June 20, 1944. R. R. CAMPBELL 2,351,660

MACHINES FOR ORNAMENTING SHOE UPPERS

Filed March 20, 1941 2 Sheets-Sheet 1

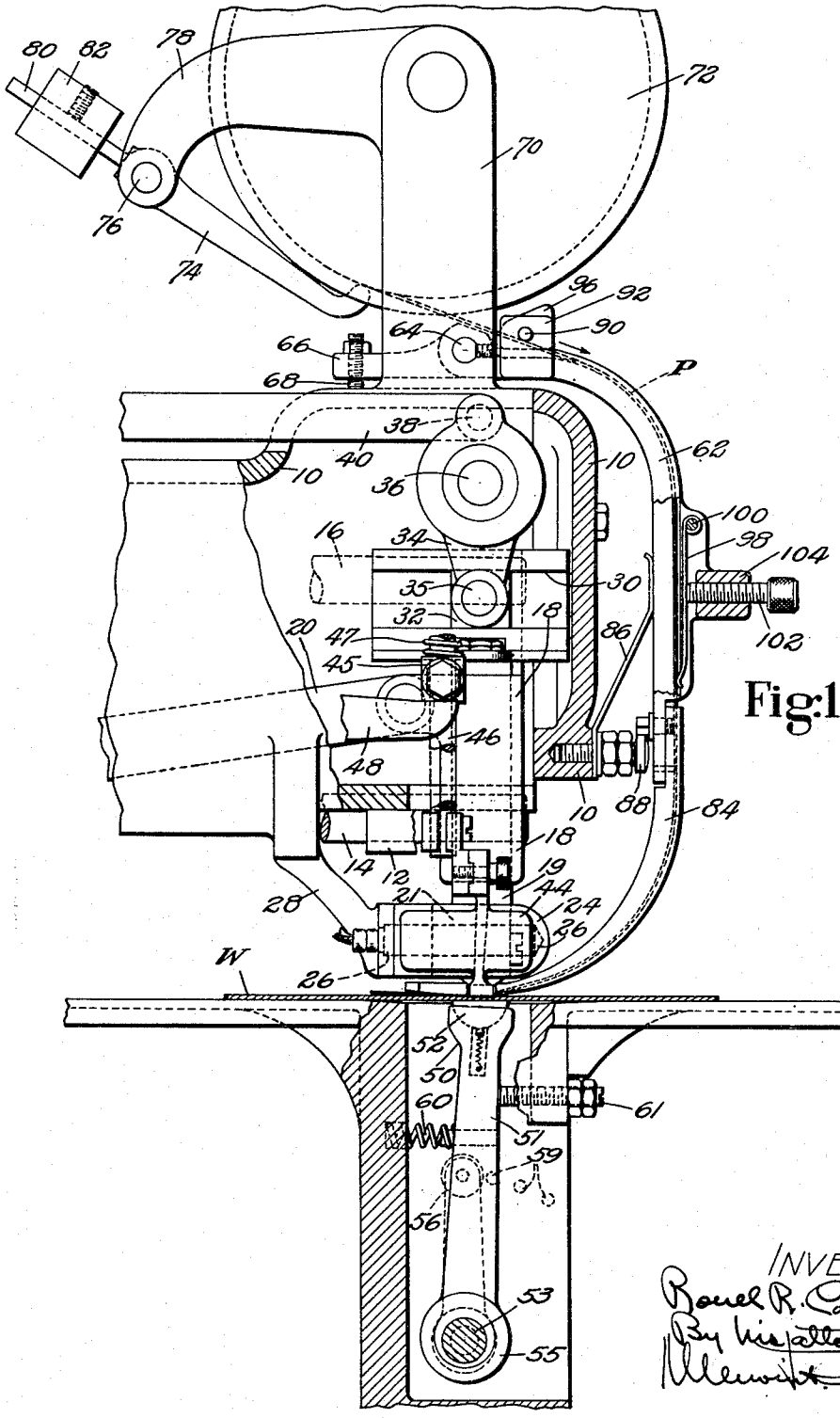


Fig:1.

