

D. THE REVERSE DOCTRINE OF EQUIVALENTS

WESTINGHOUSE v. BOYDEN POWER BRAKE CO.

170 U.S. 537 (1898)

[Westinghouse brought suit against Boyden Power Brake Company for infringement of Westinghouse's U.S. Patent No. 360,070 (Mar. 29, 1887), which covered an improved automatic railway brake known as the "quick action" brake. After the trial court found that Boyden had infringed one claim of Westinghouse's patent, the Court of Appeals reversed in favor of Boyden. *See Westinghouse v. Boyden Power-Brake Co.*, 66 F. 997 (C.C.D. Md. 1895), *rev'd*, 70 F. 816 (4th Cir. 1895). Westinghouse appealed.

The Court first set forth the history of railcar air brakes. The first airbrake had been patented by George Westinghouse in 1869 (U.S. Pat. No. 88,929). Thereafter, Westinghouse remained a leader in the field, filing numerous improvement patents on his original invention.

The patent in suit covered a "quick action" automatic brake that was designed to activate more quickly the airbrakes of each railcar on a long train having many cars. In prior art brakes, compressed air in the "train pipe" — a pipe that runs the length of the train — was used to activate the braking mechanism but only the compressed air in an "auxiliary reservoir" (which is a reservoir of compressed air found in each train) was used to supply the brakes themselves. Westinghouse's new brake allowed compressed air from both the train pipe and the auxiliary reservoir to be used in braking the train during emergencies. This new arrangement not only gave an additional boost of force to the brakes; it also activated the brakes more quickly. (See Figure 8-8, bottom row, which illustrates the Westinghouse brake; the drawing on the right side shows the valve configuration for an emergency or "quick action" stop.)

A crucial element in Westinghouse's patent claims was something Westinghouse named the "auxiliary valve." That valve allowed compressed air to flow from the train pipe to the brake cylinder during emergency stops.

George Boyden also was a recipient of patents on air brakes, and the accused brakes in this case were covered by two patents No. 481,134 (1892) and No. 481,135 (1892), which had been filed in 1889 and 1891 respectively. Boyden also had earlier patents, and one of those had some structural similarities to the Westinghouse patent in suit.]

MR. JUSTICE BROWN delivered the opinion of the Court.

The history of arresting the speed of railway trains by the application of compressed air is one to which the records of the Patent Office bear frequent witness, of a gradual progress from rude and imperfect beginnings, step by step, to a final consummation, which, in respect to this invention, had not been reached when the patent in suit was taken out, and which, it is quite possible, has not been reached to this day. It is not disputed that the most important steps in this direction have been taken by Westinghouse himself.

[After recounting the history of the technology, the Court turns to the infringement issue.] The first and fourth claims of this patent are as follows:

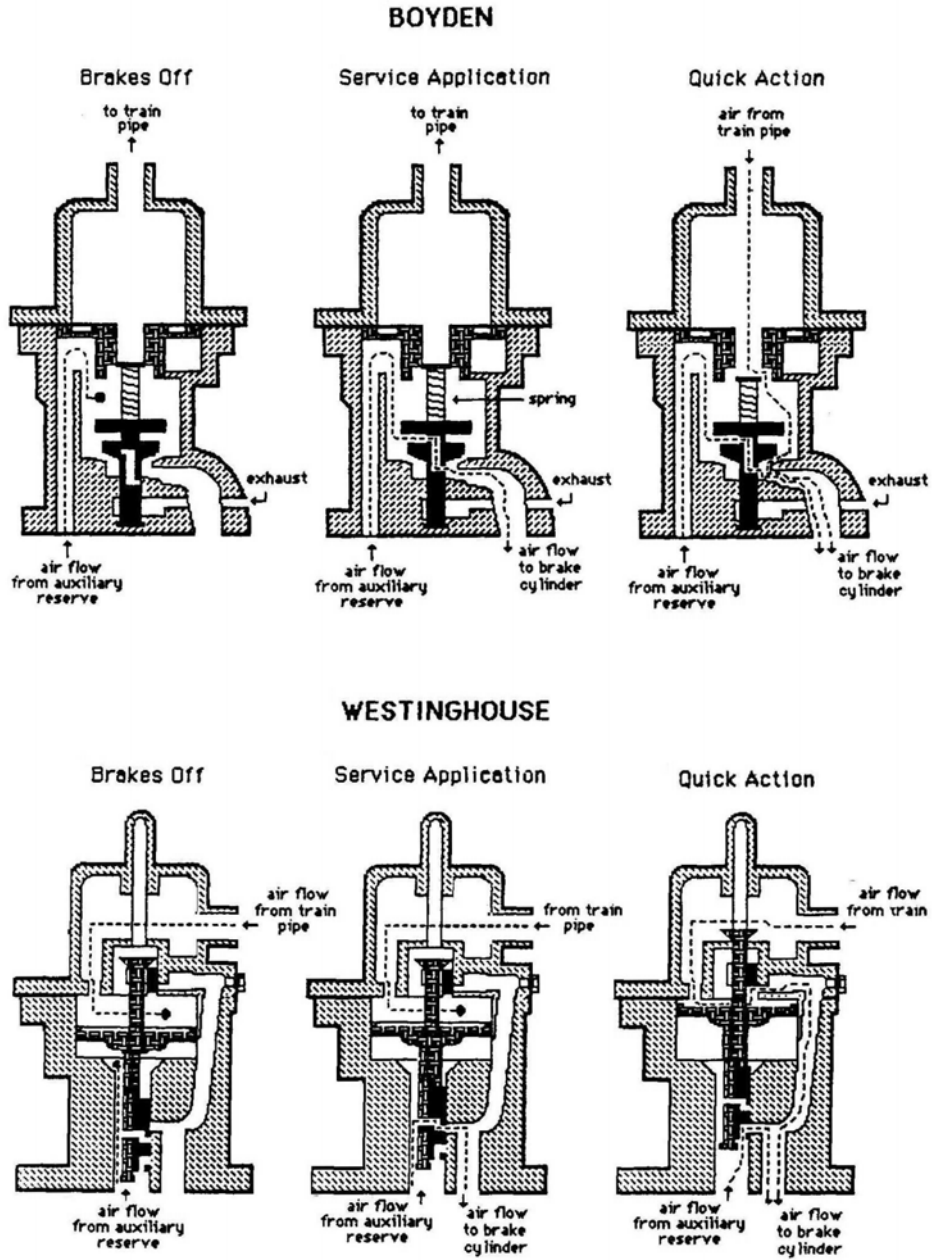


Figure 8-8

(1) In a brake mechanism, the combination of a main air pipe, an auxiliary reservoir, a brake cylinder, a triple valve, and an auxiliary valve device, actuated by the piston of the triple valve, and independent of the main valve thereof, for admitting air in the application of the brake directly from the main air pipe to the brake cylinder, substantially as set forth.

(4) The combination, in a triple-valve device, of a case or chest, a piston fixed upon a stem, and working in a chamber therein, a valve moving with the piston stem, and governing ports and passages in the case leading to connections with an auxiliary reservoir and a brake cylinder and to the atmosphere, respectively, and an auxiliary valve actuated by the piston stem, and controlling communication between passages leading to connections with a main air pipe and with the brake cylinder, respectively, substantially as set forth.

In both of these claims an auxiliary valve is named as an element. . . .

To what liberality of construction these claims are entitled depends, to a certain extent, upon the character of the invention, and whether it is what is termed, in ordinary parlance, a "pioneer." This word, although used somewhat loosely, is commonly understood to denote a patent covering a function never before performed, a wholly novel device, or one of such novelty and importance as to mark a distinct step in the progress of the art, as distinguished from a mere improvement or perfection of what had gone before. Most conspicuous examples of such patents are the one to Howe, of the sewing machine; to Morse, of the electrical telegraph; and to Bell, of the telephone. The record in this case would indicate that the same honorable appellation might be safely bestowed upon the original air brake of Westinghouse, and perhaps, also, upon his automatic brake. In view of the fact that the invention in this case was never put into successful operation, and was to a limited extent anticipated by the Boyden patent of 1883,^{*} it is perhaps an unwarrantable extension of the term to speak of it as a "pioneer," although the principle involved subsequently, and through improvements upon this invention, became one of great value to the public. The fact that this invention was first in the line of those which resulted in placing it within the power of an engineer, running a long train, to stop in about half the time and half the distance within which any similar train had stopped, is certainly deserving of recognition, and entitles the patent to a liberality of construction which would not be accorded to an ordinary improvement upon prior devices. At the same time, as hereinafter observed, this liberality must be exercised in subordination to the general principle above stated: that the function of a machine cannot be patented, and hence that the fact that the defendants' machine performs the same function is not conclusive that it is an infringement.

