United States Patent

[11] 3,530,916

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[21] Appl. No. **763,750**
[22] Filed **Sept. 30, 1968**
[45] Patented **Sept. 29, 1970**

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[54] **SELF-SEALING BREAKER PLATE FOR EXTRUDERS**
8 Claims, 2 Drawing Figs.

[52] **U.S. Cl.** **146/186,** 18/12
[51] **Int. Cl.** **A22c 5/00,** B29f 3/00
[50] **Field of Search** ..... 18/12(B), 12(A); 146/186

[56] **References Cited**
UNITED STATES PATENTS

2,791,803	5/1957	Henning	18/12X
2,923,972	2/1960	De Ghetto	18/12

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ABSTRACT: A breaker plate for extruders having an interiorly open annular groove forming a sealing lip pressed against the end of the extruding cylinder, or other part, by the pressure of the media in the cylinder.

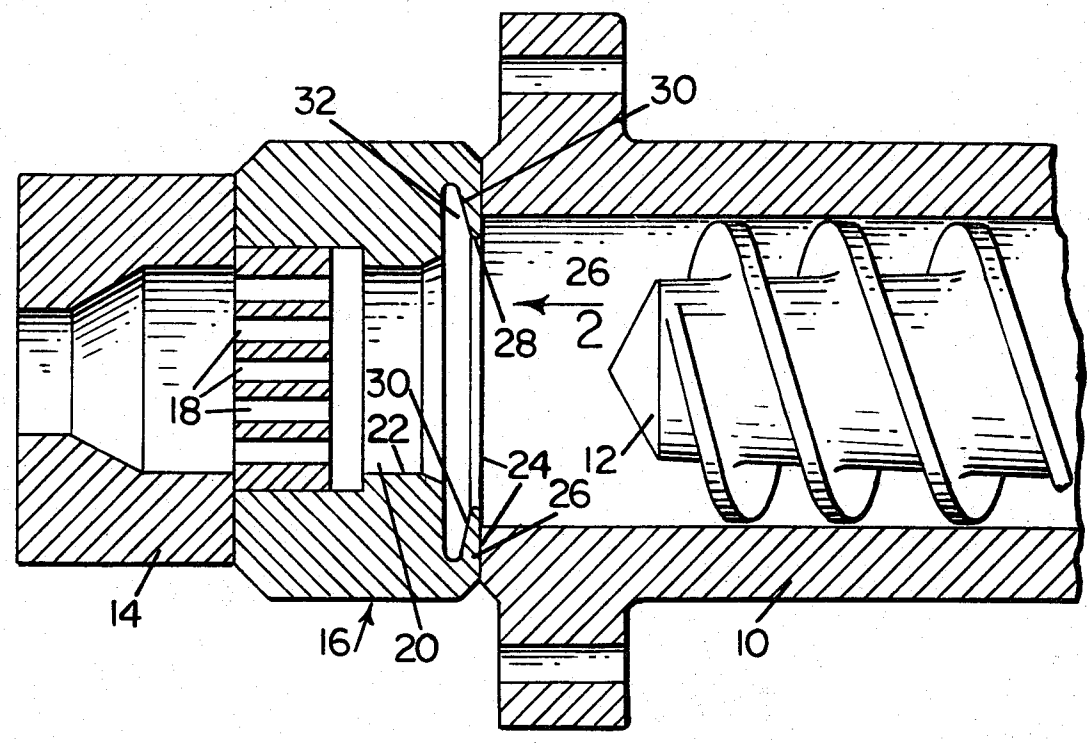


FIG. 1

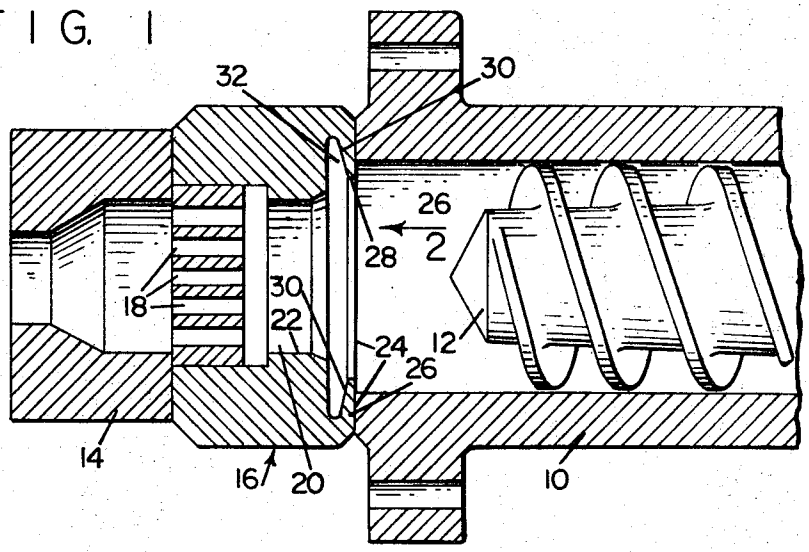
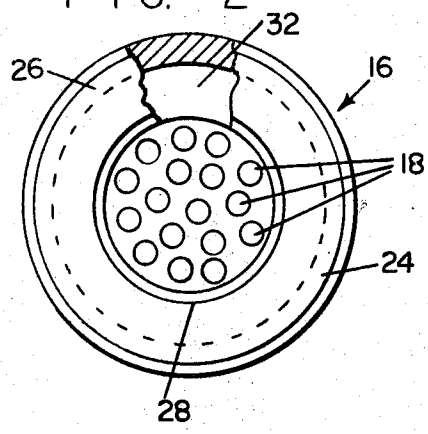


FIG. 2



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SELF-SEALING BREAKER PLATE FOR EXTRUDERS

BACKGROUND OF THE INVENTION

In plastic extruders especially of the feed screw type, it is desirable to insert an apertured breaker plate across the end of the cylinder between the ultimate discharge opening or nozzle and the end of the feed screw for holding back unmelted particles and particularly to build up a back pressure on the media being processed to increase its density. These breaker plates are found to leak at the edges thereof because after use, the bolts holding the breaker plate in position tend to elongate under the constant pressure of the media being processed.

