

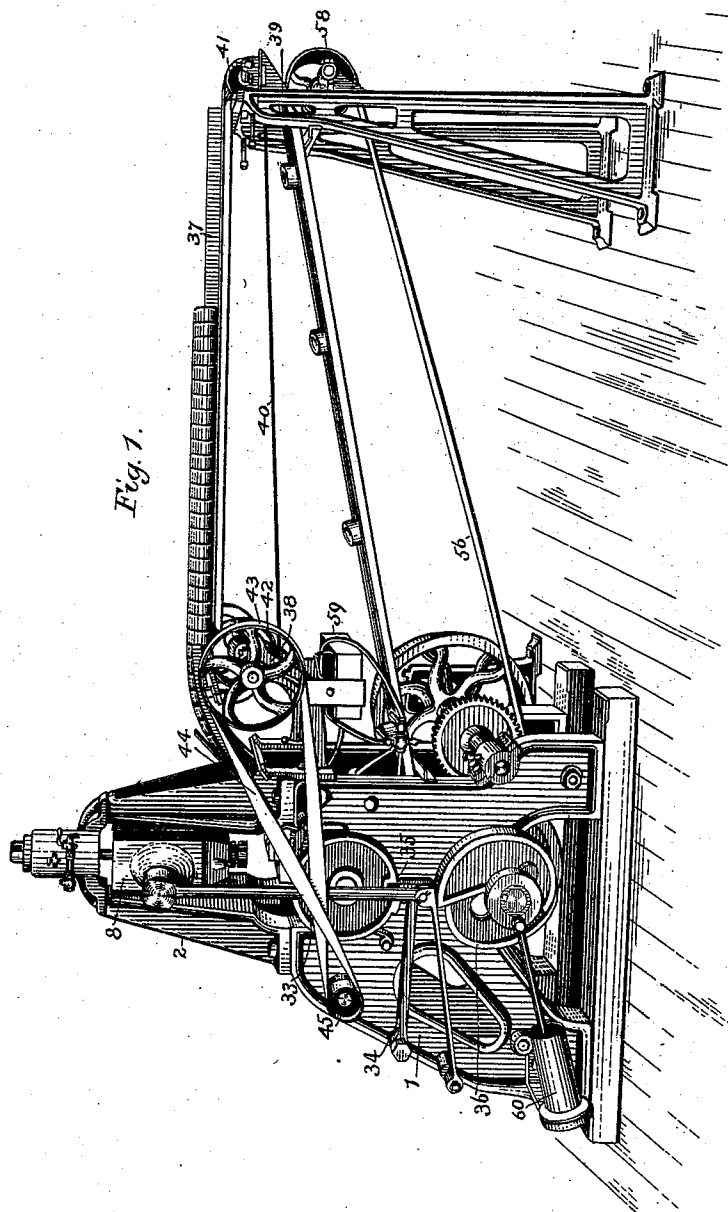
(No Model.)

3 Sheets—Sheet 1.

J. A. TILDEN.
SOAP PRESS.

No. 551,062.

Patented Dec. 10, 1895.



Witnesses

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3 Sheets—Sheet 2.

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Fig. 2.

