

United States District Court,
E.D. Wisconsin.

JAMES RIVER CORPORATION OF VIRGINIA,
Plaintiff.

v.

HALLMARK CARDS, INCORPORATED,
Defendant.

No. 93-C-1330 [JPS]

Jan. 4, 1996.

Patentee brought action against competitor, alleging infringement of its patents for pleated paper plates. On competitor's motions for summary judgment, the District Court, Stadtmueller, Chief Judge, held that: (1) action was not barred by laches; (2) infringement claim was not barred by estoppel; (3) evidence raised genuine issue of material fact as to whether patents were infringed either literally or under doctrine of equivalents, precluding summary judgment; and (4) patents were not invalid under statutory on sale bar.

Motions denied.

4,606,496, 4,609,140, 4,721,499, 4,721,500. Cited.

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John F. Flannery, Philip T. Petti, Mark A. Hamill, Mark W. Hetzler, Fitch, Even, Tabin & Flannery, Chicago, IL, Howard A. Pollack, Godfrey & Kahn, Milwaukee, WI (Larry L. McMullen, Michael Thompson, Blackwell, Sanders, Matheny, Weary & Lombardi, Kansas City, MO, Theodore W. Anderson, Leydig, Voit & Mayer, Ltd., Chicago, IL, of counsel), for Defendant.

STADTMUELLER, Chief Judge.

The plaintiff, James River Corporation of Virginia, ("James River") filed this patent infringement action against defendant Hallmark Cards, Inc. ("Hallmark") on November 29, 1993. Before the court are Hallmark's dispositive motions. Hallmark moves that it be granted summary judgment in its favor on its defenses of laches, estoppel, and on the issue of infringement, and partial summary judgment on its defense of invalidity.

I. FACTUAL OVERVIEW

At issue are four patents of which James River is the assignee. James River asserts in its complaint that Hallmark's Sturdy II plates and the processes used in making them infringe these patents. Patent No. 4,609,140 (" '140 patent") is a product patent directed to a pressed paperboard container, the rim of which has pleats that include three layers of paperboard reformed into substantially integrated fibrous structures generally inseparable into their constituent layers. Patent No. 4,721,500 (" '500 patent") is a division of the '140 patent; it is directed to the method of making the container of the '140 patent. Patent No. 4,606,496 (" '496 patent") is a product patent directed to a container including the integrated pleats of the '140 patent in both the rim and sidewall of the container. Patent No. 4,721,499 (" '499 patent") is a division of the '496 patent directed to the method of making the container of the '496 patent.

On April 13, 1982, James River filed a patent application that was the "grandparent" of the '140 patent that eventually issued on September 2, 1986. The division of the original claim resulted in the '500 patent issuing separately as a process patent on January 26, 1988. On March 20, 1984, James River filed a patent application that resulted in the '496 patent issuing on August 19, 1986. The division of the application resulted in the '499 process patent issuing separately on January 26, 1988.

In December 1988, James River became aware of Hallmark's Sturdy II plates and requested a legal opinion as to whether they infringed the patents. HF-12, DX-83. After receiving the opinion, James River sent Hallmark a notice of infringement of the four patents in suit on March 3, 1989. James River asked Hallmark to discontinue the manufacture and distribution of the accused plates. HF-14, 15. Hallmark investigated James River's claims. James River sent a second letter dated April 13, 1989 in which it sought a reply to its March 3, 1989 letter. Hallmark responded in a letter dated April 17, 1989, in which it asserted its plates did not infringe any of the four patents and gave reasons for this assertion. Hallmark sought any information that James River could provide in rebuttal. James River did not respond to Hallmark. During 1989, James River's General Patent Counsel became ill and eventually died. Ross Affidavit, para. 16. Shortly thereafter, James River embarked on a series of reorganizations that lasted two and a half years. Nemura Affidavit, para. 2-12. There was no further communication between the parties on this matter until James River filed its complaint on November 29, 1993.

Before the litigation commenced, James River and Hallmark had a vendor-buyer relationship. This was alluded to in the original notice of infringement. DX-82 at JR6780.

Hallmark contends that after it sent the letter of April 17, 1989, to James River and heard nothing, it invested substantial sums in paper plate technology, manufacturing, and marketing. Hallmark states that it spent over \$200,000 on new and additional dies for paper plate presses. DX-2002, PX-49, HF-38. It also spent money to develop laminated paperboard. DX-2003, HF-39. During this period Hallmark continued to sell the allegedly infringing plates. DX-2001, HF-29.

In its complaint, James River alleges that under the patent laws of the United States, 35 U.S.C. s. 1 *et seq.*, Hallmark "has infringed and still is infringing the Patents in this District and elsewhere" by manufacturing and selling paper plates that embody or employ claims in the patent in suit. James River seeks entry of a permanent injunction restraining Hallmark from further infringement. 35 U.S.C. s. 283. James River also seeks damages, prejudgment interest, and an award of increased damages for willful infringement, 35 U.S.C. s. 284. Finally, James River seeks attorney's fees, 35 U.S.C. s. 285, and costs of suit, 35 U.S.C. s. 284.

II. LEGAL STANDARD

Summary judgment is appropriate if "the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to judgment as a matter of law." Fed.R.Civ.P. 56(c); Celotex Corp. v. Catrett, 477 U.S. 317, 322-23, 106 S.Ct. 2548, 2552, 91 L.Ed.2d 265 (1986). Summary judgment is appropriate when the record, viewed in the light most favorable to the non-moving party, does not establish a genuine issue of material fact, and judgment is proper as a matter of law. Courtney v. Biosound, Inc., 42 F.3d 414, 418 (7th Cir.1994). "[T]he mere existence of *some* alleged factual dispute between the parties will not defeat an otherwise properly supported motion for summary judgment; the requirement is that there be no *genuine* issue of *material* fact." Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 247-48, 106 S.Ct. 2505, 2509-10, 91 L.Ed.2d 202 (1986) (emphasis in original). Facts are material if they might affect the outcome of the case under applicable law. *Id.* at 248, 106 S.Ct. at 2510. A dispute over a material fact is "genuine" if a reasonable jury could resolve it in favor of the non-moving party. *Id.*

The party moving for summary judgment has the initial burden of showing that there are no disputed material facts and that it is entitled to judgment in its favor. Hannon v. Turnage, 892 F.2d 653, 656 (7th Cir.), *cert. denied*, 498 U.S. 821, 111 S.Ct. 69, 112 L.Ed.2d 43 (1990). A defendant may satisfy this initial burden by pointing to a plaintiff's failure to introduce sufficient evidence to support each essential element of the cause of action alleged. *See* Anderson, 477 U.S. 242, 256, 106 S.Ct. 2505, 2514, 91 L.Ed.2d 202 (1986); Celotex, 477 U.S. at 323-24, 106 S.Ct. at 2552-53. Once the movant carries its initial burden, the

burden shifts to the non-moving party, who must "go beyond the pleadings" and designate specific facts to support each element of its cause of action, showing that there is a genuine issue for trial. *Celotex*, 477 U.S. at 322-23, 106 S.Ct. at 2552; *Becker v. Tenenbaum-Hill Associates, Inc.*, 914 F.2d 107, 110 (7th Cir.1990). In evaluating a motion for summary judgment, the Court must draw all reasonable inferences in favor of the non-moving party. *Matsushita Elec. Indus. Co., Ltd. v. Zenith Radio Corp.*, 475 U.S. 574, 106 S.Ct. 1348, 89 L.Ed.2d 538 (1986); *Johnson v. Pelker*, 891 F.2d 136, 138 (7th Cir.1989).

III. LACHES & ESTOPPEL

A. Laches

[T]o invoke the laches defense, a defendant has the burden to prove two factors:

[a]. The plaintiff delayed filing suit for an unreasonable and inexcusable length of time from the time the plaintiff knew or reasonably should have known of its claim against the defendant, and

[b]. the delay operated to the "prejudice or injury of the defendant."

Id. A court must look at all of a case's particular facts and circumstances and must weigh the equities of the parties. *Id.*

1. Unreasonable Delay

[4] [5] [6] A delay of six years is required for a presumption of laches. *Meyers v. Asics Corp.*, 974 F.2d 1304, 1307 (Fed.Cir.1992). A court must consider and weigh any justification or excuse offered by the plaintiff for its delay. *Aukerman*, 960 F.2d at 1033 (listing examples). Furthermore, a court must draw reasonable inferences in favor of the patentee that would shorten the delay period and that could show the delay was reasonable. *Gasser Chair Co., Inc. v. Infanti Chair Mfg. Corp.*, 60 F.3d 770, 774 (Fed.Cir.1995).

[7] James River delayed bringing suit less than six years, so there is no presumption of laches. Moreover, this case is distinguishable from cases in which laches was applied despite a delay of less than six years. James River neither took an express position it later tried to alter, nor did it expressly threaten litigation then delay bringing suit. *See, e.g., ASICS*, 974 F.2d at 1307. In its letters to Hallmark, James River said nothing of litigation. DX-653; DX-84. It merely requested that Hallmark discontinue the manufacture and distribution of the allegedly infringing plates and that it respond to the letters. *Id.* Moreover, James River has offered evidence of reasons for its delay, namely the death of its patent counsel and corporate reorganizations. In light of this evidence, Hallmark has failed to carry its burden of showing an absence of material fact as to undue delay.

2. Prejudice

[8] "Material prejudice to adverse parties resulting from the plaintiff's delay is essential to the laches defense. Such prejudice may be either economic or evidentiary." *Aukerman*, 960 F.2d at 1033.

a. Economic Prejudice

[9] [10] [11] The Federal Circuit has given extensive guidance as to economic prejudice:

Economic prejudice may arise where a defendant and possibly others will suffer the loss of monetary investments or incur damages which likely would have been prevented by earlier suit.... Such damages or monetary losses are not merely those attributable to a finding of liability for infringement.... Economic prejudice would then arise in every suit.... The courts must look for a *change* in the economic position of the alleged infringer during the period of delay....

Aukerman, 960 F.2d at 1033. For a defendant to show prejudice, its "expenditures must have an explicitly

proven nexus to the patentee's delay in filing suit." Hemstreet, 972 F.2d at 1294. "It is not enough that the alleged infringer changed his position-i.e. invested in production of the allegedly infringing device. The change must be because of and as a result of the delay, not simply a business decision to capitalize on a market opportunity." Hemstreet, 972 F.2d at 1294 (citing Aukerman, 960 F.2d at 1033). Prejudice cannot result from a business decision or gamble that the patent owner would not sue...." Gasser Chair, 60 F.3d at 775.

[12] [13] [14] An infringer's continuation of infringing activity is probative of a lack of prejudice. Where no evidence shows the infringer stopped selling the allegedly infringing product even after the patentee filed the complaint, a court may draw the inference that the infringer would have continued to sell the infringing product even if the patentee had brought suit earlier. Meyers v. Brooks Shoe, 912 F.2d 1459, 1463 (Fed.Cir.1990). The inference may follow that the infringer acted independently of the patentee's actions. *Id.* Similarly, where an alleged infringer does not submit evidence "that they curtailed design and development" of an infringing product once a patentee filed suit, it is reasonable to infer the infringer would not have acted differently had the patentee sued earlier. ASICS, 974 F.2d at 1308.

