F. E. BUTTERFIELD, DEC'D.

E. M. BUTTERFIELD, ADMINISTRATOR.

METHOD OF MAKING STIFFENED FOREPARTS OF BOOT AND SHOE UPPERS.

APPLICATION FILED AUG. 7, 1911.

1,070,406. Patented Aug. 19, 1913.

Fig. 1.

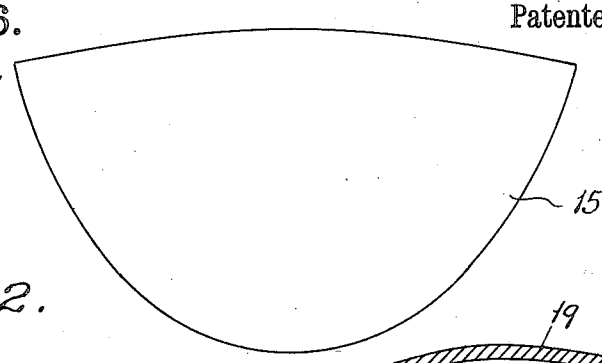


Fig. 2.

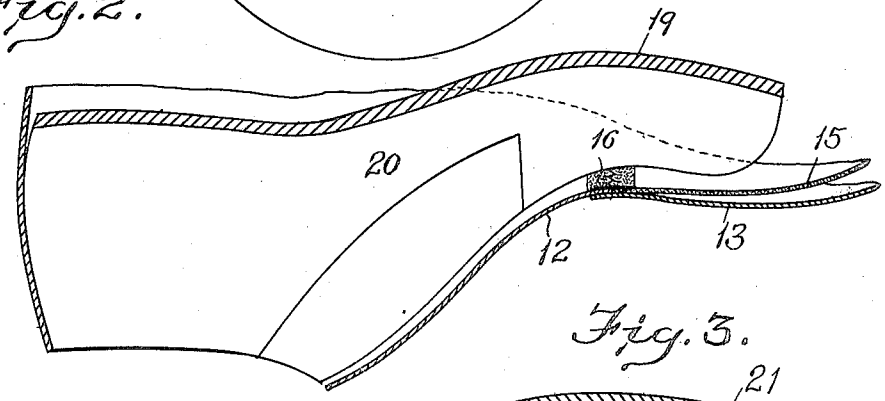


Fig. 3.

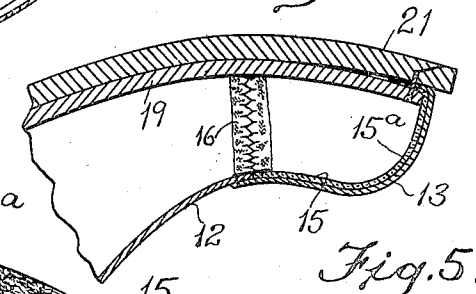


Fig. 4.

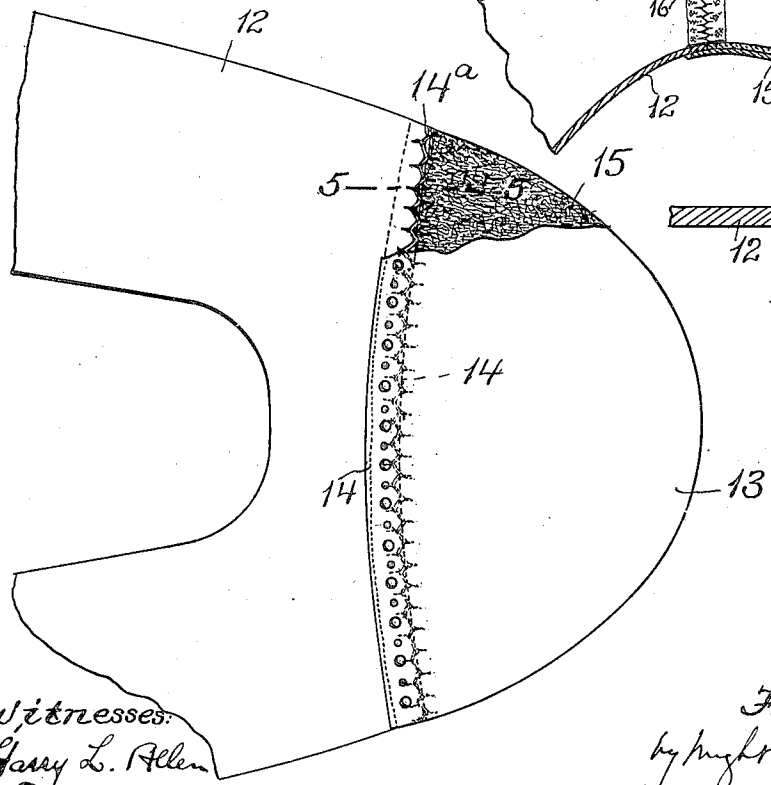
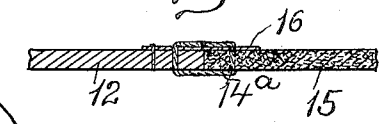


