Dec. 6, 1949 I. T. QUARNSTROM 2,490,229

STANDARD MOLDING BASE

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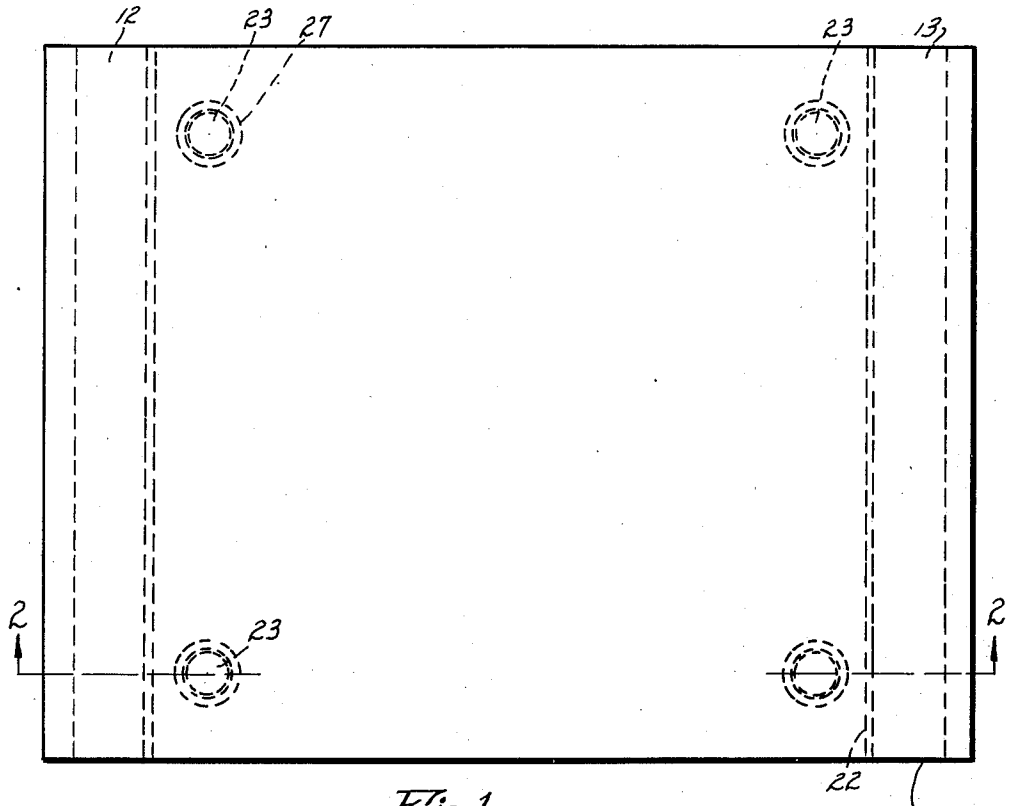


Fig. 1

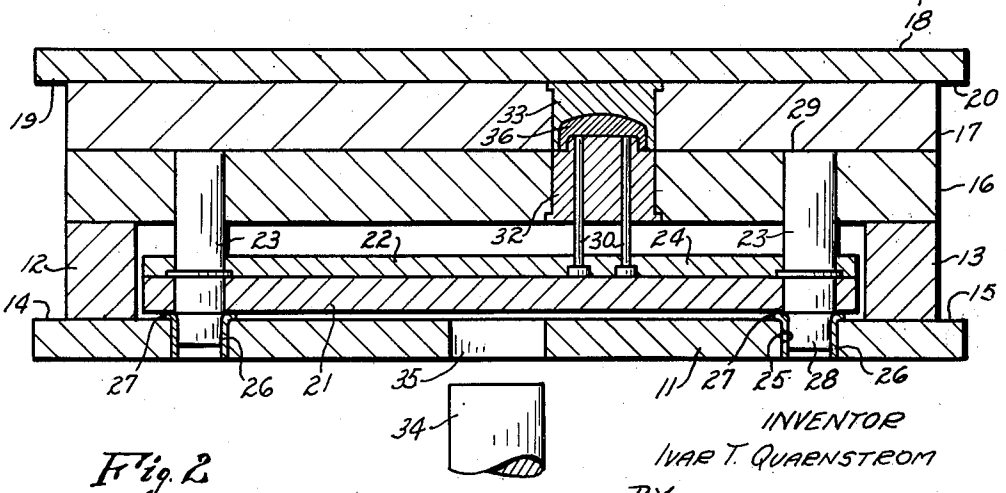


Fig. 2

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STANDARD MOLDING BASE

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2 Claims. (Cl. 18—42)

