Sept. 4, 1934. J. W. MAY 1,972,597

SHOE AND SHOEMAKING

Filed May 18, 1932

Fig. 1.

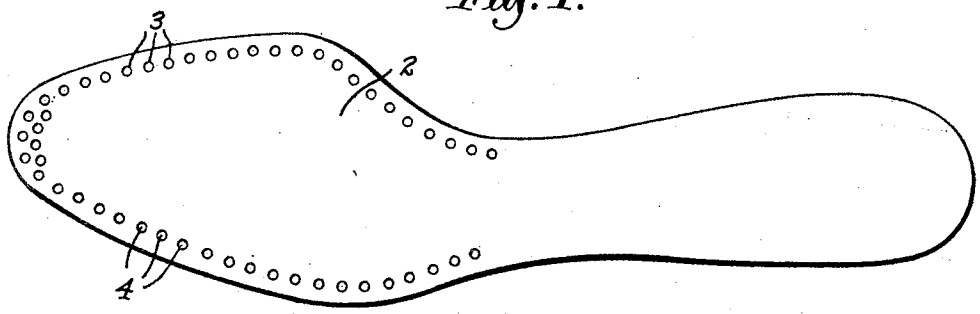


Fig. 2.

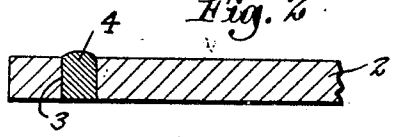


Fig. 3.

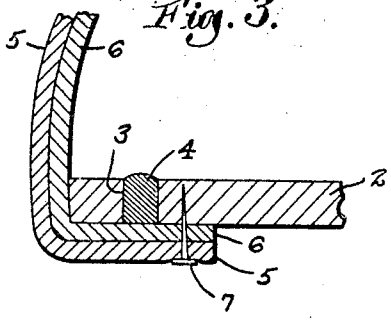


Fig. 4.

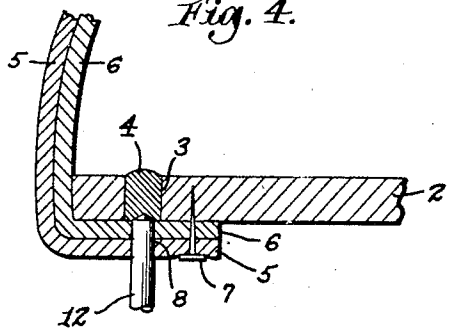


Fig. 5.

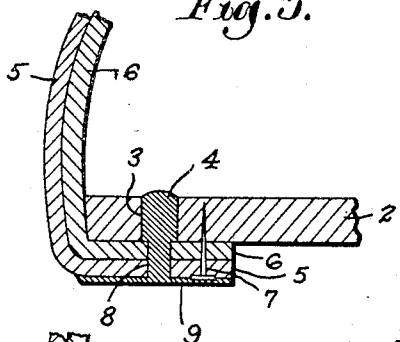


Fig. 6.

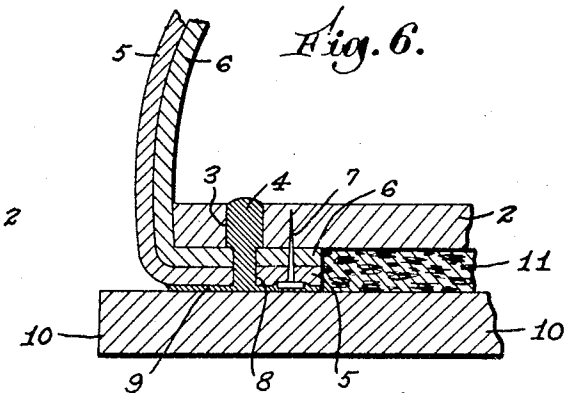
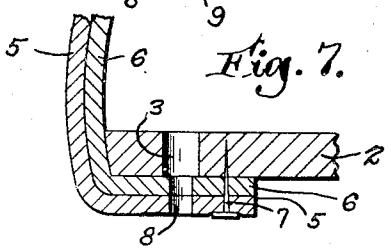


Fig. 7.



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UNITED STATES PATENT OFFICE

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SHOE AND SHOEMAKING

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Application May 18, 1932, Serial No. 612,021

5 Claims. (Cl. 12—142)

My invention relates to the art of boot and shoe making, and is particularly applicable to shoes having their outer soles cemented to the uppers. The principal object of the invention is to increase the security of the attachment of the outer sole to the upper parts of such a shoe at those points, and particularly at and near the toe portion, where experience has shown that separation of these parts is liable to occur while the shoe is being worn.

A shoe made in accordance with my invention is characterized by having its outer sole connected to the upper parts not only by the usual layer of cement but also by cement studs which are integral with said layer of cement at their outer ends and extend therefrom through the marginal portion of the upper and into cavities formed in the inner sole, the result being that separation of the inner and outer soles is resisted by the connecting studs and by the adhesion of the studs to the adjacent shoe material, in addition to the adhesive effect of the attaching layer of cement.

In the accompanying drawing, which illustrates the manufacture of a shoe in accordance with my invention,

Fig. 1 is a plan view showing the bottom of an inner sole suitable for use in making the shoe;

Fig. 2 is a detail view in section taken through one of the filled cavities of Fig. 1;

Fig. 3 is a fragmentary section drawn to a larger scale, showing the toe portion of the inner sole illustrated in Fig. 1 and the corresponding portion of a shoe upper lasted thereto;

Fig. 4 is a view similar to Fig. 3 and showing the perforating of the shoe upper and its lining;

Fig. 5 shows the same parts as Fig. 3 after the perforations have been formed in the upper and filled with cement as described below;

Fig. 6 is a sectional view similar to Figs. 3 and 5, showing the same parts with an outer sole applied thereto; and

Fig. 7 is a view similar to Fig. 3, illustrating a modification and also showing perforations in the shoe upper, hereinafter described.