[15] In this case, Hallmark recites the investments it made in developing, producing and selling its Sturdy II line of plates. This demonstrates economic detriment. However, there remains a material fact issue as to a nexus between Hallmark's alleged change in position and James River's delay. Hallmark's Vice President, General Counsel, and Secretary, Mr. Egan, stated that "we assumed James River agreed with us [that there was no infringement.] And on that basis there was no reason to advise anybody at Hallmark to change the way they were doing business." DX-627, p. 30. However, the only evidence that might show economic prejudice is Mr. Egan's statement that "[w]e would have come to some sort of an accommodation." DX-627, p. 31. This does not demonstrate beyond dispute that the required nexus existed between the delay and Hallmark's investments. Instead, for Hallmark to take James River's silence as acquiescence appears to have been a business gamble that James River would not sue. In addition, Hallmark has not ceased production or sales of the Sturdy II plates since James River brought suit. Based on this record, Hallmark has failed to demonstrate a nexus between the delay and its investments, and therefore has not demonstrated there is no genuine factual issue as to economic prejudice.

b. Evidentiary Prejudice

[16] [17] "Evidentiary, or 'defense' prejudice, may arise by reason of a defendant's inability to present a full and fair defense on the merits due to the loss of records, the death of a witness, or the unreliability of memories of long past events, thereby undermining the court's ability to judge the facts." Aukerman, 960 F.2d at 1033. Laches cannot be found unless the party asserting it demonstrates how unavailable evidence would be important to the defense. Brooks Shoe, 912 F.2d at 1463-64; *see also* Laitram Corp. v. Rexnord Inc., 15 U.S.P.Q.2d 1161, 1164, 1990 WL 71414 (E.D.Wis.1990). ("Rexnord's assertion that it was prejudiced because some of the witnesses' memories faded during the intervening period is not persuasive. Rexnord has not identified any material information which was unavailable as the result of any fading memory. Thus, there is no record evidence to support this assertion."), *rev'd on other grounds*, 939 F.2d 1533 (Fed.Cir.1991).

Hallmark contends that it has suffered evidentiary prejudice in three ways:

(1) due to the passage of time, evidence of the invalidity of the '140 and '500 patents has been lost. Hallmark alleges the patents are invalid because James River violated the on sale bar. 35 U.S.C. s. 102(b). Specifically, Hallmark relies on witnesses's lack of recall to demonstrate that the inventors cannot recall anything but what they stated in documents prepared during the time when the inventions were developed. As a result, James River has no substantial recall of its paper plates or dies made or used before August 1980, nor of the preparation and prosecution of the patent applications;

(2) Hallmark and other companies have no records of prior art paper plates due to the passage of time. Specifically, Hallmark discarded records of plates it made before the patent claim date. When Hallmark closed its Osage, Kansas plant in 1992, it did not retain plant archives of development and prior art, nor most dies used to make the plates. HF-77. In addition, other companies allegedly made and sold prior art

plates before the patent claim date, but the relevant records and witnesses are limited due to the passage of time. HF-82, 83;

(3) Mr. Lundy, who authored and who could explain many of the Hallmark documents, died before this litigation began. HF-80.

[18] Hallmark faces several difficulties in establishing prejudice. First, it must show that the prejudice resulted from the plaintiff's delay. Aukerman, 960 F.2d at 1033. In this case, however, most of the "passage of time" occurred before James River's delay. James River filed its patent claim in April 1982, and it became aware of the allegedly infringing plates in about December 1988. Hallmark complains of loss of evidence predating August 1980. Thus, there is a delay of about eight years, four months, for which James River is not to blame. The only period for which James River might be accountable is the four year, seven month delay after correspondence between the parties ceased in 1989. Hallmark has not demonstrated that any loss of evidence occurred solely, primarily, or even in part from the post 1989 delay. Even where James River's delay might have played a significant role in the loss of evidence, Hallmark still bears the burden of showing a cause and effect relationship.

[19] The second difficulty that Hallmark faces is that loss of memory, witnesses, or documentary evidence alone does not establish prejudice. Instead, Hallmark must show an inability to present a full and fair defense. Aukerman, 960 F.2d at 1033. In other words, Hallmark must show how the allegedly "lost" evidence is important to its defense. Brooks Shoe, 912 F.2d at 1463-64. However, Hallmark has not alleged any prejudicial deprivation of information. While Hallmark must understandably be frustrated by its inability to fully develop the factual record, laches requires more than inability to obtain evidence the party ideally wants. The risk of loss of evidence is inevitably a hazard of complex litigation.

i. James River's Prior Art Plates

[20] While Hallmark states that James River has no memory of the plates made and dies used before August 1980, it has not made clear what material information it cannot obtain from witnesses. Hallmark refers to documents prepared by the inventors and to market research tests, and it complains that no witnesses can recall the circumstances surrounding the preparation of these documents. However, this admits that there is documentary information pertaining to James River's pre-1980 information, and it is not clear that this is insufficient for Hallmark to make out its defense. Hallmark has not pointed to discrepancies or hints in these documents that could only be explained by witnesses who fully recollect the surrounding circumstances.

[21] Nor can Hallmark claim prejudice in being unable to question witnesses about terms used in the patent claims. The meaning of patent claims is determined from the claims, the specification, the prosecution history, and expert testimony. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed.Cir.1995). Hallmark has not demonstrated it has no access to the relevant documentary information or to expert witnesses who can testify as to "scientific principles, the meaning of technical terms, and terms of art." *Id.* The lack of contemporaneous witnesses does not constitute prejudice in this context.

ii. Hallmark's and Third Parties' Prior Art Plates

[22] Hallmark cannot show that its discarding of its prior art archives at the Osage plant is evidentiary prejudice. It only states that it did not retain this evidence when the plant closed. There is no indication that the loss of evidence resulted from James River's delay, rather than from a pragmatic business decision to dispose of old records.

[23] Hallmark has also not established prejudice as to prior art paper plates manufactured by third parties. Its allegation is that "a substantial number of prior art paper plates were made and sold by third parties prior to April 13, 1981. The records and witnesses available to testify as to these paper plates are very limited due to the passage of time." HF-82, 83. Hallmark has not named these third parties, stated when the plates were made, or even upon what basis it believes the plates might have anticipated James River's plates. Moreover, while Hallmark refers to two die-makers, it does not indicate why it believes their information would have been material, or that if it was, that the loss was due to James River's delay. DX-2016, p. 64-65, HF-81.

iii. Mr. Lundy's Death

[24] Hallmark contends that the death of Mr. Lundy, who allegedly coined the term "Dixie-type die" critical to James River's copying allegation, constitutes material prejudice. Hallmark argues compellingly that Mr. Lundy is the only one who can explain the meaning of the term. However, it is not at all clear that Hallmark cannot otherwise establish it did not copy James River's patent. See below, B. Equitable Estoppel, 4. Other Factors. Thus, Hallmark has not carried its burden in showing prejudice from Mr. Lundy's death.

3. Laches Summary

Hallmark has not carried its burden of showing there is no genuine issue of material fact as to its laches defense. James River's delay was not presumptively unreasonable, and James River has raised factual issues as to reasonableness by virtue of its excuses. For its part, Hallmark has not shown a causal relationship between its potential economic losses and James River's conduct. Finally, Hallmark has not adequately demonstrated that there was a loss of material evidence caused by the period of James River's delay in filing suit.

B. Estoppel

[25] [26] To entirely bar a patentee's infringement claim by estoppel, the alleged infringer must establish three elements:

- a. The patentee, through misleading conduct, leads the alleged infringer to reasonably infer that the patentee does not intend to enforce its patent against the alleged infringer.
- b. The alleged infringer relies on the conduct.
- c. Due to its reliance, the alleged infringer will be materially prejudiced if the patentee is allowed to proceed with its claim.

Aukerman, 960 F.2d at 1028.

Finally, the trial court must, even where the three elements of equitable estoppel are established, take into consideration any other evidence and facts respecting the equities of the parties in exercising its discretion and deciding whether to "allow the defense of equitable estoppel to bar the suit."

Id. at 1043. I discuss these elements in turn.

1. Misleading Conduct

[27] [28] The issue here is whether the patentee's conduct reasonably supported an inference that the patentee did not intend to press an infringement claim against the alleged infringer. *Id.* at 1042, 1043. While a plaintiff's silence or inaction may help establish estoppel, "plaintiff's inaction must be combined with other facts respecting the relationship or contacts between the parties to give rise to the necessary inference that the claim against the defendant is abandoned." *Id.* at 1042. In other words, "mere silence must be accompanied by some other factor which indicates that the silence was sufficiently misleading as to amount to bad faith." Hemstreet, 972 F.2d at 1295.

Moreover, silence alone will not create an estoppel unless there was a clear duty to speak.... or somehow the patentee's continued silence reenforces the defendant's inference from the plaintiff's known acquiescence that the defendant will be unmolested. Finally, on summary judgment, such inference must be the " *only* possible inference from the evidence."

Aukerman, 960 F.2d at 1043-44 (emphasis in original) (cite omitted).

There is no dispute as to these relevant facts: (1) James River noted Hallmark's alleged infringement and requested Hallmark cease production and distribution of the accused plates in a letter in March 1989; (2)

James River sent a second letter on April 13, 1989 asking for an immediate reply from Hallmark; (3) Hallmark's General Counsel replied to James River on April 17, 1989 by explaining why Hallmark's paper plates did not infringe and by asking James River for information to the contrary; (4) James River did not respond; (5) James River filed suit on November 29, 1993, more than four years, seven months after receiving Hallmark's letter.

James River incorrectly contends that summary judgment must be denied because there is a factual issue as to whether "James River made a threat of *immediate* enforcement." It is true that the case law supports the proposition that a threat of immediate and vigorous enforcement of patent rights, followed by silence, can support an estoppel defense. *See* ASICS, 974 F.2d at 1309 (citing Brooks Shoe, 912 F.2d at 1464). However, "an enforcement threat followed by silence ... is not the *only* way that silence can be misleading inaction." *ABB Robotics, Inc. v. GMFanuc Robotics Corp.*, 52 F.3d 1062, 1064 (Fed.Cir.), *cert. denied*, 516 U.S. 917, 116 S.Ct. 306, 133 L.Ed.2d 211 (1995). Thus, the focus is properly on all the factors that may bear on what inferences Hallmark could reasonably draw from James River's silence.

The relevant law is illuminated by its application in *ABB Robotics*. In that case, the patentee's "long period of inaction after [the alleged infringer] had denied infringement combined with the "other factors" found by the trial court led [the alleged infringer] to reasonably conclude that [the patentee] did not intend to enforce the ... patent against it." *ABB Robotics*, 52 F.3d at 1064. Those "other factors" included: (1) the patentee's objection to the activities as infringing followed by inaction; (2) the relationship between the patentee and the alleged infringer's parent, which was the patentee's largest single customer in its major line of business; (3) the alleged infringer's knowledge that the patentee was not active in the area of the patent and was therefore not losing sales or profits as a result of the alleged infringement; and (4) other negotiations which took place between patentee and the alleged infringer which led to licensing agreements under other patents. *Id.*

ABB Robotics reinforces the rule that "mere silence [after a notice of infringement] must be accompanied by some other factor which indicates that the silence was sufficiently misleading as to amount to bad faith." *Hemstreet*, 972 F.2d at 1295. Here, Hallmark has only pointed conclusively to the silence.

