

Quanta v. LG Electronics and the Doctrine of Patent Exhaustion –
Supreme Court Clarification Or the Start of a New Debate?

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1. Introduction

On June 9, 2008, the Supreme Court issued a unanimous opinion in *Quanta v. LG Electronics*². This is the Supreme Court's first ruling in 66 years addressing the doctrine of patent exhaustion. It is also one in a series of cases since 2005 in which the Supreme Court has reversed the Federal Circuit and scaled back the power of patent holders.³

The thinking of the Supreme Court on the doctrine is perhaps best summed up by a line of questions posed by Justice Breyer at oral argument that went something like this: "if I buy a pedal for my bike, what can I do with that pedal if I can not use it on a bike?"⁴ Questions like this and others raised at oral arguments previewed the outcome that *Quanta* should be allowed to use purchased Intel microprocessors with non-Intel memory chips. The *stare decisis* challenge was reconciling this outcome with numerous decisions, including Federal Circuit decisions to the contrary.

This paper explores the Supreme Court's decision on the law of patent exhaustion and the Court's clarification of the standard set forth in *Univis*⁵ that defines the extent of

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² *Quanta Computer, Inc. v. LG Elecs., Inc.*, No. 06-937, SUPREME COURT OF THE UNITED STATES, 128 S. Ct. 2109; 170 L. Ed. 2d 996; 2008 U.S. LEXIS 4702; 76 U.S.L.W. 4375; 86 U.S.P.Q.2D (BNA) 1673 (2008)

³ In *KSR v. Teleflex*, the Supreme Court expanded the definition of obviousness, making it harder to get a patent and in *eBay v. MercExchange*, the Supreme Court limited the use of injunctions after a finding of infringement.

⁴ See, e.g., Transcripts of Oral Hearings before the Supreme Court, pp. 29-31, 35-38, 47-48.

⁵ *Univis*, 316 U.S. 241, 62 S. Ct. 1088, 86 L. Ed. 1408, 1942 Dec. Comm'r Pat. 789 (1942)

exhaustion by a first sale and why, under the facts of *LGE*, the exhaustion of the combination and method patents may have been the right one. It explores the uncertainties as to, among other things, exactly what combination patents and method patents are “essentially embodied” in the product sold. It explores the need for companies to revise their licensing programs to account for the broader scope of patents that may now be exhausted by a first sale. It lastly explores a distinction between *LGE* and *Univis* that could provide a basis for the Supreme Court to revisit its *LGE* and *Univis* decisions in the future to square its precedent in a way that adds more certainty and predictability to the exhaustion doctrine and preserves the viability of combination and method patents as separately patentable subject matter.

2. Facts in the Case

In *LGE*, the plaintiff-appellee, LG Electronics licensed certain patents to Intel including the three patents in suit relating to computers.⁶ *LGE* 128 S. Ct. at 2113-2114 Under the terms of the license, Intel was granted the right to make and sell Intel microprocessors and chipsets. *LGE* 128 S. Ct. at 2114

The license expressly recited that no license is granted to Intel customers to use the products with non-Intel memory devices. *Id.* The license also expressly recited that the license does not alter the effect of patent exhaustion that would otherwise apply. *Id.* Under a separate Master Agreement, Intel was required to give its customers notice that the Intel microprocessors sold were licensed only for use with Intel components. *Id.* The

⁶ The three patents are U.S. Pat. No. 4,918,645 directed to increasing computer bus efficiency; U.S. Pat. No. 5,077,733 directed to controlling device access to a bus servicing multiple devices; and U.S. 4,939,641 directed to non-retrieval of outdated data from memory.

Master Agreement provided that a breach of the Master Agreement would not affect the License Agreement. *Id.*

Intel sold Intel microprocessors to third parties including Quanta and provided the customers with the written notice required under the Master Agreement. Quanta combined the Intel microprocessors with non-Intel components in ways that infringed the LG Electronics combination and method patents. Quanta did not modify the Intel components and followed Intel's specifications to incorporate the parts into their own systems. *Id.* Quanta refused to license the LG Electronics combination and method patents and LG Electronics sued Quanta for infringement. Quanta countered that the LGE patents were not infringed because, for among other reasons, Intel's sale of the microprocessor exhausted the LGE patents. *Id.*

The District Court held that Intel's sale exhausted LG Electronic's combination patents because the Intel products had no reasonable non-infringing uses except in the patented combination.⁷ *LGE* 128 S. Ct. at 2115 The District Court however held that no method claims were exhausted following a line of Federal Circuit decisions that held that patent exhaustion does not apply to method patents. *Id.*

The Federal Circuit affirmed with respect to the method patent but reversed with respect to the combination patents. The Federal Circuit ruled that the LG Electronics combination patents were not exhausted because LG Electronics did not license Intel to sell Intel microprocessors to Quanta for use with non-Intel components. *Id.*

The Supreme Court granted certiorari. *Id.*

The case attracted wide-spread attention because of the implications the decision could have on the ability of patent owners to vertically license their patents across

⁷ *LG Elecs. Inc. v. Ausustek Computer, Inc.*, 2002 U.S. Dist. LEXIS 25956, 65 U.S.P.Q.2D (BNA) 1589, (N.D. Cal. 2002).

multiple levels of the supply chain. In a unanimous decision rendered on June 9, 2008, the Supreme Court held that the sale of Intel microprocessors and chipsets exhausted all combination and method patents of LG Electronics in which the essential feature of the combination patents or essential steps in the method patents reside or take place in the microprocessor and chipsets sold. *LGE* 128 S. Ct. at 2123

3. Patent Exhaustion

3A. What is Patent Exhaustion?

Patent exhaustion derives from principles of law. *LGE* 128 S. Ct. at 2116, 2116-22 Implied license derives from principles of equity. *Bandag, Inc. v. Al Bolser's Tire Stores, Inc.*, 750 F.2d 930, 925 (Fed. Cir. 1984); *Met-Coil sys. Corp. v. Korners Unlimited, Inc.*, 803 F.2d 684, 686 (Fed. Cir. 1986); see also *LGE* 128 S. Ct. at 2123

The doctrine of patent exhaustion goes to what rights pass to the buyer on the purchase of a product *as a matter of law*. *LGE* 128 S. Ct. at 2115, 2115-22 The doctrine of implied license goes to what rights a buyer may have as the result of purchasing a product *as a matter of equity*. See, *Bandag* 750 F.2d at 925; *Met-Coil* 803 F.2d at 686; *LGE* 128 S. Ct. at 2122

3B Why Patent Exhaustion Is Important?

Patent exhaustion is important because it defines what rights a purchaser gets *as a matter of law* when he buys a product. Conversely, patent exhaustion defines what patents a patent holder *cannot* assert against a buyer after an unrestricted authorized sale has been made. *LGE* 128 S. Ct. at 2122

Once a patent has been exhausted, the patent holder can no longer invoke patent law to control postsale use of an article. *LGE* 128 S. Ct. at 2122 At that point and as held by the Court in *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U. S. 502 at 518 (1917), control of postsale use of an article is governed by general law.⁸

In *Motion Picture Patents Co.*, the Supreme Court made it clear that once a patent is exhausted the post sale control of that product falls outside the patent statutes. While before the sale, the control by the patent holder over a product is restricted to what is described in the claims of the patent, after the sale the control by the patent holder is governed by general laws and not by rights flowing from the patent. As held by the Court, after the sale, a patent holder cannot expand those patent rights by contract.

This decision [of the lower court] proceeds upon the argument that, since the patentee may withhold his patent altogether from public use, he must logically and necessarily be permitted to impose any conditions which he chooses upon any use which he may allow of it. The defect in this thinking springs from the substituting of inference and argument for the language of the statute, and from *failure to distinguish between the rights which are given to the inventor by the patent law and which he may assert against all the world through an infringement proceeding, and rights which he may create for himself by private contract*, which, however, are subject to the rules of general, as distinguished from those of the patent, law. While it is true that, under the statutes as they were (and now are), a patentee might withhold his patented machine from public use, *yet, if he consented to use it himself or through others, such use immediately fell within the terms of the statute, and, as we have seen, he is thereby restricted to the use of the invention as it is described in the claims of his patent, and not as it may be expanded by limitations as to materials and supplies necessary to the operation of it, imposed by mere notice to the public.* (emphasis added)

Motion Picture Patents Co. v. Universal Film Mfg. Co., 243 U. S. at 514.

3C. Pre-*LGE* Precedent On Exhaustion of Combination Patents

In *LGE*, the Court stated that “[t]he longstanding doctrine of patent exhaustion provides that the initial authorized sale of a patent item terminates all patent rights to that

⁸ In *Motion Pictures*, the patent holder licensed a patent to licensee for sale of a patented movie projector for use with film that was initially patented but at the time of the patent infringement suit had expired. The Court found that the sale of the projector exhausted the patent on the projector and so the restriction on the use of the projector with the film was governed by contract law. Under general law, the post sale control of the use of the projector was found to be anticompetitive.

item”. *LGE* 128 S. Ct. at 2115 However, until *LGE*, the evolution of lower court precedence in a direction contrary to the holding in *LGE* suggests that Supreme Court pre-*LGE* precedence has been less than clear as to what patent rights – i.e., device, combination, or method patents - are *actually* exhausted by the sale of a product.

The Supreme Court precedence has been perfectly clear that when a product passes to the hands of a purchaser *the product itself* is beyond the patent monopoly. See *Bloomer v. McQuewan*, 55 U.S. 539, 14 How. 539, 549, 14 L. Ed. 532 (1853) “when the machine passes to the hands of the purchaser, it is no longer within the limits of the monopoly”. *LGE* 128 S. Ct. at 2115 For that reason, the Court in *Bloomer* held that a purchaser who had purchased the right to use a planing machine during the period to which the patent was first limited was entitled to continue to use it during the extension of the patent authorized by Congress. *Bloomer*, 55 U.S. at 553

In deciding which patents – device, combination, or method - are actually exhausted by a first sale, the *LGE* Court relies largely on its precedent in *Adams v. Burke*, 84 U.S. 453, 17 Wall. 453, 21 L. Ed. 700, 1885 Dec. Comm’r Pat. (1873); *Motion Picture Patents Co. v. Universal Film Mfg. Co.* 243 U.S. 502, 518, 37 S. Ct. 416, 61 L. Ed. 871, 1917 Dec. Comm’r Pat. 391 (1917); and *Univis*, 316 U.S. 241, 62 S. Ct. 1088, 86 L. Ed. 1408, 1942 Dec. Comm’r Pat. 789 (1942). *LGE* 128 S. Ct. at 2115-2117 However, these precedents have been less than clear as to what patents are actually exhausted by the authorized sale of a product.

