



## Shaw v. E.B. & A.C. Whiting Co.

417 F.2d 1097 (1969) | Cited 35 times | Second Circuit | November 5, 1969

WATERMAN, Circuit Judge:

Plaintiff-appellants (hereafter plaintiff or appellant) appeal from a judgment order entered in the United States District Court for the District of Vermont after a trial before Judge Bernard J. Leddy sitting without jury. The trial judge filed lengthy Findings of Fact from which he concluded that appellant's patent in suit, No. 2,637,893, issued to appellant Gilbert Shaw on May 12, 1953, was invalid for obviousness under 35 U.S.C. § 103 and for lack of novelty under 35 U.S.C. § 101; that, being invalid, the claim of the patent was not infringed by either of two products manufactured by the appellee, E.B. & A.C. Whiting Company (Whiting), "Multilobate" and "Polystar-O." The judgment order also additionally provided that even if the patent should be valid "Multilobate" would not infringe the claim of the patent but that "Polystar-O" would.

Shaw and Polymers, Inc., Shaw's exclusive licensee, appeal from the portion of the judgment order that held the patent invalid and from the portion that held defendant's Multilobate product not to infringe if the patent were later found to be valid. Whiting filed a notice of appeal crossappealing from that portion of the order holding that, if the patent were eventually held to be valid, its product Polystar-O was an infringing product. Appeal was also taken by plaintiff from the trial court's disposition of certain post-trial motions and defendant appealed from the failure to award it reasonable attorneys' fees, but, as will appear hereafter, it is unnecessary to give specific attention to any issue raised by these appeals.

The Shaw invention consists of an artificial filament. These filaments are particularly adapted for use as brush bristles. Shaw's search for such a product began in the mid-1940's in order to provide the market with an artificial filament at a relatively low cost that could compete with the use of natural (animal and vegetable) fibers and bristles in brooms and related products. The primary advantages of a synthetic filament are its durability and the uniformity in size, shape and stiffness between one filament or bristle and another, for filaments from natural sources occur in widely divergent forms, vary in stiffness, and tend to wear more rapidly than the synthetic variety. Artificial filaments had been produced as early as the 1920's, but Shaw wished both to improve upon the qualities of such filaments and to lower the cost of synthetic filament manufacture. In 1947 Shaw found what he was looking for and, after testing his product, he applied for a patent in March, 1949.<sup>1</sup>

### I. The Shaw Filament

The elements of the "manufacture" or article covered by the Shaw patent may be briefly stated: (1)



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The filament is composed of a long chain linear stable thermoplastic polymer. (2) The filament has a uniform cross-sectional shape along its length and has a central portion with webs radiating outwardly at about right angles from the center. The cruciform or Y-shape so created not only gives the filament a high degree of stiffness, but a savings in production cost is realized due to a savings in material because the creation provides a greater surface area for a given amount of polymer. The angular shape is achieved by melt-extruding the filament through a die. (3) The filament is linearly oriented, an orientation in which the major axis of each molecule of polymer lies along the length of the filament. This type of orientation, achieved by stretching or tension-drawing the filament after it has been shaped, imparts tensile strength, resiliency, and resistance to lateral impact. If this particular orientation process is not undertaken a heterogeneous orientation results in which the molecules lie at random generally askew to the major axis of the filament length. A filament so heterogeneously oriented has spots of low lateral impact resistance which may cause breakage when the filament is subjected to brush use.<sup>2</sup>

### II. The Prior Art

In concluding that Shaw's patent is invalid the district court relied primarily upon five references to the prior art. It found that linear orientation of rounded or oval filaments made of a polymer used by Shaw by stretching or tensiondrawing was well known in the art as disclosed in two Carothers patents,<sup>3</sup> the Rugeley patent,<sup>4</sup> the Brubaker patent,<sup>5</sup> and from Shaw's admissions at trial.<sup>6</sup> Two prior art patents, Brubaker and Taylor, reveal that polymer filaments could be given various shapes, such as, for example, star shapes, by passing the filament through a die having an orifice of the desired configuration. The Taylor patent, nevertheless, did not indicate that a die shaped filament could be linearly oriented. The Brubaker patent specifically stated that drawing the filament through the forming die involved compressive forces, thereby necessarily leading to some heterogeneous orientation of the molecules along the length of the filament axis.<sup>7</sup>

