(No Model.)

R. N. PRATT & H. W. JOHNS.

BOOT OR SHOE.

No. 381,579. Patented Apr. 24, 1888.

Fig. I.

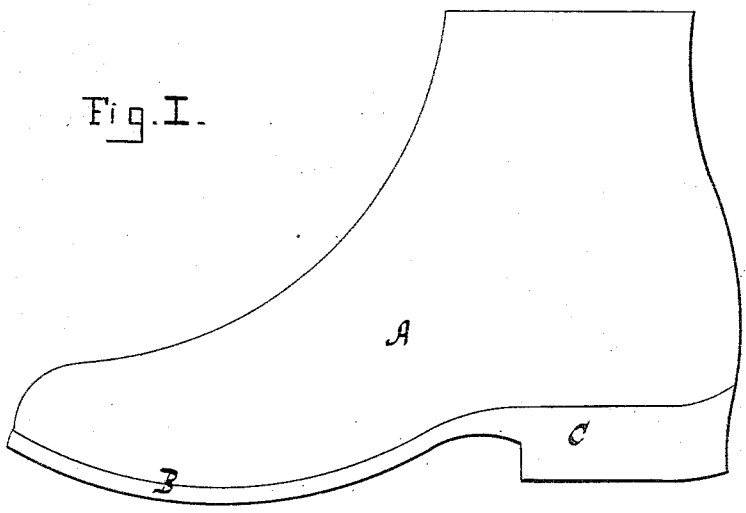
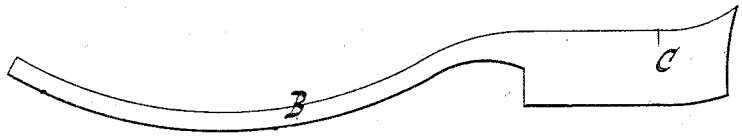


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

RUFUS N. PRATT, OF HARTFORD, CONNECTICUT, AND HENRY W. JOHNS, OF NEW YORK, N. Y.

BOOT OR SHOE.

SPECIFICATION forming part of Letters Patent No. 381,579, dated April 24, 1888.

Application filed June 2, 1887. Serial No. 240,082. (No model.)

To all whom it may concern:

Be it known that we, RUFUS N. PRATT, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, and HENRY W. JOHNS, a citizen of the United States, and a resident of New York city, New York, have invented certain new and useful Improvements in Boots or Shoes, of which the following is a specification.

Our invention relates to boots or shoes which, being water-proof, acid-proof, and fire-proof, and the soles and heels thereof tough and free from seams either vertical or horizontal, are suitable for general use, but are especially adapted for persons following those arts or trades which are peculiarly destructive to leather or wooden shoes.

Shoes made in accordance with our invention are admirably adapted for furnace and forge workers, firemen, and other persons requiring fire-proof, water proof, or acid-proof foot-coverings.

To these ends the invention consists in forming boots and shoes of a flexible fabric of asbestus, which constitutes the upper or body portion, and a tough asbestus composition constituting the sole and heel portion, as will be hereinafter fully described.

In manufacturing boots and shoes according to our invention we treat the asbestus as set forth at length in United States Letters Patent dated March 23, 1886—that is to say, the fibers of the asbestus are separated from each other, the impurities being preferably removed, and the fibers are then thoroughly coated with a solution of india-rubber or gutta-percha dissolved in naphtha with sulphur added. These several ingredients are very thoroughly incorporated with each other, so that they constitute a homogeneous mass, which is then subjected to drying and pressing operations, as set forth in the said patent, and are either formed into sheets, which are then vulcanized and from which the soles and heels of the shoes are cut by dies or otherwise, or the mass may be molded in suitable molds into the desired form for the soles and heels and then vulcanized, as also set forth in the said patent, or the soles and heels may be cut from the sheets before being vulcanized, and then vulcanized. By this method the entire lower part of the shoe will be one piece.

The uppers are made from asbestus cloth or asbestus cloth which has been impregnated with a solution of india-rubber or gutta-percha dissolved in naphtha with sulphur, which is duly dried and vulcanized. The upper is attached to the sole and heel by sewing, nailing, cementing, or in any other suitable manner. The uppers, however, like the soles, may be made of compressed asbestus fiber, being vulcanized to such an extent only as will leave them sufficiently flexible, and they may be molded into the desired form.