There is no contention that James River had a major sales relationship with Hallmark. Instead, the facts reveal that James River's sales to Hallmark comprised 0.17% of its total sales in 1991. *Simmons Affidavit*, para. 4. Moreover, these were in areas of James River's business unrelated to the patents in suit. *PX-1010, Nemura dep.* at 31-40. At the very least, there would be considerable dispute as to the significance of this buyer-seller relationship. Nor could Hallmark reasonably infer that James River's inactivity in the decorative paper plate field would minimize any economic harm. On summary judgment, it is Hallmark's burden to show such a conclusion is reasonable, and Hallmark has not carried this burden. It is more plausible to expect some competition between James River's and Hallmark's plates. Finally, there is no evidence of additional contacts between the parties beyond the correspondence already mentioned.

On the other hand, James River has given reasons for its delay that would allow an inference that it did not intend to abandon its patent rights. First, its general patent counsel became ill and died in 1989. Second, by 1990, James River had begun a series of extensive reorganizations. Although Hallmark contends that James River did not inform Hallmark of these events, such an affirmative step is not required. It is enough that Hallmark apparently could have learned of this industry news through public channels of information.

In sum, Hallmark has not established any other factors beyond James River's silence. Thus, it has not established, even by a preponderance, that James River's conduct was so misleading that Hallmark could reasonably infer that James River would not enforce its patent rights.

2. Reliance

[29] [30] [31] [32] "The accused infringer must show that, in fact, it substantially relied on the misleading conduct of the patentee in connection with taking some action. Reliance is not the same as prejudice or harm, although frequently confused." *Aukerman*, 960 F.2d at 1042-43. "To show reliance, the infringer must have had a relationship or communication with the plaintiff which lulls the infringer into a sense of

security...." that leads the infringer into taking some action. *Id.* at 1043. Thus, the trial court should not consider abstract possibilities, but instead look "at the conduct of the parties" to decide whether the parties "had a relationship" "that lulled [the infringer] into a sense of security that it would not be sued." *ABB Robotics*, 52 F.3d at 1064. The alleged infringer must show "that its activities were *in reliance upon* supposed actions of [the patentee], rather than a business judgment of its own—a judgment which subsequent events may well prove to have been faulty." *Hemstreet*, 972 F.2d at 1294-95 (citing *Brooks Shoe*, 912 F.2d at 1463 ("Conclusory averments [of business expansion] are not sufficient to show prejudice.")).

[33] Hallmark asserts that it relied on James River's conduct in taking certain actions. First, Hallmark continued to sell its paper plate lines. Second, Hallmark failed to protect itself by seeking a settlement or declaratory judgment, or by not systematically preserving documentary or testimonial evidence for litigation. James River responds by pointing to the statement of Phyllis Nolan, General Manager of the largest business unit selling the Sturdy II plates, which indicates she apparently had no knowledge of infringement claim. PX-953, Nolan dep. at 133-34. James River infers that Hallmark's actions in producing and selling its allegedly infringing plates were not based on James River's conduct with regard to the patent.

Hallmark has not met its burden on summary judgment in two ways as to this element. First, the evidence does not establish a communication or relationship which could reasonably have given Hallmark a sense of security. This overlaps the discussion above as to misleading conduct. Second, and more importantly, the record does not establish a nexus between James River's conduct and Hallmark's actions. The case law clearly indicates that "reliance" requires a causal connection *between* the sense of security and the action taken in reliance upon it, not just coexistence of the two. There is no indication that Hallmark affirmatively made decisions and took action based on specific inferences from James River's action or inactions. From all appearances, this is a case where Hallmark made "a business judgment of its own—a judgment which subsequent events ... prove[d] to have been faulty". *Hemstreet*, 972 F.2d at 1295.

3. Material Prejudice

[34] This element is the same as in the defense of laches, and requires a change of economic position or loss of evidence. *Aukerman*, 960 F.2d at 1043. As discussed above, Hallmark has not established that there is no genuine dispute of material fact as to this element.

4. Other Factors

[35] [36] "Finally, the trial court must, even where the three elements of equitable estoppel are established, take into consideration any other evidence and facts respecting the equities of the parties in exercising its discretion and deciding whether to allow the defense of equitable estoppel to bar the suit." *Aukerman*, 960 F.2d at 1043. One factor a court may properly consider is conscious copying. *Aukerman*, 960 F.2d at 1033; *see also* *Bott v. Four Star Corp.*, 807 F.2d 1567, 1576 (Fed.Cir.1986) (holding no laches where infringer committed "egregious conduct" of "plagiarizing of the plaintiff's patent"). A party moving for summary judgment on estoppel has the burden of showing that it did not copy the patents at issue. *Aukerman*, 960 F.2d at 1044.

[37] James River's claim that Hallmark copied from James River patents is based on Hallmark's success in making stronger, more rigid plates a few months after James River's '496 patent issued. Hallmark employees allegedly stated that James River's patented technology deserved credit for Hallmark's improved plates. James River's expert witness, Dr. Page, bases this conclusion on the fact that the goal of Hallmark's project was to make a paper plate with functionally equivalence to the Dixie Superware plate. Page Affidavit, para. para. 91-92. More critically, Dr. Page opines that Mr. Robert Ludwig built a "Dixie-type" die based on the teachings in the '496 patent. Page Affidavit, para. 93. This is allegedly because Mr. Ludwig built the die by lowering the 63 degree angle of the sidewall to match the 55 degree angle of the Dixie Superware plate sidewall. *Id.*; PX-187; PX-277. However, my examination of the '496 patent did not reveal any mention of either the sidewall angle nor of the construction of the die; nor has any mention been pointed out. Moreover, the Hallmark plates' sidewall angle is 55 degrees, while the James River plates' sidewall angle is 60 degrees. HF-92; DX-324, 631, 632; PX-95, 277.

While the court is not an expert in interpreting patents, Dr. Page is offered as one. "Under Rule 56(e), an

affiant must be competent to testify and must state specific facts that would be admissible in evidence and are based on the affiant's personal knowledge. Further, if the affiant offers an expert opinion, she must give reasons for the opinion, and not merely state her conclusions." National Diamond Syndicate, Inc. v. United Parcel Service, Inc., 897 F.2d 253, 260 (7th Cir.1990) (cites omitted). Dr. Page has asserted that Hallmark copied the Dixie-type dies from the '496 patent, but the record contains no factual basis for that opinion. Discounting Dr. Page's opinion as to the Dixie-type die, the only evidence of copying is Hallmark's attempt to emulate the Superware plate and its success shortly after the patent issued. This does not overcome Hallmark's evidence that it was unaware of the '496 and '499 patents until after its Sturdy II plates were in production. DX-630, pp. 236-38, 357-58; DX-2013, pp. 18-20; HF-89-91. Hallmark has shown there is no genuine issue of fact that it did not copy the '496 or '499 patents.

5. Estoppel Summary

Hallmark has not demonstrated the absence of a genuine fact issue as to the unreasonableness of James River's conduct, as to Hallmark's reliance on that conduct, or as to prejudice. Thus, Hallmark is not entitled to summary judgment on its estoppel defense. However, Hallmark is entitled to partial summary judgment on the issue that it did not copy from James River's '496 and '499 patents.

IV. NONINFRINGEMENT

A. Factual Overview

James River asserts in its complaint that Hallmark's Sturdy II plates and the processes used in making them infringe four James River patents. Hallmark has asserted that its paper plates do not infringe the patents.

There are four patents at issue in this suit. Patent No. 4,609,140 (" '140 patent") is a product patent directed to a pressed paperboard container, the rim of which has pleats that include three layers of paperboard reformed into substantially integrated fibrous structures generally inseparable into their constituent layers. It contains one independent claim, claim 1. Patent No. 4,721,500 (" '500 patent") is a division of the '140 patent; it is directed to the method of making the container of the '140 patent. It contains one independent claim, claim 1. Patent No. 4,606,496 (" '496 patent") is a product patent directed to a container including the integrated pleats of the '140 patent in both the rim and sidewall of the container. It contains one independent claim, claim 1. Patent No. 4,721,499 (" '499 patent") is a division of the '496 patent directed to the method of making the container of the '496 patent. It contains independent claims 1, 9, and 13.

Hallmark contends that its plates lack seven limitations present in the claims of the James River patents. As seen in Table 1, the independent patent claims at issue contain limitations in common. Although the language of the independent claims's corresponding limitations varies, the parties agree that corresponding limitations should be construed the same way. The parties dispute the interpretation of six of these limitations. Three of these limitations appear in all four of the patents in suit. The other four are present in only a subset of the patents.

TABLE 1
Limitations of Independent Claims at Issue

'140 Patent, Claim 1	'500 Patent, Claim 1	'496 Patent, Claim 1	'499 Patent, Claim 1
at least three layers of paperboard reformed into	at least three layers of fibrous substrate	at least three layers of paperboard reformed into	at least three layers of said paperboard
substantially integrated fibrous structures	substantially integrated fibrous structure in which	substantially integrated fibrous structures being	substantially integrated fibrous structure in which

generally
inseparable into
their constituent
layers

the constituent
layers generally
lack individual
identity

generally
inseparable into
their constituent
layers

the constituent
layers generally
lack individual
identity

having a thickness
generally equal to
circumferentially
adjacent areas

a thickness
approximately
equal to adjacent
areas

having a thickness
generally equal to
circumferentially
adjacent areas

a thickness
substantially equal
to adjacent areas

overturned rim
extending from the
periphery of the
side wall

thickness less
than

thickness ... less
than

thickness less
than

density
substantially
greater than

density
substantially
greater than

density greater
than

substantially
homogeneous
paperboard blank

substantially
homogeneous
paperboard blank

B. Legal Standard

[38] There are two steps in an infringement analysis. The first, claim construction or interpretation, is the determination of the meaning and scope of the patent claims asserted to be infringed. *Markman*, 52 F.3d at 976 (citing *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 821 (Fed.Cir.1992)). Second is the comparison of the properly construed claims to the device accused of infringing. *Id.*

1. Claim Construction

[39] [40] [41] [42] The construction of the meaning of language in patent claims is a matter of law. *Markman*, 52 F.3d at 979. The court may consider three sources to ascertain the meaning of claims: the claims, the specification, and the prosecution history. *Id.* (citing *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1561 (Fed.Cir.1991)). At the same time, a patent claim is not necessarily limited to a preferred embodiment disclosed in the patent. *Transmatic, Inc. v. Gulton Industries, Inc.*, 53 F.3d 1270, 1277 (Fed.Cir.1995) (citing *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 865 (Fed.Cir.1988) ("References to a preferred embodiment, such as those often present in a specification, are not claim limitations."), *cert. denied*, 490 U.S. 1068, 109 S.Ct. 2069, 104 L.Ed.2d 634 (1989)); *Texas Instruments, Inc. v. United States Intern. Trade Com'n*, 805 F.2d 1558, 1563, 231 USPQ 833, 835 (Fed.Cir.1986). The prosecution history should be employed to understand the claim's language but not to "enlarge, diminish, or vary" the limitations in the claims. *Markman*, 52 F.3d at 980 (citing *Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222, 227, 26 L.Ed. 149 (1880); *Intervet America, Inc. v. Kee-Vet Laboratories, Inc.*, 887 F.2d 1050, 1054 (Fed.Cir.1989)).