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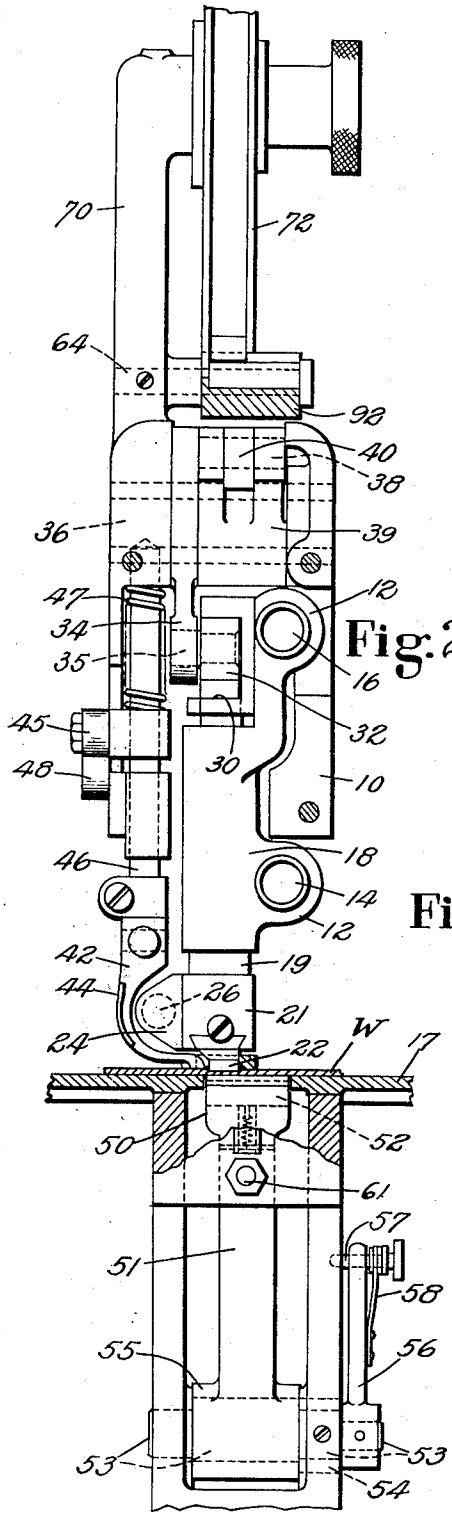


Fig. 2.

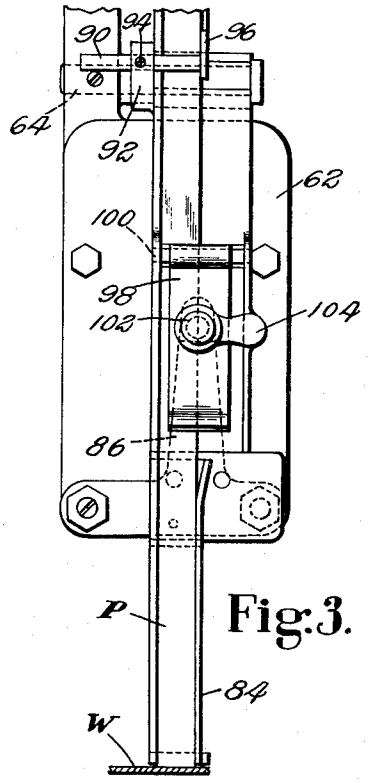


Fig. 3.

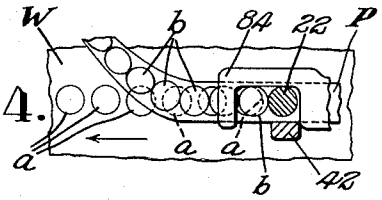


Fig. 4.

