

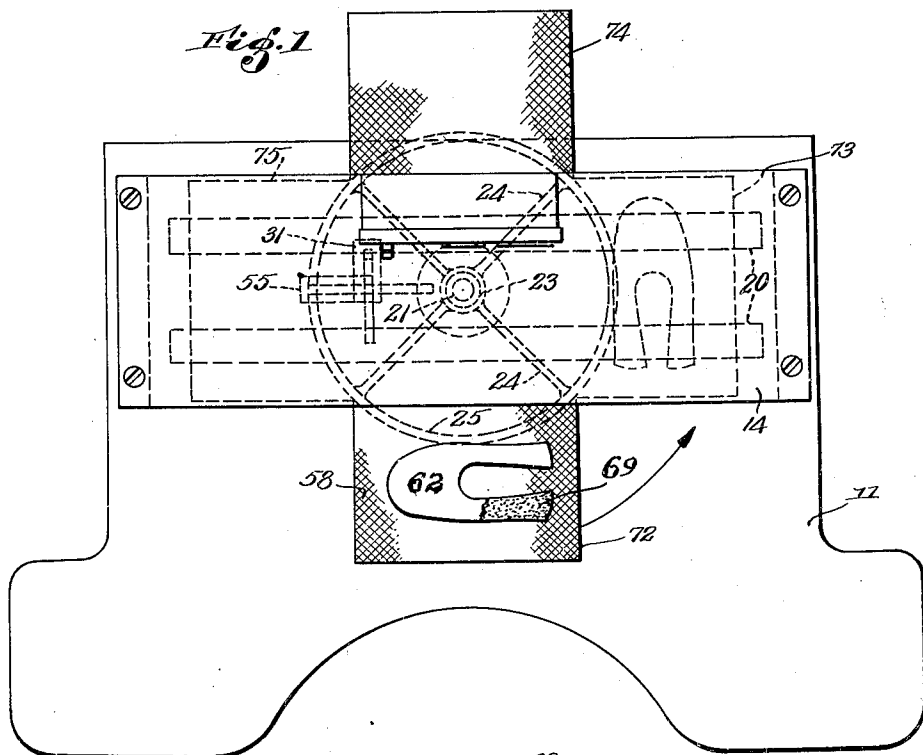
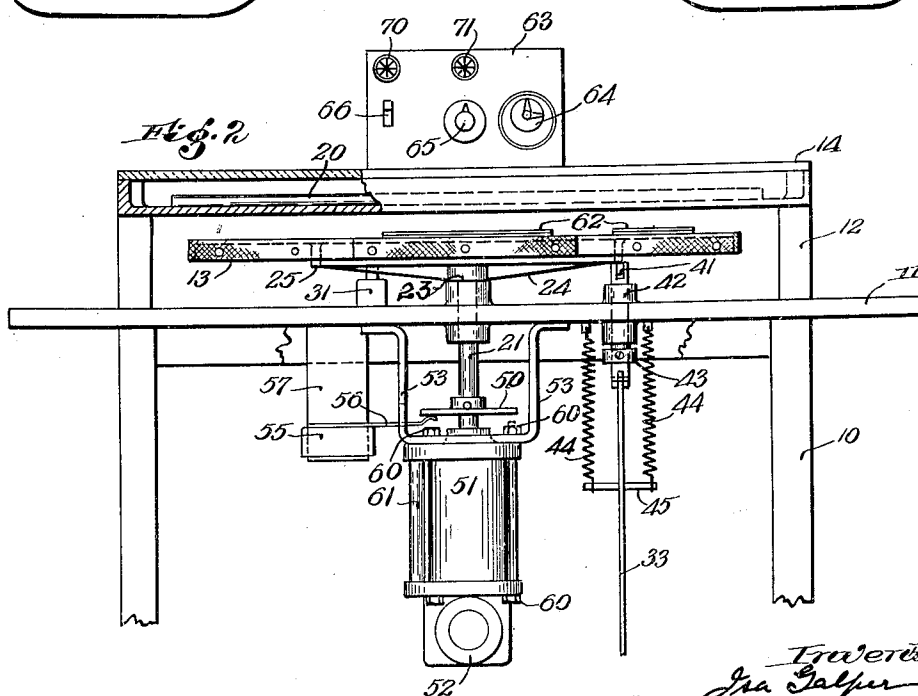
Feb. 21, 1950

