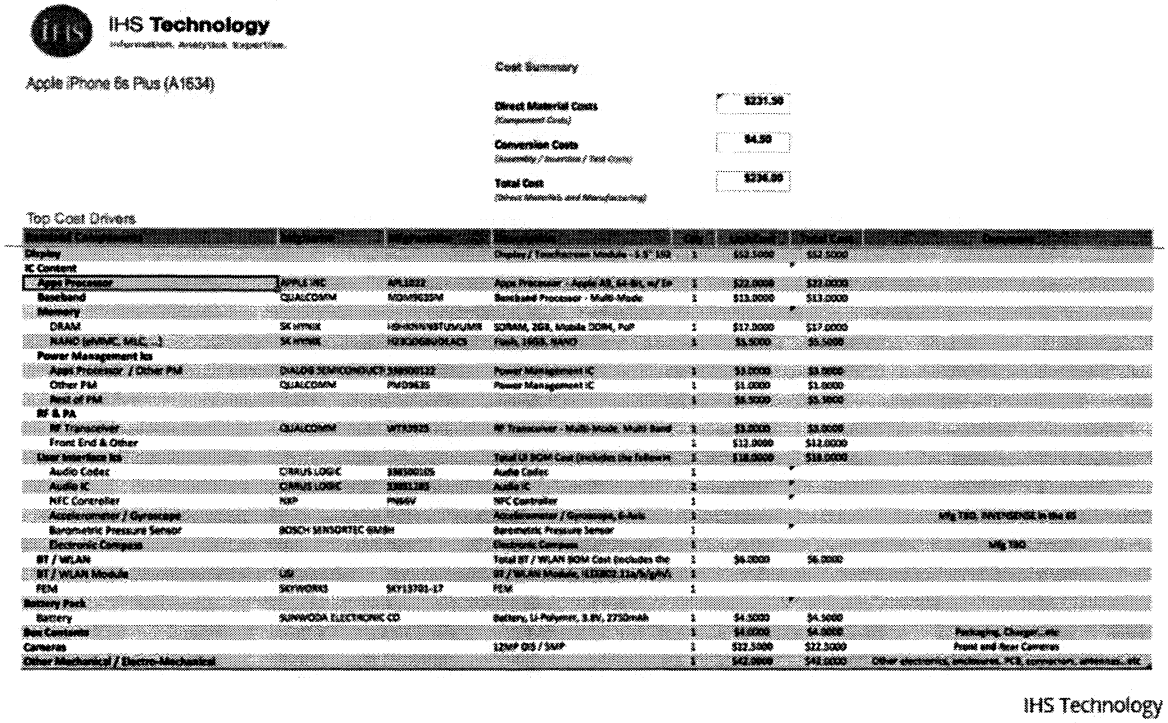
[5] US Court of Appeals for the Federal Circuit in CISRO v Cisco, available at http://www.cafc.uscourts.gov/sites/default/files/opinions-orders/15-1066.Opinion.12-1-2015.1.PDF, last visited on May 10, 2016.

6.1.3. Analysis of Current Approaches to Determination of Reasonable Royalties

(i) Determining royalty as a percentage of the sale price of the system/component

As described with reference to FIG. 6.1 above, the system may comprise multiple components. See table 6.1 below, which provides a teardown cost[6] of the bill of materials (BOM) of Apple's iPhone 6S:

Here's IHS' cost breakdown:



IHS Technology

Apple iPhone 6s Plus (A1634)

Cost Summary

Direct Material Costs	$231.50
Conversion Costs	$4.50
Total Cost	$236.00

Top Cost Drivers

Material Components	Manufacturer	Part Number	Description	Qty	Unit Cost	Total Cost	Comments
Display			Display / Touchscreen Module - 5.5" HD	1	$52.5000	$52.5000	
IC Content							
Apps Processor	APPLE INC	APL1022	Apps Processor - Apple A9, 64-Bit, w/ SP	1	$22.0000	$22.0000	
Baseband	QUALCOMM	MDM9625M	Baseband Processor - Multi-Mode	1	$13.0000	$13.0000	
Memory							
DRAM	SK HYNIX	H9HKNNNBTUVUMR	SDRAM, 2GB, Mobile DDR4, PoP	1	$17.0000	$17.0000	
NAND (eMMC, MLC, ...)	SK HYNIX	H26QCG8A4MCACR	Flash, 16GB, NAND	1	$6.5000	$6.5000	
Power Management Ics							
Apps Processor / Other PM	DIALOG SEMICONDUCTOR	338S00122	Power Management IC	1	$3.0000	$3.0000	
Other PM	QUALCOMM	PM8936	Power Management IC	1	$1.0000	$1.0000	
Rest of PM				1	$6.5000	$6.5000	
RF & PA							
RF Transceiver	QUALCOMM	WTR3925	RF Transceiver - Multi Mode, Multi Band	1	$3.0000	$3.0000	
Front End & Other				1	$12.0000	$12.0000	
User Interface Ics			Total UI BOM Cost (includes the Following	1	$18.0000	$18.0000	
Audio Codec	CIRRUS LOGIC	338S00105	Audio Codec	1			
Audio IC	CIRRUS LOGIC	338S1185	Audio IC	2			
NFC Controller	NXP	PN66V	NFC Controller	1			
Accelerometer / Gyroscope			Accelerometer / Gyroscope, 6-Axis	1			Mfg TBD, INVENSENSE is the IC
Barometric Pressure Sensor	BOSCH SENSORTEC GMBH		Barometric Pressure Sensor	1			
Electronic Compass			Electronic Compass	1			Mfg TBD
BT / WLAN			Total BT / WLAN BOM Cost (excludes the	1	$6.0000	$6.0000	
BT / WLAN Module	LSI		BT / WLAN Module, IEEE802.11a/b/g/n/ac	1			
FEM	SKYWORKS	SKY13701-17	FEM	1			
Battery Pack							
Battery	SUNWODA ELECTRONIC CO		Battery, Li-Polymer, 3.8V, 2750mAh	1	$4.5000	$4.5000	
Box Contents				1	$4.0000	$4.0000	Packaging, Charger...etc
Cameras			12MP OIS / 5MP	1	$22.5000	$22.5000	Front and Rear Cameras
Other Mechanical / Electro-Mechanical				1	$42.0000	$42.0000	Other electronics, enclosures, PCB, connectors, antennas...etc

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Table 6.1: Cost breakdown of Apple iPhone 6s plus.

