SCHRIBER-SCHROTH CO. *v.* CLEVELAND TRUST CO. ET AL.*

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

No. 3. Argued October 18, 19, 1938.—Decided November 7, 1938.

1. Where it is improbable, notwithstanding the doubtful validity of a patent, that conflict of decision respecting its validity will arise in different circuits, because of the concentration in one circuit of the industry in which the patented devices are used, there is reason for granting certiorari to review a decision in that circuit sustaining it. P. 50.
2. A patent does not extend beyond the invention described and explained as the statute requires; it can not be enlarged by claims in the patent not supported by the description. P. 57.
3. The application for a patent can not be broadened by amendment so as to embrace an invention not described in the application as filed, at least when adverse rights have intervened. *Powers-Kennedy Co.* v. *Concrete Co.*, 282 U. S. 175; *Permutit Co.* v. *Graver Corporation*, 284 U. S. 52. *Id.*
4. Amendments to Patent No. 1,815,733, to Gulick, for a combination in the structure of pistons of internal combustion engines for automobiles, designed to prevent undue thermal expansion of the pistons when in operation, were unlawfully added. P. 51.
5. In this combination, the head and skirt of the piston, separated by an air space, are connected and held in proper relation to each other by two webs which extend longitudinally within the skirt and which, pierced at right angles for wrist-pin bearings, support the piston pin bosses. The skirt is longitudinally split in order to minimize the effects of thermal expansion. The Circuit Court of Appeals regarded lateral flexibility of the webs as an essential element of the invention. The original application, however, contained no reference in terms to laterally flexible webs or to the function of the webs in securing flexibility of the skirt, but described the webs as "extremely rigid" and stated that an object of the invention was "to rigidly support the piston pin bosses from

* Together with No. 4, *Aberdeen Motor Supply Co.* v. *Cleveland Trust Co. et al.*, and No. 5, *F. E. Rowe Sales Co.* v. *Cleveland Trust Co. et al.*, also on writs of certiorari to the Circuit Court of Appeals for the Sixth Circuit.

the piston walls," and that the arrangement provided "a particularly strong support for the bosses." The webs, as shown by the drawings, conformed to these specifications, and neither drawings nor specifications gave dimensions showing thickness or other proportions of the webs which might suggest a flexible structure. *Held:*

(1) That, after a similar piston with the element of flexible webs had come into commercial use and another had been described in an application for patent, the patentee could not add that element to his application by amendment. P. 55.

(2) Amendments to that end could not be supported as being but clarifications of the application as filed. P. 57.

The contention that lateral flexibility was implied in the original description as an inherent property of the metal composing the web, and was disclosed by the drawings, is rejected.

Inherent flexibility of the web in coöperation with the slit skirt can not be depended upon to produce the desired effect in rendering the skirt yieldable in response to cylinder wall pressure. That depends upon design of the web, with correct proportioning of the different parts as to location and thickness to produce lateral flexibility. Inherent rigidity, made more effective by design of the webs, would correspondingly curtail the desired effect.

6. Decisions of the Court of Appeals for the District of Columbia and the Court of Customs and Patent Appeals sustaining the Gulick amendments are accorded weight but are not controlling in this Court when the validity of the amendments is involved in an infringement case. P. 59.

7. As flexible webs are neither described in the specifications nor mentioned in the claims of the patent for a like combination to Maynard, No. 1,655,968, they can be imported into them only by reference to the drawings or by inference from the inherent flexibility of the structure, which, as in the case of Gulick, are insufficient to accomplish the result. P. 60.

92 F. 2d 330, reversed.

CERTIORARI, 304 U. S. 587, to review the reversal of a decree holding certain patent claims invalid in suits for infringement. Other patents, held invalid by the District Court, but not passed upon by the court below, were not involved in this review.

Messrs. Thomas G. Haight and *John H. Bruninga,* with whom *Mr. John H. Sutherland* was on the brief, for petitioners.

