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A. B. MULLIN

TUBER HEAD

1,956,330

Filed Sept. 21, 1929

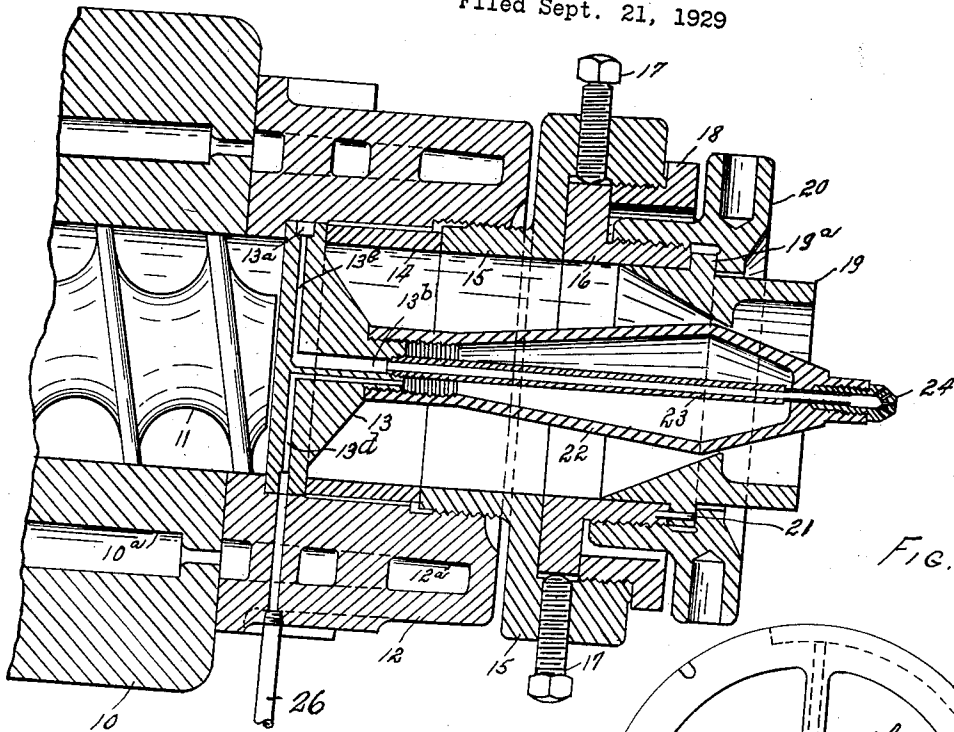


Fig. 2.

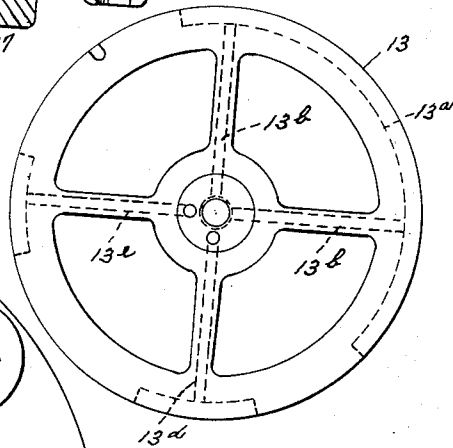


Fig. 3.

