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ART OF MANUFACTURING SHOES

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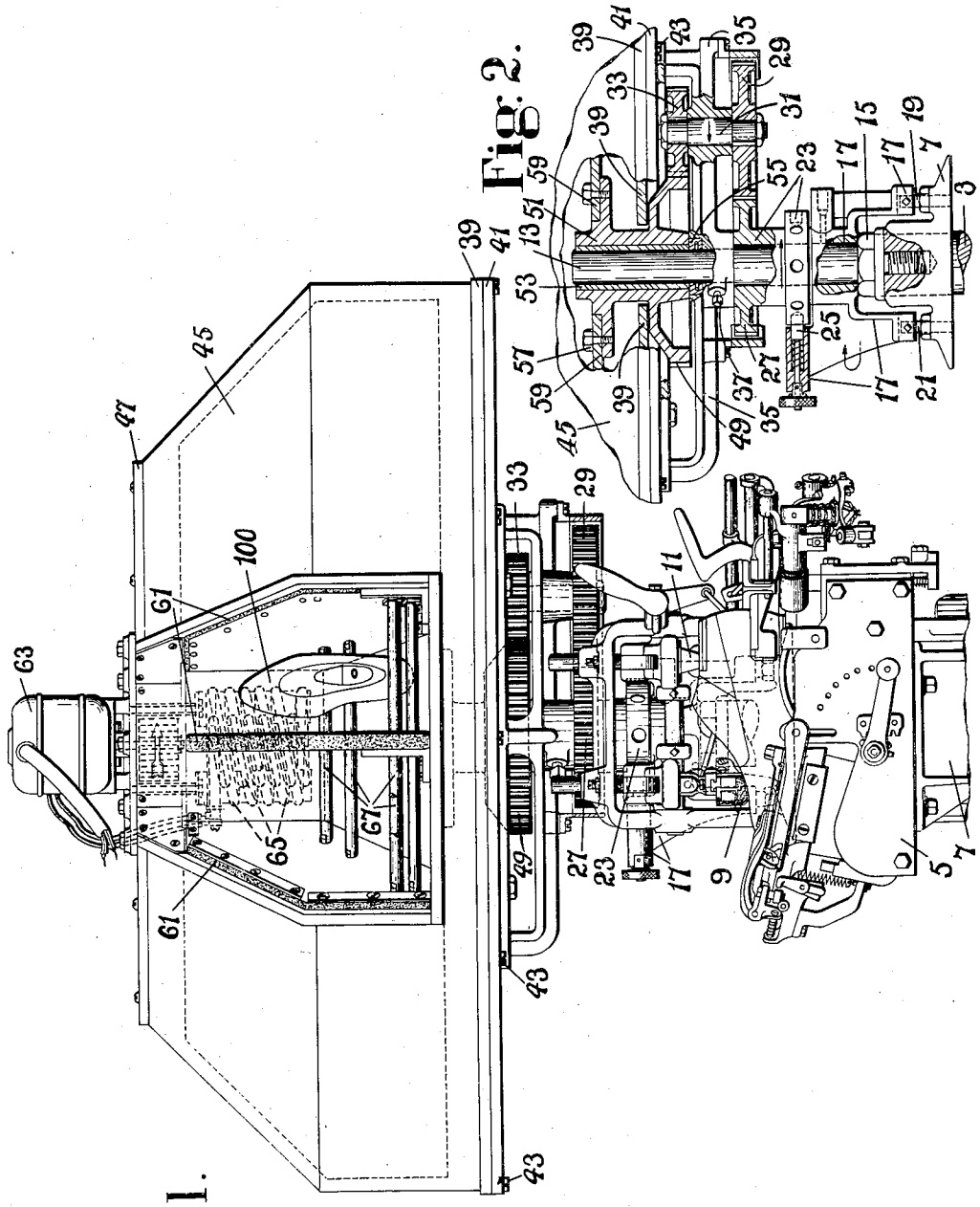


Fig. 2.

Fig. 1.