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This invention relates to a mold base for plastic injection molding, and more particularly to an ejector plate construction employed in said mold base.

Heretofore in mold bases of this type considerable difficulty has been encountered due to binding of the mold ejector pins relative to the openings within the mold base through which said pins are adapted to slidably pass. Unless the ejector plate is in perfect parallelism at all times, the ejector pins carried thereby will have the tendency to bind.

It is therefore the object of this invention to provide means for positively maintaining the ejector plate at all times parallel to the horizontal surfaces of the mold members, whereby the ejector pins will slide freely through the ejector pin openings.

It is the further object of this invention to provide a plurality of novel push-back or return pins for the ejector plate, wherein said pins also extend through the ejector plate with their ends slidably positioned through corresponding openings in the mold base.

These and other objects will be seen from the following specifications in conjunction with the attendant drawing of which;

Figure 1 is a plan view of the mold base; and

Figure 2 is an elevational section thereof on line 2—2 of Figure 1.

It will be understood that the above drawing illustrates merely a preferable embodiment of the invention, and that other embodiments are contemplated within the scope of the claims hereafter set out.

The standard mold base consists of a rectangular anchor plate 11 with the two upright parallel members 12 and 13 carried therein in spaced relation. Ledge portions 14 and 15 extend beyond upright members 12 and 13 providing a means of attachment of anchor plate 11 to the movable member of a molding machine.

Rectangular rear cavity retainer plate 16 is positioned and supported upon the top edges of parallel members 12 and 13, said retainer plate being removable and interchangeable. A corresponding front cavity retainer plate 17 is provided similar in shape to said rear cavity plate for compressive cooperative engagement with respect thereto during the molding operation.

The upper surface of plate 16 and the lower surface of plate 17 are initially blank, but are adapted to have impressed or cut therein, or inserted within openings therein, corresponding

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and mating cores and cavities within which is injected a plastic material to be molded.

Another anchor plate 18 corresponding to anchor plate 11 is suitably secured to front cavity plate 17 and similarly the edges 19 and 20 of plate 18 extend beyond the edges of plate 17 to permit clamping thereof within the stationary portion of a molding machine.

A rectangular ejector plate is indicated at 21 longitudinally disposed between the two parallel members 12 and 13 in spaced relation, adapted for manually or mechanically actuated upward movement therebetween. A secondary ejector plate 22 secured upon ejector plate 21 is adapted to retain and secure pushback pins 23 in upright position at right angles to the horizontal surfaces of ejector plate 21.

The four push-back pins 23 shown herein each have a central annular flange 24 which rests upon ejector plate 21 and fits within a corresponding opening in secondary ejector plate 22, whereby with plate 22 suitably secured to plate 21 said pins 23 are immovably retained.

Said pins project through ejector plate 21—22 from both sides thereof with one end slidably extended through a corresponding opening in plate 16. The other end projects from the opposite side of ejector plate 21—22 and is slidably positioned within corresponding co-axial openings 25 formed within anchor plate 11. Bushings 26 with annular flanges 27 are preferably positioned within openings 25; and the end portions 28 of pins 23 are adapted to slidably engage said bushings.

It will be noted also that the four annular flanges 27 of the four bushings 26 not only retain said bushings in position within anchor plate 11, but also act as a positive stop for the ejector plate in its returned inoperative position, in spaced relation to the top surface of anchor plate 11.

The end portions 29 of push-pins 23 are engaged by the bottom surface of cavity plate 17 as cavity plates 16 and 17 are brought together within a molding machine for the molding operation.

