Feb. 24, 1953 P. MOLLA 2,629,158

PRINTING AND MOLDING PRESS FOR SOAP CAKES

Filed Dec. 4, 1950 2 SHEETS—SHEET 1

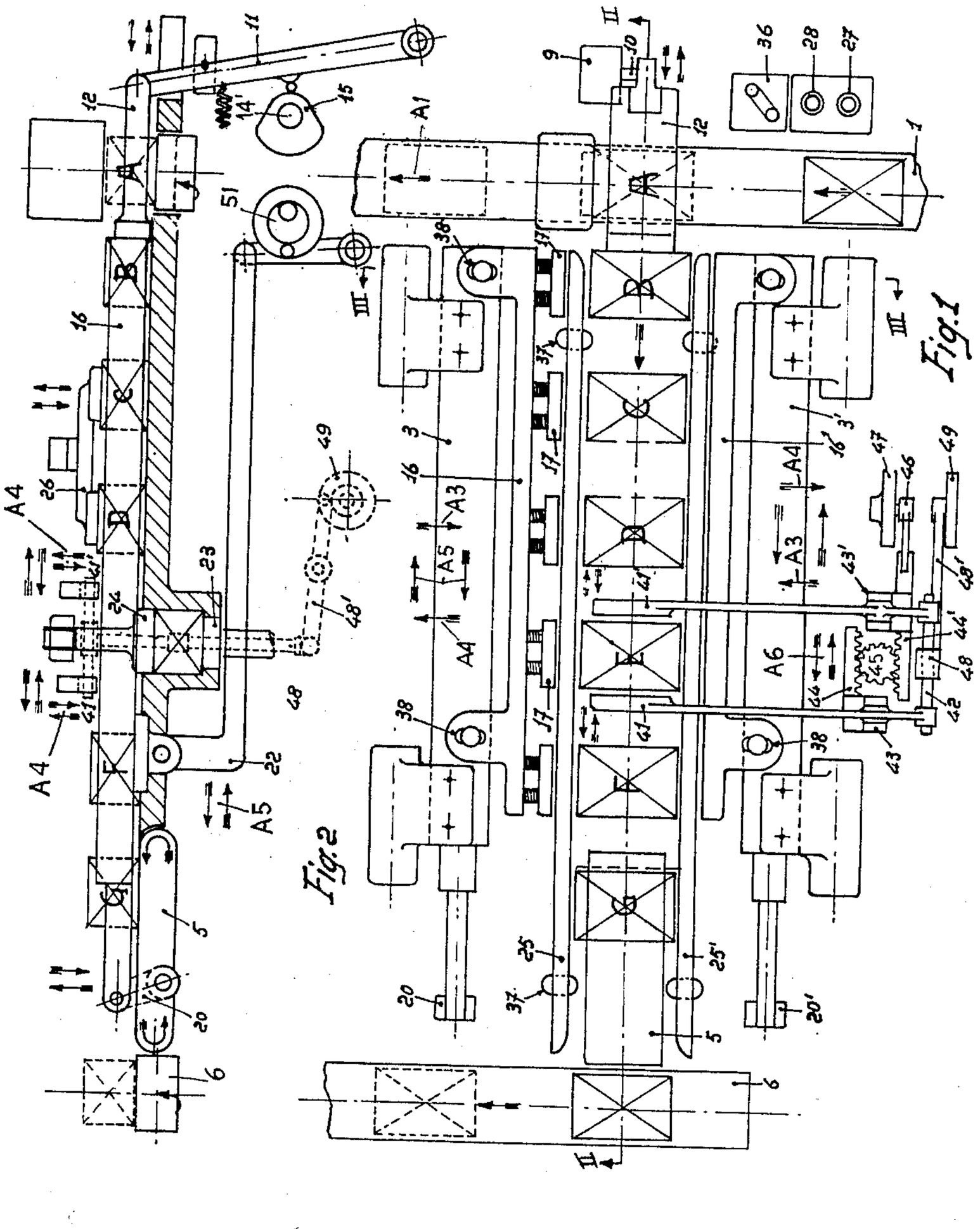

