

are reversed and remanded to the District Court for proceedings in conformity with this opinion.

Reversed.

MR. JUSTICE CARDOZO and MR. JUSTICE REED took no part in the consideration or decision of these cases.

GENERAL ELECTRIC CO. *v.* WABASH APPLIANCE
CORP. ET AL.

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

No. 453. Argued March 4, 7, 1938.—Decided May 16, 1938.

1. Product claims 25–27, of Patent No. 1,410,499, to Pacz, for a filament for electric incandescent lamps or other devices, composed substantially of tungsten and made up mainly of a number of comparatively large grains of such size and contour as to prevent substantial sagging and offsetting during a normal or commercially useful life for such a lamp or other device, *held* void for want of a sufficiently definite disclosure. R. S. § 4888; 35 U. S. C. § 33. P. 368.
2. Claimed inventions, improvements and discoveries, turning on points so refined as the granular structure of products, require precise descriptions of the new characteristic for which protection is sought. In a limited field the variant must be clearly defined. P. 369.
3. A patentee may not broaden his product claims by describing the product in terms of function. P. 370.
4. A limited use of terms of effect or result, which accurately define the essential qualities of a product to one skilled in the art, may in some instances be permissible and even desirable, but a characteristic essential to novelty may not be distinguished from the old art solely by its tendency to remedy the problems in the art met by the patent. P. 371.
5. The difficulty of making adequate description may have some bearing on the sufficiency of the description attempted, but it can not justify a claim describing nothing new except perhaps in functional terms. P. 372.

6. A patentee who does not distinguish his product from what is old except by reference, express or constructive, to the process by which he produced it, can not secure a monopoly on the product by whatever means produced. P. 373.
 7. The product claims in question, which seek to monopolize the product however created, may not be saved by a limitation to products made in accordance with the processes set out in the specification. P. 374.
- 91 F. 2d 904, affirmed.

CERTIORARI, 302 U. S. 676, to review the reversal of a decree for injunction and accounting in a patent infringement suit.

Mr. Merrell E. Clark, with whom *Messrs. Hubert Howson* and *Alexander C. Neave* were on the brief, for petitioner.

Mr. Samuel E. Darby, Jr., with whom *Mr. Paul Kolisch* was on the brief, for respondents.

MR. JUSTICE REED delivered the opinion of the Court.

Petitioner, General Electric Company, brought this patent infringement suit based on Pacz Patent No. 1,410,499, relating to a tungsten filament for incandescent lamps. The patent, issued March 21, 1922, on an application filed February 20, 1917, contains process and product claims; only the latter are here involved. The District Court for Eastern New York held claims 25, 26 and 27 valid and infringed, and gave petitioner a decree for an injunction and accounting. 17 F. Supp. 901. The Court of Appeals for the Second Circuit held that petitioner's product was anticipated by filaments produced under the teachings of the Coolidge Patent No. 1,082,933, and reversed with directions to dismiss the bill of complaint. 91 F. 2d 904. This decision conflicted with that handed down by the Court of Appeals for the Ninth Circuit, *Anraku v. General Electric Co.*, 80 F. 2d 958, which held

the same claims valid and infringed. To resolve the conflict, this Court granted certiorari.

In incandescent lamps, the tungsten filament, through which the electric current passes, grows more luminous than the carbon filament of the early days of the art. There were faults of "offsetting" and "sagging," however, affecting the efficiency of the first tungsten filaments. "Offsetting" occurs when, during heating in the use of the lamp, the filament forms crystals which extend their boundaries across the entire diameter of the filament, substantially perpendicular to its axis. The crystals in the filament thus come to have an appearance, somewhat analogous to the joints in a bamboo rod. Lateral slipping of the crystals reduces the cross-sectional area at the point of contact of the crystals with the result that the temperature at that point is increased, thus hastening the burnout, and the filament is weakened. "Sagging" is a change of position by the filament during incandescence. It elongates and thus is forced out of the plane it occupied between fixed supports. Sagging has many objections. The sagging filament may touch the glass and end the life of the lamp. In gas-filled lamps, when sagging causes the coils to spread apart, the gas flows in between the coils and unduly cools the filament. Combatting sagging by additional supports is also said to cool the filament, and reduce electrical efficiency.

Pacz undertook to remedy these faults. He carried out many experiments, and his 218th effort, made while he was in the employ of petitioner company, yielded the discovery disclosed by the patent in suit. The specification asserts that by means of his invention "the sagging is substantially eliminated and 'offsetting' of the filament is substantially prevented, during a normal or commercially useful life of the lamp." He brings "into intimate

association with tungsten a material [an alkaline silicate] which will have the desired influence upon the grain growth of the metal." The specification continues as follows:

"When the metal reaches the temperature at which extensive grain growth would ordinarily take place, the presence of this material intimately associated with the tungsten particles has a marked effect on the shape and size of the tungsten grains. The ingot of tungsten thus produced, whether it be due to the fact that the grains have not reached the equilibrium grain size or to other causes, is particularly susceptible to grain growth during subsequent heat treatments.

