# United States Court of Appeals,Federal Circuit. Wayne K. PFAFF, Plaintiff/Cross-Appellant, v. WELLS ELECTRONICS, INC., Defendant-Appellant.

# Nos. 96-1150, 96-1187.

# Decided: September 08, 1997

Before ARCHER, Chief Judge, PLAGER, and SCHALL, Circuit Judges.Barry L. Grossman, Banner & Allegretti, Ltd. of Washington, DC, argued for plaintiff/cross-appellant. With him on brief were Pamela I. Banner, Adriana S. Luedke, and Bradley C. Wright. James D. Hall,Baker & Daniels, South Bend, IN, argued for defendant-appellant. With him on brief were David C. Read and Robert D. Null. Of counsel on brief were David R. Melton and Gerard T. Gallagher, Barnes & Thornburg, South Bend, IN.

Wells Electronics, Inc. (Wells) appeals the judgment of the United States District Court for the Northern District of Texas, No. 3:91-CV-1542-H, involving U.S. Patent No. 4,491,377 ('377 patent) owned by Wayne K. Pfaff (Pfaff). The district court held that claims 1 and 6 of the '377 patent are invalid for anticipation, 35 U.S.C. § 102(b) (1994), that claims 7, 10, 11, and 19 are not invalid and that Wells' sockets infringed such claims. Wells appeals the judgment as to infringement and validity. Pfaff cross-appeals the judgment of invalidity as to claims 1 and 6.

We hold that the invention disclosed in the '377 patent was on sale within the meaning of 35 U.S.C. § 102(b) or would have been obvious in view of that sale within the meaning of 35 U.S.C. §§ 102(b) and 103. Accordingly, the judgment of invalidity as to claims 1 and 6 is affirmed on other grounds and the validity judgment as to claims 7, 10, 11, and 19 is reversed.

### BACKGROUND

The '377 patent relates to sockets for testing leadless chip carriers. Claim 1 is representative and reads:

1. Mounting means for a leadless chip carrier comprising:

(a) base support means having first and second oppositely disposed major faces;

(b) a plurality of axially elongated conductive pins passing transversely through said base support means substantially perpendicular to said first and second major faces, the opposed inner edges of the ends of said pins extending from said first major face arranged to define a cavity substantially conforming to at least two oppositely disposed lateral peripheral dimensions of said leadless chip carrier in a plane parallel with said first major face and the inner edges of said pins converging slightly inwardly with distance from said first major face; and

(c) unitary means operable independently of said leadless chip carrier reciprocally moveable axially with respect to said pins and coacting with said opposed inner edges of said pins for uniformly spreading the ends of said pins extending from said first major face to permit the insertion of a leadless chip carrier therebetween.

Figure 2 of the patent shows a sectional view of the socket:

The socket is comprised of three basic elements: a base support 15, a plurality of conductive pins 20, and a spreader 40. The chip carrier is placed in an opening in the spreader 40, which, when depressed, spreads apart the pins 20, by interaction of the lip 43 of the spreader 40 with the pins 20, to allow the carrier to fall into place between the pins 20 without applying any mechanical force to the carrier. When the spreader 40 is released, the pins 20 move back into their original positions, making electrical contact with the carrier and locking it into place. In order to release the carrier, the spreader 40 is depressed, spreading the pins 20 and allowing the carrier to fall out through the opening in the spreader 40 when the socket is inverted.

In November 1980, Texas Instruments (TI) contacted Pfaff and asked him to develop a socket for its carriers. In a later meeting with TI representatives, Pfaff made a sketch of his concept and afterwards made detailed engineering drawings of the socket. Pfaff sent his drawings to a company called Weiss-Aug for customized tooling and production in February or March of 1981. On April 8, 1981, Delta V., a company acting on behalf of TI, issued a purchase order to Pfaff's company, Plastronics, for 30,100 sockets, which were intended for production use. The purchase order confirmed an earlier, verbal order on March 17, 1981. Pfaff filed his patent application on April 19, 1982.

Pfaff subcontracted the Delta V. socket order to Weiss-Aug and received the manufactured sockets from Weiss-Aug in July of 1981. After testing some of the sockets in a mechanical cycling machine that cycled them 72,000 times and finding no noticeable wear, the sockets were shipped to and accepted by TI.

