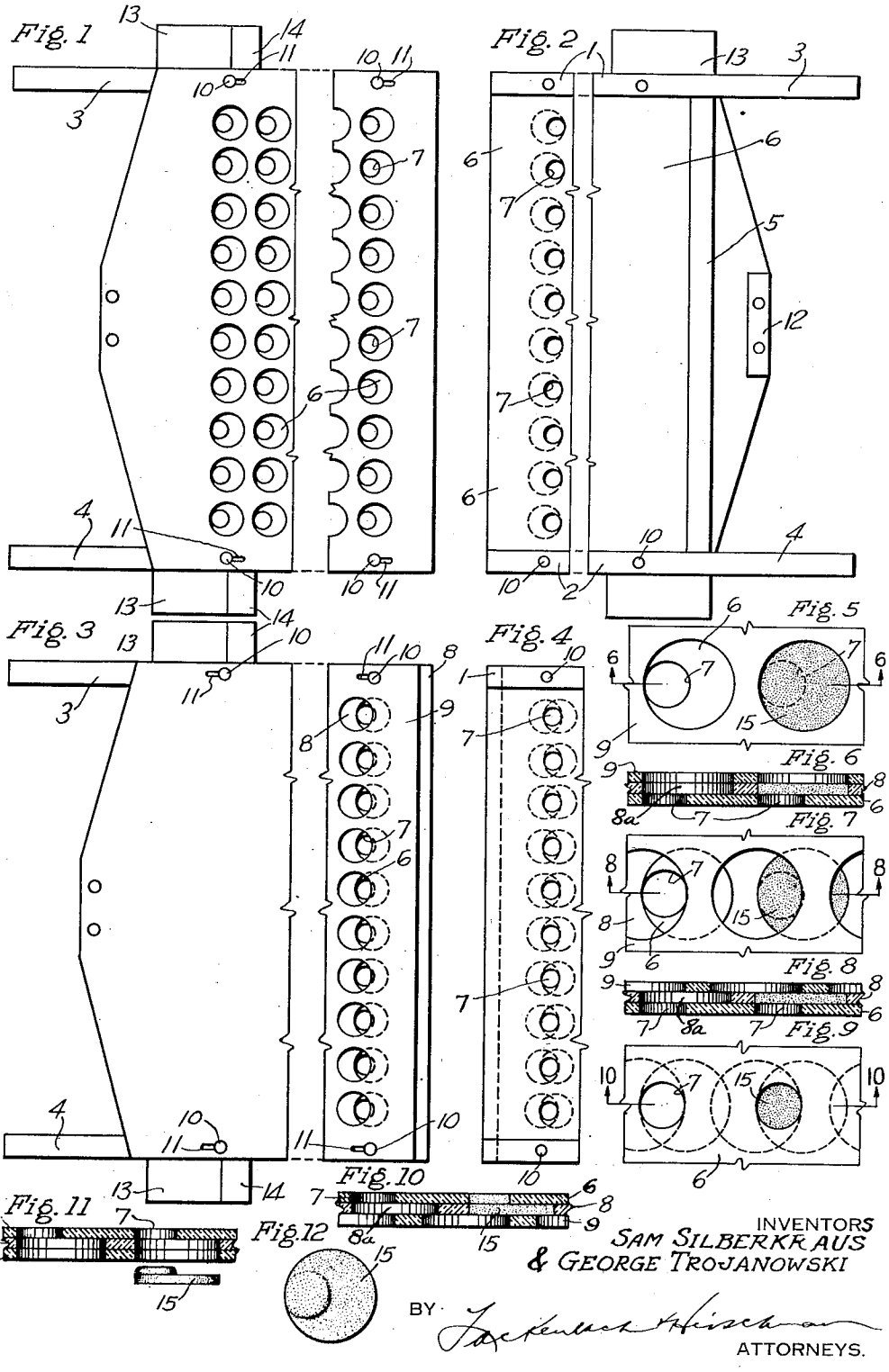
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STENCILING APPARATUS FOR CHARGING MOLDS

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STENCILING APPARATUS FOR CHARGING MOLDS

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The present invention relates to the art of compression molding, and in particular to apparatus for holding a plurality of blanks formed of relatively weakly compressed granular plastic material in proper position for performing further operation thereon, and for aligning said blanks for dumping the same into a mold block having a plurality of mold cavities for receiving such blanks prior to the compression molding operation.