As may be seen from the table above it costs Apple an estimated $236 to make and assemble its new iPhone 6s Plus, roughly one-third the $749 retail price of the smartphone, according to a teardown analysis by IHS Technology. IHS teared down iPhone 6s plus to analyze the likely cost of the individual components (Bill of Materials). However, this cost analysis does not take into account the logistics cost and the R&D costs. iPhone 6s plus incorporates

[6] Dawn Chmielewski, "Apple's iPhone 6s plus costs an estimated 236USD to make –749USD to purchase", available at http://www.recode.net/2015/9/29/11619036/apples-iphone-6s-plus-costs-an-estimated-236-to-make-749-to-purchase, last visited on May 10, 2016.

among others (a) RF and Baseband; (b) a 12-megapixel camera; (c) memory chips; (d) application processor; (e) power management ICs; (f) other communication modules such as Bluetooth, WLAN, NFC and others; (g) battery pack; (h) display, and so on. The table 6.1 depicts the cost of each component as well.

If the SEPs are embodied in a baseband processor (which costs 13USD) then extracting royalty as a percentage of the sale price of the phone will be substantially higher as compared to a royalty calculated as a percentage of the sales price of the baseband processor. Please see the Table 6.2 for comparison.

iPhone 6S plus sale price = 750USD	Royalty as 2% of the sale price of 750 USD for SEPs embodied in Baseband processor = 15USD	15 USD is more than the sale price of the baseband processor
Sale price of the baseband processor = 13USD	Royalty as 2% of the sale price of 13USD for the SEPs embodied in the baseband processor = 26 cents	13USD is for a 4G enabled baseband processor. A 2G enabled baseband processor may cost 3USD

Table. 6.2: Comparison of Royalties calculated at the level of an end product vs a smallest saleable patent unit (SSPU).

In seeking royalties from end-product suppliers or users, SEP owners are attempting to extract licensing value from innovations that have nothing to do with their SEPs. The patent holder seeking truly FRAND compensation for its valid and infringed SEPs achieves the same royalty regardless where it licenses in the supply chain (*e.g.*, if the SEP's value is Rs. X, that value remains the same even if the component incorporating the SEP is bundled in a complex multifunction device or is applied in an end-user application). That is, proper FRAND royalties can be sought at any link in the supply chain—because no matter where sought, such royalties will use a common, non-discriminate, and reasonable approach. In contrast, aggressive SEP holders seeking unjust enrichment from excessive royalties that appropriate the value of non-standardized, product-differentiating technologies, may try to license at the end-

product level of the supply chain simply because end products have the highest price. Such SEP holders dislike having to abide by their commitments not to discriminate, because non-discrimination means having to license at the level where their patented technologies may actually be implemented rather than trying to extract greater value from end products that make use of the same technology but happen to have a higher selling price based on their differentiating features—and that, in turn, means a smaller royalty base to target.

Moreover, SEP holders breach their FRAND commitment when they refuse to license implementers simply because of their position in the product supply chain[7]. Such refusals violate the basic commitment to license on a ***non-discriminatory*** basis. This principle of nondiscrimination is part of all RAND and FRAND commitments, and moreover is reinforced by other aspects of standard-setting rules. At the ITU, a party making a RAND commitment obligates itself to license "***an unrestricted number of applicants*** to make, use and sell implementations," and therefore encompasses all levels in the supply chain. Similarly, the European Telecommunications Standards Institute (ETSI) FRAND commitment requires SEP holders to be prepared to license no matter the type of implementation by requiring that a license will be available to "MANUFACTURE, including the right to make or have made customized components and sub-systems to the licensee's own design for use in MANUFACTURE."A refusal to license an implementer simply cannot be squared with these clear commitments. Nor does permitting refusals to license certain implementers fit with the purpose of the FRAND commitment to promote widespread adoption of a standard. Tolerating discriminatory refusals to license threatens to undermine incentives for a wide variety of standard-setting participants, who will be prevented from licensing the standard they helped to develop. Simply put, having made a FRAND commitment to license any interested implementer, a SEP holder has relinquished the right to discriminate in this manner or refuse to license.

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[7] FAIR STANDARDS ALLIANCE AN INTRODUCTION, available at: http://www.fair-standards.org/fileadmin/images/objectives/FSA_POSITION_PAPER_Logo.pdf, last visited on April 14, 2016.

Royalties based on end-product prices are inherently discriminatory. Such royalties impose a disproportionate tax on standards implementers who have invested significant resources to develop products encompassing technology that far exceeds the value of the patented feature, particularly where the smallest saleable unit is a chip contained in a device. For this reason, discriminatory or exploitative demand for royalties based on a full percentage of the end device prices has been found to be *prima facie* abusive by the Competition Commission of India[8]. The royalty rates being charged by the OP had no linkage to patented product, contrary to what is expected from a patent owner holding licenses on FRAND terms. The OP seemed to be acting contrary to the FRAND terms by imposing royalties linked with cost of product of user for its patents. For the use of GSM chip in a phone costing Rs. 1000, royalty would be Rs. 12. 5 but if this GSM chip is used in a phone of Rs. 10000, royalty would be Rs. 125.0. Thus increase in the royalty for patent holder is without any contribution to the product of the licensee. Higher cost of a smartphone may be due to various other hardware components, softwares/technical facilities and applications (which may be proprietary) provided by the manufacturer/licensee for which he had to pay royalties/charges to other patent holders/patent developers. Charging of two different license fees per unit phone for use of the same technology prima facie is discriminatory and also reflects excessive pricing vis-a-vis high cost phones.

Allowing royalties based on the full price of a device—with no relation to the standardized technology at issue—creates incentives for standards implementers to forego adding additional non-standardized technology. That, in turn, will deprive consumers of innovation and choices in the marketplace. SEP licensors often contend that their SEPs cover more than just the chip or processor that enables standardized functionality and thus that they should not be required to license at that level or for royalties to be set based on that

[8] In re M/s Best IT World (India) Private Limited (iBall) v. M/s Telefonaktiebolaget L M Ericsson (Publ), Case No. 04 of 2015, CCI, http://www.cci.gov.in/sites/default/files/042015_0.pdf, last accessed on April 14, 2016.

component. But, these contentions do not withstand scrutiny for the reasons stated below with reference to some real world examples:

Example – 1: *W*hen put to the test of litigation, SEP infringement claims tend to focus on the chip or processor that provides the standardized functionality. In litigation against Apple over two patents declared essential to the UMTS cellular standard, the infringement allegations were explicitly directed at the baseband chips supplied to Apple by Intel that provided cellular functionality. Moreover, litigation demonstrated that the claimed royalty demands to Apple bore no relation to the value of the functionality claimed to be covered by the patents. At trial[9], the patent holder's damages expert testified that a FRAND royalty for even just one of the asserted declared-essential UMTS patents could be between 2% and 2.75% of the full sales price of the device. The devices accused of infringement were a range of Apple's iPhone and cellular-enabled iPad devices. An accused iPhone 4 cost around $600 (approximately Rs. 40,000) at that time. Apple purchased the cellular chips from Intel for an average cost of approximately $12.00 (approximately Rs. 800), with some costing as little as about $7.00 (approximately Rs. 465). By seeking up to $16.50 (approximately Rs. 1100) per device for patents that would have been implemented in a baseband chip costing Apple no more than an average of $12, the royalty demands were not tied to the claimed technology of the SEPs. It is ironical and illogical to see that the royalties for the patents in the component is in itself greater than the sale price of the component itself. Ultimately, the jury found that Apple had not infringed either of the declared SEPs, and therefore, no damages were awarded.