This case is the second time Pfaff has sued Wells for infringement of the '377 patent. The first was appealed to this court and we upheld a finding of noninfringment and vacated the district court's holding that the patent was not invalid. See Pfaff v. Wells Electronic, Inc., 884 F.2d 1399, 12 USPQ2d 1158 (Fed.Cir.1989) (Table).

Pfaff sued again after Wells modified its socket designs. The district court held on summary judgment that Wells' modified designs did not infringe the '377 patent. When that judgment was appealed to this court we reversed and remanded for further proceedings. See Pfaff v. Wells Electronics, Inc., 5 F.3d 514, 28 USPQ2d 1119 (Fed.Cir.1993). On remand, the district court referred the case to a Special Master for a non-jury trial. The Special Master's Findings of Fact and Conclusions of Law were adopted by the district court as its opinion. The court held that claims 1 and 6 were invalid under 35 U.S.C. § 102(b) (1994) as being anticipated by a prior art reference. The court also held the claimed invention was not on sale within the meaning of § 102(b). Finally, the district court held that various models of Wells' sockets infringed the remaining claims. Both parties have appealed.

#### DISCUSSION

#### I. SECTION 102(b) ON-SALE BAR

Wells contends that claims 1, 6, 7, and 10<sup>1</sup> of the '377 patent are invalid because the invention claimed was on sale within the meaning of 35 U.S.C. § 102(b). That section provides that an inventor is not entitled to a patent if "the invention was . on sale in this country more than one year prior to the date of the application for patent in the United States." The ultimate determination of whether an invention was on sale within the meaning of § 102 is a question of law that we review de novo. See Manville Sales Corp. v. Paramount Sys., Inc., 917 F.2d 544, 549, 16 USPQ2d 1587, 1591 (Fed.Cir.1990). We review the factual findings underlying the on-sale determination for clear error. Id. at 549, 917 F.2d 544, 16 USPQ2d at 1591. In this case, there are no facts in dispute, leaving only the legal issue of whether the § 102(b) on-sale bar invalidates the patent. See UMC Electronics Co. v. United States, 816 F.2d 647, 657, 2 USPQ2d 1465, 1472 (Fed.Cir.1987).

The relevant inquiry is whether there was a definite sale or offer for sale of the claimed invention prior to the critical date, defined as one year prior to the U.S. filing date to which the application was entitled. See Envirotech Corp. v. Westech Eng'g Inc., 904 F.2d 1571, 1574, 15 USPQ2d 1230, 1232 (Fed.Cir.1990). The foremost purpose 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." Ferag AG v. Quipp Inc., 45 F.3d 1562, 1567-68, 33 USPQ2d 1512, 1515 (Fed.Cir.1995). Thus, in making the determination as to whether the invention was "on sale," "[a]ll of the circumstances surrounding the sale or offer to sell, including the stage of development of the invention and the nature of the invention, must be considered and weighed against the policies underlying section 102(b).'" Micro Chem., Inc. v. Great Plains Chem. Co., 103 F.3d 1538, 1544, 41 USPQ2d 1238, 1243 (Fed.Cir.1997) (quoting UMC, 816 F.2d at 656, 2 USPQ2d at 1471-72).

The undisputed facts in this case show that the invention claimed in the '377 patent was commercialized prior to the critical date of April 19, 1981. The district court found that a definite verbal and written purchase order for the later patented invention was received before the critical date. In a handwritten

note on one of his engineering diagrams dated February 25, 1981, Pfaff indicated that the first order would be "for 500,000 springs (25,000 sockets)." On April 8, 1981, Pfaff's company received a written purchase order from Delta V. for 30,100 sockets for \$91,155. The purchase order specified the materials to be used and the delivery date, and it noted that the order was a confirmation of a verbal order placed on March 17, 1981. See Buildex Inc. v. Kason Indus., 849 F.2d 1461, 1464, 7 USPQ2d 1325, 1327-28 (Fed.Cir.1988) (holding the existence of a sales contract or the signing of a purchase order is sufficient to demonstrate "on-sale" status).

