

United States Court of Appeals. Federal Circuit.

Paper Converting Machine v. Magna-Graphics, 745 F. 2d 11 1984

This appeal is from a judgment of the United States District Court for the Eastern District of Wisconsin (Reynolds, C.J.), 576 F.Supp. 967, entered on December 1, 1983, and awarding plaintiff Paper Converting Machine Company (Paper Converting) \$893,064 as compensation for defendant Magna-Graphics Corporation's (Magna-Graphics) willful infringement of United States Patent No. Re. 28,353. We affirm-in-part and vacate-in-part.

No. 84-738.

September 28, 1984.

NOTES: In *Paper Converting Machine* the court defined an operable assembly of a combination of parts not themselves patentable as a significant assemblage allowing for testing of different components. Also in *Paper Converting Machine* the court looked at the basis of lost profit awards. The court confirmed that calculations forming the basis of lost profit awards do not include fixed costs.

Glenn O. Starke, Milwaukee, Wis., argued for appellant. With him on the brief was Eugene R. Sawall, Milwaukee, Wis.

Jerome F. Fallon, Chicago, Ill., argued for appellee.

Before RICH, Circuit Judge, NICHOLS, Senior Circuit Judge, and NIES, Circuit Judge.

NICHOLS, Senior Circuit Judge.

I

Although the technology involved here is complex, the end product is one familiar to most Americans. The patented invention relates to a machine used to manufacture rolls of densely wound ("hard-wound") industrial toilet tissue and paper toweling. The machine, commonly known as an automatic rewriter, unwinds a paper web continuously under high tension at speeds up to 2,000 feet per minute from a large-diameter paper roll—known as the parent roll or bedroll—and simultaneously rewinds it onto paperboard cores to form individual consumer products.

Before the advent of automatic rewinders, toilet tissue and paper towel producers used "stop-start" rewinders. With these machines, the entire rewinding operation had to cease after a retail-sized "log" was finished so that a worker could place a new mandrel (the shaft for carrying the paperboard core) in the path of the paper web. In an effort to increase production, automatic rewinders were introduced in the early 1950's. These machines automatically moved a new mandrel into the path of the paper web

while the machine was still winding the paper web onto another mandrel, and could operate at a steady pace at speeds up to about 1,200 feet per minute.

In 1962, Nystrand, Bradley, and Spencer invented the first successful "sequential" automatic rewinder, a machine which not only overcame previous speed limitations, but also could handle two-ply tissue. This rewinder simultaneously cut the paper web and impaled it on pins against the parent roll. Then, after a new mandrel was automatically moved into place, a "pusher" would move the paper web away from the parent roll and against a glue-covered paperboard core to begin winding a new paper log.

On April 20, 1965, United States Patent No. 3,179,348 (the '348 patent) issued, giving to Paper Converting (to whom rights in the invention had been assigned) patent protection for machines incorporating the sequential rewinding approach. On September 1, 1972, Paper Converting applied to have the claims of the '348 patent narrowed by reissue, and on March 4, 1975, United States Patent No. Re. 28,353 (the '353 patent) issued on this application. The '353 patent, like the original '348 patent on which it is based, received an expiration date of April 20, 1982. Claim 1 of the '353 patent defines the improvement in the web-winding apparatus as an improvement comprising:

(C) means for transversely severing said web to provide a free leading edge on said web for approaching a mandrel on which said web is to be wound in said path, and

(D) pin means extensibly mounted on said roll for maintaining a web portion spaced from said edge in contact with said roll, and pusher means extensibly mounted on said roll to urge said maintained web portion against an adjacent mandrel.

Paper Converting achieved widespread commercial success with its patented automatic rewinder. Although there are not many domestic producers of toilet tissue and paper toweling, Paper Converting has sold more than 500 machines embodying the invention.

In 1979, Paper Converting brought the present action against Magna-Graphics for infringement of the '353 patent. After a trial concerning only issues of liability, the district court held the '353 patent valid and found it willfully infringed, 211 USPQ 788 (E.D.Wis.1981). It awarded treble damages, finding that Magna-Graphics had acted without the advice of counsel as to the change it made in its machines to avoid infringement. The Seventh Circuit affirmed, 680 F.2d 483 (7th Cir.1982). The parties commendably raise no issues here which the Seventh Circuit has already decided as to Magna-Graphics' liability.

When the district court held the accounting for damages (after the Seventh Circuit had affirmed it on the liability portion of the case), it found that Magna-Graphics had made two sales of infringing rewinders and associated equipment: one to the Fort Howard Paper Company (Fort Howard) under circumstances to be described, and one to the Scott Paper Company (Scott). The court awarded to Paper Converting \$112,163 for Magna-Graphics' sale to Scott, and \$145,583 for Magna-Graphics' sale to Fort Howard. The court then trebled these damages, and added \$119,826 as prejudgment interest on the untrebled award. This appeal is from the judgment awarding damages.

Magna-Graphics asserts reversible error in virtually every element of the district court's "accounting" or award of damages. In particular, Magna-Graphics contends that the district court erred in (1) finding the sale, substantial manufacture, and delivery of the Fort Howard rewinder to be an infringement, (2) basing the damages award on Paper Converting's lost profits, (3) adopting an incremental income theory when determining Paper Converting's lost profits, (4) computing Paper Converting's lost profits based on the value of the entire rewinder line as opposed to the patented rewinder alone, and (5) awarding prejudgment interest to Paper Converting. Despite Magna-Graphics' many arguments, however, we are not persuaded that the district court made any reversible error in its lengthy and detailed analysis of its accounting.

III

A

Magna-Graphics first argues that it should bear no liability whatsoever for its manufacture, sale, or delivery of the Fort Howard rewinder because that machine was never completed during the life of the '353 patent. We disagree.

