June 19, 1956 G. F. GOODMAN, JR 2,751,069

VARIABLE SPEED ADJUSTABLE POWER FEED

Filed Jan. 15, 1954 3 Sheets-Sheet 1

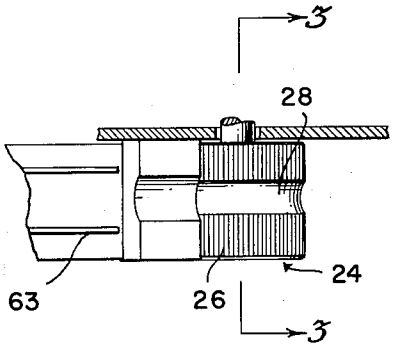

Fig. 2.

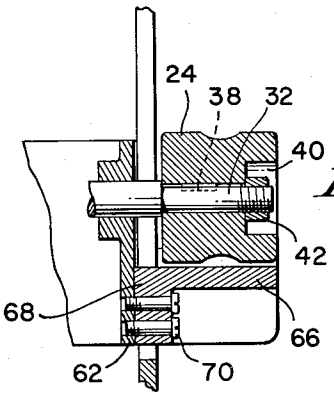

Fig. 3.

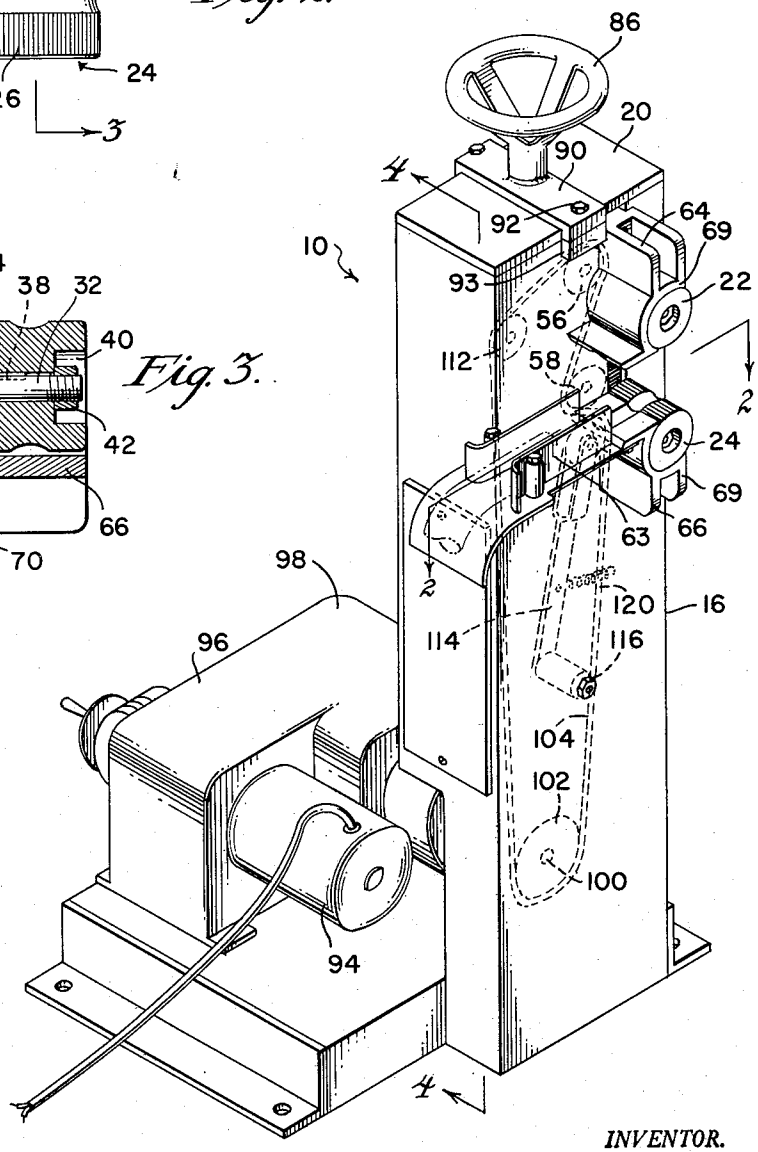

Fig. 1.