Messrs. Arthur C. Denison and *F. O. Richey,* with whom *Mr. Wm. C. McCoy* was on the brief, for respondents.

MR. JUSTICE STONE delivered the opinion of the Court.*

The principal question for decision is whether the court below rightly sustained the validity of two patents by including in the combination constituting the alleged invention of each an element which was not in terms described in one, and the description of which in the other was added only by amendment to the application after it was filed.

Respondent, the Cleveland Trust Company, is the assignee in trust of some eighty patents relating to pistons of the type employed in internal combustion engines for automobiles, under a pooling agreement to which an automobile manufacturer and a number of manufacturers of pistons are parties. It brought the present suits in the District Court for Northern Ohio to enjoin infringement of five of the assigned patents. The case was tried before a special master who, upon the basis of elaborate findings, held that the Gulick patent, No. 1,815,733, applied for November 30, 1917 and allowed July 31, 1931, was invalid for want of invention and because of the addition to the application by amendment in 1922 of a new element of the alleged invention. In reaching this conclusion he relied on this Court's decisions in *Powers-Kennedy Corp.* v. *Concrete Co.,* 282

* Opinion reported as amended by Order of December 12, 1938, *post,* p. 573.

U. S. 175 and *Permutit Co.* v. *Graver Corporation,* 284 U. S. 52, as inconsistent with the result of interference proceedings in which Gulick's amendments were sustained, *Long* v. *Gulick,* 17 F. 2d 686, *Hartog* v. *Long,* 47 F. 2d 369. The master also held that the Maynard patent No. 1,655,968, applied for January 3, 1921 and allowed January 10, 1928, was invalid for want of invention and for failure to describe and claim the alleged invention. He held invalid upon various grounds the other patents, which are not presently involved.

The District Court adopted the findings and conclusions of the master and gave its decree for petitioners. The Court of Appeals for the Sixth Circuit reversed, as to the Gulick and Maynard patents only, holding that they were valid and infringed. 92 F. 2d 330.[1] As the court regarded the claims which it sustained as basic and thought that a full recovery could be had by respondent under them, it did not pass upon the validity of the other patents or decide other questions involved in the appeal.

Petition for certiorari raising the question, among others, whether the Court of Appeals had erred in holding patentable a combination including one element not described in the original application for the Gulick patent and later added to it by amendment, and not described at all in the Maynard patent, was at first denied, there being no conflict of decision. 303 U. S. 639. We later granted certiorari, 304 U. S. 587, on a petition for rehearing showing that, notwithstanding the doubtful validity of the patents, litigation elsewhere with a resulting conflict of decision was improbable because of the concentration of the automobile industry in the sixth circuit. Cf. *Paramount Publix Corp.* v. *American Tri-Ergon Corp.,* 294 U. S. 464; *Altoona Publix Theatres* v. *American Tri-Ergon Corp.,* 294 U. S. 477.

---

[1] The decree sustained Gulick's claims numbered 1, 11, 12, 13, 15, 18, 30 and 33, and Maynard's claims numbered 1, 6 and 8.

It is important for the proper functioning of the piston in a gas engine that it should fit the explosion chamber closely so as to conserve power, prevent the passage of lubricating oil around the piston into the chamber, and insure the smooth and noiseless movement of the piston within the cylinder. In designing gas engines for automobiles and other purposes requiring a high speed piston reciprocation with the accompanying development of high temperature in the explosion chamber, it is desirable to avoid thermal expansion of the close fitting piston, which will result in loss of power and possible injury to the mechanism through increased friction, which may cause the piston to seize or stick. The danger of undue expansion is increased when, as is advantageous in automobile engines, the piston is of aluminum, which has a higher coefficient of expansion than the iron or steel chamber within which the piston moves.