[43] [44] In addition, the court may consider extrinsic evidence such as "[e]xpert testimony, including

evidence of how those skilled in the art would interpret the claims...." Markman, 52 F.3d at 980 (citing *Fonar Corp. v. Johnson & Johnson*, 821 F.2d 627, 631 (Fed.Cir.1987), *cert. denied*, 484 U.S. 1027, 108 S.Ct. 751, 98 L.Ed.2d 764 (1988)). The court may also receive, in its discretion, other extrinsic evidence that is useful to reveal the state of the prior art at the time of the invention and in order to ascertain the "true meaning of the language employed." *Id.* (citing *Brown v. Piper*, 91 U.S. 37, 41, 23 L.Ed. 200 (1875); *Seymour v. Osborne*, 78 U.S. (11 Wall.) 516, 546, 20 L.Ed. 33 (1871)). Whether to receive extrinsic evidence is left to the court's discretion. *Id.* at 980-81. When used, it "is to be used for the court's understanding of the patent, not for the purpose of varying or contradicting the terms of the claims." *Id.* at 981 (citing *U.S. Industrial Chemicals v. Carbide & Carbon Chemicals Corp.*, 315 U.S. 668, 678, 62 S.Ct. 839, 844, 86 L.Ed. 1105 (1942)).

2. Infringement

[45] "To establish infringement of a patent, every limitation set forth in a claim must be found in an accused product or process exactly or by a substantial equivalent." *Becton Dickinson and Co. v. C.R. Bard, Inc.*, 922 F.2d 792, 796 (Fed.Cir.1990).

a. Literal Infringement

[46] [47] "Literal infringement is found when every limitation of a claim is met in the accused structure." *Pall Corp. v. Micron Separations Inc.*, 66 F.3d 1211, 1217 (Fed.Cir.1995). "Literal infringement exists if each of the limitations of the asserted claim(s) read[s] on, that is, ... [is] found in, the accused device." *Baxter Healthcare Corp. v. Spectramed, Inc.*, 49 F.3d 1575, 1583 (Fed.Cir.), *cert. denied*, 516 U.S. 906, 116 S.Ct. 272, 133 L.Ed.2d 194 (1995). In other words, "[i]f an express claim limitation is absent from the accused product, there can be no literal infringement as a matter of law." *Wolverine World Wide, Inc. v. Nike, Inc.*, 38 F.3d 1192, 1199 (Fed.Cir.1994). "For literal infringement, each limitation of the claim must be met by the accused device exactly, any deviation from the claim precluding a finding of infringement." *Lantech, Inc. v. Keip Machine Co.*, 32 F.3d 542, 547 (Fed.Cir.1994).

b. Doctrine of Equivalents

[48] [49] [50] [51] [52] "[A] finding of infringement under the doctrine of equivalents requires proof of insubstantial differences between the claimed and accused products or processes." *Hilton Davis Chemical Co. v. Warner-Jenkinson Co., Inc.*, 62 F.3d 1512, (Fed.Cir.1995) (en banc); see also *Pall Corp.*, 66 F.3d at 1218. One way this may be shown is the function-way-result test, which asks whether the accused product "performs substantially the same function in substantially the same way to obtain the same result." *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 608, 70 S.Ct. 854, 856, 94 L.Ed. 1097 (1950). "[E]vidence beyond function, way, and result is also relevant to the doctrine of equivalents." *Hilton Davis*, 62 F.3d at 1518. Factors such as evidence of copying or of designing around may be important in determining whether there is infringement under the doctrine of equivalents. *Id.* at 1522. To find infringement under the doctrine of equivalents, each limitation of the claim must be met by the accused product either literally or by an equivalent. *See, e.g.*, *Genentech, Inc. v. Wellcome Foundation Ltd.*, 29 F.3d 1555, 1565 n. 28 (Fed.Cir.1994); *Hoganas AB v. Dresser Industries, Inc.*, 9 F.3d 948, 953 (Fed.Cir.1993); *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 821-22 (Fed.Cir.1992). The trial judge determines whether evidence is relevant to showing infringement under the doctrine of equivalents. *Hilton Davis*, 62 F.3d at 1522. The question of infringement under the doctrine of equivalents, i.e. whether the accused product is substantially the same as the claimed invention, is a question of fact. *Id.* at 1522; *Pall Corp.*, 66 F.3d at 1218.

[53] [54] One limitation on the doctrine of equivalents is prosecution history estoppel, which "precludes a patentee from obtaining in an infringement suit patent protection for subject matter which it relinquished during prosecution in order to obtain allowance of the claims." *Mark I Marketing Corp. v. R.R. Donnelley & Sons Co.*, 66 F.3d 285, 291 (Fed.Cir.1995). This objective test asks whether a competitor would reasonably conclude from the prosecution history as a whole that particular subject matter was relinquished. *Id.* "The application of prosecution history estoppel is a question of law." *Id.*

[55] [56] [57] [58] [59] A second limitation on the doctrine of equivalents is that "the prior art restricts the

scope of equivalency that the party alleging infringement under the doctrine of equivalents can assert." *Conroy v. Reebok Intern., Ltd.*, 14 F.3d 1570, 1576 (Fed.Cir.1994); *see also* *International Visual Corp. v. Crown Metal Mfg. Co., Inc.*, 991 F.2d 768, 772 (Fed.Cir.1993). One way of getting at this issue is the hypothetical patent claim, which is a conceptual method of determining the prior art's limitation on the scope of equivalents. *Wilson Sporting Goods Co. v. David Geoffrey & Associates*, 904 F.2d 677, 684 (Fed.Cir.), *cert. denied*, 498 U.S. 992, 111 S.Ct. 537, 112 L.Ed.2d 547 (1990). The question is whether a "hypothetical patent claim, sufficient in scope to literally cover the accused product" "could have been allowed by the PTO over the prior art." *Id.* "If not, then it would be improper to permit the patentee to obtain that coverage in an infringement suit under the doctrine of equivalents. If the hypothetical claim could have been allowed, then *prior art* is not a bar to infringement under the doctrine of equivalents." *Id.* The patentee has the burden of proving that the range of equivalents it seeks would not encroach upon the prior art. *Id.* at 685. While a court may permissibly use a method other than hypothetical claim analysis, it "also must apply standards of patentability consistent with our jurisprudence regarding anticipation and obviousness." *Conroy*, 14 F.3d at 1577.

C. Claim Construction and Infringement Analysis

1. "At Least Three Layers Reformed Into"

a. Construction

[60] This claim limitation is present in all four patents at issue. While the patents' wording varies slightly, the parties agree that this limitation should be construed the same in all four claims. The parties dispute the meaning of this limitation.

Hallmark contends that this limitation incorporates the limitation that the paperboard is folded and turned back upon itself to form three thicknesses of paperboard laid one over the other. It bases this argument on the prosecution history. In that history, James River changed the phrase "folded areas in which the paperboard has been turned over and sealed on itself" (PX-9) to "densified region ... including fiber from at least three thicknesses of said blank" (PX-8, Preliminary Amendment) and then to folds or pleats "including at least three layers of paperboard." (PX-8, Amendment at 2).

James River contends that the limitation refers to the three layers that are necessary to form any pleat. It argues that Hallmark's error is in construing the claim limitation to refer to the pleats as containing three layers after formation, not to the origin of the pleats as being formed from three layers before being pressed.

It is not the densified regions, but the pleats from which they are formed, that contain at least three layers of paperboard. This is clear from the language of the claims. The '496 claim reads: "densified regions being formed *from* pleats including at least three layers of said paperboard reformed...." PX-003 at 11, lines 17-19 (emphasis added). The '140 claim speaks of: "a plurality of circumferentially-spaced densified regions radially extending through annular portions of said rim, said densified regions *including at least three layers of paperboard reformed* into substantially integrated fibrous structures...." PX-001 at 14, lines 12-14. The '500 claim describes a process in which: "during said shaping step, forming a plurality of radially-extending, circumferentially-spaced pleats in said rim, *each said pleat including at least three layers* of fibrous substrate...." and "applying heat and pressure to said rim sufficient to ... *transform each said pleat* into a substantially integrated fibrous structure." PX-002 at 13, lines 62-68, at 14, line 1. Finally, the '499 claim refers to "pressing said blank to form said container including *pleats of at least three layers* of said paperboard" and "applying sufficient heat and pressure ... to *reform each said pleat* into a substantially integrated fibrous structure...." PX-004 at 11, lines 6-16. Each patent claim is clear from its own language, given its ordinary meaning, and together, they reinforce each other. Pleats are formed in the shaping step, and the application of heat and pressure alters the pleats to form the densified regions. In understanding how this limitation fits into the claims as a whole, it is clear that the three layers retain separate identity only in the pleat before reformation; the densified regions cannot have three layers after reformation if the layers no longer have separate identities. Thus, it is the pleats, before reformation by heat and pressure, not the densified regions, that must contain at least three layers of paperboard.

b. Literal Infringement

[61] In determining whether the accused products read on this limitation, the issue is whether the Hallmark plates are formed in a process in which pleats are first formed from at least three layers of paperboard. Hallmark contends that the densified regions in the rim of the accused plates does not contain three layers of paperboard. It relies on photomicrographs of *completed* plates, not of *partially formed* plates which would contain the structures that precede the densified regions. By contrast, James River's expert Dr. Page stated that, based upon his observation of micrographs of partially pressed pleats in Hallmark's plates, those pleats contain three layers of paperboard. Page Aff. para. 39; e.g. PX-597-MICRO-RIMPLEAT. For this reason, Hallmark has not demonstrated there is no material fact issue as to whether this claim limitation reads on Hallmark's plates.

2. "Substantially Integrated Fibrous Structures Generally Inseparable Into Their Constituent Layers"

a. Construction

[62] The parties strongly dispute this key claim limitation. Though the wording among the four patents varies as to this limitation, the parties agree that they should be similarly construed.

James River's position is that this limitation must focus on the elimination of voids or disruptions between the layers of the pleat after compression. According to this view, the substantially integrated fibrous structures are compressed pleats in which tightly compacted fibers are compressed and bonded together substantially without voids or disruptions therein. PX-9, Amendment and Response, 12/16/83, at 4. Moreover, James River argues that Hallmark's error is in importing the description of the preferred embodiment of the invention into the construction of the claim. This would require the elimination of virtually all voids and disruptions so as to obliterate the distinctions between the layers.

Hallmark's position is that this limitation means that "almost all, if not all, of the fibers of the three thicknesses of paperboard that form the pleat, have been broken down and reformed from their original structure to a homogeneous new structure such as those shown in Figures 9 and 10 of the patent." In addition, "[a]ny voids or disruptions in the rim area are compressed out and new bonds are formed between the tightly compacted fibers." Furthermore, "[o]nce the required three layers of paperboard are reformed, they are inseparable back into the three layers of paperboard" so that the "identity of the three layers of paperboard used to make the pleats must have been eliminated or obliterated." Hallmark bases its position on the changes the applicants made in their claim during the course of the prosecution while narrowing the claims to overcome the PTO's prior art rejections.

