Jan. 14, 1936. C. F. EATON 2,027,637

METHOD OF AND APPARATUS FOR MARKING SHOE UPPERS

Filed April 16, 1934

Fig. 1.

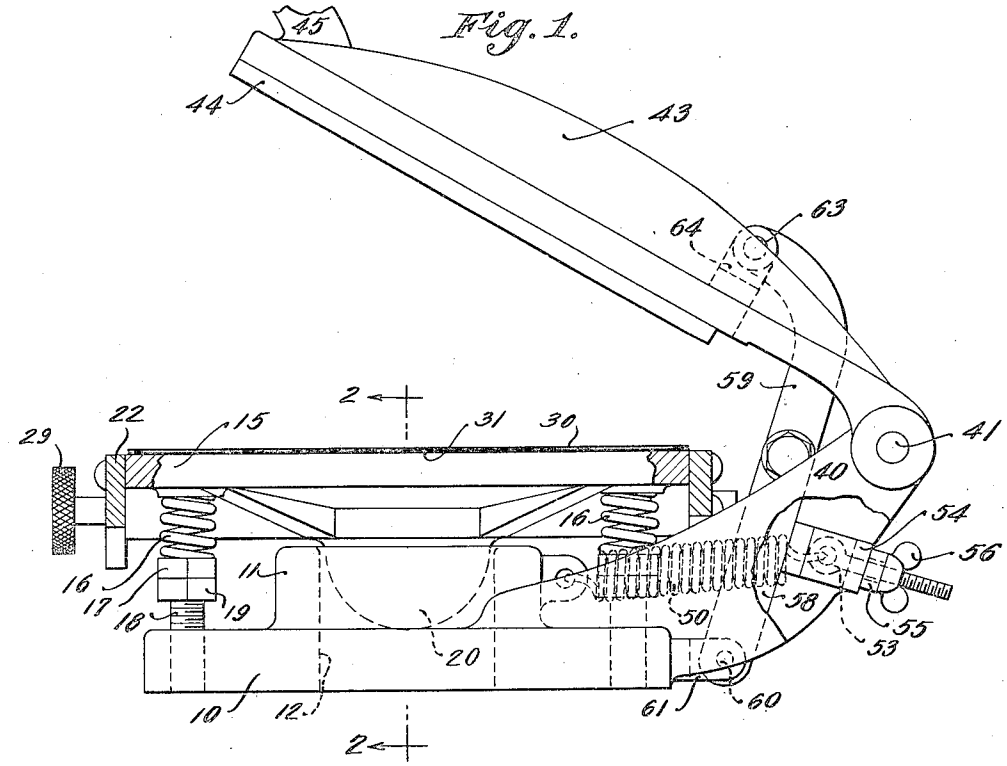


Fig. 2.

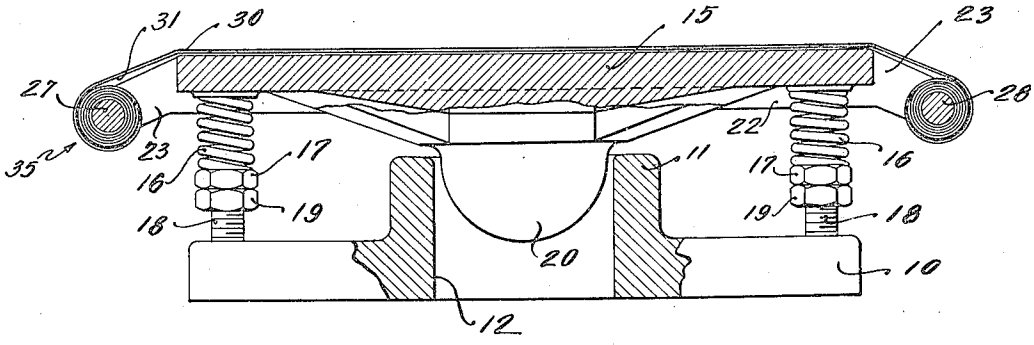
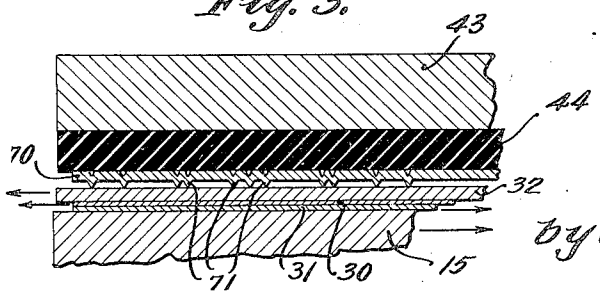


Fig. 3.