In deciding that combination patents are actually exhausted by a first sale, the *LGE* Court relies on the following language in *Adams*: “[w]here a person ha[s] purchased a patented machine of the patentee or his assignee this purchase carrie[s] with

it the right to the use of that machine so long as it [is] capable of use.” *Adams*, 84 U.S. at 455. *LGE* 128 S. Ct. at 2115 *Adams* though involved a patent on an improved coffin lid and not on any combination or method patent. In *Adams*, an assignee held the patent rights within a 10 mile radius of Boston and there was no restriction by the assignor on the use of products that were sold by the assignee under the assignment. The assignee sold the coffin lid to the buyer within the 10 mile radius and the buyer used the coffin outside that radius. Since there was no restriction by the assignor on the use of products that were sold, *Adams* held that the authorized sale of the coffin lid sold inside the 10 mile radius of Boston exhausted the coffin patent. Because no combination patents were involved in this decision, *Adams* provides little guidance as to whether combination patents are exhausted by the authorized sale of the product.⁹

LGE Court also relies on *Motion Picture Patents*, 243 U. S. at 518. *Motion Pictures*, in expressly overruling the Court’s earlier decision in *Henry v. A. B. Dick Co.*, 224 U. S. 1, 32 S. Ct. 364, 56 L. Ed. 645, 1912 Dec. Comm’r Pat. 575 (1912), noted the increasing frequency with which patent holders were using *A.B. Dick*-style licenses to limit the use of their products and thereby using the patents to secure market control of related unpatented items.¹⁰ 243 U.S at 509, 518. In *A.B. Dick*, the patent holder was limiting its sale of its patented stencil duplicating machine to use with non-patented stencil paper, ink, and other supplies sold by the patent holder. Similarly, in *Motion*

⁹ In *Adams*, a patent holder (Merrill & Horner) assigned a part of its interest in a patent for an improved coffin lid to Lockhart & Seelye. The part assignment was of all right, title, and interest in the patent for, to and in a circle whose radius is ten miles, having the city of Boston as a center. Later, the patent holder assigned its remaining interest in the patent to Adams. An undertaker Burke bought a coffin lid from Lockhart & Seelye within the 10 mile radius of Boston but used the coffin lids outside the 10 mile radius. Adams sued for infringement.

¹⁰ In response to these concerns many years later Congress passed the Patent Misuse Reform Act of 1988, Pub. L. No. 100-73 (102 Stat. 4674) (codified at 35 U.S.C. § 271(d) (1994)). Under 35 U.S.C. 271(d)(5), it is not misuse to “condition[] the license of any rights to the patent . . . on the acquisition of a license to rights in another patent or purchase of a separate product, unless, in view of the circumstances, the patent owner has market power in the relevant market for the patent or patented product on which the license or sale is conditioned.”

Pictures, the patent holder was using its patented projector to control post sale use of the product sold in connection with non-patented film products.¹¹ As held in *Motion Picture Patents*, there is no purpose for the limited license [on the purchaser of the patented product] but to extend the projector monopoly over unpatented film components. *Motion Picture Patents*, 243 U.S. at 518 Because no combination patents were involved in *Motion Picture Patents*, that case also provides little guidance as to whether combination patents are exhausted by the authorized sale of the product.

In deciding that *combination patents are actually* exhausted by a first sale, the *LGE* Court relies perhaps most heavily on *Univis*. *Univis* involved the sale of an unfinished lens component which when finished provided a lens for an eye glass. Specifically, *Univis* involved lens blanks (i.e., an unfinished piece of optical material having optical characteristics providing one focal length embedded into another piece of optical material having optical material providing a different focal length which when finished provides a bifocal lens). What troubled the Court in *Univis* was that the product had no use but as a finished blank which could only be obtained by finishing the unfinished blank in accordance with the patented method. The object of the sale was a finished blank. Hence, the *Univis* Court found that, on sale of the unfinished product, the buyer had the right to practice all of the patent rights – including the method patents to finish the product. As stated by the *Univis* Court:

“Sale of a lens blank by the patentee or by his licensee is thus, in itself, *both* a complete transfer of ownership of the blank, which is within the protection of the patent law, *and* a license to practice the final stage of the patent procedure. In the present case, the entire consideration and compensation for both is the purchase price.” (emphasis added)

¹¹ The non-patented product was kinetoscopic film that was patented by Thomas Edison (Re 12,192) but which patent had expired at the time of the alleged infringement.

316 U.S. 249

In the foregoing passage taken from *Univis*, the Court uses the conjunction “and” in describing the rights that the purchaser gets from the sale of a product . Specifically, the “sale of a lens blank by the patentee or by his licensee is thus, in itself *both* a “complete transfer of ownership of the blank, which is within the protection of the patent law,” *and* “a license to practice the final stage of the patent procedure”. The Court’s use of the conjunction “and” language in describing what rights pass on the purchase of a product makes it clear that ownership of the article passes, and a license to practice the final stage of the procedure also passes.¹² Instead, the *LGE* Court interpreted the conjunction in a way that all of the patent rights are exhausted by the sale (i.e., patents falling under both parts of the passage that are bridged by the conjunction “and” term are exhausted).

The *Univis* Court used the conjunction “and” language not once but twice in its decision:

“where one has sold an uncompleted article which, because it embodies essential features of his patented invention, is within the protection of his patent, *and* has destined the article to be finished by the purchaser in conformity to the patent, he has sold his invention so far as it is or may be embodied in that particular article.” (emphasis added)

Page 317 U.S. 250-251 The foregoing passage is the very language seized upon by the Supreme Court in deciding *LGE*. *LGE* 128 S. Ct. at 2116-2117

¹² In other words, only those patents are exhausted that fall under the first part of the passage (i.e., those patents that are “a complete transfer of ownership of the blank, which is within the protection of the patent law”). The patents falling under the second part of the passage – i.e., patents required to finish the unfinished blank falling under the “a license to practice the final stage of the patent procedure” language used in *Univis* - are rights that appear to flow to the buyer as a license (e.g., implied license) as the language suggests. See *Met-Coil v. Korners Unlimited*, 803 F.2nd at, 685-686 (Fed. Cir. 1986)

Just as with the *Univis* Court’s use of the conjunction “and” language in the first passage noted above, the *Univis* Court’s use of the conjunction “and” language in the second passage found in *Univis* makes it clear that ownership of the article passes, and a license to practice the final stage of the procedure also passes.¹³ Instead, the *LGE* Court interpreted the conjunction in a way that all of the patent rights are exhausted by the sale (i.e., patents falling under both parts that are bridged by the conjunction “and” term of the passage are exhausted). While *Univis* has now been clarified by the Supreme Court in *LGE*, the decision of the Court in *Univis* and the other precedent relied on by the Court in its *LGE* decision did not keep lower court jurisprudence on the doctrine of patent exhaustion, including the jurisprudence of the Federal Circuit, from evolving in a direction that is contrary to the Court’s *LGE* decision.

3D. Pre-*LGE* Precedent on Exhaustion of Method Patents

In finding that the sale exhausted the method patents, the *LGE* Court stated that “this Court has repeatedly held that method patents were exhausted by the sale of an item that embodied the method” citing *Ethyl Gasoline Corp.*, 309 U.S. 436, 456, 457, 60 S. Ct. 618, 84 L. Ed. 852, 1940 Dec. Comm’r Pat. 758 (1940) and *Univis*, *infra* *LGE* 128 S. Ct. at 2117 In *Ethyl Gasoline*, a patent holder held four patents directed to the use of lead additives to increase fuel efficiency.¹⁴ The patent holder granted licenses under these patents to oil refineries to manufacture, sell, and distribute fuel to jobbers who were

¹³ In other words, only those patents are exhausted that fall under the first part of the passage (i.e., those patents that cover essential features embodied in the product sold as pertaining to the first part of the passage “where one has sold an uncompleted article which, because it embodies essential features of his patented invention, is within the protection of the patent”). The patents falling under the second part of the passage –i.e., patents required to finish the unfinished blank falling under the “has destined the article to be finished by the purchaser in conformity to the patent” language used in *Univis*– are rights that appear to flow to the buyer as a license (e.g., implied license) as the language suggests. See footnote 11, *supra*.

¹⁴ Two of the four patents U.S. Pat. Nos. 1,592,954 and 1,668,022 are directed generally to an additive. A third patent No. 1,573,846 is directed generally to a fuel mix of fuel and a metal additive. The fourth patent 1,787,419 is directed to a method of using a fuel which comprises forming a mixture of fuel and air and burning it under high compression in the presence of a metallic element.

separately licensed by the patent holder. The refinery license contained covenants restricting the licensed refinery to sell only to licensed jobbers and setting resale price restrictions on jobbers. *Id.* at 449 In *Ethyl Gasoline* the Court found that the sale by the patent holder of the additive to refiners relinquished the patentee's exclusive rights to sell the treated fuel "by permitting the licensed refiners to manufacture and sell the fuel to the [jobbers]". *Ibid.* at 457 As stated by the *Ethyl Gasoline* Court, it is "by the authorized sales of the fuel by the refiner to jobbers [the sales being authorized by the patent holder] [that], the patent monopoly over it is exhausted, and after the sale, neither appellant nor the refiners may longer rely on the patents to exercise any control over the price at which the fuel may be sold." *Id.*

The exhausted patents to which the *Ethyl Gasoline* Court appears to speak to is the additive patent U.S. Pat. Nos. 1,592,954 and 1,668,022 and the fuel mix of fuel and additive patent U.S. Pat. No. 1,573,846. The refineries bought the additive from the patent holder and manufactured the fuel mix. All three of these composition patents were exhausted by the sale of the fuel mix to the jobber. The only method patent in the case is U.S. Pat. No. 1,787,419 which recites a method of forming a fuel and air mix and burning the mix in the presence of a lead additive. However, this method is practiced at the consumer level by the operation of a motorized vehicle using the fuel mix and not at the level of jobbers who are buying and selling the mixed fuel for ultimate sale to consumers. Since there is no discussion of any indirect infringement of this patent by the jobber in the *Ethyl Gasoline* decision the method patent would not appear to be one of the exhausted patents discussed in the *Ethyl Gasoline*. In the absence of indirect infringement and because no method patents were used by the jobbers in *Ethyl Gasoline*,

the precedent of *Ethyl Gasoline* provides little guidance as to whether method patents are exhausted by the authorized sale of the product to the jobbers.