Fig. 1

Fig. 2

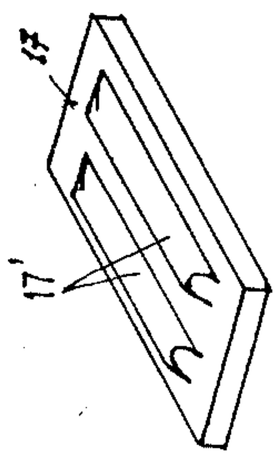

Fig. 5

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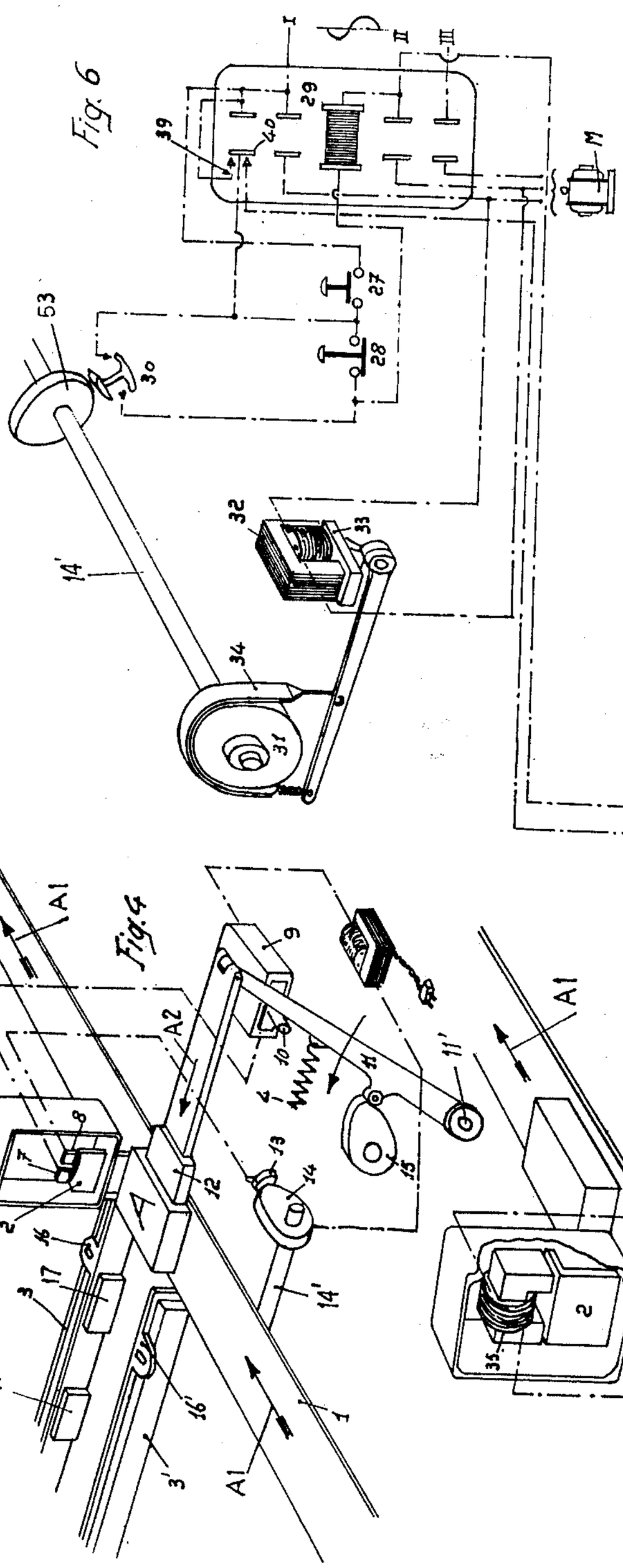