Additionally, Pfaff acknowledged in his testimony that, as a result of his meetings with TI, he had a "go" situation and that they had a "deal" prior to the critical date. Pfaff further admitted that the arrangement with TI was purely commercial, with no experimentation or additional development involved. See UMC, 816 F.2d at 657, 2 USPQ2d at 1472 ("Countering the prima facie case, UMC offers only the purely technical objection that no complete embodiment of the invention existed at the time of the sale. However, the contract was not a research and development contract, and UMC admits that the offer it made was for profit, not to conduct experimental work."). Thus, there is no issue of experimental use in this case.

Although the invention was commercialized, it had not been reduced to practice at the time of sale because there was no physical embodiment of the invention. It was for this reason alone that the district court did not apply the on-sale bar.

This court has held, however, that reduction to practice is not necessarily a prerequisite to application of the on-sale bar. See UMC, 816 F.2d at 656, 2 USPQ2d at 1471 ("[T]he on-sale bar does not necessarily turn on whether there was or was not a reduction to practice of the claimed invention."); see also Petrolite Corp. v. Baker Hughes, Inc., 96 F.3d 1423, 1427, 40 USPQ2d 1201, 1204 (Fed.Cir.1996) ("[T]he thrust of the on-sale inquiry is whether the inventor thought he had a product which could be and was offered to customers, not whether he could prevail under the technicalities of reduction to practice ." (quoting Paragon Podiatry Laboratory, Inc. v. KLM Laboratories, Inc., 984 F.2d 1182, 1187 n. 5, 25 USPQ2d 1561, 1570 n. 5 (Fed.Cir.1993))).

Indeed, we have expressly rejected the notion that a physical embodiment is always required. See Barmag Barmer Maschinenfabrik AG v. Murata Machinery, Ltd., 731 F.2d 831, 837, 221 USPQ 561, 565 (Fed.Cir.1984). In Barmag, we considered the Second Circuit's on-sale bar test as set out in Timely Products Corp. v. Arron, 523 F.2d 288, 302, 187 USPQ 257, 267-68 (2d Cir.1975), and departed from its restrictive approach. We noted that the Timely Products test was:

that an offer to sell, without the existence of a physical embodiment of what is offered, does not start the running of the time period. It is not difficult to conceive of a situation where, because commercial benefits outside the allowed time have been great, the technical requisite of Timely Products for a physical embodiment, particularly for a simple product, would defeat the statutory policy and we, therefore, do not adopt the Timely Products test as the answer in all cases.

Barmag, 731 F.2d at 837, 221 USPQ at 565. Accordingly, the appropriate question is whether the invention was substantially complete at the time of sale such that there was "reason to expect that it would work for its intended purpose upon completion." Micro Chem., 103 F.3d at 1545, 41 USPQ2d at 1244; see UMC, 816 F.2d at 657, 2 USPQ2d at 1472; see also Robotic Vision Sys., Inc. v. View Eng'g, Inc., 112 F.3d 1163, 1167, 42 USPQ2d 1619, 1623 (Fed.Cir.1997) ("[A] sale or a definite offer to sell a substantially completed invention, with reason to expect that it would work for its intended purpose upon completion, suffices to generate a statutory bar." (quoting Micro Chem., 103 F.3d at 1545, 41 USPQ2d at 1244)).

The undisputed facts show that Pfaff had completed engineering drawings accurately depicting the patented invention prior to the verbal purchase order of March 17, 1981, and the formal written order of April 8, 1981. These detailed drawings showed both precise dimensions and material requirements. According to the district court, these drawings "depict accurately the claimed invention and are very similar to the actual patent drawings used in the ['377] patent."

The only step not fully performed at the time of the sale was the customized tooling for manufacturing the invention. As the undisputed facts show, however, that step had already begun by the time of the sale. Around February or March 1981, Pfaff sent his drawings to Weiss-Aug to prepare customized tooling and thereafter to "turnkey," or produce, the sockets in accordance with his normal business practice of going directly from the drawings to tooling and production without a prototype. This tooling was for production purposes and entailed making a stamping die, injection molds, customized rivets, and automated assembly equipment. Pfaff stated that the tooling process took five to six months in this particular case. The district court found that Weiss-Aug also produced at least one detailed fabrication diagram by March 31, 1981 and that Pfaff received the finished product in July of 1981.