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METHOD OF AND APPARATUS FOR MARKING SHOE UPPERS

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10 Claims. (Cl. 101—297)

This invention relates to a method of and apparatus for marking shoe upper sections and similar pieces or blanks of sheet material.

In the manufacture of shoes, particularly women's shoes, it is customary to apply ornamental designs to the shoe uppers as by stitching. The ornamental designs are usually applied to the cut-out sections of the uppers before they are assembled and in the case of stitching, the designs are first marked on the upper sections, such as the quarters or vamps, and the markings are then followed in the stitching operation. For marking the design on a shoe upper section or similar blank an embossing plate is commonly used, the desired design being formed by bosses or projections arranged in rows or groups to delineate the design. By placing the embossing plate, the blank to be marked, and a pigmented transfer sheet in superposed relation and subjecting them to pressure, the design corresponding to the arrangement of projections on the embossing plate is transferred to the blank. An example of this method of marking and of apparatus for performing it is described in the Edwards Patent No. 1,639,332, dated August 16, 1927.

In transferring designs or markings in accordance with such procedures, considerable difficulty has been encountered in providing a fine, distinct and readily removable marking on the blank or shoe upper section. For example, in cases where the marking consists of converging rows of dots and/or dashes which delineate the design and serves as a guide for the stitching operation, one of two objectionable conditions usually exists, viz., either the markings are so blurred and heavy as not to afford an accurate guide for the precise location of the stitching or line of cut, or the markings are so light and indistinct as to be incapable of providing a reliable guide for the operator. Numerous attempts have been made to overcome these objectionable features, as by providing a pad or the like piece of sheet material beneath the transfer sheet so as to afford a certain amount of resiliency, but in all such cases the marking applied to the material has been either indistinct by reason of failure to apply sufficient pressure to overcome the resiliency of the pad, or blurred, "oversized", and difficult to remove when sufficient pressure has been applied to cause a transfer of the marking. The use of stops to limit the travel of the press-head or platen against the bed plate has been proposed, but due to the variation in thickness of the average run of material to be marked, it has been found impossible to adjust such stops so as to produce a satisfactory mark.

The principal object of the present invention is to overcome the aforementioned deficiencies inherent in the prior practices and to provide an improved, efficient and reliable method and apparatus for applying a fine, distinct and readily removable marking to blanks.

I have found that a satisfactory mark having all of the aforementioned desirable characteristics can be produced without interfering in any way with the speed of operation or the efficiency of the marking machine, by interposing a thin, smooth sheet of paper or the like piece of substantially non-yielding sheet material between the carbon or transfer sheet and the bed plate. I believe that the improved results may be attributed to the probability, if not the fact, that the thin, smooth piece of sheet material underlying the transfer sheet provides, in effect, a "slip plate" or substantially frictionless supporting surface which permits a slight relative movement or "slip" between the superposed transfer sheet, the material to be marked and the marking plate, on the one hand, and the bed plate which supports these elements, on the other hand, the relative movement or "slip" occurring during the brief interval at which the pressure is being applied to these elements and in all probability resulting from the effect of horizontal components of force acting either on the bed plate or platen, which components of force may be attributable to a slight vibratory movement of the bed plate relative to the platen, or vice versa. However, the results are clear and definite beyond possibility of error and accordingly I do not intend to confine my invention to the foregoing explanation.

In the accompanying drawing:

Fig. 1 is a side elevation, partly in section, of a marking machine embodying the present invention;

Fig. 2 is a section on the line 2—2 of Fig. 1; and

Fig. 3 is a greatly enlarged diagrammatic sectional view illustrating the manner in which the marking operation is carried out.

The embodiment chosen for the purpose of illustration comprises a base 10 having a centrally disposed tubular column 11 projecting from its upper face and providing a socket 12. A work bed 15 is mounted on the base and is yieldingly supported by coil springs 16 adjacent to each of its four corners. The work bed is preferably a flat rectangular plate of metal provided with a

smooth top surface. Each spring is seated on a nut 17 adjustably mounted on a vertically projecting threaded stem 18 carried by the base 10. A lock nut 19 may be provided to hold the supporting nut 17 in adjusted position. The work bed is provided with a centrally disposed depending boss 20 which loosely fits into the socket 12 and serves to limit both the downward and lateral movements of the work bed relative to the base. The boss 20 is preferably hemispherical in form so as to permit the work bed to rock about an axis through the center of the base, there being preferably a slight clearance between the sides of the boss and the walls of the column to permit a universal tipping movement.

