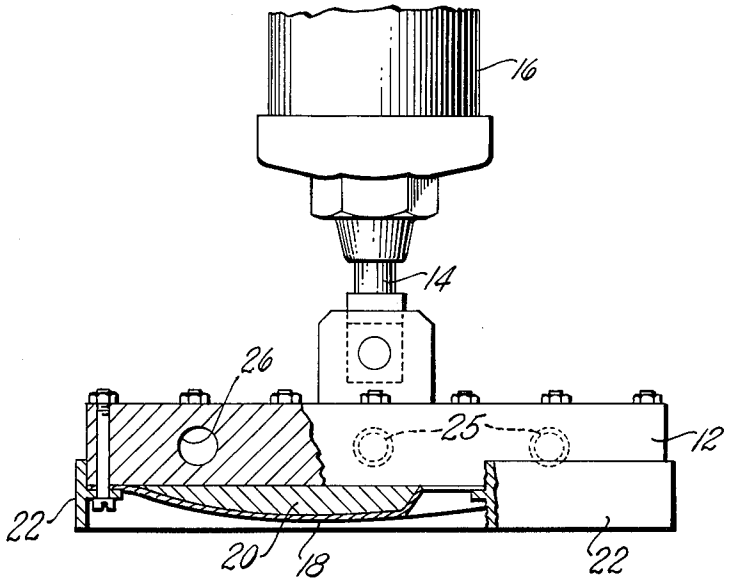
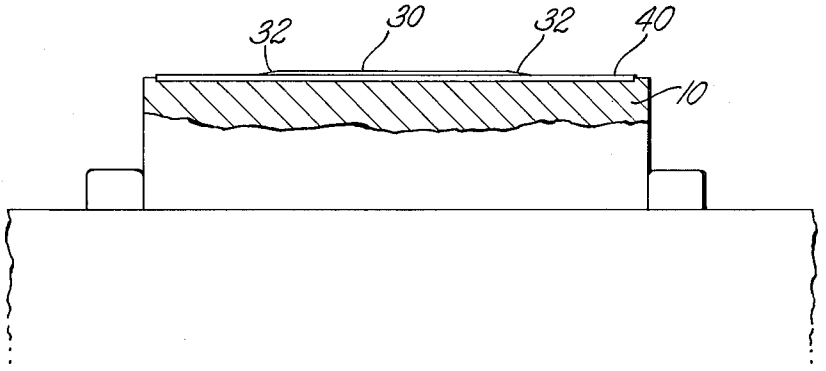
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PRESSES FOR IRREGULAR ARTICLES

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PRESSES FOR IRREGULAR ARTICLES

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This invention relates to a press for pressing the total area of an article of irregular configuration and cross-section into intimate, continuous contact with a second article. The press is particularly adapted for firmly pressing an adhesively coated shoe part, such as a box toe, into engagement with a shoe upper throughout the total area of said shoe part and for simultaneously activating the adhesive coating whereby to establish a continuous bond between the contacting surfaces or interface of the members.

Although a press made in accordance with this invention is broadly applicable to the establishment of a contacting relationship between an article of irregular configuration and cross-section and a second article and to the activation of an adhesive coating on one of said articles, a description of the press is most facilely accomplished by reference to the attachment of a box toe or stiffener to a shoe upper. Accordingly, the specification hereinafter will be directed to a discussion of the problems relating to the attachment of a box toe and to the delineation of a press embodying the subject invention which successfully solves these problems.

In the manufacture of certain types of shoes, it is common practice to attach stiffeners, referred to as box toes, to the vamp portion of a shoe upper prior to assembly of the upper on a last. The box toe adds strength to the toe area of the shoe and prevents its deformation. A common method of attaching the box toe comprises coating the surface of the box toe which is to engage the upper with a heat-sensitive adhesive, placing it in engagement with the upper and subsequently activating the adhesive by various means such as a steam chamber.

The novel method of attaching in which the press of the subject invention is employed comprises positioning an adhesively coated box toe on an upper and pressing it into intimate contact with the upper throughout its entire area and simultaneously activating the adhesive by means of the press to be hereinafter described and claimed. The novelty of this method per se does not emanate for inventiveness but rather from the lack of prior art teaching of a press which permits implementation of the method. The press must provide means for activating heat-sensitive adhesive on the box toe without adversely effecting the grain surface of the upper by the application of excessive heat. It must also be capable of pressing the box toe into intimate contact with a surface of an upper despite irregularities in cross-section as discussed hereinafter.

