# UNITED CARBON CO. ET AL. *v.* BINNEY & SMITH CO.

CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE FOURTH CIRCUIT.

No. 71. Argued November 13, 1942.—Decided December 7, 1942.

1. Product claims of Patent No. 1,889,429, to Weigand and Venuto, "1. Substantially pure carbon black in the form of commercially uniform, comparatively small, rounded, smooth aggregates having a spongy or porous interior. 2. As an article of manufacture, a pellet of approximately one-sixteenth of an inch in diameter and formed of a porous mass of substantially pure carbon black," *held,* bad for indefiniteness. P. 232.
2. A patentee may not broaden his claims by describing the product in terms of function. P. 234.
3. An invention must be capable of accurate definition, and it must be accurately defined, to be patentable. P. 237.

125 F. 2d 255, 126 F. 2d 3, reversed.

CERTIORARI, 316 U. S. 657, to review the reversal of a judgment, 37 F. Supp. 779, dismissing a suit for infringement of a patent.

*Mr. Hugh M. Morris,* with whom *Messrs. George P. Dike, Arthur M. Smith,* and *Osman E. Swartz* were on the brief, for petitioners.

*Mr. Dean S. Edmonds,* with whom *Mr. William H. Davis* was on the brief, for respondent.

*Mr. Edward F. McClennen* filed a brief on behalf of Godfrey L. Cabot, Inc., as *amicus curiae,* urging reversal.

MR. JUSTICE JACKSON delivered the opinion of the Court.

Respondent sued for infringement of Patent No. 1,889,429, issued to Weigand and Venuto, relating to carbon black in aggregated form and a process for its conversion

to that form. Its complaint was particularized to apply only to claims 1 and 2 of the patent, which are product claims and not process claims. The District Court found these claims invalid as lacking novelty and invention and because they failed to define the product asserted to have been invented in such clear, definite, and exact terms as required by patent law. It also found no infringement. 37 F. Supp. 779. The Circuit Court of Appeals held to the contrary on each of these propositions and reversed. 125 F. 2d 255. The importance of the questions in the case prompted us to grant certiorari. 316 U. S. 657.

Carbon black has been manufactured from natural gas since the 1870's. At present the most extensive of its many uses is as a binder in automobile tires.[1] The particles of carbon black in its original form are extremely fine and dispersible. They are smaller than the length of a light wave, having a diameter of about one-millionth of an inch. One pound of them is said to present surfaces sufficient to cover 12 or 13 acres. Unprocessed carbon black weighs but ten pounds or less per cubic foot.

The fineness and dispersibility of the substance causes it to raise in clouds of dust when handled, with consequent losses, discomfort to workmen, and difficulties in manufacturing processes. Since 1915, when carbon black first came to be widely used in the manufacture of rubber, many attempts have been made to cope with the dust problem. In many cases, mixing rooms were segregated at great expense from other parts of rubber factories, and the mills where the carbon black was mixed into the rubber were enclosed to confine the clouds of dust.

Efforts were made to prevent as well as to control the dust. Compressing the carbon black to force out the

[1] Carbon black is also used as an ingredient in various rubber, wax and resin compositions, phonograph records, paints and lacquers, printer's ink, and carbon paper.

air and increase its density met with some, but only indifferent, success. Attempts were made to prevent dust by the use of binders in the carbon black to make the particles adhere. These were not satisfactory, since the binders were unwanted and sometimes injurious substances and, at best, foreign matter to rubber formulas. Wetting and drying the carbon black also proved unsatisfactory, since this caused the particles to adhere in such manner that the aggregate product was not sufficiently friable (i. e., breakable) and dispersible when mixed with other substances.

Weigand and Venuto experimented extensively, and the patent in litigation is the outcome. They mixed carbon black with a liquid such as water; displaced the water with another liquid, such as gasoline, which was substantially immiscible with the first and had a greater ability to wet the carbon particles; agitated the mixture until the water was substantially free from carbon; and finally removed the gasoline by evaporation. As it apparently must in order to assert invention and infringement, respondent argues that Weigand and Venuto solved the problem of carbon black dust by a product consisting of carbon black aggregates formed without the use of any binder, sufficiently hard and flowable to prevent the formation of dust, yet sufficiently friable and dispersible for use as a component in the manufacture of rubber and other products.