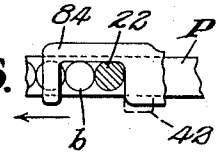


Fig. 5.

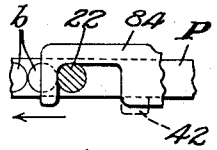


Fig. 6.

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UNITED STATES PATENT OFFICE

2,351,660

MACHINE FOR ORNAMENTING SHOE UPPERS

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Application March 20, 1941, Serial No. 384,361

9 Claims. (Cl. 101—27)

This invention relates to machines for ornamenting shoe uppers and is particularly concerned with machines adapted to produce ornamental perforations in shoe uppers or to produce ornamental marking or embossing designs therein, or to perform both operations simultaneously.

It is an object of the invention to provide a simple and effective machine of this type in which particularly the application of embossing pressure to the work is maintained over a substantial period of time during one cycle of operation, thereby attaining a more satisfactory embossing operation and at the same time reducing the amount of power required for that operation.

In accordance with one feature of the invention, the illustrated machine has a tool which according to the ornamental design required may be adapted to perforate the work or to emboss the work or to perform both operations simultaneously. The tool is constructed and arranged to move into operative engagement with the work in a direction substantially at right angles to the top face of the work and then to move in a direction substantially parallel to the top face of the work while remaining in engagement therewith, thereby imparting a feed movement to the work. There is also provided a movable work support, held by a spring in its initial position in which the work is clamped against the support as a result of the work-engaging movement of the tool. During the work-feeding movement of the tool the work support is caused to be moved in the same direction due to the tool's continued application of pressure to the work and thereby to the support. This movement of the support is against the pressure of the above-mentioned spring, and as soon as the tool has terminated its work-feeding movement and is moved out of engagement with the work, the spring is freed to return the support into its initial position while the work is held in its advanced position by a vertically movable presser foot which at that time is operated to clamp the work against a fixed support.

In performing embossing or marking operations on sheet material such as shoe upper blanks it is the common practice to apply a heated die to a ribbon, usually a paper strip, carrying a coloring medium such as a pigment or bold-leaf. As the die forces the ribbon into contact with the work, the pigment or gold-leaf is transferred to the work in the desired design. It is another object of the invention to provide improved means for presenting the pigment-carrying ribbon between the work and the tool and means for advancing the ribbon during each operating cycle of the machine an amount just sufficient to cause the unused area of the ribbon, immediately adjacent to the area engaged by the tool during the preceding cycle, to be located in alinement with the path of work-engaging movement of the tool at the beginning of the new cycle.

In accordance with another feature of the invention, the illustrated machine is provided with an improved guide member adapted to present a ribbon, carrying a coloring medium, between the tool and work. This guide member is movably mounted and is caused to participate in the work-feeding movement of the tool. However, the movement of the guide member in the direction of feed is terminated by adjustable means before the tool has completed its work-feeding movement. Accordingly, the ribbon or paper strip, the movement of which continues with the tool, is moved relatively to the guide member during only a portion of the feeding movement of the tool whereby only a short unused portion of the ribbon, which is located immediately adjacent to the previously used portion, is moved to a position relatively to the guide member in which it will be engaged by the embossing tool or die at the beginning of the next embossing operation and without waste of the strip.

These and other features of the invention may best be understood by a consideration of the following description taken in connection with the accompanying drawings, in which

Fig. 1 is a side view of a preferred embodiment of the invention showing the machine with certain parts broken away or in section;

Fig. 2 is a front view of the machine illustrated in Fig. 1 with the paper strip guide removed;

Fig. 3 is a side view of the paper strip guide; and

Figs. 4, 5 and 6 show successive stages of the feed movement of the tool and strip guide as well as the strip itself.