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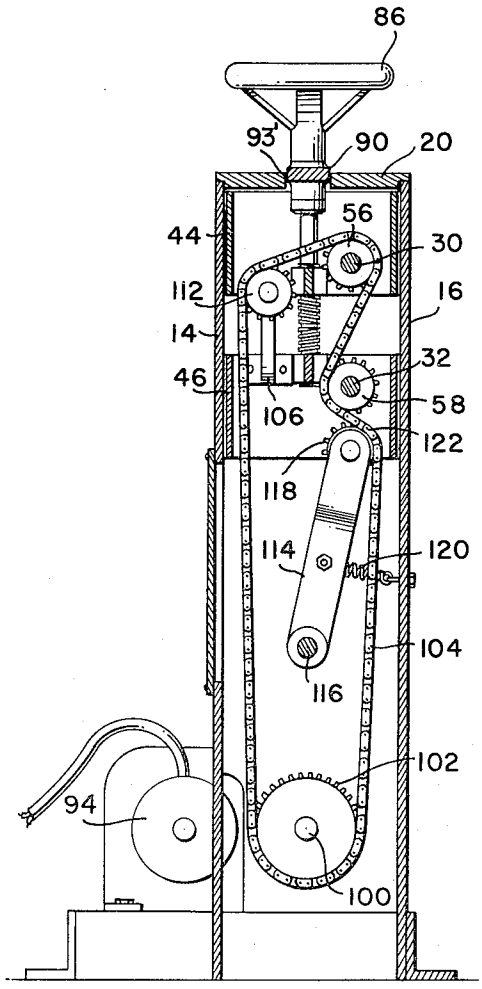

Fig. 4.

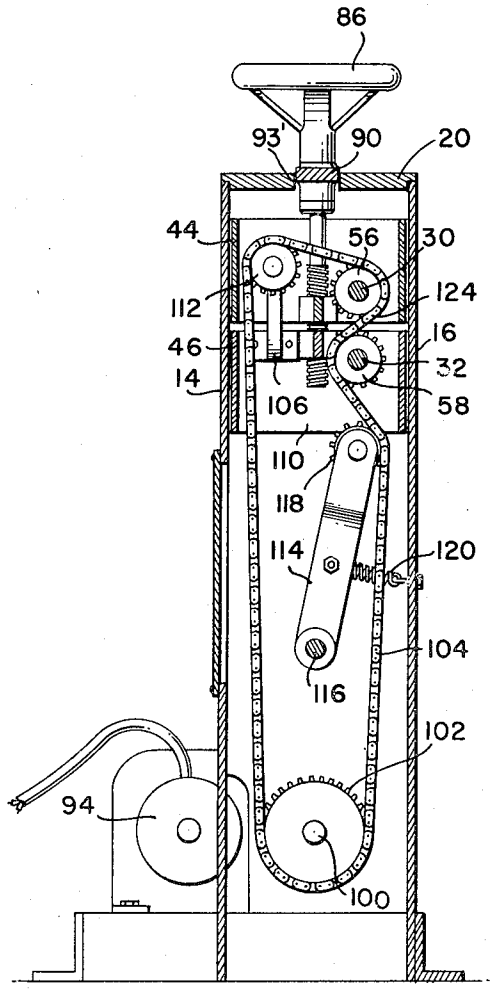

Fig. 5.

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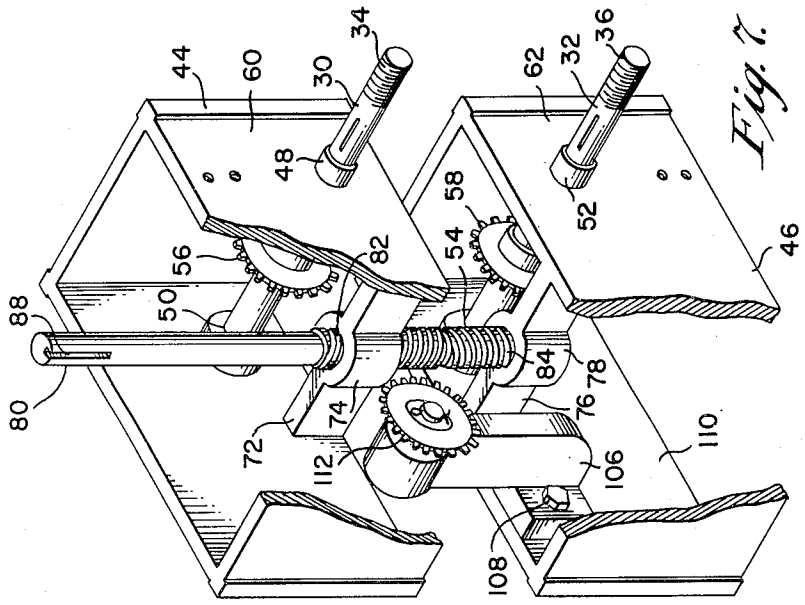
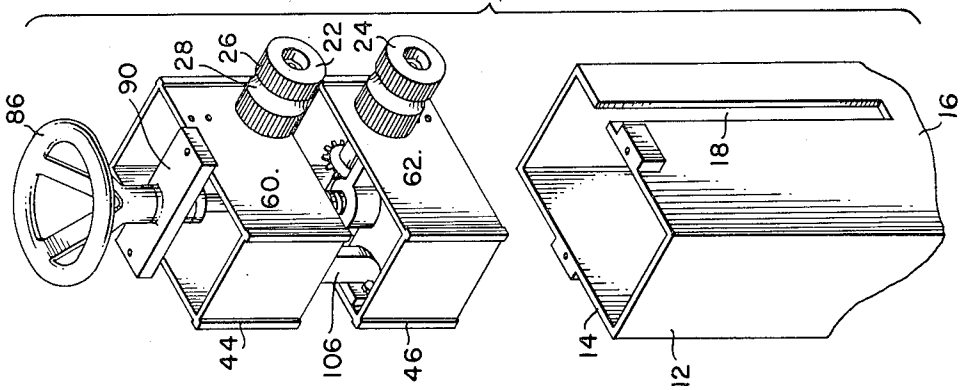