In early 1980 Fort Howard became interested in purchasing a new high-speed rewinder line. Both Paper Converting and Magna-Graphics offered bids. Because Magna-Graphics offered to provide an entire rewinder line for about 10 percent less than did Paper Converting, it won the contract. Delivery would have been before the '353 patent expired. Magna-Graphics began to build the contracted for machinery, but before it completed the rewinder, on February 26, 1981, the federal district court in Wisconsin determined that a similar Magna-Graphics' rewinder built for and sold to Scott infringed the '353 patent. The court enjoined Magna-Graphics from any future infringing activity.

Because at the time of the federal injunction the rewinder intended for Fort Howard was only 80 percent complete, Magna-Graphics sought a legal way to fulfill its contract with Fort Howard rather than abandon its machine. First, Magna-Graphics tried to change the construction of the rewinder so as to avoid infringement. It submitted to Paper Converting's counsel three drawings illustrating three proposed changes, and asked for an opinion as to whether the changes would avoid infringement. Paper Converting's counsel replied, however, that until a fully built and operating machine could be viewed, no opinion could be given. Magna-Graphics, believing such a course of action unfeasible because of the large risks in designing, engineering, and building a machine without knowing whether it would be considered an infringement, instead negotiated with Fort Howard to delay the final assembly and delivery of an otherwise infringing rewinder until after the '353 patent expired in April 1982.

Magna-Graphics thereafter continued to construct the Fort Howard machine, all the while staying in close consultation with its counsel. After finishing substantially all of the machine, Magna-Graphics tested it to ensure that its moving parts would function as intended at a rate of 1,600 feet of paper per minute. Although Magna-Graphics normally fully tested machines at its plant before shipment, to avoid

infringement in this instance, Magna-Graphics ran its tests in two stages over a period of several weeks in July and August of 1981.

To understand Magna-Graphics' testing procedure, it is necessary to understand the automatic transfer operation of the patented machine. First, from within a 72-inch long "cutoff" roll, a 72-inch blade ejects to sever the continuous web of paper which is wound around the bedroll. Then, pins attached to the bedroll hold the severed edge of the web while pushers, also attached to the bedroll, transfer the edge of the web towards the mandrel (the roll on which the paperboard core is mounted).

In the first stage of its test, Magna-Graphics checked the bedroll to determine whether the pushers actuated properly. It installed on the bedroll two pusher pads instead of the thirty pads normally used in an operating machine. It greased the pads and operated the bedroll to determine whether the pads, when unlatched, would contact the core on the mandrel. (Magna-Graphics greased the pads so as to provide a visual indication that they had touched the core.) During this stage of tests, no cutoff blades or pins were installed.

In the second stage of the test, Magna-Graphics checked the cutoff roll to determine whether the cutting blade actuated as intended. It tested the knife actuating mechanism by installing into the cutoff roll a short 4-inch section of cutter blade rather than the 72-inch blade normally used. After taping a 4-inch wide piece of paper to the outer surface of the cutoff roll, Magna-Graphics operated the cutoff roll to determine whether the latch mechanism would eject the blade to cut the paper. During this phase of the testing, no pins or pusher pads were installed. At no time during the tests were the pins, pushers, and blade installed and operated together.

To further its scheme to avoid patent infringement, Magna-Graphics negotiated special shipment and assembly details with Fort Howard. Under the advice of counsel, Fort Howard and Magna-Graphics agreed that the rewinder's cutoff and transfer mechanism would not be finally assembled until April 22, 1982, two days after the expiration of the '353 patent. With this agreement in hand, Magna-Graphics shipped the basic rewinder machine to Fort Howard on September 17, 1981, and separately shipped the cutoff roll and bedroll on October 23, 1981. The rewinder machine was not assembled or installed at the Fort Howard plant until April 26, 1982.

B

With this case we are once again confronted with a situation which tests the temporal limits of the American patent grant. See *Roche Products, Inc. v. Bolar Pharmaceutical Co.*, 733 F.2d 858, 221 USPQ 937 (Fed.Cir.1984). We must decide here the extent to which a competitor of a patentee can manufacture and test during the life of a patent a machine intended solely for post-patent use. Magna-Graphics asserts that no law prohibits it from soliciting orders for, substantially manufacturing, testing, or even delivering machinery which, if completely assembled during the patent term, would infringe. We notice, but Magna-Graphics adds that it is totally irrelevant, that Paper Converting has lost, during the term of its patent, a contract for the patented machine which it would have received but for the competitor's acts.

Clearly, any federal right which Paper Converting has to suppress Magna-Graphics' patent-term activities, or to receive damages for those activities, must be derived from its patent grant, and thus from the patent statutes. "Care should be taken not to extend by judicial construction the rights and privileges which it was the purpose of Congress to bestow." *Bauer v. O'Donnell*, 229 U.S. 1, 10, 33 S.Ct. 616, 617, 57 L.Ed. 1041 (1913). The Supreme Court, in *Brown v. Duchesne*, 60 U.S. (19 How.) 183, 195, 15 L.Ed. 595 (1856), stated that:

[T]he right of property which a patentee has in his invention, and his right to its exclusive use, is derived altogether from these statutory provisions; * * * an inventor has no right of property in his invention, upon which he can maintain a suit, unless he obtains a patent for it, according to the acts of Congress; and * * * his rights are to be regulated and measured by these laws, and cannot go beyond them.

The disjunctive language of the patent grant gives a patentee the "right to exclude others from making, using or selling" a patented invention during the 17 years of the patent's existence. 35 U.S.C. § 154. See also 35 U.S.C. § 271. Congress has never deemed it necessary to define any of this triad of excludable activities, however, leaving instead the meaning of "make," "use," and "sell" for judicial interpretation. See *Roche Products, Inc. v. Bolar Pharmaceutical Co.*, supra. Nevertheless, by the terms of the patent grant, no activity other than the unauthorized making, using, or selling of the claimed invention can constitute direct infringement of a patent, no matter how great the adverse impact of that activity on the economic value of a patent. Judge Learned Hand stated, in *Van Kannell Revolving Door Co. v. Revolving Door & Fixture Co.*, 293 F. 261, 262 (S.D.N.Y. 1920), that irrespective of where the equities may lie:

[A] patent confers an exclusive right upon the patentee, limited in those terms. He may prevent any one from making, selling, or using a structure embodying the invention, but the monopoly goes no further than that. It restrains every one from the conduct so described, and it does not restrain him from anything else. If, therefore, any one says to a possible customer of a patentee, "I will make the article myself; don't buy of the patentee," while he may be doing the patentee a wrong, and while equity will forbid his carrying out his promise, the promise itself is not part of the conduct which the patent forbids; it is not a "subtraction" from the monopoly. If it injures the plaintiff, though never performed, perhaps it is a wrong, like a slander upon his title, but certainly it is not an infringement of the patent.