The invention is illustrated as embodied in a machine of the type described in U. S. Letters Patent 1,580,132, granted April 13, 1926, upon an application filed in the name of Perley R. Glass, and reference may be made to that patent for a description of the machine structure not fully shown herein. Whereas the machine disclosed in the above-mentioned patent is a perforating machine, the machine illustrated herein is especially adapted to perform a marking operation on shoe uppers, that is, to produce ornamental impres-

sions or indentations in a shoe upper by means of a marking or embossing die, a coloring medium such as a pigment or metallic leaf being interposed between the work and the die. It will be understood that the illustrated machine, if provided with combined embossing and perforating tools, may be employed for simultaneously perforating and embossing shoe uppers.

The illustrated machine has a frame 10 provided as in the machine of the above-mentioned Glass patent with bearings 12 (Figs. 1 and 2) in which are received horizontally movable guide rods 14 and 16 secured to a slide 18. The slide 18 is reciprocated from front to rear in a substantially horizontal direction by means of a link 20 pivotally secured to the slide 18 and actuated as fully described in the Glass patent, the rods 14 and 16 serving to support and guide the slide 18 during its reciprocatory motions. The reciprocatory motions of the slide 18 serve to impart work-feeding movements to a tool 22 (Fig. 2). To that end, the slide 18 has a substantially vertical cylindrical bore in which a tool-supporting rod 19 is mounted to reciprocate in a direction to move the tool in a substantially perpendicular path relatively to the upper surface of a piece of work W resting on a table 17 forming part of the machine frame. Secured to the lower end of the rod 19 is a tool-carrying block 21 provided in its under surface with a dovetail-shaped guideway adapted to receive a guide member provided on the removable tool 22, held in position by a screw. The tool 22 may comprise, in accordance with the type of the intended operation, merely one or several embossing dies, or one or several embossing dies in conjunction with one or several perforating punches (not shown).

For the proper execution of an embossing operation it is desirable to heat the embossing tool. Accordingly, there is provided a heating element comprising a block 24 (Figs. 1 and 2) having a horizontal, longitudinally extending bore in which is mounted an electric heating cartridge 26 connected by suitable conductors to a source of electric power. The block 24 is secured to a bracket 28 (Fig. 1) which is part of the machine frame 10. The vertical side face of the block 24 engages the side face of the tool-carrying block 21, the vertically and horizontally moving block 21 continuously maintaining a sliding contact with the stationary block 24 so as to cause the tool 22 to be continuously and uniformly heated.

For the purpose of operating the tool 22 in a direction substantially at right angles to the upper surface of the work W, the slide 18 is provided with a substantially horizontal guideway 30 (Fig. 1) in which is received a sliding block 32. The sliding block 32 is pivotally secured at 35 to the lower end of a lever 34, the latter being pivotally mounted on a stud 36 secured in the machine frame. The upper extremity of the lever is pivotally secured at 38 to a substantially horizontal bar 40 which, as in a machine of the above-mentioned Letters Patent, is reciprocated by the driving mechanism of the machine so as to impart oscillatory motions to the lever 34 about the stud 36, as a result of which the slide 18 is reciprocated in a substantially vertical direction, thereby moving the tool 22 into and out of engagement with the work. The operation and timing of the link 20 and the bar 40 are such that the tool 22 is caused to perform a four-way motion in that the tool is first moved in a substantially vertical direction relatively to the work and into engagement therewith, whereupon the tool is moved in a substantially horizontal path to impatr a feed movement to the work. During this feed of the work, the heated die is maintained in contact with the strip for a substantial interval which is long enough to ensure the separation of the coloring medium from the strip and its firm adhesion to the work. At the same time, since this interval is also used for the feed movement, there is no consequent slowing of production. At the end of the feed movement the tool is raised into its elevated position and then again returned in a substantially horizontal path spaced from the work into its initial or starting position.