In deciding that method patents are actually exhausted by a first sale, the *LGE* Court relies perhaps most heavily on *Univis*. *LGE* 128 S. Ct. at 2117 But as discussed in Section 3C above, the use by the *Univis* Court of the conjunction “and” language twice in its decision on what rights flow to a purchaser of the unfinished blanks makes it clear that the purchaser of the unfinished blanks obtained the rights under the method patents through an implied license.

3E. The Federal Circuit Precedent

The *LGE* Court states that exhaustion of combination and method patents by a first sale is unequivocally grounded in its precedent— e.g., “[n]othing in this Court’s approach to patent exhaustion supports LGE’s argument that method patents cannot be exhausted.” *LGE* 128 S. Ct. at 2117 However, for the reasons discussed in Sections 3C and 3D including the *Univis* Court’s use of the conjunction “and” language twice in its decision, it is clear that the purchaser of the unfinished blanks obtained rights under the combination and method patents through an implied license.¹⁵

Indeed Federal Circuit law evolved to the contrary. Under Federal Circuit law, an authorized sale exhausted device patents embodied entirely in the product sold. Neither combination nor method patents are exhausted.¹⁶ On the other hand, an implied license

¹⁵ See *Met-Coil v. Korners Unlimited*, 803 F.2nd 684, 686 (Fed. Cir. 1986) (in *Univis* the “[s]ale of a lens blank by the patentee or by his licensee is thus in itself both a complete transfer of ownership of the blank which is within the protection of the patent law, and a license to practice the final stage of the patent procedure.” (emphasis added))

¹⁶ For a more in depth analysis of the Federal Circuit precedent on patent exhaustion and implied license see “Patent Exhaustion, Implied License and the Strategic Use of Non-asserts in Agreements, by Paul R. Juhasz, Presented at the 2003 AIPLA Annual Meeting, Oct. 30- Nov. 1, 2003.

may arise if under the circumstances of an authorized sale the use of the product in patented combinations or methods was implied and there were no substantial noninfringing uses of the product but in the patented combination or method.¹⁷ In *Univis*, the products sold were “destined” to be finished and so under the circumstances of the sale of unfinished blanks the method and combination patents were impliedly licensed.¹⁸ This is even though the licensor expressly restricted the rights flowing to the purchasers of the unfinished blanks by separate license with those purchasers¹⁹. Under the equities, the circumstances of the sale in *Univis* indicated that the purchasers of the unfinished blanks had the right to finish the blanks under an implied license. So evolved the law of patent exhaustion and implied license by the Federal Circuit.²⁰ And so have licensing programs governed by U.S. law been structured.

3F. The Supreme Court Interprets the Laws Based on How the Issues are Framed

In *LGE*, the issue before the Supreme Court was cast in terms of the *uses* that could be made of a product sold. The arguments before the Supreme Court hence turned largely around questions of the kind raised by Justice Breyer "if I buy a pedal for my

¹⁷ See footnote 14, *supra*.

¹⁸ See footnote 15, *supra*.

¹⁹ The purchasers of the unfinished blanks sold by a company held by the patent holder were the wholesalers, finishing retailers, and prescription retailers who by license were required to sell the finished blanks at prices set by the patent holder.

²⁰ In limiting patent exhaustion to patents residing in the product sold, the Federal Circuit recognized the fundamental distinction between patents and other forms of property – namely, the right of the patent holder to exclude but not use a patent if doing so infringes another patent. The Federal Circuit also recognized that there are differences between a patent on a component, a combination, and a method. Since a patent on a combination or a method are *other* patents and these other patents carry the right to exclude the buyer of the component from practicing the combination or method, the combination and method patent rights were not part of the rights of the purchased component as a matter of law. Rather, the rights of the buyer in the purchased component are limited to the patents residing in the component. Hence, the sale of the component carried no rights *as a matter of law* to practice the combination patent with which the component may be used or the method steps performed outside of the purchased article.

bike, what can I do with that pedal if I can't use it on a bike?"²¹ Little was argued of the differences in property rights between patents and other forms of property. Little was argued of the right of a patent holder to exclude others from practicing the patent. Little was argued that a patent holder has no right to use a patent if doing so infringes another patent.²² Little was argued of the patentable differences between component, combination, and method patents. The question of use raised by Judge Breyer reveals the importance to the Supreme Court of the *uses of the product* sold in determining what patents are exhausted. In short, the Supreme Court early on decided to treat the patented product sold like a house or a car in which the buyer is generally entitled to all uses to which his property may be put. In so focusing its thinking, the Supreme Court effectively blurred the fundamental distinction between, on the one hand, a house or a car, and on the other, a patent, which, unlike a house or a car, only gives the holder the right to exclude and not use.

If, the Supreme Court in *LGE* reasoned, the rights of a buyer from a purchase of a product goes beyond the product sold to the *uses* of that product, then the doctrine of patent exhaustion, which defines what rights the buyer gets on purchasing a product, must necessarily extend to those uses of the product. Under this analysis, the Supreme Court decided that the rights of a buyer to a purchased product extends to uses of that product in combination and in method patents of the seller provided that the essential features of those combinations and methods are found in the product sold and that the

²¹ See footnote 4, *supra*.

²² A patent holder may be excluded from practicing his patent because of a dominant patent that overlaps with his patent.

only “reasonable and intended use” of the product sale was to practice the combination or method patent.

In so holding, the *LGE* Court has articulated the following two-part test for determining when the authorized sale of a product will exhaust combination and method patents:

- i. the only "reasonable and intended use" of the component product sold was to practice the combination or method patent
- ii. and the component product sold "embodies essential features" of the combination or method patent.

LGE 128 S. Ct. at at 2119.

The two-part test of *LGE* is not unlike the two part conjunction ‘and’ language articulated in *Univis*. Indeed, the *LGE* Court relied on the following passage taken from *Univis* in finding that the first sale can exhaust combination and method patents:

“where one has sold an uncompleted article which, because it embodies essential features of his patented invention, is within the protection of his patent, *and* has destined the article to be finished by the purchaser in conformity to the patent, he has sold his invention so far as it is or may be embodied in that particular article.” (emphasis added)

A comparison of the *LGE* two-prong test to the foregoing *Univis* language shows that the first prong of the *LGE* test correlates to the second part of the *Univis* conjunction language “destined to be finished by the purchaser in conformity to the patent” under the *LGE* Court’s clarification of its *Univis* decision. Similarly, the second part of the *LGE* test is seen to correlate to the first part of the *Univis* conjunction language “embodies essential features of his patented invention” under the *LGE* Court’s clarification of its *Univis* decision.

Hence, the two prong standard in *LGE* can be argued to reconcile with the *Univis* two part standard. However, *LGE* is contrary to the compelling interpretation given to the *Univis* language by lower court jurisprudence, which has provided the legal bedrock on which for the past 66 years patent licensing programs in the U.S. have been grounded. Whereas a reasonable pre-*LGE* interpretation of *Univis* was that a purchaser obtained an implied license to practice the method and combination patent, the Supreme Court has decided now that all patents covering any reasonable and intended uses of the product – component, combination, and method – that are essentially embodied in the product sold are exhausted as a matter of law by the sale of the component. The remainder of this paper explores the *LGE* two prong standard for determining what patents are exhausted by the first sale of a product and its effect on licensing programs and litigation.

4. The Two-Prong Standard for Determining Whether Combination or Method Patents are Exhausted

For a combination or method patent to be exhausted by an authorized sale, the product must satisfy the following two-part test:

- i. the only "reasonable and intended use" of the component product sold was to practice the combination or method patent
- ii. and the component product sold "embodies essential features" of the combination or method patent.

LGE 128 S. Ct. at 2119 Hence, to determine whether a combination or method patent is exhausted by an authorized sale one must look at the product sold and determine first the “reasonable and intended uses” of that product.

In *LGE*, the Court found that the only reasonable and intended use of the Intel microprocessor and chipsets authorized for sale under the LGE license was with *any* memory device including the memory devices recited in the *LGE* combination and method patents.

Moreover, the possibility of using the Intel microprocessors and chipsets with Intel memory was not addressed in the *LGE* decision.²³ Nor did it matter that the infringing functionality residing in the microprocessor and chipset could have been disabled. *LGE* 128 S. Ct. at Footnote 6 “Quanta was not required to make any creative or inventive decision when it added those parts” *LGE* 128 S. Ct. at 2120 In short, “LGE has suggested no reasonable use for the Intel Products other than incorporating them into computer systems that practice the LGE Patents”. *LGE* 128 S. Ct. at at 2119 Hence, the Intel products sold satisfied the first prong of the two-prong test for determining whether the LGE combination and method patents were exhausted under the first sale doctrine.

The second prong of the test for determining whether a combination or method patent has been exhausted is whether the component or a step performed within the component is a "material part" or “essential feature” of the combination or method patent. *Id.* Hence, if the component sold contains the essential features of a combination or method patent, then even if there are non-infringing uses of the product, the combination and method patents are exhausted. The Court found that essential elements of the patented combination and essential steps of the patents method were embedded in the products sold by Intel and so the combination and method patents of LGE were exhausted by the sale of the Intel products.

²³ At the trial level, LGE proffered only two non-infringing uses for the Intel microprocessors and chipsets – namely, use in computers sold outside the U.S. and use as replacement parts. *LG Elecs. Inc. v. Ausustek Computer, Inc.*, 2002 U.S. Dist. LEXIS 25956, at *35, *36. An interesting question is whether the microprocessor sold to Quanta could have had non-infringing uses with at least Intel memory devices which also appear to have been licensed.

