

March 6, 1951

C. H. AMIDON ET AL

2,544,627

LABELING MACHINE

Filed March 8, 1950

4 Sheets-Sheet 1

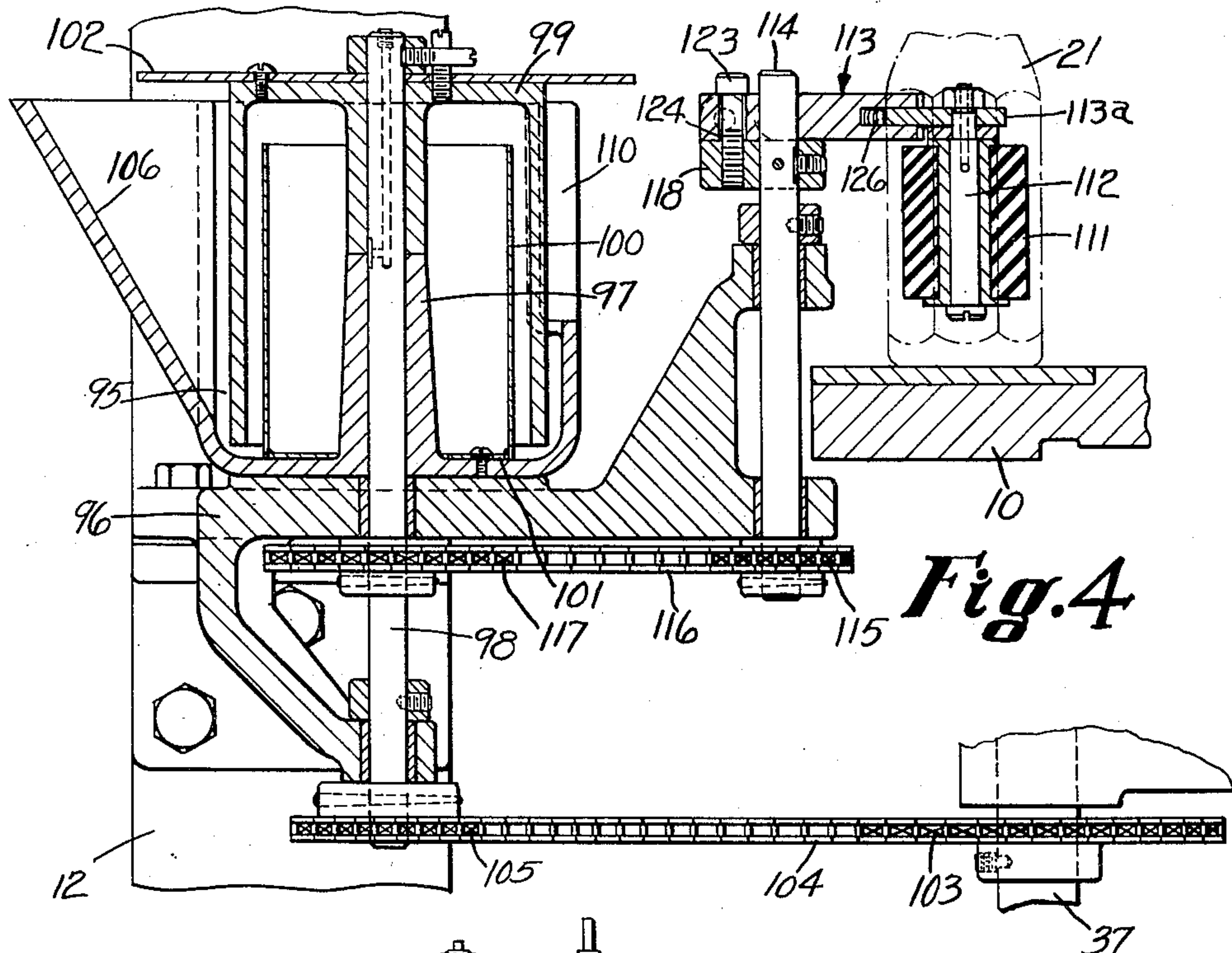


Fig. 4

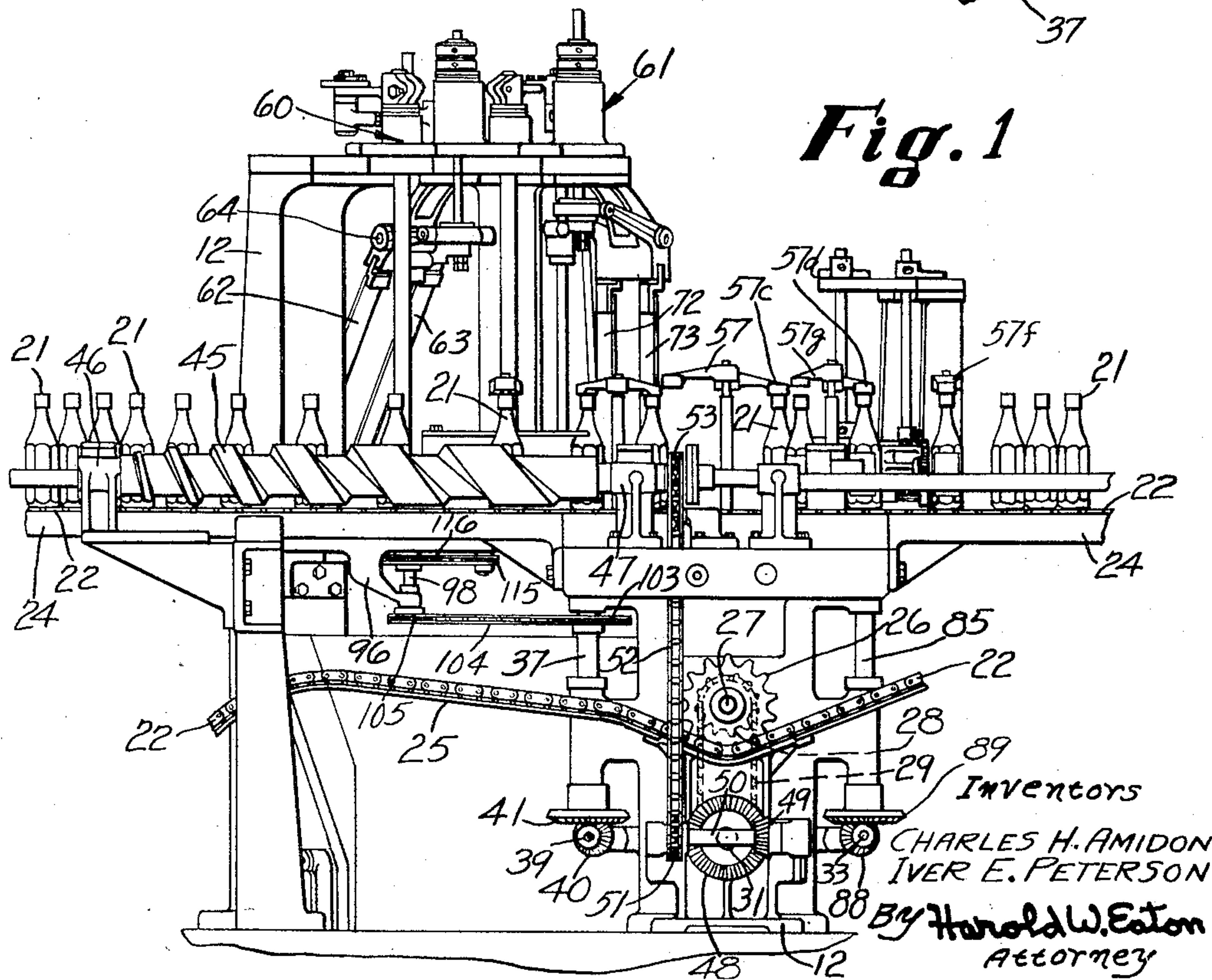