The illustrated machine is also provided with a presser foot 42 (Fig. 2) which is immovable horizontally but is reciprocated in a substantially vertical path in timed relation with the operation of the tool 22. To protect the operator's fingers aaginst burning by accidental contact with the heating unit 24, the lower portion of the presser foot is provided with a finger guard 44 (Fig. 1), in the form of a shield located in front of the heating unit 24. For the purpose of reciprocating the presser foot vertically a bar 46, to the lower end of which the presser foot 42 is secured and which, as in a machine of the above-mentioned Letters Patent, is guided in the machine frame for vertical reciprocation, is actuated by a lever 48 the forward end of which underlies a roll 45 pivotally secured to the side of the presser foot bar 46. This lever 48 is operated by the driving mechanism of the machine substantially in the manner disclosed in the above-mentioned patent. Mounted on the upper portion of the presser foot bar 46 is a spring 47 which tends to depress the presser foot bar 46 and thus to hold the presser foot 42 yieldingly in engagement with the work. The operation of the presser foot 42 is so timed in relation to the operation of the tool 22 that, during the horizontal work-feeding movement of the tool, the presser foot is maintained in its elevated inoperative position and is caused to descend upon the work to hold it against displacement after the completion of the feed movement thereof and while the tool returns to its starting position.

The work is supported in the illustrated machine on a movable work support 50 which is yieldingly held in an initial position in which the tool 22, after having been moved into engagement with the work, clamps the work against the support, whereupon as a result of the horizontal work-feeding movement and the continued clamping pressure of the tool exerted against the work and thereby against the work support, the support is caused to participate in the feed movement of the tool. To this end the work support 50 comprises an upwardly extending arm 51 the lower end of which is pivotally mounted in the lower portion of the machine frame and carrying in a semi-cylindrical recess provided in its upper extremity a tiltable work-supporting anvil 52 engaged at its bottom face by a spring tending to maintain the anvil 52 in a predetermined position relative to the arm 51 but permitting tilting movements of the anvil relative to the arm for the purpose of maintaining the entire work-supporting surface of the anvil continuously in contact with the lower surface of the work upon pivotal movement of the arm 51. The arm 51 has a hub 55 rotatably mounted on a pivot stud 53. As illustrated in Fig. 2, the stud 53 is rotatably mounted at both end portions in suitable bearings provided in aper-

tures in spaced vertical arms of a lower frame portion. The stud 53 has an eccentric portion on which the hub 55 is mounted and which permits vertical adjustment of the arm 51 and anvil 52 to accommodate work pieces of different thicknesses. To facilitate assemblage of the pivot stud 53 in the machine, the aperture in the frame portion accommodating the right-hand bearing (Fig. 2) is sufficiently large to permit passage of the eccentric portion of the stud therethrough. This aperture after the assemblage of the pivot stud 53 receives a bearing sleeve 54 secured to the frame by means of a screw. The stud 53 has a right-hand reduced end portion extending outwardly from the outer face of the frame portion. Secured to the projecting portion of the stud 53 is the hub of an adjustment arm 56, by the rotation of which the stud 53 is rotated about its axis with the result that the arm 51 and anvil 52 are adjusted vertically. To maintain the pivot stud 53 in a selected position of adjustment, the arm 56 carries at its upper extremity a plunger 57 provided with a thumb piece. A leaf spring 58 secured at one end to the arm 56 engages with its other end the plunger 57 and tends to maintain the plunger 57 in engagement with one of a series of sockets 59 (Fig. 1) provided in the wall of the frame portion. As illustrated in Fig. 1, a spring 60 seated at one end in a suitable bore provided in the left-hand lower frame portion and engaging with its other end a pin extending from the forward face of the arm 51 tends to rotate the arm 51 into its initial position determined by an abutment screw 61 secured in the machine frame and engaging the rear face of the arm. The screw 61 is so adjusted that the work-supporting anvil 52 is positioned in alinement with the path of work-engaging movement of the tool 22 thus enabling the anvil 52 to support the work effectively against the pressure exerted by the tool 22. Moreover, the above-mentioned participation of the anvil 52 and arm 51 in the feed movement of the tool occurs against the pressure of the spring 60 with the result that upon conclusion of the feed movement of the tool and elevation of the tool, the spring 60 automatically returns the arm 51 and with it the anvil 52 into their initial positions determined by the screw 61.