Here, the dispositive issue is whether Magna-Graphics engaged in the making, use, or sale of something which the law recognizes as embodying an invention protected by a patent. Magna-Graphics relies on *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 92 S.Ct. 1700, 32 L.Ed.2d 273, 173 USPQ 769 (1972). That case dealt with a "combination patent" covering machinery for shrimp deveining. The only active issue was whether certain export sales were properly prohibited in the district court's injunction and whether damages should include compensation for past infringement by these exports. The infringer had put in effect a practice of selling the machines disassembled for export, but with the subassemblies so far advanced, and with such instructions, that the foreign consignee could put them together on receipt in operable condition with an hour's work. The Supreme Court's five to four holding that these exports did not infringe was interwoven of three strands of thought: (1) that the patent laws must be construed strictly because they create a "monopoly" in the patentee; (2) that a "combination patent" is not infringed until its elements are brought together into an "operable assembly;" and (3) that an attempt to enforce the patent against a machine assembled abroad was an attempt to give it

extraterritorial application and to invade improperly the sovereignty of the country where the final assembly and the intended use occurred.

Magna-Graphics' effort to apply *DeepSouth* as precedential runs into the obvious difficulty that the element of extraterritoriality is absent here, yet it obviously was of paramount importance to the *DeepSouth* Court. We must be cautious in extending five to four decisions by analogy, *United States v. Kennesaw Mountain Battlefield Ass'n*, 99 F.2d 830, 833-34 (5th Cir.), cert. denied, 306 U.S. 646, 59 S.Ct. 587, 83 L.Ed. 1045 (1938). The analysis of where infringement occurs is applicable, *Magna-Graphics* says, to determining when an infringement occurs, whether before or after a patent expires. We have not found any case that has so held, and are not cited to any. It does not at all necessarily follow, for the *DeepSouth* analysis is made to avert a result, extraterritoriality, that would not occur whatever analysis was made in the instant case.

Although in *DeepSouth* the Court at times used broad language in reaching its decision, it is clear that *DeepSouth* was intended to be narrowly construed as applicable only to the issue of the extraterritorial effect of the American patent law. The Court so implied not only in *DeepSouth* ("[A]t stake here is the right of American companies to compete with an American patent holder in foreign markets. Our patent system makes no claim to extraterritorial effect, * * *" 406 U.S. at 531, 92 S.Ct. at 1708, 173 USPQ at 774 (emphasis added)), but in a subsequent decision as well ("The question under consideration [in *DeepSouth*] was whether a patent is infringed when unpatented elements are assembled into the combination outside the United States." *Dawson Chemical Co. v. Rohm & Haas Co.*, 448 U.S. 176, 216, 100 S.Ct. 2601, 2623, 65 L.Ed.2d 696, 206 USPQ 385, 405 (1980) (emphasis added).). Moreover, in *Decca Limited v. United States*, 544 F.2d 1070 (Ct.Cl.1976), the Court of Claims considered the worldwide system of electronic navigation aids called "Omega," which employs as a means of fixing the locations of ships and planes "master" and "slave" transmission stations, and receivers making computer printouts on board the ships and planes to be guided. The government relied on *DeepSouth* to establish that the involved patent, if enforced against it, would be given an extraterritorial application. The Court of Claims held that the application was not extraterritorial and therefore *DeepSouth* was not implicated. The Court of Claims viewed *DeepSouth* as simply and wholly a decision against extraterritorial application of United States patent laws. *Id.* at 1072-74.

While there is thus a horror of giving extraterritorial effect to United States patent protection, there is no corresponding horror of a valid United States patent giving economic benefits not cut off entirely on patent expiration. Thus, we hold that the expansive language used in *DeepSouth* is not controlling in the present case. The facts in *DeepSouth* are not the facts here. Because no other precedent controls our decision here, however, we nevertheless look to *DeepSouth* and elsewhere for guidance on the issue of whether what *Magna-Graphics* did is an infringement of the '353 patent.

A further examination of the *DeepSouth* opinion reveals that the Court stated what was for it a most unusual reliance on a precedent established in an inferior court, the case being *Radio Corporation of America v. Andrea*, 79 F.2d 626 (2d Cir.1935). The reason for this was the eminently logical one that when in 1952 the Congress recodified the patent law, and specifically § 271, the most relevant precedent was *Andrea* as to the legal effect of exporting, unassembled, components that if exported assembled would infringe a "combination patent." Presumably the Congress accepted and enacted Judge Swan's interpretation in *Andrea*, absent any relevant pronouncement by our highest court.

Judge Swan's opinion on the appeal from a preliminary injunction is, indeed, a rather dramatic application of the view of the law he announced. The patents related to radio receiving sets. The alleged infringer, Andrea, exported them complete except for vacuum tubes exported in the same package, but not in their sockets. All the buyer had to do to have a patented set was, therefore, to put the tube in the socket designed to receive it. Swan's opinion does not mention any horror of extraterritoriality. Rather, the analysis is that the sale in this condition, even to domestic users, is not a direct infringement, but is only a contributory infringement. Thus, the practical impact of the Swan opinion, but not its reasoning, is limited to export sales, where contributory infringement is not logically applicable. Swan notes, however, as possible direct infringement evidence, that the alleged infringer put the tubes in their sockets to test them, and the sets generally, and then disassembled for export, and the reversal leaves it open to the trial court to look into this.