Fig. 1

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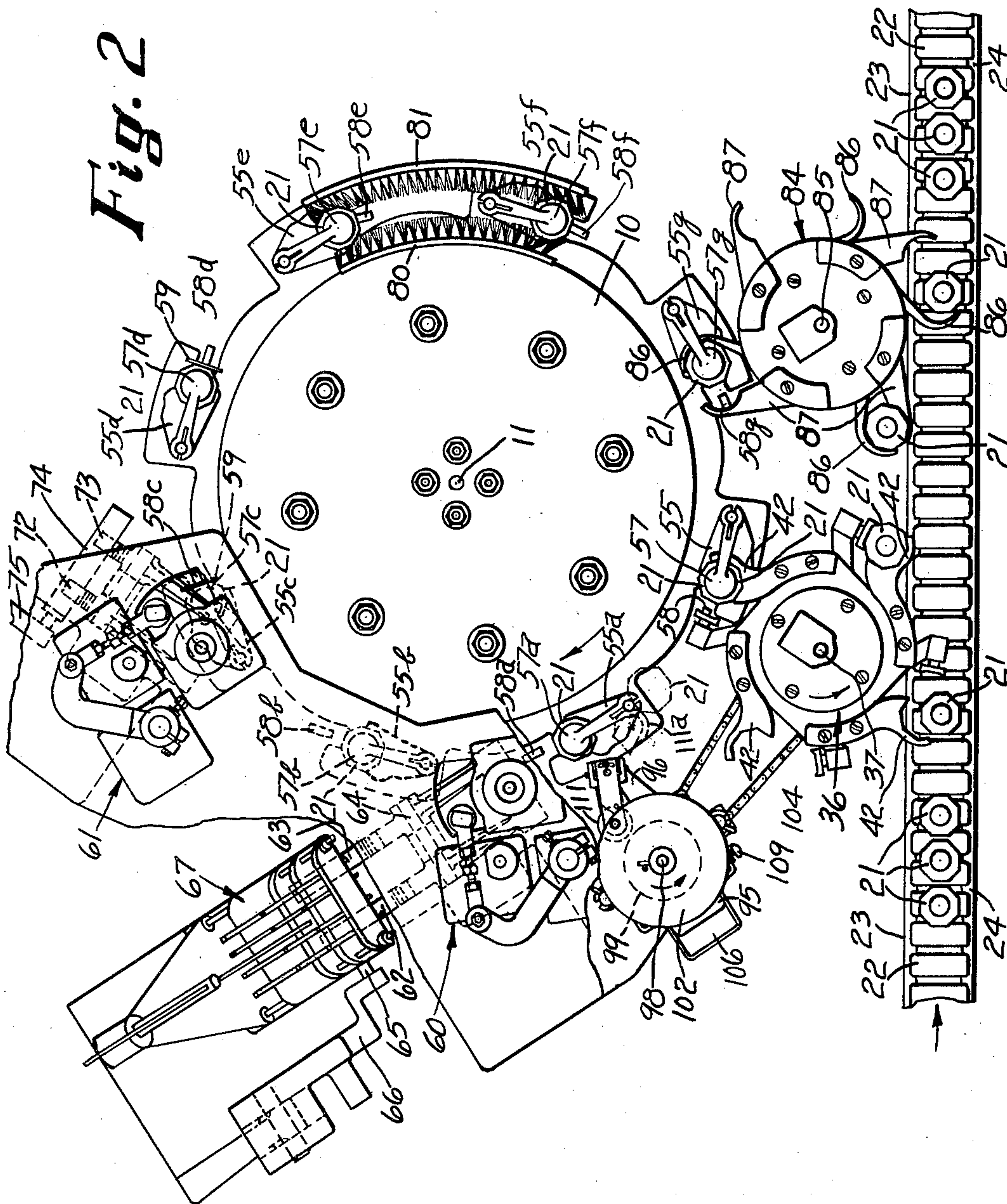
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4 Sheets-Sheet 2