### III. Validity

#### A. Novelty

The district court's first ground for holding the Shaw patent invalid is its conclusion that the subject matter of the patent was not novel within the meaning of Section 101, and Section 102(a).<sup>8</sup> This result rested upon the court's findings that all the elements found in the Shaw patent are contained in the prior art patents above discussed and that the Shaw product is not greater than the sum of its parts. However, the fact that each element of a creation sought to be patented is found in the prior art does not negate novelty if the old elements are combined in such a way that as a result of the combining an improved, useful, and more advantageous innovation is obtained. *Grinnell Washing Mach. Co. v. E. E. Johnson Co.*, 247 U.S. 426, 432, 38 S. Ct. 547, 62 L. Ed. 1196 (1918); cf. *Reiner v. I. Leon Co.*, 285 F.2d 501, 503 (2 Cir. 1960).



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The Shaw patent meets the fairly liberal test of Section 101 and Section 102(a) because nowhere in the prior art is the Shaw filament "identically disclosed," *Ling-Temco-Vought, Inc. v. Kollsman Instrument Corp.*, 372 F.2d 263, 267 (2 Cir. 1967), nor is it plain from the prior art references that linear orientation of rounded filaments was functionally equivalent to linear orientation of angular shaped filaments. The fact that prior to Shaw's invention no filament of the shape described by Shaw had been linearly oriented sets Shaw's product apart from the prior art. See *United States v. Adams*, 383 U.S. 39, 48, 86 S. Ct. 708, 15 L. Ed. 2d 572 (1966).<sup>9</sup>

### B. Obviousness

The important issue in this appeal, then, is whether "the differences between the subject matter [of the Shaw invention] \* \* \* and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains \* \* \*." 35 U.S.C. § 103. The ultimate question of obviousness is one of law to be determined after several factual inquiries have been made. As the Supreme Court has recently stated:

[1] the scope and content of the prior art are to be determined; [2] differences between the prior art and the claims at issue are to be ascertained; and [3] the level of ordinary skill in the pertinent art resolved. Against this [factual] background, the obviousness or nonobviousness of the subject matter is determined. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 86 S. Ct. 684, 694, 15 L. Ed. 2d 545 (1966).

The crucial question here is whether in light of the prior art the bringing of linear orientation to a cruciform-shaped filament would be obvious to a person having ordinary skill in the art. In dealing with this question the district court while discussing the Brubaker patent stated:

32 \* \* \* The die drawing process of the [Brubaker] patent involves compressive as well as tension forces \* \* \* while Shaw claims that his patent involves tension forces only. However, Shaw also testified in this regard that, "One would expect the molecules, some of them, to be aligned in the direction of the axis by the tension force. \* \* \*" From this statement, I find that Shaw expected an alignment in the direction of the axis by the tension forces mentioned in his patent \* \* \*. In other words, Shaw did not obtain an unexpected result.

The court then summed up its findings with respect to obviousness by stating:

36. I have seriously considered the scope and content of the prior art \* \* \* and particularly the Rugeley patent \* \* \*, [the Carothers patents] \* \* \*, Brubaker patent \* \* \*, and the Taylor patent \* \* \* set forth in findings 29 to 33, respectively, and have considered the differences and similarity between the prior art and the claim in the Shaw patent and find that there is no material difference between such prior art and the Shaw claim. I have further considered the level of ordinary skill in the pertinent art. From the foregoing, I find that the subject matter of the Shaw patent would be obvious to a person having



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ordinary skill in the art to which the subject matter pertains within the meaning of 35 U.S.C. § 103.