Attached to the front edge of the work bed 15 is a bar 22 which extends beyond each end of the bed, as shown in Fig. 2, so as to provide brackets or projections 23, each of which may be provided on its top side with an obliquely disposed slot. Secured to the rear edge of the work bed are bracket arms 24 projecting beyond each end of the work bed and corresponding to the brackets 23 on the front edge of the work bed. Each of the bracket arms 24 is provided with a circular opening which is aligned with the bottom of the slot in the corresponding bracket at the front of the work bed. Spindles 27 and 28 are mounted in the openings and slots of the bracket 23 and arms 24, as shown in Fig. 2, and each spindle is provided at its front end with a hand wheel 29 by means of which the spindle may be manually rotated. Each spindle is also provided with a longitudinally extending slot between its ends, through which the ends of a transfer sheet 30 and a slip sheet 31 may be inserted.

The transfer sheet 30 may be of any suitable thin sheet material, such as paper, impregnated or coated with a pigment of a color which preferably contrasts with the color of the leather or other blank 32 which is to be marked. Each end of the transfer sheet and slip sheet is secured to one of the spindles and upon rotating one or the other, the transfer sheet and slip paper will be wound up into a roll as indicated at 35.

The slip sheet 31 is preferably of thin paper having a smooth calendered surface and its width and thickness preferably correspond approximately to the width and thickness of the transfer sheet. Satisfactory results have been obtained by using a transfer sheet having a thickness of approximately 0.0025 inch and a slip sheet having a thickness of approximately 0.0020 inch. Both the transfer sheet and the slip sheet extend across the top of the work bed from one roll to the other, the pigmented surface of the transfer sheet facing upwardly and the slip sheet being disposed between the top of the work bed and the transfer sheet, thus providing a smooth, substantially frictionless, non-yielding supporting surface or "slip plate" for the transfer sheet during the marking operation.

Either spindle 27 or 28 may be manually rotated and adjusted from time to time by the operator during the continued use of the machine to shift the transfer sheet and slip paper back and forth across the work bed and thus present fresh areas of the pigmented surfaces to the work as required.

Bolted to the top of the base 10 are two upwardly and rearwardly extending bracket arms 40 which support a horizontal pivot or pintle 41, the axis of which is parallel to and in approximately the same horizontal plane as the top of the work bed 15. A platen 43 is pivotally mounted on the pintle 41 and comprises a body portion conforming in size and shape to the work bed 15 and a flat under surface to cooperate with the top surface of the work bed 15. Secured to the under surface of the platen is a layer 44 of slightly resilient rubber or other suitable cushioning material. Attached to the top of the body portion of the platen are a pair of upwardly and forwardly curved bracket arms 45, the forward ends of which support a handle (not shown).

The platen is normally and yieldingly held in elevated or open position by means of a coil spring 50, one end of which is anchored to the column 11 on the base and the other end of which is attached to an eye-bolt 53 carried by a bracket 54. The eye-bolt 53 is provided with a stop nut 55, the adjustment of which regulates the tension of the spring 50 and the stop nut 55 may be secured in its adjusted position by means of a wing nut 56. The bracket 54 is attached to the lower link 58 of a pair of toggle links 58, 59. The lower toggle link 58 is pivoted at 60 to a bracket 61 rigidly fastened to the base 10 and the upper end of the upper toggle link 59 is pivotally connected at 63 to a bracket 64 secured to the platen 43. The spring 50 is under sufficient tension normally to support the platen in open position as shown in Fig. 2 and when the platen is swung downwardly the toggle links 58, 59 are buckled outwardly away from the base to stretch the spring 50 so that it will automatically return the platen to its normal elevated position when the operator releases it after each marking operation.