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4 Sheets-Sheet 3

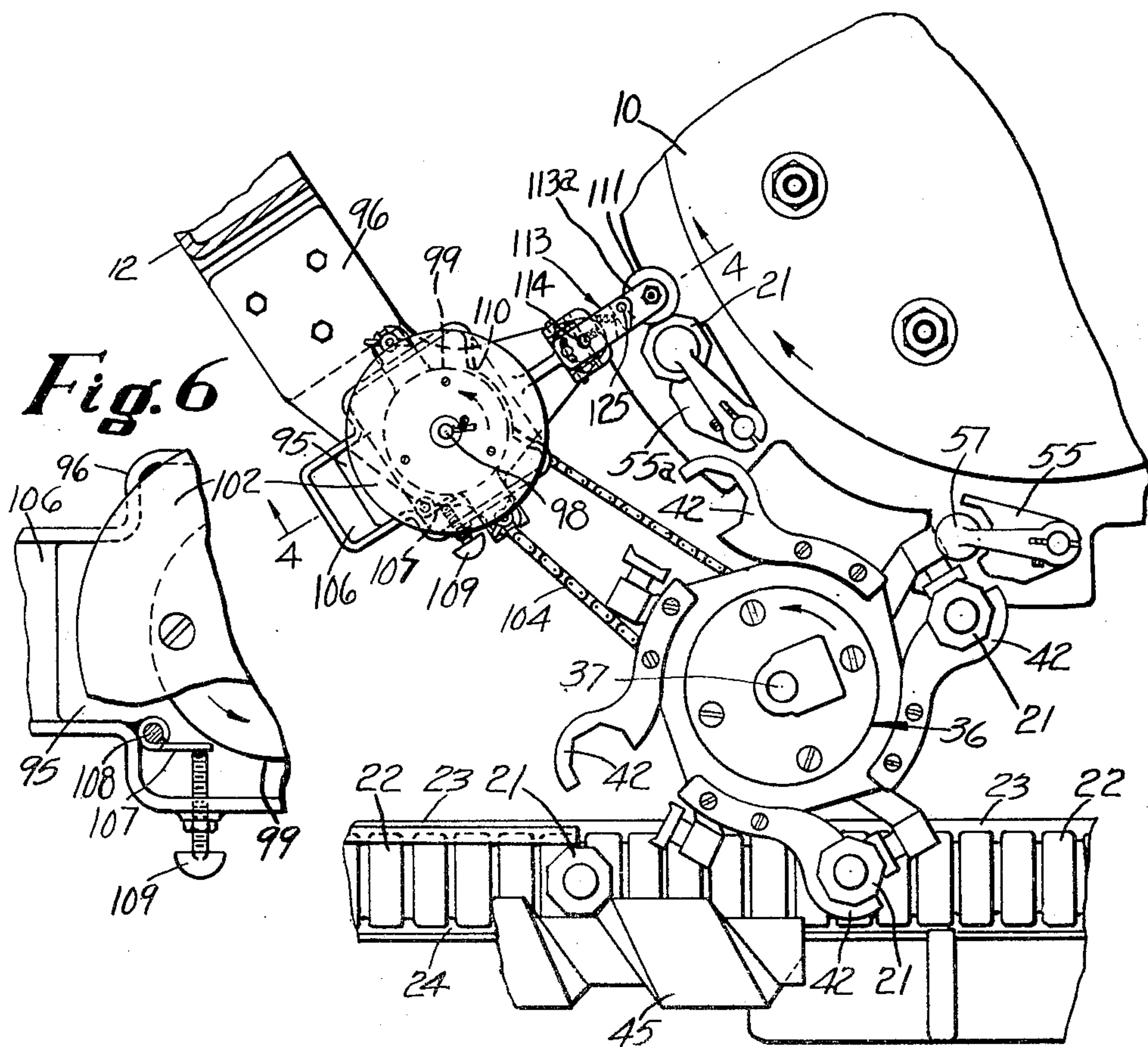
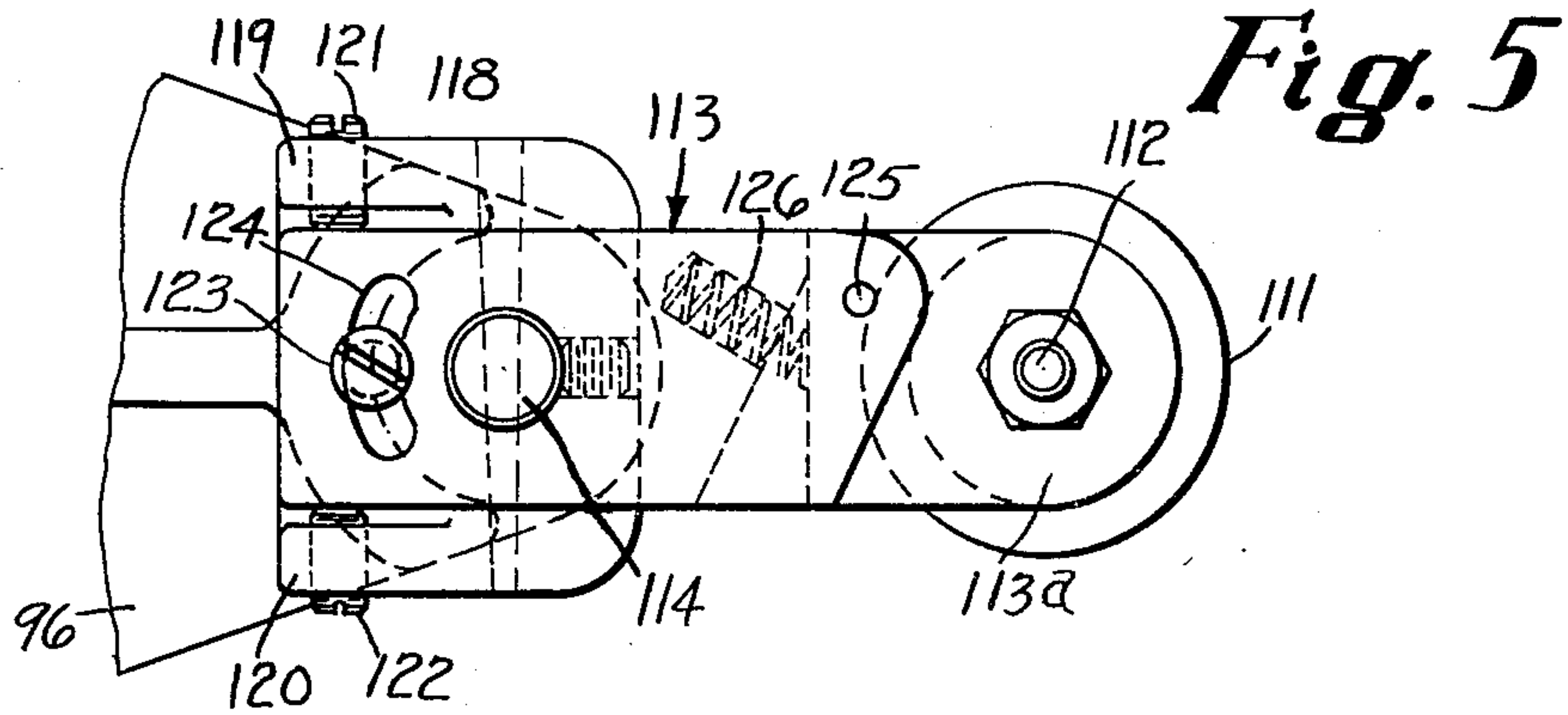