In Fig. 1 of the drawing, 2 indicates an inner sole provided near the outer edge of its toe portion, and preferably throughout the ball portion, with a multiplicity of cavities 3, into each of which has been introduced a mass of soft cement 4 of a character suitable for use in attaching the outer soles of shoes of the general type above referred to. This may be a self-hardening cement, or it may be a rubber cement which is hardened by subsequent vulcanization. The cavities 3, which preferably consist of perforations, may be arranged in one or more series, two series being shown at the toe end of the inner sole and one elsewhere, and may extend along as much of the periphery of the inner sole as may be desired, but ordinarily the object of the invention will be attained if they extend around the toe portion, as shown.

The inner sole 2 is utilized by first attaching to it a shoe upper 5, which will ordinarily be provided with a lining 6, the usual lasting process being employed. This results in the structure shown in Fig. 3, in which 7 indicates one of the metal fastenings which are commonly used in lasting for securing the edge of the upper to the bottom of the inner sole and remain as a part of the completed shoe.

The next step in my process is to perforate the upper 5 and lining 6 in line with each of the cavities 3 in the inner sole 2, and preferably the diameter of the perforations, shown at 8 in Fig. 4, is less than the diameter of the masses of cement 4, for a reason hereinafter explained. All of the perforations 8 may be conveniently formed at one operation by using a set of punches 12 of suitable size and relative arrangement, as required for cooperation with the cavities 3. Cement is then applied to the marginal portion of the upper 5 over a sufficient area to include the perforations 8 and in sufficient quantity to fill said perforations and amalgamate with the masses of cement 4 in the inner sole 2, and also leave an adhesive coating 9 on the exposed margin of the upper 5, as shown in Fig. 5.

The application of the outer sole 10 to the parts above described is illustrated in Fig. 6, in which 11 indicates the filling material commonly employed to fill the space between the inner and outer soles, within the edge of the shoe upper. The outer sole 10 is cemented on in the usual way, utilizing the adhesive coating 9 applied to the margin of the upper 5 as above described, and thereupon the shoe is subjected to the usual vulcanizing process in case a cement has been used which requires vulcanization. If a self-hardening cement has been used, of course no vulcanizing step is necessary. In either case, the inner and outer soles, when the shoe is completed, are directly connected by a multiplicity of unitary studs of hardened cement which include the cement masses 4, extend therefrom through the upper and its lining and merge at the outer sole with the cement coating whereby it is attached to the other parts of the shoe. The separation of these parts is, therefore, resisted by the struc-

tural strength of the studs themselves as well as by the adhesion of the cemented surfaces, which result is enhanced by forming the studs with enlarged inner ends, due to the greater diameter of the cement masses 4 as compared with the perforations 8.

The number and size of the cavities 3 in the inner sole may obviously be varied to a considerable extent, and the masses of cement 4 may be produced by forcing a sufficient quantity of the cement into said cavities through the perforations 8 during the process of making the shoe, if desired, in which case the cavities will be left empty until after the shoe has been lasted, as illustrated in Fig. 7. I prefer, however, to provide the inner sole with the masses 4 by a preliminary operation because by so doing I insure the presence of an adequate quantity of cement in each of the cavities 3. In the latter case, the masses 4 amalgamate effectively with the cement subsequently introduced through the perforations 8, as previously explained, so that in either case the shoe is provided with unitary studs which, when hardened, constitute a direct and effective bond between the inner and outer soles.

I claim:

1. A shoe comprising an inner sole provided with marginal cavities, an upper provided with marginal perforations in line with and of less diameter than said cavities, respectively, an outer sole cemented to said parts, and unitary headed studs of hardened cement located in said cavities and perforations and merging at their outer ends into the cement layer by which the outer sole is attached.

2. A process of making shoes, comprising the steps of forming a series of cavities in an inner sole, lasting an upper thereto, perforating the upper in line with each of said cavities, each perforation being of less diameter than the corresponding cavity, applying a layer of cement to the exposed margin of the upper, introducing said cement while soft into said cavities and perforations to form unitary headed studs merging at their outer ends with said cement layer, and attaching an outer sole by means including said cement layer.

3. A process of making shoes, comprising the steps of forming a series of cavities in an inner sole, introducing a mass of soft cement into each of said cavities, lasting an upper to said inner sole, perforating the upper in line with each of said cavities, forcing soft cement through said perforations to form unitary studs occupying the cavities and perforations and provide a layer of said cement on the exposed margin of the upper, and attaching an outer sole by means including said cement layer.

4. A process of making shoes, comprising the steps of forming a series of cavities in an inner sole, introducing a mass of soft cement into each of said cavities, lasting an upper to the inner sole, perforating the upper in line with each of said cavities, each perforation being of less diameter than the corresponding cavity, forcing soft cement through said perforations to form unitary headed studs occupying the cavities and perforations and provide a layer of said cement on the exposed margin of the upper, and attaching an outer sole by means including said cement layer.

5. An article of manufacture for use in shoemaking, consisting of an inner sole provided prior to lasting with a series of cavities each containing a mass of soft cement adapted to be hardened after a shoe containing the inner sole has been lasted.

J. WALTER MAY.