The trial court thereafter made further findings and entered its final judgment (then called its decree) and the case came up again, same name, 90 F.2d 612 (2d Cir.1937). Where previously the panel had consisted of only Swan and the subsequently ill-famed Manton, this time Circuit Judge Chase was added and Manton authored the opinion. The matter of testing was now clarified, and it was also now clear to the panel:

The purchaser to connect the tube needs only insert it in the socket. No adjustment is required; no screw or nut need be tightened. Where the elements of an invention are thus sold in substantially unified and combined form, infringement may not be avoided by a separation or division of parts which leaves to the purchaser a simple task of integration. Otherwise a patentee would be denied adequate protection.

[Id. at 613.]

The court further noted that in part the sets were fully assembled for testing in the United States and that the sales of the completed though partly disassembled sets were made in the United States. The main problem dealt with in the second Andrea opinion was what "implied license" the infringer acquired when it bought the tubes separately.

Swan dissented, saying the holding that the sale of the disassembled parts in this country was an infringement overruled the decision in 79 F.2d 626. This history was, of course, not overlooked in the Supreme Court and is mentioned by Justice Blackmun in his dissent in *Deepsouth*.

What are we to make of all this? It does seem as if the concept of an "operable assembly" put forward by Justice White in his majority opinion is probably something short of a full and complete assembly; thus, if the infringer makes an "operable assembly" of the components of the patented invention, sufficient for testing, it need not be the same thing as the complete and entire invention. The other thing is, if the infringer has tested his embodiment of the invention sufficiently to satisfy him, this may be a "use," because as held in *Roche Products, Inc.*, "use" includes use for the purpose of testing. Apparently, this was also a factor in the second Andrea decision, though given the confusing way Manton put his opinion together, it is hard to be sure. Swan also may be right that Manton is simply overruling the interlocutory 79 F.2d 626 decision. If so, apparently the Supreme Court majority liked the first holding better. That is, the part quoted above of the second decision is not law. But there is no apparent difference between Swan and the rest of the second panel as to the legal effect of testing and sale.

In any case, we would not be justified in thinking Justice White and the Supreme Court majority intended to hold, or to be understood as holding, that the second Andrea decision in 90 F.2d 612, was not before Congress just as much as the first Andrea decision in 79 F.2d 626, or was not just as much to be considered in interpreting § 271, as reenacted in 1952.

Whether Magna-Graphics' rewriter infringed the '353 patent is a question of fact which the Federal Rules leave to the district court to decide. The question is not always so simply decided as the dissent makes it out to be. In particular, where it is necessary to decide whether a complex mechanical contraption infringes a claim in a patent, the district court is often faced with a difficult chore. To require that in all situations the district court must decide a complicated factual issue within the narrow confines of a simple bright-line test makes the district judge's function nothing more than that of a master assigned to set out simple facts.

The dissent's argument is based on the utopian belief that a copier "should be able to look to the patent claims and know whether his [or her] activity infringes or not." Although this may be a desirable goal for the patent laws, it is not the law as it exists. In particular, the doctrine of equivalents has been judicially created to ensure that a patentee can receive full protection for his or her patented ideas by making it difficult for a copier to maneuver around a patent's claims. In view of this doctrine, a copier rarely knows whether his product "infringes" a patent or not until a district court passes on the issue. We see no difference in putting a copier into the same position here.

It is undisputed that Magna-Graphics intended to finesse Paper Converting out of the sale of a machine on which Paper Converting held a valid patent during the life of that patent. Given the amount of testing performed here, coupled with the sale and delivery during the patent-term of a "completed" machine (completed by being ready for assembly and with no useful noninfringing purpose), we are not persuaded that the district court committed clear error in finding that the Magna-Graphics' machine infringed the '353 patent.

To reach a contrary result would emasculate the congressional intent to prevent the making of a patented item during the patent's full term of 17 years. If without fear of liability a competitor can assemble a patented item past the point of testing, the last year of the patent becomes worthless whenever it deals with a long lead-time article. Nothing would prohibit the unscrupulous competitor from aggressively marketing its own product and constructing it to all but the final screws and bolts, as Magna-Graphics did here. We rejected any reduction to the patent-term in Roche; we cannot allow the inconsistency in the patent law which would exist if we permitted it here. Magna-Graphics built and tested a patented machine, albeit in a less than preferred fashion. Because an "operable assembly" of components was tested, this case is distinguishable from *Interdent Corp. v. United States*, 531 F.2d 547, 552 (Ct.Cl.1976) (omission of a claimed element from the patented combination avoids infringement) and *Decca Ltd. v. United States*, 640 F.2d 1156, 1168, 209 USPQ 52, 61 (Ct.Cl.1980) (infringement does not occur until the combination has been constructed and available for use). Where, as here, significant, unpatented assemblies of elements are tested during the patent term, enabling the infringer to deliver the patented combination in parts to the buyer, without testing the entire combination together as was the infringer's usual practice, testing the assemblies can be held to be in essence testing the patented combination and, hence, infringement.

That the machine was not operated in its optimum mode is inconsequential: imperfect practice of an invention does not avoid infringement. We affirm the district court's finding that "[d]uring the testing of

the Fort Howard machine in July and August 1981, Magna-Graphics completed an operable assembly of the infringing rewinder."

C

Although Magna-Graphics does not raise the issue, we nevertheless find bothersome the district court's summary award of treble damages as to the Fort Howard machine. At the liability phase of this action, the district court found that Magna-Graphics willfully infringed, 211 USPQ at 798:

Defendant made and sold the accused [Scott] machine with full knowledge of plaintiff's patent and without having obtained an opinion of counsel relative to infringement as to changes made only to avoid the patent with no corresponding change in function. Defendant is therefore an intentional infringer * * *.

When the district court made this finding, Magna-Graphics had not yet completed the Fort Howard machine and obviously the court did not have it in mind. On the basis of the record before us, it appears that if Magna-Graphics had immediately ceased production of the machine intended for Fort Howard, the district court would not have awarded damages to Paper Converting for that machine.