In view of the claim language and the prosecution history, the meaning of the claim limitation is clear. As observable in specifications' photomicrographs, the layers must be compressed so as to substantially eliminate the voids and gaps that are present in prior art plates. The specification and the prosecution history teach the proper comparisons to use in determining whether the voids and disruptions have been adequately reduced. The two proper comparisons are between the prior art plates' pleats and those in the invention's plates, and between the center and the pleats of the invention plates. FN1 '140 patent at 11-12, lines 31-43; PX-9 at 62-63, Amendment and Response of December 16, 1983 at 3. A small portion of the densified regions may not be entirely reformed in this way, but the substantial portion of the pleat has been reformed. PX-6 at 71.

FN1. It is also true that the specification and the prosecution history teach that the density of the compressed pleats is higher than that of the bottom of the plates as shown in Fig. 8 of the '140 patent. However, density is not a part of this claim limitation. Moreover, while the existence of gaps and voids would affect a region's density, it might be counteracted by the existence of areas of extremely compacted fibers. Thus, density is considered only as a part of claim limitation 6, below.

However, the layers cannot be simply compressed; they must be reformed, as shown by the loss of individual identity. This loss of the layers' individual identity occurs because the former layers are bonded

together at the fiber level. Thus, the loss of layer identity is manifested by the pleats being "generally inseparable into their constituent layers." This key aspect was added just before the allowance of claims in both the '140 and '496 patents. PX-7, Preliminary Amendment at 1; PX-6, Amendment at 10-11. The prior art's pleat structures constituted "areas of weakness because of the ease with which they could separate into their constituent layers permitting the container to flatten to its previous planar state." PX-6, Amendment at 10. Moreover, the phrase "in which the constituent layers generally lack individual identity" was added to the '499 and '500 claims just before their allowance. PX-10 at 72-74; PX-11 at 65-66. This is consistent with the applicant's remark in the prosecution history of the '496 patent that the "fibrous structures of the densified regions no longer retain the individual identity of the layers which constitute the structures." Thus, if force is applied to the pleats, the pleats should not unfold. If they unfold, the pleats would by definition be composed of layers that retain an aspect of their individual identity.

The plain language of the claim is not inconsistent with the definition suggested by the prosecution history. Loss of individual identity at the level of individual layers and fibers is manifested as a tendency not to separate into constituent layers. For this reason, methods other than photomicrographs may be useful in determining whether the densified regions are generally inseparable into constituent layers.

[63] As to the meaning of "substantially integrated," Hallmark contends that "[t]he term 'substantially' is an imprecise word of degree that renders the claim invalid under 35 U.S.C. s. 112 (indefinite) unless the specification provides some standard for specifically defining that term." *Seattle Box Co. v. Indus. Crating & Packing, Inc.*, 731 F.2d 818, 826 (Fed.Cir.1984). An imprecise claim limitation does not impart invalidity to the claims but rather must be considered in determining infringement. *Andrew Corp. v. Gabriel Electronics, Inc.*, 847 F.2d 819, 822 (Fed.Cir.1988) (citing *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 842 F.2d 1275, 1280 (Fed.Cir.), *cert. denied*, 488 U.S. 927, 109 S.Ct. 312, 102 L.Ed.2d 330 (1988)). The test is that "[i]f the claims, read in the light of the specification, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, the courts can demand no more." *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 624 (Fed.Cir.) (cites omitted), *cert. dismissed*, 474 U.S. 976, 106 S.Ct. 340, 88 L.Ed.2d 326 (1985).

The fact that the specification teaches the comparison of prior art and invention photomicrographs of the rim pleats gives sufficient definition to the term "substantially." One skilled in the art could recognize the difference between prior art pleats and the invention plate's pleats. It is permissible for there to be a range between the prior art and the preferred embodiment that is still included in the claim. In this context, "substantially" allows for something short of absolute elimination of gaps and voids. It does require that comparison of photomicrographs reveal to one skilled in the art that the gaps and voids are distinctly reduced as compared to the prior art.

b. Literal Infringement

[64] Literal infringement of this claim limitation requires that the Hallmark Sturdy II plates have a substantial reduction in voids and disruptions as compared to the prior art and the plate bottom. Hallmark suggests that stained sections of its plates' densified regions reveal wide gaps and voids between their gathers and crimps, with large visible disruptions of the pleat surface. Hallmark Brief at 15; DX-2025 B1-B4. Such gaps and voids in the fiber structure of the pleats are also visible in electron micrographs prepared by James River's experts. DX-2024, Tab 5.

However, the claim limitation requires a *comparison* to prior art plates or the plate bottom. FN2 James River relies on Dr. Page's affidavit, in which he compares "micrographs of a series of pleats that were formed at varying pressures" to "micrographs of pleats from the accused plates." Page Aff. para. 44. The micrographs in the series are not adequately identified or labeled to allow me to determine whether Dr. Page's conclusions have an adequate factual basis. While my role does not include assessing Dr. Page's credibility, his opinion must be more than conclusory. It must be supported by reasoning. *National Diamond Syndicate*, 897 F.2d at 260. However, James River also relies on a comparison of the prior art rim pleats (Fig. 6, '140 patent) to the rims or wrinkles in the Hallmark plates. (PX-226-MICRO-RIMPLEAT-1). Based on this comparison, there is at least a dispute as to whether the Hallmark rim pleats have substantially fewer gaps and voids than do the prior art rim pleats. While there do appear to be gaps and voids in the Hallmark

plates' rims, this is allowable under the limitation's proper construction.

FN2. James River counters this by comparing the rim pleats or wrinkles of Sturdy II plates to the rim regions adjacent to the pleats. This is not the correct comparison.

An additional requirement for this limitation to be present in the Hallmark plates is that their densified rim pleats must be inseparable into their constituent layers. FN3 Hallmark, to support its contention that Sturdy II rim pleats are separable, relies on videotapes of tensile testing experiments and the affidavit of Mr. Alexander. In the videotapes, Hallmark plate rim pleats appear to unfold into constituent layers before the plate tears. DX-2026. This is confirmed by Mr. Alexander. Alexander Aff. para. 14. Mr. Alexander also states that the wrinkles can be pulled apart by hand and thereby flatten out into a blank state. The force applied in pulling apart the pleats by hand is comparable to the force exerted in the normal use of the plates. Thus, this indicates that Sturdy II plates have wrinkles that are separable into their constituent layers. Hallmark has thus met its initial burden of pointing to facts that, when uncontradicted, indicate James River cannot prove this element of its case. Celotex, 477 U.S. at 325, 106 S.Ct. at 2553.

FN3. Hallmark initially argues that the Sturdy II plates's densified regions have not lost the identity of the blank layers. In plates made from laminated paperboard, there is no homogenous mixing of the constituent layers and no indication that fibers from layers have reformed into a new structure that mixes fibers from the different constituent layers. DX-2025 B1. However, this is not the issue. Based on this evidence, Hallmark plates could still show a substantial reduction in voids and gaps and have pleats generally inseparable into constituent layers. The distinct appearance of the layers in the photomicrographs does mean these layers could not be interbonding in a way undetected in the photomicrographs.

James River rebuts with the affidavit of Dr. Page. Dr. Page states that the results of tensile-strength test are consistent with the conclusion that Sturdy II plates are substantially integrated. Specifically, he states that the tensile strength tests in PX-502 demonstrate that the pleats in the Sturdy II plates require substantially more force to be displaced or pulled apart than do pleats in comparable conventional plates. Page affidavit para. 45. This is not the issue. The claim limitation requires that the pleats' layers be generally inseparable into their constituent layers. That it takes a greater degree of force do so does not alter the fact that the layers retain a separate identity. For this reason, James River has provided no evidence that establishes a genuine issue of fact whether Hallmark's pleats are generally inseparable into their constituent layers. Accordingly, the Sturdy II plates do not literally infringe this claim limitation.

c. Doctrine of Equivalents

[65] There are several preliminary matters to be addressed here. The first is that Hallmark contends that James River is estopped from claiming infringement under the doctrine of equivalents. This is because James River allegedly did not serve a complete answer to Hallmark's Interrogatory No. 9, which requested a statement of James River's infringement contention. HF-100. Because James River only stated generally that it was alleging equivalent infringement and did not state its complete intentions until May 5, 1995, Hallmark seeks to bar James River from contending infringement under the doctrine of equivalents. Fed.R.Civ.P. 37.

A motion for sanctions under Rule 37 requires "a certification that the movant has in good faith conferred or attempted to confer with the party failing to answer or respond in an effort to obtain such answer or response without court action." Rule 37(d). James River indicated in September 1, 1994 that it contended that the Hallmark plates infringed equivalently. Hallmark has not certified that it attempted to clarify this response, and its motion is therefore deficient.

In addition, the substance of James River's doctrine of equivalents claim was set out in the 1994 amended response. *See, e.g.*, DX-2038 at 47, 52, 54, 58-59. Dr. Page also testified on this issue at his deposition. PX-1020, Page dep. at 157; PX-1021 at 347-48; PX-1020 at 162-63. In light of these facts, Hallmark's position is without merit.

The second preliminary matter is that of the "additional authority" supplied by James River and challenged by Hallmark. This issue arises from Hallmark's argument in its reply brief that "James River failed to meet its burden of proving that Hallmark Sturdy II plates are not part of the prior art and are not obvious variations of the prior art." Hallmark made mention of hypothetical claim analysis in its initial brief. Brief in Support of Hallmark's Motion for Summary Judgment of Noninfringement. 16, 19. James River did not address this issue in its response, and it cannot do so now. Thus, Hallmark's motion to strike James River's statement of additional authority on the claim of non-infringement will be granted.

[66] Although it is true that the patentee bears the ultimate burden of proving infringement, this is a summary judgment motion by the defendant. Where the plaintiff bears the ultimate burden of proof, a defendant may satisfy its initial burden on summary judgment by pointing to a plaintiff's failure to introduce sufficient evidence to support each essential element of the cause of action alleged. *See Anderson*, 477 U.S. 242, 256, 106 S.Ct. 2505, 2514, 91 L.Ed.2d 202 (1986); *Celotex*, 477 U.S. at 323-24, 106 S.Ct. at 2552-53. Once the movant carries its initial burden, the burden shifts to the non-moving party, who must "go beyond the pleadings" and designate specific facts to support each element of its cause of action, showing that there is a genuine issue for trial. *Celotex*, 477 U.S. at 322-23, 106 S.Ct. at 2552; *Becker v. Tenenbaum-Hill Associates, Inc.*, 914 F.2d 107, 110 (7th Cir.1990).

[67] The only real argument here that the Hallmark plates infringe equivalently must be based on *Graver Tank's* function-way-result test. James River has advanced no tenable argument that Hallmark copied, nor has Hallmark introduced evidence of designing around.