Both the Gulick and Maynard patents are for combinations in the structure of a piston for gas engines designed to prevent or restrict undue expansion of the piston when in operation. The Gulick patent exhibits a piston in which the ring-carrying head is separated by an air space at its periphery from the cylindrically shaped skirt or guide wall, whose surface engages the inner surface of the cylinder. The piston head and skirt are connected by two "webs" or walls extending longitudinally through the interior of the skirt. The webs are pierced at right angles for wrist pin bearings, and support, at the bearings, piston pin bosses formed with integral flanges extending laterally from their respective bosses to form the webs, which in turn are integrally connected on either side with the interior wall of the lower part of the skirt and at their ends with the piston head. The skirt is longitudinally split on one side at a point in its circumference approximately midway between the pin bosses, with the edges of the skirt formed by the split separated so as

to admit of the free movement of the edges toward each other.

The structure is thus designed to minimize the expansion resulting from high temperatures developed in the chamber and to avoid the effects of thermal expansion of the skirt. The webs, which afford at the wrist pin bearings the means for connecting the piston-rod with the piston, serve to hold the head and skirt in proper relation to each other so that the air space between them retards flow of heat from the head to the skirt, undue expansion of the skirt, and the consequent increase of friction between piston and enveloping cylinder. Undue expansion of the piston is said by the patent's specifications to be avoided by the separation of the skirt by the longitudinal split in order to admit of unrestrained movement of the edges of the skirt toward each other. Elsewhere they state that "when the longitudinal split is used, as shown, the web structure has sufficient lateral flexibility to permit the split to close more or less under the action of the expansion forces incident to the heating of the piston."

The elements of the combination as enumerated in Claim 39 are: "A piston for an engine cylinder comprising a skirt, a head separated from the skirt wall around its entire periphery, said skirt being longitudinally split to render the skirt wall yieldable on every diameter in response to cylinder wall pressure, wrist pin bosses, and means rigidly connecting said bosses to the head and yieldingly connecting said bosses to the skirt whereby said skirt is yieldable in response to cylinder wall pressure." Reference to a combination including, with other elements, web connections, "whereby said piston skirt is rendered yieldable during operation in response to cylinder wall pressure," appears in Claim 18.

The combination of piston head separated from a slitted skirt by an air space, the two being connected by

webs supporting wrist pin bearings with bosses which do not come directly in contact with the walls of the skirt, was plainly foreshadowed by the prior art as a practicable means of minimizing the flow of heat from head to skirt and of securing lateral flexibility in the skirt. The expired Spillman and Mooers patent No. 1,092,870, of April 14, 1914, pooled with the patents in suit, showed a piston with head separated by an air space from the skirt, the two being connected by a web separated from the skirt except at the point of integral connection with it at the lower end of the piston, and providing bearings for a wrist pin connection with bosses not in direct contact with the wall of the skirt.

Flexibility of the skirt attained by longitudinal slits was old, as shown by the Ebbs patent No. 700,309 of 1902, and Van Bever, No. 1,031,212 of 1912. The Franquist piston, patent No. 1,153,902 of 1915, another of the pooled patents, which showed piston head partially separated from skirt by air spaces, attained flexibility of the piston wall by longitudinal grooves in the skirt which interrupted its outer periphery though connected at the inner edges of the groove by a fold of the metal on the accordion principle. The Long piston, patent No. 1,872,772 of 1932, which the master and the district court found was in commercial use from 1917 on, and before the amendment of the Gulick application, presently to be discussed, showed longitudinal slits cut through the skirt, which was separated by air spaces from the piston head, the two being connected by parallel webs pierced for wrist pin bearings.