The invention in this case is mechanical and there is no argument that it contains complicated components or involves a complex interaction of parts. The step of finishing the customized tooling was, therefore, routine and not a major step in the completion of an embodiment of the invention. Under all of the circumstances, including the completion of engineering drawings, the ordering of production tooling, and the commencement of fabrication of the tooling necessary to manufacture the invention for a specific customer, it is clear that more than a mere concept was on sale. The substantially completed socket had entered the production phase prior to the critical date and a specific purchase order was being filled.

Even though a prototype of the invention had not been built prior to the TI sale, the district court found that Pfaff was confident, based on his drawings, that this invention would work. Pfaff testified that it was his practice to produce his inventions without building any prototypes and that he had almost always been successful with this approach. Indeed, that Pfaff expected his invention to work for its intended purpose is substantiated by the large sale to TI and the ordering of customized tooling.

Pfaff argues on appeal that the on-sale bar should not apply because no sockets had been tested prior to the critical date to ensure that the device would work. According to Pfaff's testimony, he feared that the pins would act as "a knife cutting through the cap." Given this concern, Pfaff contends that he could not have known that the invention would work prior to the 72,000 cycle test.

Testing, however, is not always necessary for the completion of an embodiment of an invention. See Mahurkar v. C.R. Bard, Inc., 79 F.3d 1572, 1578, 38 USPQ2d 1288, 1291 (Fed.Cir.1996) (noting that "some inventions are so simple and their purpose and efficacy so obvious that their complete construction is sufficient to demonstrate workability"); In re Asahi/America, Inc., 68 F.3d 442, 445, 37 USPQ2d 1204,1206 (Fed.Cir.1995) (same). Moreover, the invention need not "be in a commercially satisfactory stage of development." Scott v. Finney, 34 F.3d 1058, 1061-62, 32 USPQ2d 1115, 1118 (Fed.Cir.1994) (quoting In re Dardick, 496 F.2d 1234, 1238, 181 USPQ 834, 837 (CCPA 1974)).

By relying on the 72,000 cycle test, Pfaff did not show that he had doubts as to whether the socket would work for its intended purpose. The test was a fatigue test, not a functionality test, and only demonstrated that the socket would work repeatedly under intensive use. Since durability was not a claimed requirement of the invention, the fatigue testing is irrelevant to the on-sale bar analysis.

Because durability is not a claimed or inherent aspect of the invention, Pfaff's reliance on Seal-Flex, Inc. v. Athletic Track and Court Construction, 98 F.3d 1318, 40 USPQ2d 1450 (Fed.Cir.1996), is inapposite. There, durability of the track surface was necessary to the efficacy of the invention. In contrast, the durability of the socket is not a requirement to the substantial completion of Pfaff's invention.

Pfaff also cites our decision in Micro Chemical to argue that his invention was not substantially complete. In Micro Chemical, however, a key part of the invention was missing entirely. At the time of the offer for sale, the inventor had made a prototype of a weighing system and a sketch of a mixing system, but he had not "designed the elements for isolating the weighing system" from the mixing system. Micro Chem., 103 F.3d at 1544-45, 41 USPQ2d at 1243. The isolation means was not contained in the drawings or in the prototype of the weighing system. This critical part of the invention had not even been designed.

Pfaff also argues that the innovative nature of the invention weighs against the application of the on-sale bar. Pfaff appears to be suggesting that we should afford greater latitude under the on-sale bar to an

innovative, or pioneer, patent, see generally 4 Donald S. Chisum, Patents § 18.04[2] (1996). Pfaff has not cited any authority or put forth a persuasive reason for making such a differentiation in the on-sale bar context, assuming arguendo that this invention would be considered pioneering.

We have considered, but are not persuaded by, Pfaff's other arguments because we are satisfied that the evidence establishes that Pfaff's invention was substantially complete at least by the time of the precritical date offer to sell and receipt of the purchase order. For these reasons, we conclude that the invention of claims 1, 6, 7, and 10 was on-sale within the meaning of § 102(b) and that these claims are invalid.