"The probable reason why filaments made according to my invention do not sag, is that the structure is comparatively coarse grained. The coarse grained filament produced by means of my invention does not 'offset' so as to cut short the life of the lamp appreciably."

The District Court found that Pacz's patent exhibited novelty and invention; that Pacz produced large crystals early in the life of the lamp; that although coarse-grained and thus non-sagging, filaments meant "offsetting" to the art, where it was "common knowledge" that grains large enough to extend across the filament induced slippage, Pacz procured a particular kind of coarse-grained filament which did not "offset" because of the nature of the boundaries of the grains, their contour being "a very important element."

The Circuit Court of Appeals held that the Pacz product was anticipated by Patent No. 1,082,933, issued December 30, 1913, to William D. Coolidge for a process of producing ductile tungsten for incandescent electric lamp filaments and for the product itself.

The question before this Court is the validity of the claims in suit. Claim 25, which is typical,¹ reads as follows:

"25. A filament for electric incandescent lamps or other devices, composed substantially of tungsten and made up mainly of a number of comparatively large grains of such size and contour as to prevent substantial sagging and offsetting during a normal or commercially useful life for such a lamp or other device."

We need not inquire whether Pacz exhibited invention, or whether his product was anticipated. The claim is invalid on its face. It fails to make a disclosure sufficiently definite to satisfy the requirements of R. S. § 4888, 35 U. S. C. § 33. That section requires that an applicant for a patent file a written description of his discovery or invention "in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which it appertains . . . to make, construct, compound and use the same; . . . and he shall particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery." We may assume that Pacz has sufficiently informed those skilled in the art how to make and use his filament. The statute has another command. Recognizing that most inventions represent improvements on some existing article, process or machine, and that a description of the

¹"26. A drawn filament for electric incandescent lamps or other devices, composed substantially of tungsten and made up mainly of a number of comparatively large grains of such size and contour as to prevent substantial sagging and off-setting during a normal or commercially useful life for such a lamp or other device.

"27. A filament for electric incandescent lamps or other devices, composed of tungsten containing less than three-fourths of one percent of non-metallic material and made up mainly of comparatively large grains of such size and contour as to prevent substantial sagging or offsetting during a normal or commercially useful life for such a lamp or other device."

invention must in large part set out what is old in order to facilitate the understanding of what is new, Congress requires of the applicant "a distinct and specific statement of what he claims to be new, and to be his invention."² 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.³ The statute seeks to guard against unreasonable advantages to the patentee and disadvantages to others arising from uncertainty as to their rights.⁴ 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."⁵ The claims "measure the invention."⁶ Patentees may reasonably anticipate that claimed inventions, improvements and discoveries, turning on points so refined as the granular structure of products, require precise descriptions of the new characteristic for which protection is sought. In a limited field the variant must be clearly defined. This was one in a series of patents. *United States v. General Electric Co.*, 272 U. S. 476, 480.

Pacz did not adequately set out "what he claims to be new." The tungsten filament "made up mainly of a number of comparatively large grains," differentiates the

² *Merrill v. Yeomans*, 94 U. S. 568, 570.

³ Cf. *The Incandescent Lamp Patent*, 159 U. S. 465, 474 ff.

⁴ See *Brooks v. Fiske*, 15 How. 212, 215.

⁵ *Permutit Co. v. Graver Corp.*, 284 U. S. 52, 60; *Grant v. Raymond*, 6 Pet. 218, 247.

⁶ *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U. S. 405, 419.

claimed invention from tungsten drawn into a single crystal (Schaller No. 1,256,930), and from Coolidge's fine-grained thoriated filament, but serves aptly to describe the product of earlier manufacture, with its large regular grains subject to offsetting. According to the District Court, the earliest, so-called "squirted," tungsten filaments, also "consisted of comparatively large crystals, many of which were large enough to extend clear across the filament, but they shifted." 17 F. Supp. at 902. The failure of the patentee to make claim to a distinct improvement is made clear by comparison of the language of the claims under consideration with descriptions of offset difficulties recognized by other inventors.⁷

The claim further states that the grains must be "of such size and contour as to prevent substantial sagging and offsetting" during a commercially useful life for the lamp. The clause is inadequate as a description of the structural characteristics of the grains. Apart from the statement with respect to their function, nothing said about their size distinguishes the earliest filaments, and nothing whatever is said which is descriptive of their contour (termed by the District Court a "very important element"), not even that they are irregular.