Fig. 3

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Fig. 7

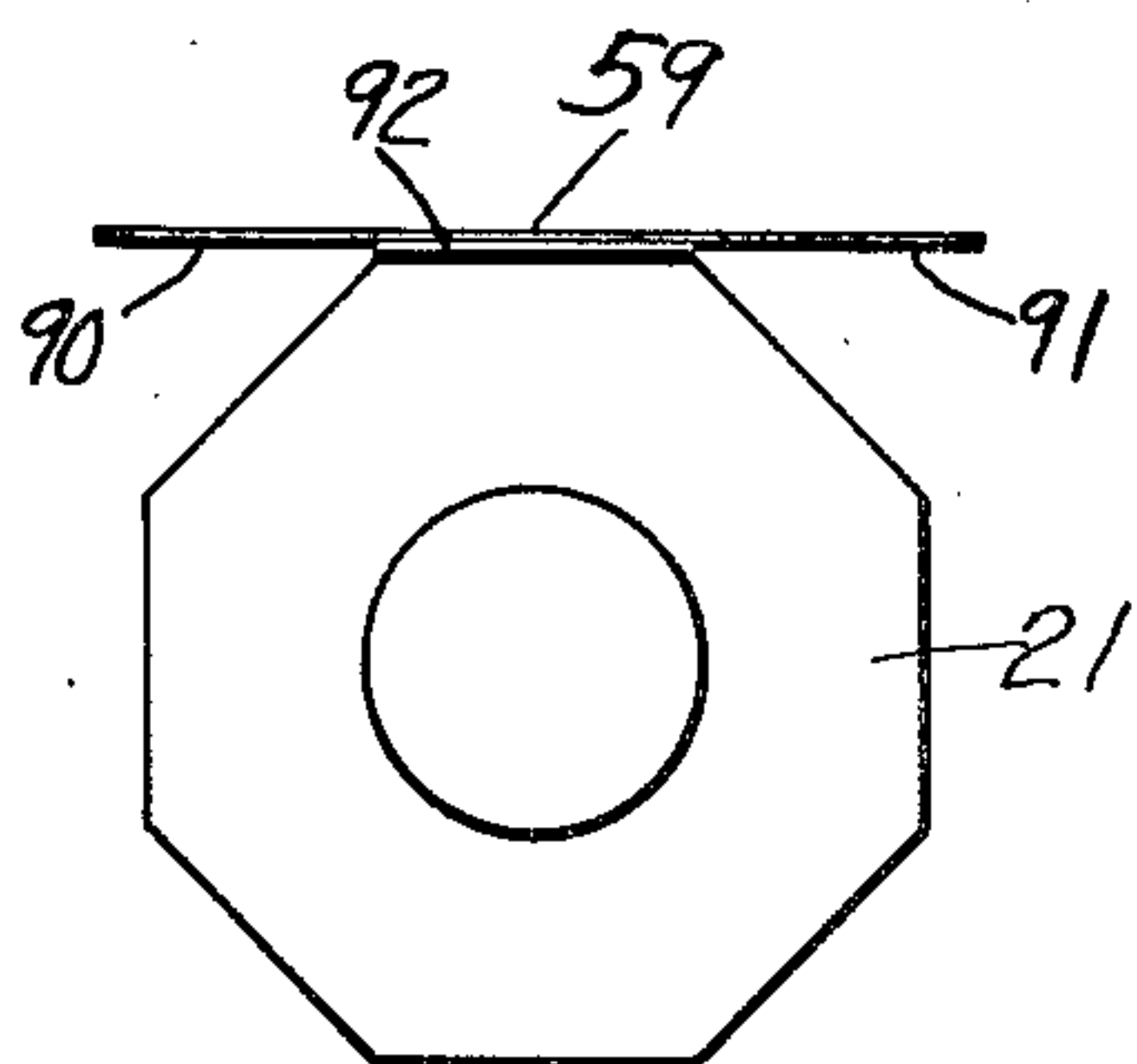
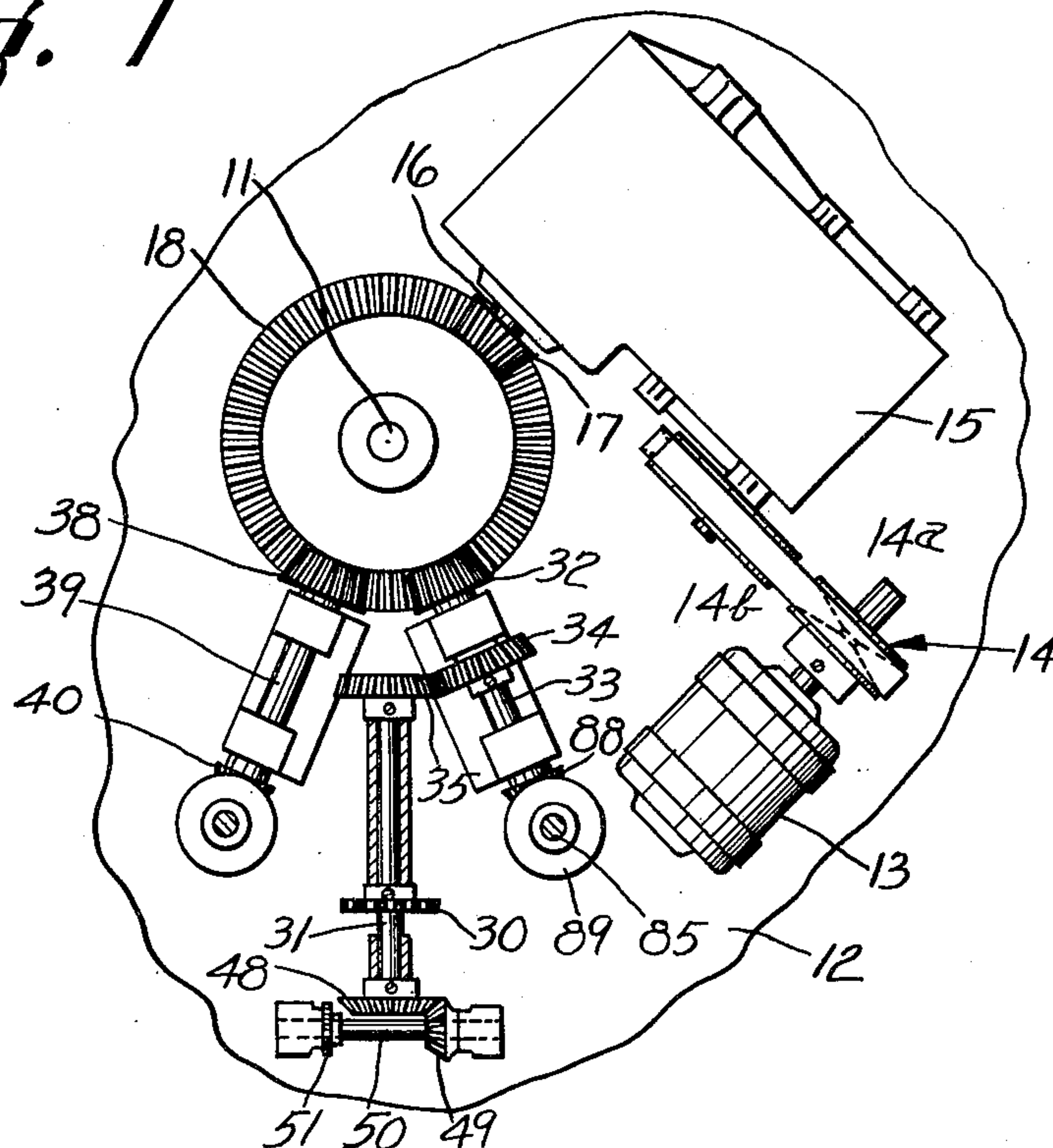


Fig. 8

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2,544,627

LABELING MACHINE

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Application March 8, 1950, Serial No. 148,472

5 Claims. (Cl. 216—54)

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The invention relates to labeling machines, and more particularly to apparatus whereby substantially the entire surface of the label is stuck to the article being labeled.

One object of the invention is to provide a simple and thoroughly practical labeling machine whereby substantially the entire surface of the label may be stuck to the article being labeled. Another object is to provide a labeling machine in which label pickers apply adhesive to spaced portions of a label and an independent gumming apparatus is provided for applying adhesive to a predetermined portion of the surface of the article to be labeled to stick the ungummed portion of the label thereto. Another object of the invention is to provide a center gumming attachment which may be applied to a labeling machine for applying adhesive to a predetermined portion of the surface of the article to be labeled. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which is shown one of various possible embodiments of the mechanical features of this invention,

Fig. 1 is a fragmentary front elevation of a labeling machine embodying the invention;

Fig. 2 is a fragmentary plan view, on an enlarged scale, of the labeling machine;

Fig. 3 is a fragmentary plan view, on an enlarged scale, of a portion of the labeling machine showing the center gumming apparatus;

Fig. 4 is a cross sectional view, on an enlarged scale, taken approximately on the line 4—4 of Fig. 3, through the center gumming apparatus;

Fig. 5 is a fragmentary plan view, on an enlarged scale, of the center gumming roll and its support;

Fig. 6 is a fragmentary plan view, on an enlarged scale, of a portion of the center gumming apparatus showing the blade for regulating the thickness of adhesive on the gumming drum;

Fig. 7 is a diagrammatic illustration of the driving mechanism for the machine; and

Fig. 8 is a diagrammatic illustration showing a label to which adhesive has been applied by the label pickers and also the adhesive applied to the container for sticking the center portion of the label.

