I. L. KEITH.

BOX TOE STIFFENER.

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1,046,194. Patented Dec. 3, 1912.

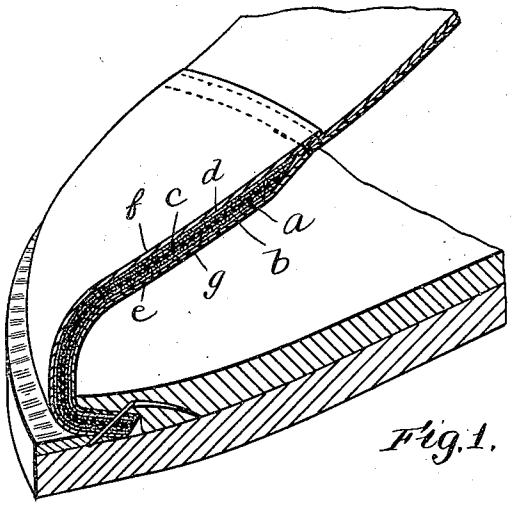

Fig. 1.

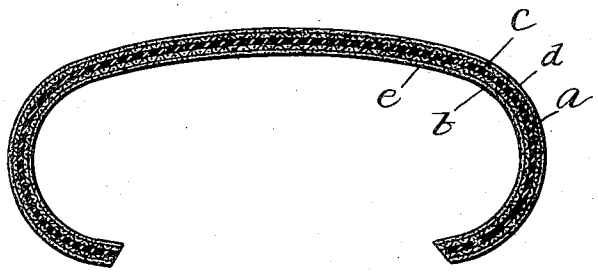

Fig. 2.

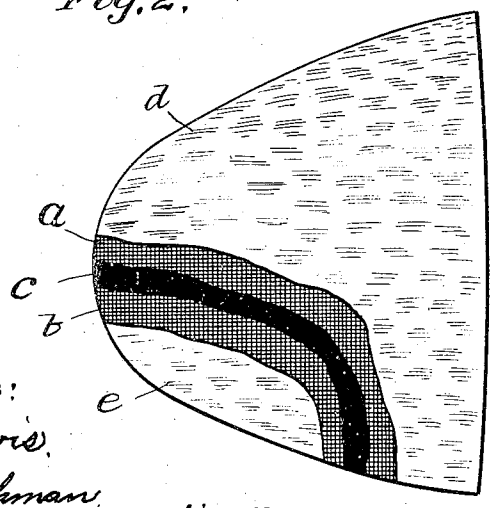

Fig. 3.

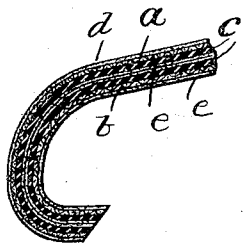

Fig. 4.

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UNITED STATES PATENT OFFICE.

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BOX-TOE STIFFENER.

1,046,194. Specification of Letters Patent. Patented Dec. 3, 1912.

Application filed January 19, 1911. Serial No. 603,447.

To all whom it may concern:

Be it known that I, IRVING L. KEITH, residing at Haverhill, in the county of Essex and State of Massachusetts, have invented an Improvement in Box-Toe Stiffeners, of which the following is a specification.

This invention relates to certain improvements in box-toes for shoes, and more particularly to a specially prepared material which is adapted to be used in the making of the box when the shoe is lasted.

Prior to my invention it has been customary to make the boxes in the toes of shoes by using various adhesive and stiffening compositions, commonly known to the trade as "box toe gums" and which are placed in the shoe between the upper and the lining, or by inserting or securing a stiffening piece therein which consists of canvas, or other suitable material, impregnated or covered with a self-hardening substance, which is placed in the shoe while in plastic condition, at the time of lasting, and dries and hardens while held in shape on the last. A box stiffened with "box toe gum" and the like is open to various objections, particularly in that the stiffening material is brittle and may be easily broken and when broken cannot be repaired except with great difficulty, if at all, and with the exception of the so called "waterproof" box-gum, which is extremely brittle, when dry, the self hardening or stiffening substances which, so far as I am aware, have been used in practice, are readily affected by moisture, so that, in case the shoe should become wet, the box is likely to lose its shape. A further objection to the gums and similar self-hardening substances, which are applied while in plastic form by the workman at the time of lasting the shoe, is that the workman has difficulty in making boxes which are uniform in appearance and strength, as he is likely to use too much or too little of the gum and there seems to be no practical way of regulating the amount of gum used.