II. SECTION 102(b)/103 ON-SALE BAR

As to the remaining claims, Pfaff argues that, even if the invention in claims 1, 6, 7, and 10 was on sale, claims 11 and 19 are distinguishable because these claims contain a barb element which is absent from the engineering diagrams. Claim 19 states:

19. Mounting means for a leadless chip carrier comprising:

(a) a support housing having first and second oppositely disposed major faces;

(b) a plurality of axially elongated contact means mounted within said support housing and extending therethrough with their axes aligned parallel to each other and normal to said first and second major faces, the free ends of said contact means extending from said first major face arranged to define a cavity rectangular in dimensions in a plane substantially parallel with said first major face, the ends of said contact means defining said cavity having edges which incline inwardly toward said cavity in said plane substantially parallel with said first major face and outwardly from said cavity in a second plane substantially parallel with said first major face;

(c) spreader means comprising a substantially rectangular body arranged substantially parallel with said first major face and reciprocally moveable axially with respect to said contact means, said spreader means having a surface inclined with respect to the axes of said contact means and mating with the inclined inner edges of said contact means whereby movement of said spreader means axially with respect to said contact means in a first direction urges said free ends of said contact means outwardly with respect to said cavity; and

(d) barb means projecting inwardly from the inwardly inclined edges of said contact means.

(Emphasis added). Claim 11 depends from claim 7, invalidated above, and adds the limitation that "the inwardly inclined edges of said contact means include an inwardly projecting barb."

The on-sale bar is not limited solely to a sale of, or an offer to sell, a product that anticipates the later patented invention. It also applies if "the subject matter of the sale or offer to sell . would have rendered the claimed invention obvious by its addition to the prior art." UMC, 816 F.2d at 656, 2 USPQ2d at 1472. In effect, what was offered for sale before the critical date becomes "a [prior art] reference under section 103 against the claimed invention." Baker Oil Tools v. Geo Vann, Inc., 828 F.2d 1558, 1563, 4 USPQ2d 1210, 1213 (Fed.Cir.1987). Because of the conjunctive use of sections 102(b) and 103, this bar has been called the § 102(b)/103 bar. See LaBounty Mfg., Inc. v. United States Int'l Trade Comm'n, 958 F.2d 1066, 1071 n. 3, 22 USPQ2d 1025, 1028 n. 3 (Fed.Cir.1992); In re Corcoran, 640 F.2d 1331, 1333, 208 USPQ 867, 869 (CCPA 1981).

Because both on-sale and obviousness determinations are questions of law that we review de novo, see Manville Sales Corp., 917 F.2d at 549, 16 USPQ2d at 1591; B.F. Goodrich Co. v. Aircraft Braking Systems Corp., 72 F.3d 1577, 1582, 37 USPQ2d 1314, 1317 (Fed.Cir.1996), the ultimate determination of obviousness under the § 102(b)/103 bar is necessarily also a question of law subject to de novo review. Cf. Ferag, 45 F.3d at 1566, 33 USPQ2d at 1514; Envirotech, 904 F.2d at 1574, 15 USPQ2d at 1232 (both discussing obviousness under on-sale bar rubric and noting on-sale determination is a question of law). We review the factual determinations underlying the § 102(b)/103 obviousness determination for clear error. See KeyStone Retaining Wall Systems, Inc. v. Westrock, Inc., 997 F.2d 1444, 1451-52, 27 USPQ2d 1297, 1303 (Fed.Cir.1993); cf. Panduit Corp. v. Dennison Mfg. Co., 810 F.2d 1561, 1568-69, 1 USPQ2d 1593, 1597-98 (Fed.Cir.1987); Manville Sales Corp., 917 F.2d at 549, 16 USPQ2d at 1591. A finding of fact is clearly erroneous when, "although there is evidence to support it, the reviewing court is left with the definite and firm conviction that a mistake has been committed." Buildex, 849 F.2d at 1464, 7 USPQ2d at 1328 (citing Anderson v. City of Bessemer City, 470 U.S. 564, 573, 105 S.Ct. 1504, 1511, 84 L.Ed.2d 518 (1985)). In any obviousness determination, the following factors are relevant: the scope and content of the prior art, the differences between the prior art and the claims, the level of ordinary skill in the art at the time of the invention, and objective evidence of nonobviousness. See Graham v. John Deere Co., 383 U.S. 1, 17, 86 S.Ct. 684, 693-94, 15 L.Ed.2d 545 (1966).

