(No Model.)

G. H. STEVENS.

SHANK STIFFENER FOR BOOTS OR SHOES.

No. 263,617. Patented Aug. 29, 1882.

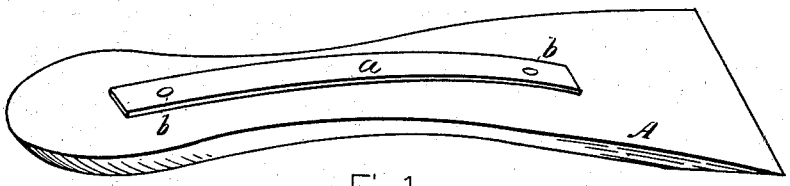

Fig. 1.

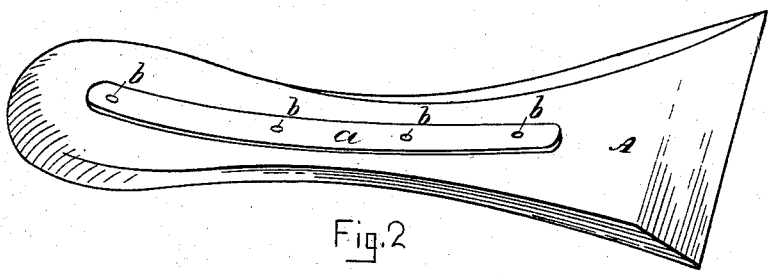

Fig. 2

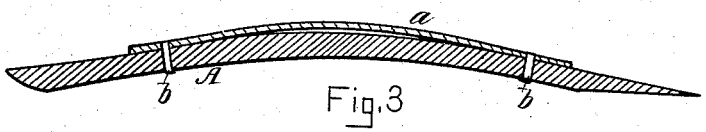

Fig. 3

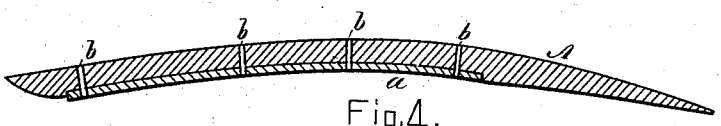

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Witnesses.
Eugene Humphrey
H. E. Remicke.

Inventor
George H. Stevens
By Porter & Whitehouse
Attys

UNITED STATES PATENT OFFICE.

GEORGE H. STEVENS, OF BOSTON, MASSACHUSETTS.

SHANK-STIFFENER FOR BOOTS OR SHOES.

SPECIFICATION forming part of Letters Patent No. 263,617, dated August 29, 1882.

Application filed May 22, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. STEVENS, of the city of Boston, in the State of Massachusetts, have invented an Improved Boot or Shoe Shank Stiffener, of which the following is a specification.

This invention relates to the stiffeners which are interposed between the inner sole and outer sole of boots or shoes at the shank or narrowest part thereof; and it will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claim.

Figure 1 is a perspective view of a shank-stiffener embodying my invention, and showing the re-enforce applied to the upper side of the body or main piece. Fig. 2 is a perspective view of a similar stiffener, bottom up, and with the re-enforce applied to the under side of the main piece. Fig. 3 is a longitudinal vertical section of Fig. 1. Fig. 4 is a longitudinal vertical section of the stiffener shown in Fig. 2, but shown in its normal position. Fig. 5 is a view like Fig. 3, except that the re-enforce is shown as united to the main body by cement, instead of rivets, as in the four preceding figures. Fig. 6 is a transverse section taken through the narrowest part of Fig. 1. Fig. 7 is a similar section of Fig. 2.

The essential feature of my invention consists in a shank-stiffener produced or formed by a combination of the well-known "leather-board" of commerce and a chemically-prepared fibrous body, which is employed as a re-enforce of the main piece composed of said leather-board.