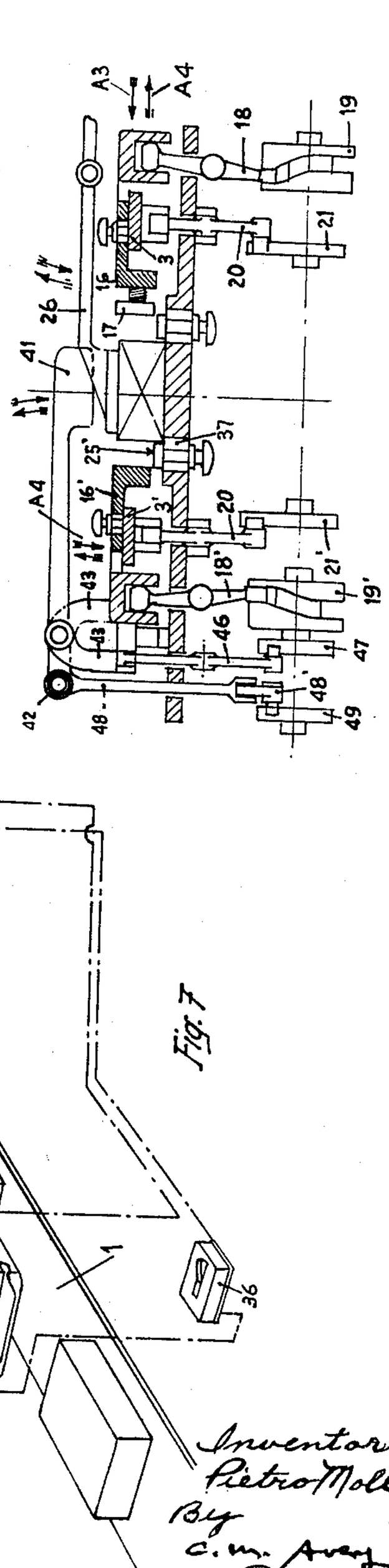

Fig. 3

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PRINTING AND MOLDING PRESS FOR SOAP CAKES

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9 Claims. (Cl. 25—7)

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Conventional soap presses for molding and impressing soap cakes have a magazine hopper for receiving a supply of cake blanks, and a feeding device for passing the blanks from the magazine toward the dies.

When charged by hand, the hopper requires continuous attention. When a conveyor is provided for automatically charging the hopper the blanks must reach the hopper in a close succession and the hopper must be kept well filled to prevent stoppage of the press due to blanks dropping or capsizing in the hopper.

The feeding device, as a rule, has a plunger which ejects the blanks from the bottom of the hopper and pushes each blank against the preceding ones horizontally toward and beyond the die. There are also feeding devices whose plunger mechanism comprises two pincer arms which not only eject the blanks from the hopper but, by means of the pincer arms, also remove the pressed cakes from the die box.

Aside from the fact that machines of this kind either need constant attendance or must meet exacting requirements as to an accurate and close succession of the cake blanks being supplied to the hopper, such soap presses, as heretofore known, have considerable other shortcomings. In the first place, when the supply of blanks is terminated, the last cake will stop in the die box because there is no subsequent blank to push it out. When the impression comprises lettering or lines in relief or engraved, it is difficult to remove the cakes from the die by means of simple thrust and without some damage to the impression.

It is an object of my invention to provide a printing and molding press for soap cakes which avoids these disadvantages.

According to a feature of my invention, I provide a soap press with a horizontal belt conveyor for supplying the soap blanks and with an automatic device, placed across the supply conveyor belt, which when contacted by a travelling cake blank, causes an electromagnet to release a power-driven plunger to laterally divert the blank from the belt toward the die portion of the machine in proper phase relation to the pressing operation.

According to another feature of my invention, I dispose between the die portion of the machine and the plunger location of the pertaining supply conveyor a blank feeding device with two coacting guide plates capable of performing three movements. First, the two plates approach each other to catch a blank diverted from

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the conveyor belt by the action of the plunger; then the two plates are raised, holding the blank between each other, and are moved forward a given distance to carry the blank along. Thereafter the plates are lowered and move apart from each other, thus depositing the blank on a work table. Finally, the plates return to their initial position. This cycle covers the interval between two strokes of the machine. After a number of cycles, the blank is deposited on the bottom die. The pressing of the blank takes place during the period of time in which the plates travel back to their initial position. During a subsequent cycle the printed blank is taken up again by the plates, raised and advanced another step and so on until the blank is deposited on a take-off conveyor.

Other features of my invention reside in a device for centering each blank while it is being introduced into the die box, and an automatic device for arresting the machine whenever its operating members are at the starting point of the above-described cycle. According to still another feature of the invention, I provide an automatic device which, when the pressing operation is interrupted, permits the blanks to travel on the conveyor beyond the above-mentioned plunger releasing device until they reach the end of the conveyor where they may be collected to be fed again to the same or to another machine.

The foregoing and other objects and features of my invention will be apparent from the following description of a preferred embodiment shown in the drawings in which:

Fig. 1 is a schematic top view of the machine;

Fig. 2 is a longitudinal section along the line II—II of Fig. 1;

Fig. 3 is a cross section along the line III—III of Fig. 1;

Fig. 4 is a schematic perspective view of a pertaining feeding plunger controlled by an automatic electric device;

Fig. 5 shows a detail relating to the extraction of blanks from the die box;

Fig. 6 is a diagram of the automatic electromagnetic arrangement for arresting the machine;

Fig. 7 is a diagram showing the electric device that permits the continuous passage of soap cakes on the supply conveyor when the machine is inactive.