The court below found invention in the Gulick disclosure in a combination of elements, of which one was webs "laterally flexible," which were not specifically so described in the Gulick application until the amendment of 1922. Conceding that the deceleration of the flow of heat from head to skirt by an air gap might be an obvious

expedient of the art, and that to slit the skirt vertically so as to compensate for thermal expansion might not be beyond the skill of the art, the court added: "But to combine insulation of head from skirt, retraction of the bosses from the skirt periphery, connection of such bosses to the skirt with webs laterally flexible and yet so carried from the head as to support the load upon the wrist pin with sufficient strength and rigidity, and to utilize the mechanical force of the cylinder wall upon the skirt and the thermal expansion of the bosses so as to compensate evenly and fully for head expansion and to secure a balanced flexibility of the skirt with no bending concentration at any point therein, discloses, we think, a meritorious concept beyond the reach of those skilled in the art." 92 F. 2d, at 334.

We can find no support in the opinion for the contention of respondent that the Circuit Court of Appeals did not consider the flexible web an essential element in Gulick's invention. Its enumeration, among other named elements, of the connection of head and skirt by webs laterally flexible as embodying a meritorious concept must be taken to indicate that the court regarded the flexible webs as a part of the invention, the more so since it indicates that lateral flexibility of the webs is the only feature mentioned not within the prior art or within the expected skill of the art. It rejected, on the authority of *Long* v. *Gulick, supra,* and *Hartog* v. *Long, supra,* the contention made below and pressed here that Gulick's application as filed did not disclose "webs laterally flexible" and the resultant "balanced flexibility of the skirt," and that those features were added to specifications and claims after the use of the Long piston and after they had appeared in Hartog.

The Gulick application, which was filed November 30, 1917, contained no reference in terms to laterally flexible webs or to the function of the webs in securing flexibility

of the skirt. The specifications pointed to no inadequacy in the structure or function of webs of the prior art which would be remedied by the webs specified and to no function to be performed by them other than as a means of connecting and holding head and skirt so as to maintain the air gap between them and to support the wrist pin bearings and their bosses as both were shown in Spillman and Mooers. On the contrary, Gulick's application described the webs as "extremely rigid" and stated that an object of the invention was "to rigidly support the piston pin bosses of a piston from the piston walls." The only description of the web structure was as follows:

"It will be seen that in addition to providing a piston with a split skirt the above described construction also provides an extremely rigid connection between the piston pin bosses and the skirt of the piston, which construction may be used either with or without the split skirt and separated head. The arrangement of the supporting flanges 17 between the ends of the piston pin bosses and the connection of those flanges with the piston skirt provide a particularly strong support for the bosses."

The webs as shown by the drawings conform to the specifications of an "extremely rigid connection" between piston pin bosses and skirt and "a particularly strong support for the bosses." They form chords subtending the arc of the circle of the skirt, with flanges depending from the head to the bosses at right angles to the webs, and the skirt as shown is provided with interior corrugations and with an inturned flange at the bottom, all familiar devices for securing rigidity of structure. Neither drawings nor specifications give dimensions showing thickness or other proportions which might suggest a flexible structure.

In 1922, after the Long piston, whose webs concededly were laterally flexible, was in commercial use, and Hartog, to the knowledge of Gulick's assignee, had specified and

claimed a yieldable web, Gulick copied the Hartog claim and amended his specifications so as to state that one of the objects of his invention was "to rigidly support the piston pin bosses of a piston from the piston wall against mechanical load thrust from the connecting rod without interfering with the yielding characteristics of the skirt in response to cylinder wall pressure." And he amended his description of the web structure to read:

"The arrangement of the supporting flanges 17 between the ends of the piston pin bosses and the connections of those flanges with both the piston guide portion and the head provide a particularly strong construction, and at the same time, when the longitudinal split is used, as shown, the web structure has sufficient lateral flexibility to permit the split to close more or less under the action of the expansion forces incident to the heating of the piston."