We do not limit ourselves to india-rubber or gutta-percha as the binding or solidifying materials, since shellac and glue rendered water-proof by suitable processes or not, and also other equivalent materials, as set forth in another application for a patent made by us, now pending, may be employed. We much prefer the rubber and gutta-percha with sulphur added, however, because the shoes can then be vulcanized after being formed and thus their durability be greatly increased, and they can be given any desired degree of flexibility, depending on the extent of the vulcanization, as is now well understood.

We do not limit ourselves to boots or shoes in which both the sole and the upper are made of asbestus compounds, because we purpose to make the soles with or without the heels attached as distinct articles of manufacture, by the use of which completed boots and shoes can be made having ordinary leather uppers, the uppers being attached to the sole, &c., in the manner above stated, or in any other suitable manner. Thus our asbestus soles will simply take the place of ordinary leather soles.

In order to add durability to the soles, we sometimes mix with the binding or solidifying material and the fibrous asbestus certain foreign bodies adapted to add density and consequently durability to the products. This use of foreign bodies is described by us in a pending application for Letters Patent, and we do not herein claim it, broadly, but solely in connection with the manufacture of shoes. Some of the foreign substances which may be

used in making the soles and heels are oxide of iron, the metallic powders as a class, fine sand, and the like bodies. We also add to the solution which is used to impregnate the uppers certain foreign bodies which add to the heat-resisting qualities of the uppers, and also act as a filler, whereby the uppers may be improved in appearance, and, if desired, be finished after vulcanization with an enameling or like surfacing treatment. The foreign substances which may be beneficially used for this purpose are umber, argillite, china-clay, powdered asbestus, and the like. These substances should be applied after the cloth for the uppers has boen woven, and preferably immediately after or at the same time with the application of the rubber or gutta-percha solution, and should preferably be applied to the outer surface of the "uppers" only to reduce weight. They may be applied on both sides, however, if preferred.

We also employ in our shoes a lining of suitable non conducting material, such as hair or wool, or a hair or wool felt or asbestus fiber or asbestus cloth or felt. It may be applied to the soles alone or to the uppers alone, or to both, and may be fastened in place by any suitable cement or by other means.

In the accompanying drawings, Figure 1 illustrates a shoe having a flexible upper made of prepared asbestus cloth and a sole and heel molded in one piece of tough asbestus composition. Fig. 2 is a side view of a sole and heel molded or shaped in one piece.

The upper or body A of the shoe or boot is made of asbestus cloth, as already described, and its shape or form is like that of an ordinary shoe or boot upper. The sole B and the heel C (shown in the present instance formed integral with the sole) are made of a tough or leather-like plastic composition in which asbestus predominates, as has already been fully set forth.

We are well aware that asbestus fabrics and compounds have been used in the manufacture of articles of fire-proof wearing-apparel, and that an asbestus insole has heretofore been applied to boots and shoes. Our invention, however, differs from the above, since it concerns a new article of foot-wear, a boot or shoe having the proper requisites—viz., a flexible upper and a tough and sufficiently rigid sole and heel having the properties and characteristics above recited.

In conclusion, we desire to be understood by the terms "flexible asbestus composition" and "tough or rigid asbestus composition" as including any and all compositions for use in the manufacture of boots and shoes in which asbestus predominates sufficiently to produce a fire, water, and acid proof flexible upper and a tough or rigid outer sole or heel for the same.

Having described our invention we claim—

1. As an improved article of manufacture, the herein-described boot or shoe having an upper or body portion made of a flexible asbestus composition or cloth and a sole and heel formed of a tough or rigid asbestus composition, substantially as hereinbefore set forth.

2. As an improved article of manufacture, a sole for boots and shoes formed of a tough or rigid composition composed mainly of asbestus and a sufficient quantity of rubber or equivalent vulcanizable or binding compound or material, as set forth.

3. As an improved article of manufacture, a sole and heel for boots and shoes in one piece formed of a tough or rigid composition composed mainly of asbestus and a sufficient quantity of rubber or equivalent vulcanizable or binding compound or material, as set forth.

4. As an improved article of manufacture, a sole and heel in one piece formed of a tough or rigid composition composed mainly of asbestus mixed with an oxide of iron or its equivalent and a sufficient quantity of rubber or equivalent vulcanizable or binding compound or material, as set forth.

Signed at New York, in the county of New York and State of New York, this 2d day of May, A. D. 1887.

RUFUS N. PRATT.
HENRY W. JOHNS.

Witnesses:
HENRY W. JOHNS, Jr.,
PHILLIPS ABBOTT.