The illustrated soap press is provided with a horizontal belt conveyor 1 (Figs. 1, 4) for supplying the blanks to be pressed to the die portion of the machine. If the conveyor serves several

soap presses, it is preferably driven by its own motor (not shown) so that the soap blanks can pass by the illustrated press to another, similar one while the illustrated press is inactive. Otherwise, a single motor for driving the press as well as the conveyor is sufficient. A movable interceptor blade 2 (Fig. 4) is placed across the conveyor belt at a given height above it. Any soap blank placed lengthwise onto the belt, travels with the belt in the direction of the arrows A1 until it reaches the position A where it abuts against the blade 2. Blade 2 then closes an electric circuit between contacts 7 and 8 of a contact device for an electromagnet 9. This magnet, when energized, removes a stop 10 from latching engagement with a lever 11 pivoted at 11'. Hinged to lever 11 is a horizontally reciprocable plunger 12. The circuit of electromagnet 9 extends from contact 8 through another fixed contact 13 which, at every turn of the machine shaft 14' comes into contact with a revolving contact member 14 mounted on the shaft and positioned to engage contact 13 at a given moment of the machine cycle. Consequently, when the soap blank, by abutting against feeler blade 2, has closed the circuit at contacts 7 and 8, the magnet 9 becomes energized at the just-mentioned cycle moment. Only then can the magnet 9 withdraw stop 10 from lever 11. A cam 15, which previously placed the lever 11 into the illustrated latched position against the force of a spring 4, is then turned away from the lever 11 so that the released lever follows the spring bias and moves the plunger in the direction of the arrow A2 against the soap blank thus, forcing the blank between two jaws 16 and 16' of a blank feeding device. This movement, though controlled by the feeler blade, occurs always at the proper time with respect to the operating cycle of the machine and hence with respect to the cycle of the feeding device.

The jaws 16 and 16' are rigidly but adjustably secured to respective guide plates 3 and 3' (Figs. 2, 3, 4). One of the jaws, namely the jaw 16, is provided with a number of small spring-cushioned strips 17 designed to follow small variations in the size of the soap blanks and to more firmly hold the blanks.

The guide plates 3 and 3' are mounted and driven to perform three movements. One of these movements is reciprocal and transverse to the blank feed direction, both plates moving toward and away from each other in the directions of the arrows A3 and A4 (Fig. 1). This movement is imparted to plates 3 and 3' by respective levers 18 and 18' from respective cylindric cams 19 and 19' (Fig. 3). The second movement is a lifting and lowering movement as indicated by arrows A4 and is imparted to plates 3 and 3' by respective levers 20 and 20' from cam discs 21 and 21' (Fig. 3). The third movement is forward and reverse, as indicated by arrows A5, parallel to the blank feed direction and is imparted to the plates 3 and 3' by respective levers 22 and 22' from driving cams 51 (Fig. 2). The cams 19, 19', 21, 21' and 51 are all operated from the drive of the press mechanism so that the three reciprocal plate movements occur in a fixed sequence and in a cycle coinciding with the operating cycle of the press.

The blank in position A is pushed by plunger 12 into position B, between jaws 16 and 16', at the very moment in which plates 2 and 3' begin to approach each other. The blank is then held between jaw 16' and the first spring-cushioned strip 17. Thereafter, the raising and forwarding movements take place followed by the lowering and opening of the plates until the blank is deposited in position C opposite the second spring strip 17. The cycle is then completed by the return of plates 3 and 3' to their initial position. During a second cycle, the blank is caught between the jaw 16' and the second spring strip 17 and brought into position D. And so on, until the blank is brought into the die position E. The number of cycles necessary for a blank to reach the die may be varied as desired. In the illustrated embodiment three such cycles are required. The operating movement of the top and bottom dies 24 and 23 (Fig. 2) takes place in the interval of time during which the plates 3 and 3' perform the return stroke of their third movement. When the bottom die 23 is at its lowest position and top die 24 at its highest position, a device for centering the blank enters into action. This device has two paddle-shaped arms 41 and 41' (Figs. 1, 2, 3) which close onto the blank while the blank is being brought into position E by jaw 16' and the third spring strip 17, and accompany the blank in its descending movement until the blank fits well into the die opening. The arms 41 and 41' are hinged on an axle 42, along which they can slide and are supported by fulcrum pieces 43 and 43' rigidly secured to two reciprocating gear racks 44 and 44' meshing with a pinion roll 45. Rack 44' is driven by a lever 46 from a cam disc 47, that imparts to the rack an alternating horizontal movement (arrows A6) which causes arm 41' to approach to or withdraw from the cake blank. Pinion 45 causes rack 44 to simultaneously move the arm 41 toward and away from the blank. The approaching movement takes place when arms 41 and 41' with their paddles are at the upper position, and withdrawal when the arms are at their lowest position. The lowering and raising motion is imparted to arms 41 and 41' by the axle 42 whose center is joined with a flexible lever 48' and 48 driven by a cam disc 49 (Figs. 1, 2, 3) that controls the raising and lowering of axle 42 to occur in phase with the movements of the dies. During the subsequent cycle, the pressed soap cake is seized by the jaw 16' and the fourth spring strip 17, and is lifted and brought forward into position F. A further cycle, causes the cake to be deposited at G on a take-off conveyor 5 that may pass it to another conveyor 6, which may be a collector for several machines (Figs. 1, 2).