A labeling machine has been illustrated in the

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drawings comprising a rotary table 10 which is supported on the upper end of a vertical shaft 11. The shaft 11 is rotatably supported in suitable bearings (not shown) which are fixedly mounted in a base 12.

A driving mechanism is provided comprising an electric motor 13 which drives a variable speed pulley 14. The pulley 14 is connected by a combination V and flat belt 14a which drives a pulley 14b of a speed reduction unit 15. The speed reduction unit 15 may be of any of the standard and well known gear reducer units now on the market. The speed reduction unit 15 is provided with a driven shaft 16 (Fig. 7) which supports a bevel pinion 17 meshing with a large bevel gear 18 mounted on the lower end of the vertical shaft 11.

Articles, such as bottles 21, to be labeled are placed on an endless conveyer chain 22 either manually or automatically as desired. The conveyer chain 22 is supported by a pair of spaced parallel guide rails 23 and 24. The conveyer chain wraps around idler pulleys (not shown) which are supported on the base of the machine. A track 25 supported by the base 12 supports the slack side of the conveyer chain 22, as shown in Fig. 1. The conveyer chain 22 is driven by means of a sprocket 26 which is mounted on a shaft 27. The shaft 27 supports a sprocket 28 which is connected by a link chain 29 with a sprocket 30 mounted on a rotatable shaft 31. The shaft 31 is driven by the large bevel gear 18. A bevel pinion 32 mounted on a rotatable shaft 33 carries a bevel gear 34 which meshes with a bevel gear 35 mounted on the inner end of the shaft 31. It will be readily apparent from the foregoing disclosure that rotary motion of the large bevel gear 18 will be transmitted through the drive mechanism above described continuously to rotate the sprocket 26 and thereby transmit a continuous motion to the conveyer chain 22.

A suitable transfer mechanism is provided for transferring bottles from the conveyer chain 22 onto the rotary table 10. This mechanism may comprise a feed turret 36 which is mounted on a vertical shaft 37. The vertical shaft 37 is driven by the large bevel gear 18. A small bevel pinion 38 meshes with the bevel gear 18 and is mounted on the inner end of a rotatable shaft 39 (Fig. 7). A bevel pinion 40 is mounted on the outer end of the shaft 39 and meshes with a bevel gear 41 mounted on the lower end of the shaft 37. The feed turret 36 is provided with a plurality of bottle engaging hooks 42 by means of which bottles 21 to be labeled are transferred

from the conveyer chain 22 onto the rotary table 10.

It is desirable to provide a mechanism for spacing the bottles on the conveyer and positively controlling the movement of the bottles until they are positioned in alignment for engagement with one of the bottle engaging hooks 42 of the feed turret 36. A rotatable feed worm 45 is mounted in bearings 46 and 47 and is arranged to engage bottles travelling along the chain 22 and to properly space the bottles and also to positively feed them into predetermined positions for engagement by the bottle engaging hooks 42. A suitable driving mechanism is provided for the feed worm 45 comprising a bevel gear 48 (Fig. 7) mounted on the outer end of the shaft 31. The bevel gear 48 meshes with a bevel gear 49 mounted on a rotatable shaft 50. The shaft 50 is provided with a sprocket 51 which is drivingly connected by means of a link chain 52 with a sprocket 53 fixedly mounted on the feed worm 45.

As soon as each bottle 21 is transferred onto the table 10 by rotation of the feed turret 36, it is engaged by a bottle supporting bracket 55 mounted on the upper surface of the rotatable table 10. There are a plurality of these brackets 55, 55a, 55b, 55c, 55d, 55e, 55f and 55g equally spaced about the circumference of the table 10. The speed of rotation of the feed turret 36 is related to the speed of rotation of the table 10 in the ratio of the number of brackets 55 to the number of bottle engaging hooks 42. With eight brackets 55 on the table 10 and four turret hooks 42, the turret should rotate twice while the table is rotating once.

A plurality of vertically movable bottle clamps 57, 57a, 57b, 57c, 57d, 57e, 57f and 57g are mechanically operated when a bottle is placed on the table in engagement with a supporting bracket 55 to clamp the bottle 21 to the table during a labeling operation. These bottle clamps 57 may be substantially identical with those shown in the prior U. S. patent to C. H. Oslund No. 2,259,212 dated October 14, 1941, to which reference may be had for details of disclosure not contained herein.

The table 10 is also provided with a plurality of mechanically actuated label grippers 58, 58a, 58b, 58c, 58d, 58e, 58f and 58g which are arranged to hold a label in a predetermined position on the bottle to facilitate withdrawal of the label pickers therefrom and to hold the label in position until the label has been wiped in a manner to be hereinafter described.

The labeling machine as illustrated in the drawings is a duplex machine having two label applying mechanism 60 and 61 which are arranged to apply a label to alternate bottles as they are carried in a rotary path by movement of the table 10. The label applying mechanism 60 is provided with a pair of spaced parallel pickers 62 and 63 which are supported on a rock shaft 64 (Fig. 2). As the pickers 62 and 63 are swung toward a label pack or magazine 67, a gumming roller 65 carried by a rock arm 66 rolls over the face of the pickers and applies a coating of adhesive thereto. Continued swinging movement of the pickers 62 and 63 swings them into engagement with the exposed label in the magazine 67 thereby gumming spaced portions of the label. When the pickers 62 and 63 are swung in the opposite direction, the exposed label is withdrawn from the magazine and swung into a predetermined position on a bottle 21 after

which the label gripper 58 engages the center portion of the label and holds it in a predetermined position so as to allow the pickers to withdraw without disturbing the position of the label relative to the bottle 21.

