

GRAY, Justice. This is a bill in equity for the infringement of a patent granted to Isaac Adams, Jr., on May 6, 1879, for an improvement in coating metallic articles with vulcanizable rubber. The specification begins as follows:

"Great difficulty has been experienced in making rubber adhere securely to metals; but by my improvement a firm adhesion may be obtained. The invention consists in interposing between the metallic article and the rubber a film of any metal which, at the temperature of vulcanization, has a considerable tendency to unite with the sulphur always contained in the rubber compounds. Of metals possessing such tendency, the films of which may be interposed, the most suitable are copper and silver, and of these copper is the easiest as well as the cheapest to apply. Lead and zinc may likewise be used; but there is a greater difficulty in obtaining a suitable deposit of these metals for the interposing film. The metallic article is first covered with the film selected, and the rubber compound is then applied in the usual way and vulcanized."

The specification throughout insists upon the necessity of making the interposed film very thin. It states that the film must not be of the same metal as the article on which it is deposited; that it may be produced either by dipping or by electro-plating; that in covering iron, steel, or tin articles with copper, the method of dipping is preferable, and the article must be immersed in a weak solution of sulphate of copper just long enough to produce a bright copper-colored deposit; and that when the method of electro-plating is adopted, great care should be taken that too thick a film be not deposited, and a film such as is known as "coloring" or "striking" is sufficient.

The principal claim is for "the process of covering metallic articles with rubber, by first coating the said metallic articles with a thin film of copper or other metal which readily unites with sulphur, and then applying the rubber and submitting it to vulcanization, substantially as described."

According to the evidence, the peculiar value of this invention consists in the very thin film of copper, or other suitable metal, which, in the process of vulcanizing, is acted on by the sulphur contained in the rubber, so as to unite or combine with the sulphur and be absorbed into the rubber, and to hold together the rubber and the metal which has been coated with the film, and make the rubber stick so fast to that metal that it cannot be forced off without tearing the rubber itself. If the film of copper is too thick, the whole of it is not absorbed into the rubber, and so much of it, modified by the action of the sulphur, as is not absorbed, has so little coherence that the rubber may be readily detached. The difference is analogous to that which appears in the case of a glue, in itself friable and of little tenacity, a very thin film of which will hold two articles together, but a thicker layer of which may be easily broken apart. The value of the invention is well exemplified in the construction of wringer rolls, for which it has been much used by both parties.

The defendants admit that if the Adams patent is valid they have

infringed it. They contend that Adams was not the first inventor, but was anticipated by Louis Sterne, three patents to whom were introduced in evidence. Sterne's first patent is one granted in England, in 1866, for "improvements in buffers, draw-springs, and bearing springs," the specification of which describes the invention as consisting in introducing, between disks of hard India rubber or ebonite, alternate rings of soft India rubber, and uniting the rings to the disks during the process of vulcanization or otherwise; and states that "instead of the disks being made of hard India rubber or ebonite they may be made of brass, iron coated with brass, by means of the galvanic process or by other means, or they may be made of any other suitable metal or hard material." Of the two other patents of Sterne, the one for pneumatic springs made of alternate metal plates and rubber rings, forming an air chamber, was patented in the United States on February 23, 1869; the other, for driving-belts made of parallel strips of metal and of rubber, was patented in England on June 2, 1868, and in the United States on August 3, 1869. According to the description in either specification the rubber is chemically united with the metal during the process of vulcanization, and the metal plates or strips are first ground or scoured until their surfaces are perfectly free from scale or oxidized matter, and then "placed in a bath prepared to deposit the necessary precipitation of copper and zinc by the electro-metallurgical process." Each of Sterne's three patents speaks only of brass, a compound of copper and zinc, as the metal to be deposited; and the complainants contend that even a very thin film of brass would, by reason of securing a less perfect adherence, differ from the invention of Adams, in which the film is of a single metal. But it is unnecessary to consider that point, because it is quite clear that neither of the Sterne patents contemplates or points out the necessity of making the film very thin, or gives any directions by which a person of competent skill would be led to make the film so thin as to produce the result described in and obtained by the patent of Adams. A patent is not invalidated by statements in an earlier publication, unless those statements are full and definite enough to inform those skilled in the art how to put in practice the invention now patented. *Betts v. Menzies*, 10 H. L. Cas. 117; *Neilson v. Betts*, L. R. 5 H. L. 1; *Seymour v. Osborne*, 11 Wall. 516, 555; *Cawood Patent*, 94 U. S. 695, 703, 704; *United Nickel Co. v. Anthes*, Holmes, 155; *Same v. Manchester Brass Co.* 16 Blatchf. 68.

Decree for the complainants.