[9] Ann Armstrong, Joseph J. Mueller, and Timothy D. Syrett, The Smartphone Royalty Stack: Surveying Royalty Demands for the Components Within Modern Smartphones, Last accessed on 01 Apr, 2016

Example-2: Likewise, in the European Commission's investigation of Motorola for seeking an injunction against Apple in Germany[10], the Commission concluded that "as the technology covered by the Cudak GPRS SEP in Germany relates only to the baseband chipset, a small component of the relevant end-product whose selling price amounts to only a fraction of the final mobile device, the seeking and enforcement of an injunction by Motorola against Apple in Germany on the basis of the Cudak GPRS SEP constitutes a disproportionate interference with the freedom of Apple to conduct its business."[11] Although the issues of seeking an injunction and setting a royalty are not identical, both involve a concern for an outcome proportional to the SEP at issue.

Example-3: Similarly, in Microsoft and Motorola's[12] recent litigation regarding a RAND rate for Motorola's declared SEPs, the court concluded that Marvell's "semiconductor chipsets provide 802.11 functionality for a variety of products, including the Microsoft Xbox." The court went on to explain that "Marvell manufactures and sells its chips to Microsoft, Motorola, Sony and others, which the companies incorporate into products as diverse as the Sony Playstation and the Audi A8 automobile. Though the products are diverse, each company incorporates the Marvell chips into its products for the same reason: to provide 802.11 functionality."

(ii) Claims drafting and Reasonable royalties: Even where the language of the claim of a SEP nominally covers more than just the component (apparatus and system claims) responsible for implementing the standardized technology does not mean that the proper royalty base is broader than the standardized component. An apparatus claim may be focused on a Wi-Fi or a baseband processor, however, a system claims may be focused on a smart phone (or

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[10] Motorola Mobility, Inc. v. Apple Inc. and NeXT Software, Inc., U.S. Dist. Ct., Dist. Del., 2010-10-8; Apple Inc. v. Motorola, Inc. and Motorola Mobility, Inc., U.S. Dist. Ct., W.Dist. Wisc., 2010-10-29;

[11] Commission Decision (EC) 1/2003 of 29 April 2014, ¶ 522, 2014 O.J. (Case AT.39985), available at http://ec.europa.eu/competition/antitrust/cases/dec_docs/39985/39985_928_16.pdf, last visited on April 14, 2016..

[12] Microsoft Corp. v. Motorola, Inc., **696 F.3d 872 (9th Cir. 2012)**.

mobile device) comprising the base band or Wi-Fi processor in addition to other components such as memory, applications processor etc. Even then the royalties cannot be claimed at the system level merely because a system claim is granted. In fact, it appears that the value of having multiple independent claims (such as apparatus and system) is to enable the patent holder to bring about infringement suits against both the component manufacturer and the system manufacturer. However, that does not imply that the patent holder can extract more royalties based on the sale price of the system (merely because of having system claim granted). Contrary, the damages or royalties should be sought on the value that the patents bring to the component. The U.S. Federal Trade Commission has warned that the inquiry into the appropriate royalty base should focus on the "economic realities and not the vagaries of claim drafting"[13].

Vagaries in the claim is an artificial construct for identifying the base that courts should reject is always to equate it with the device recited in the infringed claim. In many cases, there will be an easy correspondence between the inventive feature, the device recited in the infringed claim, and the appropriate base. In other cases, the correspondence will not be so clear. A software invention for rendering video images can be recited in a claim covering video software, or in a claim covering a standard personal computer running the video software. The real focus ought to be on the economic realities and not the vagaries of claim drafting, particularly because the way claims are drafted is so open for manipulation.

(iii) Patent exhaustion and Reasonable Royalties: Patent exhaustion is another important factor that is associated with seeking reasonable royalty at the level of the system (and not at the level of the component) and not licensing SEPs to component manufactures. Not licensing SEPs to component manufacturers is under an imaginary threat of not being able to license the SEPs to system manufacturers once it is licensed to component manufactures due to

[13] Microsoft Corp., 2013 WL 2111217, at *93

patent exhaustion. However, the U.S. Supreme Court[14], in addressing whether sales by Intel of microprocessors to its customer Quanta exhausted certain patents to which Intel was licensed, rejected the idea that there was no exhaustion merely because the claims required the microprocessor to use certain "standard components in the system":

[T]he Intel Products constitute a material part of the patented invention and all but completely practice the patent. Here the incomplete article substantially embodies the patent because the only step necessary to practice the patent is the application of common processes or the addition of standard parts. Everything inventive about each patent is embodied in the Intel Products. . . . ***Naturally, the Intel Products cannot carry out these functions unless they are attached to memory and buses, but those additions are standard components in the system, providing the material that enables the microprocessors and chipsets to function.*** The Intel Products were specifically designed to function only when memory or buses are attached; Quanta was not required to make any creative or inventive decision when it added those parts. Indeed, Quanta had no alternative but to follow Intel's specifications in incorporating the Intel Products into its computers because it did not know their internal structure, which Intel guards as a trade secret. ***Intel all but practiced the patent itself by designing its products to practice the patents, lacking only the addition of standard parts.***

The same logic applies to SEPs. Even if the claim of a SEP recites the use of some other common components of a device—such as an antenna in a cellular phone—that does not mean that the central inventive aspect of the patent extends beyond the component actually implementing the standard.

For these reasons, it is NOT appropriate for Indian courts to adopt the full price of a device as the appropriate royalty base for FRAND royalties. In

[14] QUANTA COMPUTER, INC., ET AL., PETITIONERS v. LG ELECTRONICS, INC, US SC No. 06–937.

Telefonaktiebolaget LM Ericsson v. Intex Technologies (India) Limited[15], the High Court of Delhi concluded that "the argument that defendant to pay the royalty on the chipset value cannot be accepted in view of plaintiff's practice of charging Royalty on the device price is Non-Discriminatory." But simply because the SEP licensor had a practice of charging such rates, does not mean that they are necessarily FRAND.

Although existing licenses may be relevant to determining FRAND rates in certain circumstances, they must be scrutinized carefully to ensure that they accurately reflect the value of the SEPs at issue and not any other factors, such as the distorting impact of hold-up. In litigation between Microsoft and Motorola[17], the U.S. court setting a RAND royalty for Motorola's claimed SEPs refused to consider any of Motorola's proffered licenses as relevant to a determination of RAND royalties, including because they reflected the value of hold-up gained through using injunctive relief [16].