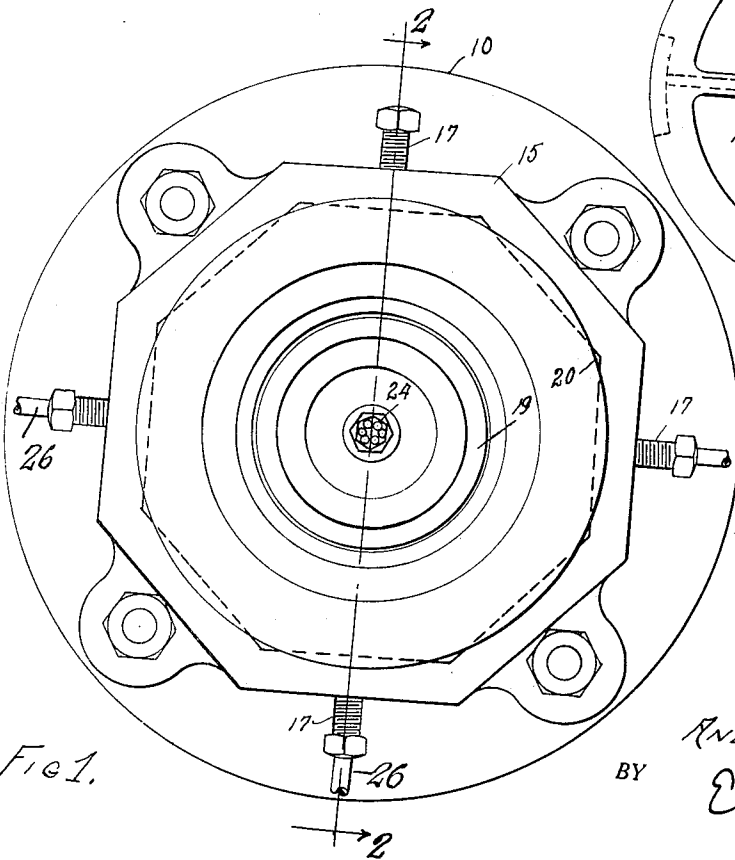


Fig. 1.

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UNITED STATES PATENT OFFICE

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TUBER HEAD

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3 Claims. (Cl. 18—14)

This invention relates to die-expressing or tubing machines and more particularly to the dies used in conjunction therewith.

In the tubing of rubber, frequent cleaning of the dies of the tubing machines heretofore used has been a necessity. This is due primarily to the presence of strong accelerators of vulcanization in the stock. It has been found that the stocks tend to be precured by the heat in the die mandrels, the precured rubber adhering tenaciously to the mandrel, thus reducing the wall thickness and clogging the dies.

The present invention has for certain of its objects the provision of a die which can be easily cleaned and also the provision of means for maintaining the temperature of the mandrel below that at which the prevulcanization of the stock can occur.

A further object of the invention is to provide improved die carrying means which permit ready adjustability and removability.

The foregoing and other objects of the invention are attained in the tubing machine briefly described below and illustrated in the accompanying drawing.

In the accompanying drawing;

Figure 1 is an end view of a tubing machine head embodying the invention;

Figure 2 is a diametrical sectional view on line 2—2 of Figure 1 showing a portion of the housing or body of the tubing machine; and

Figure 3 is an elevation of a spider which is adapted to support a mandrel in the center of the dies of the tubing machine.

A tubing machine housing indicated at 10 and having suitable ducts 10^a therein for the circulation of a temperature controlling medium is adapted to receive an extruding screw 11 which is rotated in the housing bore as is well known in the art. A head 12, having ducts 12^a in its walls is bolted to the housing 10 so that the head forms a continuation of the housing bore and preferably so that the ducts 10^a and 12^a cooperate.

A wheel-like spider 13 having, as shown in Figure 3 hub, rim and spoke portions is adapted to fit in the head 12 and is clamped in place therein by a double flanged carrier 15 which is threaded to screw into the head 12. A spacer ring or collar 14 is preferably interposed between the carrier 15 and the spider 13.

The numeral 19 indicates a die which is arranged to be adjustably supported in the carrier 15. This is accomplished by means of a die holder 16 which slidably receives the die 19 and which in turn is received in the enlarged end of

the carrier 15. Radially projecting screws 17 and a lock nut 18 on the carrier 15 permit the die holder and thus the die to be adjusted to any desired axial position. The die 19 is held in the die holder 16 by any suitable means such as a flanged nut 20 threaded onto the die holder 16 and which engages with a peripheral rib 19^a on the die 19. A pin 21 on the die cooperating with a recess in the die holder may also be provided to properly align the die if desired.