Fig. 5.



Witnesses:
Harry L. Allen
E. Batchelder

Inventor
Frank E. Butterfield
by Hyde Brown Dunby & May
Attys.

BEST AVAILABLE COPY

UNITED STATES PATENT OFFICE.

FRANK E. BUTTERFIELD, OF WAKEFIELD, MASSACHUSETTS; EUGENE M. BUTTERFIELD, OF WALTHAM, MASSACHUSETTS, ADMINISTRATOR OF SAID FRANK E. BUTTERFIELD, DECEASED, ASSIGNOR TO BECKWITH BOX TOE COMPANY, OF DOVER, NEW HAMPSHIRE, A CORPORATION OF MAINE.

METHOD OF MAKING STIFFENED FOREPARTS OF BOOT AND SHOE UPPERS.

1,070,406. Specification of Letters Patent. Patented Aug. 19, 1913.

Application filed August 7, 1911. Serial No. 642,690.

To all whom it may concern:

Be it known that I, FRANK E. BUTTERFIELD, a citizen of the United States, and a resident of Wakefield, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Methods of Making stiffened Foreparts of Boot and Shoe Uppers, of which the following is a specification.

This invention relates to the manufacture of boots and shoes, the toe portions of the uppers of which are stiffened by a box toe formed during the operation of lasting the toe portion of the upper instead of being formed or molded prior to the lasting operation.

The invention has for its object to enable a properly stiffened and durable forepart to be produced more perfectly and quickly than heretofore, and to reduce to the minimum the cost for producing a stiffened upper forepart.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings which form a part of this specification, Figure 1 represents a side view of a box toe blank used in practising the invention; Fig. 2 represents a longitudinal section of a shoe upper before lasting, the said blank being incorporated in the upper and the upper being shown applied to the last without being conformed thereto; Fig. 3 represents a view similar to Fig. 2, showing the upper conformed to the toe portion of the last. Fig. 4 represents a side view of a portion of an unlasted vamp, and a box toe blank and a toe cap attached thereto, a portion of the toe cap being broken away to show a portion of the box toe blank. Fig. 5 represents an enlarged section on line 5—5 of Fig. 4.

Similar reference characters indicate the same or similar parts in all the figures.

In the drawings, 12 represents the vamp portion of a shoe upper and 13 represents the usual or any suitable toe cap attached by stitches 14 to the vamp and adapted to be lasted over the toe portion of the upper in the usual manner. 20 represents a last.

15 represents a box toe blank adapted to be conformed to and cover the toe portion of the upper surface of the last and to be bent or crimped inwardly over the marginal portion of the bottom of the toe portion of the last. The blank 15 may be attached at one edge to the vamp 12 by zig-zag stitches 14^a, the blank being at the inner side of the toe cap. If desired, however, the blank may be placed loosely on the inner side of the toe cap and interposed between the toe cap and the toe portion of the vamp in case the latter is formed to cover the upper surface of the toe portion of the last. I prefer, however, especially in McKay sewed shoes to stitch the blank to the vamp as shown by Figs. 4 and 5. The blank 15 is made of a fibrous absorbent material, preferably felt, although it may be composed of one or more layers of textile fabric if desired. The material of the blank in any case must be of such nature that it is capable of absorbing a fluid stiffening material or composition.

In carrying out my invention, I saturate the blank with a composition or material adapted to be softened by a degree of heat which is not injurious to the upper leather, and is also adapted to be stiffened by cooling. A suitable composition is provided by making an alcohol solution of shellac composed of eight pounds of shellac and one gallon of alcohol, and mixing with this a solution of borax dissolved in hot water, suitable proportions being one ounce of borax to two ounces of water.