Further, the High Court of Delhi relied on a U.S. district court decision from the Eastern District of Texas, *CSIRO v. Cisco*[17], *id.* ¶ 156, which was in fact subsequently reversed by the Federal Circuit Court of Appeals. In the Federal Circuit's decision reversing the district court, it confirmed that the principle of apportioning royalties so that they ***"reflect the value attributable to the infringing features of the product, and no more" is the "governing rule" "where multi-component products are involved."*** The court indicated that this may be achieved by using comparable licenses in appropriate circumstances as well as by examining the smallest salable patent practicing unit, and it

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[15] *Telefonaktiebolaget LM Ericsson v. Intex Technologies (India) Limited*, No. 6735/2014, ¶ 157 (High Court of Delhi March 13, 2015)

[16] *Microsoft Corp. v. Motorola, Inc.*, No. C10-1823JLR, 2013 2111217, at *69 (W.D. Wash. Apr. 25, 2013) ("the RIM license agreement provides for a comprehensive settlement of a wide range of litigation between the parties, including litigation in which Motorola was seeking an exclusion order in the ITC to prevent the importation of RIM's flagship BlackBerry products. . . . The court agrees with Microsoft that no evidence exists tending to prove that RIM would have agreed to royalties for either 802.11 or H.264 Patents alone, apart from this broader agreement that allows RIM to avoid an exclusion order on its BlackBerry products.")

[17] Commonwealth Scientific and Industrial Research Organisation v. Cisco Systems, Inc. (Fed. Cir., Dec. 1, 2015)

therefore in no way endorsed the district court's conclusion that a chipset could not be an appropriate royalty base. To the contrary, the Federal Circuit confirmed the established principle that *"where a damages model apportions from a royalty base, the model should use the smallest salable patent-practicing unit as the base."* Accordingly, the approach to FRAND royalties adopted by the CCI in the *prima facie* opinions in certain FRAND-related investigations better reflects prevailing legal and economic norms regarding the determination of patent damages generally, and FRAND royalties specifically than the decisions thus far of Indian courts.

6.2. Appropriate Basis for Determining Reasonable Royalty

A basis for determining the reasonable royalty should be the intrinsic value of the SEP and it should not include an inflated royalty value because a patent has become a SEP. An overview of the fundamental FRAND principles and its operation so far is discussed in detail. A commitment to license on FRAND terms embodies certain fundamental principles that have been recognized widely by courts and regulators[18]. These principles arise from the fundamental purpose of the FRAND commitment: to promote widespread adoption of the standard. The FRAND commitment is thus aimed principally at preventing patent holders from using their patented technology to exploit the hold-up power created by standardization and subsequent investments made by implementers to develop products using the standard to extract unreasonable royalties and concessions. As the European Commission has explained:

> *FRAND commitments are designed to ensure that essential IPR protected technology incorporated in a standard is accessible to the users of that standard on fair, reasonable and non-discriminatory terms and conditions[19]. In particular, FRAND commitments can prevent IPR holders from making the implementation of a standard difficult by refusing to*

[18] John Matheson, Director of Legal Policy (Asia Pacific), Intel, SSOs and FRAND: Licensing issues, http://cis-india.org/a2k/blogs/conference-on-standards-settings-organizations-sso-and-frand-nlsiu, last visited on April 04, 2016.

[19] Kirsty Middleton - 2015 - Antitrust law, Blackstone's UK & EU Competition Documents, Last accessed on 05 Apr, 2016

license or by requesting unfair or unreasonable fees (in other words excessive fees) after the industry has been locked-in to the standard or by charging discriminatory royalty fees.

Abusive licensing practices create a disincentive for companies to implement standards, threatening the adoption of standards themselves as well as the non-standardized innovations that implementers add on top of standardized technology to differentiate their products. Those incentives directly affect consumers, who may face decreased competition, less innovation, lower quality, and higher prices.

In choosing to make a FRAND commitment[20], a SEP holder willingly makes a trade-off. Unlike the more general patent holder, the SEP holder has accepted as part of the quid pro quo of standardization that the royalties it may earn, and its scope to secure injunctive relief, will be constrained by the FRAND commitment. SEP holders willingly relinquish these rights because of the valuable benefits they may receive if their patented technology is standardized, including the often substantially expanded licensing opportunities that widespread adoption of the standard can create.

Standardization can transform the potential licensing revenue of a patent dramatically if every device complying with the standard will necessarily use it. Consistent with the aim of the FRAND commitment to promote widespread adoption of a standard, there are certain principles that follow:

- Non-discrimination requires that a SEP holder is prepared to negotiate with and provide a FRAND license to any party that requests one for the purpose implementing the standard, no matter what type of standard-implementing component or product that party supplies;

[20] Brief of amici curiae intel corporation, aruba networks inc., dell inc., hewlett-packard company, newegg inc., sas institute inc., sierra wireless, inc., vizio, inc., and xilinx, inc. in support of appellee and affirmance, http://www.essentialpatentblog.com/, last visited on April 14, 2016.

- Fair and reasonable royalties must reflect the value of the SEPs, which generally includes applying at least the following factors to setting a rate:

→ Assessing a royalty based on the relevant aspect of the component that implements the SEPs (often referred to as the "smallest saleable patent-practicing unit"), not the full price of the end device into which that component is incorporated;

→ Isolating the *ex ante* or incremental or inventive value of the SEPs before the standard is set, not any hold-up value conferred by standardization; and

→ Considering the potential aggregate royalty demands for other SEPs (*i.e.*, "royalty stacking").

(i) SSPPU: The term "Component" refers to the smallest saleable patent practicing unit (SSPPU). As explained below, the SSPPU for interoperability standards is often a processing chip that is incorporated into an end device—*e.g.*, a baseband processing chip incorporated into a mobile phone to provide cellular functionality, or a Wi-Fi chip integrated into a mobile phone or a laptop to allow an Internet connection on a wireless local area network. In other contexts the SSPU may be different technology, such as a piece of software or a section of a service. The key point is distinguishing between a standards-implementing component/technology that is responsible for providing standardized functionality, on the one hand, and end products or services that embrace not only standardized functionality but also other, differentiating features, on the other hand. It is appropriate to base FRAND royalties using (at most) the cost of a standards-implementing component/technology (i.e., SSPPU) as a starting point, to ensure the tightest possible correspondences between FRAND royalties and the actual patented inventions. Although these basic FRAND principles follow clearly from the purpose and nature of the FRAND commitment, however, there have been abusive and discriminatory licensing practices.

