Feb. 15, 1949. H. T. TORNBERG 2,461,856

DIE MOUNT FOR PLASTIC EXTRUDERS

Filed Aug. 30, 1947

Fig. 1.

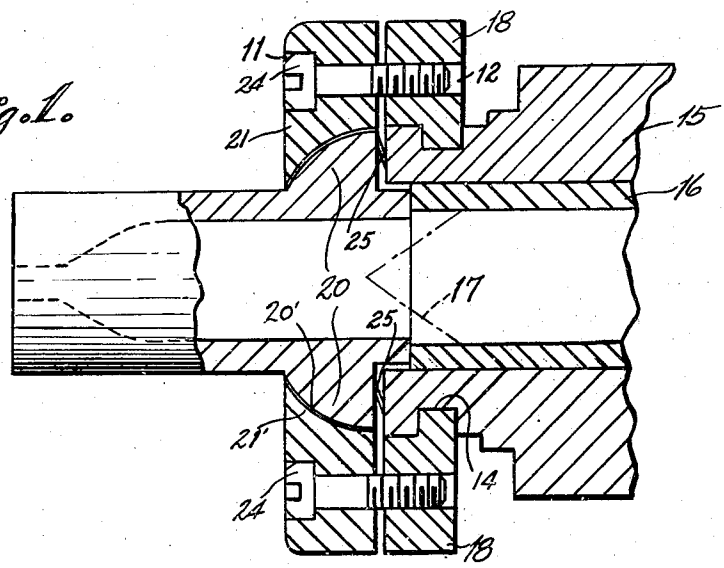


Fig. 2.

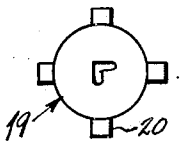
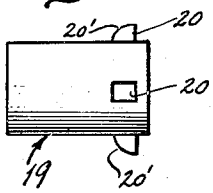


Fig. 3.



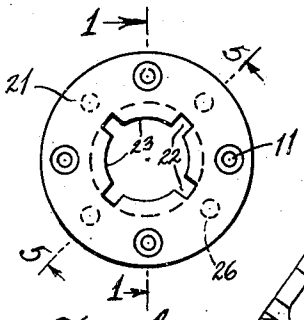


Fig. 4.

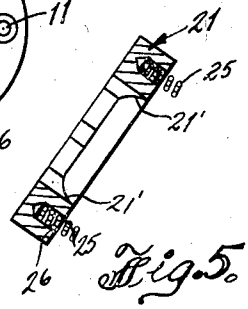


Fig. 5.

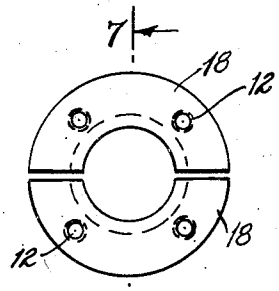


Fig. 6.

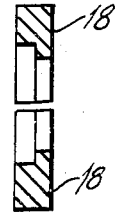


Fig. 7.

HENNING T. TORNBERG,
INVENTOR.

BY: [signature]

ATTORNEY.

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UNITED STATES PATENT OFFICE

2,461,856

DIE MOUNT FOR PLASTIC EXTRUDERS

Henning T. Tornberg, Ridgewood, N. J., assignor to Modern Plastic Machinery Corporation, Lodi, N. J., a corporation of Delaware

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5 Claims. (Cl. 18—12)

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The present invention relates to plastic extrusion machines and more particularly to means for mounting extrusion dies thereon.

An object of this invention is to provide a novel and improved die mounting means for plastic extruders, whereby dies may be easily interchanged and properly fitted at the discharge end of such machines.

Another object hereof is to provide die mounting means of the character mentioned, of novel and improved construction, which insures a proper positioning of the die, a positive seal against leakage, even if the parts constituting such mounting means have their securing bolts tightened unevenly.

A further object hereof is to provide a novel and improved die-mounting means for plastic extruders, which is of simple construction, reasonably cheap to manufacture, easy to use, positive in action and efficient in carrying out the purposes for which it is designed.

Other objects and advantages will become apparent as this disclosure proceeds.

In the accompanying drawings forming part of this specification, similar characters of reference indicate corresponding parts in all the views.

Fig. 1 is a partial longitudinal sectional view of an embodiment of this invention mounted on a plastic extruder.

Fig. 2 shows the discharge end of the die included in Fig. 1.

Fig. 3 is a side view of Fig. 2.

Fig. 4 shows the front view of the collar used to effect a ball joint socket for the die.

Fig. 5 is a section taken at line 5—5 in Fig. 4. The section of said collar shown in Fig. 1, is taken at line 1—1 in Fig. 4.

Fig. 6 shows the front view of a split collar included in the embodiment shown in Fig. 1.

Fig. 7 is a section taken at line 7—7 in Fig. 6.