5. The Uncertainties Created by the Two-Prong Standard for Determining Whether Combination or Method Patents are Exhausted

The “embodies essential features” prong of the Supreme Court two prong standard for determining what combination and method patents are exhausted is likely to be where the *LGE* decision has introduced the greatest uncertainty into the doctrine of patent exhaustion. Before *LGE*, previous jurisprudence provided a bright line indicating exactly what patents are exhausted by a sale - i.e., patent exhaustion ended with all patents that completely reside in the product sold. Under *LGE*, that bright line has been replaced with a factual query of whether a product sold "embodies essential features of the combination or method patent" or constitutes a "material part of the combination or method patent". Since the factual queries of what combination and method patents are “embodied” in a product sold and whether those features are “essential features” of a combination or method patent are likely to be the subject of wide dispute, questions of whether a product sold embodies the “essential features” of a combination or method patent are likely to be heavily litigated.

The first prong of the two-prong test for determining what patents are exhausted is also likely to be litigated insofar as it requires a determination of what are the “reasonable and intended uses” of a product, a question about which reasonable minds are likely to differ. Further, it is not enough to defeat exhaustion for a license agreement to clearly and articulately identify the “reasonable and intended uses” of a product. If the actual reasonable and intended uses of a product as determined by a court are found to conflict with the reasonable and intended uses as expressed in the contract, the contract

language may be set aside and the patents exhausted.²⁴ The subjective expression of “reasonable and intended uses” that are found in a contract may diverge from the objective determination that courts are likely to make and lead to litigation.

6. As Applied to Intel Products Sold, the Two-Prong Standard May Have Lead to the Right Outcome As To The Exhaustion of *LGE* Combination and Method Patents

The *LGE* Court found that there were no “reasonable and intended” uses of the Intel microprocessors and chipsets other than with standard off the shelf memory devices. Hence, the *LGE* Court found the LGE patents to satisfy the first prong of the two-prong test for determining patent exhaustion.

In applying the LGE combination and method patents to the second prong of the two-prong test, however, it does not appear as though the Court considered any meaningful claim analysis of the LGE combination or method patents in finding that the Intel microprocessor and chipsets sold embodied essential elements of the combination and method patents.²⁵ Instead, the *LGE* decision turns on a finding by the Court that Quanta used the Intel products in the way that Intel designed those chips.²⁶

Had there been arguments on a claim analysis chart showing where the recited elements of the combination and method patents resided in the assembled computer system, the arguments might have illustrated that essential elements of the combination

²⁴ If the only uses of the product are in the infringing combination or method, patent exhaustion will extend to those combination and method patents *as a matter of law*.

²⁵ At oral arguments before the Supreme Court, Petitioners did argue that “the district court look[ed] to LGE’s own claim charts and [said] that [LGE’s] own allegations show that [the Intel products sold] were manufactured in a way that met many of the limitations of the claims.” Transcripts of Oral Hearings before the Supreme Court, p. 10 However, the *LGE* Court did not discuss nor rely on Petitioner’s argument in its *LGE* decision.

²⁶ The Court does say that “everything inventive about each patent is embodied in the Intel Products. They control access to main and cache memory, practicing the ‘641 and ‘279 patents by checking cache memory against main memory and comparing read and write requests. They also control priority of bus access by various other computer components under the ‘733 patent.” LGE 128 S. Ct. at 2121. But there appears to be no claim analysis demonstrating that these and the other elements of the combination patents actually reside in the microprocessor.

patent or steps of the method patent occurred *outside* of the microprocessor. As it turns out though, the finding by the Court that the Intel microprocessors embodied essential elements of the LGE combination and method patents may have been the right one. To illustrate this point, Attachment A shows a preliminary analysis of a representative claim from each of the patents. The analysis suggests that the essential elements of the combination patents and the essential steps of the method patents *may in fact* reside in the microprocessor and chipsets. So despite the apparent absence of any claim analysis considered by the Court in its opinion, the finding of the *LGE* Court may have been the correct one. The essential elements of these claims do appear to reside in the microprocessor and chipsets and so the LGE combination and method patents appear to satisfy the second prong of the two prong test for determining what combination and method patents are exhausted by the first sale of the Intel microprocessor.

7. The *LGE* Decision – A Sea-Change Despite Being Called A Clarification

Does the *LGE* decision turn established jurisprudence on the doctrine of patent exhaustion on its head? Probably yes and no. The answer is no insofar as the underpinnings of the doctrine remain unchanged. The law is still that an authorized sale exhausts certain patents *as a matter of law*. But the answer is definitely yes as to the scope of patents that are exhausted by the first sale. Before *LGE*, licensing programs were structured in accordance with the precedent handed down by the Federal Circuit based on Supreme Court precedent in which the first sale exhausted only patented devices entirely residing in the product sold. Now, the Supreme Court has “clarified” its *Univis* decision in a way that has overturned the lower court jurisprudence on patent

exhaustion to allow the first sale to capture combination and method patents essentially residing in the product sold.

Under *LGE*, when an authorized sale has been made, the buyer gets the "reasonable and intended" uses of the product *as a matter of law*. Hence, the buyer not only gets the right to practice the patents entirely residing in the product, but he also gets the right to use the product in patented combinations and to practice the steps of a patented method but only to the extent that the "essential" features of those patented combinations and methods reside in the product authorized for sale. In determining patent exhaustion today, the question is not whether a component cannot be used without the combination and/or method patent (e.g., has substantial non-infringing uses) . The question in deciding whether a patent is exhausted today is whether the reasonable and intended use of a product containing essential combination functionality or performing essential steps of a method patent is in the combination and/or method patent. If it is, those combination and/or a method patents will be exhausted.

In *LGE* the combination patents were exhausted since the essential features of the combination or system patents were found to reside in the Intel microprocessor authorized for sale. In *LGE*, the method patents were exhausted since the essential method steps occurred in the microprocessor.

In view of the sea change in the law on patent exhaustion, practitioners need to revise their licensing programs to account for the broader scope of patents that under *LGE* are now exhausted by the first sale of a product *as a matter of law*. Section 8 of this paper explores several areas of a licensing program that a practitioner should revisit in view of the *LGE* decision.

8. Effect of *LGE* on Licensing and Litigation Programs

Under *LGE*, all combination and method patents that satisfy the two prong test for exhaustion are exhausted *as a matter of law* upon the sale of a product. So licensing and litigator practitioners need to pay particular attention to identifying which combination patents have essential elements that reside in a product authorized for sale and which method patents have essential steps that take place in the product. *LGE* provides several valuable lessons to the licensing practitioner and/or litigator on how to structure a license.

8A. Exhausted Patents, Over Payment of Royalties, Etc.- - In view of *LGE*, Companies Need to Revisit their Licensing Programs

First and foremost, companies need to revisit their licensing programs and the sales that have been authorized under their licenses to determine what patent rights have been licensed and what rights may be exhausted. Also, companies need to determine whether the payment made for those licensed patent rights is the bargained for exchange contemplated by the parties pre-*LGE*.

The profound effects of the *LGE* decision on licensing programs is illustrated with the following example involving the sale of cell phones to the marketplace. In this example, Company X holds device, combination and method patents that are directed to cell phone systems and methods as well as patents on the components that are used in these systems. Before the *LGE* decision was handed down, Company X licenses two companies – a first company, Company Y, which makes communication chipsets which it sells to handset maker, Company Z, and a second company, Company Z, that makes

cell phone handsets for sale to cell phone users. Patent holder Company X licenses communication chipset maker Company Y to sell chipsets to handset makers, including Company Z. In the license, Company X obligates the chipmaker to notify its customers that they have no implied license rights in order to cutoff any implied license rights flowing to its customers under the system and method patents from the purchase of the chipsets. Company X further separately licenses its system and method patents to cell phone manufacturer Company Z.

Under pre-*LGE* thinking, the authorized sale of chipsets under the license to chipset maker Company Y exhausted only the device patents entirely residing in the chipsets sold. Hence, patent holder Company X was left with combination and method patents to license handset maker Company Z provided that the cell maker had no implied license to use the chipset it buys from chipset Company on account of the circumstances of the sale. It is to keep this from happening that the patent holder Company X required the chipset maker Company Y as part of the license to also notify its customers when making the sale that the sale of the chipsets carried no implied license.²⁷

Now, under the *LGE* decision, patent holder Company X learns that his license to chip maker Company Y authorizing sales of chipsets to Company Z has exhausted *not only* the device patents entirely residing in the chipset sold as per pre-*LGE* thinking, *but also system and method patents whose essential functionality or steps reside in that chipset*. The *LGE* decision has created several problems for the patent holder Company X. In a worst case scenario, the essential functionality and steps of all of Company X's system and method patents reside in the chipset licensed. In this scenario, Company Y's authorized sale of chipsets exhausts all of Company X's combination and method patents

²⁷ See footnote 14, *supra*.

with respect to the chipsets sold. Hence, Company Z now obtains all rights it needs from Company X through the purchase of the chipset from Company Y; perhaps obviating the need for cell phone maker Company Z to license any patents from Company X. In short, by authorizing the chipset sale, in this scenario post-*LGE* the patent holder may have nothing left to license the cell phone maker.

In another scenario, the patent holder Company X finds that post-*LGE* some but not all of the essential functionality and steps of his system and method patents are embodied in the chipsets sold to the licensee so that some but not all of his patents are exhausted by the sales of chipsets by Company Y authorized under the chipset license. In this scenario, the patent holder Company X is relieved that he has at least some patents to license to phone maker Company Z to support the continuance of that phone maker license. However, the cell phone maker Company Z may now question whether it is paying too much for those remaining patents under the current license. In other words, whereas the pre-*LGE* bargained for exchange under the license included all combination and method patents that Company Z needed, under post-*LGE* precedent, the phone maker Company Z gets a number of those patents through purchase of chipsets from Company Y through exhaustion. Hence, Company Z may find that it is overpaying on its license by paying royalties on patents that post-*LGE* may no longer need to be licensed because they have been exhausted. In short, Company Z is paying pre-*LGE* rates for a license under fewer post-*LGE* patents.