I. GALPER
SHOEMAKING APPARATUS

2,498,541

Filed May 28, 1948

2 Sheets-Sheet 1

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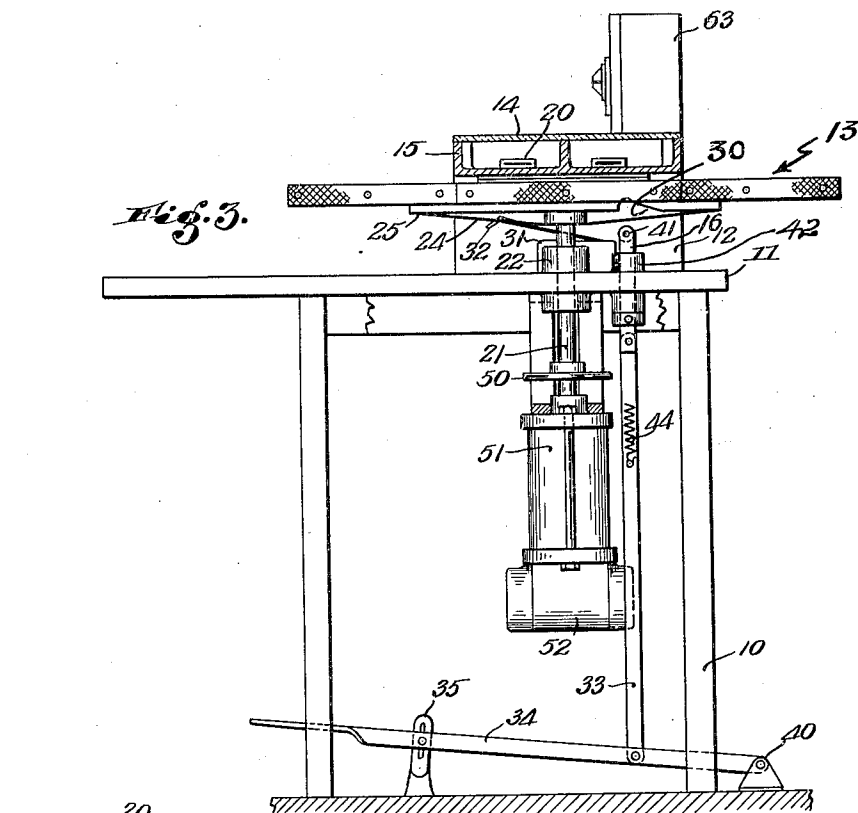
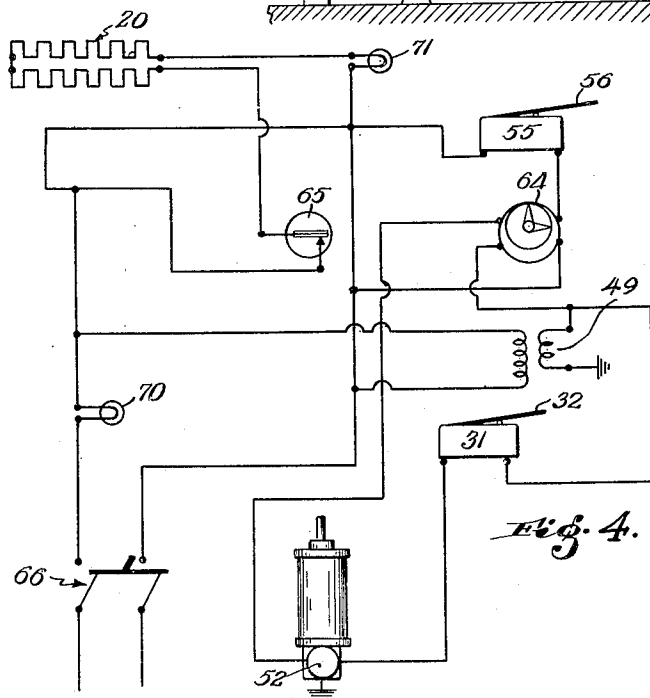
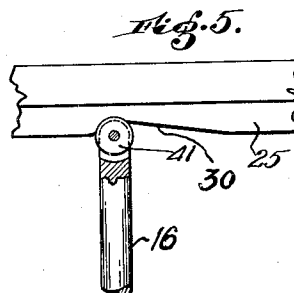
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2 Sheets-Sheet 2



Fraser & Neave
Isa. Galper -
By Henry, James, White & Caldwell.
A. H. Collins.