Manufacture was undertaken, one Glaxner being employed to put into use the process taught by this patent. He soon bettered his instruction by devising a simpler and much less expensive process employing but one liquid. His process was the subject of another patent,[2] and at once superseded that of the patent in suit, which thereupon became obsolete. Several other processes to achieve

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[2] Glaxner, Re. No. 21,379.

very similar results, including those used by the petitioner, have also been developed and patented.[3] Commercial success of respondent's process was short-lived, and the really impressive commercial success has been achieved since the development of the Glaxner process.[4]

The product claims which respondent says the petitioner's product infringed, regardless of the process by which it was made, read as follows: "1. Sustantially (*sic*) pure carbon black in the form of commercially uniform, comparatively small, rounded, smooth aggregates having a spongy or porous interior. 2. As an article of manufacture, a pellet of approximately one-sixteenth of an inch in

[3] Billings & Offutt, Re. No. 19,750; Nos. 2,039,766, 2,120,540, 2,120,541; Price, No. 2,127,137; Heller & Snow, No. 2,131,686; Offutt, No. 2,134,950; Grote, Re. No. 21,390.

[4] Commercial success may be gauged by reference to the following statistics on the sales of pounds of carbon black aggregates:

| *Year* | *Sales by respondent* | *Sales by petitioner* | | | *Sales by Cabot Co. "Cabot" process* |
|---|---|---|---|---|---|
| | | *"Extrusion" process** | *"Sayre" process†* | *"Cabot" process‡* | |
| 1929 | 20,000 | | | | |
| 1930 | 164,000 | | | | |
| 1931 | 194,000 | (Total gross sales price, about $2,000.) | | | |
| 1932 | 281,000 | (In this year the Weigand and Venuto process was superseded by the Glaxner process, which made possible the elimination of a price premium.) | | | |
| 1933 | 800,000 | | | | 8,000,000 |
| 1934 | 3,300,000 | 2,000 | | | 23,000,000 |
| 1935 | 15,000,000 | 84,875 | | 3,656,294 | 39,000,000 |
| 1936 | 30,000,000 | 7,031,000 | | 18,135,756 | 62,000,000 |
| 1937 | 44,000,000 | 26,205,000 | 680,363 | 11,928,742 | 58,000,000 |
| 1938 | 53,000,000 | 29,858,000 | 3,747,538 | 11,298,887 | 45,000,000 |
| 1939 | 97,000,000 | 48,578,000 | 17,752,439 | 11,533,200 | 73,000,000 |

*In this process, carbon black mixed with water is forced through small apertures, dried, and broken into short cylinders.

†This process, like the Glaxner process, employs but one liquid, water, and agitation.

‡This is a "dry" process, employing only agitation to cause the particles of carbon black to adhere. It is the subject of a number of patents, the first of which was applied for by Billings and Offutt on July 18, 1932 and issued as No. 2,120,540. Manufacture is under license of the Cabot Company, patent owner.

diameter and formed of a porous mass of substantially pure carbon black."

Section 4888 of the Revised Statutes, 35 U. S. C. § 33, requires that the applicant for a patent "shall particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery." As the Court recently stated in *General Electric Co.* v. *Wabash Corp.*, 304 U. S. 364, 369:

"Patents, whether basic or for improvements, must comply accurately and precisely with the statutory requirements as to claims of invention or discovery. The limits of a patent must be known for the protection of the patentee, the encouragement of the inventive genius of others and the assurance that the subject of the patent will be dedicated ultimately to the public. The statute seeks to guard against unreasonable advantages to the patentee and disadvantages to others arising from uncertainty as to their rights. The inventor must 'inform the public during the life of the patent of the limits of the monopoly asserted, so that it may be known which features may be safely used or manufactured without a license and which may not.' The claims 'measure the invention.' . . . In a limited field the variant must be clearly defined."

The District Court found that the claims did not meet these requirements, and the Circuit Court of Appeals held that they did. Much testimony was directed to this question at the trial, and it has been discussed in the briefs and argument in this Court. Petitioner seeks reversal on the grounds of anticipation and non-infringement. The scope and sufficiency of the claims in suit necessarily present themselves as preliminary problems in the resolution of these ultimate issues. The courts in determining the questions of invention and infringement brought to them by respondent, no less than the parties-litigant, need and may insist upon the precision enjoined by the statute.