ITU requires that a party making a FRAND commitment agree that it "is prepared to grant a license to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions to make, use and sell implementations"[21]. The only exception noted in the licensing commitment is that a SEP holder can indicate that its "willingness to license is conditioned on Reciprocity"—*i.e.*, a licensee must be willing to similarly license its SEPs to the licensor for implementation of the relevant ITU "Recommendation." The Common Patent Policy that governs the ITU disclosure further provides that the licensing "statement must not include additional provisions, conditions, or any other exclusion clauses in excess of what is provided for each case in the corresponding boxes of the form."[22] As the United States Court of Appeals for the Ninth Circuit concluded about the ITU commitment: "This language admits of no limitations as to who or how many applicants could receive a license ('unrestricted number of applicants')."[23]

Fair and reasonable royalties must *isolate the inherent technical value of the SEPs, rather than the value of standardization* or of other features/functions in an end product. FRAND royalties for SEPs must reflect the value of the SEPs at issue to the relevant products, rather than any hold-up value conferred by the standard as a whole, or the value of other, non-standardized innovations in an end product. The following factors are critical to ensuring that FRAND royalties properly reflect the actual technical merits of the patents. *A FRAND royalty must be assessed in proportion to the value of the invention (i.e., on the relevant aspect of the component that implements the SEPs, not the full price of the end device into which the component is incorporated).* Patent royalties are often determined, whether by parties negotiating a license or by courts, by multiplying

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[21] *Patent Statement and Licensing Declaration for ITU-T or ITU-R Recommendation, ISO or IEC Deliverable* at 2, *available at* http://www.itu.int/dms_pub/itu-t/oth/04/04/T04040000020003PDFE.pdf, last visited on April 14, 2016.

[22] ITU, Common Patent Policy for ITU-T/ITU-R/ISO/IEC ¶ 3, http://www.itu.int/en/ITU-T/ipr/Pages/policy.aspx, last visited Feb. 9, 2015.

[23] *Microsoft Corp. v. Motorola, Inc.*, 696 F.3d 872, 884 (9th Cir. 2012). *59Microsoft Corp. v. Motorola, Inc.*, 696 F.3d 872, 884 (9th Cir. 2012).

a royalty rate by a royalty base. The royalty base that is selected for setting a rate is critical to ensure that the resulting royalty accurately reflects the incremental value of the patents. If an improper base is selected, it can skew the determination of a royalty. In the case of SEPs, the royalty base should be set with reference to, at most, the price (or profit margin) of the component that supplies the standardized functionality. In particular, using the component that implements the SEPs to derive the royalty base is an important step to ensuring that the resulting royalties will be reasonable and non-discriminatory, and will compensate the patent owner for its actual invention, and not based on the value of other unpatented, downstream technologies.

Using a royalty base that is no greater than the component is critical to ensuring reasonableness. Determining royalties at the component level enables the patent holder to be compensated for whatever value its patent contributes to the end product—that value is included in the price of the component—but ensures that the patent holder does not extract value to which it is not entitled[24]. This principle has been recognized by at least one SSO that has expressly indicated in its intellectual property rights policy what factors are to be taken into account in assessing a FRAND royalty. Thus the IEEE Patent Policy directs that a "Reasonable Rate" for RAND royalties should take into account, among other factors, the value an SEP contributes to the "smallest saleable Compliant Implementation" practicing the standard:

"Reasonable Rate" shall mean appropriate compensation to the patent holder for the practice of an Essential Patent Claim excluding the value, if any, resulting from the inclusion of that Essential Patent Claim's technology in the IEEE Standard. In addition, determination of such Reasonable Rates should include, but need not be limited to, the consideration of:

[24] J. Gregory Sidak, THE PROPER ROYALTY BASE FOR PATENT DAMAGES, Journal of Competition Law & Economics, 10(4), 989–1037 doi:10.1093/joclec/nhu030 Advance Access publication 26 November 2014

→The value that the functionality[25] of the claimed invention or inventive feature within the Essential Patent Claim contributes to the value of the relevant functionality of the smallest saleable Compliant Implementation that practices the Essential Patent Claim.

→ The value that the Essential Patent Claim contributes to the smallest saleable Compliant Implementation that practices that claim, in light of the value contributed by all Essential Patent Claims for the same IEEE Standard practiced in that Compliant Implementation.

→ Existing licenses covering use of the Essential Patent Claim, where such licenses were not obtained under the explicit or implicit threat of a Prohibitive Order, and where the circumstances and resulting licenses are otherwise sufficiently comparable to the circumstances of the contemplated license.

This approach, with its concept of the "smallest saleable unit" reflects a longstanding principle of patent damages law in the United States, that a patent holder must apportion the value contributed by its patent from other value in a device accused of infringement. The U.S. Supreme Court has held that a patent holder[26]:

(a) must in every case give evidence tending to separate or apportion the defendant's profits and the patentee's damages between the patented feature and the unpatented features, and such evidence must be reliable and tangible, and not conjectural or speculative; or

(b) must show, by equally reliable and satisfactory evidence, that the profits and damages are to be calculated on the whole machine, for the reason that the entire value of the whole machine, as a marketable article, is properly and legally attributable to the patented feature.

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[25] IEEE-SA STANDARDS BOARD BYLAWS, http://standards.ieee.org/develop/policies/bylaws/sect6-7.html, last visited on 24 Mar, 2016.

[26] Garretson v. Clark, 111 U.S. 120 (1884) , Last accessed on 04 Apr, 2016

Also, U.S. Federal Circuit Court of Appeals (in CISRO v Cisco), which specializes in patent cases, has held that one way in which to apportion the value contributed by a particular patent to a complex device is to consider the "smallest saleable patent-practicing unit" as a royalty base. But even when the smallest saleable patent-practicing unit is identified, that "is simply a step toward meeting the requirement of apportionment. Where the smallest saleable unit is, in fact, a multi-component product containing several non-infringing features with no relation to the patented feature. The Federal Circuit started with what it deemed a long-standing rule of apportionment when awarding damages for patent infringement under 35 U.S.C. § 284, stating:

Under § 284, damages awarded for patent infringement must reflect the value attributable to the infringing features of the product, and no more. This principle—apportionment—is the governing rule where multi-component products are involved. Consequently, to be admissible, all expert damages opinions must separate the value of the allegedly infringing features from the value of all other features.

Courts must use their gate-keeping authority to ensure expert testimony "using whatever methodology" is "sufficiently reliable to support a damages award," because parties have "great financial incentive ... to exploit the inherent imprecision in patent valuation." The Federal Circuit said that the "essential requirement" for such reliability is apportionment:

And as we have repeatedly held, the essential requirement for reliability under Daubert is that the ultimate reasonable royalty award must be based on the incremental value that the patented invention adds to the end product. In short, apportionment.