The blank 15 having been saturated with the above described composition and dried, becomes relatively hard and stiff and is in this condition when assembled with the other parts of the upper. I use the term upper in its comprehensive sense as including the vamp, the toe cap and the blank 15.

The parts of the upper having been assembled in suitable relation to the last, as indicated by Fig. 2, I soften the blank by heating it to a degree which is not injurious to the leather parts of the upper, the degree of heat employed being preferably from 110 to 120 degrees F. The composition above described has a relatively low melting point so that it is adapted to be softened to render the blank limp and flexible, by a degree of heat such as that above indicated, this heat being free from liability to injure the leather. While the blank is softened by heat I conform the entire toe portion of the up-

per, including the blank, to the toe portion of the last by the usual lasting operation, the blank 15 conforming readily and accurately to the surfaces of the last against which it is pressed, and receiving therefrom the form of a box toe 15ª (Fig. 3).

After the lasted upper has been suitably secured, either temporarily or otherwise, to the last, the box toe 15ª is allowed to stiffen by cooling. Owing to the relatively low degree of heat required to soften the blank, the box toe into which the same is converted by the lasting operation is stiffened and hardened in a correspondingly brief period. I find in practice that in making a McKay sewed shoe it is practicable to remove the last from the shoe immediately after the upper has been lasted and the outer sole laid, the box toe having been sufficiently stiffened by cooling at the end of the sole laying operation.

I do not limit myself to the above described composition, there being many other materials or compositions which may be used with the same results. In any case, the stiffening material should be capable of resisting the heat of the body so that it will not be softened by bodily heat when in use. Moreover, the composition should be practically insoluble in water so that it will not be softened by dampness to which it is likely to be subjected when in use.

I am aware that a box toe blank made of felt has been treated with a solution of shellac and has been incorporated in an upper and conformed, while in a soft or limp condition, to the toe portion of a last by the operation of lasting the upper. The melting point of shellac is so high that a felt blank treated with shellac alone, cannot be softened by a relatively low degree of heat which is not injurious to the upper leather, hence the shellac-stiffened blank heretofore used, has necessarily been softened by a solvent of shellac such as alcohol, the upper being lasted while the blank is saturated with the solvent and therefore wet. The box toe formed by lasting the wet blank has to be thoroughly dried to stiffen it, the drying operation consuming much more time than is required to stiffen the box toe by cooling in accordance with my invention. Moreover, the employment of a solvent is objectionable on account of its cost and its combustibility.

When a stiffening composition composed of shellac and borax is used, the borax acts as a flux which lowers the melting point of the shellac and causes it to melt or sufficiently soften at a relatively low temperature, the said composition being adapted to resist softening by a temperature approximately that of the human body.

It is obvious that a box toe blank treated as above described is adapted to be softened by a degree of heat which is not only not injurious to the leather, but also is not injurious to the material of the blank itself, there being no liability of scorching or weakening the material of the blank by excessive heat.

I have omitted the usual cloth lining in Figs. 2 and 3, for the sake of simplicity and clearness.

16 represents a reinforcing strip of thin cloth, which covers the joint formed by the abutting edges of the vamp 12, and blank 15, the portions of the zig-zag stitches 14ª which pass through the vamp and blank also passing through the reinforcing strip as shown by Fig. 5. The strip 16 is laid on the inner surfaces of the vamp and blank as shown by Figs. 2 and 3. Fig. 2 shows an inner sole 19 applied to the last 20. Fig. 3 shows the toe portion of a completed McKay sewed shoe, removed from the last and provided with an outer sole 21 attached in the usual manner.

I claim:—

The method of making stiffened foreparts of boot and shoe uppers, which consists in incorporating in the un-lasted upper a stiffener blank comprising absorbent fibrous material containing a stiffening composition or material adapted to be softened by a degree of heat which is not injurious to leather, and to be stiffened by cooling, heating the blank to soften the same, lasting the upper while the blank is heated and soft and thereby imparting to the blank the form of a box toe conforming to the toe portion of the last, and allowing the box toe to stiffen by cooling.

In testimony whereof I have affixed my signature, in presence of two witnesses.

FRANK E. BUTTERFIELD.

Witnesses:
HARRY L. ALLEN,
P. W. PEZZETTI.