In another scenario, under post-*LGE* thinking, patent holder Company X realizes that it's combination and method patents whose essential functionality and steps reside in the chipset of X that has been licensed are being passed through to Company Z through

Company Y's sale of chipsets which exhausts those patents. In effect, Company X is giving away through its license with chipset Company Y, which is set at pre-*LGE* royalty rates, the additional value represented by those exhausted combination and method patents. Before *LGE*, patent holder Company X collected the additional value represented by those exhausted patents from Company Z. Now under *LGE* Company Z steps into those rights through exhaustion with respect to the product it purchases from Company Y. Hence, in this scenario, Company X may want to try to renegotiate its chipset license with Company Y to collect the additional value represented by those exhausted patents.

These are but a few of the questions likely to be faced by companies in view of the *LGE* decision. The *LGE* decision has a profound effect on licensing programs. Companies need to revisit their licensing programs to account for the broader scope of patents that under *LGE* are now exhausted by the first sale *as a matter of law* and to make changes as necessary to reflect the bargained for exchange contemplated by the parties in view of the exhausted patents.

8B. Understand Which Combination and Method Patents are Essentially Embodied in the Product Sold

In the aftermath of *LGE*, now more than ever, a practitioner needs to understand the component, combination, and method patents that make up the company's portfolio and the interplay between each before striking a license. Before authorizing any sale under any patents, the practitioner should structure the licensing deal to account for the effect of the exhaustion of any combination and method patent on the license. One way a

practitioner may do this is to structure the license grant with, for example, the component maker to include the combination and method patents and to adjust the royalty payments under the license to account for the value added by the combination and method patent grant to the license. See Section 8C for further discussion on this point. Alternatively, the practitioner may structure the license with the component maker to exclude combination and method patents from the deal. The discussions set forth in Sections 8D-8K provide guidelines on some ways this may be done.

8C. Consider Licensing Your Combination and Method Patents In One License

In view of *LGE*, a practitioner may decide to license all patents including combination and method patents in one license outright for a royalty payment to be paid by licensee on every sale or in a lump sum payment that reflects the value that the combination and method patents add to the license. Doing so may remove the uncertainty of having the combination and method patents determined by a court later on to have been exhausted by an authorized sale under a more limited license.

A good way to do this would be to grant a one-stop license to the downstream end manufacturer and give him “have made” rights. The down-stream manufacturer is often in the best position to evaluate the value of the system and method patents as well as the value of the components that may go into a system in view of the market demand and the price that the market may bear for the system. The downside is that the patent holder may get a higher royalty on a particular device patent if he licensed that device patent to an up-stream component manufacturer who may be more anxious to secure freedom of movement for his component under the device patent than a downstream manufacturer of

a system who must spread the overall royalty borne by the system sold across many device patents because the system has many components.

Another way to have a one-stop license would be to license the upstream component maker. The downside is that the upstream component maker may not be able to pay system level royalty rates on the system and method patents in the licensing package because his component price represents a small portion of the cost of the overall system. In addition, the down-stream manufacturer, not the upstream component maker, may have the kind of patent portfolio that can be used to negotiate more favorable royalty rates with the patent holder on the system and method patents. The down-stream manufacturer is also in the best position to evaluate a fair royalty rate for system level patents.

While a one-stop license may provide an effective way to license a patent portfolio for some companies, the considerable downsides that will accompany a one-stop license in many situations indicate that the one-stop license is probably not widely practical.

8D. If You Want To Keep Patent Rights From Being Exhausted Beware of What Sale You Authorize In Your License Agreement

In *LGE*, LGE had licensed certain patents to Intel directed to computers. Under the terms of the license, Intel was granted the right to make and sell Intel products. On these facts, the Court found that Intel had the unrestricted right to manufacture and sell products under the LGE patents.

It did not matter that the license expressly recited that no license is granted to Intel customers to use the products with non-Intel memory devices. *LGE* 128 S. Ct. at

2114 Nor did it matter that the license also expressly recited that the license does not alter the effect of patent exhaustion that would otherwise apply. *Id.* at 2114 According to the Court patent exhaustion will arise *as a matter of law* when a product is sold and so when a product is authorized for sale without restrictions, that sale will trigger exhaustion *as a matter of law* regardless of the contract language. *Id.* at 2116-22

Nor did it matter that under a separate Master Agreement, Intel was required to give notice to its customers that the Intel microprocessors sold were licensed only for use with Intel components. *Id.* at 2114 Whis this condition might have impacted upon the issue of an implied license, the Court held it had no effect on the question of exhaustion. Moreover, the condition was included in the Master Agreement and not in the License Agreement. *Id.* at 2121-2122

Also, the Master Agreement provided that a breach of the Master Agreement would not affect the License Agreement. *Id.* at 2114 This language bolstered the finding of the Court that the authorized sale by Intel was unrestricted. Even breach of the Master Agreement by a customer using Intel microprocessors with non-Intel chipsets did not affect Intel's authorization to sell and continue selling Intel products under the license. Lastly, none of the other limitations found in the Master Agreement affected the unauthorized sales grant since they were not part of the License Agreement.

Since there were no restrictions placed on Intel's authorized sale in the License Agreement, the Court found that Intel had the unrestricted authorization to manufacture and sell microprocessors and chipsets under the LGE patents. Further since every unrestricted sale triggers exhaustion of patents *as a matter of law*, once authorization to sell was deemed to be unrestricted, the only question left for the Court to decide was

which patents were exhausted *as a matter of law* which the Court decided applying the two-prong test for determining patent exhaustion.

A practitioner needs to be aware of what sale he authorizes in the license agreement since that is the event that will trigger exhaustion of the patents. It is how the grant authorizing the sale in the license is crafted that will determine what patents are exhausted.

8E. To Cutoff Exhaustion the Authorized Sale Must be Restricted

To cutoff patent exhaustion, the authorized sale must be a restricted sale. An unrestricted sale will lead to the exhaustion of patents *as a matter of law*.

Over the years, the Court has had the opportunity to address the issue of patent exhaustion in the context of different licensing language. A look at how the Court has treated the sales grant crafted using different licensing language provides some guidance on whether a sales grant considered by a practitioner is likely to be deemed to be restricted.

In *Adams*, the assignment of rights to assignee to use and sell the patent was geographically restricted but there was no restriction on the assignee customer's use of the product (i.e., no restriction on the sale such as "authorized sale *for use in* the 10 mile radius" language). In *Motion Picture Patents*, the licensee was granted an unrestricted right to manufacture and sell machines even though the license agreement contained a covenant restricting the authorized sale. In *Univis*, the lens *maker* was granted the unrestricted right to manufacture and sell unfinished blanks to designated licensees. Covenants in separate license agreements with wholesalers, finishing retailers, and

prescription retailers restricted the activities of each end use licensee. In *LGE*, the license granted Intel the unrestricted right to sell Intel microprocessors. Covenants in the license and a separate Master agreement did not change Intel's unrestricted license grant.

However, in *General Talking Pictures Corp.*²⁸, the license grant was deemed to be a restricted sale. The license granted licensee the right to manufacture and sell patented amplifiers for radio amateur reception, radio experimental reception, and home broadcast reception. Licensee's sale of patented amplifiers for commercial use was not authorized and so the sale of patented amplifiers to a customer did not exhaust the patents on the amplifiers.

8F. Some Examples of How To Restrict The Authorized Sale

With the above background, the following examples provide some guidelines for use by practitioners in crafting a restricted sales grant in a license.

8F(i) "to sell Intel microprocessors to customers who are licensed under the LGE patents"

LGE could have restricted the sale of microprocessors to LGE in the following way:

Licensors grants licensee the right to make, use and sell Intel microprocessors to customers who are licensed under the LGE patents

Here, the "sales grant" is limited to the "sale of Intel microprocessors to customers who are licensed under the LGE patents". The authorized sale cannot be said to be an unrestricted sale since the sale is restricted to the sale of the product to "customers who

²⁸ *General Talking Pictures Corp. v. Western Elec. Co.*, 304 U. S. 175 (1938)

are licensed under the LGE patents”. As a restricted sale any sale that violates the grant would not trigger patent exhaustion. Crafting the license grant in this way may also satisfy the concerns raised by Justice Ginsberg during oral arguments.²⁹

Realistically speaking though, a licensee is likely to push back on the foregoing type of language since it would require the licensee to ensure that a customer is licensed under the patents before making a sale and, if the customer is not licensed, then the license stands in the way of making the sale. Given how long it may take to negotiate a license, the negotiation of a license may not be an option if it holds up the sale. Such license grant language also prevents the licensee from making sales to customers who are not licensed.

8F(ii) “to sell Intel microprocessors to customers under the restriction and condition that the license grant authorizes no sale of products except to customers who have a obtained a valid license from the patent holder under patents X, Y, Z ”

LGE could also have restricted the sale using the following language:

“under the restriction and condition that the license grant authorizes no sale of products except to customers who have a obtained a valid license from the patent holder under patents X, Y, Z”

This language is not unlike the language discussed in Section 8F(i) and is likely to be treated the same way.

8F(iii) “to sell Intel microprocessors for use with patent X (to customers who have licensed patent X), but not patents Y, Z”

The license could have restricted the sale of microprocessors to for use with patent X. For example, the grant could have been limited in the following way:

²⁹ See for example Transcript p. 7 where Justice Ginsberg asked “[i]f the patentee wants to maintain control further down the line, why doesn’t the patentee just limit the license to selling to people who are licensed.”

Licensor grants licensee the right to make, use and sell Intel microprocessors for use with Patent X but not Patents Y, Z.

Alternatively, the grant could have limited the sale to “customers who have licensed patent X”.

In either example, the “sales grant” is limited to “Intel microprocessors for use with Patent X (or to customers who have licensed patent X), but not Patents Y, Z”,³⁰. The authorized sale cannot be said to be an unrestricted sale since the sale is restricted to the sale of the product for “use with Patent X (or to customers who have licensed patent X). As a restricted sale any sale that violates the grant would not trigger patent exhaustion.