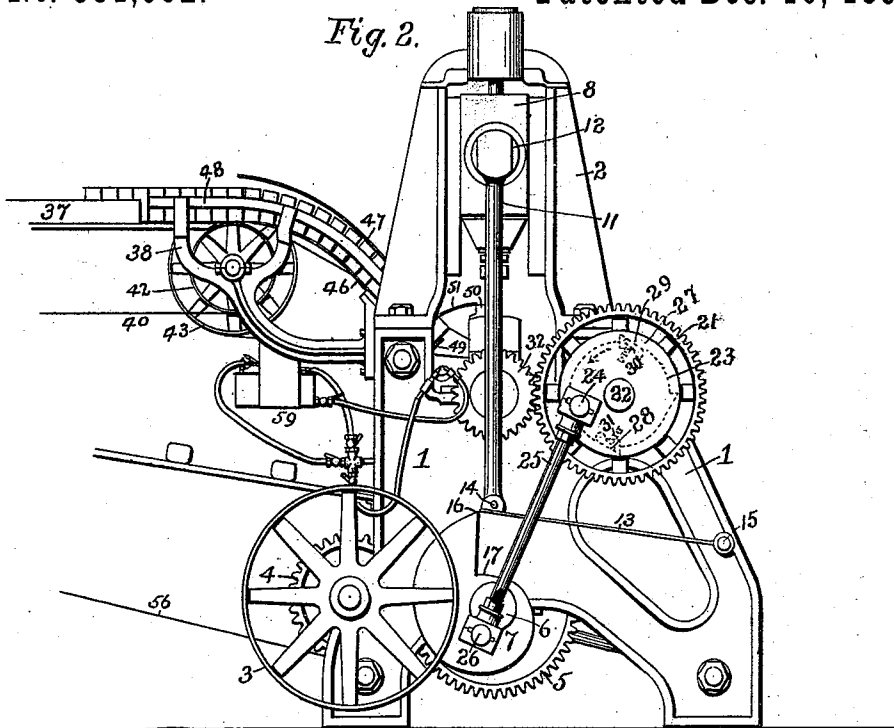
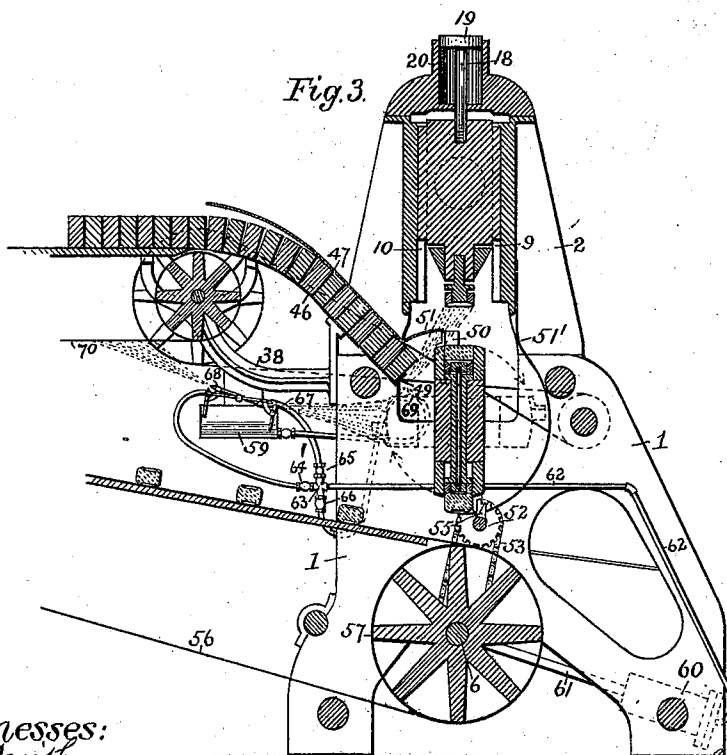


Fig. 3.



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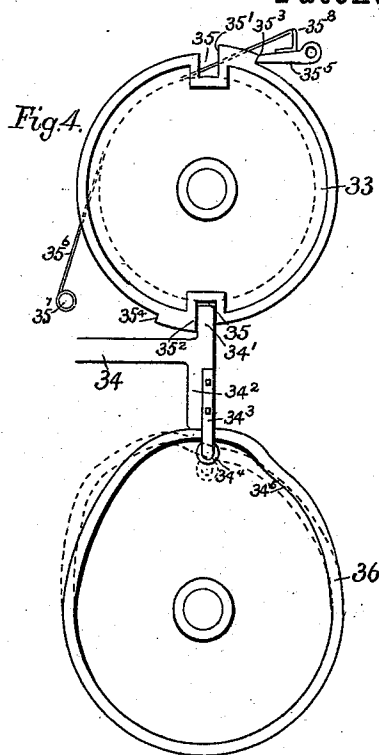


Fig. 5.