In its conclusions of law the court referred to Graham in holding the Shaw patent invalid. The court quoted an excerpt from the legislative history of § 103 relied upon by Justice Clark in his opinion in that case:

"An invention which has been made, and which is new in the sense that the same thing has not been made before, may still not be patentable if the difference between the new thing and what was known before is not considered sufficiently great to warrant a patent." *Graham v. John Deere Co.*, supra at 14, 86 S. Ct. at 692, quoting from S.Rep. No. 1979, 82d Cong., 2d Sess. (1952); H.R.Rep. No. 1923, 82d Cong., 2d Sess. (1952).

While the above is the extent of the district court's elaboration in support of the holding that the Shaw patent is obvious, it would seem that the court reached its conclusion by reasoning as follows: Given the facts that linear orientation techniques for rounded filaments were well known in the prior art, as disclosed by Carothers and Rugeley and recognized by Brubaker, and that Brubaker disclosed filaments of other than rounded, circular or oval shapes, it would be an obvious step for Shaw to stretch his filaments to achieve linear orientation after they were extruded through a die into the shape desired and, although Brubaker did not take this final step in the production of his filaments, it would seem but a simple and logical advance for one skilled in the art to borrow the stretching techniques disclosed in earlier patents, and therefore the new step taken by Shaw was so obvious as not to justify its patentability.

Of course we are mindful that we may not upset a district judge's findings of fact "unless [the findings are] clearly erroneous." Fed.R.Civ.P. 52(a). Here, in this case, although there may be evidence to support the facts found, we are left upon reviewing the record as a whole "with the definite and firm conviction that a mistake has been committed." *United States v. United States Gypsum Co.*, 333 U.S. 364, 395, 68 S. Ct. 525, 92 L. Ed. 746 (1948). As will be demonstrated, we believe that the trial court failed adequately to resolve the factual inquiries required by Graham, quoted supra, in particular, "the scope and content of the prior art" and "the level of ordinary skill in the pertinent art" by ignoring an abundance of unchallenged uncontroverted evidence in the record which tends to demonstrate that Shaw's patent was not obvious.

The trial below lasted five days. Numerous exhibits were produced, and the testimony of the patentee, Shaw, and that of three expert witnesses was adduced. The trial court relied upon the five prior art patents we have previously discussed and upon a limited portion of Shaw's testimony in determining the factual background against which to resolve the obviousness of the Shaw patent.

As already shown, implicit in the district court's reasoning is the assumption that no material difference was known in the art at the time of Shaw's invention between filaments of a circular nature and filaments of a precise angular shape from which an inference was drawn that orientation



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of one could be achieved as easily as orientation of the other and that men skilled in the art knew or should have known this. The same prior art, however, so relied upon by the court to sustain its conclusion of obviousness, contains uncontroverted evidence that clearly negates the assumption and the inference drawn therefrom.

We return to the Brubaker patent, which postdated all other prior art patents reviewed by the court and which can be viewed as embodying all the relevant teachings which would or would not point the obvious way for Shaw to innovate.

The specifications of the Brubaker patent point out two significant difficulties encountered by that patentee in reaching his discovery: (1) Brubaker found that tension drawing or stretching a circular polymer filament produced a linearly oriented filament of oval shape. In other words, the process of aligning the molecules along the filament axis distorted the original shape. The example recited disclosed a round filament having cross-sectional dimensions of 57 and 58 mils (one thousandth of an inch = 1 mil) after having been die drawn. Stretching or cold (tension) drawing this filament resulted in an oval cross-section of 43 and 62 mils. Brubaker, therefore, utilized the die drawing method to insure that the filament would not lose its shape; the patentee admitted that "die drawn filaments tend to be more uniform both in cross-sectional area and in shape than tension drawn filaments." U.S. Patent No. 2,291,873 issued to Brubaker, August 4, 1942, p. 4, col. 1, ll. 51-53; p. 2, col. 2, ll. 42-54; p. 4, col. 2, ll. 1-7. (2) Brubaker also found that there was limited distortion in the shape of the filament even when a die was used to impart shape (i.e., star) and assigned as a reason therefor the compressive forces at work as the filament was solid-extruded (drawn) through the die. *Id.* p. 4, col. 2, ll. 1-9. The patentee, therefore, admitted that his filament could only "approach being triangular, square, rectangular, oval, star, etc." *Id.* p. 4, col. 1, ll. 60-61 (Emphasis supplied).