In the drawings, the numeral 15 indicates the cylinder of a plastic extruder. The cylinder liner is 16, and the feed screw is designated as 17. The cylinder is provided with an anullar groove 14 at its discharge end, to accommodate the split collar parts 18.

The body of the die 19 is cylindrical, and 20 indicates its discharge orifice in an element integral with or otherwise part of an entity with said body. A bit spaced from the receiving end of the die 19, are a number of equi-spaced lugs 20 extending laterally radially around the body of said die. The surfaces 20' of said lugs are components of the surface of a single sphere.

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The flange or collar 21, has the wall of its hole machined for surface contact with such sphere, and then is provided with a number of equi-spaced radially extending slots 22 adapted to permit the passage of the lugs 20 therethrough, one lug through one slot. Then the die 19 may be axially turned a bit, whereby the lugs 20 will respectively contact the respective segmental spherical surfaces of the segments 23. The diameter of the body of the die in the region where it is met by the convex surfaces 20' of the lugs 20, should preferably be less than the diameter of the smallest section of the hole of collar 21. That is, that when the collar 21 is on the die 19, and the surfaces 20' of the lugs are in contact with the concave surfaces 21', said collar will be capable of some movement without disturbing such contact. This is most practical, for a good and proper joint is effected, even if the screws 24 joining the collars 21 and 18, are unevenly tightened. In assembly, the liner 16, acts as a seat for the die 19. Compression coil springs 25 in sockets 26, automatically space the collars, upon loosening of screws 24. For the reception of the screws 24, the collar 21 is provided with the counterbores 11, and the collar 18 with the threaded holes 12.

For any particular extruder, all dies to be used therewith shall be provided with lugs to suit the spherical surface of the hole of the collar 21, and the dimensions and number of its slots 22. If desired, the collar parts 18, may be an integral flange on the cylinder 15.

In use, the collar 21 is maintained always mounted on the flange made by parts 18. To mount a die 19, the screws 24 are loosened, whereupon springs 25 will separate the collars they bear against. The lugs 20 of the die are passed through the slots 22, and the die then axially turned so that the convex surfaces of said lugs be covered by the respective segments 23 of the collar 21. The die is then held seated against the cylinder's liner 16, and the screws 24 tightened. The manner of removal of the die is obvious, without removing the collar 21 from off the machine.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the embodiment shown herein be deemed illustrative and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the specific descrip-

tion herein to indicate the scope of this invention.

I claim:

1. In combination with a plastic extrusion machine or the like, a die having an inlet end and a discharge end and a plurality of outwardly laterally extending lugs in a predetermined spaced relation around the body of the die at the inlet end thereof; each of said lugs presenting a surface sloping outwardly respectively, away from the discharge end of said die, a separate collar on said die having such a flared bore; the surface of said bore in the collar being in contact with said sloping surfaces of the lugs and provided with a plurality of channels extending through the face of the collar positioned furthest from the inlet end of the die; said channels being spaced and of such dimension and number as to permit passage of the lugs therethrough respectively simultaneously when the die is turned within the bore of the collar so that the lugs are aligned with said channels respectively; the inlet end of said die being positioned in communication with the discharge outlet of such machine and adjustable means securing the collar on such machine wherein the die is maintained with its inlet end in communication with the discharge outlet of said machine, and upon manipulation of said means, the collar is loosened from its hold on the die.

2. A combination as defined in claim 1, wherein the flared bore in the collar is part of a spherical surface.

3. A combination as defined in claim 1, wherein the body of the die is cylindrical in front of and to the rear of the lugs towards the end of the die, wherein said lugs are equally spaced and extend radially from the body of the die and wherein the flared bore in the collar is part of a spherical surface.

4. A combination as defined in claim 1, wherein the extrusion machine on its body near its discharge end is provided with an annular groove, and including a two-part collar positioned in said groove and extending laterally therefrom and wherein the adjustable means securing the collar having the flared bore on the machine, comprises a plurality of bolts threadedly engaged and extending from the face of said two part collar; the other collar being slidably mounted on said bolts and wherein the flared bore in the collar is part of a spherical surface, whereby said latter collar may assume a tilted relation with respect to the two-part collar upon tightening of the bolts and maintain the inlet end of the die in communication with the discharge outlet of the machine, and then upon loosening of the bolts, the die is free for removal.

5. A combination as defined in claim 1, wherein the extrusion machine on its body near its discharge end is provided with an annular groove, and including a two-part collar positioned in said groove and extending laterally therefrom and wherein the adjustable means securing the collar having the flared bore on the machine, comprises a plurality of bolts threadedly engaged and extending from the face of said two-part collar; the other collar being slidably mounted on said bolts and wherein the flared bore in the collar is part of a spherical surface, whereby said latter collar may assume a tilted relation with respect to the two-part collar upon tightening of the bolts and maintain the inlet end of the die in communication with the discharge outlet of the machine, and including spring means between and acting against both collars, whereby upon loosening of the bolts, said spring means will cause the collars to separate thereby freeing the die for removal.

HENNING T. TORNBERG.

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