Similarly the label applying mechanism 61 is provided with a pair of spaced pickers 72 and 73 which are gummed by a gumming roller 74 carried by a rock arm 75 when the pickers 72 and 73 are swung toward the label pack or magazine (not shown). The label picking and applying mechanism is substantially identical to that as shown in prior U. S. patent to W. W. Oslund No. 1,940,011 dated December 19, 1933, to which reference may be had for details of disclosure not contained herein.

After labels 59 have been applied to the bottles 21, continued rotation of the table 10 carries the bottles 21 between a pair of spaced wipers such as brushes 80 and 81 which serve to wipe the label into engagement with the surface of the bottle. During this wiping movement, the label grippers 58 hold the center portion of the label 59 in a predetermined position on the bottle during the wiping operation.

After the bottles pass through the wiping station, continued rotation of the table 10 carries the labeled bottles 21 into a discharge position. A rotatable bottle discharge turret 84 mounted on a vertical shaft 85 serves to transfer labeled bottles 21 from the table 10 onto the discharge end of the conveyor chain 22 (Fig. 2). The bottle discharge turret 84 is provided with a plurality of bottle engaging hooks 86 which are rotated in a counter-clockwise direction with the discharge turret 84 to engage a labeled bottle and to transfer the bottle from the table onto the conveyer chain 22. A plurality of brackets 87 are provided on the discharge turret 84 which serve with the hooks 86 to hold the bottles in an upright position during the discharge operation. Just before the labeled bottle 21 reaches the discharge position, the vertically movable bottle clamp raises thereby unclamping the bottle so that it may be readily discharged by means of the mechanism above described. The discharge turret is rotated in timed relation with the rotation of the table 10. The shaft 33 (Fig. 7) is provided with a bevel pinion 88 which meshes with a bevel gear 89 mounted on the lower end of the vertical shaft 85. By means of this driving connection the feed turret is rotated in a definite timed relationship with the rotation of the rotary table 10.

The label pickers above described serve to apply a coating of adhesive 90 and 91 to spaced parallel end portions of the label 59. Thus when the label 59 is wiped onto the bottle only the two end portions thereof are stuck to the bottle.

In order to attain one of the main objects of this invention, it is desirable to provide an independent gumming mechanism whereby adhesive may be applied to a predetermined portion of the surface of the bottle 21 so that the ungummed portion of the label will be stuck thereto. This is preferably accomplished by means of a center gumming attachment to apply adhesive to a predetermined area 92 of the bottle 21. This center gumming attachment may comprise an adhesive reservoir 95 (Fig. 4) which is fixedly mounted on a bracket 96 which is in turn fixed to the base 12 of the machine. The reservoir 95 is provided with an upwardly extending boss 97 which serves as a bearing for a rotatable drive shaft 98. The drive shaft 98 is operatively connected to rotate

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a hollow gumming cylinder 99 the lower end of which rides within the adhesive within the reservoir 95. A sheet metal cylinder 100 having its lower end enclosed by a flat plate 101, is fastened to the reservoir 95 and serves to keep the adhesive away from the drive shaft and bearing therefor. A disc 102 is fastened to the upper end of the gumming cylinder 99 to prevent adhesive from riding over the top of the cylindrical surface thereof.

The gumming cylinder 99 is preferably driven in timed relation with the other mechanisms of the machine. As shown in the drawings, the vertical shaft 37 is provided with a sprocket 103 which is connected by means of a link chain 104 with a sprocket 105 which is mounted on the lower end of the shaft 98.

As illustrated in the drawings, only a small amount of adhesive is required in the reservoir 95. As the gumming cylinder 99 is rotated, adhesive in the reservoir 95 is thrown into engagement with a wiper or doctor blade 107 which serves to spread the adhesive uniformly over the entire peripheral surface of the cylinder 99. The offset or inclined surface 106 in the reservoir 95 serves to receive the accumulation of adhesive adjacent to the blade 107. In order to regulate the thickness of the film of adhesive which passes to the operative side of the attachment, the wiper blade 107 is pivotally supported on a stud 108 and is arranged to be adjusted toward and from the periphery of the gumming cylinder 99 by means of an adjusting screw 109. It should be noted that the right hand vertical wall of the reservoir is provided with an opening 110. This opening 110 is above the normal level of the adhesive within the reservoir 95.

In order to transfer adhesive from the cylinder 99 onto a predetermined portion of the throttle 21 being labeled, a soft or resilient rubber gumming roller 111 is rotatably supported on a vertical stud 112 carried by an arm 113 which is adjustably connected to the upper end of a vertically arranged shaft 114. The lower end of the shaft 114 is provided with a sprocket 115 which is connected by a link chain 116 with a sprocket 117 mounted on the vertical shaft 99. It will be readily apparent from the foregoing disclosure that a rotary motion of the shaft 37 (Fig. 4) will be transmitted through the link chain driving mechanism above described to rotate the gumming cylinder 99 and also to rotate the shaft 114 to swing the gumming roller 111 into engagement with the gumming cylinder 99 to pick up adhesive therefrom and thereafter to swing into engagement with a predetermined portion of the surface of the bottle 21 to apply a coating of adhesive thereto.

In order to facilitate timing the motion of the gumming roller 111, an adjustable connection is provided between the arm 113 and the shaft 114. A plate 118 is fixedly mounted on the shaft 114. The plate 118 is provided with a pair of spaced upwardly extending ears 119 and 120 (Fig. 5) each of which is provided with aligned opposed adjusting screws 121 and 122 respectively. The screws 121 and 122 are arranged to engage the opposite side faces of the arm 113 to facilitate a rotary adjustment of the arm 113 relative to the shaft 114. In order to lock the arm 113 in adjusted position relative to the shaft 114, a clamping screw 123 (Figs. 4 and 5) passes through an elongated arcuate slot 124 formed in the arm 113 and is screw threaded into the plate 118. It will be readily apparent from the fore-

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going disclosure that by adjusting the opposed screws 121 and 122, the position of the arm 113 may be rotarily adjusted relative to the shaft 114, after which it may be locked in adjusted position relative thereto by means of the clamping screw 123.