Obviously, then, disclosures used by the trial court to negate validity demonstrate that, if the Brubaker patent were taken at face value, Shaw's filament could not be produced. Rather than serving to point the way to innovation, therefore, Brubaker's teachings would tend to discourage one skilled in the art from investigating the methods ultimately used by Shaw to achieve production of an improved polymer filament. As was said by the Supreme Court in *United States v. Adams*, *supra*, 383 U.S. at 52, 86 S. Ct. at 714-715:

We do say, however, that known disadvantages in old devices which would naturally discourage the search for new inventions may be taken into account in determining obviousness.

Here, as in *Adams*, individually old concepts were combined to solve an existing problem in the art, and

Where the invention for which a patent is sought solves a problem which persisted in the art, we must look to the problem as well as to its solution if we are to properly appraise what was done and to evaluate it against what would be obvious to one having the ordinary skills of the art. In re



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Rothermel, 276 F.2d 393, 397, 47 C.C.P.A. 866 (1960).

The district court failed to evaluate the problem posed by the prior art and appears to have relied on the proposition that, as Shaw's solution to the problem seemed a simple one, his filament was an obvious outgrowth. The simplicity of an invention or an improvement thereof is not, however, the test of its obviousness. *Goodyear Tire and Rubber Co. v. Ray-O-Vac Co.*, 321 U.S. 275, 279, 64 S. Ct. 593, 88 L. Ed. 721 (1944). Further, the burden is on the appellee to show facts that would lead to the conclusion that appellant's product was obvious. The mere recital of the known elements in the art does not, without more, invalidate the patent under Section 103.<sup>10</sup> There must appear evidence that the bringing together of these elements would have been obvious. Doubt as to validity, no matter how strong, cannot justify resort to unfounded assumptions or supply deficiencies in the factual background. *Graham v. John Deere Co.*, supra.

Furthermore, it appears that the court below may have used the benefit of hindsight when it stated that "I find that Shaw expected an alignment in the direction of the axis by the tension forces mentioned in his patent \* \* \*. In other words, Shaw did not obtain an unexpected result." The issue, however, is not what the patentee expected to produce, but what a hypothetical person "having ordinary skill in the art" would expect to develop if he had thought about the problem. 35 U.S.C. § 103; *Graham v. John Deere Co.*, supra. In resolving the question of obviousness, the judicial view must not include the knowledge contributed by the patentee; the teachings of his patent are irrelevant when determining what "would have been obvious" to one skilled in the prior art before he created his "manufacture." *Application of Aufhauser*, 55 C.C.P.A. 1477, 399 F.2d 275, 277 (C.C.P.A. 1968); *Application of Warner*, 54 C.C.P.A. 1628, 379 F.2d 1011, 1016 (C.C.P.A. 1967).

Other uncontradicted evidence fortifies our conclusion that Shaw's patent was not obvious. As Judge Learned Hand noted in *Reiner v. I. Leon Co.*, 285 F.2d 501, 503-504 (2 Cir. 1960):

The test laid down is indeed misty enough. It directs us to surmise what was the range of ingenuity of a person "having ordinary skill" in an "art" with which we are totally unfamiliar; and we do not see how such a standard can be applied at all except by recourse to the earlier work in the art, and to the general history of the means available at the time. To judge on our own that this or that new assemblage of old factors was, or was not, "obvious" is to substitute our ignorance for the acquaintance with the subject of those who were familiar with it. There are indeed some signposts: e.g., how long did the need exist; how many tried to find the way; how long did the surrounding and accessory arts disclose the means; how immediately was the invention recognized as an answer by those who used the new variant?