As previously stated, it is common when performing an embossing or marking operation to present a pigment-carrying or coloring medium between the tool and the work so that the tool may engage this medium and move it into engagement with the work to produce on the work an ornamental design of a selected color. The medium is usually carried on a ribbon, commonly a paper strip P, successive portions of which are progressively located in operative position to furnish the tool with the embossing medium.

For supporting a paper strip carrying a coloring medium and for progressively presenting successive portions of that paper strip in the path of work-engaging movement of the tool, the illustrated machine is provided with a guide 62 (Figs. 1 and 3) for the paper strip P, the guide being pivotally mounted on a fulcrum stud 64 secured in the machine frame substantially in vertical alinement with the path of work-engaging movement of the tool 22, so that the movement of the lower end of the guide 62 is substantially parallel to the horizontal plane through the lower end of the tool. The substantially U-shaped strip guide 62 has at its upper end a tail portion 66 (Fig. 1) carrying an abutment screw 68 which by engagement with the top face of the machine frame 10 determines the initial position of the strip guide 62. The paper strip P is wound on a reel 72 (Figs. 1 and 2) rotatably secured in an upright supporting bracket 70. To prevent excessive unreeling of the paper strip P a retarding lever 74 is pivotally secured at 76 to an arm 78 fixed on the bracket 70. The rounded right-hand end (Fig. 1) of the lever 74 engages the strip coil on the reel frictionally under the pressure of a weight 82 which is adjustably secured to an extension 80 of the lever 74.

The strip guide 62 has a lower removable portion 84 (Figs. 1 and 3) which is curved to present the forward end of the paper strip P to the work and the tool, and which has a hook-shaped end to prevent buckling of the end of the paper strip at the point of operation. A leaf spring 86 secured at one end to the right-hand side wall (Fig. 1) of the frame 10 by a screw 88 and engaging with its free end the inner side of the strip guide 62 serves to hold the guide 62 in its initial position determined by the screw 68, the screw 88 also acting as an abutment to terminate swinging movement of the guide 62 in a clockwise direction (Fig. 1) for a purpose which will be presently described.

To accommodate paper strips of different widths the strip guide 62 is provided at its upper portion with a strip gage which takes the form of a pin 90 (Figs. 1 and 3) adjustable widthwise of the paper strip P in a boss 92 on the upper portion of the strip guide 62. The pin 90 is held in adjusted position by a screw 94 threaded through the boss 92 and engaging the pin 90. The right-hand end (Fig. 3) of the pin 90 carries a flange 96 which serves to guide one edge of the paper strip. Upon use of a paper strip of different width the pin 90 is adjusted in accordance with the width of that strip and at the same time the lower portion 84 of the strip guide 62 is exchanged for a similar portion adapted to accommodate the selected width of the paper strip.

For tensioning the paper strip P, the strip guide 62 carries a leaf spring 98 (Figs. 1 and 3), the free end of which is in frictional engagement with the paper strip P and the other end of which is secured on a pin 100 mounted in the front portion of the strip guide 62. The pressure of the leaf spring 98 against the paper strip P is determined and adjusted by a screw 102 engaging the leaf spring and threaded through a socket 104 provided at the front face of the strip guide 62.

