

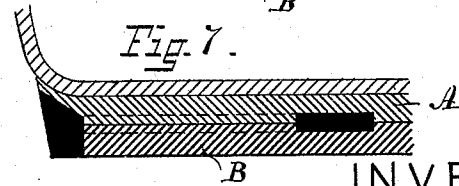
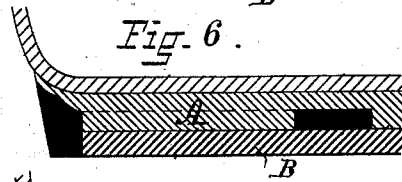
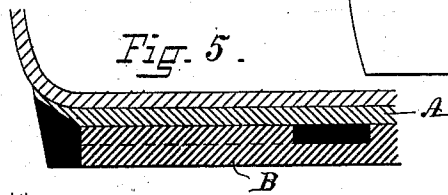
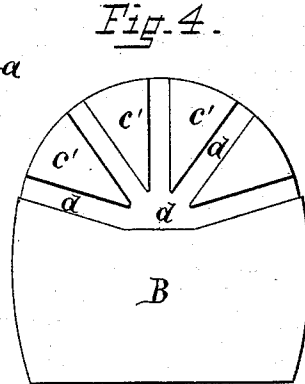
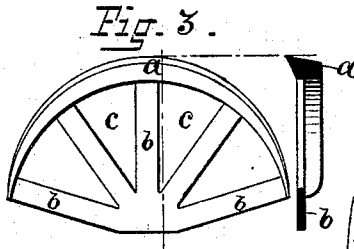
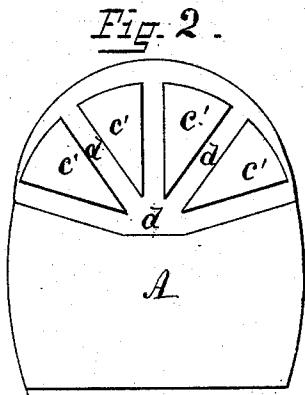
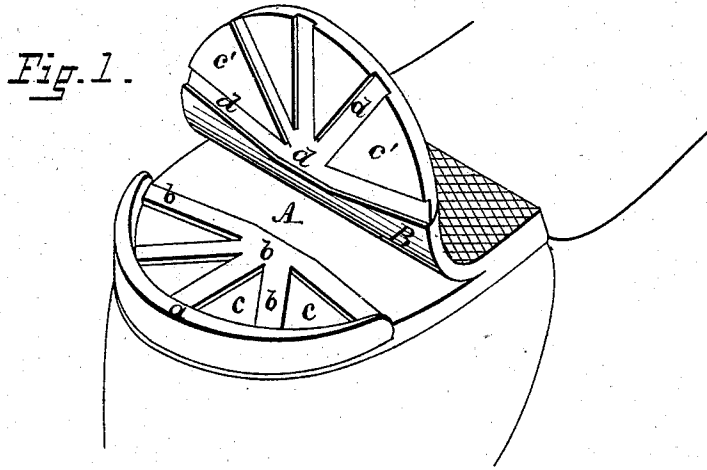
(No Model.)

F. RICHARDSON.

PROCESS OF SECURING METAL WEARING SURFACES TO RUBBER BOOTS
AND SHOES.

No. 255,672.

Patented Mar. 28, 1882.



WITNESSES:

Henry J. Miller
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UNITED STATES PATENT OFFICE.

FREDERICK RICHARDSON, OF PROVIDENCE, RHODE ISLAND.

PROCESS OF SECURING METAL WEARING-SURFACES TO RUBBER BOOTS AND SHOES.

SPECIFICATION forming part of Letters Patent No. 255,672, dated March 28, 1882.

Application filed December 22, 1881. (No specimens.)