In the construction of a box-toe it is desirable to employ a stiffening material having an adhesive coating thereon which is adapted to be rendered readily pliable and adhesive when dipped in water, and which is somewhat flexible but sufficiently stiff to retain its shape when dry, so that the box may be readily shaped onto the last when the shoe is lasted, but such an adhesive, obviously, becomes soft again when wet after the shoe is made, and I have been unable ever to discover a stiffening substance which became adhesive when wet and which could also be applied to a waterproofed surface. While it has been attempted to waterproof a box by inserting a sheet of rubber therein, this method has not been found to be practical, as such a box is expensive to make, and the parts of the box are not, or cannot be connected so as to give the box the desired strength.

The object of my invention is to provide a stiffening sheet constructed to be cut out to form a stiffener for box-toes, counters and the like, the surfaces of which are coated with a substance which becomes adhesive when inserted in water, so that the piece may be placed between the lining and the upper or between the tip and vamp when the shoe is unlined, and caused to adhere thereto, when the shoe is lasted, so as to make a practically integral structure, and which remains somewhat flexible but becomes sufficiently stiff when the moisture has evaporated, to hold the box in shape, and which, further, is provided with means whereby moisture which affects one of the adhesive coatings is prevented from affecting the other, so that the box will not be caused to lose its shape by moisture, and which, in case it becomes misshapen through accident, may be readily reshaped, so that it will become set in the desired form when dry. I accomplish this object by providing a stiffening material, which comprises two sheets of fabric, cloth, leather, leatherboard or other suitable, flexible and absorbent material, firmly connected by an interposed layer of waterproof adhesive, and by coating the outer surfaces of the sheet thus formed with a somewhat flexible stiffening composition or material which is adapted to become pliable and adhesive when immersed in water, and to return to its original state when dry.

For a more complete understanding of my invention reference is made to the accompanying drawing, in which,—

Figure 1 is a sectional view of the toe portion of a shoe having a box made according to my invention. Fig. 2 is a sectional view of the material before it is applied, and, Fig. 3 is a plan view, partly in section, of the material in the form in which it is cut before it is used. Fig. 4 is a sec-

tional view of a modified form of box-toe, which I preferably employ in many instances.

According to my invention I provide two sheets *a* and *b*, of a suitable fabric, cloth, leather or leather-board, or other suitable material which is flexible and absorbent, said sheets being superimposed and having their surfaces securely connected by an interposed layer of waterproof cement *c*, as for example, rubber cement, forming practically a single integral sheet, through which water cannot pass. Both surfaces of the sheet thus formed are then covered with a thick coating of non-waterproof adhesive material *d*, and *e*, such as dextrin, glue or paste, which is adapted to become pliable and adhesive when wet and to become sufficiently stiff for the purpose, though somewhat flexible, when dry. To make a box for the toe of a shoe, the stiffeners are cut out in suitable form, from sheets, thus prepared, as indicated in Fig. 3, and the stiffener may be stitched to the upper at the time the tip is stitched, or it may be inserted between the upper *f* and the lining *g* of the shoe, at the beginning of the lasting, or "pulling-over" operation, the stiffener first being immersed in water, so that the coating on each side thereof will become pliable and adhesive, and the formation of the box, by the lasting of the shoe about the toe, may be easily accomplished. As the different parts which compose the box are all drawn into shape about the last, and the upper and lining are drawn tightly against the adhesive coated sides of the stiffening sheet, when the parts become dry, while the shoe is on the last, said coated sides will firmly adhere to the upper and lining, respectively, and will become sufficiently stiff to hold the parts in shape. Moreover, the fact that all of the different layers of which the box is composed are bound together, as one integral structure, causes the strength of the box to be greatly increased. As the adhesive coatings or layers *d* and *e* are somewhat flexible and all other parts of the box are perfectly flexible, the walls of the box are adapted to yield to a considerable extent without breaking. In case the upper should become wet, so that the adhesive outer layer *d* becomes moist and soft, the moisture will be prevented from penetrating through to the adhesive inner layer *e*, by the waterproof layer *a*, which is interposed, and, although the outer adhesive layer may thus be caused to become soft and yielding, the adhesive inner layer will still hold the parts in shape. In the same way, the outer layer of adhesive will be protected by the waterproof layer *a*, if moisture should reach the inner layer of adhesive, so that it becomes soft. It will be apparent, therefore, that if only one coating or layer of the adhesive becomes soft from moisture, the other layer will hold the box in shape, but in case both layers should become soft, if the box is pushed into shape while they are in this condition, when the materials become dry the box will be held in its original condition. If the box should be broken down, it may be restored practically to its original condition by moistening the adhesive coatings and pressing the box into its original shape.