Figure 4 from the '377 patent illustrates the barb element (51a) at issue.

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According to the written description, the "barb" is used to "scrape the surface of the lands 11 to remove any oxidation therefrom and thus form good electrical contact with the lands 11 while also acting to retain the leadless chip carrier within the cavity." Col. 5, line 66 to col. 6, line 2. The barb is the only element arguably missing from what was offered for sale.

The district court evaluated the obviousness of the barb element in the context of § 103 and held that the barbs were not taught in the prior art and, thus, were not obvious. In reaching this conclusion, the district court summarily determined that the "AMP references" and the "TO-5 Contactor" reference did not teach the use of barbs.<sup>2</sup> The court, however, failed to evaluate two of the AMP references presented by Wells: U.S. Patent No. 4,262,984, issued to Takahashi (Takahashi) on July 19, 1979, and U.S. Patent No. 3,216,580, issued to Fricker (Fricker) on November 9, 1965. Review of these references convinces us that the district court clearly erred in determining that the barb element was not taught in the prior art.

Takahashi discloses an electric contact terminal member. The terminal member has a temporary holding slot to hold an electrical cable before it is pressed into the conductor slot in which electrical contact is made. The inside surfaces of the terminal "arms 5b have opposed temporary holding projections 5c which project into the cable holding slot 5e, to temporarily hold the cable 4a in the cable holding slot 5e," as shown in Figure 2 from the patent.

FIG.2

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Likewise, Fricker discloses a support device for retaining card-like devices in a base. Fricker notes that "the card element 7 may be a printed circuit carrying card which is inserted into a multiple contact plug in base 5." In order to hold the card in place, "the upper member 2 may project over the top of card 7 in a fully inserted position. In this case, the bottom edge 12 of member 2 would bear against the top edge of card 7," as shown in Figure 4 of the patent.

FIG. 4

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Both pieces of prior art teach using a barb-like element to hold the desired object into place. Additionally, both consider uses in electrical settings, and Fricker particularly notes the use of the barb element to hold the object in a position to maintain electrical contact. Similarly, the barb in the Pfaff patent is used to hold the carrier in place, even though it also scrapes oxidation from the carrier and provides electrical contact. Notwithstanding these additional features, the teachings of Fricker and Takahashi thus provide sufficient motivation to combine the barb-like element in the prior art with what was offered for sale to yield the invention in claims 11 and 19. See In re Kemps, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed.Cir.1996) (noting motivation to combine in prior art need not be identical to that of applicant) (citing In re Dillon, 919 F.2d 688, 693, 16 USPQ2d 1897, 1901 (Fed.Cir.1990) (in banc)).

Unrebutted expert testimony also demonstrates that the motivation to combine the prior art to lock an object in place with barb elements would be provided by the knowledge of one skilled in the art. See Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n. 24, 227 USPQ 657, 667 n. 24 (Fed.Cir.1985) (noting that knowledge of one skilled in the art may provide motivation to combine).

Although the district court determined that the commercial success of the invention supported a finding of nonobvious under § 103, this evidence is insufficient to rebut the clear teachings of Fricker and Takahashi. Further, no evidence suggests that the socket's commercial success was related to the barb element. See Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 1539, 218 USPQ 871, 879 (Fed.Cir.1983) (requiring nexus between merits of invention and evidence of secondary considerations).

Accordingly, we conclude that the invention of claims 11 and 19 would have been obvious in light of the prior art and the socket that was on sale. These claims are, therefore, invalid under 102(b)/103.

## CONCLUSION

Because all of the claims at issue are invalid, we need not reach the other issues raised in the appeal and cross-appeal.

AFFIRMED-IN-PART AND REVERSED-IN-PART.

### FOOTNOTES

1. Because claims 11 and 19 contain a barb element that, as discussed below, arguably was not in the device offered for sale, the validity of these claims depends on whether they would have been obvious in view of the prior art and what was offered for sale.

2. The district court seemingly based its § 103 nonobviousness determination primarily on its view that "[n]o combination of prior art suggested by Wells teaches all of the limitations in claims 11 and 19." In the context of a § 103 obviousness determination, this conclusion may be correct. Here, however, the only element not on sale was the barb.

ARCHER, Chief Judge.