⁷ "When this crystallization becomes excessive the crystals may, in the case of a filament, become so large as to extend across the entire section of the filament and thereupon the sections may move laterally upon each other and produce the condition known as 'offsetting.' I shall hereinafter describe more in detail the special method which I employ for minimizing the loss in ductility and for preventing this offsetting effect." Coolidge Patent, No. 1,082,933.

"Such crystals seem to increase in size in much the same manner as crystals formed in liquid solutions, and, if the crystals become large enough to extend almost or entirely across the filament, adjacent crystals tend to slip along their cleavage planes thereby giving the filament the offset or faulted appearance above referred to." Myers and Hall patent, No. 1,363,162.

The claim uses indeterminate adjectives which describe the function of the grains to the exclusion of any structural definition, and thus falls within the condemnation of the doctrine that a patentee may not broaden his product claims by describing the product in terms of function.⁸ Claim 25 vividly illustrates the vice of a description in terms of function. "As a description of the invention it is insufficient and if allowed would extend the monopoly beyond the invention."⁹ The Court of Appeals for the Ninth Circuit relied on the fact that the description in the claims is not "wholly" functional.¹⁰ 80 F. 2d 958, 963. But the vice of a functional claim exists not only when a claim is "wholly" functional, if that is ever true, but also when the inventor is painstaking when he recites what has already been seen, and then uses conveniently functional language at the exact point of novelty.¹¹

A limited use of terms of effect or result, which accurately define the essential qualities of a product to one skilled in the art, may in some instances be permissible and even desirable, but a characteristic essential to nov-

⁸ *Holland Furniture Co. v. Perkins Glue Co.*, 277 U. S. 245, 256-258, and cases cited.

⁹ 277 U. S. at 258.

¹⁰ Presumably that court would have assented to the condemnation of other product claims of the patent in suit, containing even less description than the ones under discussion:

"28. A coiled filament composed substantially of tungsten and capable of use in an electric incandescent lamp without either substantial sagging or offsetting during a normal or commercially useful life.

"29. A coiled filament composed mainly of drawn tungsten and capable of use in an electric incandescent lamp without substantial sagging and without substantial offsetting during a normal or commercially useful life."

¹¹ See *Gynex Corp. v. Dilex Institute*, 85 F. 2d 103, 105; *Davis Co. v. New Departure Co.*, 217 F. 775, at 782.

elty may not be distinguished from the old art solely by its tendency to remedy the problems in the art met by the patent. And we may doubt whether the language used in Claim 25, taken by itself, conveyed definite meaning to those skilled in the art of incandescent lighting.¹²

The Circuit Court of Appeals below suggested that "in view of the difficulty, if not impossibility, of describing adequately a number of microscopic and heterogeneous shapes of crystals, it may be that Pacz made the best disclosure possible, . . ." But Congress requires, for the protection of the public, that the inventor set out a definite limitation of his patent; that condition must be satisfied before the monopoly is granted.¹³ The difficulty of making adequate description may have some bearing on the sufficiency of the description attempted, but it cannot justify a claim describing nothing new except per-

¹² There is no showing whether, under established principles in the science, the language indicated grains extending across the width of filament, and if so whether the boundaries were irregular, or regular but not perpendicular to the axis of the filament; or whether the language indicated grains larger than the fine grains of Coolidge's thoriated filament but not large enough to extend across the entire section, and if so what type of boundaries existed.

Indeed, those merely skilled might have suspected the absence of crystals large enough to extend across the entire section of the filament, in view of the efforts of other patentees to avoid such crystals, (Coolidge, No. 1,082,933, p. 2, l. 13; Myers and Hall, No. 1,363,162, p. 1, l. 56), and in view of the "common knowledge in the art that where grain boundaries, large enough to extend across the filament, were produced, there would be bound to be slippage" (17 F. Supp. 901, at 903); yet those are the crystals found in respondent's lamps.

¹³ Different considerations may apply under the Act of May 23, 1930, c. 312, § 2, 46 Stat. 376, 35 U. S. C. § 33, providing that no "plant patent shall be declared invalid on the ground of non-compliance with this section if the description is made as complete as is reasonably possible."

haps in functional terms. It may be doubted whether one who discovers or invents a product he knows to be new will ever find it impossible to describe some aspect of its novelty.