From a realistic standpoint though, a licensee is likely to push back on the foregoing type of language since it would require the licensee to *both* ensure that its product is not used with patent Y and Z *and* that a customer is using the Intel microprocessor sold only with patent X or in the latter example is being sold only to customers who have licensed patent X. Hence, such language would inhibit the freedom of movement of the licensee with respect to its product in view of patents Y and Z and further may require the licensee to police the commercial activities of its customers with respect to patent X which a licensee is not likely to do. In the examples “under patent X” or “to customers who have licensed patent X”, the customer would need to be licensed under patent X in order to use the product sold which introduces the problems discussed in Section 8F(i, ii).

³⁰ For example, LGE could have allowed Intel to sell microprocessors for use with the LGE ‘379 patent which is directed to memory control and have restricted the sale with respect to the LGE ‘641 data processing system patent and LGE ‘733 priority node patent.

8F(iv) “to sell Intel microprocessors for use with Intel products”

The license could have tried to restrict the sale of microprocessors to use with Intel components. For example, the grant could have been limited in the following way:

Licensors grants licensee the right to make, use and sell Intel microprocessors for use with Intel products.

Here, the “sales grant” is limited to “Intel microprocessors for use with Intel products”. The authorized sale cannot be said to be an unrestricted sale since the sale is restricted to the sale of the product for “use with Intel products”. As a restricted sale any sale that violates the grant would not appear to trigger patent exhaustion.

However, the foregoing would likely be a non-starter for many companies since any sales by the licensee would require the licensee to sell its licensed microprocessor product to its customer only on the condition that the customer also buys a different unlicensed product (the other “Intel product”) from the licensee. Such an agreement to sell one product but only on condition that the buyer also purchases a different product may create antitrust issues depending on the market power of the company.³¹

Some practitioners may argue that the foregoing language is not unlike the language in *Motion Pictures* which the Supreme Court held to be an unrestricted sale. However, the language more resembles that in *General Talking Pictures Corp* which the Supreme Court held to be a restricted sale. In *Motion Pictures*, the license granted licensee “a right and license to manufacture and sell machines embodying the inventions”. *Motion Picture Patents*, 243 U. S. at 506. The license agreement then went

³¹ As a tying agreement, the licensee could face challenges of engaging in illegal tying and monopolization in violation of the Sherman Antitrust Act. *Illinois Tool Works Inc. v. Independent Ink, Inc.*, 126 S. Ct. 1281 (2006) While no longer a *per se* violation, evidence of the licensee’s relevant market or licensee’s power within that market could make the tying of the patent license to the purchase of a non-patented good a violation of the Sherman Antitrust Act. *Id.* Hence, for many companies, the foregoing suggested license grant would not be a good one. Nonetheless the decision of the Supreme Court in *Illinois Tool Works* suggests that in some cases the tying of a patent license to a non-patented product as suggested in the foregoing example may be permissible.

on to restrict the license “sales” grant by the following covenant “to for exhibition or projecting motion pictures containing the inventions of reissued patent No. 12,192”. *Id.* The covenant sought to contractually restrict an unrestricted license grant and so the Court struck down the license as anti-competitive as seeking to extend the patent monopoly through the contract covenant. In contrast, in the license grant “to sell Intel microprocessors for use with Intel products”, the restriction “for use with Intel products” is actually part of the sales grant in the license. Just as the restricted authorization in *General Talking Pictures Corp* cut off the exhaustion of patents with respect to the sale by the licensee of patented amplifiers for commercial use so too the restricted authorization in the example language should cutoff sales by the licensee of microprocessors that are used with non-Intel products – i.e., sales that fall outside the scope of the restricted sales grant in the license will not trigger patent exhaustion.

Nonetheless, notwithstanding Supreme Court precedent that suggests that a restricted sale for use with a particular unpatented product passes muster as a restricted sale for purposes of cutting off patent exhaustion, the Supreme Court could in a future case treat a restriction on a use of a product sold with an unpatented product as crafted into the sales grant as an impermissible restriction on the use of a sale. So practitioners should be mindful that the foregoing type of language stands on weaker footing and may ultimately not defeat exhaustion.

Even if the license grant passed muster under the laws, a licensee would likely push back on the foregoing type of language since it would require the licensee to ensure that a customer is using the Intel microprocessor sold with Intel products.³² Such

³² One way the deal could be structured to satisfy the license grant in a way that does not require the licensee to police the customer’s commercial use of the product sold might be to recite in the license that the sale by the licensee to the customer of non-patented

language would require the licensee to police the commercial activities of its customers. Such language also prevents the licensee from making sales to customers who do not use the Intel microprocessor with Intel products.

8F(v) “to sell products only for use with licensee products”

The license could have restricted the sale of licensee products to for use only in combination with products made by the licensee such as by using the following language:

“under the restriction and condition that such products sold shall be used only in combination with products made by the licensee”

This language is not unlike the language discussed in Section 8F(iv) and is likely to be treated the same way.

8F(vi) *General Talking Pictures Corp.* remains good law – a sale can be restricted to a field of use

In *General Talking Pictures Corp.*, a patent holder granted a licensee the right to manufacture and sell patented amplifiers for radio amateur reception, radio experimental reception, and home broadcast reception. 304 U.S. 175 at 180 The licensee sold the patented amplifiers into the commercial field and the patent holder sued for infringement. The Supreme Court held that the sale was authorized for private and home use only and not for commercial use and so the license granted authorization to make a restricted sale. The sale of patented amplifiers by the licensee for commercial uses fell outside the scope of the authorized sale and so there was no exhaustion of the patents by the sale of the patented amplifiers.

products that is in an amount [to be determined] of the number of patented products sold to the customer creates a rebuttable presumption that the sale satisfies the condition of the sale grant. The actual number of unpatentable products recited in the license can be determined based on how much nonpatented product is typically used with the patented product in the type of marketplace serviced by the customer.

General Talking Pictures Corp remains good law today. A sale can be restricted to a field of use. For example, limiting the sale of a radio unit to a wireless application is a restricted sale not unlike the restricted sale in *General Talking Pictures Corp*.

Practitioners should consider field of use restrictions when crafting a sales grant in a license as a way to cutoff patent exhaustion.

8F(vii) “limiting the authorized sale to licensed products not embodying essential features of specified combination or method patents ”

The license could have restricted the sale by defining licensed products to exclude “essential features” of an unlicensed combination or method patent. To identify the “essential features” of the patented methods and combinations to be excluded from licensed products, the patent holder could include a list of combination and method patents in the license and the licensee could covenant, represent, and warrant that no products sold will embody essential features of the listed combination or method patents.

From a realistic standpoint though, a licensee would be reluctant to undertake such an obligation since it would effectively require a licensee to take positions on the patents of a patent holder with respect to its products – something a licensee would likely be reluctant to do. The patent holder may likewise be cautious about going down the road of identifying essential features of his combination or method patents as any positions taken will undoubtedly come back to haunt him in litigation. For either party, the task of identifying essential features may be onerous and possibly also contentious.

8F(viii) “requiring a licensee to disable any features in a product that are essential features of a combination or method patent”

In addition to using language of the type shown in examples 8F(i-vii), a license could require a licensee to disable any features in a product sold under the licensed patents that would exhaust any non-licensed patented method or combination. The patented methods and combinations could be identified in the license and the license could require the licensee as part of the sales grant to disable any features in their products that embody essential features of the listed combination or method patents. Structuring a license in this way could address the concern of the *LGE* court that whether a feature in a product can be disabled or not by a customer is not a defense to exhaustion since the product as sold has that feature since the product would be delivered with the functionality disabled. See *LGE* 128 S. Ct. at footnote 6.

From a realistic standpoint though, a licensee would be reluctant to undertake such an obligation since it would effectively require a licensee to take positions on the patents of a patent holder with respect to its products – something a licensee would likely be reluctant to do. Disabling features of a product may also not be an option for the licensee.

8G. Include the Restrictions in the License Grant

If a license grant is to provide for a restricted sale, then the restrictions should be specified in the license grant granting the authorization to sell and not as a covenant in the license agreement in a separate agreement. In *LGE* the Court found the restrictions in the Master Agreement to be separate from the license granting the unrestricted

authorization for sale. *Id.* at 2114 To be a restricted sale, the license grant must recite the restriction.

8H. In Your Licensing Language, Craft Your Sales Grant So That It Fails to Satisfy One or Both Prongs of the 2-Prong Standard for Determining Exhaustion

LGE Court has provided guidelines for determining what patents are exhausted by an authorized sale. The guidelines are found in the two prong standard for determining patent exhaustion which is as follows:

- i. the only "reasonable and intended use" of the component product sold was to practice the combination or method patent
- ii. and the component product sold "embodies essential features" of the combination or method patent.

LGE 128 S. Ct. at 2119

8H(i). First Prong – the “Reasonable and Intended Use” of the Product is In the Combination Patent or Using the Method Patent

To satisfy the first prong of the test, the only “reasonable and intended use” of the component product sale must be to practice the combination or method patents exhausted. Hence, crafting language into the license to indicate the “reasonable and intended uses” of the product sale could cut off patent exhaustion. In *LGE*, the Court found no use for the Intel microprocessor but in the patented combination. “Here, *LGE* has suggested no reasonable use for the Intel Products other than incorporating them into the computer systems that practice the *LGE* Patents. Nor can we discern one: A microprocessor or chipset cannot function until it is connected to buses and memory. And here, as in *Univis*, the only apparent object of Intel’s sales to Quanta was to permit

Quanta to incorporate the Intel Products into computers that would practice the patents.”

LGE 128 S. Ct. at 2119

However, where, for example, a product has several uses – some of which are patented and some of which are not – then stating as the “object” of the sale that the reasonable and intended uses contemplated by the authorized sale is for use in the non-patented combination may cut off the uses of the product in the patented combination and hence cut off the exhaustion of the combination patents. This cut-off would be based not on the failure of the product sold to satisfy the second “essentially embodied in the product” prong; rather on the failure of the product to satisfy the first “reasonable and intended uses” prong of the two-prong test for determining whether a patent is exhausted.