To all whom it may concern:

Be it known that I, FREDERICK RICHARDSON, of the city and county of Providence and State of Rhode Island, have invented a new and useful Improvement in the Process of Securing Metal Wearing-Surfaces to Rubber Boots and Shoes; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improved process or method of securing any kind or form of metal wearing-surface to the heel or other portion of a rubber boot or shoe, by which the rubber is protected by metal at such points or places where the boot or shoe is most exposed to wear.

As the weakest place in a rubber shoe, and more particularly in rubber overshoes, is at the rear of the heel, this specification refers particularly to this portion; but the toe end of the sole or the edges of the sole may be protected in a similar manner.

The invention consists in rolling, pressing, stamping, or forming in the sole and the heel, in either or both, or into any other two sheets of rubber, depressions, into which the plate-frame, or arms forming part of the wearing-surface may be placed, and the whole cemented together before vulcanization, as will be more fully set forth hereinafter.

Figure 1 is a perspective view, showing the heel portion of a rubber shoe with the metal wearing-piece set on the sole, the heel-piece being shown as raised, so as to show the depressions made in the same, corresponding with the frame of the metal wearing-piece. Fig. 2 is a view of the heel portion of the sole, showing the depression or matrix into which the plate or frame of the metal wearing-surface can be placed. Fig. 3 is a view and section of the metal wearing-surface selected for illustration. Fig. 4 is a view of the heel portion or tap of a rubber boot or shoe, having a matrix or depression formed therein, in which the plate or frame of the metal wearing-surface can be placed. Fig. 5 is a sectional view of the heel portion of a rubber shoe, showing the plate of the metal wearing-surface embedded in the sheet of rubber forming the wearing-surface of the heel and the sole and heel secured to-

gether by cementation. Fig. 6 is a sectional view of the heel portion of a rubber shoe, showing the plate of the metal wearing-surface embedded in the sole; and Fig. 7 is a sectional view of the heel portion of a rubber shoe, showing the plate embedded in both the sole and heel.

In the drawings, A is the sheet of rubber forming the sole of the shoe. B is the sheet of rubber forming the heel of the rubber boot or shoe. These two pieces or sheets are usually secured together by cementation.

a represents any form of metallic wearing-surface that is or can be provided with a plate, frame, or arms, which, by being secured between two sheets of rubber, will secure the metal wearing-surface. The form selected for illustrating the present invention is shown in Fig. 3; but the form of the wearing-surface or the form of the frame or plate has no reference to the present invention, as any form may be secured in the same manner as the one shown.

b is the frame or plate, which extends between the two sheets of rubber.

c c are central openings formed in the plate. *d* is the matrix, formed by rolling, stamping, or pressing in either or both the pieces A and B. It is of the form of the plate or frame.

b c' are the central cores, which correspond with the central openings, *c c*.

When the two sheets have been prepared by forming the matrix *d* the metal wearing-piece is inserted and the two pieces A and B are secured together with cement in the usual manner, care being taken that no air-space is left, as the presence of air will ruin the work in the process of vulcanization.

I will now describe my improved process more fully.

I first take the metal piece that is to form the wearing part or the heel-guard of a rubber boot or shoe, and, by pickling in an acid bath, clean the surface. After washing and drying the same I cover the portion to be inserted between the rubber sheets with rubber cement, usually made by dissolving rubber in naphtha. I now place the part to be secured between the sheets of rubber into the cavity or matrix formed in them, secure the whole together by cement, and then subject the whole to the process of vulcanization. The metal should be

well covered with the liquid cement, and should
fill every part of the matrix, so as to expel
every particle of air. The metallic wearing
parts or guards, when so secured, form one
5 solid part with the rubber shoe and protect the
rubber.

Having thus described my invention, I claim
as new and desire to secure by Letters Patent—

The process herein described for securing
10 metal wearing-surfaces or guards to rubber

boots or shoes, the same consisting in forming
depressions or grooves in one or both of the
sheets, placing the plate, frame, or arms into
such depressions, and securing the two sheets
together by cementation, as described.

FREDERICK RICHARDSON.

Witnesses:

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