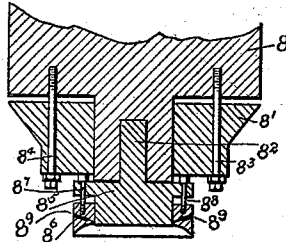
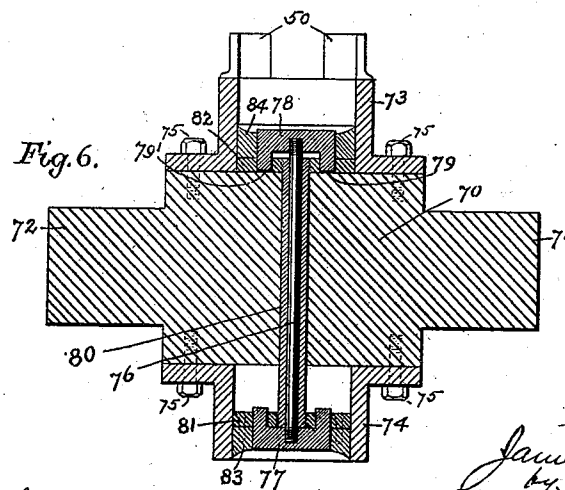


Fig. 6.



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UNITED STATES PATENT OFFICE.

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SOAP-PRESS.

SPECIFICATION forming part of Letters Patent No. 551,062, dated December 10, 1895.

Application filed May 2, 1894. Serial No. 509,744. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. TILDEN, a citizen of the United States, residing at Hyde Park, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Automatic Presses for Soap or other Plastic Materials, of which the following, together with the drawings accompanying same, forms a specification of my apparatus by which its construction and operation may be fully understood.

My invention relates to an automatic pressing or stamping machine for giving ornamentation, form, or design to cakes of soap or similar plastic materials, and pressing trademarks or lettering of any description upon them, and has for its object the automatic feeding, pressing, and delivering of said cakes in rapid succession and continuously without any further manipulation on the part of an operator other than to place roughly-shaped cakes upon a continuously-moving feed-belt or conveyer and to receive the same, properly stamped, from a continuously-moving delivery-belt.

Referring to the drawings, Figure 1 is a perspective view of the machine complete. Fig. 2 is an elevation of the opposite side of the machine, leaving off a portion of the supply and delivery belts. Fig. 3 is a sectional view taken through the center of the machine, by which the internal mechanism may be seen. Fig. 4 is a detailed view of the locking mechanism by which the rotating dies are secured while the pressure is being applied to the soap. Fig. 5 is a part sectional view of the upper or pressure die. Fig. 6 is a sectional view of the die-block, together with the die-boxes, the dies, and their parts.

Referring to Fig. 2, 1 is a frame in which are mounted the several parts forming the driving mechanism of the machine. This frame is formed of two side pieces similar in form and secured to each other by cross-bars. 2 is a frame secured to the main frame 1, which forms a guide to the pressure-plunger and a support to the air-controlling device. 3 represents pulleys, preferably tight and loose, which are the driving-pulleys to operate the machine and are controlled by a belt connected with power. On the same shaft with

these pulleys is a gear 4, which engages with a gear 5 upon the shaft 6. This shaft projects through both sides of the main frame 1 and carries a cam 7 outside of the frame. This cam is duplicated on the opposite side of the machine.

Secured to the weighted block 8, which is guided in grooves 9 and 10, Fig. 3, is a rod 11, Fig. 2. This rod is duplicated on the opposite side of the machine, and they both swing upon studs on each side of the weighted block at the point 12. The lower end of these rods are connected with a flat bar, as at 13, by means of pins, as at 14. Said bars swing upon studs, as at 15, the whole forming lifting-rods, which rest at the point 16 upon the cam 7. As the cams on each side of the machine are revolved by means of the shaft 6 and gear 5, the rods on either side will be lifted to the highest point of the cam and will drop to the point 17 when it has made its complete revolution. This allows the weighted block 8 to drop and perform the pressing effect of the apparatus. Secured to the upper end of this weighted block 8 is a rod 18, Fig. 3, upon the end of which is a piston 19, which moves in a cylinder 20. This piston traveling in the cylinder forms a cushion for the weighted block when it falls. This cushion is governed by a small petcock in the side of the cylinder, which regulates the amount of air that can escape from the under side of the piston 19, and consequently the speed with which the weighted block falls is regulated. This can be so governed by adjusting the petcock that the weighted block will fall upon a perfect air-cushion instead of falling with rigidity upon mechanical parts.

