

whether by this mechanism or otherwise, in wire which was in process of formation into wire cloth. It is said that the structures existing before the patent, and shown in previous patents, may now, with slight modifications, involving only ordinary mechanical skill, be used in weaving wire cloth in the method used by the patentee. I suppose this to be true, and I conclude that in the discovery that this is true resides the invention which is protected by this patent. *Pennsylvania R. Co. v. Locomotive Engine Safety Truck Co.*, 110 U. S. 490, 4 Sup. Ct. 220. The same observations lead me to the conclusion that the invention was not abandoned by these complainants by the descriptions of the mechanism capable of performing the function described in this patent, and by reason of which this patent is sustained, which descriptions are contained in the prior patents to Sawyer and Wright, No. 135,446, issued February 4, 1873, and to Waters and Orr, assignors to the complainants, No. 117,837, issued August 8, 1871, and No. 121,830, issued December 12, 1871.

The respondents set up in defense a prior public use of a loom containing the patented improvement. It is sufficient for me to say that I am satisfied from the testimony that the alleged use was only experimental, and does not operate as a bar to the rights under the patent. My conclusion, therefore, is that there must be a decree for an injunction and for an account as prayed in the bill.

THOMSON METER CO. v. NATIONAL METER CO.

(Circuit Court of Appeals, Third Circuit. January 2, 1895.)

No. 18.

1. PATENTS—EXTENT OF MONOPOLY—UNFORESEEN RESULTS.

An inventor is entitled to all the legitimate results of the invention covered by his patent, including even those which were not foreseen by him.

2. SAME—INFRINGEMENT—IMMATERIAL VARIATIONS.

Changes of form do not avoid infringement when the two devices do the same thing in substantially the same way, and accomplish the same result.

3. SAME—WATER METERS.

The Nash patent, No. 379,805, for an improvement in water meters, *held* valid, and infringed as to claims 15 and 17.

Appeal from the Circuit Court of the United States for the District of New Jersey.

This was a bill by the National Meter Company against the Thomson Meter Company for infringement of a patent. The circuit court rendered a decree for an injunction and accounting. Defendant appeals.

Edward H. Brown, for appellant.

J. Edgar Bull and Edmund Wetmore, for appellee.

Before ACHESON, Circuit Judge, and BUTLER and WALES, District Judges.

WALES, District Judge. This suit was brought in the circuit court of the United States for the district of New Jersey to restrain

the infringement of letters patent No. 379,805, dated March 20, 1888, for improvement in water meters, issued to the National Meter Company, as assignee of Lewis H. Nash. The complainant had a decree for an injunction and an accounting. The defendant brings this appeal. The defenses in the court below were nonpatentability and noninfringement, and the same defenses are relied on here.

The claims alleged to be infringed are these:

"(15) In a water meter, a piston, formed of hard rubber, and having a motion of nutation, substantially as described, combined with a skeleton of strengthening material, such as steel wire, substantially as set forth."

"(17) In a water meter, a piston, formed of hard rubber, combined with a skeleton of strengthening material, such as metal, substantially as and for the purposes set forth."

The meter to which the Nash piston is applied may be briefly described as having a measuring circular chamber, with curved sides and conical ends, and a flat or conical disc piston, having a central ball bearing, to which piston a wobbling motion is imparted by the flow of water through the meter chamber. The meter chamber is provided with a radial partition, called an "abutment," which separates the inlet and escape ports, and which prevents any rotation of the piston. On the top of the meter case is a box containing a system of gear wheels and dials to register the number of complete movements of the piston, and to indicate the quantity of water passed. Nutating discs were not unknown before Nash's invention, but they had been made wholly of hard rubber or wholly of metal. The objections to the use of a metal piston were (1) its weight, and its resistance to the flow of water, in consequence of its not operating as rapidly as would a piston made of lighter material; (2) if made sufficiently thin to be light enough, accuracy of measurement would be impaired; and (3) the friction between metal and metal is greater than between metal and rubber. The superior adaptation of hard rubber for use in a water-meter piston was also well known, but, prior to the invention of Nash, it had the serious and apparently insuperable defect of losing its resilience and shape by temporary immersion in hot water. Only metal pistons can be successfully used for measuring hot water; but in meters designed for the measurement of cold water the hard-rubber piston is universally admitted to be the best. Cold-water meters, however, are subjected occasionally to the entrance of hot water from either one or two causes: First, whenever the valve which is between the meter and a kitchen range or steam boiler gets out of order, and there is an excessive back pressure of steam; and, second, by the cutting off or the reduction of pressure on the supply side. The effects of this "accidental hot water"—a phrase well known and understood by the manufacturers of water meters—are to soften the hard-rubber disc, to impair or destroy its resilience, and to produce a radial expansion, which causes its edges to jam against the sides of the meter chamber, so that the disc becomes warped, changed in form, and is rendered useless. The jamming of the disc by its radial expansion is accounted for from the fact that the coefficient of expansion of hard rubber is higher than that of metal, and that a slight elevation of temperature is sufficient

to cause it to jam. When in operation, the edge of the piston does not come into actual contact with the sides of the chamber; a small space intervenes between them; and what is known as "water packing" keeps the water from leaking around the piston. If the coefficient of expansion of hard rubber and metal were the same, the piston would never jam against the case, which is solely consequent upon the inequality of expansion referred to. In his specification Nash says:

"When the piston is formed of hard rubber, I prefer to construct it with an interior strengthening piece of metal, t, as shown in Figs. 6 and 7, so that it will be less liable to change its form, or distort."