In operation the shoe upper section or other blank 32 to be marked (Fig. 3) is laid on the transfer sheet 30 with the grain side of the leather, or the finished side of the blank which it is desired to mark, in contact with the transfer sheet. The embossing or marking plate 70, which is preferably of the same size and shape as the blank to be marked, is laid on the blank with the embossing projections 71 against the surface of the blank. It will be understood that the embossing plate may be of usual construction in which the marking projections are arranged to delineate the design which is to be transferred or applied to the blank, and that suitable guide or gauge means may be used, if desired, to assist in positioning the blank and the embossing plate in precise registry with each other. When thus assembled, the blank 32 is firmly held between the embossing plate 70 and the transfer sheet 30, there being little or no chance of relative slippage occurring between these elements due to the fact that the projections 71 of the marking plate securely hold the underlying blank against relative movement and the pigmented surface of the transfer sheet being in contact with the blank provides a firm engagement therewith. Hence, these elements are firmly held together and constitute, in effect, an integrated unit.

After having positioned the blank and marking plate on the transfer sheet, in the manner previously described, the operator swings the platen 43 downwardly so as forcibly to strike the top side of the marking plate 70, thereby forcing its projections 71 into the blank and at the same time causing a slight transverse movement or lateral displacement of the marking plate, blank and transfer sheet, as a unit, relative to the work bed 15 (indicated by the arrows in Fig. 3) due to the horizontal component of force acting on these members, which component of force becomes

more effective when the work bed is yieldingly supported for a universal tipping movement.

The simultaneous application of pressure to and the relative movement or slip between the work bed 15 and the marking plate, blank and transfer sheet effects the transfer of the design delineated by the embossing projection 71 to the surface of the leather or blank 32, the individual markings being fine and yet distinct and readily removable, thus affording an accurate guide for the operator during the stitching or cutting operation.

In marking a blank in accordance with the present invention the necessity of using a great amount of force or pressure in order to insure a complete transfer of the markings to the blank is avoided as it is merely necessary to use a moderate pressure in order to apply a fine, distinct marking to the blank, due to the fact that the application of the marking to the blank is not primarily dependent upon the pressure applied, but rather upon the conjoint action of the pressure and slip or creep between the supporting plate on the one hand and the transfer sheet, blank and marking plate on the other hand, resulting from the interposed slip sheet.

While I have shown and described one desirable embodiment suitable for carrying out the present invention, it is to be understood that the present disclosure is for the purpose of illustration and that various changes of shape, proportion and arrangement of parts, as well as the substitution of equivalent elements for those herein shown and described, may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. The method of marking blanks for shoe uppers and the like by means of a pigmented transfer sheet and a marking plate having marking projections thereon delineating the design to be applied to the blank, which comprises interposing the blank between the marking plate and the transfer sheet so that the surface to be marked is in contact with the pigmented surface of the transfer sheet and the opposite surface is in contact with the marking projections on the marking plate, disposing a slip plate beneath the transfer sheet, applying pressure to the assemblage by means of opposed pressure members, and during the application of pressure causing a slight lateral movement between the assembled marking plate, blank and transfer sheet on the one hand and the pressure member and slip plate adjacent to the transfer sheet on the other hand.

2. The method of marking blanks for shoe uppers and the like by means of a pigmented transfer sheet and a marking plate having marking projections thereon delineating the design to be applied to the blank, which comprises interposing the blank between the marking plate and the transfer sheet so that the surface to be marked is in contact with the pigmented surface of the transfer sheet and the opposite surface is in contact with the marking projections on the marking plate, disposing a slip plate beneath the transfer sheet, inserting the assembled marking plate, blank and transfer sheet between cooperating pressure members into cooperative relation so as to press the assembled marking plate, blank, transfer sheet and slip plate and simultaneously effect a slight transverse movement between the pressure member and juxtaposed slip plate on the one hand and the assembled marking plate, blank and transfer sheet on the other hand.

3. The method of marking blanks for shoe uppers and the like by means of a pigmented transfer sheet and a marking plate having marking projections thereon delineating the design to be applied to the blank, which comprises interposing the blank between the marking plate and the transfer sheet so that the surface to be marked is in contact with the pigmented surface of the transfer sheet and the opposite surface is in contact with the marking projections on the marking plate, disposing a slip plate beneath the transfer sheet, inserting the assembled marking plate, blank and transfer sheet between cooperating pressure members, one of which is mounted for universal tipping movement so that the slip plate is juxtaposed to the pressure member mounted for universal tipping movement, and bringing said pressure members into cooperative relation so as to apply pressure to the assembled marking plate, blank, transfer sheet and slip plate and simultaneously effect a slight transverse movement between the last mentioned pressure member and slip plate on the one hand and the assembled marking plate, blank and transfer sheet on the other hand.