The foregoing proposition finds support from the way the *LGE* Court crafted the product “uses” language identified in the first prong of the two-prong test for determining exhaustion. In crafting the first prong of the two-prong test, the *LGE* Court resorted to “reasonable and intended uses” language when it could just have easily crafted the first prong of the two-prong test in terms of *all uses* to which the functionality “essentially embodied” in the product can be put. This distinction does not appear to be an insignificant one. In fact, this distinction indicates that *both* the “reasonable and intended” uses specified in the first prong of the two-prong test for determining exhaustion *and* the *uses* to which the functionality or method steps “essentially embodied” in the product specified in the second prong can be put *do not have to be* mutually inclusive. In other words, there may be “reasonable and intended uses” of a product sold that exist apart from use of the product in a patented combination or method.

Hence, had LGE recited the uses of the Intel microprocessor and chipsets with Intel memory devices, if in fact Intel sold memory devices could be used with the microprocessor and chipset products, as the “reasonable and intended” uses of the product sold, that recitation may have served as evidence on the issue of the “reasonable and intended” uses of the product sold to defeat exhaustion.

Note though that even if the license contains an express recitation of “reasonable and intended use”, a court will likely still look at the combination patent functionality and steps of the method patent residing in the product sold to judge the credibility of the expressed recitation. However, to the extent the “reasonable and intended uses” of a product sold may be a subset of *all* of the uses of the product including its use in the combination functionality and method steps residing in the product, the recitation of the reasonable and intended uses of the product in the license that excludes the use of the product in the patented combination or method may serve to defeat exhaustion. While a practitioner should not rely solely on a recitation of reasonable and intended use in a license to defeat exhaustion, the inclusion of such a recitation may provide yet another basis for defeating exhaustion.

8H(ii). Second Prong – Product Embodies Essential Features of the Patented Combination or Methods

To satisfy the second prong of the test the component must embody essential features of the patented combination or method for the combination or method patent to be exhausted. Hence, exhaustion of combination or method patents could be cut off by authorizing the sale for use with products that do not embody essential features of the

patented combination or method. An example of how such a conditional grant could be crafted is the following language:

“for manufacture, use, and sale of products that do not embody essential features of any patented combination or method patents of the patent holder”

See Section 8F(vii) for a discussion on the difficulties of negotiating this kind of provision in a license.

8I. That a Product Sold Has Substantial Non-infringing Uses May Not Matter

That a product has a substantially non-infringing use does not affect the second prong (“essentially embodied” prong) of the two part test for determining what patents are exhausted on the authorized sale of a product. However, a substantial non-infringing use may have an affect on the first prong of the two part test – namely, the “reasonable and intended” use of the product. As noted though in Section 8H(i), the “reasonable and intended” use is not mutually inclusive with “substantial non-infringing” uses. *LGE* 128 S. Ct. at 2122 (“Intel’s microprocessors and chipsets substantially embodied the LGE patents because they had no reasonable non-infringing use and included all of the inventive aspects of the patented methods.”)

In short, in determining patent exhaustion in the aftermath of the *LGE* decision, the question is not whether a component can be used without the combination and/or method patent (e.g., has substantial non-infringing uses) since “intended reasonable non-infringing” uses and not “substantial non-infringing” uses is the test for determining the reasonable and intended uses required by the first prong of the two-part test for determining infringement. Rather, the question in deciding whether a patent is exhausted

is whether the reasonable and intended use of the product sold is in the combination and/or method patent substantially embodied in the product. If the use of the product in the patented combination or method is the reasonable and intended use of the product, those combination and/or a method patents substantially embodied in the product will be exhausted even if there are substantial non-infringing uses for that product.

8J. Implied License Language Will Not Save Your Patents From Exhaustion

The license agreement in *LGE* contained the following language that stated that no license:

“is granted by either part hereto . . . to any third party for the combination by a third party of Licensed Products of either party with items, components, or the like acquired . . . from sources other than a party hereto, or for the use, import, offer for sale or sale of such combination.”

LGE, S. Ct. at 2114

As the *LGE* Court stated, such language goes to an implied license and so has nothing to do with the patent exhaustion question before the Court. *LGE*, S. Ct. at 2122. See also Section 3A on the differences between patent exhaustion and an implied license.

8K. Boiler Plate Language is Fine But Won't Preclude Exhaustion

The LGE License purported to not alter the rules of patent exhaustion by providing that:

“[n]otwithstanding anything to the contrary contained in this Agreement, the parties agree that nothing herein shall limit or alter the effect of patent exhaustion that would otherwise apply when a party hereto sells any of its Licensed Products.”

LGE, S. Ct. at 2114.

An unrestricted sale exhausts patents *as a matter of law* and so any contractual language be it consistent with the law on patent exhaustion, such as the language in the LGE License was found to be, or contrary to the law on patent exhaustion will not alter this rule.

9. Conditional Sales In Biotechnology License Agreements

While patents in *LGE* pertained to computer systems, the holding in *LGE* is likely to impact biotechnology license agreements as well. Hence biotechnology companies too need to revise their licensing programs to account for the broader scope of patents that under *LGE* are now exhausted by the first sale *as a matter of law*.

The effects of *LGE* on licensing and litigation programs discussed in Section 8 provide guidelines for the biotechnology practitioner too on how to structure a biotechnology license.

In view of the discussion in Section 8A, biotechnology companies should revisit their license agreements with an eye towards exhaustion of patents, overpayment of royalties, and other issues in view of the broader scope of patents that under *LGE* are now exhausted by the first sale of a product as a *matter of law*. Changes should be made to licensing agreements as necessary.

As discussed in Sections 8B and 8C, biotechnology companies need to understand which combination and method patents are essentially embodied in the product sold and the companies may want to consider licensing the combination and method patents in one license.

In order to keep combination and method patents from being exhausted, biotechnology practitioners need to be aware of what sale they authorize as discussed in Section 8D. For example, if the license is for noncommercial research purposes by a licensee and not for use by any third party, the license grant may limit the license “to make and use the invention for noncommercial research purposes with no right to sell products embodying the invention” in order to keep a third party from using the invention. This kind of license grant appears to be not unlike the field of use license found in *General Talking Pictures Corp, supra*. which continues to be good law. See Section 8F(vi) above.

Just as in Section 8F(iii), a license could permit the sale of licensed products “only for use in licensed method X for use in diagnostic but not therapeutics.”

Just as in Section 8F(vii), a license could restrict the term “licensed products” to products that do not “essentially embody” an unlicensed combination or method patent.

With respect to genetically engineered plants, for example, as well as other products that replicate themselves, the pre-*LGE* practice has been to bag tag the seeds sold with the restriction that they be used to grow a crop for sale and not for the production of seeds for second generation crop. *LGE* would not appear to impact this practice insofar as *General Talking Pictures Corp.* remains good law. In accordance with *General Talking Pictures*, a sale can be restricted to a field of use. Hence, provided that a bag tag restriction limits the sale of the seeds “to for use in growing crops and not for production of seeds for second generation crop”, the sale would appear to be a permissible restricted sale and likely to be upheld.

10. Does *LGE*'s Ascribing of Essentiality to Features of a Combination Patent Residing in a Product Sold Square With the Court's Precedent in *Aro* that "There is No Legally Recognizable or Protected "Essential" Element, "Gist" or "Heart" of the Invention in a Combination Patent"?

In *LGE*, the sale of microprocessors exhausted the combination and method patents because the essential functionality of the combination and method patents resided in the microprocessor and chipsets. Among the precedents discussed by the Court in *LGE* is *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 81 S. Ct. 599, 5 L. Ed. 2d 592, 1961 Dec. Comm'r Pat. 635 (1961). *Aro* involved a patent directed to a combination, in an automobile body, of a flexible fabric, supporting structures, and a mechanism for sealing the fabric against the side of the automobile body to keep the rain out. In *Aro*, a patent infringement suit was brought against manufacturers who manufactured and sold replacement fabrics for use in the patented combination. The *Aro* Court held that the manufacturers were not guilty of either direct or contributory infringement of the patent because the replacement of the worn-out fabric was a permissible repair. In arriving at this holding, the *Aro* Court cited precedent that "a combination patent covers only the totality of the elements in the claim, and that no element, separately viewed, is within the grant. *Aro*, 365 U. S. 337-346

Hence, according to the Supreme Court's own *Aro* precedent, as to combination patents, the *combination* of elements is the invention and it is distinct from any of its elements. Yet in *LGE*, the Court went on to find that the inventive part of the LGE combination and method patents lies not in the combination but in the microprocessor itself "[i]n this case, the inventive part of the patent is not the fact that memory and buses are combined with a microprocessor or chipset; rather, it is included in the design of the

Intel Products themselves and the way these products access the memory or bus.” *LGE* at 2121 The *Aro* court warned that no element can be viewed as central to or equivalent to the invention. *Aro*, 365 U.S. at 344 Yet the *LGE* Court did just that with the explanation that “*Aro*[’s] warning that no element can be viewed as central to or equivalent to the invention is specific to the context in which the combination itself is the only inventive aspect of the patent.” *LGE*, S. Ct. at 2121

By resorting to the use of an “essential elements” test in analyzing combination patents though, *LGE* appears to be in contradistinction to the Supreme Court’s holding in *Aro* that there is no legally recognizable or protected “essential” element, “gist” or “heart” of the invention in a combination patent. “The basic fallacy in respondent’s position is that it requires the ascribing to one element of the patented combination the status of patented invention in itself. Yet this Court has made it clear in the two *Mercooid* cases that there is no legally recognizable or protected “essential” element, “gist” or “heart” of the invention in a combination patent. *Aro*, 365 U. S. at. S. 346

By looking at the “essential” element, “gist” or “heart” of the invention in the *LGE* combination patent, the *LGE* decision may have opened up a Pandora’s box with respect to combination patents. If, for example, “inventiveness” of a combination patent is found to lie in the essentiality of one of its elements as suggested by the *LGE* decision, then does patentability lie in that element and not in the combination? If so, then does a combination patent cease to be patentable subject matter because it is the same invention as the patented element?³³ These are but some of the many troubling questions raised by

³³ The short answer may be that under *LGE* a device patent and the combination patent in which it is used may both be treated as device patents (i.e., the simpler device patent of the “device patent” and the complex device patent of the “combination patent”). Both the simple device patent and complex device patent distinguishes over one another for purposes of patentability. Now though because of the exhaustion of one patent by the sale of the other it is up to the patent holder to choose which one of the two patents to license.

the *LGE* decision which the Court will likely be asked to decide in the future unless preempted by Congressional legislation.