The evidence in the record is sufficient to create a factual issue as to infringement of this claim limitation under the doctrine of equivalents. A reasonable trier of fact could find that the separability of the layers is sufficiently reduced in the pleats of Hallmark plates so as to be equivalent to the claim limitation. As stated above, part of the proper construction of the limitation is that the pleats must not separate into their constituent layers because they have lost individual identity. However, a less than perfect use of the invention could fail to obliterate the identities of the pleats' individual layers and still result in pleats that are significantly less likely to separate into constituent layers than prior art pleats. "[I]nfringement is not escaped by proof that the accused product is less satisfactory under extreme circumstances not met in normal use." *Laitram Corp. v. Cambridge Wire Cloth Co.*, 863 F.2d 855, 859 n. 10 (Fed.Cir.1988), *cert. denied*, 490 U.S. 1068, 109 S.Ct. 2069, 104 L.Ed.2d 634 (1989); *see also Wahpeton Canvas Co., Inc. v. Frontier, Inc.*, 870 F.2d 1546, 1548 n. 2 (Fed.Cir.1989) ("inferior infringement is still infringement"). As Dr. Page noted, "[t]he tensile-strength tests (PX502) show that the pleats in the Sturdy II plates require substantially more force to be displaced or pulled apart under controlled and measurable conditions than do the pleats in conventional plates...." Page Aff. para. 45. Neither party has made clear whether the tensions at which Hallmark pleats separate are equivalent to normal or extreme use conditions. Thus, based on this record, there remains a disputed fact issue as to whether there is infringement of this claim limitation under the doctrine of equivalents.

[68] Hallmark has also failed to demonstrate that James River cannot show this scope of equivalency is prohibited either by prosecution history estoppel or by the prior art. In the prosecution history, there are numerous comments suggesting that the invention does not entirely eliminate the tendency to separate. For example, there are references to regions on the coated side of the pleat where traces of the individual layers remained. Moreover, the use of qualifiers throughout the prosecution history, such as "virtually" and "substantially" suggests that the significance of the invention was not to absolutely eliminate all vestiges of individual layer identity but to form a structure that would preclude separation, presumably under normal, not extraordinary use; the most significant qualifier, of course, is in the claim limitation itself, i.e. the pleats are "generally inseparable into their constituent layers." Thus, a competitor reasonably should have known it could not use the invention to make pleats that would separate only at tensions significantly higher than those at which prior art pleats would separate.

[69] Hallmark has also not borne its burden of proof as to prior art restrictions on the scope of equivalency. In its brief, Hallmark asserts "James River has not made any contention or explanation of how its expanded scope of Claim 1 is patentable over the prior art plates including the Hallmark Countryside plates, James River's plates sold prior to April 1981, and the pre-1981 plates identified by a witness from Peerless." The

discussion above indicates that the expanded scope depends on pleat separation occurring only at tensions significantly higher than those at which prior art pleats would separate. Such a showing is evidenced in Dr. Page's conclusions, and would suffice to make the expanded scope patentable under the prior art. Page Aff. para. 45. Moreover, it is not useful for Hallmark to name several prior art plates without advancing any reason to believe they would have precluded a patent of the scope that James River seeks as an equivalent.

The record is not a model of clarity on this issue. However, the court recognizes that arguing for or against summary judgment on this issue requires both predictions of how the claims will be construed, as well as what expanded scope of equivalency might be contemplated. Additionally, there are underlying evidentiary issues, such as whether the Hallmark pleats separate more like invention plates or prior art plates, that make any determination of this legal issue problematic on the record before the court. Drawing every favorable inference for the non-moving party, I cannot conclude as a matter of law that James River cannot show that the prior art does not preclude a scope of equivalency that covers the Hallmark plates.

For these reasons, Hallmark has not carried its burden of proof as to the issue of non-infringement of this claim element.

3. "A Thickness Generally Equal to Circumferentially Adjacent Areas"

a. Construction

[70] Hallmark contends that this limitation should be interpreted to mean that "the thickness of the pleat and the thickness of the adjacent areas of the rim are such that a smooth and unbroken surface is provided. All evidence of the folds or pleats particularly on surfaces without an overcoat should have disappeared." Hallmark argues this construction is required by the need to turn to the specification to define the term "generally."

[71] The proper test in construing a potentially vague limitation is that "[i]f the claims, read in the light of the specification, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, the courts can demand no more." *Shatterproof Glass Corp. v. Libbey-Owens Ford Co.*, 758 F.2d 613, 624 (Fed.Cir.) (cites omitted), *cert. dismissed*, 474 U.S. 976, 106 S.Ct. 340, 88 L.Ed.2d 326 (1985). As James River argues, the specifications provide both quantitative and qualitative measures to define the phrase "generally equal." These comparisons use physical measurements and photomicrographs of plate cross sections.

The quantitative comparisons examine the thickness of the rim pleats and the thickness of the bottom wall. The '140 patent's Figure 6 shows a cross section of a non-integrated fold, and the specification states the thickness is 0.026 inches. Figure 9 shows a cross section of an integrated fold, and the thickness is 0.017 inches. As the paperboard blank is 0.016 inches, the specification reveals that the invention's fold is 6.25% thicker than the bottom wall, while the prior art fold is 62.5% thicker than the bottom wall. Thus, the specification teaches a quantitative comparison of the thickness of the folds compared to either the blank or the center of the plate. FN4

FN4. There is an assumption that the thickness of the bottom wall is equal to that of the blank. As the bottom wall is not subjected to pressure, and as both measure 0.016", this assumption appears to be valid. Moreover, any error likely to be introduced by this assumption will only work against James River. If the bottom wall is compressed in an accused plate, there will likely be greater variation between the thicknesses of the rim pleats and the bottom wall, thus potentially allowing the accused plate to escape infringement.

The problem with the quantitative comparison taught by the specification is that it does not match the claim limitation. The specification contains no clear measurements of rim areas circumferentially adjacent to the pleats. The only measurements given are the pleat thickness, the blank thickness, and the bottom wall thickness. Moreover, the non-pleat rim areas are subjected to pressure and compressed, so one cannot assume they are equal to the blank areas in thickness.

There is no reason why the rim pleats and the adjacent areas cannot be quantitatively compared. They

simply were not in the specification. As the claim language is clear, there is no need to import an additional comparison from the specification. *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1433 (Fed.Cir.), *cert. denied*, 488 U.S. 986, 109 S.Ct. 542, 102 L.Ed.2d 572 (1988). However, the specification does indicate the usefulness of being able to quantitatively compare the rim pleats. The only question is: how much variation is allowable between the pleats and circumferentially adjacent areas? In the '140 specification, the preferred embodiment had a 6.25% variation between the pleat and the bottom wall, while the prior art had a 62.5% variation. PX-001 at 11-12; James River Response Brief in Opposition at 17. Thus, making allowance for the compression of the circumferentially adjacent areas, a 25% variation between the pleats and the adjacent areas will be considered generally equal. This will still represent a substantial improvement over the prior art.

In addition, the specification teaches a qualitative comparison of rim smoothness, which will ensure James River's invention is limited to its claim. The '140 specification teaches a comparison between the paperboard surfaces of the prior art and the invention's preferred embodiment. As the specification states, the invention plate shown in Fig. 9 has an "essentially smooth and continuous" surface at both the top and bottom of the pleat, while the prior art plate in Fig. 6 has "discontinuity of surfaces." PX-1, Co. 12, lines 57-65. Admittedly, once again, the claim language refers to the equality between rim pleats and adjacent areas, while the specification compares the rim pleats to the prior art plates, instead of the invention's adjacent areas. Here, however, the smoothness of the rim pleats extends into the beginning of the adjacent areas, so that the entire rim area is smooth.

These comparisons allow a claim interpretation in accord with the limitation's natural language. The physical measurements verify that thicknesses along the rim are similar, and the qualitative comparisons verify that the pleat surfaces are smooth and that there is a smooth transition to the adjacent areas. Both of these comparisons must indicate that the claim limitation reads on the accused plates to show infringement.

b. Literal Infringement

[72] The quantitative comparison indicates that there is a genuine fact issue as to whether this claim limitation reads on Hallmark's accused plates. James River's measurements show that the pleat thickness exceeds the circumferentially adjacent areas by no more than 23.7%, which falls within the claim limitation. DX-2022, col. I. Hallmark's data shows a variation of 13.0-31.4%, with only one sample exceeding 25%. DX-2022, col. I. This data indicates there is at minimum a dispute as to whether this limitation reads on Hallmark's plates.

There is also a factual dispute as to whether the qualitative comparison reveals that this claim limitation reads on Hallmark's plates. Dr. Page, based on a comparison of micrographs taken of pleats and adjacent areas, suggests that the thickness of the rim pleats is equivalent to that of the adjacent areas. Page Aff. para. 57-58; PX-201-MICRO-RIMPLEAT1; PX-216-MICRO-RIMPLEAT. Thus, there remains a factual issue as to whether this claim limitation reads on Hallmark's plates.

4. "Overturned Rim Extending From the Periphery of the Side Wall"

a. Construction

[73] This limitation is present only in the '500 patent. The construction favored by Hallmark is "a rim which is curved from the periphery of the sidewall and which has an edge portion extending downward for a length sufficient to contain compressed pleats and provides increased rigidity to the claimed container." This is based on a modification made during prosecution, in which the PTO required amendment from an "outwardly extending rim" to an "overturned rim extending from the periphery of the sidewall." PX-11, pp. 71, 73-74. Moreover, the specification describes the "overturned rim" as being "found to particularly enhance the rigidity of the container structure." DX-2, col. 3, lines 12-14. In addition, the specification refers to the rim having "a downturned edge portion, compressed and densified" and the rim being seen to "curve over and down about a smaller radius to form the overturned rim." DX-2, col. 3, lines 12-12; DX-2, col. 4, lines 64-68.

James River favors the meaning of "a rim that is a termination and outward extension of the sidewall and

that serves to add geometric stability to the plate and to provide an area for grasping the plate."

Any uncertainty about the natural meaning of "overturned rim" is eliminated by the specification. The rim of the invention clearly must turn over, i.e. curve downward. Moreover, the specification indicates the rim must curve about a smaller radius. One can easily imagine a rim that would remain flat and not curve down, or angle upward at a shallower angle than the side wall. These would not be overturned rims. Moreover, the specification clearly indicates that the overturned rim's downturned edge portion must be compressed and densified so as to add strength and rigidity.

b. Literal Infringement

[74] Hallmark has not demonstrated that there is no genuine issue of material fact as to the infringement of this claim limitation. It states in its proposed findings of fact that its plates's rims are "outwardly and upwardly extending with a slight downward turned edge." HF-129; DX-2029, para. 19. Thus, it does curve downward. There is no evidence, as opposed to a conclusion, that it does not curve about a smaller radius. Mr. Alexander states that the downward turned edge is not long enough to significantly increase the rigidity of the plate and that the wrinkles in the downturned edge are not sufficiently pressed to add significant rigidity. *Id.* It is clear Mr. Alexander looked at the Hallmark plates. However, he has given no other basis for his conclusions, and there is an insufficient reasoning underlying his conclusions. *National Diamond Syndicate*, 897 F.2d at 260. Thus, Hallmark has not shown there is an absence of a genuine issue of fact as to this claim limitation.