The general object of the invention is to provide a novel, simple, inexpensive, and practical apparatus for holding in alignment with such a mold block a number of such blanks and for dumping the same in proper spaced relationship into appropriate mold cavities in such block; and especially for supporting a number of such blanks while additional pulverized plastic of different physical properties from that of the blanks is selectively deposited on to such blanks through a stencil board for the purpose of producing mottled or other pattern effects.

The invention is of particular utility in the mass production of compression-molded buttons and similar articles made of granular plastic material and having mottled or other variegated surface. Buttons so produced are usually first made up into blanks approximating in diameter that of the final product, and the blanks are then coated, either entirely or partially with a powdered resin or other material, and then subjected to a final molding operation.

The apparatus of the present invention includes a stenciling board and means associated with such board for receiving and holding a plurality of blanks in proper spaced relationship to facilitate their dumping simultaneously into a plurality of mold cavities. The blank holding and dumping mechanism itself may be of known construction wherein two superposed boards are provided having registering openings which can, however, be brought out of registry by movement of the lower board to hold the blanks in the apertures or cavities of the upper board; upon movement of the lower board to bring its apertures into registry with those of the upper board, the blanks can be dumped into the cavities of a mold. According to the present invention, there is associated with these boards a third board which we designate a stencil board which is in fixed relation with respect to the blank-receiving board (hereinafter called the middle board), a third or dumping board being slidable with reference to the other boards to bring the apertures therein into or out of registry with the apertures

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of the middle board. The stencil board is provided with stencil openings which overlie the apertures in the middle and are of predetermined shape pursuant to a selected design, and are intended to receive a quantity of powdered resin or other material which is deposited upon each of the blanks in order to produce various design effects when the blanks are subjected to heat and pressure with added material thereon. The openings in the stencil board are smaller than those in the middle board which in turn are only slightly larger than the blanks, so as to present no interference to the dropping of the blanks into the mold. Whereas in the known molding boards composed of two relatively slidable boards having registering apertures of the same size the blanks are deposited directly into the apertures of the holding board after sliding the bottom board so that its apertures are out of registry with those of the holding board, with the structure of the present invention the blanks are distributed in the openings of the holding (middle) board, only after inverting the apparatus so that the spencil board is at the bottom. Prior to loading, the slidable board, which is now on top, is moved to bring its apertures into registry with those of the holding board, and the blanks are inserted into the apertures of the holding or middle board by dropping them through the apertures of the slidable board. After the loading is completed, the slidable board is then moved out of registry with the holding board and the apparatus can now be inverted to bring the stencil board on top.

With the blanks locked in this fashion within the openings of the holding or middle board, the stencil board, which is now on top, is dusted with any suitable material, such as powdered resin of different color, as described in the application of Sam Silberkraus, entitled "Molding Process and Articles Produced Thereby," Serial No. 19,673 filed simultaneously herewith; and after all of the stencil cavities have been filled with the powder, the surface of the stencil board may be wiped off. Upon bringing the board into position over the mold so that the apertures of the middle board are in registry with the mold cavities, the bottom, slidable board is moved to bring its apertures into registry with those of the middle board, whereupon the blanks with the stenciled mounds of powder thereon are dropped into the mold cavities.

The present invention is of particular utility in connection with the process described in the above-mentioned application. It will readily be seen that the stencil apparatus of the present in-

vention can be utilized right at or over the mold, so that no time is lost nor labor expended in moving the blanks to a place where they receive the treatment resulting in the production of a mottled or other design thereon and returning them to the mold. The operation of reversing or inverting the stencil board assembly for loading the blanks and then returning the apparatus to its normal position over the mold block can be accomplished in a minimum of time and with a minimum of effort. It will also be recognized that by combining the stencil board with the loading board composed of the holding and sliding boards, the stencil board performs an important function during the loading in preventing the blanks from falling through the middle board when the apparatus is in the inverted condition.

