Statement of the Case.

to appeal from the first decree elapsed; and, no question being raised as to the second decree, that of July 14, 1887, it must be *Affirmed, and it is so ordered.*

INTERNATIONAL TOOTH CROWN COMPANY *v.* GAYLORD.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE DISTRICT OF CONNECTICUT.

No. 294. Argued April 8, 1891. — Decided April 27, 1891.

Letters patent No. 277,941, granted May 22, 1883, to Cassius M. Richmond for an artificial denture, are void by reason of an abandonment of the invention to the public by the inventor before the patent was applied for.

Letters patent No. 277,943, granted to Cassius M. Richmond May 22, 1883, for a process for preparing roots of teeth for the reception of artificial dentures, are void for want of novelty and for want of invention in the invention claimed in it.

It is no invention, within the meaning of the law, to perform with increased speed a series of surgical operations, old in themselves, and in the order in which they were before performed.

IN EQUITY, for the infringement of letters patent. The case was stated by the court as follows:

This was a bill in equity for the infringement of two letters patent, granted May 22, 1883, to Cassius M. Richmond, viz., No. 277,941 for an artificial denture, and No. 277,943 for a process for preparing roots of teeth for the reception of artificial dentures.

The main contest took place over No. 277,941, which covered a device intended to replace the loss or destruction of that part of the natural tooth which projects into the mouth externally to the gum, the device being an artificial crown to be placed upon and supported by the natural stump or root of the partially destroyed tooth. The manner in which this is done was stated in the specification substantially as follows: The top of the tooth is cut off and a hole drilled in the root;

the end of the tooth being then properly prepared, a ferrule is made of such a size and shape as to exactly fit the base of the root. An artificial porcelain or other crown of suitable color, size and shape is then selected to be applied to the root; upon the back of this crown is placed a platinum or gold plate, which has holes through it to allow the passage of pins which are firmly imbedded in the porcelain. The root and crown having been so prepared, the crown is placed in position and attached to the ferrule by wax, which holds the crown sufficiently firm in position to allow of the removal of the ferrule. Thereafter a suitable pin is imbedded in the wax, which is designed to enter the hole which has been drilled in the root. The crown thus prepared is then invested or protected by a suitable covering of marble dust or plaster, leaving the wax exposed. This investiture holds the parts firmly in the position they are to occupy when placed in the mouth. The wax is then melted from behind the crown and replaced by a suitable gold solder, which is blown in by a blow-pipe, and fused around the pin. This solder unites with the pin, the ferrule and plate, making a solid backing to the crown, and firmly holding all the parts together. The prepared crown is then slipped upon the prepared root and cemented thereto. The ferrule when in position should project under the free margin of the gum sufficiently to prevent the root from decay, and is likewise concealed from view by the gum.

Following this description, the patentee proceeded to state that "when this denture is applied to a root the end of the root is entirely protected from the injurious action of the fluids of the mouth, and is hermetically sealed, being covered by a closed cap. This inclosing-cap is of the greatest importance, because otherwise decay must necessarily take place by reason of the action of the fluids of the mouth on the exposed dentine, and the denture would become useless. By this arrangement, therefore, both the end of the root and so much of the same as might otherwise be exposed to the fluids of the mouth are hermetically sealed, and the root is thus protected from the injurious effect which would otherwise result from the action of the fluids. It is obvious, likewise, that by this

arrangement the end of the root may retain its natural configuration, and its substance is not destroyed by cutting away or shaping the same at the sides, which is very injurious and tends greatly to the destruction of the root. . . . The caps hereinbefore described are so constructed, as set forth, as to cover and inclose the prepared end of the root, wholly excluding the juices of the mouth therefrom, and preventing the decay that would otherwise result."

Infringement was alleged and admitted of all the claims of the patent, which read as follows:

1. The combination of a prepared root, having its natural terminal contour near the margin of the gum, with an inclosing-cap attached thereto for supporting an artificial denture, substantially as described.

2. Combination of a prepared root, having its natural terminal contour near the margin of the gum, with an inclosing-cap attached thereto, and with an artificial porcelain or other crown supported by said cap, substantially as described.

3. The combination of a prepared root, having its natural terminal contour near the margin of the gum, with an inclosing-cap attached thereto, the said cap being attached to the root by a pin or suitable attaching contrivance passing upward and into a suitable cavity in the root, substantially as described.