There may be more than one reliable method to estimate the royalty, since different cases present different facts, but its important that whatever methodology is used is "sufficiently tied to the facts of the case":

In practice, this means that abstract recitations of royalty stacking theory, and qualitative testimony that an invention is valuable—without being anchored to a quantitative market valuation—are insufficiently reliable. Where the data

used is not sufficiently tied to the facts of the case, a damages model cannot meet the substantive statutory requirement of apportionment of royalty damages to the inventions value. The Federal Circuit then discussed the smallest salable patent-practicing unit being one principle that can "aid courts in determining when an expert's apportionment is reliable." There are two justifications for it:

*"**First**, where small elements of multi-component products are accused of infringement, calculating a royalty on the entire product carries a considerable risk that the patentee will be improperly compensated for non-infringing components of that product. **Second** is the important evidentiary principle that care must be taken to avoid misleading the jury by placing undue emphasis on the value of the entire product. Fundamentally, the smallest salable patent-practicing unit principle states that a damages model cannot reliably apportion from a royalty base without that base being the smallest salable patent-practicing unit.*

For wireless interoperability standards, such as cellular or Wi-Fi, that are generally implemented in a chip, the chip is the appropriate smallest saleable unit from which to derive a royalty base. In a recent case[27] in which patents claimed to be essential to 3G and 4G cellular standards were asserted against Apple, the court held "as a matter of law that in this case, the baseband processor is the proper smallest saleable patent-practicing unit." In particular, the court rejected the patent holder's contention that the relevant "invention [of its patents] is the entire device" and not just in the baseband chip: "GPNE may not claim the entire accused iPhones and iPads as the smallest salable patent-practicing units for damages purposes solely because GPNE claimed a 'node' having a processor that can perform the invented signaling steps rather than just the processor itself." Similarly, in the recent *Innovatio* case[28] in which the court set RAND royalties for Wi-Fi SEPs, the court concluded that it would "consider the price of a Wi–Fi chip to be the appropriate RAND royalty base."

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[27] GPNE Corp. v. Apple Inc., (N.D.Cal. April 16, 2014)
[28] In re Innovatio IP Ventures LLC Patent Litig., (N.D. Ill. Oct. 3, 2013).

Using the full cost of a Component, such as a cellular chip, as a royalty base will generally be over inclusive because such a Component often incorporates other functionality beyond a single standard, including non-standardized technologies. Moreover, the price of a Component encompasses more than just the cost of patent royalties to third parties. The price also must account for the costs that the supplier incurred in developing that Component, production costs, materials, shipment, sales and marketing, and many other costs of the design, manufacturing, and distribution processes. Accordingly, although the court in *Innovatio* started with the price of the Wi-Fi chip, it ultimately concluded that the average profit margin on the chips was a more appropriate royalty base. As the court observed, "[i]f the royalty is excessive in comparison to a chip manufacturer's profit margin on a chip the royalty is too high chip manufacturers facing a demand for a royalty far outstripping their expected profit margin would not agree to take a license on the patents, but would instead exit the chip-making business."

Likewise, in the European Commission's decision[29] in its proceedings against Rambus for alleged deceptive conduct in an SSO setting standards for Dynamic Random Access Memory (DRAM), the Commission did not accept Rambus's proposed commitments until Rambus first "clarified that the royalty shall be determined on the basis of the price of an individually sold chip and not of the end-product. If they are incorporated into other products, the individual chip price remains determinative." Further, the commitment used a royalty cap to provide for additional apportionment for chips that incorporated additional functionality beyond Rambus's patents.

Using a common royalty base avoids discriminatory rates - Assessing royalties based on the Component implementing the SEPs also better ensures

[29] European Commission decision on RAMBUS Case - Case COMP/38.636, available at http://ec.europa.eu/competition/antitrust/cases/dec_docs/38636/38636_1203_1.pdf, last visited on 24 Apr 2016.

that FRAND royalties will be non-discriminatory because they will be consistent across the industry no matter the type of product is licensed and will not penalize suppliers of differentiated products that innovate in ways that allow their products to command a higher price. Because SEP holders must grant licenses to all interested licensees—including Component suppliers—determining a FRAND royalty starting from the Component level helps to ensure that SEP holders comply with their commitment to be prepared to negotiate and provide a license on their SEPs to all implementers on reasonable and ***non-discriminatory*** terms, when requested. As court observed in *Innovatio* , using the profit margin on the Component as a royalty base furthers the goal of setting a non-discriminatory rate "because a RAND licensor . . . cannot discriminate between licensees on the basis of their position in the market"—*i.e.*, what type of product they supply.

(ii) Ex-ante: *FRAND royalties must reflect only the ex ante or incremental value of the SEPs before the standard is set, not any hold-up value conferred by standardization*[30]. A FRAND royalty must reflect only the value of the SEP, not any value conferred on the SEP holder by the value of the standard or hold-up value through standardization. The European Commission has recognized this point in its Horizontal Guidelines[31]: "the assessment of whether fees charged for access to IPR in the standard-setting context are unfair or unreasonable should be based on whether the fees bear a reasonable relationship to the economic value of the IPR." Similarly, the U.S. Federal Circuit has recently explained that assessing the actual or incremental value of SEPs involves two separate steps of apportionment[32]. When dealing with SEPs, there are two special apportionment issues that arise. ***First,*** the patented feature must be apportioned from all of the unpatented features reflected in the standard. ***Second,*** the patentee's royalty

[30] Norman V. Siebrasse & Thomas F. Cotter, THE VALUE OF THE STANDARD, https://www.tilburguniversity.edu, last visited on 28 Mar, 2016.

[31] Communication from the Commission: Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, 2011 O.J. (C 11) ¶ 287 [hereinafter Horizontal Guidelines], available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2011:011:0001: 0072:EN:PDF, last visited on April 14, 2016.

[32] Ericsson Inc. v. D-Link Systems 773 F.3d 1201, U.S. Court of Appeals, Federal Circuit (2014)

must be premised on the value of the patented feature, not any value added by the standard's adoption of the patented technology. These steps are necessary to ensure that the royalty award is based on the incremental value that the patented *invention* adds to the product, not any value added by the standardization of that technology.

One robust method to gauge the incremental value of SEPs is to assess the value of the patent before the effects of standardization. The European Commission has endorsed such an approach[4]: "it may be possible to compare the licensing fees charged by the company in question for the relevant patents in a competitive environment before the industry has been locked into the standard (*ex ante*) with those charged after the industry has been locked in (*ex post*).[33]" Similarly, the U.S. FTC[34] has also advocated that "[c]ourts should cap the royalty at the incremental value of the patented technology over alternatives available at the time the standard was chosen." In particular, consideration should be given to whether there were alternative solutions available at the time of standardization or whether the SSO simply could have foregone including the function the technology performs in the standard altogether. Analyzing the availability of such alternatives prior to standardization—and the price competition they would have created—allows an appropriate assessment of the SEP's incremental worth and reduces the risk of hold-up skewing the patent's valuation[35]. Although determining with precision the *ex ante* value of a SEP may be challenging, even if analyzing available alternatives does not yield a precise royalty figure, it nonetheless may provide direction about the appropriate range of values for the SEP.