Magna-Graphics completed the Fort Howard machine, however, after the district court issued its injunction and before the '353 patent expired. Thus, when the district court determined during the accounting stage of this action that the Fort Howard machine infringed, it should have made new findings as to the willfulness of Magna-Graphics' post-injunction activities. In particular, if Magna-Graphics' continued manufacture of the Fort Howard machine was willful infringement, it was done in contempt of the district court's order.

Our review of the record appears to indicate that there are several factual differences between Magna-Graphics' activities leading to the construction of the Scott machine and its activities leading to the construction of the Fort Howard machine. Magna-Graphics, for example, consulted its counsel several times before performing any post-injunction activities towards the completion of the Fort Howard machine. Its attorneys apparently believed that by carefully planning the construction schedule, Magna-Graphics could complete the machine without infringing the '353 patent. Each calculated step Magna-Graphics took, it meticulously documented for the inevitable day in court.

We do not pretend that we ourselves should act as fact-finders and determine willfulness of infringement. An increase in damages for willfulness, however, is generally inappropriate when the infringer mounts a good faith and substantial challenge to the existence of infringement. See, e.g., *Central Soya Co., Inc. v. Geo. A. Hormel & Co.*, 723 F.2d 1573, 220 USPQ 490 (Fed.Cir.1983). We need explicit findings with which we can review the district court's decision. Since no such findings were made here, we vacate that part of the lower court's judgment awarding trebled damages for the infringing manufacture of the Fort Howard machine. We remand for a determination of Magna-Graphics' willfulness in infringing the '353 patent after the district court issued its injunction against infringement on February 26, 1981. Finally, we hasten to add, if Magna-Graphics continued infringement was willful, it was done in contempt of the district court's decree, and the district court may therefore consider

appropriate remedies other than the mere trebling of damages. See, e.g., *Pfizer, Inc. v. International Rectifier Corp.*, 217 USPQ 157 (C.D.Cal.1982).

IV

After the district court has determined the quantity of infringing articles, it must choose a methodology with which to compute damages. *Magna-Graphics* argues here, in effect, that although it has been adjudged a willful infringer, the district court should have chosen the accounting method which provides for the least amount of damages. We disagree.

Congress established in 35 U.S.C. § 284 the requirement of a damage award for patent infringement:

Upon finding for the claimant the court shall award the claimant damages adequate to compensate for the infringement but in no event less than a reasonable royalty for the use made of the invention and costs as fixed by the court.

Section 284 does not instruct a court on how to compute damages: the only congressional intent expressed ensures that a claimant receive adequate damages, not less than a reasonable royalty. The size of an award is left to the trial court's sound discretion. *Stickle v. Heublein, Inc.*, 716 F.2d 1550, 1563, 219 USPQ 377, 387 (Fed.Cir.1983). Thus, our review is limited to a determination of whether the trial court has abused its discretion in choosing a method with which to compute an award. Simply because different accounting methods lead to different results does not make an award at the higher end of a spectrum "more than adequate." The burden is on the infringer to persuade us that the amount of the award, or the choice of accounting method, constitutes an abuse of the trial court's discretion. *Magna-Graphics* has not met its burden here.

A

Whenever determining the quantum of a damage award adequate to compensate a patent holder for infringement, the district court may consider the profits the patent holder lost as a result of the infringement. In particular, the award of lost profits is proper when it can be demonstrated that "but for" the infringement, the patent holder would have made the sales. *Bio-Rad Laboratories, Inc. v. Nicolet Instrument Corp.*, 739 F.2d 604, 616, 222 USPQ 654, 663 (Fed.Cir.1984). To justify a damage award equal to lost profits, the patent holder can present affirmative evidence of the demand for his patented product in the marketplace, the absence of acceptable noninfringing substitutes, his production and marketing capacity to meet the demand, and computations on the loss of profits. *Central Soya Co. v. Geo. A. Hormel & Co.*, 723 F.2d 1573, 1579, 220 USPQ 490, 494 (Fed.Cir.1983). A patent holder can most commonly show these elements when the parties involved in the action are the only suppliers. *Lam, Inc. v. Johns-Manville Corp.*, 718 F.2d 1056, 1065, 219 USPQ 670, 675 (Fed.Cir.1983).

The patent holder does not need to negate all possibilities that a purchaser might have bought a different product or might have foregone the purchase altogether. The "but for" rule only requires the

patentee to provide proof to a reasonable probability that the sale would have been made but for the infringement.

Magna-Graphics places in issue here only the magnitude of demand for the patented product. Indeed, Magna-Graphics concedes that Paper Converting has the requisite production and marketing capacity (the sales of the two additional machines would have constituted but a minor portion of Paper Converting's total capacity) and that there is a total absence of acceptable non-infringing high-speed machines. Magna-Graphics contends, in effect, that because of Paper Converting's high prices, Scott and Fort Howard would have foregone their purchase of new rewinders altogether if Magna-Graphics had not submitted its low bid. Magna-Graphics argues, therefore, that the district court failed to give proper consideration to price differentials.

"Determining the weight and credibility of the evidence," however, "is the special province of the trier of fact." *Inwood Laboratories, Inc. v. Ives Laboratories, Inc.*, 456 U.S. 844, 856, 102 S.Ct. 2182, 2189, 72 L.Ed.2d 606, 214 USPQ 1 (1982); *Litton Systems, Inc. v. Whirlpool Corp.*, 728 F.2d 1423, 1445, 221 USPQ 97, 111 (Fed.Cir.1984). Here, the district court thought more persuasive the long history and continuous volume of Paper Converting's sales than Magna-Graphics' price-related data and testimony. The simple assertion that a fact-finding is clearly erroneous never makes it so; where, as here, merely the weight given to one subfactor is termed "clearly erroneous," the appellant faces a Sisyphean task to leave us with a "definite and firm conviction that the trial judge has committed a mistake." *Seattle Box Co. v. Industrial Crating & Packing, Inc.*, 731 F.2d 818, 823, 221 USPQ 568, 572 (Fed.Cir.1984). Magna-Graphics has not persuaded us here. We affirm the district judge's award of lost profits here.