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ART OF MANUFACTURING SHOES

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8 Claims. (Cl. 12—142)

This invention relates to the manufacture of boots and shoes and more particularly to a method of attaching soles to shoes by means of cement.

It is common in the manufacture of shoes, the soles of which are permanently attached by cement, to coat the margin of the bottom of a lasted shoe and the margin of a sole with a solution of a strongly adhesive substance, to permit the coats of cement to dry hard, and then, after having applied a solvent to one or both coats of cement, to position the sole upon the bottom of the shoe and to hold the shoe and sole together under pressure until the solvent evaporates sufficiently to cause the cement to set. Pyroxylin cement is commonly used, said cement being applied in the form of a solution which, upon evaporation of the solvent, leaves a hard coating of pyroxylin upon the sole and upon the shoe. Although the solvent is volatile nevertheless the shoe and sole must be held together under pressure for a considerable interval before enough of the solvent evaporates to cause the cement to set sufficiently to permit the shoe with its attached sole safely to be removed from the press by which the pressure is commonly applied. This interval varies somewhat according to the particular cement and solvent or softener used, but is frequently as long as twenty minutes with the consequent disadvantages which such a time-consuming operation entails.

Although a particular procedure has been described above in which both the sole and the shoe are provided with hard coats of cement to one or both of which softener is directly applied, it should be understood that variations in the procedure are possible. In any variation, however, a layer of soft sticky cement will be present between the shoe and the sole after they are put together; and the same disadvantages, due to the necessity of holding the shoe and sole together under pressure for a comparatively long interval, will be involved.

The general object of the present invention is to hasten the setting of the cement and thus to shorten the interval of time during which the shoe and sole must be held together in the press. To this end either the shoe or the sole or both are heated before the two articles are put together so as to store up heat which, being given off later when the shoe and sole are being held together under pressure, will hasten the setting of the cement. Although heat may be stored in either or both articles, it will preferably be stored in the shoe and the last upon which the shoe is mounted since, at a given temperature which is not injurious to leather, much more heat may be stored in the larger of the two articles.

Referring to the accompanying drawing,

Fig. 1 is an elevation of an apparatus by the use of which the method may be conveniently practiced; and

Fig. 2 is a detail, principally in vertical section of part of the apparatus.

The shoe and sole with the soft sticky cement between them are commonly held together by a unit of a press. Such a unit is sometimes an integral part of a turret press having a plurality of units, and sometimes is a removable unit adapted to maintain the pressure upon the shoe after it has been removed from the press. In the present instance one unit which is an integral part of a turret press is shown, the turret being rotated intermittently about a vertical standard or rod 3 by mechanism not shown, and adapted to bring the units one by one successively into a position accessible to the operator. The unit shown, which is in that accessible position, comprises a box 5 fastened to the turret 7 and containing a yielding pad. The operator places a sole upon this pad, places a shoe upon the sole, and having previously provided a layer of soft cement between the shoe and the sole manipulates parts of the machine to cause a jack comprising a toe pad 9 and a heel post 11 to force the shoe down firmly against the sole and hold the shoe and sole together under pressure. They remain so held until the turret, which is intermittently rotated, has made a complete revolution and once more reaches the position of rest shown, when the jack is released, the shoe with its attached sole is removed and a new sole and lasted shoe are placed in the unit. No further description of the turret press will be given since the details of its construction form no part of the present invention. The particular press, a portion of which is herein shown, forms the subject-matter of application Serial No. 636,202, filed October 4, 1932, in the names of Milton H. Ballard et al.

Associated with this press is a turret heater adapted to hold a plurality of lasted shoes or a plurality of soles, to store up heat in them and to present a hot shoe or sole in a position accessible to the operator every time a unit of the turret press reaches such a position. A vertical rod 13 has a lower end of greatly reduced diameter which is threaded into a socket in the top of the stationary vertical rod 3 about which the turret 7 rotates intermittently, said rod 13 having

threaded upon it near its lower end a lock-nut 15 which bears against the flat top of the rod 3. Rotatably mounted upon the lower portion of the rod 13 is a sleeve 17 having a depending fork the branches of which are connected to the turret 7 by pins 19, 21 so that this sleeve rotates intermittently with the turret. Rotatably mounted upon the rod 13 above the sleeve 17 is a second sleeve 23 having a collar provided with spaced holes into any one of which may extend a spring-pressed locking-pin 25 carried by a boss or extension integral with the lower sleeve 17. This pin is always in locking position, as shown, when the press is running, and consequently the upper sleeve 23 turns with the lower sleeve 17 and with the turret 7.