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[33] Supra at 214

[34] Fed. Trade Comm'n, *The Evolving IP Marketplace Aligning Patent Notice and Remedies with Competition* 211 (2011), *available at* http://www.ftc.gov/os/2011/03/110307patentreport.pdf, last visited on April 14, 2016.

[35] *See In re Innovatio IP Ventures*, 2013 WL 5593609, at *37 (adopting methodology that "best approximates the RAND rate that the parties to a hypothetical ex ante negotiation most likely would have agreed upon ... before Innovatio's patents were adopted into the standard"); Joseph Farrell, et al., *Standard Setting, Patents, and Hold-Up*, 74 Antitrust L. J. 603, 659 (2007) ("[T]he consensus view among economists [is] that FRAND should be based on *ex ante* technology competition.").

Incorrectly, the value of the technology covered by a SEP appears to be coming substantially from the ability (improperly) to extract hold-up value for the SEP. However, the technical specifications that standards developers draft often address a series of small details regarding how to implement standardized functionality and may include details that may not present significant technical challenges but that necessarily must be addressed by choosing one solution, even if others could serve equally well. Thousands of these details are aggregated to create voluminous standards for which there may be thousands of patents claimed to be essential. The SSO decision-making can involve consideration of many factors bearing on the solution that is chosen. Referring to a SEP as "essential" may not even reflect the technical superiority of a SEP as other superior alternatives may be available at the time.

Litigations in which FRAND royalties have been determined demonstrate that there is a significant divergence between the demands of SEP holders and what judges or juries believe an actual FRAND royalty should be on examination of the facts. Table 6.4 below summarizes demands made by SEP holders in cases in which a judge or jury later set a FRAND rate for the SEP portfolio at issue, that were far above the court-determined rate:

Case	Standard	Royalty Requested by Patent Holder	FRAND Royalty Set By Court Jury
Microsoft Corp. v. Motorola, Inc.	Wi-Fi/802.11	2.25% of end product, resulting in royalties of up to $9 per Xbox[36]	$0.03471/unit (for Xbox)[37]
	H.264	2.25% of end product prices, such as laptops and smartphones	$0.00555/unit[38]

[36] Motorola initially offered Microsoft a license to its purported Wi-Fi SEPs at a royalty of 2.25%. *Microsoft Corp.*, 2013 WL 2111217.
[37] *Id 219*, This rate on eleven alleged SEPs was set based on the court's application of its RAND royalty rate analysis to the Xbox. This relates to a per-patent rate of 0.32 cents per device.
[38] *Supra 199*

Innovatio IP Ventures	Wi-Fi/802.11	$3.39 - $36.90 per end product[39]	$0.0956 per Wi-Fi chip[40]
Realtek Semiconductor Corp. v. LSI Corp.	Wi-Fi/802.11	5% of end product[41]	0.19% of chip price, or $0.0033, for two patents[42]

(iii) Royalty stacking: *FRAND royalties must consider potential aggregate royalty demands for other SEPs* - In addition to considering the incremental value of SEPs free from any hold-up value, a FRAND rate must also consider royalties for other patents required to implement the standard. The goal of widespread adoption of a standard cannot be achieved if these aggregate demands are not considered when setting a FRAND rate, or else a "royalty stack" will be created that makes implementing the standard prohibitively costly and uneconomical.

The need to account for the aggregate royalty stack is well recognized. The European Commission has stated that "hold-up is exacerbated where a large number of SEPs, covering various standards, are applied to a single product. In such circumstances, the number of potential licensors may cause the combined royalty payments made to the various SEP-holders to become excessive. This phenomenon is known as 'royalty stacking'.[43]"

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[39] *In re Innovatio IP Ventures*, 2013 WL 5593609, (Innovatio advocated a damages methodology of determining a "Wi-Fi feature factor" for a device that takes into account the value of Wi-Fi to the product, multiplying that feature factor by the end device price and then applying a 6% rate to that figure, resulting in "royalties on average of approximately $3.39 per access point, $4.72 per laptop, up to $16.17 per tablet, and up to $36.90 per inventory tracking device (such as a bar code scanners).

[40] *Id.* 222 (covering nineteen patents found by the Court to be among the top 10% most valuable 802.11 SEPs, resulting in a per-patent rate of 0.5 cents).

[41] *Realtek Semiconductor Corp. v. LSI Corp.*, 946 F. Supp. 2d 998, 1001-02 (N.D. Cal. 2013) (noting a 2002 demand by Agere of 5% on all 802.11b products sold by Realtek).

[42] A jury awarded LSI/Agere 0.19% of Realtek's chipset price for two asserted patents. Jury Verdict Form, *Realtek Semiconductor Corp. v. LSI Corp.*, No. CV-12-3451-RMW (N.D. Cal. 2013) (Dkt. No. 324). Testimony at trial indicated the average chip price was $1.74. Trial Transcript, *id.* at 607. This produces a per-patent rate of less than 0.17 cents per chip.

[43] Opinion of AG Wathelet, *Huawei v. ZTE*, Landgericht Düsseldorf [LG], Nov. 20, 2014, note 14.

The U.S. Federal Circuit[22] has held that "SEPs pose two potential problems that could inhibit widespread adoption of the standard: patent hold-up and royalty stacking." The court further explained that "[r]oyalty stacking can arise when a standard implicates numerous patents, perhaps hundreds, if not thousands. If companies are forced to pay royalties to all SEP holders, the royalties will 'stack' on top of each other and may become excessive in the aggregate.[44]" The court in the *Microsoft* case likewise held that when setting a RAND rate, "the parties attempting to reach an agreement would consider the overall licensing landscape in existence vis-à-vis the standard and the implementer's products. In other words, a RAND negotiation would not be conducted in a vacuum. The parties would instead consider other SEP holders and the royalty rate that each of these patent holders might seek from the implementer based on the importance of these other patents to the standard and to the implementer's products.[45]" As noted above, the IEEE Patent Policy also provides that a RAND rate should factor in the "overall royalty that could be charged for all Necessary Claims."

Although the FRAND litigation royalty rates listed in the chart above—fractions of pennies on a per-patent basis—may seem low, they nonetheless could result in considerable licensing revenue given the proliferation of standardized devices that may potentially support licensing royalties. One estimate puts the number of Wi-Fi devices to be sold in 2016 at 3 billion units, for an overall number sold of more than 15 billion[46]. Similarly, as of 2013, there

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[44] *Ericsson, Inc.*, 773 F.3d at 1208. In acknowledging royalty stacking, the CAFC ruled that jury instructions on stacking issues should be provided by the court so long as one of the parties has presented evidence of stacking problems in the particular case.