Ejector pins 30 are shown in Fig. 2 secured to ejector plate 21—22 with their ends extending therefrom and adapted to extend through corresponding openings in plate 16 and core 32 therein. The latter is positioned by the mold maker within cavity plate 16 in corresponding and cooperating aligned relation to the cavity member 33 which is similarly positioned within retainer plate 17.

After a molding operation plate 16 and anchor plate 11 are withdrawn by operation of a molding machine. Ejector plate 21—22 is withdrawn only partially and then stopped from further movement by engagement with stationary base 34 which extends from the molding machine and loosely through opening 35 in anchor plate 11.

Thus it is seen that the ends of pins 30 as well as the ends 29 of return pins 23 will project above the top surface of plate 16 as the same is further withdrawn by the molding machine. In this manner the molded element 36 is ejected from core 32 by the action of pins 30.

By operation of the molding machine, and in anticipation of the next molding operation, plates 11 and 16 are projected towards stationary front cavity plate 17 so that initially the push-back pins 23 are operatively engaged by the surface of plate 17. Further movement of plate 16 up to engagement with plate 17 effects the complete return of push-back pins 23 and ejector plate 21—22 to their initial inoperative position as illustrated in Fig. 2.

Reciprocal movement of ejector plate 21—22 is at all times guided by return pins 23. Ends 29 thereof are adapted for sliding movement within corresponding openings in plate 16, while their opposite ends are adapted for sliding movement within the spaced coaxially aligned bushings 26 in anchor plate 11. Thus it is guaranteed that ejector plate 21—22 will be maintained at all times in parallel relation to the surfaces of the plates 11, 16, 17 and 18. It follows that ejector pins 30 will always slide freely within their guide openings eliminating any possible binding. While the present drawing illustrates merely one core and cavity positioned respectively within cavity retainer plates 16 and 17, it will be understood that normally there may be a plurality of such cores and cavities. Consequently there will be an increased number of ejector pins corresponding to each core and cavity so that it is doubly important to prevent binding action of the ejector pins relative to their guide openings formed within plate 16 and the cores carried thereby.

It will be noted that the lower ends 28 of push-back pins 23 will be in engagement with bushings 26 throughout the greater portion of the upward movement relatively of ejector plate 21—22. In the event that a greater movement is contemplated it will be seen that said ejector plate will be adequately guided by the approximate full length of the upper portion 29 of push-back pins 23 extending through the corresponding openings in cavity retainer plate 16.

Having described my invention reference should now be had to the claims which follow for determining the scope thereof.

I claim:

1. In a mold for injection plastic molding, a movable anchor plate, a rear cavity retainer plate carried thereby in spaced relation thereto, a stationary anchor plate, a front cavity retainer plate carried thereby, a reciprocal ejector plate intermediate the movable anchor plate and rear retainer plate, a plurality of annularly flanged bushings positioned within openings in said movable anchor plate, and a plurality of return pins secured to and extending through said ejector plate with one of their ends slidably extending within said bushings, and with their other ends slidably extending within corresponding coaxial openings in said rear retainer plate, said other ends being operatively engageable with said front cavity retainer plate as said retainer plates are brought together on closure of the mold.

2. In a mold for injection plastic molding, a movable anchor plate, a rear cavity retainer plate carried thereby in spaced relation thereto, a stationary anchor plate, a front cavity retainer plate carried thereby, a reciprocal ejector plate intermediate the movable anchor plate and rear retainer plate, a plurality of annularly flanged bushings positioned within openings in said movable anchor plate, and a plurality of return pins secured to and extending through said ejector plate with one of their ends slidably extending within said bushings, and with their other ends slidably extending within corresponding coaxial openings in said rear retainer plate, the flanged portions of said bushings projecting above said movable anchor plate acting as stops for said ejector plate to maintain a spaced relation between said ejector plate and movable anchor plate in its inoperative position, said other ends being operatively engageable with said front cavity retainer plate as said retainer plates are brought together on closure of the mold.

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