UNITED STATES PATENT OFFICE

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SHOEMAKING APPARATUS

Isa Galper, Manchester, N. H., assignor to Bee Bee Shoe Co., Manchester, N. H., a corporation of New Hampshire

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7 Claims. (Cl. 154—1)

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This invention relates to the art of bonding materials together wherein both heat and pressure are necessary concomitants, and more particularly to shoe lining presses.

In the past, shoe lining presses have been constructed in several ways. One type has comprised two plates, one of which is heated, and has a mechanical lever means for pressing the two plates together. Usually this lever comprises a pivotally mounted arm, and foot pedal and the pressure is derived from the weight of the operator as he stamps on it. This type has numerous disadvantages; first the operator must preferably be a man in order to have sufficient weight to provide the desired pressure; second, he must reach between the plates and withdraw the pressed materials, an operation requiring considerable motion; third, he must use his judgment as to length of pressing time and the pressure necessary for effective bonding; and fourth, he must develop skill in placing and withdrawing the materials to be pressed.

In other variations, the pressure has been applied by hydraulic or compressed air means, thereby making it possible for a woman to operate the machine and also eliminating the judgment factor with respect to the amount of pressure required. With this variation, however, the operator must still make the motions and develop the skill required in placing and withdrawing the materials. Also she must still take the step of actuating the pressing means as well as use her judgment as to how long to press the work. That type of lining press has the further disadvantages of being noisy and presenting a hazard to the fingers of the operator.

The objects of my invention are to provide an automatic press that obviates the step of actuating the press, that provides the operator with a convenient working surface upon which to lay the pieces to be bonded, which working surface does not lie directly under the hot plate when being prepared, and a press that can be operated by a woman in sitting position without the fear of inadvertently having her fingers caught or crushed.

A further object of my invention is to provide automatic means for gauging the length of time that pressure is to be applied by the machine and the amount of force to be exerted upon the work, thereby reducing the necessity for skill of the operator.

To achieve these objects I employ a turntable in the shape of a cross and mount it under a stationary heating unit. The operator may ordi-

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narly sit in front of the machine, put the materials to be bonded on the cross arm-end which projects toward her and manually swing the table counterclockwise. When the arm approaches position under the heating unit it trips a switch closing a circuit and the turntable automatically is raised and pressed with the work against the heater. An automatic timer then serves to gauge the pressing time and finally actuates means for returning the turntable to the lowered position whence the operation is repeated. Thus the operator has nothing to do but place the materials and swing the turntable.

These and other features and advantages of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings in which—

Fig. 1 is a plan view of the press showing one pair of transverse cross arms in position for pressing,

Fig. 2 is a view in front elevation showing the turntable in its down position,

Fig. 3 is a view in side elevation showing the turntable in elevated position,

Fig. 4 is a wiring diagram showing the electrical circuits, and

Fig. 5 is a detailed view in side elevation of the positioning detent used in holding the turntable from free rotation when not in use.

In describing the preferred embodiment of my invention, I will first enumerate its principal parts and then proceed to outline their components in detail. The machine includes in its structure a work table 11 supported by legs 10. Centrally and towards the rear of the work table 11, is mounted a turntable 13 on a vertical shaft 21. The shaft 21 with its turntable is raised and lowered by a compressed air cylinder 51 suspended beneath the work table 11. Above the turntable 13 is mounted a heating unit 15 and a control panel 63.

Proceeding now to describe the parts more particularly, the turntable 13 is in the shape of an oblong cross with cross arm ends 12, 13, 14, and 15. It is mounted on the shaft 21 by the hub 23 located at the geometric center of the turntable 13, and is braced beneath by ribs 24 and an annular ring or flange 25. The annular ring 25 is provided with notches 30 into which fits a positioning detent comprising a roller 41 located at the upper end of a plunger 16 connected to a vertical link 33. The said plunger 16 is slidably mounted in the table 11 through bearings 42, is held in the

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upward position by springs 44, and the roller 41 is disengaged from the notches 30 by depressing the foot pedal 34 which is connected to the link 33. The pedal is pivoted to a support 40 and is restrained in the scope of its arc by a guide 35. A stop ring 43 is connected to the plunger 16 and prevents it from following the annular ring upward when the turntable 13 is raised into the elevated position (see Fig. 2).

Above the turntable 13 is suspended a heating unit 15 containing heating coils 20 and an insulated top 14. The heating unit 15 is supported from the table 11 by braces 12.