A satisfactory form of the invention is shown on the accompanying drawing by way of illustration, and not as indicating the limits of the invention. In said drawing

Fig. 1 is a bottom plan view of apparatus embodying the present invention showing the boards in position for receiving the blanks;

Fig. 2 is a top plan view of the apparatus, the boards being in the relative position shown in Fig. 1;

Fig. 3 is a bottom plan view of the apparatus corresponding to Fig. 1, but showing the bottom-most board moved out of registry with the middle board so as to lock the blanks in the apertures of the middle board;

Fig. 4 is a fragmentary top plan view of the apparatus with the boards in the position shown in Fig. 3.

Fig. 5 is a fragmentary bottom plan view, on an enlarged scale, of a portion of the apparatus in the position of the parts shown in Fig. 1, one of the apertures of the middle board being occupied by a blank which is visible through a registering aperture of the bottom board;

Fig. 6 is a section along the line 6—6 of Fig. 5;

Fig. 7 is a view of the area illustrated in Fig. 5, showing the near bottom board moved out of register with the other two.

Fig. 8 is a section along the line 8—8 of Fig. 7;

Fig. 9 is a view of the other top side of the apparatus corresponding to the area illustrated in Fig. 5, the stencil board being near, and the bottom, slidable board being out of registry with the other two;

Fig. 10 is a section along the line 10—10 of Fig. 9, showing additional plastic dusted into the righthand opening of the stencil board and onto one side of the upper surface of the blank;

Fig. 11 is a section similar to that of Fig. 10 but showing the bottom board moved back into normal relative position, thereby permitting the blank to drop into a mold cavity (not shown); and

Fig. 12 is a top plan view of a blank as seen looking down into the mold.

Referring to the drawing, there is shown a frame comprising two parallel members 1 and 2, which may conveniently be strips of wood extended to form handles 3 and 4, respectively, and a cross piece 5, all rigidly connected to a stencil board 6, which is here shown to be provided with openings 7 of predetermined pattern form. A middle board 8 is likewise secured to the members 1 and 2 and is provided with openings 8a of a size to accommodate the blanks to be pressed. A third board 9, having a pattern of apertures like that of the middle board, slidably is secured to the frame by means of four pins 10 received

in elongated slots 11 at the sides of the bottom board. A hand-grip for the slidable board 9 is provided at 12. The top or stencil board may conveniently be shaped to provide ears 13 to which gauge blocks 14, 14 are secured to aid in porperly aligning the apparatus when it is placed over a mold block.

The stencil board may be permanently fixed to the frame and to the middle board where only a single design is to be applied to the blanks to be molded. The stencil board may, however, be made detachable so as to replace any particular board with another of a different stencil design. The boards may be made of wood, fiber board, plastic, or any other suitable material. It will be understood that the middle board will have a thickness approximately that of the blanks but at least equal thereto; while the thickness of the stencil board will be dependent upon the quantity of powder it is desired to deposit upon each blank. The bottom board may have any convenient thickness.

The operation of the above-described apparatus is as follows:

In what may be termed the normal position, the stencil board is on top. To effect loading of the apparatus, it is inverted, so that the stencil board is at the bottom. In this position, by reason of the fact that the apertures in the stencil board are smaller than those of the middle board, the stencil board effectively closes the bottom of the aperture in the middle board. The slidable board 9, which is now on top, is moved into the position in which its apertures are in registry with those of the middle board 8 (see Fig. 1). The blanks are then dropped into the openings in the middle board, after which the board 9 is shifted until its openings are out of registry with those of the middle board. The apparatus is now returned to its normal position, in which the stencil openings are in proper relationship with respect to the blanks. The stencil board is now dusted with a resin or other powder until all the stencil openings are filled. The stencil board is now preferably wiped off to prevent excess powder from dropping into the mold cavities. The dusting can conveniently be done while the stencil apparatus is positioned directly over the mold block; and upon now shifting the bottom board 9 to bring its openings into registry with those of the middle board, the blanks drop into the mold cavities with their deposits of powder thereon. The length of fall of the blanks is so small that the mounds of powder, which normally have a certain degree of cohesion, are not materially disturbed.