As shown in Fig. 4, by placing two of the stiffening sheets, one on the other in the toe of the shoe, between the upper and lining, as before described, the contacting adhesive coatings will become united and a relatively thick layer of the adhesive stiffening will be provided between two waterproof layers, so that access of water to the intermediate stiffening layer will be absolutely prevented. Two stiffening layers will thus be provided, in addition to those provided in the form of box already described, and the resulting construction will be much stronger. Inasmuch as the thickness of the fabric, or other absorbent material which is joined by the waterproof cement and coated with the adhesive, may be reduced almost to any extent desired, two of the sheets prepared and joined, as shown in Fig. 2, may be used without making the stiffening undesirably thick or bulky.

When my improved form of toe stiffener is used in the manufacture of turned shoes, in which the lasting and sewing operation is performed before the shoe is turned, if it is found, before the shoe is turned, that the adhesive coating which comes next the lining, has become hardened, moisture may easily be applied thereto, so as to soften it, while in practice, the inner adhesive coating, which comes next the upper will not, ordinarily, become set before the shoe is turned, as the turning operation follows the sewing operation almost immediately, and the presence of the last in the shoe, together with the waterproof lining, will prevent evaporation of the moisture from the adhesive.

The above described material may be used to advantage as a shoe counter in substantially the manner above described, but is particularly advantageous when used in making box-toes as above described, for reasons already stated and for the further reasons that uniformity of appearance is secured, as the different layers of material, which make up the box, do not vary in thickness, and, as the stiffeners merely have to be dipped in water to make them perfectly pliable, the making of the box may be rapidly performed at slight expense.

I claim:—

1. A stiffener for the toes of shoes, adapted to be inserted between the lining and

upper of the shoe, and comprising two superimposed layers of fabric having an interposed connecting layer of waterproof material, to form an impervious sheet, the outer sides of said layers of fabric each having a coating of self-hardening, stiffening material adapted to become soft and adhesive when moistened so as to be readily conformable to the desired shape, and to connect adhesively the upper and lining of the shoe.

2. A stiffener for the toes of shoes and the like, comprising two layers of fabric having an interposed layer of waterproof material adhesively connecting their inner surfaces to form an impervious sheet, the outer surfaces of the sheet each having a coating of self-hardening and somewhat flexible, stiffening material adapted to become soft and adhesive when moistened.

3. A stiffener for box-toes of shoes and the like, comprising two inner sheets of textile material having an interposed layer of self-hardening, non-waterproof stiffening material adhesively connecting the same, and two outer sheets, also of textile material, each having a layer of waterproof material adhesively connecting its inner surface to the outer surface of the adjacent inner sheet and providing an impervious layer at each side of said non-waterproof stiffening, and each outer sheet having on its outer surface a coating of self-hardening, non-waterproof, adhesive, stiffening material.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

IRVING L. KEITH.

Witnesses:
MARGARET H. EMERSON,
RANSOM C. PINGREE.