[45] *Microsoft Corp.*, 2013 WL 2111217, at *20. *108Microsoft Corp.*, 2013 WL 2111217, at *20.

[46] Wi-Fi Alliance, *Wi-Fi® device shipments to surpass 15 billion by end of 2016*, Jan. 5, 2016, *available at* http://www.wi-fi.org/news-events/newsroom/wi-fi-device-shipments-to-surpass-15-billion-by-end-of-2016. Wi-Fi Alliance, *Wi-Fi® device shipments to surpass 15 billion by end of 2016*, Jan. 5, 2016, *available at* http://www.wi-fi.org/news-events/newsroom/wi-fi-device-shipments-to-surpass-15-billion-by-end-of-2016, last visited on May 16, 2016.

were estimated to be 6 billion 3GPP (GSM, HSPA, and LTE) cellular subscriptions worldwide[47].

Moreover, these royalty awards are also significant in light of the potential aggregate industry demands and the actual cost of the Components at issue. In *Microsoft*[17], the district court set a RAND rate of $0.03471 per unit for Motorola's eleven 802.11 SEPs that applied to the Xbox[48]. That portfolio rate translates to $0.00316 per patent, and it has been estimated that there may be over 3,000 SEPs for the 802.11 standard[49]. If each SEP was valued using the per-patent rate set by the *Microsoft* court, the cumulative royalty stack for the 802.11 standard would be $9.47 (approximately Rs. 630) per unit (below, the "Implied Royalty Stack (3,000 SEPs)").

By contrast, the chips that Microsoft uses to provide Wi-Fi functionality in the Xbox were described by the court as "commodity products" that sell for less than $3 (approximately Rs. 200) per chip[50]. Thus, the aggregate royalty demand for an 802.11 product applying the district court's RAND rate ($9.47) far exceeds the ***entire*** cost of the chip ($3), as shown in the chart below. The unreasonableness of basing a FRAND royalty on the cost of the entire device price is shown in Motorola's demand of 2.25%, which would have resulted in royalties of $9 (approximately Rs. 600) where the chip supplying Wi-Fi functionality cost only $3. Further, if the ***initial*** demands of SEP holders before being decreased through litigation are considered on an industry-wide basis, they are staggering. Motorola's pre-litigation of $9 per Xbox for 11 SEPs amounts to $0.82 per SEP. If all patent holders sought that amount for the reported 3,000

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[47] 3GPP, *6 Billion & Growing!*, Mar. 2013, http://www.3gpp.org/news-events/12-news-events-others/press-clippings/1465-6-billion-growing, last visited on May 16, 2016.

[48] Motorola asserted that it had twenty-four 802.11 SEPs but that only eleven were relevant to the Xbox. *Microsoft Corp.*, 2013 WL 2111217.

[49] *In re Innovatio IP Ventures*, 2013 WL 5593609.

[50] *Microsoft Corp.*, 2013 WL 2111217, The cost of Wi-Fi chips has continued to decline over time and many are now available for far less than $3.00 per unit.

Wi-Fi SEPs, it would create a royalty stack of $2,454 (approximately Rs. 163,000) per $3 (or less) Wi-Fi chip.

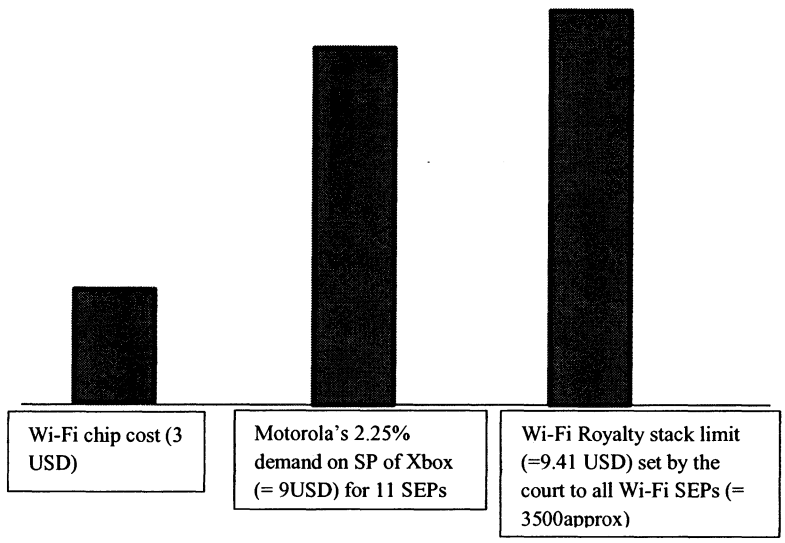

Fig. 6.5: Effect of Royalty Stacking

SEP licensors often try to paint royalty stacking as merely theoretical. But as a practical matter, no rational SEP licensee views a single SEP licensing negotiation in isolation; rather, the licensee necessarily views the current negotiation in the context of past and future negotiations for all SEPs needed to practice the standard (or at least those for which it is reasonably foreseeable that will be demanded). Accordingly, the rational licensee will not agree to pay royalties for a single license that would make it uneconomical to license the remaining SEPs it may need, and so the licensee necessarily will take into account the potential royalty stack, even in its first negotiation. In any event, royalty stacking is far from theoretical as the SEP litigations discussed above illustrate.

Moreover, taking action to address royalty stacking only ***after*** a prohibitively expensive royalty stack has been created necessarily will not prevent harmful effects from royalty stacking. If the first royalty is not set taking into account the potential aggregate demands to come, a disproportionate share of royalties would go to those SEP holders first in line, without regard to the relative value of their SEPs. That has serious potential to distort innovation

incentives by undercompensating inventors of truly valuable standardized technologies and overcompensating inventors of low value technologies simply because they acted quickly and aggressively to demand high royalties.

6.3. Conclusion

From the above it is evident that SEP holders have attempted to extract higher royalties in each and every case. The courts have determined that in each of the above case the actual reasonable royalty rates were 50 to 100 times (9 USD to 0.036 cents) less than what was sought by SEP holders. Also, it is clear that the SEP holders are using end product as a basis for calculating royalties and it has led to seeking 100 times more than what ought to be the reasonable royalty. From the above discussions it is glaringly evident that apportionment should be the key to determine the royalty and reasonable royalty. The smallest saleable patent practicing unit (SSPPU), which embodies a SEP should be considered as a basis for determining reasonable royalties. Considering an end product as a basis for determining royalties will invariably lead to unjust enrichment of the SEP holder and such an approach affects licensees, competition, consumers, and the innovation as it tax burdens the entire system. Another important inference is that the negotiation between the parties should focus on determining reasonable royalties and other clauses in the licensing agreement without the threat of injunction as such a threat will generally result in a higher royalties (which is non-FRAND or reasonable).