SUMMARY OF THE INVENTION

In the present invention, the breaker plate is prevented from such leakage by a sealing member about the plate which is responsive to the pressure. The greater the pressure, the greater the sealing effect. This is accomplished by providing an interiorly directed annular lip on the breaker plate, said lip contacting the end of the cylinder, (or nozzle) where the leakage might otherwise occur, the lip having a surface opposite the cylinder end (or nozzle) against which the processing media impinges. The lip is distortable under such pressure, so that it bears against the cylinder end (or nozzle) with greater sealing force the greater the pressure exerted on it.

The sealing lip may be conveniently formed by making an inwardly opening annular groove in the breaker plate at one side face thereof in a manner to provide an annular inwardly directed preferably tapering lip having a face abutting the cylinder end (or nozzle) and an opposite face exposed to the pressure of the media under influence of the screw.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional view of a breaker plate according to the invention shown interposed between the end of the cylinder containing the feed screw and the nozzle for the molding die, and

FIG. 2 is a view in elevation looking in the direction of arrow 2 in FIG. 1, part being broken away.

PREFERRED EMBODIMENT OF THE INVENTION

In the preferred embodiment of the invention disclosed in the drawings, the cylinder **10** is provided with a feed screw **12** which rotates to advance the media (plastic) being processed, e.g. to be molded, working and mixing it. The media is eventually discharged through nozzle **14**, e.g. to the die.

The nozzle and cylinder are suitably connected by removable bolts not shown but as is well understood in the art, and interposed between the nozzle and the cylinder end is the breaker plate **16**. This plate is also held by the bolts or in any way desired, and has a series of orifices **18** for passage of the media to the nozzle. Since the breaker plate orifices leave a large portion of the plate solid, a back pressure is built up to the right of the plate **16** and also of course in the chamber **20** therein.

Chamber **20** has an interior annular wall **22** and an annular end surface at **24** contacting the end of the cylinder **10**. A lip **26** extends inwardly, this lip being annular and preferably tapering down to a fairly fine edge at **28**. One surface of the lip is the annular end surface **24** of the breaker plate, and in the case illustrated its other surface at **30** is formed by the side wall of a groove **32**.

Groove **32** is open inwardly, it is annular, and the wall at **30** is inclined, so that the sealing lip **26** gradually thickens in a direction towards the periphery of the breaker plate. The lip is made thin enough to tend to bear against the cylinder end under internal pressure in the groove. This pressure builds up due to the presence of the breaker plate and the greater this pressure is, the greater the force of the sealing action of the lip.

Although the disclosure herein is that of a separate breaker plate interposed between the cylinder and nozzle and clamped therebetween by any convenient means, attention is directed to U.S. Pat. No. 2,923,972, showing a breaker or "strainer" plate in a recess in the end of the cylinder, and the parts of the present self-sealing breaker plate can be inverted to conform to the location of the strainer plate in the patent.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims.

I claim:

1. A self-sealing apertured breaker plate for an extruder, an inwardly directed generally annular rib on said breaker plate in position to engage another portion of the extruder, and means forming an inwardly opening generally annular groove one side of which forms a side surface of the lip so that media being processed extends into the groove and presses on said rib, forcing the same into sealing engagement with said other portion of said extruder.

2. An apertured breaker plate for an extruder including a chamber, deformable inwardly extending lip adjacent the periphery of the plate, a groove adjacent the lip, said groove opening into the chamber and receiving media passing through the breaker plate, whereby the pressure of the media is exerted on said lip to tend to deform the same in an axial direction.

3. An extruder comprising a cylinder element and a nozzle element, means in said cylinder to feed plastic material through the cylinder, said cylinder having an open end portion:

an apertured breaker plate extending across the opening at the end of the cylinder to impede the flow of said plastic material; and

a rib on said plate, said rib being resiliently deformable at least in part and engaging one of said elements, said lip having a surface open to the plastic material, the latter being under pressure due to the feeding means in the cylinder and the pressure being transmitted to said rib so as to engage said one element with greater sealing force.

4. The extruder of claim 3 wherein said lip is generally annular.

5. The extruder of claim 3 wherein said lip is generally annular and extends inwardly of the breaker plate.

6. The extruder of claim 3 wherein said lip is generally annular and extends inwardly of the plate, a groove forming the rib, said groove being open to the plastic material, the latter impinging upon the surface of said lip for moving the same into tight sealing engagement with respect to said one element.

7. The extruder of claim 3 wherein the lip has a free edge portion, said lip tapering down to said free edge portion.

8. The extruder of claim 3 wherein said one element is the open end of the cylinder.