4. The combination of a tooth crown, a metallic backing soldered to said crown, and a pin firmly soldered to said artificial backing and secured to and passing through a ferrule adapted to surround the root, substantially as described.

Two other claims are practically repetitions of the above.

The principal defence to this patent was that of abandonment, and upon this ground the bill was dismissed by the Circuit Court, whose opinion regarding the validity of this patent is contained in another case involving the same facts, reported as *The International Tooth Crown Co.* v. *Richmond*, 24 Blatchford, 223, and 30 Fed. Rep. 775.

Patent No. 277,943 was for a method of preparing the roots for the application of the cap covered by the prior patent, which consisted in grooving the same by opposite grooves, suddenly removing the crown from the root by a suitable for-

ceps or other contrivance, and then immediately expelling the nerve from its cavity by driving a suitable shaped piece of wood into the nerve cavity, in removing the same and cleansing the cavity, and in immediately plugging or filling the upper part of the nerve cavity by driving in another piece of wood.

The defence to this patent, viz., want of novelty, was sustained by the court below and the bill dismissed.

Mr. E. N. Dickerson for appellant.

Mr. John K. Beach and *Mr. Charles K. Offield* for appellees.

Mr. Justice Brown delivered the opinion of the court.

Prior to the invention of Dr. Richmond, the only method of supplying an artificial for a natural crown, in case the tooth had decayed or broken off, was by what is called a peg tooth. This was made by drilling the nerve canal larger; then a porcelain tooth with a hole in it was ground to fit the root, and the two were connected together by a wooden or metallic pin or dowel made to fit the hole in the porcelain as well as the hole in the tooth. The operation, however, was very unsatisfactory. It was found to be impossible to fit the artificial and the natural tooth so closely together that particles of food and saliva would not work in between them, fouling the mouth and ultimately causing the decay of the root or such a swelling of the wood as would split the root in the act of mastication, or such an enlargement of the cavity as would cause the wooden pin to drop out, resulting in either case in the loss of the tooth. It was the object of Dr. Richmond to supersede this method of crowning teeth by a more perfect, cleanly and durable device.

It is substantially conceded in this case, and was found by the court below, that his patent No. 277,941 describes an invention of great utility in the practice of dentistry, which has been largely adopted by the profession throughout the country, for building upon the roots of decayed teeth artificial crowns, which are claimed to be as strong and as well adapted to the purposes of mastication as natural teeth, and to imitate them

so perfectly in appearance that it is impossible to distinguish them except by a critical examination.

Gold or other metallic caps were not wholly unknown before the invention of Dr. Richmond. One such, known as the Morrison operation, was described in the Missouri Dental Journal of May, 1879. Another is explained in the patent of November 4, 1873, to John B. Beers, who seems to have been the first to make use of a screw or pivot to attach the cap to the root of the tooth. In both of these cement or porcelain enamel was used to fill the cap and secure the necessary adhesion to the root. Two or three other similar devices are shown; but none of them seem to have been attended by any practical success, and neither of them exhibits the combination of the Richmond patent. Indeed, it was scarcely claimed that his invention had been anticipated, and, as infringement of all his claims was admitted, the whole defence practically turned upon the question of abandonment.

The facts bearing upon this defence are substantially as follows: Dr. Richmond began his experiments in fitting a gold collar to the neck of a tooth as early as 1875 or 1876 in San Francisco, and he states himself that he performed the operation described in his principal patent in the mouth of one Kalloch on Christmas of 1876, and, so far as he knew, the operation was entirely successful, and the tooth still remained in the mouth of his patient. He further states in his examination that he practised this operation extensively in San Francisco, Chicago, Detroit, Cleveland, New York and New London, and demonstrated it to five hundred dentists in private practice and in public clinics. In their general characteristics these operations, as he states them in his testimony, were the same as were described in his patent, although there appear to have been certain differences in detail. Sometimes the tooth was backed with gold and sometimes with platina; sometimes the crowns were made entirely of platina, except the solder and porcelain. The operation was performed by making a band surrounding the root, with a porcelain front, a pin extending into the root, and the whole cemented on the root in one piece. The band was made with a piece of gold-

plate material soldered together to form a solid ring; this was fitted around the end of the root. The porcelain tooth was then ground upon this band to correspond with the adjoining tooth. The tooth was then waxed into its position; the band was then removed, and the porcelain waxed into its position on the band; the pin was then inserted into the wax forming the crown, the porcelain, pin and band being held together with wax. It was then invested, as it is called, with marble dust and plaster. The wax was then removed, and that portion of it which was filled with wax before was filled with gold, forming one solid crown.