B

Magna-Graphics next argues that the district court relied on improper or inaccurate figures to determine Paper Converting's lost profits, and that the district court erred in using an incremental income method for computing lost profits. We disagree.

The incremental income approach to the computation of lost profits is well established in the law relating to patent damages. See, e.g., *Lam, Inc. v. Johns-Manville Corp.*, supra; *Levin Bros. v. Davis Manufacturing Co.*, 72 F.2d 163 (8th Cir.1934). The approach recognizes that it does not cost as much to produce unit N + 1 if the first N (or fewer) units produced already have paid the fixed costs. Thus fixed costs—those costs which do not vary with increases in production, such as management salaries, property taxes, and insurance—are excluded when determining profits.

After it has chosen an accounting method, the district court is free to use its discretion in choosing the charts or figures from which to determine the amount of damages. A computation of damages, of course, is not always amenable to a precise determination. "In such case, while the damages may not be determined by mere speculation or guess, it will be enough if the evidence show the extent of the damages as a matter of just and reasonable inference, although the result be only approximate." *Story Parchment Co. v. Paterson Parchment Paper Co.*, 282 U.S. 555, 563, 51 S.Ct. 248, 250, 75 L.Ed. 544 (1931); see also, *Lam, Inc. v. Johns-Manville Corp.*, 717 F.2d at 1065, 219 USPQ at 670.

In the district court's exhaustive analysis here, it found Paper Converting's figures reasonable and not utterly without basis; it concluded that a 61.8 percent cost rate generates a "reasonably fair estimate" of Paper Converting's total lost profits. Magna-Graphics is not entitled to any higher level of certainty: fundamental principles of justice require us to throw the risk of any uncertainty upon the wrongdoer instead of upon the injured party. *Story Parchment Co.*, supra. We affirm the method of computing the damage award here.

C

Magna-Graphics next assigns error to the district court's award of lost profits as to the entire rewinder line rather than to the rewinder itself. Again, we affirm.

The "entire market value rule" allows for the recovery of damages based on the value of an entire apparatus containing several features, even though only one feature is patented. In *Leesona Corp. v. United States*, 599 F.2d 958, 974, 202 USPQ 424, 439 (Ct.Cl.1981), our predecessor court stated that under the entire market value rule:

[I]t is not the physical joinder or separation of the contested items that determines their inclusion in or exclusion from the compensation base, so much as their financial and marketing dependence on the patented item under standard marketing procedures for the goods in question.

The present case differs from the usual one in which the patented and unpatented components are part of a single machine. Here, the mechanism for the high speed manufacture of paper rolls comprises several components, only one of which incorporates the invention claimed in the '353 patent. The auxiliary equipment includes an "unwind stand" which supports the large roll of paper which is supplied to the rewinder for cutting and rewinding, a "core loader" which supplies paperboard cores to the rewinder, an "embosser" which when located between the unwind stand and the rewinder embosses the paper and provides a special textured surface, and a "tail sealer" which seals the paper's trailing end (the tail) to the consumer-sized roll.

None of the auxiliary units here are integral parts of the rewinder; rather, they each have separate usage. Paper Converting therefore obviously cannot prevent the manufacture or sale of these auxiliary units. This fact, however, does not control our decision. The deciding factor, rather, is whether "[n]ormally the patentee (or its licensee) can anticipate sale of such unpatented components as well as of the patented" ones. *Tektronix, Inc. v. United States*, 552 F.2d 343, 351, 193 USPQ 385, 393 (Ct.Cl.1977). If in all reasonable probability the patent owner would have made the sales which the infringer has made, what the patent owner in reasonable probability would have netted from the sales denied to him is the measure of his loss, and the infringer is liable for that. *Livesay Window Co. v. Livesay Industries, Inc.*, 251 F.2d 469, 471-72, 116 USPQ 167, 169 (5th Cir.1958).

The district court found that Paper Converting adduced sufficient evidence at trial to sustain its burden of showing that if Magna-Graphics had not infringed the '353 patent, Paper Converting would have sold its entire rewinder line to Scott and Fort Howard. Substantial evidence showed, for instance, that the entire industry routinely purchased a complete rewinder line from the seller of the rewinder machine so

as to ensure a single source of responsibility. Fort Howard and Scott exemplify this industry practice: every time Paper Converting sold a highspeed automatic rewinder to either of them, they purchased the entire rewinder line including auxiliary equipment. Moreover, in the two infringing sales which Magna-Graphics made, both Fort Howard and Scott again purchased the entire rewinder line including auxiliary equipment. Indeed, of Paper Converting's 572 rewinder sales, only nine involved rewinders alone.

Whether a patentee could anticipate additional income from the auxiliary parts is a question of fact which we cannot and will not disturb unless clearly erroneous. Fed.R.Civ.P. 52(a). The evidence amply supports the district court's finding that Paper Converting would have made these sales but for Magna-Graphics' infringing sales. We affirm.

D

Not allowing a single item of the damage award to go unchallenged, Magna-Graphics argues that the district court erred in awarding prejudgment interest on the untrebled portion of the award "in view of the fact that the court already had trebled plaintiff's damages." The frivolity of this argument is readily apparent in view of *General Motors Corp. v. Devex Corp.*, 461 U.S. 648, 655, 103 S.Ct. 2058, 2062, 76 L.Ed.2d 211, 217 USPQ 1185, 1188 (1983) and our own decisions. Prejudgment interest should ordinarily be awarded absent some justification for withholding such award, *Leinoff v. Louis Milona & Sons, Inc.*, 726 F.2d 734, 743, 220 USPQ 845, 851 (Fed.Cir.1984); it is to compensate for the delay a patentee experiences in obtaining money he would have received sooner if no infringement had occurred, *Central Soya Co. v. Geo. A. Hormel & Co.*, 723 F.2d 1573, 1578, 220 USPQ 490, 492 (Fed.Cir.1983). On the other hand, damages are trebled as punishment. There is no conflict in the award of both. See *Lam, Inc. v. Johns-Manville Corp.*, 718 F.2d at 1066, 219 USPQ at 670.