Fig. 7.

Fig. 6.



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VARIABLE SPEED ADJUSTABLE POWER FEED

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Application January 15, 1954, Serial No. 404,338

5 Claims. (Cl. 203—260)

This invention relates to a mechanism for feeding stock of varying diameters to a cutting machine.

Heretofore, rubber stock in the form of snakes of varying diameter was fed either by hand or by means of a conveyor to a cutting machine which reduced the stock to slugs for use in the molding of such articles as grommets, washers and the like.

It is the primary object of the present invention to provide a machine which will feed the rubber stock to the cutting machine.

Another important object of the invention is to provide a machine of the character described which includes a pair of rollers adapted to grip the rubber stock, which rollers may be adjustably spaced apart to accommodate stock of varying diameters.

A further object of the invention is to provide a rubber stock feeding machine of the character described in which the adjustable gripping rollers are driven by an endless chain, the machine including a means automatically applying uniform tension on the chain throughout the entire range of movement of the rollers.

Another object of the invention is to provide a roller stock feeding machine which includes, in addition to a means of automatically applying uniform tension on the chain driving the rollers, a further chain tensioning means which operates particularly at the extreme open and closed positions of the rollers.

And yet another object of the invention is to provide a roller stock feeding machine which is relatively simple in construction, easy to manipulate with respect to the adjustment of the spaced position of the rollers and easy to operate with respect to the feeding of the rubber stock to the cutting machine.

These and other objects of the invention will become more apparent as the following description proceeds in conjunction with the accompanying drawings, wherein:

Figure 1 is a perspective view of the machine, parts being shown in dotted lines to illustrate details of construction;

Figure 2 is an elevational view taken on the line 2—2 of Figure 1;

Figure 3 is a sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a sectional view taken on the line 4—4 of Figure 1 and illustrating the extreme open position of the rollers;

Figure 5 is a view similar to Figure 4 and illustrating the closed position of the rollers;

Figure 6 is a fragmentary group perspective view of certain features of the invention; and

Figure 7 is an enlarged broken-away perspective view of the roller-adjusting movable members of the machine.

Specific reference will now be made to the drawings wherein similar reference characters are used for corresponding elements throughout.

The machine is generally indicated at 10 and comprises a substantially rectangular casing 12 having opposing side walls 14 and 16, the latter including a vertically

extending slot 18 opening through the top thereof, as shown in Figure 6. The upper end of the casing is provided with a two-piece removable closure plate 20.

An upper gripping roller 22 and a lower gripping roller 24 are provided, each including axially extending, circumferentially spaced serrations 26 and a circumferential groove 28 to assist in the gripping of rubber stock of a given diameter between the rollers as the stock is fed to a cutting machine.

A pair of upper and lower stub shafts 30 and 32 are provided having threaded ends 34 and 36 respectively. Keyed as at 38 on each of the stub shafts to rotate therewith are the upper and lower gripping rollers 22 and 24, each being provided with a recess 40 for receiving a nut 42 engaging the threaded portions 34 and 36 of the respective stub shafts 30 and 32; see Figure 3.

