June 13, 1950 W. KOSOBUD 2,511,350

PLASTIC MOLD BASE

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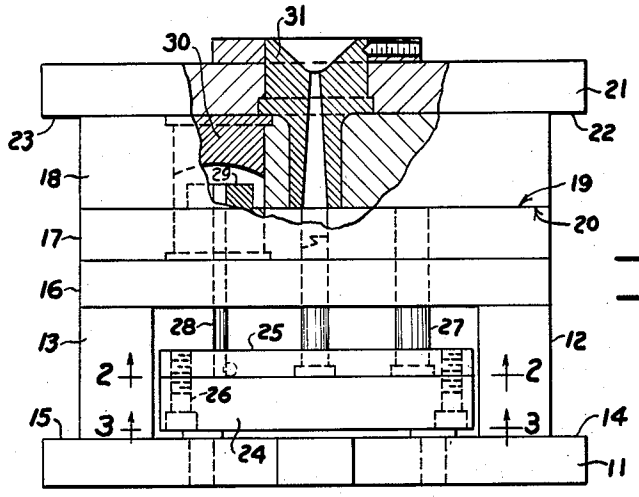


Fig. 1

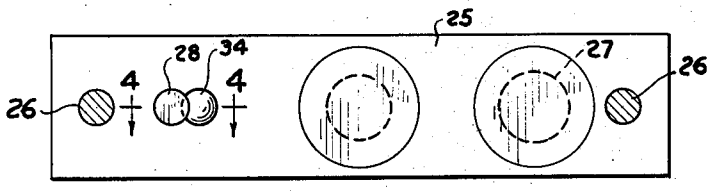


Fig. 2

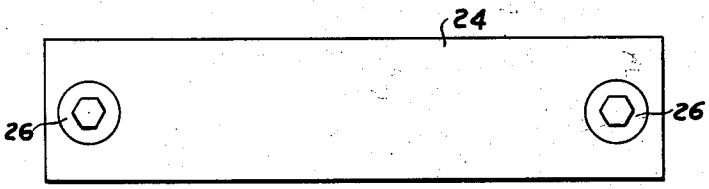


Fig. 3

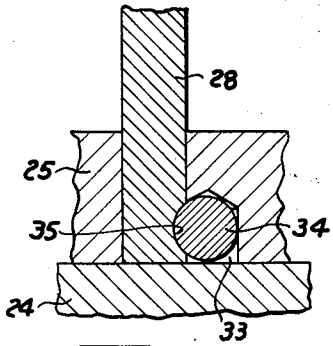


Fig. 4

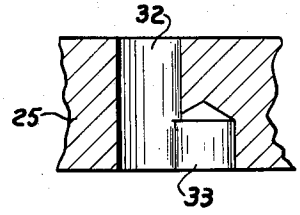


Fig. 5

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PLASTIC MOLD BASE

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2 Claims. (Cl. 18—42)

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This invention relates to mold bases for injection plastic molding, and more particularly to the ejector and ejector pin construction which forms a part of such mold base.

Heretofore the ejector pins were threaded at one end and threadably secured within the ejector plate.

Heretofore ejector pins have been formed with an annular flange at one end to be secured to the ejector plate within a corresponding undercut recess formed in a secondary ejector plate, which was secured to said first ejector plate.

It is the principal object of this invention to provide a novel means of attachment of the ejector pin to the mold ejector plate wherein said threads are eliminated as well as said annular flange.

It is the object of this invention to provide a plain cylindrically shaped ejector pin with an arcuate recess formed adjacent one end thereof. Said pin is slidably positioned within and through a secondary ejector plate which is secured to the principal ejector plate, and a locking element is positioned within said secondary ejector plate cooperable with the main ejector plate and snugly projecting into the recess in said ejector pin for immovably securing same relative to said ejector plates.

These and other objects will be seen from the following specification and claims in conjunction with the appended drawing in which:

Figure 1 is a partially broken away and sectioned elevational view of the mold base.

Figure 2 is a plan view enlarged and taken on line 2—2 of Figure 1.

Figure 3 is an enlarged plan view taken on line 3—3 Fig. 1.

Figure 4 is a section on line 4—4 of Figure 2; and

Figure 5 is a similar view showing a portion of the secondary ejector plate with its ejector pin opening and the undercut recess for receiving the pin locking means.

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

Referring to the drawing Figure 1 shows the mold base as having a substantially rectangular anchor plate 11 with two parallels 12 and 13 disposed thereon and secured thereto in spaced relation. Said parallels are placed inwardly of the edges of anchor plate 11 to provide extending portions 14 and 15 to permit clamping thereof to a molding machine.

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A back-up plate 16 rectangular in shape is positioned upon the top edges of parallels 12 and 13, is suitably secured thereto, and provides a means for supporting the removable and interchangeable rear cavity retainer plate 17.

A corresponding front cavity retainer plate 18 is provided similar in shape to said rear cavity plate for compressive cooperative engagement with respect thereto. Both the upper surface 19 of plate 17 and the lower surface 20 of plate 18 are initially blank, but are adapted to have inserted therein corresponding and mating molds and cores within which is injected a plastic material to be molded therein.

Another plate 21 corresponding to anchor plate 11 is suitably secured to cavity plate 18 and similarly the edges 22 and 23 of plate 21 extend beyond the outer edges of plate 18 to permit clamping thereof within the stationary portion of a molding machine.