Petitioners insist that the flexible web element of the Gulick combination, as found and sustained by the court below, is excluded from the Gulick patent by reason of his failure to describe that element in his application as filed, and that he could not cure the omission and secure a patent embodying that feature by substituting by way of amendment "webs laterally flexible" for "extremely rigid webs" in the description of his invention. The statute, R. S. § 4888, provides that the application which the inventor must file as a prerequisite to a patent shall contain "a written description of [his invention] . . . and of the manner and process of making, constructing . . . and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art . . . to . . . construct . . . and use the same; and in case of a machine, he shall explain the principle thereof, and the best mode in which he has contemplated applying that principle, so as to distinguish it from other inventions; . . ."

The object of the statute is to require the patentee to describe his invention so that others may construct and use it after the expiration of the patent and "to 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." *Permutit Co.* v. *Graver Corporation,* 284 U. S. 52, 60. It follows that the patent monopoly does not extend beyond the invention described and explained as the statute requires, *Permutit Co.* v. *Graver Corporation, supra,* at 57; that it cannot be enlarged by claims in the patent not supported by the description, *Snow* v. *Lake Shore & M. S. Ry. Co.,* 121 U. S. 617; cf. *Smith* v. *Snow,* 294 U. S. 1; and that the application for a patent cannot be broadened by amendment so as to embrace an invention not described in the application as filed, at least when adverse rights of the public have intervened. *Railway Co.* v. *Sayles,* 97 U. S. 554, 563, 564; *Powers-Kennedy Corp.* v. *Concrete Co.,* 282 U. S. 175, 185–186; cf. *Webster Electric Co.* v. *Splitdorf Electrical Co.,* 264 U. S. 463; *Permutit Co.* v. *Graver Corporation, supra; Crown Cork & Seal Co.* v. *Gutmann Co.,* 304 U. S. 159.

Respondent earnestly argues, as both courts held in the interference proceedings, *Long* v. *Gulick, supra,* and *Hartog* v. *Long, supra,* that the changes in Gulick's application were not alterations in the description of his invention but were at most a permissible clarification of its description of the flexible web element which was present, or at least plainly suggested, in the specifications and drawings of the Gulick application. Flexibility, it is said, as is well known to those skilled in the art, is an inherent property of the metal out of which the webs are made, and in consequence reference to the webs in the application as filed was sufficient to import into it as a part of the description of the invention their known quality of

flexibility, a description which was made more specific, but not altered, by the amendments. The argument suggests that it was but the skill of the art, and not invention, to substitute a flexible for a rigid means of connecting head and skirt in a known combination of piston head separated from a slitted skirt by an air space and connected by webs. But in any case we think it falls short of establishing that the Gulick amendments were not new matter beyond the scope of the device described in the application as filed.

The properties of any given material are many and diverse. The antithetical qualities of rigidity and flexibility of a structure are not absolute but relative; it may be more rigid than some and more flexible than others; too rigid for some purposes and too flexible for others. The one quality may be increased and the other diminished by choice of materials from which the structure is made and by variation in its proportions. If invention depends on emphasis of one quality over the other, as the court below found was the case with the laterally flexible webs in the Gulick device, the statute requires that emphasis to be revealed to the members of the public, who are entitled to know what invention is claimed. That is not accomplished either by naming a member having inherent antithetical properties or by ascribing to it one property when the other is meant. Since rigidity is a relative term, the characterization of the structure as rigid must be taken as emphasizing rigidity rather than its opposite, flexibility, with special reference to the conditions to be encountered in the operation of the piston. Even if those skilled in the art would have known that a piston with webs which would yield enough laterally to accommodate the constriction of the split skirt under the pressure developed by thermal expansion would work most effectively if the webs were laterally flexible rather than

rigid, that was not the invention which Gulick described by his references to an extremely rigid web.

Gulick also failed to explain the principle of his machine so as to distinguish it from the prior art. Webs having the inherent properties both of rigidity and flexibility were familiar elements in piston structure. The court below, after pointing out that the slots of the Franquist skirt rendered it capable of limited constriction, found a distinguishing feature of Gulick's piston to be a web relatively flexible laterally, so as to accommodate the constriction of skirt to thermal expansion, the combination operating to secure a "balanced flexibility" of the skirt. But that principle—facilitating skirt constriction rather than obstructing it—was first explained and its embodiment in the flexible-webbed device was first claimed by the amendments to the application.