On the blank-facing surfaces of the fourth spring strip 17 and jaw 16', at the die position E, there are two elliptic bulges 17' (Fig. 5) which improve the grip on the end sides of the blanks during their extraction from the die. The imprints left by the bulges have a decorative character.

Along the path of the soap from the supply conveyor 1 to the take-off conveyor 5, there are two guiding bars 25 and 25' fixed to the table and adjustable by means of key slots 37 (Figs. 1, 3) to different sizes of soap cakes. For the same purpose, the jaws 16 and 16' are secured to plates 3 and 3' in such a way as to allow for adjustment by means of key slots 38 (Fig. 1). Hence, the press can be readily adapted for different sizes of cakes by changing only the die equipment.

Above cake positions C and D, there is a pressure lever 26 (Figs. 2, 3) for holding the blank on the work table when the jaws 16, 16' open.

This prevents the blanks from sticking to the jaws and being displaced out of phase. However, if a displacement of the blank from its exact position should occur due to any cause independent of the machine operation so that the piece of soap is cut in two by the die, this would not cause stoppage of the machine, since jaw 16' and spring strip 17, with their triple motion, then push the cut pieces out of the machine.

The machine is controlled by a starting push-button 27 and a stop push-button 28 (Figs. 1, 6). When the stop button 28 is depressed, the machine does not stop immediately but continues running until bottom and top dies 23 and 24 are at their upper dead centers and the plunger 12 is locked in its rest position. This is achieved by a relay circuit shown in Fig. 6. The normally closed push button 28 lies in the coil circuit of a relay 29 in parallel relation to a normally closed switch contact 30 controlled by a cam 53 on the machine shaft 14'. When push button 28 is depressed, the coil circuit of relay 29 continues to receive current through the by-pass contact 30 until contact 30, being driven by cam 53 in proper phase relation to the operative stroke, opens the circuit and causes the machine to stop at the desired position above mentioned.

To prevent overrunning of the machine due to inertia beyond the moment in which interruption occurs at contact 30, the machine is provided with a brake 31 that enters in action when a pertaining electromagnet 32 become deenergized. The contacts 28 and 30, when cutting the supply of current to the main motor M, also interrupt the passage of current through the electromagnet 32. Then a counterweight 33 drops down from the electromagnet and, by gravity, puts tension on the friction belt 34 of the brake wheel 31.

As has been pointed out, the supply conveyor may be driven by a separate motor independent of the drive motor of the press. In this case, when the machine is arrested for any reason, the conveyor belt 1 keeps on running. To then prevent soap blanks from collecting against blade 2 and to permit these blanks to pass to another press, if any, an automatic system is provided for lifting the blade 2 out of the path of the blanks travelling on the conveyor. This system, illustrated in Fig. 7, has an electric circuit in which an electromagnet 35 and two contact devices are put in series. One of these devices is a normally open push-button contact 36. The other contact device has stationary contacts 39 and a normally closed movable contact 40 of relay 29. Operation of the electromagnet 35 is, therefore, dependent upon non-operation of the soap press. In this condition, when button 36 is depressed, the electromagnet 35 attracts the blade 2 and lifts it sufficiently to permit the soap blanks to travel freely on the independently driven conveyor 1.

It is apparent that a machine according to the invention eliminates the disadvantages of the conventional machines since the supply of blanks does not require special attention, and the pressed cakes, whatever the engraving may be, is always taken off the bottom die by a raising movement and independently of the operation of the feeding plunger. In addition, there is also the advantage that the press movements are independent of the supply conveyor movements so that, if desired, the blanks charged onto the supply conveyor may be diverted from their way to the pressing stage.