The marginal portion of a box toe is frequently skived to provide a tapered surface which blends into the surface of an upper to which it is attached. That is, the periphery of the box toe is tapered to provide a smooth transition to the raised portion established by the major area of the box toe. The presence of the box toe is thus effectively concealed whereby there is no indication of the boundary thereof in the exterior of the completed shoe. It is difficult to establish intimate, continuous contact of the surface of the skived margin of a box toe with the surface of an upper and to activate adhesive on the tapered portions by means of a heated press. Heretofore, the platen of a press used for this purpose had to be machined to exacting tolerances to complement the configuration of the

particular box toe to be used at extreme cost. Attachment of box toes by use of a heated press was thus economically unfeasible and, therefore, was not a commercial method prior to the revelation of the press taught by this invention.

Accordingly, an object of the present invention is to provide a press for pressing an article of manufacture of irregular configuration and cross-section into intimate contact with a second article to establish continuous engagement of the total area of one surface of the first article with a surface of the second article and to activate heat-sensitive adhesive on one of said articles whereby to establish a continuous bond between said surfaces.

A further and more specific object is to provide a press for pressing a stiffener or similar shoe part of irregular cross-section into continuous engagement with a second shoe part and for activating heat-sensitive adhesive on said stiffener whereby to establish a bond extending across the entire surface area of the stiffener in contact with the second shoe part.

To these ends and in accordance with a feature of the present invention, there is provided a press for attaching an article of manufacture coated with thermoactive adhesive to a second article of manufacture comprising a first platen, a deformable membrane secured along its peripheral margin to said first platen, a mass of relatively low melting point material enclosed between said first platen and said deformable membrane, a second platen, and means for heating said first platen whereby to heat said membrane and melt said mass of material thereby facilitating the deformation of said membrane and the configuration of said mass of material to urge said articles of manufacture into continuous contact and to activate said thermoactive adhesive when said articles are pressed between said platens.

The above and other features of the invention including various novel details of construction and combinations of parts will now be more particularly described with reference to the accompanying drawing and pointed out in the claims. It will be understood that the press embodying the invention is shown by way of illustration and not as a limitation of the invention. The principles and features of this invention may be utilized in varied and numerous embodiments without departing from the scope of the invention.

In the drawing:

The figure is a view, partly in section, of upper and lower platens of a press embodying the features of the subject invention.

The press of the subject invention comprises a fixed lower platen **10** and a movable upper platen **12**. The upper platen **12** may be mounted for movement relative to the lower platen by any convenient means such as a pneumatic piston **14** housed in a cylinder **16**. The structure appurtenant to the cylinder **16** or other convenient operating means and the mounting means therefor may be of conventional design and are not illustrated in the drawing as they do not constitute a part of this invention.

The upper platen **12** has a resilient sheet or membrane **18** secured and hermetically sealed along its peripheral margin to the peripheral margin of the platen **12**. The membrane **18** comprises, for example, a woven or knitted glass fibre cloth impregnated and coated with silicone rubber paste. A cavity formed between the lower surface of the upper platen **12** and the resilient membrane **18** is filled with a mass **20** of low melting point alloy such as "Cerobond," Wood's Metal or Rose Metal. Air and moisture are evacuated from the cavity. A skirt **22** surrounds the seal between the membrane **18** and the upper platen **12** to prevent escape of the alloy mass **20** if the seal is damaged. The upper platen **12** is heated during the use of the press, as hereinafter described, to melt the

low melting point alloy thereby to render it deformable and to heat the deformable membrane **18**. The platen **12** is preferably heated by a plurality of electric heating elements **25** positioned in cavities **26** in the platen **12**.

In practicing the method of attaching a box toe to an upper in which a press embodying the features of the present invention is used, a skived box toe **30** having for example, skived margins **32** and a thermoactive cement coating on its unskived surface is placed on the flesh side of a leather upper **40** with the cement in contact with the upper. The leather upper **40** and box toe **30** positioned thereon are then located on the lower platen **10** in alignment with the membrane **18** of the upper platen **12**. The heating elements **25** are activated by any convenient means (not shown) whereby heat is transferred through the platen **12** to the mass **20** of low melting point alloy. The heated mass **20** is thereby converted to a liquid or semi-liquid state and is, therefore, readily deformable to facilitate uniform application of pressure to an article of irregular cross-section such as the box toe **30** with skived margins **32**. Heat is also transferred through the mass of alloy **20** to heat the deformable membrane **18**. When the press is to be used repeatedly within a given period of time, the alloy mass **20** may be maintained continuously in the molten state to eliminate the time necessary to convert it from its normal solid state condition.