A rectangular ejector plate is indicated at 24 longitudinally disposed between the two parallels 12 and 13 and adapted for manually or mechanically actuated upward and downward sliding movements between anchor plate 11, and back-up plate 16 upon which cavity retainer plate 17 is mounted.

A secondary ejector plate 25 is secured upon ejector plate 24 by the socket headed screws 26, and is adapted to retain and secure in upright position the spaced push-back pins 27, one of which is shown in the drawing for illustration.

An ejector pin 28 is shown in Figure 1 as also secured by secondary ejector plate 25 to ejector plate 24, so as to extend upwardly through corresponding openings in back-up plate 16 and also into openings within the core 29. The latter is positioned by the mold maker within rear cavity plate 17 in corresponding and cooperating aligned relation with the mold 30 positioned and secured within front cavity plate 18.

Upon outward movement of ejector plate 24—25 in addition to outward movement of ejector pins 28, one of which is shown, a corresponding outward movement is given to push-back pins 27. When the cavity plates 17 and 18 are again brought together within a suitable molding machine the outer ends of push-back pins 27 engage the surface 20 of plate 18 whereby said ejector plate 24—25 is forced back to its inoperative position as shown in Figure 1.

In operation, in carrying out injection molding the two plates 17 and 18 are tightly brought together and a plastic molding material is supplied through the hollow throated sprue bushing 31 for injection into the core and cavity 29 and 30.

A plurality of transverse openings 32, Figure 5, one of which is shown, are formed within secondary ejector plate 25 to slidably receive ejector pin 28, whose end is adapted to bear against the top surface of ejector plate 24.

An undercut circular recess 33 is formed in the under surface of secondary ejector plate 25, and is adapted to snugly receive the ball shaped pin locking element 34 as illustrated in Figure 4.

A concave transverse recess 35 is formed adjacent the lower end of ejector pin 28 for registry with the undercut recess 33 which is positioned relative to opening 32 in overlapping relation, as viewed in Figure 5.

The ball shaped locking element is snugly nested within recess 33, and a portion thereof cooperatively projects within the arcuate recess 35 formed in said ejector pin.

In the construction shown in Figure 4 recess 33 is of sufficient depth that the outer portion of locking element 35 is flush with and cooperatively bears against the top surface of the ejector plate 24.

When the latter plate is secured to secondary ejector plate 25 it will be seen that ball shaped locking element 34 is immovably secured within recess 33 and also that ejector pin 28 is retainingly positioned within ejector plate 25.

By this construction relative movements between ejector pin 28 and the ejector plates 24—25 is prevented when the same are properly secured together by means of the screws 26.

Operation

In use the plates 24 and 25 are separated and the ejector pin 28 slidably positioned through secondary ejector plate 25 with its lower recessed portion extending below the surface thereof. The ball shaped locking element is manually positioned within the arcuate recess 35 in said ejector pin, and then the pin as well as the locking element 34 are manually projected into secondary ejector plate 25 until the lower end of said pin is flush with the lower surface of said secondary ejector plate. At the same time the outer portion of locking element 35 is flush with said lower surface. The ejector plate 24 is then brought into cooperative bearing relation with plate 25 and tightly secured thereto by the socket headed screws 26.

So assembled it is clear that ejector pin 28 is immovably secured relative to said ejector plates.

To remove the ejector pin, it is not necessary to completely disassemble the mold base, but on the other hand plates 24 and 25 are loosened sufficiently whereby the locking element 35 may be forced out of its supporting recess 33. This is normally accomplished merely by tapping the outer end of the ejector pin until the same slides inwardly sufficiently to permit the release of locking element 34, which will drop out. The ejector pin may then be manually withdrawn by sliding the same outwardly through secondary ejector plate 25.

The advantage of the present construction over other types resides in the fact that said ejector pin 28 may be constructed in one piece and properly case hardened. On the other hand where the threaded type of ejector pin was previously employed, a threaded element of relatively flexible steel was welded to a heat treated case hardened shank element to produce the ejector pin. As all machining is eliminated with the exception of the formation of the arcuate recess 35, it becomes clear that the present construction is a substantial simplification not only in the construction of the ejector pin, but in its method of mounting.

The same thing was true in the case of the ejector pin having an annular flange of enlarged diameter, inasmuch as said flanged portion was usually machined and separately welded to a case hardened ejector pin shank. It is clear that the present construction is a decided improvement over present and existing ejector pin constructions and methods of mounting of ejector pins relative to the ejector plates.

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

I claim:

1. The combination, an ejector plate, a secondary ejector plate secured thereto and having a transverse opening therethrough, there also being a circular slot in the underside thereof overlapping said opening, an ejector pin slidably positioned through said opening and bearing upon said first ejector plate, there being an arcuate recess formed in said pin in registry with said slot, and a ball shaped locking element within said slot bearing upon said first ejector plate and extending snugly into said recess for cooperative retaining engagement with said ejector pin, said first ejector plate supporting and securing said locking element within said secondary ejector plate.

2. The combination, a pair of plates secured to each other, one thereof having a transverse opening and a circular recess formed in its common surface, overlapping said opening, an upright element loosely extending through said opening and bearing against the other plate, there being an arcuate recess formed in said element in registry with said first recess, and a ball shaped locking element supported in said first recess, bearing against said other plate and extending snugly into said second recess, for firmly retaining said element against movement relative to said plates, said other plate supporting and securing said locking element within said circular recess.

WILLIAM KOSOBUD.

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