^{*} [Eds. note: The 1883 Boyden patent is U.S. Pat. No. 280,285. In an omitted portion of the opinion, the Court explained that "in his original application Mr. Westinghouse made a broad claim for the admission of air directly from the main air-pipe to the brake-cylinder, which was rejected upon reference to a prior patent to Boyden, No. 280,285." In response to that rejection, Westinghouse narrowed his claims and stressed that the Boyden patent "fails to embody a device which in structure or function corresponds with the auxiliary valve of applicant."]

[In the top row of Figure 8-8, the defendants' device is illustrated] in its three positions of release, service application and quick action. . . . Whether this device has an auxiliary valve, or not, is one of the main questions in the case; complainants' theory being that [the] poppet valve [i.e., the valve with the spring, shown most clearly in the center illustration on the top row of Figure 8-8], is an auxiliary valve, while defendants' claim is that it is in reality the main valve.

[After analyzing the function of the poppet valve in Boyden's device, the Court continues:] [T]he poppet valve . . . is practically an auxiliary valve, by which, we understand, not necessarily an independent valve, nor one of a particular construction, but simply a valve which in emergency cases is called into the assistance of the [main valve]. . . . [This valve] meets the demand of the first claim of the patent, and . . . it seems also to be covered by the fourth claim.

But, even if it be conceded that the Boyden device corresponds with the letter of the Westinghouse claims, that does not settle conclusively the question of infringement. We have repeatedly held that a charge of infringement is sometimes made out, though the letter of the claims be avoided. The converse is equally true. The patentee may bring the defendant within the letter of his claims, but if the latter has so far changed the principle of the device that the claims of the patent, literally construed, have ceased to represent his actual invention, he is as little subject to be adjudged an infringer as one who has violated the letter of a statute has to be convicted, when he has done nothing in conflict with its spirit and intent. . . .

We have no desire to qualify the repeated expressions of this court to the effect that, where the invention is functional, and the defendant's device differs from that of the patentee only in form, or in a rearrangement of the same elements of a combination, he would be adjudged an infringer, even if, in certain particulars, his device be an improvement upon that of the patentee. But, after all, even if the patent for a machine be a pioneer, the alleged infringer must have done something more than reach the same result. He must have reached it by substantially the same or similar means, or the rule that the function of a machine cannot be patented is of no practical value. To say that the patentee of a pioneer invention for a new mechanism is entitled to every mechanical device which produces the same result is to hold, in other language, that he is entitled to patent his function. Mere variations of form may be disregarded, but the substance of the invention must be there. As was said in *Burr v. Duryee*, 1 Wall. [68 U.S.] 531, 573 [(1864)], an infringement "is a copy of the thing described in the specification of the patentee, either without variation, or with such variations as are consistent with its being in substance the same thing. If the invention of the patentee be a machine, it will be infringed by a machine which incorporates in its structure and operation the substance of the invention; that is, by an arrangement of mechanism which performs the same service or produces the same effect in the same way, or substantially the same way. . . . That two machines produce the same effect will not justify the assertion that they are substantially the same, or that the devices used are, therefore, mere equivalents for those of the other."

Not only is this sound as a general principle of law, but it is peculiarly appropriate to this case. Under the very terms of the first and fourth claims of the Westinghouse patent, the infringing device must not only contain an auxiliary valve, or its mechanical equivalent, but it must contain the elements of the combination “substantially as set forth.” In other words, there must not only be an auxiliary valve, but substantially such a one as is described in the patent, i.e. independent of the triple-valve. Not only has the Boyden patent a poppet instead of a slide-valve — a matter of minor importance — but it performs a somewhat different function. [The Court then discusses in detail the differences between the Westinghouse and Boyden brakes.]

We are induced to look with more favor upon [the Boyden] device, not only because it is a novel one, and a manifest departure from the principle of the Westinghouse patent, but because it solved at once, in the simplest manner, the problem of quick action, whereas the Westinghouse patent did not prove to be a success until certain additional members had been incorporated into it. The underlying distinction between the two devices is that in one a separate valve and separate by-passage are provided for the train-pipe air, while in the other [Boyden] has taken the old triple (or quadruple) valve, and by a slight change in the functions of two of its valves, and the incorporation of a new element, has made a more perfect brake than the one described in the Westinghouse patent. If credit be due to Mr. Westinghouse for having invented the function, Mr. Boyden has certainly exhibited great ingenuity in the discovery of a new and more perfect method of performing such function. If his [invention] be compared with the later Westinghouse patent, No. 376,837, which appears to have been the first completely successful one, the difference between the two, both in form and principle, becomes still more apparent, and the greater simplicity of the Boyden [device] certainly entitles it to a favorable consideration. If the method pursued by the patentee for the performance of the function discovered by him would naturally have suggested the device adopted by the defendants, that is in itself evidence of an intended infringement; but, although Mr. Boyden may have intended to accomplish the same results, the Westinghouse patent, if he had had it before him, would scarcely have suggested the method he adopted to accomplish these results. Under such circumstances, the law entitles him to the rights of an independent inventor.