It is but just to the plaintiff to state in this connection that Richmond appears to have had a quarrel with the treasurer of the plaintiff company in 1883, very soon after the patent was issued to the Richmond Tooth Crown Company as assignee of the inventor; and that he was called as a witness by the defendants, and apparently testified under a strong bias against the plaintiff; but his evidence regarding the extent of his operations is fortified by a large number of letters from dentists in different parts of the country, written in 1878 and 1879, certifying in strong language to the value of his invention. Indeed, the evidence is that he instructed Dr. Gaylord, one of the defendants in this suit, in the art of making and applying this tooth crown as early as 1879, performing two operations in Dr. Gaylord's mouth and one in that of a patient, and receiving pay for the same. As the application for the patent was not made until December 1, 1882, more than two years after all these operations were conducted, the evidence of abandonment is overwhelming, if it be once admitted that the operation was identical with that described in the patent, or different from it only in an immaterial particular.

The reply to all this testimony is, that the tooth crowns made prior to the year 1880 were defective, because they were made with an incomplete metallic floor to the ferrule, and for that reason the metal cap or thimble was more or less leaky. There is considerable evidence upon this point, Dr. Gaylord swearing that the operation taught to him was exactly like that which was described in the patent, while the plaintiff's

witnesses lay great stress upon the point that the cap was imperfect by reason of the incomplete covering to the root, although in some cases the hole or aperture is admitted to have been microscopic. Among the earliest exhibits put in evidence is that known as Searles, No. 1, which was a tooth which had been treated by the defendant Gaylord in 1879, according to the Richmond process as then practised, and which remained in good condition until 1885, when it fell out, the root having become loose. The exhibit as originally put in evidence showed the root surmounted by a crown. This Exhibit Searles, No. 1, is claimed to be identical with the patent in having a floor extending completely across the ferrule, and united therewith in front as well as in the rear. With regard to this, however, the plaintiff's expert testifies that he had examined it with a magnifying glass and with a microscope, and did not find that there was a closed cap. "There is a platina floor, but it is not closed. Therefore the tooth cannot show the perfected invention of Richmond, for it does not show any hermetically closed metallic cap, and without this the said perfected invention is not found." The same witness on redirect testifies further with regard to this hole by saying: "I have examined Searles, No. 1, carefully under a powerful magnifying glass. I find an opening in the gold around the pin, and also another opening about the middle of the gold which forms a part of the floor." It was said by the Circuit Judge of this and another similar exhibit, "It is conceded by the expert for the complainant that if these dentures had been made with a ring or ferrule having a complete floor embracing the exposed end of the root, they would be the tooth crowns of the patent. One of them has a half floor of platinum back of the porcelain under the ring, intended to partially inclose the exposed end of the root, and the other has a partial floor, made of loose gold foil stuffed behind the porcelain before the solder was flowed through the back of the crown. It is insisted that when the crown is constructed in this way it does not have the inclosing-cap of the patent, and consequently the end of the root is not hermetically sealed. The controversy as to this patent is thus narrowed to the question whether the sub-

stitution of a complete floor over the end of the ferrule, so as to wholly inclose the end of the natural root, in the place of a partial floor, involves sufficient invention to sustain the patent."

But whether a cap thus constructed be imperfect or not, it is entirely clear that the closing of this alleged hole, which is so small that its very existence is denied, is such a carrying forward and perfection of the original device as would occur to any ordinary dentist, since it is of the very alphabet of dental science that the dentine of a tooth shall be protected as far as possible from the action of food and the fluids of the mouth. There is little doubt that some progress was made between the first operations of Dr. Richmond in San Francisco and that disclosed by his patent; but the real invention was made when the ferrule with the porcelain crown was adopted and applied to the root of a tooth prepared for the purpose of receiving it. All subsequent progress was made on this line and in furtherance of this idea, and was such as would occur to an ordinarily skilful dentist. There is a multitude of cases in this court to the effect that something more is required to support a patent than a slight advance over what had preceded it or mere superiority in workmanship or finish. *Smith* v. *Nichols*, 21 Wall. 112; *Atlantic Works* v. *Brady*, 107 U. S. 192, 199; *Pickering* v. *McCullough*, 104 U. S. 310.