11. Other Questions Raised by the LGE Decision

LGE also raises a number of other questions.

For example, if patent misuse involves the patentee impermissibly broadening the "physical or temporal scope" of the patent grant with anticompetitive effect, *Windsurfing*, 782 F.2d at 1001 (quoting *Blonder-Tongue Labs., Inc. v. Univ. of Ill. Found.*, 402 U.S. 313 (1970)), then does licensing of an exhausted patent create a patent misuse because it broadens the "temporal scope" of the patent grant with anticompetitive effect ala *Windsurfing* by the collection of royalties on an exhausted patent (i.e., you are extending the patent (or more precisely your return on your patent) beyond the exhaustion of the patent)?³⁴

Another example is the doctrine of equivalents. For infringement to exist under the doctrine of equivalents, the accused device must contain an equivalent of every limitation of the claimed invention (i.e., the "all elements" test). *Warner-Jenkinson Co v. Hilton Davis Chem Co.*, 520 U.S. 17, 40 (1997); *TIP Sys., LLC v. Phillips & Brooks/Gladwin Inc.*, Nos. 2007-1241, 2007-1279, F.3d, 2008 U.S. App. LEXIS (Fed. Cir. June 18, 2008). If an accused device contains an equivalent of the "inventive element" of a combination patent but is missing one or more other non-inventive elements of the patent, then would that device nonetheless infringe the combination

In other words, *pre-LGE* a patent holder had both patents to license. Now post-*LGE* because of the exhaustion of one by the other the patent holder may only hold one arrow in his quiver.

³⁴ Maybe not if the license provides a licensee with some other freedom of movement with respect to its business. For example, the freedom of movement could come from the licensee's freedom from liability regarding where it gets its chipsets or if it decides to make its own chipsets. If the license also grants a license to know-how, the know-how license may save the license from these kinds of challenges.

patent under the doctrine of equivalents in view of the “inventive elements” thinking set forth in *LGE*?

By some measure, some might say that in deciding *LGE*, the Supreme Court may have raised more questions than it has answered.

12. Conclusion

In *LGE*, the Supreme Court has clarified the reach of *Univis* of patents that are exhausted under the first sale doctrine. Under *LGE*, an authorized sale will exhaust all patents of the patent holder *as a matter of law* that satisfy a two-prong test. According to the first part of the test, combination and method patents are exhausted if they are the “reasonable and intended use” of the product sold. Per the second part of the test, the combination and method patents are exhausted if the product sold “essentially embodies” the combination and/or the method patents. On the one hand, the *LGE* decision is disguised as a clarification of the Supreme Court’s decision in *Univis*. But on the other hand, *LGE* has actually introduced a sea change in the law on what patents are exhausted. Before *LGE*, only device patents entirely residing in the product sold were exhausted. Under *LGE* all combination and method patents essentially embodied in the product sold are also exhausted if the only reasonable and intended use of the product sold is to practice the combination or method patent. The Supreme Court has interpreted the conjunction “and” test used in *Univis* one way in *LGE*. Yet the *Univis* conjunction “and” test as interpreted by lower court jurisprudence over the past 66 years provides the Supreme Court with a basis to revisit the law of patent exhaustion from the standpoint of the *uses of a patent* residing in a product as opposed to the *actual uses* of the product on

which the *LGE* decision is based. Doing so could provide an opportunity for the Supreme Court to square all of its precedent with *Univis* in a way that adds more certainty and predictability to the exhaustion doctrine and preserves the viability of combination and method patents as separately patentable subject matter. Doing so could also minimize litigation that is likely to occur from the application of the *LGE* two-prong test for determining what patents are exhausted about which reasonable minds are likely to differ. Until that happens, however, if ever, companies need to revise their licensing programs to account for the broader scope of patents that under *LGE* are now exhausted by the first sale *as a matter of law*. As the dust settles in the aftermath of *LGE* at least one thing is clear. A restricted sale still serves to cut-off the exhaustion of patents.

Attachment A – Representative Claims of LGE Patents and Where Essential Elements Are Likely To Lie In a Computer System

LGE '641 patent

1. A data processing system including one or more central processing units, main memory means, and bus means, for each central processing unit the invention comprising:

cache memory means coupled between the central processing unit and said bus means;
[LIKELY A STANDARD MEMORY DEVICE?]

bus monitor means associated with said cache memory means and coupled to said bus means for detecting on said bus means an address associated with a data unit transferred from said main memory means to a bus connection requesting the data unit; [LIKELY DONE BY PROCESSOR AND CHIPSETS?]

means coupled to said cache memory means and to said bus means for determining if data having the same address as said transferred data unit is present in said cache memory means and, if present, for asserting a hold signal on said bus means, the assertion of the hold signal indicating at least to the bus connection requesting the data unit that another data unit may be transmitted over said bus means; and
[LIKELY DONE BY PROCESSOR AND CHIPSETS?]

means for detecting whether data corresponding to the address of said transferred data unit and determined to be stored in said cache memory means may be different in content from said transferred data unit and, if so, transmitting said data from said cache memory means to said bus means for reception by the bus connection requesting the data unit.
[LIKELY DONE BY PROCESSOR AND CHIPSETS AND USING A STANDARD MEMORY DEVICE?]

LGE '379 Patent

1. A memory control unit for controlling a main system memory of a data processing system, the main system memory being comprised of at least one memory unit, comprising:

first interface means for coupling said memory control unit to the at least one memory unit of the main system memory; [LIKELY STANDARD HARDWARE?]

second interface means for coupling said memory control unit to a system bus having signal lines for expressing information units, including memory read and write requests, the system bus including a system address bus; [LIKELY STANDARD HARDWARE?]

means, coupled to said first and to said second interface means and responsive to a write request from said system bus, for executing the write request by storing one or more information units within a memory unit at an address specified by the system address bus, said write request executing means comprising write request receiving and buffer means having a plurality of storage locations capable of storing a plurality of received write requests and associated write addresses prior to execution of the write requests; [LIKELY DONE BY PROCESSOR AND CHIPSETS AND USING A STANDARD MEMORY DEVICE?]

means, coupled to said first and to said second interface means and responsive to a read request from said system bus, for executing the read request by reading one or more information units from a memory unit at

a location specified by the system address bus, said read request executing means comprising read request receiving and buffer means having a plurality of storage locations capable of storing a plurality of received read requests and associated read addresses prior to execution of the read requests; [LIKELY DONE BY PROCESSOR AND CHIPSETS AND USING A STANDARD MEMORY DEVICE?]

said memory control unit further comprising:

means, having a first input coupled to said write buffer means and a second input coupled to said read request receiving means, for comparing a received read address to write addresses stored in said write address buffer means, said comparing means having an output signal for indicating, when asserted, an occurrence of the reception of a read address within a predetermined range of addresses of one of said stored write addresses; and [LIKELY DONE BY PROCESSOR AND CHIPSETS AND USING A STANDARD MEMORY DEVICE?]

means for controlling the execution of read and write requests, said controlling means being coupled to said comparing means output signal and being responsive to said comparing means output signal not being asserted for causing an execution of all buffered read requests before any buffered write requests, said controlling means further being responsive to said comparing means output signal being asserted for first causing an execution of only those buffered read requests which precede a buffered read request which caused the assertion of said comparing means output signal and then causing an execution of buffered write requests. [LIKELY DONE BY PROCESSOR AND CHIPSETS AND USING A STANDARD MEMORY DEVICE?]

7. In an information processing system having a system bus for coupling together a plurality of bus connections, one of the bus connections being a memory control unit coupled to one or more memory units, the memory control unit being responsive to address and data signal lines of the system bus for writing information units to and for reading information units from the memory units, a method of reading and writing the information units comprising the steps of:

buffering write requests, including write addresses, as they are received from the system bus; [LIKELY DONE BY PROCESSOR AND CHIPSETS]

buffering read requests, including read addresses, as they are received from the system bus; comparing when received each read address against buffered write addresses, if any, to determine if a received read address has an address value within a predetermined range of address values of a buffered write address; [LIKELY DONE BY PROCESSOR AND CHIPSETS]

if a received address is determined not to be within the predetermined range of addresses of any buffered write addresses then:

first executing in sequence all buffered read requests; and [LIKELY DONE BY PROCESSOR AND CHIPSETS]

then executing in sequence all buffered write requests; [LIKELY DONE BY PROCESSOR AND CHIPSETS]

else if a received address is determined to have an address value within the predetermined range of address values of any buffered write address: [LIKELY DONE BY PROCESSOR AND CHIPSETS]

first executing in sequence all buffered read requests up to but not including the received read request which was determined to be within the predetermined range; [LIKELY DONE BY PROCESSOR AND CHIPSETS]

then executing all buffered write requests; and [LIKELY DONE BY PROCESSOR AND CHIPSETS]

then executing the buffered read request which was determined to be within the predetermined range.
[LIKELY DONE BY PROCESSOR AND CHIPSETS]

LGE '733 patent

1. Apparatus for determining priority of access to a bus among a set of devices coupled to the bus, each device being represented for priority purposes by a node in a group of nodes, each node being coupled to the bus and receiving a priority line from a first adjacent node and providing a priority line to a second adjacent node and having a priority relative to a single node with the highest priority, the priority determining apparatus comprising in each node: [THE NODE IS LIKELY A STANDARD CONFIGURATION FOR DEVICES?]

priority logic means for permitting access to the represented device if no higher priority node has requested access; and [LIKELY DONE BY PROCESSOR AND CHIPSETS?]

highest priority node specification means responsive to the bus for specifying whether the node is presently the highest priority node and, if the node is presently the highest priority node, dynamically giving the highest priority to another of the nodes in response to a predetermined number of accesses of the bus by one of the set of devices. [LIKELY DONE BY PROCESSOR AND CHIPSETS USING STANDARD HARDWARE IN THE NODE?]