Referring to Fig. 2, 21 is a gear mounted upon a shaft 22, which passes through the frame of the machine and which has secured to it a clutch. (Shown in dotted lines 23.) Connected to the central oscillating part of this clutch is a connecting-rod 25, the other end of which connects upon the cam 7 at 26, and as this cam 7 is revolving upon the shaft 6 the central part of the clutch is given a movement back and forth. Each movement in the direction of the arrow allows the outer part of the clutch 27 to engage with the pawls 28 and 29, which are held out by springs 30

and 31, and the gear is thereby caused to travel one-quarter of a revolution. When the connecting-rod causes the reverse movement of the central part of the clutch, the pawls are made to crowd in against the spring and no movement of the gear takes place. This gear 21 engages with a pinion 32, which is mounted upon the end of the trunnion carrying the die-block and the several parts of the die. This pinion has one-half the number of teeth contained in the gear 21, so that the die-block makes one-half a revolution, thereby causing the die-boxes on opposite sides of the block to be alternately presented under the weighted block. This operation will be more fully shown in the details of Fig. 6 and will be more thoroughly described later.

So far as I have described, it will be seen that the gear 5, which is the main gear upon the machine, has the effect, first, of lifting the weighted block by means of the cams, as at 7, and letting it fall, and that the die-block which is mounted in the central portion of the frame is caused to make a half-revolution for every complete reciprocation of the plunger. These parts are so timed with one another by means of the gears and cam that when the weighted block is lifted the die-block is rotated in time to receive the falling weighted block 8 in perfect line.

On the opposite side of the machine, referring to Fig. 1, is a disk 33, which will be more fully described in Fig. 4. The purpose of this disk is to securely lock the die-block at just that point when the weighted block is about to fall, so that the dies mounted upon the block will always be held rigidly in position to receive the dies mounted upon the weighted block in perfect line. This disk is locked by means of a bar 34, Fig. 1, which is driven into a slot 35 at just the right point. This is accomplished by means of a cam 36, mounted upon the same shaft with the lifting-cams, the precise operation of which will be more fully described later.

To supply the soap to the dies a rack 37, referring to Fig. 1, is secured upon the frame 38 at one end and upon a stand 39 at some little distance from the machine. Over this rack there is a belt 40, running upon pulleys 41 and 42, it being driven by means of pulley 43, belt 44, and pulley 45, the latter pulley being upon the end of the shaft 22, which is driven by the cam-shaft and connecting-rod previously described. By placing the soap upon this belt running over the rack 37 it will be carried along to the machine and gradually kept crowding forward until it slides down the inclined chute, (shown better in Fig. 3,) which has guides to hold the soap in position, the guides being formed by a sheet-metal strip 46, constituting the bottom, a strip 47 on the upper side, and strips 48 on opposite sides. (Better shown in Fig. 2.) The soap is therefore guided and confined on all sides by these strips and rests upon a toe-

piece 49 at the end of the bottom strip 46. This toe-piece is quite narrow, but sufficiently strong to sustain the weight of the soap as it lies in the inclined position.

It will be seen that as the die-block revolves the lower cake of soap will be picked off the chute by means of the finger-pieces 50, which are mounted upon the end of the die-box and which are made in two parts, so as to straddle the toe-piece 49. The cake which has been picked off by means of these fingers drops into the die-boxes and is prevented from throwing out by means of a depressing-foot 51, which is formed on the end of upper guiding-strip 47, and which is so curved that the soap not only drops, but is pressed into the die-boxes before it has an opportunity to throw out.

To further prevent the soap from throwing from the die-box, a retaining-piece 51' is secured to the side of the frame 2 by means of screws or bolts. This piece terminates upon the shaft 52 and forms a curve corresponding to the movement of the die-box, and is used as a precaution to prevent the cake, in case it becomes loosened in any way in the die-box, from throwing out of the box until it has reached the proper point.

The cake of soap having been received in the die-box is ready for the stamping operation, which takes place by the dropping of the weighted block. A more detailed description of the operation of the dies will be given later. Directly under the die-block is a spur-wheel 52, which is driven by means of a chain 53 and corresponding spur-gear mounted upon the shaft 6. A wiper 55 is located upon the shaft, which the gear 52 drives in such a way that if the soap-cake fails to fall from the die the wiper will detach it and cause it to fall upon the carrier-belt 56, which runs upon the pulley 57 and which conducts the soap away from the machine. The other end of this carrier-belt runs over a pulley 58. (Shown in the perspective view.)