As already indicated, the omission from the specifications was not supplied by the drawings, which failed to disclose by dimensions the proportions of the webs. Inherent flexibility of the web in coöperation with the slit skirt cannot be depended upon to produce the desired effect in rendering the skirt yieldable in response to cylinder wall pressure. As respondent's own expert testified, that depends upon design of the web, with correct proportioning of the different parts as to location and thickness to produce lateral flexibility. Inherent rigidity, made more effective by design of the webs, would correspondingly curtail the desired effect.

We recognize the weight to be attached to the determinations in the interference proceedings in which the Court of Appeals of the District of Columbia and the Court of Customs and Patent Appeals sustained the Gulick amendments. Cf. *Radio Corporation* v. *Radio Laboratories,* 293 U. S. 1, 7. But the decisions in those cases are not controlling here. So far as the courts relied on

the inherent flexibility of the webs to supply the feature of lateral flexibility omitted from the Gulick description they ignored the principle recognized in *Permutit Co.* v. *Graver Corporation, supra,* and *Powers-Kennedy Corp.* v. *Concrete Co., supra.* So far as they relied on the drawings to supply the omission they disregarded the fact shown both by inspection and by the evidence presented here that the drawings do no more to point to Gulick's invention than does the fact of inherent flexibility. We conclude that respondent can take no benefit from the flexible web element added by amendment to the Gulick application.

In sustaining the claims of the Maynard patent the court below said that "Maynard . . . embodies the Gulick combination of skirt insulation, skirt flexibility by means of vertical slotting cooperating with longitudinal slotting, and flexible webs in the region of the wrist pin bosses. He also follows Jardine's simplified design to permit economical manufacture and Jardine's boss relief," and after enumerating certain mechanical features of the Maynard construction differing from Gulick and Jardine, concluded: "It is clear that Maynard, while not departing from the teaching of Gulick in basic combination of elements, discloses a piston lighter and more economical of manufacture than Gulick and one more rugged and durable than Jardine." 92 F. 2d, at 337.

Invention over Gulick and Jardine was apparently found in the details of construction but, as we are without other indication of the character of the invention, we construe the court's opinion as including the laterally flexible webs as an essential element in the patented combination. As flexible webs are neither described in Maynard's specifications nor mentioned in his claims, they can be imported into them only by reference to the drawings or by inference from the inherent flexibility of the structure, which, for reasons already given in our considera-

tion of the Gulick amendments, are insufficient to accomplish that result. We conclude that the court below erred in giving any effect to so much of the Gulick patent as by amendment describes or claims the flexible webs, and in treating any of the specifications or claims in Gulick and Maynard as referring to such webs. We assume that it sustained Claim 1 of the Gulick patent, which makes no mention of web flexibility, only by reading into it that element, which the court regarded as an essential part of the invention.

As the Court of Appeals did not pass upon other questions in the case, the causes will be reversed and remanded to it for further proceedings, in conformity with this opinion, with respect to such claims of the patents in suit as appellant below submitted to that court for adjudication.

Reversed.

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

STAHMANN ET AL., DOING BUSINESS AS STAHMANN FARMS CO., *v.* VIDAL, COLLECTOR OF INTERNAL REVENUE.

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

No. 12. Argued October 12, 13, 1938.—Decided November 7, 1938.

1. The purpose of the Bankhead Cotton Act (April 21, 1934; repealed by Act of Feb. 10, 1936) was to restrict the production of cotton and, to that end, to levy a heavy tax in respect of that produced in excess of the farmer's quota. The burden was to fall upon the producer. The assessment of the tax against the ginner was intended to immobilize the cotton in his possession until the producer should liquidate the tax. P. 65.