Nor do we think the use which Dr. Richmond made of his invention can be fairly called experimental. The fact that he taught it to a large number of dentists throughout the country, with no suggestion that it was an experiment, and received pay for such instruction, precludes the defence he now sets up that all this was simply tentative. It was said in *Smith & Griggs Mfg. Co.* v. *Sprague*, 123 U. S. 249, 256, by Mr. Justice Matthews, speaking for this court: "A use by the inventor for the purpose of testing the machine, in order by experiment to devise additional means for perfecting the success of its operation, is admissible; and where, as incident to such use, the product of its operation is disposed of by sale, such profit from its use does not change its character; but where the use is mainly for the purposes of trade and profit, and the experi-

ment is merely incidental to that, the principal, and not the incident, must give character to the use. The thing implied as excepted out of the prohibition of the statute is a use which may be properly characterized as substantially for purposes of experiment. Where the substantial use is not for that purpose, but is otherwise public, and for more than two years prior to the application, it comes within the prohibition." If, as was said in *Consolidated Fruit Jar Co.* v. *Wright*, 94 U. S. 92, 94, and *Egbert* v. *Lippmann*, 104 U. S. 333, a single instance of sale or of use by the patentee may be fatal to the patent, much more is this so where the patentee publicly performs an operation covered by his patent in a dozen different cities throughout the country, and teaches it to other members of the profession, who adopt it as a recognized feature of their practice. Granting that, under the rule laid down in *Elizabeth* v. *Pavement Co.*, 97 U. S. 126, a patentee has a right to test the durability of his invention as one of the elements of its success, it is manifest that his experiments to that end should extend no farther, either in time or in the number of cases in which it is used, than is reasonably necessary for that purpose. In that case the inventor of a pavement who had filed a caveat therefor laid seventy-five feet of it upon an avenue belonging to a toll corporation, of which he was a stockholder, and allowed it to remain there six years before he took out his patent, visiting it almost daily. As the test was purely experimental, and he received no compensation for the use of his pavement, it was held not to constitute an abandonment. But the court observed: "If the inventor allows his machine to be used by other persons generally, either with or without compensation, or if it is, with his consent, put on sale for such use, then it will be in public use and on public sale, within the meaning of the law." Manifestly that case is no authority for the use that was made of the patented device in the present case.

In preparing his specification Dr. Richmond naturally laid great stress upon the hermetical sealing of the cap; as he must have been satisfied that his first operations constituted a complete abandonment of what he did to the public, and that the entire validity of his proposed patent would depend upon his

ability to draw a distinction between his operations as formerly and as then conducted. We are satisfied, however, that his real invention, and the only one to which he was properly entitled to a patent, is such as he put in practice prior to the years 1878 and 1879, and taught so extensively throughout the country. In the light of this testimony we are compelled to hold that this constituted such an abandonment of his claim as to preclude his obtaining a valid patent for it.

Little need be said with regard to patent No. 277,943, which is for preparing the root for the reception of the denture described in the former patent. This preparation consists in removing the crown from the root, and then driving into the nerve cavity a suitably shaped piece of wood; in removing the same and cleansing the nerve cavity; and in immediately plugging or filling the upper part of the nerve cavity by driving in another piece of wood, as described in his fourth claim. These operations were all old, and were performed in the order stated in this patent. Practically, the only novelty is in the immediate filling of the nerve cavity with a wooden plug after the previous operation. In this connection, the patent states that, "in order to avoid pain by treating the tooth while still benumbed, and to prevent abscess or inflammation, it is very important to close the pulp canal immediately. This I accomplish by driving a second piece of wood, shaped like the first, into the pulp canal in the presence of carbolic acid, filling it to its apical foramen, thus perfectly excluding the air."

It is hardly necessary to say that it is no invention, within the meaning of the law, to perform with increased speed a series of surgical operations old in themselves, and in the order in which they were before performed. With what celerity these successive operations shall be performed depends entirely upon the judgment and skill of the operator, and does not involve any question of novelty which would entitle him to a patent therefor.

The decree of the court below dismissing the bill is therefore

Affirmed.

Mr. Justice Brewer did not sit in this case and took no part in its decision.