It will be understood that while for the sake of simplicity we have illustrated the stencil pattern to be constituted of a small circular opening, it is obvious that any other pattern or shape can be employed, provided that it provides sufficient material over the openings in the middle board to prevent the blank from falling through the stencil board during the operation of loading the blanks into the stencil apparatus.

From the foregoing it will be seen that we have provided extremely simple and suitable apparatus, both for loading and for stenciling blanks of various type, and particularly for the manufacture of molded buttons. Because of the fixed relationship between the stencil board and the middle board, uniformity in the pattern effects on the surface of the molded article is promoted, while at the same time the number of

operations and movements performed by the operative is greatly reduced.

We claim:

1. In apparatus of the class described, the combination of a holding board and a stencil board, the stencil board overlying the holding board in the stenciling position of the apparatus, and the holding board having apertures of a size to receive blanks to be molded, and the stencil board having apertures of smaller area than the blanks, and adapted to expose portions of the blanks disposed in the holding board according to a predetermined pattern, said stencil board serving to hold the blanks in the apertures of the holding board when the apparatus is inverted to fill the holding board, and means for locking the blanks in the apertures of the holding board after the blanks have been inserted in said holding board, said means being movable to release the blanks to effect dumping thereof into the cavities of a mold after restoring the apparatus to stenciling position.

2. Apparatus according to claim 1, wherein said means comprises a third board underlying the holding board in the stenciling position of the apparatus and slidable relative to said holding board, said third board having apertures of sufficient size to allow the blanks to pass therethrough when the same are in registry with the apertures of the holding board.

3. In apparatus of the class described, the combination of a holding board and a stencil board, the holding board having apertures of a size to receive blanks to be molded, and the stencil board having apertures in which one of the dimensions is smaller than the corresponding dimension of the blanks to be molded, so that said blanks cannot be inserted through nor fall through the apertures of the stencil board, said stencil apertures being adapted to expose portions of the blanks disposed in the holding board according to a predetermined pattern, and means for locking the blanks in the apertures of the holding board, said means being movable to release the blanks to effect dumping thereof into the cavities of a mold.

4. In apparatus of the class described, a frame, a stencil board fixed to said frame and having apertures of a predetermined shape therein, a middle board also fixed to said frame and having openings therein for receiving blanks to be molded, said openings being in register with the apertures of said stencil board, the apertures of the stencil board being of such shape that the blanks cannot pass therethrough, a third board underlying said middle board in the stenciling position of the apparatus and being apertured similarly to the middle board, said third board being slidably mounted on the frame relatively

to the other boards so that the apertures of the middle and third boards may be selectively brought into and out of register, whereby blanks may be introduced into the apertures of the middle board through those of the third board when the apparatus is positioned with the latter on top and, after the third board has been moved out of register with the middle board the apparatus, may be reversed without dumping the blanks.

5. Apparatus according to claim 4, including means for limiting the sliding movement of the third board.

6. Apparatus according to claim 4, including spaced handles attached to said frame, and a handgrip for the third board disposed between said handles.

7. In apparatus of the class described a frame, a board slidably mounted on said frame by a pin and slot connection, whereby the sliding movement of the board is limited, a holding board mounted on the frame in overlapping relation with respect to the first mentioned board, a stencil board mounted on the frame and overlying said holding board in the stenciling position of the apparatus, apertures in said first-mentioned board and in said holding board of slightly larger size than the blanks to be molded, whereby the blanks may be inserted through the apertures in the first-mentioned board into the apertures of the holding board when said apertures are in registry, a hand grip mounted on said first-mentioned board whereby said first-mentioned board may be moved horizontally relative to the holding board, the slot in the first mentioned board being of a length less than the diameter of the apertures in said first-mentioned board, so that said first-mentioned board will slide only until its apertures are partially out of register with the apertures of the holding board and the whole apparatus may be reversed without dumping the blanks, said stencil board having apertures in which one dimension is smaller than the corresponding dimension of the blanks to be molded and which are in the shape of the pattern that is to be stencilled on the blanks.

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GEORGE TROJANOWSKI.

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