To sustain claims so indefinite as not to give the notice required by the statute would be in direct contravention of the public interest which Congress therein recognized and sought to protect. Cf. *Muncie Gear Works* v. *Outboard, Marine & Mfg. Co.*, 315 U. S. 759.

Here, as in many other cases, it is difficult for persons not skilled in the art to measure the inclusions or to appreciate the distinctions which may exist in the words of a claim when read in the context of the art itself. The clearest exposition of the significance which the terms employed in the claims had for those skilled in the art was given by the testimony of Weigand, one of the patentees, whom respondent called as its witness. Weigand was employed as Director of Research of the Columbian Carbon Company, whose stock respondent owned, and for whom respondent acted as sole selling agent. His testimony in this respect was given principally upon cross-examination, but it was in no wise impeached or contradicted, and is borne out by that of other witnesses. From it we learn that "substantially pure" refers, not to freedom from ash and other impurities, but rather to freedom from binders; "commercially uniform" means only the degree of uniformity demanded by buyers; "comparatively small" is not shown to add anything to the claims, for nowhere are we advised what standard is intended for comparisons; "spongy" and "porous" are synonymous, and relate to the density and gas content of aggregates of carbon black. Although sponginess or porosity is not a necessary attribute of a friable substance, it does contribute to the friability of aggregates of carbon black. It is of value only in that regard. A spongy or porous aggregate of carbon black may be so friable as to permit of the formation of dust; and, on the other hand, it is conceivable that it might not be sufficiently friable to mix satisfactorily with other substances such as those used in the manufacture of rubber products. The correct degree of friability can be ascer-

tained only by testing the performance of the product in actual processes of manufacture of products of which carbon black is a component. A "pellet" of carbon black is "a spheroidal shaped aggregate that has substance and strength to it." For "strength" "we have this rough and ready test: does it survive under gentle rubbing of the fingers. I would not say that is an adequate test to predicate rubber behavior on, but it is a rough and ready test"; and if it responds to that test it is a pellet within the meaning of the claim. Finally, what on first impression appears to be reasonable certainty of dimension disappears when we learn that "approximately one-sixteenth of an inch in diameter" includes a variation from approximately 1/4th to 1/100th of an inch.

So read, the claims are but inaccurate suggestions of the functions of the product, and fall afoul of the rule that a patentee may not broaden his claims by describing the product in terms of function. *Holland Furniture Co.* v. *Perkins Glue Co.*, 277 U. S. 245, 256–258; *General Electric Co.* v. *Wabash Corp., supra,* at 371–372.

Respondent urges that the claims must be read in the light of the patent specification,[5] and that as so read they are sufficiently definite. Assuming the propriety of this

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[5] This states in pertinent part that:

"The main object of our invention is to secure carbon black having the desired dispersive properties, greater density, freedom from dust, freedom from gritty particles, less absorbed or occluded gases, reduced oil absorption than the ordinary powder form, and capable of considerable handling without crushing or dusting.

. . . . . .

"This process, if carried out under certain conditions, causes the carbon black to form into pellets which are hard enough to stand any ordinary shipment or handling without dusting, flying or breaking down, and which at the same time are easily crushed by moderate pressure, as between the fingers or by the pressures commonly employed in the rolls of rubber compounding machinery, printer's ink mixers and the like. The crushed particles have substantially their

method of construction, cf. *General Electric Co.* v. *Wabash Corp., supra,* at 373–375, it does not have the effect

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original softness and the material disperses freely without leaving any particles of undispersed carbon in the material.

"While the pellet form is a very convenient form of the carbon black, the shape of the particles is not the most important characteristic of this novel carbon black.

. . . . .

"The pellets are very porous, of substantially spherical or globular form, have a smooth somewhat lustrous outer surface which is not easily broken by handling, are more compact than untreated carbon, are fragile under light pressure, and may be easily reduced to soft minute particles which cannot be told from the original particles except that possibly they have a more unctuous feel. They somewhat resemble lead shot and may be rolled in the hand without dirtying or dusting. Apparently the outer surface portion or shell of each pellet is slightly more compact than the inner part, but still porous.