The process of preparing the leather-board is so well and generally known that a description thereof is not necessary, as it consists in milling and thoroughly separating the fibers in water and properly coloring the same, which pulp, being thus prepared, is then formed into sheets of suitable size and thickness, which are, by repeated pressure-rolling, drying, and pressure between plates, rendered dry, smooth, and hard. From these sheets it is common to form shank-stiffeners, which have in some instances heretofore been re-enforced by leather or other substances; but as the leather-board, as well as such re-enforce, is highly susceptible to moisture, the arch of the shoe is soon destroyed by the settling of the stiffener when exposed to moisture. The employment of a steel re-enforce, which has been attempted with other stiffeners, if not with leather-board, is highly objectionable, for the reason that the corrosion of the metal soon renders it weak and easy to fracture when subjected to the usual strain. To obviate these defects, and at the same time produce a stiffener of desired thickness, which is readily molded to form, and which is re-enforced by an elastic body not easily affected by moisture and not subject to corrosion, I employ as such re-enforce a ribbon or strip of fibrous material chemically prepared in the manner next to be described. Into a bath of diluted sulphuric acid is placed a small quantity of metallic zinc, the proportions being about thirty-two parts, by weight, of acid solution to one part of zinc. This is allowed to stand until the acid has combined with as much zinc as it will take. The purpose of this combination will be hereinafter stated. After it has cooled there is added a quantity of dextrine in about the proportion of four parts, by weight, of solution to one part of dextrine. This produces a peculiar effect upon the workings of the bath when a sheet of paper or fiber pulp is immersed therein. It is probable that the acid takes some of the elements of water out of the dextrine, and while the superfluous strength of the acid is thus expending itself in one direction the remainder is exerting itself in parchmentizing the fiber and cannot concentrate itself to carbonize; but whatever be the action, chemical or mechanical, it is certain that when a sheet of paper or mass of fiber pulp is immersed in this bath and withdrawn the acid does not immediately destroy the paper or pulp, while its cohesiveness is maintained for a considerable time. This gives the time necessary to place two or more sheets together to form a board of the requisite thickness or to mass or mold the treated pulp. After this is done I pass the treated material through a bath of common salt and water; and here, it is believed, a double decomposition takes place, due to the presence of sulphate of zinc and free sulphuric acid retained by the material from the treating-bath. The sulphuric acid attacks the chloride of sodium, forming sulphate of soda and setting free hy-

drochloric acid, which, united with the zinc held in the material, forms chloride of zinc. The two salts—sulphate of soda and chloride of zinc—thus formed are soluble in water. The material is then washed in clear water, which abstracts all soluble matters from the paper or pulp and leaves it in the condition desired. It may then be operated upon by any of the well-known means or machinery employed in the manipulation of substances of a kindred nature. The process consists essentially in treating fiber by sulphuric acid in presence of such medium as will retard the intense effect of the acid; and iron might be substituted for zinc and a suitable reacting solution substituted for that of chloride of sodium, effecting like results. Instead of dextrine, other organic matters may be used, such as crude petroleum, blood, albumen, or even paper or paper-pulp, as also the cuttings and scraps of parchment materials. In all these substances the elements of water are combined. By this process all forms of vegetable fiber or tissue may be treated, and when so treated can be laminated to the required degree of thickness; and as in other kindred processes, by means well known to those skilled in the art, the product can be rendered of any desired quality—hard, soft, pliable, or plastic—and this renders it suitable for the degree of force or strain to which it may be subjected.

In said views, A represents the body or main piece of my stiffener, the same being cut or otherwise formed from the fibrous material commercially known as "leather-board." The re-enforce *a* formed from said chemically-prepared material is secured to body A by rivets or nails, as shown in Figs. 1, 2, 3, 4, 7, or by gluing or cementing, as shown in Figs. 5, 6; and it may be secured to the upper side of A, as shown in Figs. 1, 3, 5, 6, or to the under side, as shown in Figs. 2, 4, 7; but I prefer to secure it to body A by nails or rivets, and to the under side thereof. When the re-enforce is secured to the upper side of A the nails or rivets *b* need only be applied to the ends of the re-enforce, as the pressure upon the stiffener in use does not in that case tend to separate the two at or near their lineal center. By forming body A of common leather-board the same may at trifling cost be formed of the requisite thickness, and can be molded to the required form and curve to give the desired contour to the shank of the shoe, and the described re-enforce possesses the desired elasticity and strength to preserve the form of body A when subjected to use. Said re-enforce is not affected injuriously by oil or grease, and is practically impervious to moisture, and by adding a small quantity of nitrate of potash to the treating-bath in which it is prepared it may be rendered entirely water-proof.

I do not claim the described method of treating or preparing the material from which my said re-enforce is made, as said method is fully described and claimed in United States Letters Patent No. 198,382, my invention being confined to a boot or shoe shank stiffener formed of the two materials combined, as already specified; and hence

I claim as my invention—

A boot or shoe shank stiffener formed with the main body A of leather-board, and the re-enforce *a* formed of the fibrous material chemically prepared as described, the two being united by nails or rivets, or by glue or cement, or by both gluing or cementing and nailing or riveting, substantially as specified.

GEORGE H. STEVENS.

Witnesses:
T. W. PORTER,
EUGENE HUMPHREY.