A hollow mandrel 22 formed with an internal thread at one end is adapted to be screwed onto the threaded hub of the spider 13 and to be held centrally of the die 19 thereby. In the tubing of rubber stock, it is desirable to supply a separating material such as soapstone to the interior of the issuing tubing. To provide means to accomplish this, the mandrel 22 has a nozzle 24 in the outer end thereof to which the separating material may be supplied. A separating material supply line is connected to the head 12 and through suitable means to the nozzle 24. Such means include ducts 13^a and 13^b in the spider 13 and a pipe 23 connecting the hub of the spider and the nozzle 24.

In order to supply a temperature controlling fluid to the interior of the hollow mandrel 22, supply and exhaust pipes 26 are provided which cooperate with ducts 13^a and 13^b of the spider connected to the interior of the mandrel as shown.

In the operation of the tubing machine, a fluid temperature controlling medium is circulated in the housing and head ducts 10^a and 12^a to maintain the stock at the required consistency for effective expressing, and the heat absorbed by the mandrel is conveyed therefrom by circulation of a relatively cool medium through the mandrel whereby the mandrel is kept at a temperature below that at which prevulcanization will take place.

When it is desired to clean the die, it will be apparent that it may be readily removed and that the mandrel will be accessible for easy cleaning without removal. It can be easily removed for cleaning if necessary, as will be apparent.

The amount of opening between the mandrel and the die which determines the thickness of the walls of the tubing, can be adjusted in several ways. First, the mandrel 22 can be screwed in or out on the hub of the spider 13 and secondly, the flanged nut 20 can be unscrewed, whereby the pressure of the stock forces the die outwardly against the nut. These adjustments are devised to change the longitudinal relation of the mandrel and the die, which due to the

cooperating tapers on the die and mandrel change the wall thickness of the stock.

The axial position of the die about the mandrel is controlled by the screws 17 and the locking nut 18 which assures uniform or desired wall thickness in the tubing.

Various modifications of the invention can be resorted to without departing from the spirit of the invention or the scope of the appended claims.

10 What is claimed is:

1. In combination with an extruding machine, a head having a bore cooperating with the material extruding bore, a spider in the bore of said head, a double flanged carrier for removably clamping said spider in said bore, a spacer tube interposed between said spider and said carrier, means on said double flanged carrier to support a die holder, said means comprising spaced radial set screws for adjusting the axial position of the holder, a clamping nut for holding said die holder in said carrier, a die slidable in said die holder and means for removably clamping said die in said holder, a hollow mandrel supported at one end on the spider, a nozzle at the other end of said mandrel, a pipe in said mandrel connecting said nozzle to a duct in the spider, said spider being formed with additional ducts opening in said hollow mandrel, said additional ducts permitting the circulation of temperature controlling fluid through said mandrel, said head being

formed with ducts cooperating with said spider ducts, whereby separating material can be supplied to said nozzle and cooling fluid to said hollow mandrel.

2. In combination with an extruding machine, a head having a bore cooperating with the material extruding bore, a spider in the bore of said head, a double flanged carrier for removably clamping said spider in said bore, a spacer tube interposed between said spider and said carrier, means on said double flanged carrier to support a die holder, said means comprising spaced radial set screws for adjusting the axial position of the holder, a clamping nut for holding said die holder in said carrier, a die slidable in said die holder and means for removably clamping said die in said holder, and a hollow mandrel supported at one end on the spider.

3. In combination with an extruding machine, a head having a bore cooperating with the material extruding bore, a spider in the bore of said head, a double flanged carrier for removably clamping said spider in said bore, means on said double flanged carrier to support a die holder, a die slidable in said die holder and means for removably clamping said die in said holder, and a hollow mandrel supported at one end on the spider.

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65	140
70	145
75	150