Mounted for sliding movement within the casing 12 is a pair of vertically separable box-like upper and lower members 44 and 46, the casing serving as a retainer for said members. The upper stub shaft 30 is secured within a sleeve 48 that is carried by the upper member 44 and is journaled for rotation in the member 44, as at 50. The lower stub shaft 32 is secured in a similar sleeve 52 that is carried by the lower member 46 and is journaled for rotation in the member 46, as at 54. The outer ends of the sleeves 48 and 52 extend through the vertical slot 18 of the casing 12. Mounted upon the sleeves 48 and 52 for rotation therewith are sprockets 56 and 58. These sprockets are in vertical alignment and are located adjacent the side walls 60 and 62 of the upper and lower members 44 and 46 through which the stub shafts 30 and 32 extend.

To assist in guiding and controlling the feed of the rubber stock between the gripping rollers 22 and 24, a guide 63 is secured to casing wall 16 in front of the rollers and guards 64 and 66 are provided which embrace the guide rollers, as shown in Figure 1, each guard including a shank portion 68 that extends through the vertical slot 18 of the casing, there to be secured by appropriate screws 70 to the side walls 60 and 62 of the upper and lower box-like members 44 and 46. The guards 64 and 66 are cut back as at 69 to prevent jamming of the stock passing between the rollers.

A means is provided for adjustably moving the box-like members 44 and 46 and the gripping rollers 22 and 24 carried thereby towards and away from each other. The means comprises a first bar 72 carried by the side walls of the upper member 44 and including centrally thereof a threaded bearing 74. A second bar 76 is provided which is carried by the side walls of the lower member 46 and which includes centrally thereof a threaded bearing 78. A vertical shaft 80 passes through the interior of both box-like members 44 and 46 and includes at its lower end reversely threaded portions which are engaged in the threaded bearings 74 and 78, the upper threaded portion 82 being left handed while the lower threaded portion 84 is right handed. Thus, rotation of the shaft 80 in one direction will move the box-like members and the gripping rollers apart a predetermined distance, whereas rotation in the opposite direction will move the box-like members and gripping rollers towards each other. Rotation of the shaft 80 is effected by a turn wheel 86 which is keyed as at 88 to the shaft 80. The turn wheel 86 extends through and is rotatable in a cross bar 90 which is mounted as at 92 upon two lugs 93 that are welded to the upper ends of the sides 14 and 16 of the casing 12. The turn wheel also extends through the space 93' between the two piece closure plate 20.

A motor 94 is provided adjacent the lower end of the casing 12 which is connected to a conventional variable speed unit 96 that is in turn operatively connected to a conventional reduction gearing 98. The reduction gear-

ing terminates in a drive shaft **100** upon which is mounted a drive sprocket **102**. An endless chain **104** is disposed within the casing and operatively connects the drive sprocket **102** with the roller sprockets **56** and **58** in a manner which will be described hereinafter.

A means is provided for applying uniform tension to the chain **104** through the entire predetermined range of movement of the gripping rollers towards and away from each other. This means comprises a vertically extending bar **106** which is secured as at **108** to the side wall **110** of the lower box-like member **46** opposite the side wall **62** thereof, as shown clearly in Figure 7.

Rotatably mounted upon the upper end of the bar **106** is an idler sprocket **112** which engages the endless chain **104**. The location of the idler sprocket **112** relative to the two roller sprockets **56** and **58** is important. The location is such that the center of rotation of the idler sprocket **112** is in horizontal alignment with the center of rotation of the upper roller sprocket **56** when the rollers **22** and **24** are spaced apart half of the predetermined maximum opening position of the rollers. Thus, for example, if the predetermined maximum opening position of the gripping rollers is three inches (3″), the center of rotation of the idler sprocket **112** will be in horizontal alignment with the center of rotation of the upper roller sprocket **56** when the centers of rotation of the upper and lower rollers **22** and **24** are spaced apart one and one-half inches (1½″). Because of this, the tension applied to the endless chain **104** by the idler sprocket **112** will be uniform throughout the entire opening and closing movement of the gripping rollers.

It has been found that at the extreme opening position of the gripping rollers, an additional tensioning means may be required to take up a slight slack in the endless chain **104**. This means comprises a bar **114** which is pivoted at its lower end as at **116** to one of the side walls of the casing **12**. At its upper end the bar **114** rotatably carries an idler sprocket **118** which is urged into engagement with the endless chain **104** by means of an appropriate spring **120** that is terminally secured to one of the side walls of the casing **12** and to the bar **114** intermediate its ends.