It is curious that the trial court made no mention of the statements, not significantly challenged, of plaintiff's expert witnesses, Drs. Martin Kuehne and Fred Kidd, who corroborated the negative teachings of Brubaker.



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Dr. Kidd, head of the British Brush Manufacturers Research Association when Shaw's filament was first brought to his attention in 1957, testified that he was quite surprised that someone could produce a linearly oriented filament of a precise X-shape because his previous experience had taught that the process of stretching or tension drawing would tend to distort the filament's shape or to round it out.

Dr. Kuehne, a professor at the University of Vermont and an expert in organic chemistry, testified that the Shaw filament posed for him an unexpected result because the stretching process would tend to induce, on the basis of chemical or molecular theory, a loss in filament shape, causing it to become more circular.

Moreover, it is significant that E. I. duPont de Nemours & Company, which owns the Carothers and the Brubaker patents and which may be considered a leader in the plastics field, took out a license under the Shaw patent. Also, Shaw has enjoyed considerable commercial success, and licenses have issued under his patent, in addition to that issued to duPont, to seven domestic and foreign manufacturers, one of which, Celanese Corporation of America, owns the Taylor patent. Furthermore, it does not appear that the Brubaker and Taylor patents, the only prior art references disclosing similar shapes to those produced by Shaw, have met with commercial success or acceptability.

Finally, there is considerable evidence that indicates that the defendant Whiting, having been informed that Shaw's filaments were being purchased and used by several manufacturers, obtained samples of Shaw's products and sought other relevant information in order to develop similar filaments so as to compete in the market heretofore enjoyed by Shaw. It has been said of such conduct:

The imitation of a thing patented by a defendant, who denies invention, has often been regarded, perhaps especially in this circuit, as conclusive evidence of what the defendant thinks of the patent, and persuasive of what the rest of the world ought to think. *Kurtz v. Belle Hat Lining Co.*, 280 F. 277, 281 (2 Cir. 1922).

Accord, *Ling-Temco-Vought, Inc. v. Kollsman Instrument Co.*, 372 F.2d 263, 269 (2 Cir. 1967).

Although these "subtests" or secondary considerations of validity cannot be given talismanic importance in our deliberations, they may be utilized to "guard against hindsight" and "to resist the temptation to read into the prior art the teachings of the invention in issue." *Graham v. John Deere Co.*, 383 U.S. 1, 36, 86 S. Ct. 684, 703, 15 L. Ed. 2d 545 (1966). See also Note, Subtests of "Non-Obviousness": A Non-Technical Approach to Patent Validity, 112 U.Pa.L.Rev. 1169 (1964).<sup>11</sup>

## IV. Infringement



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Appellee Whiting produces two types of filaments which are alleged by Shaw to infringe his patent. The first, "Polystar-O," held by the court to infringe, does not vary in any material respect from the Shaw filament. We agree with the holding of the district court on this issue and therefore affirm that holding.

Whiting's other product, "Multilobate," differs from Shaw's filament in one respect. While Shaw's filament has "at least three flat thin erect webs," Multilobate's cross-sectional shape is nearly round save for three equally spaced indentations which gives the filament a cloverleaf appearance. A precise shape is the essence of the Shaw invention as indicated by the patent claim and by its file wrapper history.<sup>12</sup> The claim cannot now be expanded to incorporate shapes other than those involving "flat, thin, erect webs." See note 2, *supra*. Where the shape is the substance of an invention, forms substantially departing from the shape claimed do not infringe. *Winans v. Denmead*, 56 U.S. (15 Howard) 330, 14 L. Ed. 717 (1854); see *Sanitary Refrigerator Co. v. Winters*, 280 U.S. 30, 50 S. Ct. 9, 74 L. Ed. 147 (1929); cf. *Graham v. John Deere Co.*, *supra* 383 U.S. at 33-34, 86 S. Ct. 684 (1966). Appellant's argument that Whiting's "Multilobate" filament fits this claim description is without merit. We conclude that the trial court's findings in this respect are not "clearly erroneous," and agree with the court below that the "Multilobate" filament is a non-infringing product.