Integral with the upper portion of the sleeve 23 is a gear 27 which meshes with a gear 29 fast to the lower end of a short vertical shaft 31 to the upper end of which a small gear 33 is fast. The short vertical shaft 31 is rotatably mounted in a stationary casting 35, said casting having a hub through which the vertical supporting rod 13 passes. The hub of the casting 35 rests upon a shoulder formed upon the rod 13 and is fastened to said rod by a set-screw 37. This stationary casting 35 supports not only the short vertical shaft 31 but also the stationary enclosure of the turret heater, said enclosure comprising a flat circular plate 39 fastened by means of a narrow annular member 41 and screws 43 to a cover 45, said cover comprising a hollow member having a cylindrical lower portion and a frusto-conical upper portion closed at its top by a circular plate 47.

The small gear 33 meshes with a larger gear 49 integral with an upright sleeve 51 having a bushing 53, said sleeve and its bushing resting upon a ball-thrust bearing 55 carried by the stationary support 35. The rotary sleeve 51 extends up through a hole in the center of the plate 39 and has near its upper end a circular flange to which is fastened, by means of cap screws 57, a circular plate 59. This plate 59 forms the bottom of the rotary member of the turret heater, said rotary member being divided into a series of compartments two of which are shown in Fig. 1. These compartments are formed by partitions 61 three of which are shown in Fig. 1. A blower operated by a motor 63 mounted on the stationary plate 47, causes a current of air to pass through the coils 65 of an electric heater, through the various compartments, and back through the heater to heat the lasted shoes 100 or other articles which have been placed upon supporting rods 67 in each of the compartments.

The stationary enclosure of the rotary turret heater is cut away, as shown, at a locality adjacent to the station of the turret press at which the operator stands, the opening being of just sufficient size to expose two of the compartments. The rotary turret of the heater is rotated intermittently in timed relation to the intermittent rotation of the turret press by the gearing which has been described above in such manner that the turret rotates through an angle defined by the converging walls of each of its compartments each time that the turret press rotates one step, the construction and arrangement of parts being such that the turret heater always comes to rest in a position like that shown with two compartments exposed to view and accessible to the operator.

With the turret press and the turret heater in the positions of rest shown, and assuming that the left-hand compartment contains a hot shoe, that the right-hand compartment is empty and that the unit of the turret press contains a shoe with its attached sole which has made one complete revolution in the press, the procedure is as follows:—The operator removes the shoe from the press. He then puts a sole on the pad in the unit of the press, puts a cold shoe in the right-hand compartment of the heater and at the same time takes the hot shoe out of the left-hand compartment. At this time the operator makes provision for the subsequent presence between the sole and the bottom of the shoe of a layer of soft sticky cement, for example, by applying a softener to the hard coat or coats of cement with which the shoe or the sole or both have been previously supplied. He places the hot shoe upon the sole and manipulates certain members to cause the shoe and the sole to be properly located with respect to each other and to be pressed firmly together and held under pressure. This is the position of parts shown. He then manipulates a member to cause the turret press to move one step and come to rest again. This movement of the press moves the right-hand compartment into the stationary enclosure 45 taking with it the cold shoe. There are then exposed to view two compartments, the right-hand one of which is empty and the left-hand one of which contains a hot shoe. The operator then proceeds as before by removing the finished shoe from the press, putting a cold shoe in the right-hand compartment and removing the hot shoe from the left-hand compartment. In this way, every time that a unit of the press reaches a position or station accessible to the operator, a hot shoe is also presented in such a position. Any suitable number of compartments may be employed in the heater. In the illustrated construction the press has eight units and the heater seventeen compartments, the gearing between the turret of the press and that of the heater being such that the two turrets operate in the timed relation which has been described above. Referring to Fig. 2, the purpose of the spring locking pin 25 is to permit the turret heater to be turned by hand independently of the turret press if desired, for example to fill the heater with shoes before the press is started or to remove the hot shoes from the heater if for any reason it is desired to empty the filled heater without operating the press.