V

The judgment of the district court awarding damages and prejudgment interest for Paper Converting's lost profits on two automatic rewinder lines is affirmed. The trebling of damages on the Fort Howard machine is vacated, and remanded for a determination of willfulness. Each party is to bear its own costs of this appeal.

AFFIRMED IN PART AND VACATED IN PART.

NIES, Circuit Judge, dissenting-in-part.

I dissent from the majority's holding that Magna-Graphics' activities in connection with the Fort Howard machine constitute direct infringement of any claim of Paper Converting's patent. The majority's conclusion necessitates giving a meaning to "patented invention" contrary to the definition set forth by the Supreme Court in *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 92 S.Ct. 1700, 32 L.Ed.2d 273 173 USPQ 769 (1972).

The analysis must begin with the statutory language of 35 U.S.C. § 271(a):

Except as otherwise provided in this title, whoever without authority makes, uses or sells any patented invention, within the United States during the term of the patent therefor, infringes the patent. [Emphasis added.]

The majority holds that incomplete assembly of the patented invention is making, testing of subassemblies is using, and a sale of an unassembled machine is selling the patented invention within the meaning of the above section. The majority reasons that a contrary result would emasculate the congressional intent to prevent the making of a patented item during the patent's full term of 17 years. It could be said with equal validity that, given the lead time necessary to make the invention here, the majority effectively extends the patentee's right of exclusivity beyond the statutory 17 years.

I do not see in *Deepsouth* that the Supreme Court's only concern was the extraterritorial operation of our patent laws. The activities of *Deepsouth* under attack were all performed in the United States and were found not to result in direct or contributory infringement of the patent. That the activities of final assembly occurred abroad merely precluded a holding that *Deepsouth*'s activities constituted contributory infringement. Contributory infringement cannot arise without a direct infringement. *Mercoid Corp. v. Mid-Continent Investment Co.*, 320 U.S. 661, 677, 64 S.Ct. 268, 276, 88 L.Ed. 376, 60 USPQ 21, 29 (1944). The situation in *Deepsouth* is exactly comparable to the one at hand. That the activities of final assembly occurred after the patent expired precludes holding *Magna-Graphics* to be a contributory infringer, there being no direct infringement by another to which the charge can be appended.

Thus, we are back to the dispositive direct infringement issue in *Deepsouth*, which is the same as the issue here. What is the meaning of "patented invention" in 35 U.S.C. § 271(a)? The alleged infringer, in each case, made and sold something, but was it the "patented invention"?

The relevant facts in *Deepsouth* were as follows: *Laitram Corp.* held two U.S. patents, which together constituted a commercial shrimp deveining machine. Each patented component was, as in all but the simplest machines, a combination of elements. *Deepsouth* made all of the parts for an infringing machine, assembled them but for two elements, and sold the assembled and unassembled parts as a unit. *Deepsouth* advertised to its customers that final assembly was of no importance and, in fact, required less than an hour. Indeed, the partially assembled equipment and parts were sold at the same price at which *Deepsouth* previously had sold fully assembled machines held to be infringements. Admittedly, its course of conduct was, in the words of the majority here, a "scheme" to avoid infringement. *Deepsouth*'s "scheme" was, however, ultimately successful.

Following precedent of the Second, Third and Seventh Circuits[1], the district court had held that *Deepsouth* could not be prohibited from exporting elements of the patented invention even when those elements could, and predictably would, be combined to form the whole. *Laitram Corp. v. Deepsouth Packing Co., Inc.*, 310 F.Supp. 926, 165 USPQ 147 (E.D.La.1970). The Fifth Circuit, to which the case was appealed, reversed, finding the construction of the statute by the other circuits "artificial" and "technical". In its view, "The Constitutional mandate cannot be limited to just manufacturing and selling

in the United States." Accordingly, the court held "substantial manufacture" to be a sufficient basis for direct infringement. *Laitram Corp. v. Deepsouth Packing Co.*, 443 F.2d 936, 170 USPQ 196 (5th Cir.1971).

In reversing, Justice White wrote:

We cannot endorse the view that the "substantial manufacture of the constituent parts of a machine" constitutes direct infringement when we have so often held that a combination patent protects only against the operable assembly of the whole and not the manufacture of its parts. [Emphasis added.]

406 U.S. at 528, 92 S.Ct. at 1707, 173 USPQ at 773.

Nothing in Justice White's opinion in *Deepsouth* indicates that the concept of an operable assembly is "probably something short of a full and complete assembly," as the majority states. The Court had before it the Fifth Circuit opinion which had analyzed just such less-than-full-assembly situations. Repeatedly, the Court emphasized that the "patented invention" means that all of its claimed elements must be united.

Thus, if the claimed invention comprises the elements A, B, C and D, it is only the combination in its entirety that is protected. The making of the lesser combination A, B and D falls short of direct infringement, even though the missing element C is also supplied by the alleged infringer.

This conclusion follows, in the Court's analysis, from the principles expressed in *Mercoird Corp. v. Minneapolis-Honeywell Regulator Co.*, 320 U.S. 680, 684, 64 S.Ct. 278, 280, 88 L.Ed. 396, 60 USPQ 30, 32 (1944) and other precedent, that "a patent on a combination is a patent on the assembled or functioning whole, not on the separate parts." 406 U.S. at 528, 92 S.Ct. at 1707.

The *Deepsouth* opinion also reiterates the following language from *Radio Corp. of America v. Andrea*, 79 F.2d 626, 628, 27 USPQ 364, 366 (2d Cir.1935):

[The] relationship is the essence of the patent.

... No wrong is done the patentee until the combination is formed. His monopoly does not cover the manufacture or sale of separate elements capable of being, but never actually, associated to form the invention. Only when such association is made is there a direct infringement of his monopoly....