4. The method of marking blanks for shoe uppers and the like by means of a pigmented transfer sheet and a marking plate having marking projections thereon delineating the design to be applied to the blank, which comprises interposing the blank between the marking plate and the transfer sheet so that the surface to be marked is in contact with the pigmented surface of the transfer sheet and the opposite surface is in contact with the marking projections on the marking plate, inserting the assembled marking plate, blank and transfer sheet between cooperating pressure members, interposing a thin, smooth and non-resilient piece of sheet material between the transfer sheet and the adjacent pressure member, and bringing said members into cooperative relation so as to press the assembled marking plate, blank and transfer sheet and cause a slippage of the assembled marking plate, blank and transfer sheet relative to the pressure member adjacent to the transfer sheet.

5. The method of marking blanks for shoe uppers and the like by means of a pigmented transfer sheet and a marking plate having marking projections thereon delineating the design to be applied to the blank, which comprises interposing the blank between the marking plate and the transfer sheet so that the surface to be marked is in contact with the pigmented surface of the transfer sheet and the opposite surface is in contact with the marking projections on the marking plate, inserting the assembled marking plate, blank and transfer sheet between cooperating pressure members, interposing a thin, smooth and non-resilient sheet of paper between the transfer sheet and the adjacent pressure member, and bringing said members into cooperative relation so as to press the assembled marking plate, blank and transfer sheet and cause a slippage of the assembled marking plate, blank and transfer sheet relative to the pressure member adjacent to the transfer sheet.

6. The method of marking blanks for shoe uppers and the like by means of a pigmented transfer sheet and a marking plate having marking projections thereon delineating the design to be applied to the blank, which comprises interposing the blank between the marking plate and the transfer sheet so that the surface to be marked is in contact with the pigmented surface of the transfer sheet and the opposite surface is in con-

tact with the marking projections on the marking plate, inserting the assembled marking plate, blank and transfer sheet between cooperating pressure members, one of which is mounted for universal tipping movement so that the transfer sheet is juxtaposed to the latter pressure member, interposing a thin, smooth sheet of paper between the transfer sheet and the last mentioned pressure member, and bringing said pressure members into cooperative relation to press the assembled marking plate, blank and transfer sheet and simultaneously cause a slippage of the assembled marking plate, blank and transfer sheet relative to one of said pressure members.

7. Marking apparatus comprising relatively movable cooperating pressure members, one of said members having means for holding a transfer sheet on its surface and being adapted to support an embossing plate and a blank to be marked, and means on the surface of said last mentioned pressure member adapted to be interposed between the transfer sheet and the underlying pressure member to provide a smooth and non-yielding slipping surface engageable with the under surface of said transfer sheet, said means being operative to effect a relative slippage between said transfer sheet, embossing plate and blank on the one hand, and one of said pressure members on the other hand.

8. Marking apparatus comprising a work bed adapted to support an embossing plate and a blank to be marked, means for retaining a transfer sheet on the surface of said work bed, means interposed between said work bed and transfer sheet providing a smooth, relatively frictionless and non-yielding slipping surface engageable with the under surface of said transfer sheet, and a platen supported for movement toward and away from said bed plate, said last-mentioned means being operative to effect a relative slippage between said transfer sheet, embossing plate and blank on the one hand, and said work bed on the other hand, when said platen is brought into marking position.

9. Marking apparatus comprising a base, a work bed yieldingly supported on said base, a thin, smooth and unyielding piece of sheet material on said work bed providing a slip plate, means for holding a transfer sheet in superposed relation to said sheet material, and a platen mounted for movement toward and away from said work bed, said sheet material being operative to effect a relative movement between said transfer sheet and a blank and marking plate disposed thereon on the one hand, and said work bed on the other hand, when said platen is brought into marking position.

10. Marking apparatus comprising a base, a work bed yieldingly supported on the base and supported so as to rock with relation to the base, a thin, smooth and non-yielding piece of sheet material disposed on said work bed and providing a slip plate, and a platen pivotally mounted on said base to move downwardly into marking relation to the rocking work bed and upwardly away therefrom, said material being operative to effect a relative slippage between said transfer sheet and a blank and marking plate disposed thereon on the one hand, and said work bed on the other hand, when said platen is moved downwardly into marking position.

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