When the mass of alloy **20** and the membrane **18** have been adequately heated, the platen **12** is lowered under the action of fluid pressure admitted to the cylinder **16** and the membrane **18** is urged into resilient engagement with the box toe **30**. The membrane **18** and alloy mass **20** are deformed as a result of the pressure applied thereto and assume a configuration complementary to the irregular cross-section of the box toe **30** and its skived margins **32**. The application of pressure by the platen **12** through the membrane **18** and molten alloy mass **20** thus urges the box toe **30** including the tapered margin **32** into continuous contact with the upper **40** over the entire contacting interface.

The heated membrane **18** also functions to transfer heat to the box toe **30** whereby the heat-sensitive adhesive is activated and a continuous bond established throughout the entire contacting surface area of the box toe **30** and upper **40**.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. A press for attaching an article of manufacture coated with thermoactive adhesive to a second article of manufacture comprising a first platen, a deformable membrane secured along its peripheral margin to said first platen, a mass of relatively low melting point metallic material enclosed between said first platen and said deformable membrane, a second platen, means for moving said first and second platens toward and away from each other, and means for heating said first platen whereby to heat said membrane and to melt said low melting point metallic material thereby facilitating the deformation of said membrane and said low melting point metallic material by said articles to be attached to urge said articles into complete continuous interfacial contact and to activate said thermoactive adhesive when said articles are pressed together between said platens.

2. A press for pressing an article of manufacture having an irregular contour into intimate, continuous contact with a second article of manufacture comprising a first platen, a deformable membrane secured along its peripheral margin to said first platen, a mass of relatively low melting point metallic material enclosed between said first platen and said deformable membrane, a second platen for supporting said articles, means for heating said first platen whereby to heat said membrane and to melt said low melting point metallic material, and means for urging the membrane into resilient contact with one of said articles supported on said second platen whereby said membrane and said low melting point metallic material are deformed to assume a contour complementary to that of the articles, and to establish continuous interfacial contact between said articles.

3. A press for attaching an article of manufacture coated with thermoactive adhesive and having an irregular contour to a second article of manufacture comprising a first platen, a deformable membrane continuously secured along its margin to said first platen thereby forming a cavity therebetween, a mass of relatively low melting point metallic material enclosed in said cavity, a second platen for supporting said articles, means for heating said first platen whereby to heat said membrane and to melt said low melting point metallic material, and means for urging said membrane into resilient contact with said first article whereby said membrane and said low melting point metallic material are deformed to assume a contour complementary to that of said first article thereby to establish continuous interfacial contact between the articles mounted on the second platen and to activate the adhesive on said first article.

4. A press for attaching a box toe having thermoactive adhesive on one side thereof to a shoe upper comprising a first platen, a deformable membrane secured along its peripheral margin to said first platen, a mass of relatively low melting point material enclosed between said first platen and said deformable membrane, a second platen, means for moving said first and second platens toward and away from each other, and means for heating said membrane and melting said low melting point material thereby facilitating the deformation of said membrane whereby to urge said box toe into continuous contact with said upper and to activate said thermoactive adhesive when the box toe and shoe upper are pressed between said platens.

5. A press for attaching a box toe coated with thermoactive adhesive and having an irregular contour to a shoe upper comprising a first platen, a deformable membrane continuously secured to said first platen to form a cavity therebetween, a mass of relatively low melting point material enclosed in said cavity, a second platen for supporting said box toe and shoe upper, means for heating said first platen whereby to heat said membrane and to melt said low melting point material, and means for urging said membrane into resilient contact with said box toe whereby said membrane and said low melting point material are deformed to assume a contour complementary to that of said box toe thereby to establish continuous interfacial contact between said members and to activate the adhesive on said box toe.

References Cited by the Examiner

UNITED STATES PATENTS

1,365,267	1/1921	Oakley	12—33.2 X
2,382,004	8/1945	Curran	100—211 X
2,426,267	8/1947	Hart	12—33.2 X
2,489,643	11/1949	Hunter	12—33.2 X
2,725,091	11/1955	Miner et al.	100—211 X

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