"In shipping or storing, we find that approximately twice the number of pounds of these pellets can be placed in a container of a given size than is the case with the untreated carbon black. Thus, expense is reduced for shipment or storage.

. . . . .

"There are various factors which enter into the process and these may be varied to get the pellets harder or softer or larger or smaller. Among these factors are the thickness of the paste, the amount of gasoline used, the adding of the gasoline in bulk or a little at a time, speed of agitation, temperature, type of gasoline used, and character of the carbon black.

. . . . .

"If small pellets are desired, a lesser amount of gasoline or other liquid should be used in respect to the amount of water and carbon, and greater agitation should be employed. To secure large pellets, we use a larger amount of gasoline and slower agitation. In practice, we do not consider a size larger than one-quarter of an inch desirable. There are many kinds, grades or varieties of carbon black and often identification of the particular kind or grade is difficult. With our improved process the different kinds or grades may be made into pellets of different sizes so that identification is facilitated, for instance, very small pellets may be made for printer's ink and larger ones for rubber, etc."

claimed, for the description in the specification is itself almost entirely in terms of function. It is therefore unnecessary to consider whether the rejection of certain claims [6] by the Patent Office might in turn deprive the specification of any curative effect in this regard. Cf. *Schriber-Schroth Co.* v. *Cleveland Trust Co.*, 311 U. S. 211; *Exhibit Supply Co.* v. *Ace Patents Corp.*, 315 U. S. 126.

The statutory requirement of particularity and distinctness in claims is met only when they clearly distinguish what is claimed from what went before in the art and clearly circumscribe what is foreclosed from future enterprise. A zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement claims would discourage invention only a little less than unequivocal foreclosure of the field. Moreover, the claims must be reasonably clear-cut to enable courts to determine whether novelty and invention are genuine. Congress has provided that a patent may be awarded only for a new and useful manufacture "not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof." R. S.

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[6] To meet objections of the examiner, the following product claims were withdrawn in course of prosecution of the application:

"4. A pellet formed of (substantially pure)* soft carbon black particles, the pellet being sufficiently hard to withstand ordinary shipment or handling, but readily breaking down to a fine state of subdivision upon the application of slight pressure.

"8. Soft carbon black particles cohering in small masses of substantially uniform size and having smooth outer surfaces.

"2. Carbon black in the form of pellets of sponge-like or porous structure.

"7. A carbon black pellet formed of soft carbon black, the pellet having sufficient hardness to withstand ordinary shipment or handling without dusting, but sufficiently fragile to permit reduction to the original fine state of subdivision upon the application of light pressure."

*Added by amendment.

§ 4886, 35 U. S. C. § 31. While we do not find it necessary to consider questions of novelty and invention, in the view we take of the claims in suit, a mere reading of prior art patents shows how, if they are read with the liberality and inclusiveness claimed for those in suit, they describe products, if not identical, at least of confusing similarity.[7] Whether the vagueness of the claim has its source in the language employed or in the somewhat indeterminate character of the advance claimed to have been made in the art is not material. An invention must be capable of accurate definition, and it must be accurately defined, to be patentable. Cf. *General Electric Co.* v. *Wabash Corp., supra,* at 372–373.

We are of opinion that the claims in litigation are bad for indefiniteness, and have no occasion to consider questions of novelty, invention, and infringement. The judgment below is

*Reversed.*

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[7] The prior Knowlton and Hoffman patent, No. 1,286,024, stated in the specification that "Instead of using the lampblack in its natural condition, we prepare and treat the fine powder so as to cause its concretion into friable grains or small lumps, dry and substantially free from dust, and in this form incorporate it with the rubber on the roller mill . . . the friability of the lumps or grains permitting a uniform distribution of the filler throughout the rubber." Claim No. 7 of this patent is: "The method of compounding rubber with lampblack which consists in mixing the lampblack with water and a binder, producing a granular condition, evaporating the water, and incorporating the dry, granular lampblack with rubber on a heated mixing mill."

Claim No. 10 of the prior Coffin and Keen patent, No. 1,561,971, is: "As a new article of manufacture, dried pulverulent material in the form of very small individually dried friable globular masses composed of lightly cohering particles of the material."