In further explanation of the wiper this is used more as a precaution, as the soap almost always falls by means of the jar of the dies, as will be better understood in the detailed description of the die-block; but occasionally a cake may stick, and in that event the wiper detaches it.

In order that the dies may be lubricated to prevent the soap from sticking thereto, I have provided the following: A pan 59 is hung upon the frame 38 and contains water or a solution of brine. At the lower end of the main frame 1 is mounted an air-pump, (shown in the dotted lines 60,) which is driven by means of a shaft 61, which is connected with the shaft 54 on the opposite side of the machine from that shown in Fig. 3. This will be better understood by reference to the perspective drawings. This pump is connected by means of a pipe 62 with a T 63 and cocks 64 65 66, each of which in turn connects with spraying devices 67, 68, and 69. As the shaft 6 revolves,

a pressure is given by means of the pump through the pipe 62 at each stroke. Consequently a spray of water is ejected from the points of the sprayers, or, as they may be termed, "atomizers." One of these, 68, causes a fine spray to be ejected upon the belt 70 on the underside. This keeps the belt wet, so that it will slide underneath the cakes of soap, giving just enough friction to carry the cakes along and at the same time moisten one edge. The second atomizer 67 directs a spray into the die-box just as it has made about a quarter of a revolution, thereby lubricating the interior of the revolving die-box and the dies. The third atomizer 69 directs a spray against the upper die, which is secured to the under side of the weighted block and keeps that moist. These several sprays are not continuous, but are given as the plunger of the pump makes its downward stroke, which is just at the time that the die-block has made a quarter of its revolution and when the weighted block carrying the upper die is nearly raised.

Referring now to Fig. 4, I will give a description of the locking device partially described heretofore.

33 is a circular disk, which is mounted upon the end of one of the trunnions carrying the die-block and is provided with recesses, as at 35³ 35. One side of each recess, as at 35³ and 35², projects beyond the circular surface and forms a small section of a circle of larger diameter than the main disk. The back side of such sections, as at 35³ and 35⁴, forms detents, which allow a pawl 35⁵ to engage against them as they are successively brought in front of it. On the back side of this disk (shown in dotted lines) is a circle of smaller diameter than the main disk, the surface of which is flat and has a belt 35⁶, secured to the machine at 35⁷, carried over it and secured at the point 35⁸ upon the pawl 35⁵. This belt acts as a friction—that is, when the circular disk is revolved and the pawl is resting upon the smaller circular part of the disk the friction-belt will be loose upon the face of the inner circular projection; but when the pawl mounts upon the edge of the projection 35⁷ it will be lifted and will tighten the friction-belt and cause the disk to drive hard during the time the pawl is riding over this projection 35⁷. The purpose of this friction device is to prevent the die-block which swings upon the same shaft upon which the disk 33 is mounted from stopping too suddenly or with that shock it would have if it were not checked in its inertia before being locked rigidly. Just before the die-block has to come to a stop it is checked by means of the tightening of this friction-belt upon the friction-surface, and instead of having to suddenly break the inertia it has gained in its movement it is practically slowed down for a fraction of a second, and consequently stops with much less shock than it otherwise would. Below this disk 33 is a cam 36, which is mounted upon the same

shaft with the lifting-cams, and between the disk 33 and the cam 36 is located a lever 34, upon the end of which are projections 34¹ and 34², also a projecting piece 34³, upon the under side of which is mounted a roller 34⁴. This latter projection containing the roller is arranged so that the roller engages under a projecting rim 34⁵ upon the cam 36. It will be seen that the projection 34² rides upon the surface of the cam 36 and is kept against this surface by means of the roller on the under side of the projecting surface, which compels it to follow the precise form of the cam 36. The lever 34 is fulcrumed some distance off on the machine, as may be seen in the perspective view.

The operation of this locking device is as follows: As the shaft upon which the cam 36 is mounted rotates, the lever 34 is lifted by means of the high point upon the cam, so that the projection 34¹ has been forced into the recess 35. The end of the lever starts to move toward the recess just before the die-block comes to a standstill, and is driven way in, so as to lock it just as the die-block stops to receive the pressure from the pressure-die. As soon as the pressure is given and the die has been withdrawn, the projection 34¹ is withdrawn from the recess by the movement of the cam 36 in the direction shown in the dotted lines. As it continues to revolve, the projection is driven into the recess at each half-revolution of the die-box, thereby perfectly locking the die-block during the time that the pressure-die is doing its work.