406 U.S. at 529, 92 S.Ct. at 1707, 173 USPQ at 773.

It must also be noted that the Supreme Court discounted *Deepsouth's* sales activity in the following words:

[*Laitram's*] argument that *Deepsouth* sells the machines—based primarily on *Deepsouth's* sales rhetoric and related indicia such as price—cannot carry the day unless it can be shown that *Deepsouth* is selling the "patented invention." The sales question thus resolves itself into the question of manufacture: did *Deepsouth* "make" (and then sell) something cognizable under the patent law as the patented invention, or did it "make" (and then sell) something which fell short of infringement?

406 U.S. at 527, 92 S.Ct. at 1706, 173 USPQ at 773 (footnote omitted).

It is not surprising that *Magna-Graphics'* counsel read *Deepsouth* as permitting the course of conduct condemned here. The majority opinion is no less than a reversal of *Deepsouth*[2]. Regardless of the reasonableness of the alternative interpretation of § 271(a) given by the majority, we are bound by the

Supreme Court's decision. No greater prerogative to modify it accrues to us from a 5-4 vote than from a unanimous decision. Change must be left to Congress, or the Court itself. In *Deepsouth* the extension of patent protection which had been urged was viewed as a matter for a legislative directive:

In sum: the case and statutory law resolves this case against the respondent. When so many courts have so often held what appears so evident—a combination patent can be infringed only by combination—we are not prepared to break the mold and begin anew. And were the matter not so resolved, we would still insist on a clear congressional indication of intent to extend the patent privilege before we could recognize the monopoly here claimed. Such an indication is lacking.

406 U.S. at 532, 92 S.Ct. at 1708, 173 USPQ at 774.

Such indication is still lacking. We cannot assume that the present Court would find reason to depart from *Deepsouth* in the face of congressional inaction over the twelve years since the decision was handed down.[3]

Indeed, the *Deepsouth* decision is not without redeeming virtue. This is one of the few areas of patent law where a bright line can be, and has been, drawn. That consideration in itself has merit. A competitor should be able to look to the patent claims and know whether his activity infringes or not. Here, the majority provides no guidance to industry or the district courts. One cannot tell from the opinion whether testing and sales activity must also accompany substantial assembly, as it appears to hold, or whether simply substantially making the device preparatory to selling after the patent expires would be sufficient. Given the disjunctive language of the statute, no basis appears for "summing up" partial making with the testing of partial assemblies and with sales made by the alleged infringer. Those activities do not, in some nebulous way, supply the missing physical elements of the "patented invention."

The determinative factor in *Deepsouth* was that the alleged infringer had never made, used or sold the "patented invention." Its activities fell short of direct infringement because the court rejected the view that direct infringement required anything less than "the operable assembly of the whole and not the manufacture of its parts." In this case as well, no operable assembly of the whole was ever made by *Magna-Graphics*. If the patented invention was not made, a fortiori, it could not have been used or sold. Thus, there is no direct infringement.[4]

As a final matter, a decision of non-infringement here would not create an "inconsistency" with the decision in *Roche Products, Inc. v. Bolar Pharmaceutical Co.*, 733 F.2d 858, 221 USPQ 937 (Fed.Cir.1984). In *Roche*, the patented invention had been made, albeit not by the alleged infringer, *Bolar*. The only issue was whether *Bolar's* testing of the patented invention for FDA purposes was "use" within § 271(a). The *Roche* decision lends no support to the proposition that testing of components of a patented invention constitutes infringement.

I would, accordingly, reverse.

[1] *Hewitt-Robins Inc. v. Link-Belt Co.*, 371 F.2d 225, 151 USPQ 670 (7th Cir.1966); *Cold Metal Process Co. v. United Engineering & Foundry Co.*, 235 F.2d 224, 110 USPQ 332 (3rd Cir.1956), aff'd on other grounds, 351 U.S. 445, 76 S.Ct. 904, 100 L.Ed. 1311 (1956); *Radio Corp. of America v. Andrea*, 79 F.2d 626, 27 USPQ 364 (2nd Cir.1935), 90 F.2d 612, 34 USPQ 312 (2d Cir.1937).

[2] The district court in this case relied on the doctrine of equivalents to find direct infringement. While that court's position is sound in theory, the facts do not support application of that doctrine here. Contrary to what one would understand from reading the majority opinion, more was required to make the Fort Howard machine operable than affixing final nuts and bolts. Assembly was started on April 26, 1982; substantial problems were encountered requiring changes in some parts; and Fort Howard did not accept the machine until November 1982.

[3] Legislative efforts to overrule *Deepsouth* have been extensive. However, the thrust of proposed legislation has not been directed to changing the meaning of "patented invention." For example, pending H.R. 4526, 98th Congress, 1st Session, provides in relevant part:

(f) Whoever without authority supplies or causes to be supplied in the United States the material components of a patented invention, where such components are uncombined in whole or in part, intending that such components will be combined outside of the United States, and knowing that if such components were combined within the United States the combination would be an infringement of the patent, shall be liable as an infringer.

[4] *Accord, Amstar Corp. v. Envirotech Corp.*, 730 F.2d 1476, 1484, 221 USPQ 649, 655 (Fed.Cir.1984); *Decca Ltd. v. United States*, 640 F.2d 1156, 1168, 209 USPQ 52, 61 (Ct.Cl.1980); *Teledyne McCormick Selph v. United States*, 558 F.2d 1000, 1007-1008, 195 USPQ 261, 267 (Ct.Cl. 1977); *Strumskis v. United States*, 474 F.2d 623, 628, 175 USPQ 243, 246 (Ct.Cl.1973), cert. denied, 414 U.S. 1067, 94 S.Ct. 576, 38 L.Ed.2d 472 (1973).

It appears to me that the "taking" by the government in *Decca* would have occurred at an earlier date had the Court of Claims utilized the standard here. Use by the government of operable components was held in *Decca* not to directly infringe claims which required interconnection of the components.