The shaft 21 is held in alignment by bearings 22 mounted in the work table 11 and through which the shaft 21 can slide vertically as well as rotate freely. At its lower end the shaft 21 enters the compressed air cylinder 51 where it acts as the cylinder piston. An annular disk 50 is mounted on the shaft 21, concentric with the shaft 21 in a plane normal to it, between the bearings 22 and the cylinder 51. The said annular disk serves as a control switch trip as will be explained presently.

The compressed air cylinder 51 is supported beneath the worktable 11 by braces 53 and secured by tie bolts 61. A solenoid means 52 is connected to the cylinder 51 and serves to position its valves (not shown).

The microswitch 31 is located on the worktable 11 under the turntable 13 and in such a position that its arm 32 will be depressed by the ribs 24 as they pass in rotation. The microswitch 31 is in an electrical circuit which includes the source of power 66, the transformer 49, the switch 31, the double acting solenoid 52 and ground. This circuit, when the microswitch 31 is closed, operates through the solenoid to place the air valves (not shown) in position so as to impart upward thrust to the shaft 21. Finally, the upward motion of shaft 21 and the turntable 13 frees the arm 32 from the rib 24 thereby breaking the circuit. The valves, however, will stay in the latter position until returned as will be described presently.

The microswitch 55 is located beneath the work table 11 in such position that its arm 56 is depressed by the annular disk 50 when the turntable 13 is in the lowered position. When the turntable 13, however, is raised, the arm 56 operates through the switch 55 to close the circuit in which the said switch 55 is located. This latter circuit comprises the source of power 66, the microswitch 55, the automatic timer 64, and ground.

The automatic timer 64 is located in the control panel 63 where it can conveniently be set manually. As stated above, it lies in the circuit 66, 55, 64 and ground which circuit serves to start the timer 64 on its predetermined run. Upon the completion of the time run, the circuit 66, 55, 64 and ground is broken by the timer 64, and simultaneously a second circuit is made. This second circuit comprises the source of power 66, the transformer 49, the automatic timer 64, thence through the double acting solenoid 52 and out to ground. This latter circuit reverses the thrust of the solenoid, placing the valves (not shown) in position so as to impart downward thrust to the shaft, and is broken when the disk 50 returns to the lowered position, depresses the arm 56, and resets the timer 64.

At this point it is of importance to note that the turntable 13 rotates a small amount after the rib 24 trips the microswitch 31, thus placing

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the rib 24 slightly beyond the arm 32 and preventing re-actuation of the circuit 49, 31, 52 and ground, upon the return of the turntable 13 to lowered position. This latter circuit will not be reactuated again until the turntable 13 is again rotated.

In the lowered position the turntable 13 is positioned so that its cross arms are directly under the heating unit 15. To allow for minor variations in the position of the turntable 13, the notch 30 is provided with a slanting edge which operates in conjunction with the roller 41 to rotate the turntable 13 into the correct position.

In the control panel 63 is placed pilot lights 70 and 71, and a bimetallic thermostat 65. The pilot light 70 is in series with the main power circuit and serves to indicate whether the power is on or not. The pilot light 71 is in series with the heating coils 20 and shows whether power is on them or not. Finally, the bimetallic thermostat is in series with the coils 20, and serves to keep them at the desired temperature.

In the operation of my device, I take two pieces of material such as items 62 and 69, one being precoated, place them on one of the turntable arm ends 72, release the positioning detent by depressing the foot pedal 34, and manually swing the turntable 13 counter-clockwise. As the arm end 72 approaches a position under the heating unit 15, one of the ribs 24 trips the microswitch 31 which through the double acting solenoid 52 actuates the compressed air cylinder 51, and drives the turntable 13 up against the heating unit 15. The upward motion of the shaft 21 trips the microswitch 55 and starts the automatic timer 64, and incidentally disengages the microswitch 31. At the end of its selected time interval, the automatic timer 64 through the double acting solenoid 52 reverses the thrust of the compressed air cylinder 51 and returns the turntable to the lowered position. At this point, the automatic timer 64 re-clocks itself, and since the arm end 75 now presents itself, the operation may be repeated. When the device is used in steady operation, the pedal 34 may be tied down or eliminated entirely, thereby obviating a separate step in the operation. During a complete cycle, the materials will be pressed twice before returning to the operator to be removed. However, it can readily be seen that two operators could be used, working in tandem on opposite sides of the work table 11. Variations such as this, of course, will suggest themselves, and it is to be understood that the invention is not limited to the precise embodiment shown herein, but is rather to be measured by the terms of the appended claims.