Referring now to Fig. 5, a description of the pressure-die will be given.

8 represents a portion of the weighted block. 8' is a loose block, which is free to lift upon the projecting stud 8², forming the lower portion of the block 8. It is held from dropping away from this block by means of studs 8³ and 8⁴, which are secured to the block 8, and having a nut and check-nut upon the lower end to prevent its getting away from its position. This block acts as a weight, which can be lifted a distance, which can be adjusted by means of the nuts upon the studs 8³ and 8⁴. Into the projection 8² is secured a piece 8⁵, which forms a panel of the die and which may have lettering or designs upon it, as desired. This is fastened into the projection 8² by means of a set-screw, and on the outside of this panel is a rim 8⁶, which is free to slide upon the panel 8⁵. It is prevented from dropping from the panel by means of screws 8⁷ and 8⁸, which are secured in the rim and loosely fitted in the projection of the panel. This die may be called a "compound die." It will be seen that when the die-block 8 falls and the die comes against the surface of the block of soap the soap will be pressed in accordance with the shape of the under side of the rim 8⁶ and the panel 8⁵. As the pressure takes place, the rim of the die will be lifted by the pressure of the soap and cause the block 8' to be lifted by means of the heads

of the screws 8⁷ and 8⁸ until the back surface of the rim engages with the projecting portions of the panel. This will cause the panel to project into the soap and give the proper shape to the surface of the cake. When the die is withdrawn, the rim will be maintained in place by the weight, while the panel is drawn out first until it comes against the heads of the screws 8⁸ and 8⁷, when the rim will come away. The object of these details is to prevent the soap from sticking to the surface of the die and drawing out of the die-box—that is, when the pressure is first given the outside rim and panel will be separately and independently forced upon the soap, and on the return the rim of the die will hold the soap in place while the panel portion is withdrawn, thereby removing itself from the soap a portion at a time, so that it has no tendency to stick to the whole surface of the die and draw away from the box. In lieu of a supplemental weight the rim of the die may be made sufficiently heavy in itself. To further insure the soap not sticking to the upper die, there are ventilating-holes 8⁹ drilled through the rim of the die, which admit air to the panel when the same is withdrawn in its upward movement, thus breaking the suction. When the rim is seated, which occurs when the soap is being pressed, the holes are covered by the panel. This prevents the holes being filled up with soap and made inoperative.

Referring now to Fig. 6, a detailed description of the die-block and die-boxes will be given.

70 is a sectional view of the die-block referred to, 71 and 72 representing the trunnions upon which it turns. 73 and 74 are die-boxes secured upon the die-block with bolts, as shown. The dies are compound, and the die-panels 77 and 78 are connected by means of a rod 76, which can be so adjusted as to length that the upper panel 78 rests upon the die-block 70 at the points 79 and 79' at the same time that the panel 77 is at its lowest point, as shown in the die-box 74. This rod 76 is free to move back and forth in an outside tube 80, to both ends of which are secured plates 81 and 82. To these plates are secured the rims of the dies 83 and 84. Upon the die-boxes 73 and 74 are mounted fingers, as at 50, those on the opposite box not showing in this section. In the position of the die-block in the drawings the panel 78 and the rim 84 rest upon the die-block firmly, to receive the soap as it is picked off the chute by means of the finger 50 and landed in the box ready to receive its pressure. It will be seen that the soap on this side will take the form shown by the face of the rim and panel of the die with whatever design may be upon it, the panel projecting into the soap. As soon as the pressure-die is withdrawn and the die-block revolves, the panel and the rim will drop into the position shown on the lower side of the die, thereby forcing out upon the belt, which runs be-

neath, the soap which has been pressed. In doing this, however, it begins gradually to move in the box, and before it has reached its full movement the panel on the upper side has engaged with the die-block 70 at the points 79 and 79' and caused the lower panel to come to a stop, while the rim, which is mounted upon the plate 81 and rod 80, will continue to follow a little farther, thereby causing the rim to be forced from the soap first, so that there is only a small surface around on the rim that is in contact with the surface of the soap, and the jar of the dies falling dislodges the soap from the surface of the rim on to the belt. If by any means the soap should stick to the outside rim, the wiper 55, as shown in Fig. 3, will engage with the soap and detach it, but in so doing will not injure the lettering or design made by the panel, which has already been withdrawn. When the die-block has made the rest of its revolution, the lower set of dies will assume the position of those shown on the upper side, and vice versa, and the next cake will be thrown out. In starting the machine after the first cake has been pressed the jar due to the pressing of the succeeding cakes materially assists the dislodging of the pressed cake.