Reversed on the issue of validity, affirmed on the issues of infringement, and remanded to the district court to determine the extent of infringement, and to issue a permanent injunction consistent with this opinion.

IRVING R. KAUFMAN, Circuit Judge (dissenting):

While I find myself in full agreement with my brother Waterman's general discussion of the applicable patent law, I disagree with his ultimate conclusion as to the obviousness, and hence the validity, of Shaw's patent under 35 U.S.C. § 103 (1964). The Act, 35 U.S.C. § 101, authorizes patents on " \* \* \* any new and useful process, machine, manufacture, or composition of matter \* \* \* ." Shaw's patent was for a "manufacture," or in the common parlance, was a product patent, not a process patent. Product patents cover only the article -- here the shaped synthetic bristle -- and not the process, or method by which it is produced. Although a product claim "may, and indeed must, be read upon the specifications," *Musher Foundation v. Alba Trading Co.*, 150 F.2d 885 (2d Cir. 1945) (L. Hand, J.),

" \* \* \* the invention in the case of such a product patent must lie exclusively in the conception of the product, and regardless of any method of its production, though of course the patent must disclose one way by which it can be made. While that imposes a severe standard, it is no severer than it should be, if the monopoly is to extend to the product however made. Unless conception alone is the test, and if the inventor may eke out his right by recourse to the ingenuity involved in any process or the machine, he gains an unfair advantage; for the claims cover the product produced by other machines and processes, to which by hypothesis he has contributed nothing. \* \* \* At times indeed a process



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may leave traces in the product and the difficulty is avoided, but that is seldom or never true of the product of a machine; \* \* \*." *Buono v. Yankee Maid Dress Corporation*, 77 F.2d 274, 279 (2d Cir. 1935) (L. Hand, J.). See also *General Electric Co. v. Wabash Co.*, 304 U.S. 364, 373-375, 58 S. Ct. 899, 82 L. Ed. 1402 (1938).

Applying the test announced in *Buono*, for Shaw to succeed, he must show that the idea of shaping linear filaments to improve stiffness must have been a new "conception," one that would not have been obvious to one skilled in the art. Prior patents seem to me to indicate precisely the contrary. Most damning of all, in my view, is the *Brubaker* patent, which discusses drawing linear polymers through shaping dies and concludes:

"The present invention through the selection of different shape openings in the die makes possible the production of filaments of various forms, for example, filaments which approach being triangular, square, rectangular, oval, star, etc. \* \* \* Bristles having a star shaped cross-section have better stiffness than those having the same cross-sectional area in the form of a circle." [Emphasis added.]

I find the *Brubaker* patent conclusive evidence that the product Shaw patented -- a shaped bristle -- was obvious even from a cursory examination of the prior art. The point is not that creating such a product was not difficult, or that it did not involve some ingenuity in devising a process; it is that devising the product itself was obvious. The law is clearly different where a process patent is involved; but that is not this case.

I would affirm on the ground of obviousness.

1. Having limited facilities to test his product in 1947, Shaw requested the research department of The Fuller Brush Company to fabricate a broom using the newly created filaments as bristles. Fuller Brush consequently made several sample brooms and forwarded one of them to Shaw. Although it appears that the Fuller Brush people kept a broom for themselves, they did so for testing purposes only and they informed Shaw of their findings as to weight savings and the feasibility of using the filaments in brooms. The broom forwarded to Shaw was used to sweep up around Shaw's plant in Vermont for over a year to test the performance and durability of the filaments. Appellee claims that these facts demonstrate Shaw's invention was in "public use \* \* \* more than one year prior to the date of the application for patent" and, therefore, not entitled to be patented. 35 U.S.C. § 102(b). There is no evidence that Shaw submitted his product to Fuller Brush as an inducement to purchase the filaments, nor was there any disclosure of the process by which the filaments were made. The district court correctly found that the evidence demonstrated that Shaw's product was not in public use at any time prior to the date of the application for the patent. Use of an invention primarily for experimental purposes is not public use. *City of Elizabeth v. American Nicholson Pavement Co.*, 97 U.S. 126, 134, 24 L. Ed. 1000 (1878); *Robine v. Apco, Inc.*, 386 F.2d 267, 269 (2 Cir. 1967); *Aerovox Corp. v. Polymet Mfg. Corp.*, 67 F.2d 860, 862 (2 Cir. 1933); *Sperry Rand Corp. v. Bell Telephone Laboratories, Inc.*, 208 F. Supp. 598, 603-604 (SDNY 1962).