An important advantage of my improved press is that its construction doubles the capacity of the machine as compared to presses heretofore used in the same field of industry. This is because two work pieces are under heat and pressure at the same time or because each piece is pressed twice in the total cycle. Accordingly, the work may be fed to the press and removed therefrom at twice the rate of a press having a single dwell in each cycle.

Having thus disclosed my invention, I claim as new and desire to secure by Letters Patent:

1. An automatic shoe lining press comprising a frame, a turntable presenting a surface in the shape of an oblong cross with arms of equal length and breadth mounted on the said frame so as to rotate freely, heating means suspended above the said turntable presenting a flat surface

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in the same shape and dimensions as one of the transverse cross arms of the said turntable, automatic means for elevating the said turntable after partial rotation and pressing it against the said heating means at predetermined pressure, automatic means for actuating the said elevating means at spaced intervals in the rotation of the said turntable, and an automatic timer controlling the length of pressing time.

2. A press of the character described in claim 1, further characterized by ribs bracing the turntable on its under side, means actuated by contact with the said ribs in turn actuating the elevating means and pressing the turntable against the surface of said heating means, so constructed and arranged that the turntable will continue to rotate sufficiently before being halted by contact with the heating surface that the rib will not reactuate the elevating means upon its return to the lowered position.

3. A press of the character described in claim 2, further characterized by a releasable link restraining the rotation of the turntable when in lowered position at a point where the said ribs are not in contact with the means which actuate the elevating means.

4. An automatic press for bonding materials together wherein both heat and pressure are necessary concomitants, comprising a frame, an oblong box supported horizontally across the top of said frame, means in the said box for heating the under surface of the said box, bearings mounted centrally within said frame, a shaft supported vertically by the said bearings, a turntable presenting the surface shape of an equilateral cross, each pair of cross arms of which comprise the same shape as the said oblong box, the said turntable being mounted on the said shaft so as to rotate about its geometric center, four ribs reinforcing the under side of the turntable and connected to the said shaft at right angles to each other, the said shaft being both free to rotate and to slide vertically within its bearings, compressed air means for elevating and lowering the said shaft and turntable and for pressing the turntable against the said under surface of the said box with predetermined pressure and for predetermined lengths of time, and automatic means for actuating the compressed air means located so as to be tripped by the said ribs as the turntable rotates.

5. An automatic press of the character described in claim 4, further characterized by an annular ring concentric with the said shaft and connected to the said ribs, a releasable detent engaging notches in the said ring and halting the rotation of the said turntable in such position that one pair of the turntable cross arms lie directly under the oblong box, but in such a position that the said ribs will have rotated beyond the means for actuating the compressed air means and will not re-trip it upon the turntable's return to the lowered position.

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6. An automatic press for bonding materials together wherein both heat and pressure are necessary concomitants, comprising a frame, a turntable mounted on the said frame, heating means presenting a flat surface suspended above the said turntable in a plane parallel to it, compressed air means for lowering, raising and pressing the turntable against the flat surface of the heating means, valves in the compressed air means for controlling its direction of thrust, an automatic timing means controlling the length of time the valves are in position for the compressed air means to thrust the turntable upwards, means for varying the effective air pressure, ribs bracing the turntable on its under side, means actuated at intervals during the rotation of the turntable by contact with the said ribs for placing the said valves in such position that the compressed air means thrusts the turntable upward against the flat surface of the heating means, means for starting the automatic timer actuated by the elevation of the turntable, and separate means actuated by the automatic timer at the end of its selected time interval for returning the valves into such position that the compressed air means will lower the turntable at the completion of the selected time period.

7. An automatic press of the character described in claim 6, further characterized by electrical means controlling the position of the said valves comprising a first circuit, a microswitch in the said first circuit located so as to be actuated by the said ribs as they pass in rotation closing the said first circuit, solenoid means actuated by the said first circuit placing the valves in position to admit air into the lower chamber of the compressed air means, to impart upward thrust to the said shaft and to break the said first circuit, a second circuit, a microswitch in the said second circuit so located as to be actuated by the upward motion of the shaft, an automatic timer actuated by the said second circuit, a third circuit closed by the said automatic timer at the end of its time interval, and solenoid means actuated by the said third circuit for placing the said valves in position to impart downward thrust to the said shaft.

ISA GALPER.

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