5. "Thickness Less Than"

a. Construction

[75] The parties do not dispute that this limitation should be given its ordinary meaning. The '500 patent's claim 1 requires that the thickness of the rim be less than that of the paperboard blank. PX-002 at 13, lines 66-68. The '496 patent's claim 1 requires the thickness of the sidewall, second curved portion and rim to be less than that of the bottom wall and first curved portion. PX-003 at 11, lines 21-23. Finally, claim 1 of the '499 patent requires the thickness of the sidewall, second curved portion and rim to be less than that of the blank, while claims 9 and 13 require only that the thickness of the sidewall and rim to be less than that of the blank. PX-004 at 12, lines 11-13, 40-43.

The parties differ as to whether the compressed pleats and sidewalls must have a thickness less than the blank, bottom, or first curved portion. Hallmark presents valid arguments, based upon the preferred embodiments described in the specifications, that the entire rim, including the pleats, must be thinner than the paperboard blank. However, the specification clearly gives measurements showing the pleats in the preferred embodiment are thicker than the blank, i.e. 0.17 compared to 0.16. *See, e.g.*, PX-002 at 11, lines 48-50, at 12, lines 28-29, 45-47. Thus, the pleats cannot be thinner than the blank. For this reason, the claim limitation must refer to the areas of the rim adjacent to the pleat, not the pleats themselves, being thinner than the paperboard blank or plate bottom. Moreover, this interpretation is consistent with the fact that the rim is compressed while the bottom is not.

b. Literal Infringement

[76] Hallmark has not shown there is no genuine fact issue as to this claim limitation. It does not point to evidence that demonstrates the rim areas circumferentially adjacent to the pleats in Hallmark plates are not less thick than the blank or plate bottom. Instead, it has pointed only to measurements of the rim pleats. As discussed above, the claim limitation refers to the circumferentially adjacent areas, not the rim pleats.

6. "Density Substantially Greater Than"

a. Construction

[77] This limitation must be construed according to its ordinary meaning. Hallmark contends that because the '496 patent claim requires the compression of three layers of paperboard into a thickness less than the

bottom wall, the density must be three times as great in the densified regions. This argument is based on an unstated and unfounded assumption about pleat structure: that the three layers in the unpressed pleat have no gaps or spaces between them. This assumption is probably false in the absence of any evidence that the layers are packed together as closely as possible.

By contrast, James River cites the '500 patent's specification, which states that "since the folded-over areas [pleats] contain substantially more solid fibrous material than the rest of the paperboard; perhaps 40 to 100% more, the density of the folded areas is substantially greater than the remainder of the paperboard." PX-1, col. 12, lines 51-56. Photomicrographs of the pleats show that these regions are substantially free of voids or disruptions. PX-1, col. 5, I. 67. Thus, the author has acted as his own lexicographer and provided a definition of this limitation. The density of the pleats must be 40 to 100% greater than the rest of the paperboard.

b. Literal Infringement

[78] Hallmark has not demonstrated there is no genuine issue of fact as to this claim limitation. It argues that the density of the Hallmark pleats is "not substantially greater than the adjacent areas of the rims." However, Hallmark does not point to measurements demonstrating that its plates' pleats' density is less than 40 to 100% greater than the paperboard's density. By contrast, James River points to density measurements revealing that Hallmark plates have rim pleat densities of between 40 and 100%. PX-509. For this reason, there is a fact issue as to whether this limitation reads on Hallmark's plates.

7. "Substantially Homogenous Paperboard Blank"

a. Construction

[79] Hallmark's position is that the limitation means "a paperboard blank that has a uniform composition throughout (i.e. no constituent layers) except for a possible clay coating on one side." It relies on the '499 specification's use of the term "substantially homogenous" in reference to the reformed pleats' fibrous structures. PX-10, Amendment, August 5, 1987, at 6. However, this refers not to the makeup of the paperboard blank, but to the reformation of the pleat layers into a "substantially homogenous fibrous structure."

James River's position is that the limitation means "a blank that has not had additional layers of paperboard or other non-uniformly dispersed reinforcing material added to its periphery for purpose of increasing the strength of the resulting plate." To support this position, it refers to the '496 specification, which states that "the blank is a unitary, flat piece of paperboard stock conventionally produced by a wet laid papermaking process...." PX-3, col. 5, lines 56-58. Both the specification and Dr. Page's affidavit indicate the paperboard has a basis weight of 100-400 pounds per ream. PX-003 at 5, lines 60-66; Page Aff. para. 11. In addition, the thickness should be about 0.008 inch to 0.050 inch. PX-003 at 5, lines 62-63. More importantly, the specification states what would make the blank non-homogenous. In distinguishing the prior art, the specification discloses that earlier processes strengthened the plate by adding layers of paperboard around the blank's edge. PX-3, at 2, lines 30-31.

Finally, James River contends that the specification makes clear that cosmetic layers may be present in the blank. These are added for reasons other than adding strength. Specifically, the specification provides that liquid proof coating or ink may be added. PX-3, col. 6, lines 13-24. Hallmark contends that the laminated paperboard's additional layers are not entirely cosmetic, but that they add strength.

The specification reveals that the meaning of the claim limitation: in addition to having the basis weight and thickness outlined in the specification, the blank must have not had additional layers of paperboard or other non-uniformly dispersed reinforcing material added to its periphery for the purpose of increasing the plate's strength. This allows for less than perfect homogeneity or uniformity in the paperboard blank. It also makes clear that the invention's achievement of adding strength is due to the process used, not to the materials in the blank. In addition, it allows the patent-holder protection of its invention against those who would make minor, cosmetic changes to the paperboard yet gain the benefit of using the invention.

b. Literal Infringement

[80] Under this construction, there remains a genuine fact issue as to this claim limitation. Mr. Alexander's affidavit suggests that the laminated paperboard used in Hallmark plates adds rigidity to its paper plates. DX-2029, para. 18. It is unclear on what facts this statement is based, and there is no requirement that laminates cannot add strength. An additional characteristic does not mean an invention does not infringe.

Instead, Hallmark has not pointed to any evidence that would remove genuine fact issues as to whether the composition of its paperboard infringes. The key is that additional paperboard must not be added non-uniformly to add strength. As Hallmark cannot demonstrate this, it is not entitled to summary judgment as to this claim limitation.

V. INVALIDITY

A. Legal Standard

[81] The statutory bar of 35 U.S.C. s. 102(b) prevents issuance of a patent to a person otherwise entitled if "the invention was ... in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States." "An on sale bar determination requires that the claimed invention asserted to be on sale was operable, the complete invention claimed was embodied in or obvious in view of the device offered for sale, and the sale or offer was primarily for profit rather than for experimental purposes." *KeyStone Retaining Wall Systems, Inc. v. Westrock, Inc.*, 997 F.2d 1444, 1451 (Fed.Cir.1993).

[82] [83] The issue of whether the "on sale" bar applies is one of law, based on the record as a whole. *Ferag AG v. Quipp Inc.*, 45 F.3d 1562, 1566 (Fed.Cir.), *cert. denied*, 516 U.S. 816, 116 S.Ct. 71, 133 L.Ed.2d 31 (1995). The party seeking to invalidate a patent under the on sale bar has the burden of demonstrating by "clear and convincing evidence 'that there was a definite sale or offer to sell more than one year before the application for the subject patent, and that the subject matter of the sale or offer to sell fully anticipated the claimed invention or would have rendered the claimed invention obvious by its addition to the prior art.' " *Id.* (quoting *UMC Electronics Co. v. U.S.*, 816 F.2d 647, 656 (Fed.Cir.1987), *cert. denied*, 484 U.S. 1025, 108 S.Ct. 748, 98 L.Ed.2d 761 (1988)). "If these facts are established, the patent owner is called upon to come forward with an explanation of the circumstances surrounding what would otherwise appear to be commercialization outside the grace period. The possibilities of such circumstances cannot possibly be enumerated." *UMC Elec. Co. v. U.S.*, 816 F.2d 647, 656-57 (1987) (cites omitted).

[84] [85] A wide variety of factors may be considered to determine whether the on sale bar applies, but the court must examine the totality of the circumstances. *Ferag AG*, 45 F.3d at 1566 (citing *Envirotech Corp. v. Westech Engineering Inc.*, 904 F.2d 1571, 1574 (Fed.Cir.1990)). The analysis of the totality of the circumstances is driven by the policies that underlie the statutory bar. *Id.* (citing *King Instrument Corp. v. Otari Corp.*, 767 F.2d 853, 860 (Fed.Cir.1985)). The primary policy of the on sale bar is to prevent inventors from "exploiting the commercial value of their inventions while deferring the beginning of the statutory term." *Id.* (citing *Envirotech*, 904 F.2d at 1574). The bar's other policy goals are "encouraging prompt and widespread disclosure of inventions to the public, discouraging the removal of inventions from the public domain when the public has come to rely on their ready availability, and giving inventors a reasonable period to discern the potential value of an invention." *Id.*

B. Factual Overview

In the spring of 1980, James River began a project intended to increase the rigidity of its paper plates in order to improve their competitiveness. DX-30 at JR7951; DX-47 at JR37348. The employee responsible for the research and development was Dr. Van Handel. DX-30 at JR7951. Based upon testing done using James River's existing presses and dies, he initially believed that process control appeared to be the key factor in improving plate rigidity. PX-715 at JR7977. At a July 17, 1980 meeting, James River employees decided that the project's emphasis would be "to commercialize known processing parameters to improve rigidity." PX-717 at JR28718; DX-50 at JR37357. Feasibility studies were conducted in August 1980 at the Fort Smith, Arkansas plant. DX-32 at JR8072. This study used Press No. 107. DX-32 at JR8075; DX-97.

Dr. Van Handel concluded improved plates could be made with the proper press setup. PX-721 at JR7984; DX-98 at JR37367. Based on this feasibility study, James River decided to run Press No. 107, after overhauling it, for the remainder of the year. DX-32 at JR8074; DX-100 at JR38396; PX-723 at JR28742; DX-99 at JR7962; PX-724 at JR28745; DX-74 at JR7986; DX-97. Some plates produced during this run were sent to a testing facility, but the rest were eventually sold to the public with other paper plates. DX-101 at JR37314; DX-97. Thus, plates produced from Press No. 107 and Die A-87 were apparently sold commercially from August 1980 to March 1981. James River's Response Brief, in Opposition to Motion for Summary Judgment, at 22.

Further testing by Dr. Van Handel at the Darlington, South Carolina plant was unsuccessful in matching results obtained with the No. 107 press. DX-107 at JR7745; DX-97 at 3. After that, testing in December 1980 on other presses also failed to match the test runs on No. 107. DX-97 at 3; PX-731 at JR7991; DX-35 at JR3743. James River at this point seemed to believe it could not reliably produce plates with increased rigidities. PX-725 at JR7116; PX-731 at JR7992.