2. The Shaw patent claim disclosing his product states: A filament of substantially uniform cross-section throughout its



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length which is particularly adapted for use as a brush bristle, said filament being formed from a long chain linear oriented stable thermoplastic polymer, said cross-section comprising at least three flat, thin, erect webs radiating at about equal angles from each other from a small center portion having a cross-sectional dimension of about the order of the thickness of such webs, whereby a high degree of stiffness and a great amount of surface is obtained with a minimum of polymer. For a diagram of Shaw's filament see Appendix to this opinion.

3. The district court found in relevant part: 30. Carothers patent No. 2071250 \*\*\* was not cited by the examiner in the Shaw patent. It was issued February 16, 1937, and relates to the preparation of long chain linear super polymers having unusual and valuable properties and more particularly relates to the production of fibers from synthetic materials \*\*\*. The patent defines linear polymers as "combination whose molecules are long chains built up from repeating units." \*\*\* It discloses a high degree of orientation along the fiber axis \*\*\*. The orientation is caused by stretching \*\*\*. The patent discloses long chain linear oriented thermoplastic polymers that may be spun or extruded from solution or from the molten state \*\*\*. The patent discloses annealing. The only thing not disclosed is a specific shape with a cross-section \*\*\*. 31. Carothers patent No. 2071251 \*\*\* cited by the examiner in the Shaw patent was issued February 16, 1937. It relates to preparation of a long chain linear thermoplastic polymer and the production of filaments or fibers from such material. It discloses \*\*\* the concept of a high degree of orientation along the fiber axis by cold drawing, that is by stretching \*\*\*. It discloses that filament of the invention may be spun from solution or from the molten state by both dry and wet spinning.

4. The court found in pertinent part: 29. The Rugeley patent No. 2161766 \*\*\* cited by the examiner in the Shaw patent was issued June 6, 1939. It deals with the production of synthetic fibers \*\*\*. The materials used in this invention are linear, long chain thermoplastic polymers \*\*\*. Rugeley also mentions stretching of the filaments and while he does not mention that such stretching will cause orientation, this effect of stretching on thermoplastic polymers was known at the time. See Carothers patent No. 2071250 [note 3 supra] \*\*\*. The stretching operation is important because it increases the tensile strength and elasticity of the fibers.

5. The court found in part: 32. Brubaker patent No. 2291873 \*\*\* was not cited by the examiner. It was issued August 4, 1942, and relates to a process for drawing long chain linear thermoplastic polymer filaments in the solid state into oriented filament by passing the filament through a rigid die having an orifice of smaller cross-sectional areas than the original filament. It applies specifically to materials disclosed in Carothers patents [note 3 supra] \*\*\* and recognizes that long chain linear thermoplastic filaments may be stretched or "cold drawn" and that such orientation would be along the fiber axis \*\*\*. The die drawing process of the patent [necessary to impart a specific shape] involves compressive as well as tension forces \*\*\*, while Shaw claims that his patent involves tension forces only \*\*\*.

6. Shaw admitted at trial that he was aware prior to his invention that polymer materials of the type used in his filament had been linearly oriented.