Nash's contrivance was the introduction of a steel-wire ring embedded in the rubber near the periphery of the disc,—relatively like the tire of a wheel,—and after repeated trials this arrangement was found to effectually restrain the radial expansion of the disc when immersed in "accidental hot water," and prevent the jamming and the change of form and distortion of the disc, which it was the aim of Nash to overcome. On the proofs there can be no doubt of the novelty and utility of Nash's piston as applied to meters for the measuring of cold water. Hard rubber, by reason of its being of about the same specific gravity as water, and having a minimum of friction in addition to its other advantages, was conceded to be the best material for a water-meter piston, but it could not be used, as already explained, on account of its liability to soften, expand, and distort under certain conditions, until Nash discovered the means by which these disadvantages could be overcome or neutralized.

The defense of anticipation is not supported by the defendant's exhibits. Various articles were produced to show that it was not novel to strengthen articles made of rubber by the introduction of a metal rod or grid; but these articles were either made of metal, and covered with hard rubber for the purpose of ornamentation, or to protect them from oxidation, or such articles as were incased in ordinary India rubber or in soft rubber of various grades of hardness or adulteration.

It is also contended that Nash adopted the wire ring merely for strength, and that he did not contemplate nor foresee what is now claimed for it, namely, that it would prevent radial expansion of the disc. Be this as it may, admitting it to be true that Nash did not realize the full extent of his discovery,—which it would be difficult to believe after reading the specifications of the patent, and in view of the state of the art,—still he would be entitled to all the necessary and legitimate results attained by his invention, including even such as were unexpected. *Wells v. Jacques*, 5 O. G. 364, Fed. Cas. No. 17,398; *Eames v. Andrews*, 122 U. S. 40, 7 Sup. Ct. 1073; *Brown v. District of Columbia*, 130 U. S. 87, 9 Sup. Ct. 437; *Stow v. Chicago*, 104 U. S. 457; *Gandy v. Belting Co.*, 143 U. S. 587, 12 Sup. Ct. 598.

Nor is the complainant's piston only an aggregation of old parts. The metal and the rubber do not act independently, but co-operate in producing a new result, and this constitutes a patentable combina

tion. *Reckendorfer v. Faber*, 92 U. S. 357; *Hailes v. Van Wormer*, 20 Wall. 353; *Pickering v. McCullough*, 104 U. S. 310. The new use of an old compound has been held to be patentable. *Muntz v. Foster*, 2 Webst. Pat. Cas. 93; *Merwin*, Patentability, 306.

The validity of the claims being established, infringement of them by the defendant is also placed beyond doubt. The only difference between complainant's meter and that of the defendant consists in this: that in the place of a wire ring used in the former the defendant uses a thin, broad, flat, and perforated metal plate, which produces the same result. The complainant's meter uses a thick, annular metal piece, while the defendant uses a broad, thin, annular metal piece, both being split to straddle the radial abutment in the measuring chamber. The substance of complainant's patented piston is employed, and only its form is slightly changed. As was said in *Machine Co. v. Murphy*, 97 U. S. 120:

"Authorities concur that the substantial equivalent of a thing, in the sense of the patent law, is the same as the thing itself; so that, if two devices do the same thing in substantially the same way, and accomplish substantially the same result, they are the same, even though they differ in name, form, or shape."

Nash sought to construct a meter piston of hard rubber that would not easily change its form or distort. Lightness, strength, and durability were the desirable qualities for such a piston, and this combination has been secured by his invention, which is none the less an invention because he may have been unable to explain or describe the principle or theory on which the desired effects have been obtained. It is the resultant product, and not the principle by which it is wrought out, which is patentable. The decree of the circuit court is affirmed.

THE COLUMBUS.

THE SCOWS NOS. 6, 8, 11, AND 12.

MUNN v. THE COLUMBUS et al.

(District Court, E. D. Pennsylvania. January 8, 1895.)

No. 25.

ADMIRALTY—SERVICES RENDERED TO SEVERAL VESSELS—JOINT LIEN.

The P. Dredging Co., owning three dredges and fifteen scows, which were employed, under a contract, in removing obstructions in a river, hired libelant's tugboats to tow the scows from the place where the dredging was going on to the place where they were to be discharged, and back again, and to move the dredges from place to place, as their work progressed. Neither scows nor dredges would have been of any use alone; neither had any means of propulsion or steering, and without the use of tugs they could do nothing. Libelant's tugboats performed the work and towed the various scows back and forth many times, no itemized account being kept of the towage of any particular scow or dredge. *Held*, that libelant had no joint lien on the several scows and dredges for the entire price of the services separately rendered to those vessels.

This was a libel by Frank W. Munn, managing owner of the tugboats Philadelphia and Alert, against the dredge Columbus and four