The extent to which the shoe or the sole is heated may, of course, be varied; but in general it is desirable to heat the article throughout to as high a temperature as is safely practical, having in mind that too great a heat will injure the materials of the shoe as well as the cement. As an example of what is safe and practical, it may be stated that, in carrying out the method of the invention, the lasted shoe may be heated throughout to a temperature of 130° F., that is until the middle portion of the wooden last has reached that temperature.

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

1. The method of attaching a sole to a shoe which comprises providing on a surface of at least one of the two articles a coating of hard cement, heating at least one of the two articles sufficiently to store up in it a considerable amount of heat, applying a softener to at least one of the coatings, positioning the sole and the shoe properly with respect to each other, and holding the sole and shoe together under pressure for an

interval during which the stored-up heat hastens the setting of the cement.

2. The method of attaching a sole to a shoe which comprises providing coatings of hard cement upon selected portions of the two articles, storing up heat in one of the articles, applying a softener to at least one of the coatings, positioning the sole and the shoe properly with respect to each other, and holding the sole and shoe together under pressure for an interval during which the stored-up heat hastens the setting of the cement.

3. The method of attaching a sole to a lasted shoe which comprises providing on the bottom of the shoe and on the sole hard coatings of cement, heating the lasted shoe sufficiently to raise the temperature of the shoe and last throughout to a point considerably above room temperature, applying a softener to the coating of cement on the sole, positioning the sole and the shoe properly with respect to each other, and holding the shoe and sole together under pressure for an interval during which the stored-up heat hastens the setting of the cement.

4. The method of attaching a sole to a lasted shoe which comprises providing on the bottom of the shoe and on the sole hard coatings of cement, heating the lasted shoe sufficiently to raise the temperature of the shoe and last throughout to a temperature above 130° F., applying a softener to the coating of cement on the sole, positioning the sole and the shoe properly with respect to each other, and holding the shoe and sole together under pressure for an interval during which the stored-up heat hastens the setting of the cement.

5. The method of attaching a sole to a shoe which comprises providing on each of the two articles a coating of cellulose ester cement, treating one of the articles with a current of hot gas, the temperature of the gas and the length of time of the treatment being insufficient to render the coating appreciably tacky but sufficient to store up in the article a considerable amount of heat, applying a liquid softener to one or both coatings, positioning the shoe and the sole properly with respect to each other while one is hot and the other cold, and holding them together under pressure for an interval during which the stored-up heat hastens the evaporation of the solvent.

6. The method of attaching shoes to soles which comprises presenting shoes containing stored-up heat one by one in a position accessible to an operator, successively assembling hot shoes and cold soles with layers of soft, sticky cement between them, and successively holding the shoes and soles together for an interval during which the stored-up heat hastens the setting of the cement.

7. The method of attaching shoes to soles which comprises providing a series of shoes the temperatures of which vary from one end of the series to the other, moving intermittently the series to bring one of the hotter shoes into a position accessible to an operator, assembling hot shoes and cold soles with layers of soft, sticky cement between them, and successively holding the shoes and soles together for an interval during which the stored-up heat hastens the setting of the cement.

8. The method of attaching soles to shoes which comprises bringing successively into a position accessible to an operator a series of pressing units, simultaneously bringing successively into an adjacent position also accessible to the operator a series of shoes having heat stored up in them, assembling, each time that a shoe and unit reach the positions named, a hot shoe and a sole with a layer of soft, sticky cement between them, putting the assembly in the unit, and holding it under pressure for an interval during which the stored-up heat hastens the setting of the cement.

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