It will be seen by the detailed description of this die-block that both on the upper and lower surfaces of the soap the panel and rims of the die are separately removed from the soap, so that there is the least possibility of the soap sticking to the dies, and at the same time when the soap is detached from the dies there is no possibility of the design being injured thereby. The soap is carried by the delivery-belt to a packing-table or other convenient place.

I have shown a revolving die-block with but two dies. It is evident that it may be provided with four dies, in which case the block would make but a quarter of a revolution for each pressing. The locking-disk would be provided with four locking-notches, and the clutch could be located on the die-block trunnion, thus dispensing with the shaft 22 and the gears 21 and 32. The compound dies would be connected with two rods each, so as not to interfere in the center where they cross.

Modifications in the exact details here described may be made in many of the parts without departing from the principle of my device.

Having thus fully described my pressing apparatus in detail and in that manner which has proved operative, what I claim, and desire to secure by Letters Patent, is—

1. In an automatic press the combination with a rotary die block, of a reciprocating clutch for intermittingly rotating said block, a lock to secure said block at the end of each movement thereof, a pressure plunger intermittingly raised and allowed to drop by lifting cams, and an air cushion furnished with

a pet cock and connected with the said plunger whereby the force of said pressure plunger may be regulated as it drops, substantially as described.

2. In an automatic press the combination with a rotary die block provided with die boxes, of a stationary depressing foot by which the roughly shaped material is pressed into said die boxes preliminary to the final pressing by the pressure plunger, substantially as described.

3. In an automatic press the combination with a rotary die block and boxes, of compound connected dies arranged to reciprocate therein and relatively to each other, substantially as described.

4. In an automatic press the combination with a rotary die block and boxes, of fingers attached to said boxes, adapted to remove the roughly shaped material from the end of the feed chute and direct it into the die boxes, substantially as described.

5. The combination of a compound lower die with rods of different lengths to connect the several parts of said compound die with corresponding parts of another compound lower die, whereby a relative reciprocation of the several parts may be had as the compound dies seat when the material is pressed, substantially as described.

6. In a press the combination with a movable die block, of a die box provided with fingers for removing from the end of the chute the material to be pressed and directing it into the dies, substantially as described.

7. In an automatic press the combination with a rotary die block provided with die boxes and connected dies, of a wiper arranged to dislodge the material from said connected dies at the proper time, substantially as described.

8. In a press the combination with a pressure plunger of an upper compound die provided with a supplemental weight, whereby one part of said compound die may be depressed beyond the other when said pressure plunger is withdrawn after pressing, substantially as described.

9. In a press the combination with a compound die, of ventilating passages communicating with the panel section, whereby as the parts reciprocate relatively to each other, air may be admitted to said panel section and destroy the suction at that point, substantially as described.

10. In an automatic press the combination with a rotary die block, of die boxes provided with compound connected dies, and a feeding chute to deliver to said die boxes and dies the material to be pressed, substantially as described.

11. In an automatic press the combination with a rotary die block and die boxes provided with fingers, of a feeding chute provided with a toe piece 49, and the depressing foot 51, substantially as described.

12. In an automatic press the combination with a rotary die block provided with die boxes and compound connected dies, of an air pump and atomizers to spray said dies, substantially as described.

13. The combination in a press provided with dies for molding plastic materials, of an air pump adapted to operate at intervals corresponding to the reciprocation of the pressure plunger, and atomizers connected with said air pump whereby said atomizers are intermittently operated as and for the purposes described.

14. In an automatic press the combination with rotary die block and dies provided with fingers of a feed chute provided with a toe piece 49 and depressing foot 51, of a feed belt adapted to deliver to said chute the material to be pressed, substantially as described.

15. In an automatic press the combination with a rotary die block provided with die boxes and compound connected dies, of a delivery belt arranged to carry off the pressed material after it has been ejected from said dies and die boxes, substantially as described.

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