Upon a careful consideration of the testimony, we have come to the conclusion that the Boyden device is not an infringement of the complainants' patent, and the decree of the circuit court of appeals is therefore

Affirmed.

MR. JUSTICE SHIRAS, with whom concurred MR. JUSTICE BREWER, dissenting.

I am unable to concur in the reasoning and conclusion of the court, and shall briefly state my views.

The history of the art discloses that the patent in suit was what is called a “pioneer invention.” In it, for the first time, was brought to light a method or

process which, by the cooperation of the air from the train-pipe with that from the car reservoir, created the "quick action" brake. . . .

It in nowise detracts from the merit of this invention that later devices have been adopted which render its practical operation more efficient. The very term, "pioneer patent," signifies that the invention has been followed by others. A pioneer patent does not shut, but opens the door for subsequent invention.

The particular patent in suit was, as I understand it to be admitted, an entire success in supplying passenger trains and short freight trains with a "quick action" brake; but while it enabled even the longest freight trains to stop in half the time and half the distance previously occupied, there remained difficulties which required further devices to give to the invention the perfect success which it has now attained.

Being of the character so described as a pioneer, the patent in suit is entitled to a broad or liberal construction. In other words, the invention is not to be restricted narrowly to the mere details of the mechanism described as a means of carrying the invention into practicable operation. . . .

MR. JUSTICE GREY and MR. JUSTICE MCKENNA also dissented [without opinion] from the decision of the Court.

NOTES

1. **Still Alive?** Consider this recent statement by the Federal Circuit:

Not once has this court affirmed a decision finding noninfringement based on the reverse doctrine of equivalents. And with good reason: when Congress enacted 35 U.S.C. § 112, after the decision in *Graver Tank*, it imposed requirements for the written description, enablement, definiteness, and means-plus-function claims that are co-extensive with the broadest possible reach of the reverse doctrine of equivalents. [Citations omitted.]

Even were this court likely ever to affirm a defense to literal infringement based on the reverse doctrine of equivalents, the presence of one anachronistic exception, long mentioned but rarely applied, is hardly reason to create another. We therefore decline the invitation to adopt [the accused infringer's proposed extension of the doctrine of equivalents.]

Tate Access Floors, Inc. v. Interface Architectural Resources, Inc., 279 F.3d 1357, 1368, 61 U.S.P.Q.2D (BNA) 1647 (Fed. Cir. 2002) (Gajarsa, J.). This passage suggests that the 1952 Act fundamentally changed infringement analysis, but *Warner-Jenkinson* (Chapter 8.C, *supra*) stated that pre-1952 infringement precedent of the Supreme Court "survived passage of the 1952 Act." 520 U.S. at 26. The Federal Circuit's effective abrogation of the reverse doctrine of equivalents remains intensely controversial, and the debate over the vitality of the doctrine is likely until the Supreme Court revisits the issue.

2. Relationship Between Reverse Doctrine and § 112 ¶ 6. Some cases have pointed out a similarity between the reverse doctrine of equivalents and the equivalency standard of § 112 ¶ 6:

[S]ection 112 para. 6 does not, in any event, *expand* the scope of the claim. An element of a claim described as a means for performing a function, if read literally, would encompass *any* means for performing the function. But section 112 para. 6 operates to *cut back* on the types of means which could literally satisfy the claim language. . . . Properly understood section 112 para. 6 operates more like the reverse doctrine of equivalents than the doctrine of equivalents because it restricts the scope of the literal claim language.

Johnston v. IVAC Corp., 885 F.2d 1574, 1580, 12 U.S.P.Q.2d (BNA) 1382 (Fed. Cir. 1989). Should the existence of § 112 ¶ 6 preclude continued application of the reverse doctrine of equivalents in claims that are not drafted in means-plus-function format? Recall that a similar argument for abolishing the doctrine of equivalents was considered and rejected in *Warner-Jenkinson, supra*.