The location of the idler sprocket **118** relative to the two roller sprockets **56** and **58** is important. This location is clearly illustrated in Figures 4 and 5. It will be noted that the endless chain **104** is entrained over the drive sprocket **102**, over the idler sprocket **112**, over the upper roller sprocket **56**, under the lower sprocket **58** and over the idler sprocket **118**. The location of the idler sprocket **118** relative to the roller sprockets **56** and **58** is such that, as shown in Figures 4 and 5, the angular disposition of the portion of the chain **122** between the lower sprocket **58** and the idler sprocket **118** is the same in the fully opened position of the rollers as the angular disposition of the portion of the chain **124** between the upper and lower roller sprockets **56** and **58** when the latter are in their fully closed position; compare Figures 4 and 5. This location permits the idler sprocket **118** to exert a slight tensioning pressure on the endless chain at the extreme opening and closing positions of the gripping rollers while the idler sprocket **112** applies uniform tension to the endless chain in all of the intermediate positions of the gripping rollers.

Thus, it will be seen that a variable speed machine is provided for adjustably accommodating and feeding rubber stock of varying diameters to a cutting machine wherein the adjustment of the positions of the gripping rollers can be readily and easily effected and wherein, regardless of the adjustment of the gripping rollers, uniform tension is applied to the endless chain connecting the gripping rollers with the power source throughout the entire range of movement of the gripping rollers.

While a preferred embodiment of the invention has been shown and described hereabove, it will be understood that minor variations may be made in the construction and arrangement of parts by skilled artisans without departing from the spirit of the invention and the scope of the appended claims.

What is claimed is:

1. A mechanism adapted to feed stock of varying diameters to a cutting machine comprising a pair of upper and lower stock gripping rollers mounted on shafts, a pair of upper and lower members mounting said roller shafts, means to adjustably move said members toward and away from each other so that the rollers are moved from a closed to a maximum predetermined opened position, upper and lower sprockets mounted on said roller shafts, a motor, an endless chain drivingly connecting said sprockets to said motor, and means automatically applying uniform tension on said chain throughout the entire range of movement of said rollers, said means including an idler sprocket carried by said lower member and engaging said chain, the center of rotation of said idler sprocket lying on a horizontal line passing through the center of rotation of said upper roller shaft when the rollers are spread apart half the distance of their maximum opening.

2. The combination of claim 1 and a further chain tensioning means for operation at the extreme open and closed positions of said rollers, said further means including a pivoted yoke carrying an idler sprocket, and spring means urging said yoke idler sprocket into engagement with said chain, said chain being entrained over said first mentioned idler sprocket, over said upper roller sprocket, under said lower roller sprocket and over said yoke idler sprocket, the angular disposition of the chain between said upper and lower roller sprockets when they are in a closed position being substantially the same as the angular disposition of the chain between said lower roller sprocket and said yoke idler sprocket when the rollers are in their maximum spread apart position.

3. The combination of claim 1 wherein said means to adjustably move the upper and lower roller mounting members includes a threaded bearing carried by each of said members and a manually operable shaft having reversely threaded portions engaged respectively in each of said bearings.

4. The combination of claim 1 wherein said upper and lower roller mounting members are movable vertically towards and away from each other and a casing embracing said members and guiding the movements thereof, said casing having an elonagted vertical slot in one wall thereof and said roller shafts extending through said slot with said rollers mounted exteriorly of said casing.

5. A mechanism adapted to feed stock of varying diameters to a cutting machine comprising a pair of upper and lower stock gripping members mounted on shafts, a pair of upper and lower box-like members mounting said roller shafts, means to adjustably move said members vertically from a closed to a maximum predetermined opened position, upper and lower sprockets mounted on said roller shafts, a bar secured to and extending upwardly from said lower box-like member, an idler sprocket mounted on the upper end of said bar, a motor, and an endless chain entrained over all of said sprockets and drivingly connecting them to said motor, the center of rotation of said idler sprocket being in horizontal alignment with the center of rotation of said upper roller sprocket when said rollers are spaced apart one-half of the predetermined maximum opened position of said rollers.

References Cited in the file of this patent

UNITED STATES PATENTS

425,951	Marble	Apr. 15, 1890
441,411	Hartness	Nov. 25, 1890
486,222	Dore	Nov. 15, 1892
1,342,608	Steele	June 8, 1920
2,433,477	Quinn	Dec. 30, 1947
2,679,924	Powell	June 1, 1954