As has been stated, the spring 86 tends to swing the strip guide 62 in a counterclockwise direction, as viewed in Fig. 1, until the screw 68 engages the machine frame 10. This determines the initial position of the strip guide 62 and more specifically the position of the hook-shaped lower extremity of the removable portion 84 (Figs. 4 to 6) of the strip guide 62 relative to the presser foot 42 and the path of work-engaging movement of the tool 22. This position of the machine parts at the point of operation of the machine is illustrated in Fig. 4. As will be noted in that figure, the marks *a* produced in the work piece W are circular and are equally spaced apart. These marks, if desired, may be indented below the surface of the work by suitable adjustment of the work support 50 and its anvil 52 by means of the arm 56. If the paper strip P should be fed forwardly as far as the work W to present new and

unused portions of the paper strip in the path of work-engaging movement of the tool 22, the result would be that the used portions *b* of the paper strip P would be spaced apart the same distances as the embossed portions *a* of the work. Obviously, this would result in a considerable waste of embossing material. It is, therefore, desirable to control the feed movement of the paper strip such that the used portions *b* are contiguous to each other and that there is no waste of paper strip material between successive used portions. To obtain this result the work-engaging operating instrumentalities of the machine cooperate in the following manner. After the tool 22 has moved into engagement with the paper strip P and the work W substantially in the vertical plane of movement of the presser foot 42, as shown in Fig. 4, the tool 22, as previously described, begins to move in a substantially horizontal path toward the left of Fig. 1 or Fig. 4, thereby moving the paper strip P and the work W forward in the direction of feed illustrated in Figs. 4 to 6 by an arrow. As a result of the feed movement imparted to the paper strip P the lower end of the strip guide 62 is also moved in the same direction, the frictional resistance between the paper strip and the strip guide being sufficient to insure that movement of the strip guide 62 which takes place about its fulcrum 64 and against the pressure of the spring 86. However, this concomitant movement of the strip P and the strip guide 62 is terminated on the part of the guide by the engagement of the latter with the stop screw 88, whereupon the feed movement of the tool 22 and accordingly the feed movement of the paper strip P and the work W continues. The position assumed by the parts when the movement of the strip guide 62 along the line of feed has been terminated by the stop screw 88, is illustrated in Fig. 5, the lower end of the strip guide portion 84 having been moved in this instance a distance substantially equal to the length of the work contacting end of the presser foot 42, as seen in the line of feed.

As a result of the continued movement of the paper strip P along the line of feed after the movement of the strip guide 62 in the same direction has been arrested, the paper strip P is moved relatively to the strip guide 62, or more specifically, a certain length of the strip is pulled out of the lower end of the strip guide. The length of this relative movement between paper strip P and strip guide 62 is determined by the amount of continued feed movement of the tool 22 after the engagement of the strip guide 62 with the abutment screw 88. Preferably the screw 88 is so adjusted that this relative movement between strip P and strip guide 62 corresponds substantially to the overall length of the next portion of the paper strip to be engaged and used by the tool, so that this next portion *b* of the strip is located immediately adjacent to the previously used portion *b*. This relative movement between paper strip and strip guide is terminated upon conclusion of the feed movement of the tool 22. This position of the machine parts is illustrated in Fig. 6. In the illustrated example, the tool 22 has moved substantially twice as far from its initial position as the strip guide 62, as may be determined by comparing the positions of these parts shown in Figs. 4 and 6 with the position of the presser foot 42 which is immovable in the line of feed. Upon raising the tool 22 and the attendant release of the paper strip P, the strip guide 62 which during the relative movement between paper strip and strip guide was held against the stop screw 88 is now returned by the spring 86 into its initial position, thereby moving with it or returning the paper strip P which, however, as a result of its being pulled out of the guide 62 to some extent, is now displaced relatively to the guide such that a new unused portion of the strip contiguous to the previously used portion *b* will be positioned in the path of work-engaging movement of the tool in readiness for the next operating cycle of the machine.

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

1. An embossing machine having a movable work support, an embossing tool, a support for said embossing tool, crank-operated means engaging the tool support for reciprocating the tool in a substantially vertical path with the tool engaging the work on the work support in the dead center position of said crank-operated means, and means for reciprocating the tool support in a substantially horizontal direction to impart a work-feeding movement to the tool and to cause the work support to move in the same direction.