As discussed in the notes after *Phillips v. AWH Corp.* (*supra* Chapter 8.B.1), the Federal Circuit's interpretation of § 112 ¶ 6 — that the statute provides a special rule for interpreting means-plus-function elements more narrowly than other claim elements — remains controversial. A case such as *Westinghouse* suggests that the rule articulated in § 112 ¶ 6, which requires claim language to be interpreted as encompassing what is disclosed in the specification and equivalents, was consistent with the general approach to claim interpretation under Supreme Court precedent. Does *Westinghouse* cast doubt on current doctrine requiring different approaches to interpreting mean-plus-function elements and other claim elements?

3. Relationship to Nonobviousness? In explaining why Boyden's device does not infringe, the *Westinghouse* Court stated:

[A]lthough Mr. Boyden may have intended to accomplish the same results, the Westinghouse patent, if he had had it before him, would scarcely have suggested the method he adopted to accomplish these results.

But isn't this point true for any patentable — and therefore nonobvious — improvement over the prior art? Was the Court suggesting that any patentable improvement should be deemed not to infringe prior patents?

Earlier in the same paragraph, the Court stated a more narrow ground for exonerating the Boyden invention:

We are induced to look with more favor upon this device, not only because it is a novel one, and a manifest departure from the principle of the Westinghouse patent, but because it solved at once, in the simplest manner, the problem of quick action, whereas the Westinghouse patent did not prove to be a success until certain additional members had been incorporated into it.

Are patentable improvements necessarily a "manifest departure from the principle" of earlier patents? Was this characterization of the Boyden device accurate? Note that the Court did not rely on any factual findings from the trial court in reaching this conclusion.

4. Brake Background. For detailed and fascinating information on the background to the *Westinghouse* case, see Steven Usselman, REGULATING RAILROAD INNOVATION: BUSINESS, TECHNOLOGY AND POLITICS IN AMERICA, 1840-1870 (2002). Usselman devotes a good deal of attention to the role of patents in the early railroad industry, and makes these points among many others: (1) The early railroad industry did not engage in concerted R&D activities, defining its role as applying and adapting existing technology to the major job of systems building; (2) Westinghouse was one of a group of “outside” inventors whose assertion of patent rights irritated the vested railroad interests; and (3) air brakes were required by various legislative enactments in the wake of catastrophic and widely publicized railway accidents. For additional background, see ALBRO MARTIN, RAILROADS TRIUMPHANT: THE GROWTH, REJECTION AND REBIRTH OF A VITAL AMERICAN FORCE (1991).

~~1. MODERN CASE STUDY: *SCRIPPS CLINIC v. GENENTECH*~~

~~A fascinating reverse equivalents issue was raised in *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 U.S.P.Q.2d (BNA) 1001 (Fed. Cir. 1991). In the early 1980s, Scripps obtained a patent on purified Factor VIII:C, a blood clotting agent that is naturally produced in the human body and is useful in treating clotting disorders such as hemophilia. The Scripps patent contained broad product claims of the sort permitted under Learned Hand’s decision in *Parke-Davis & Co. v. H.K. Mulford & Co.*, 189 F.95 (S.D.N.Y. 1911) (Chapter 2, *supra*).~~

~~24. A human VIII:C preparation having a potency in the range of 134 to 1172 units per ml, and being substantially free of VIII:RP.~~

~~28. A human VIII:C preparation having a specific activity greater than 2240 units/mg.~~

~~927 F.2d at 1570.~~

~~Prior to the work of Scripps, other scientists had succeeded in isolating Factor VIII:C from human blood, but not at the purity levels described in the above claims. Scripps obtained these higher purity levels by inventing a new process that used monoclonal antibodies for purifying Factor VIII:C from raw blood. (The Scripps patent contained several process claims and product-by-process claims, but the broad *Parke-Davis* style product claims were the focus of most of the controversy.) While the Scripps process was clearly an advance in the art, the process still required human blood plasma as a starting material — a significant problem because, inter alia, blood plasma can transmit diseases such as AIDS.~~

~~In the mid-1980s, Genentech succeeded in producing Factor VIII:C using a process based on recombinant DNA technology. In Genentech’s method, Factor VIII:C is not purified from blood plasma. Instead, the human Factor VIII:C gene is isolated and inserted into a host cell, which then produces Factor VIII:C and excretes it into a culture medium. Factor VIII:C is then separated from the culture medium using, inter alia, monoclonal antibodies. See 927 F.2d at 1580 n.9. (Genentech would later receive a patent on this~~