Ultimately, study of Press No. 107 indicated that die clearances might be an important factor in increasing plate rigidity. DX-107 at JR7745; PX-736 at JR7789; DX-107 at JR7745; PX-734 at JR7328. This realization occurred in about January 1981. Die A-87 was removed from Press No. 107 and measured. Two dies, NTC-1 and NTC-2 were recut to duplicate die A-87 with some differences, including increased clearance in the sidewall. PX-741 at JR33238; PX-740 at JR76797. James River concluded in a report of May 1, 1981 that the NTC dies could make plates with the required rigidity. PX-748 at JR28879; DX-94 at JR76807. Dies cut to the specifications of the NTC dies were ordered on June 1, 1981. James River embarked on studies that led to its understanding of the high-rigidity plates' structure. PX-752 at JR28893; JR37446; PX-754 at JR28184.

C. Analysis

1. Subject Matter of the Sale

[86] Hallmark argues that the patents are invalid under the statutory bar because James River produced plates using die A-87 that met the claim limitations and sold those plates before April 13, 1981. The relevant patent application date for the '140 and '500 patents was April 13, 1982, and the grace period for public use and sale commenced April 13, 1981. There is no dispute that James River sold large numbers of plates, made using the A-87 die, to the public between August 1980 and March 1981.FN5 The issues here are (a) whether the claimed invention asserted to be on sale was operable; (b) whether the complete invention claimed was embodied in or obvious in view of the device offered for sale; and (c) whether the sale was primarily for profit, not for experimental purposes. KeyStone Retaining Wall Systems, 997 F.2d at 1451.

FN5. DX-97; DX-193 at JR7803; DX-96; DX-623, Wnek at 727-34; DX-2017, Smith at 103-115; DX-626, Wnek at 54; DX-2021, Wnek at 12-18, 70-71; DX-2017, Smith at 114-17.

a. Operability

Although there is no question that James River produced plates from the A-87 dies, it is unclear whether the invention can be considered "operable" in this context. In one sense, paper plates are paper plates, but for the invention to be operable, the plates must have the characteristics claimed for the invention. As to the method claimed, it appears some of the A-87 dies were producing stronger plates. However, in this context, the issue of whether the invention was "operable" is inseparable from the second issue, whether the invention claimed was embodied in or obvious in view of the plates offered for sale.

b. Embodiment of or Obviousness in Light of Claims

As to this second issue, Hallmark contends that the plates manufactured using the A-87 die met the claim limitations of the '140 and '500 patents. Apparently, none of the plates in question remain. Hallmark therefore relies on following similarities: first, the process parameters used in plate production from the A-87 die before April 13, 1981 were similar to those described in the '140 and '500 patent specifications

(Hallmark's Proposed Findings of Fact, Tables A, B); second, the clearances of the A-87 die were similar to those recommended by the patents and set forth in the patents' examples. (Table C). Hallmark's evidence clearly shows that the process parameters of James River's production from the A-87 die before April 13, 1981 fall within those set forth in the patents. Moreover, the A-87 die clearances are similar to those recommended by the '140 and '500 patents. It would be a reasonable inference from these similarities that the plates made from the A-87 die met the claim limitations. However, that is not the only reasonable inference.

The first reason that other reasonable inferences exist is that some critical A-87 die clearances were greater than those recommended in the patents. The bottom wall clearance might be expected to be unimportant, as both values exceed the thickness of the paperboard, so that little pressure would be exerted on the paperboard at that point. The same is true of the sidewall clearance. By contrast, the A-87 die's clearances at the start of the rim and the rim edge both exceed the corresponding clearances in the patents by .0005 inches. The rim is where the pleats are located, and the compression of the pleats is the key to the plates' rigidity.

The second reason to believe the A-87 plates did not meet the claim limitations is that they were not as strong as those made from the NTC dies, described in the '140 and '500 patents. Plates from the A-87 dies had strengths averaging 102 grams per 1/2 inch deflection, FN6 while plates from the NTC-1 die had rigidities of 130 (plus-or-minus sign) 10 gm/ 1/2 inch. FN7

FN6. James River's Responses to Hallmark's Proposed Findings of Fact (Invalidity), Response No. 68; DX-34 at JR8061.

FN7. PX-748 at JR28879; DX-94 at JR76807; PX-749 at JR7421 (Response Brief at 20).

The third reason to believe the A-87 plates did not meet the claim limitation is that the NTC dies, unlike the A-87 dies, did not have a tight spot at the transition between the sidewall and the bottom of the plate. As a key of the patents' invention is the concentration of die pressure on the rim, it is reasonable to infer that such a tight spot would weaken the plates. Thus, it is an entirely reasonable inference, and one to which James River as the non-moving party is entitled, that the pre-April 13, 1981 plates did not meet the claim limitations of the '140 and '500 patents.

c. Sale For Profit

There is no suggestion that James River's sales, as opposed to its production, were for experimental purposes. The evidence is uncontradicted that while James River culled some plates from Press No. 107 and the A-87 die for testing at its Neenah facility, others were sold to customers. DX-101 at JR37314; DX-97.

[87] Sales to the public, after which the patentee has no control over the product, ordinarily cannot meet the experimental purpose doctrine. In re Hamilton, 882 F.2d 1576, 1581 (Fed.Cir.1989). Moreover, it is unclear why James River had to produce more plates than it needed for testing from the A-87 die.

However, even if the plates from the A-87 die met the claim limitations, and were sold primarily for profit, the totality of the circumstances indicates there is a genuine issue of material fact as to whether James River violated the statutory bar. This is because it is not clear that James River's actions in selling the plates were contrary to the policies underlying the on sale bar. The test to resolve this question is an objective one that asks "whether, under the totality of the circumstances, the inventor placed his invention on sale, objectively manifested by a sale or offer for sale of a product that embodies the invention claimed in the patent." Ferag AG, 45 F.3d at 1568.

At the heart of this test "lies the inventor's attempt to commercialize the invention." *Id.* Thus, as Hallmark argues, the purchase or prospective purchaser's knowledge that she is offered the invention's product is irrelevant. King Instrument Corp. v. Otari Corp., 767 F.2d 853, 860 (Fed.Cir.1985). However, this only

means that the patentee's intent must be determined objectively from his actions. Thus, "a bare unexplained offer, not explicitly shown to be of the new invention may be insufficient" to show that an offer or sale of the new invention was made. *Id.*

Here, it is not clear that James River attempted to exploit or commercialize its invention by offering for sale and selling the plates made using the A-87 die. First, it is unclear whether James River's sale or attempt to sell constituted an exploitation of its invention. Some case law suggests that a mere offer, combined with facts showing an intent to use the invention in connection with the offer, can trigger the on sale bar. *See, e.g., Paragon Podiatry Laboratory, Inc. v. KLM Laboratories, Inc.*, 984 F.2d 1182, 1188 (Fed.Cir.1993); *In re Caveney*, 761 F.2d 671, 676 (Fed.Cir.1985); *D.L. Auld*, 714 F.2d at 1150. However, it is instructive that in *Paragon Podiatry*, the Federal Circuit considered more than the offer and the intent to use the invention. Instead, the court also looked at the inventor's failure to keep records of testing, the patentee's representations to buyers that the invention was fully functional, the failure to describe the product as experimental, and the failure to retain control after sale. *Paragon Podiatry*, 984 F.2d at 1188. Thus, "exploit" or "commercialize" does not mean the same thing as "sell" or "offer of sale." It is more appropriate to determine whether the patentee gained an advantage by selling or offering to sell the invention, as in a competitive advantage or additional profit.

In this case, the record does not show that James River gained such an advantage from sales of its invention before April 13, 1981. James River batched the plates from the A-87 die with other plates and sold them without special designation. When James River sold these batches, only some of the plates, those from the A-87 die, had the greater strength. James River did not market the plates as having a greater strength, so it did not attempt to gain a direct competitive advantage. The record does not indicate that the A-87 plates had a lower production cost that would have increased James River's profits. To the contrary, it is plausible that taking samples for testing would have reduced profits from plate production. For these reasons, there is factual dispute as to whether James River attempted to commercialize its invention.

Perhaps most telling in this regard is that James River did not move toward full-scale production of the invention plates until June 1981. At that time, James River ordered 87 dies for commercial use based on the measurements of the recut NTC experimental dies, not on the A-87 die. These dies were delivered in September and October 1981, and production began in October 1981. DX-97 at HM6104. Had James River truly intended to commercially exploit its invention before the grace period, it is reasonable to believe it would have done so on a larger scale than using only the A-87 die.

As to the other policies, the evidence indicates that the statutory bar could reasonably not apply. First, while s. 102(b) encourages prompt and widespread disclosure of inventions to the public, James River indicates that it could not make a useful disclosure. As James River says in its brief, if it could not instruct its own plants on how to consistently make the invention plates, it could not instruct the public on how to do so. It did not know the A-87 die's measurements until February 1981. DX-97 at HM6103; PX-738 at JR8019; DX-198. It did not acquire new dies based upon what it had learned from the A-87 dies until April 1981. PX-748 at JR28879; DX-94 at JR76807; PX-749 at JR7421. It did not know the invention plates' microstructure until November 1981. PX-754 at JR28184. This policy is closely in accord with the doctrine that the on sale bar does not apply to accidental, unintended, and unappreciated sales or uses. *See, e.g., Tilghman v. Proctor*, 102 U.S. 707, 710, 26 L.Ed. 279 (1880); *H.K. Regar & Sons, Inc. v. Scott & Williams*, 63 F.2d 229, 231 (2d Cir.1933).

Second, the statutory bar also discourages removing inventions from the public domain if the public relies on their ready availability. There is no showing of such a circumstance here. Competitors were not deprived of the invention, as no evidence shows that competitors were aware of, much less using, the inventions at issue. Consumers did not lose access to the invention plates. Because James River was batching the A-87 die plates with other merchandise, there is no suggestion that consumers were buying Livingware plates FN8 for the extra-strong plates that appeared in the Livingware line. Thus, Hallmark has not shown that the public relied on the ready availability of the invention plates.

FN8. James River manufactured and sold both Livingware plates and Ultra-Lux plates, which were essentially the same. DX-2020, Shepherd at 12; HF-13.

Finally, inventors have a reasonable period to discern an invention's potential value. As discussed above, the invention was of no value unless James River could reliably reproduce stronger plates. Before the grace period, James River was trying to ascertain whether it could consistently make the stronger plates. This required producing plates for testing, and once the plates were produced, it should not be required that James River receive no value for them. *Lear Siegler, Inc. v. Ark-Ell Springs, Inc.*, 569 F.2d 286, 291 (5th Cir.1978). While it appears that for some time, the "experimental" production runs comprised James River's entire output of paper plates, the record does not show that extended runs were unnecessary to optimize testing conditions.

As I reach this result without considering the additional authority, cited by James River and objected to by Hallmark in its motion to strike, Hallmark's motion will be granted. Accordingly,

IT IS ORDERED that Hallmark's motion to strike James River's additional statements of authority be and the same is hereby **GRANTED**;

IT IS FURTHER ORDERED that Hallmark's motion for summary judgment of estoppel be and the same is hereby **DENIED**;

IT IS FURTHER ORDERED that Hallmark's motion for summary judgment of laches be and the same is hereby **DENIED**;

IT IS FURTHER ORDERED that Hallmark's motion for summary judgment of invalidity be and the same is hereby **DENIED**; and

IT IS FURTHER ORDERED that Hallmark's motion for summary judgment of non-infringement be and the same is hereby **DENIED**.

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