7. The court found in relevant part: 32. \*\*\* [The Brubaker] invention has as an object new and improved methods and apparatus for drawing filaments capable of undergoing permanent elongation. A further object is the manufacture of synthetic linear polyimide filaments which have a high degree of toughness, resiliency, transparency and uniformity and which have a cross-section of pre-determined shape \*\*\*. By the use of different shape openings in the die, various



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cross-sectional forms can be made, including square, oval, star and so forth \* \* \*. It recognizes that filaments having star shaped cross-sections have better stiffness than those having a circular cross-sectional area \* \* \*. 33. Taylor patent 2041798 \* \* \* was not cited by the examiner in the Shaw patent. This patent was issued May 26, 1936, and relates to the production of artificial filaments of large cross-section from a number of artificial filaments of small cross-section. The materials used in the invention may be thermoplastic. The patent discloses a stretching operation of the filament and, while orientation was not specifically mentioned, it was generally known in the art at that time that stretching would cause orientation. It further discloses that the filaments can be made in a variety of cross-sections including cruciform and may have "substantially uniform cross-section," \* \* \* by drawing through a die having an orifice of the proper shape.

8. 35 U.S.C. § 101 provides in pertinent part: Whoever invents or discovers any new and useful \* \* \* manufacture \* \* \*, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title. 35 U.S.C. § 102 contains the following condition: A person shall be entitled to a patent unless -- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent \* \* \*.

9. First, in a case such as this, it is necessary to isolate the essential differences between the prior art and the subject matter of the claim in issue. This inquiry was satisfied by the court below. A look at the findings, in relevant part, relating to the Brubaker patent, the invention most resembling the Shaw product, and relied upon primarily by the appellee for proving invalidity, will demonstrate wherein this essential difference lies. The court found: "The die drawing process of the [Brubaker] patent involves compressive as well as tension forces \* \* \* while Shaw claims that his patent involves tension forces only." (See note 5 supra). The difference between the Shaw product and that of Brubaker, then, is one of orientation, the former being linearly oriented by tension forces alone, while the latter involves some heterogeneous orientation because of the compressive forces involved by extruding the filament in a solid state through a shaping die. Shaw had discovered that stretching the filament already shaped by melt-extruding the polymer through a die eliminated heterogeneous orientation. In the final analysis, Shaw had produced an improved filament which is better adapted for use in brushes or brooms than the filament that could be produced by following the Brubaker process. The Taylor patent fails to disclose linear orientation of die drawn filaments, which would involve compressive forces as disclosed by Brubaker, while the other patents were concerned with producing linearly oriented circular or oval filaments and did not pretend to foreshadow the creation of filaments having cruciform or Y-shapes.

10. The appellee contends that because the patent examiner did not cite the Brubaker and Taylor patents that the trial court considered, the presumption that a patent is valid cannot operate. While we do not quarrel with this as a general proposition of law, e.g., *Aerotec Industries of Calif. v. Pacific Scientific Co.*, 381 F.2d 795, 803-804 (9 Cir. 1967), the Brubaker patent, as we have shown, clearly leads away from the obviousness of the Shaw product. The Taylor patent, which antedates the Brubaker invention, reveals a more remote and complicated means of producing shaped filaments, and the use of a secondary die would also involve the compressive forces found by Brubaker. In any event, although the patent was not cited by the examiner, it appears that Shaw brought the Taylor patent to the examiner's attention during the file wrapper prosecution of Shaw's invention.

11. Whiting's final contention, rejected by the district court, that the Shaw claim contains "new matter" not found in his specifications merits little discussion. 35 U.S.C. §§ 112, 132. Phraseology in a claim need not be precisely paralleled in the



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specifications explaining the invention if the clear import of the meaning of language in the claim is found in the specification disclosures. *A. S. Boyle Co. v. Harris-Thomas Co.*, 18 F. Supp. 177, 181 (D.Mass.1937). There is ample support in the patent specifications for the terms of the Shaw claim.

12. The Shaw claim was not accepted by the Patent Office until, among other changes in the submission, specific limitations were placed upon the filament's shape.