Having thus described what I now consider to

be the preferred embodiment of my invention, it will be understood that various modifications in the form and in the disposition of its component members may be resorted to, without departing from the essence of the invention and within the scope of the appended claims.

I claim:

1. A machine for pressing and molding soap cakes, comprising a die-press portion having a substantially horizontal work-table surface, a horizontal belt conveyor extending along said surface for supplying thereto the cake blanks to be pressed, a feed plunger having an inactive position and being reciprocable from said position across said conveyor and toward said surface for diverting the blanks from said conveyor onto said surface, stop means engageable with said plunger to arrest it in said inactive position, a movable interceptor member disposed above said conveyor in the path of the blanks, control means connecting said member with said stop means for controlling said stop means in response to movement of said member to release said plunger in dependence upon a blank abutting against said member, a feeding device disposed on said work-table surface and having two guide parts extending parallel to the stroke direction of said plunger and being spaced from each other, at least one of said two plates being movable toward and away from the other plate to periodically hold between said two guide plates the soap blanks diverted from said conveyor, and said two plates being periodically movable upwardly and downwardly as well as forwardly and reversely to incrementally advance and deposit the blanks on said surface, and drive means connected with said die-press portion for imparting movements to said two plates in a fixed phase relation to the pressing operation.

2. A machine according to claim 1, comprising two jaws adjustably secured to said respective two plates at the inner sides thereof, one of said jaws having a number of spring-biased strips projecting toward the path of the blanks and engageable with the blanks, said strips being center spaced from each other along the blank path a distance equal to the forward advance movement of said two plates of an individual cycle of plate movements.

3. A machine according to claim 1, comprising a pressure lever having a vertically reciprocable portion engageable with the blanks and disposed above said surface between said plates, said lever being synchronized with said plates to descend into engagement with a blank being deposited by said plates onto said surface.

4. In a machine according to claim 1, said feeding device extending from said conveyor to beyond said die-press portion and being engageable with the die-pressed cakes for removing them from said die-press portion, and a take-off conveyor adjoining said device to receive said cakes.

5. In a machine according to claim 1, said feeding device having projecting elements disposed at the die location and engageable with the blanks at said location to laterally impress the blanks.

6. A machine according to claim 1, comprising a centering device having two arms pivoted for mutually opposing angular movement and extending transversely of said plates at both respective sides of the die location, said arms being engageable with a blank at said die location for centering the blank due to said angular move-

ment, and said arms being capable of joint reciprocal displacement in the vertical direction for placing the blank into pressing position, and drive means connected with said arms for imparting thereto said angular movement and said vertical displacement in a fixed phase relation to said pressing operation.

7. A machine for pressing and molding soap cakes, comprising a die-press portion having a substantially horizontal work-table surface, a horizontal belt conveyor extending beside said surface for supplying thereto the cake blanks to be pressed, a feed plunger having an inactive position and being reciprocable from said position across said conveyor and toward said surface for diverting the blanks from said conveyor onto said surface, stop means engageable with said plunger to arrest it in said inactive position, a movable interceptor member disposed above said conveyor in the path of the blanks, control means connecting said member with said stop means for controlling said stop means in response to movement of said member to release said plunger in dependence upon a blank abutting against said member, drive means connected with said die-press portion and with said plunger for operating said die-press portion and moving said plunger to said inactive position, said drive means having an electric motor, a control relay connected with said motor and having a coil circuit for controlling said motor, a normally closed stop contact series connected in said circuit, a position-responsive switch mechanically connected with said drive and being open only at the initial cycle moment of machine operation, said switch being parallel connected with said stop contact, whereby upon actuation of said stop contact the machine continues running until its movable parts are in the respective initial positions.

8. A machine according to claim 7, comprising a friction brake joined with said drive means and having electromagnetic release means parallel connected with said motor to be controlled jointly with said motor by said relay so as to arrest the machine at the moment when said stop contact and said switch are both closed.

9. In a machine according to claim 7, said interceptor member being movable to a place out of the path of the blanks to let the blanks freely pass by the machine, an electromagnet joined with said interceptor member for moving it to said place when said magnet is energized, an energizing circuit connected with said magnet and having a control contact, said relay having a normally closed contact connected in said energizing circuit in series with said control contact so that said member is moved to said place only when said motor is deenergized by said relay and said control contact is actuated.

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