The product claims here involved cannot be validated by reference to the specification. Assuming that in a proper case a claim may be upheld by reference to the descriptive part of the specification in order to give definite content to elements stated in the claim in broad or functional terms,¹⁴ the specification of the Pacz patent does not attempt in any way to describe the filament, except by mention of its coarse-grained quality. Even assuming that definiteness may be imparted to the product claim by that part of the specification which purportedly details only a method of making the product,¹⁵ the description of the Pacz process is likewise silent as to the nature of the filament product. Although in some instances a claim may validly describe a new product with some reference to the method of production,¹⁶ a patentee who does not distinguish his product from what is old except by reference, express or constructive, to the process by which he produced it, cannot secure a monopoly on the product by whatever means produced. "Every patent for a product or composition of matter must identify it so that it can be recognized aside from the description of the process for making it, or else nothing can be

¹⁴ Compare *Mitchell v. Tilghman*, 19 Wall. 287, 391; *Westinghouse v. Boyden Power Brake Co.*, 170 U. S. 537, 557-558.

¹⁵ Compare *Holland Furniture Co. v. Perkins Glue Co.*, 277 U. S. at 255, with *United States Repair & Guarantee Co. v. Assyrian Asphalt Co.*, 183 U. S. 591, at 600-601.

¹⁶ Cf. *Dunn Wire-Cut Lug Brick Co. v. Toronto Fire Clay Co.*, 259 F. 258, 261; *Trussell Mfg. Co. v. Wilson-Jones Co.*, 50 F. 2d 1027, 1029.

held to infringe the patent which is not made by that process.”¹⁷

Finally, the product claims may not be saved by a limitation to products produced in accordance with the process set out in the specification. This construction, though possibly of no avail against respondent, might add to the protection afforded petitioner by the process claims, if they are valid, in view of its application to filaments produced abroad. But putting aside questions as to the general propriety of such a construction,¹⁸ unless the claim uses language explicitly referring to the method of preparation, or describing the product in phrases suggestive of that process,¹⁹ to save the product claim in this fashion would constitute an improper importation into the claim of a factor nowhere described there.²⁰ The claims in suit seek to monopolize the product however created, and may not be reworded, in an effort to establish

¹⁷ *Cochrane v. Badische Anilin & Soda Fabrik*, 111 U. S. 293, 310. See also *Hide-It Leather Co. v. Fiber Products Co.*, 226 F. 34, 36; cf. *Maurer v. Dickerson*, 113 F. 870, 874.

See also *National Carbon Co. v. Western Shade Cloth Co.*, 93 F. 2d 94, 97:

“It has been said that a claim for a product produced by any process which will produce a like result covers the product only when made by equivalent processes. *Pickhardt v. Packard* (C. C.), 22 F. 530.”

¹⁸ *Steinfur Patents Corp. v. William Beyer, Inc.*, 62 F. 2d 238, 241; *Buono v. Yankee Maid Dress Corp.*, 77 F. 2d 274, 279; *Dunn Wire-Cut Lug Brick Co. v. Toronto Fire Clay Co.*, 259 F. 258, 261-262.

¹⁹ *Smith v. Goodyear Dental Vulcanite Co.*, 93 U. S. 486; *Cochrane v. Badische Anilin & Soda Fabrik*, 111 U. S. 293, 310; *Plummer v. Sargent*, 120 U. S. 442, 448; *Downes v. Teter-Heany Development Co.*, 150 F. 122; *Hide-It Leather Co. v. Fiber Products Co.*, 226 F. 34.

²⁰ Compare *McCarty v. Lehigh Valley R. Co.*, 160 U. S. 110, 116; *Altoona Publix Theatres v. American Tri-Ergon Corp.*, 294 U. S. 477, 487.

their validity, to cover only the products of the process described in the specification, or its equivalent.

For reasons set out, claims 25, 26, 27 are invalid. The judgment is

Affirmed.

MR. JUSTICE CARDOZO took no part in the consideration or decision of this case.

FEDERAL POWER COMMISSION *v.* METROPOLITAN EDISON CO. ET AL.

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

No. 915. Argued May 2, 1938.—Decided May 23, 1938.

1. An order of the Federal Power Commission is not reviewable in the Circuit Court of Appeals under § 313 of the Federal Power Act, as amended, unless there has been an application to the Commission for a rehearing. Review does not extend to an order granting a rehearing. P. 381.
2. Section 313 (a) (b) of the Federal Power Act does not empower the Circuit Court of Appeals to review orders of the Power Commission which are preliminary or procedural, but relates to orders of a definitive character dealing with the merits of a proceeding before the Commission and resulting from a hearing upon evidence and supported by findings appropriate to the case. P. 383.
3. Where the only orders made by the Federal Power Commission were, first, an order fixing a hearing and requiring the respondent corporations to appear and produce certain information and documents, and, second, an order purporting to grant a rehearing of the first, the Circuit Court of Appeals had no appellate jurisdiction to restrain proceedings under the original order until the questions raised by the petition for rehearing were determined or to define the scope of the rehearing and of evidence to be there considered. Pp. 385, 387.
4. Judicial Code § 262, which provides that the federal courts shall have power "to issue all writs not specifically provided for by statute, which may be necessary for the exercise of their respective