2. An embossing machine having a combined work-embossing and punching tool, means for heating the tool, means for moving the tool in a substantially vertical path relatively to the work, means for moving the tool in a substantially horizontal path to feed the work, a pivotally mounted work support constructed and arranged to participate in the work-feeding movement of the tool, spring means for returning the work support into initial position, and a guide member for delivering a coloring medium between the work and the tool, the guide member being movably mounted to participate in the work-feeding movement of the tool.

3. An embossing machine having an embossing tool, a work support, means for moving the tool heightwise of the machine into and out of embossing engagement with the work on the support, means for imparting a work-feeding movement to the tool transversely of the machine, and a guide member for a strip carrying a coloring medium pivotally mounted to move about a fulcrum located in vertical alinement with the path of work-engaging movement of the tool and at a substantial distance above the path of work-feeding movement of the tool, said guide member having a delivery end turned in toward the tool and being arranged to participate in at least a portion of the work-feeding movement of the tool.

4. An embossing machine having an embossing tool, a work support, means for moving the tool in one direction into and out of embossing engagement with the work on the support, means for imparting a work-feeding movement to the tool in an angularly related direction, a movable guide member for a strip carrying a coloring medium, said member extending to a point close to the tool thereby to deliver the coloring medium between the work and the tool and being mounted for movement in the direction of feed by the frictional engagement of the strip with the guide member during the work-feeding movement of the tool, means for stopping the movement of the guide member in the direction of feed prior to the conclusion of the work-feeding movement of the tool to cause a displacement of the strip with relation to the guide member, and means for returning the guide member, with the strip

displaced relatively thereto, into initial position.

5. An embossing machine having an embossing tool, a work support, means for moving the tool into and out of engagement with the work on the support, means for imparting a work-feeding movement to the tool, and a guide member delivering to the tool a strip carrying a coloring medium, the guide member being mounted to pivot on an axis located a substantial distance vertically above the tool to participate in the work-feeding movement of the tool and being provided with an upper portion having an adjustable strip gage to accommodate paper strips of different widths and a removable curved delivery portion.

6. An embossing machine having an embossing tool, a movable work support, means for moving the tool into and out of operative engagement with the work on the support, means for imparting a work-feeding movement to the tool, a guide member for a strip carrying a coloring medium pivotally mounted to participate in the work-feeding movement of the tool, a fixed work support, a presser foot guided for vertical reciprocatory motion, and means for operating the presser foot substantially upon completion of a feed movement of the tool to press the work against the fixed support.

7. In a machine for ornamenting shoe uppers, a movably mounted member for both carrying the work forward and sustaining it against operative pressure applied thereto, a movable guide member adjacent to the point of pressure application for guiding and presenting a coloring medium into position to be applied to the work, and a tool for embossing and feeding the work and coacting with both said members to move them in the direction of feed while feeding the work.

8. In a machine for ornamenting shoe uppers, a movably mounted member for both carrying the work forward and sustaining it against operative pressure applied thereto, a movable guide member extending adjacent to the point of pressure application for guiding and presenting a coloring medium into position to be applied to the work, a tool for embossing and feeding the work and coacting with both said members to move them in the direction of feed while feeding the work, means for automatically returning the guide member into initial position after the completion of each feed movement of the tool, and means for automatically returning the work-carrying member into initial position after the completion of each feed movement of the tool.

9. In a machine for ornamenting shoe uppers, a movably mounted member for both carrying the work forward and substaining it against operative pressure applied thereto, a movable guide member adjacent to the point of pressure application for guiding and presenting a coloring medium into position to be applied to the work, a tool for embossing and feeding the work and coacting with both members to move them in the direction of feed while feeding the work, means for automatically returning both members into their initial positions after the completion of each feed movement of the tool, and adjustable stops for determining the initial positions of said members.

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