To facilitate operation of the center gumming roller 111, the arm 113 is preferably provided with a give-away or yieldable connection in which the end portion 113a supporting the stud 112 and the gumming roller 111 is pivotally connected by means of a stud 125 with the main part of the arm 113. A compression spring 126 (Fig. 5) serves normally to hold the give-away or yieldable portion 113a of the arm 113 in a position as illustrated in Fig. 5. As the arm 113 revolves in a counter-clockwise direction to carry the gumming roller 111 into engagement with the gumming cylinder 99, the give-away or yieldable portion 113a of the arm 113 is allowed to rock about the stud 125 as a pivot against the compression of the spring 126 so that the gumming roller 111 may be maintained in engagement with a sufficient portion of the gumming cylinder 99 to receive a coating of adhesive. After the gumming roller 111 has passed across the gumming cylinder 99, the continued rotation of the shaft 114 serves to move the arm 113 to carry the gumming roller 111 into dotted line position 111a (Fig. 2) in the path of the next bottle 21 as the table 10 continues its rotary motion to apply a coating of adhesive to a predetermined portion of the surface of the bottle 21 so as to stick the ungummed portion of the label 59 onto the bottle 21.

The operation of the improved machine will be readily apparent from the foregoing disclosure. The motor 13 is started continuously to rotate the rotary table 10, the feed turret 36, the bottle discharge turret 84 and to drive the link conveyer chain 22. This driving mechanism also serves in a manner above described to rotate the gumming cylinder 99 of the center gumming attachment and to revolve the center gumming roller 111. Bottles to be labeled are placed on the conveyer 22 at the left hand end (Fig. 1). The conveyer 22 carries the bottles 21 toward the right until they are engaged by the feed worm 45 which thereafter positively controls the feeding movement of the bottles toward the loading position. The bottle engaging hooks 42 of the feed turret 36 engage the bottles 21 when they reach a loading position and transfer the bottles 21 onto the rotary table 10 in alignment with the bottle supporting brackets 55. As soon as a bottle 21 has been placed on the table in engagement with the bottle supporting bracket, one of the vertically movable bottle clamps moves downwardly to clamp the bottle in position on the table. The table 10 rotates continuously and as the bottle to be labeled approaches the center gumming position, the center gumming roller 111 which is positioned in position 111a engages a predetermined portion of the surface of the bottles and continued rotation of the table causes the center gumming roller 111 to move across a predetermined portion of the surface of the bottle so as to apply a coating of adhesive thereto to stick the ungummed portion of the label to the bottle. After the bottle leaves the center gumming position, it moves into a labeling position where a label gummed in two end portions is applied either by the label applying apparatus 60 or 61. As above described the label applying apparatus 60 and 61 are arranged and timed to

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apply labels to alternate bottles as they are carried in a circular path by rotation of the table 10. As soon as the pickers 62 and 63 or 72 and 73 move a label into engagement with a bottle 21 to be labeled, one of the label grippers 58 moves into engagement with the center portion of the label to hold the label in a predetermined position on the bottle so as to allow the pickers 62 and 63 or 72 and 73 to withdraw to an inoperative position. The label gripper remains in engagement with the label until the bottle 21 passes through between the wiper brushes 80 and 81 which smooth out and wipe the label into engagement with the bottle. After the bottles leave the wiper brushes 80 and 81, the label gripper 58 moves out of engagement with the label, the vertically movable bottle clamp 57 moves upwardly so that when the labeled bottle 21 is engaged by a bottle engaging hook 86 carried by the bottle discharge turret 84, the labeled bottle 21 may be swung in a counter-clockwise direction from the table 10 onto the discharge end of the conveyer chain 22. It will be seen that the pickers 62 and 63 or 72 and 73 apply adhesive to end portions of the label and the center gumming roller 111 applies a coating of adhesive to a predetermined portion of the surface of the bottle to be labeled so that substantially the entire surface of the label is stuck to the bottle.

It will thus be seen that there has been provided by this invention apparatus in which the various objects hereinabove set forth together with many thoroughly practical advantages are successfully achieved. As many possible embodiments may be made of the above invention and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

We claim:

1. In a labeling machine having means to apply labels having spaced gummed portions into a predetermined position on an article to be labeled, a gumming apparatus including an adhesive reservoir, a rotatable cylinder therein, means including an adjustable blade to control the thickness of the film of adhesive on said cylinder, a rotatable gumming roller, and means to move said roller into engagement with said cylinder to receive a coating of adhesive and thereafter to move said roller into engagement with the article to be labeled to apply adhesive to a predetermined portion of the surface thereof for sticking the ungummed portion of the label to said article.

2. In a labeling machine having a rotatable table for supporting articles to be labeled, means to rotate said table, a center gumming attachment including an adhesive reservoir, a gumming cylinder therein, means including a shaft for rotating said cylinder, a rotatable gumming roller, an arm to support said roller, and means

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to swing said arm to move said roller into engagement with the cylinder to receive a coating of adhesive and thereafter to move said roller into engagement with the article to be labeled to apply adhesive to a predetermined portion of the surface of said article.

3. In a labeling machine having a rotatable table for supporting articles to be labeled, means to rotate said table, a center gumming attachment including an adhesive reservoir, a vertically arranged cylinder therein, a vertical shaft for rotating said cylinder, a vertically arranged rotatable gumming roller, an arm to support said roller, and means to move said arm so as to move said roller into engagement with said cylinder to receive a coating of adhesive and thereafter to move said roller into engagement with the article to be labeled to apply adhesive to a predetermined portion of the surface of said article.

4. In a labeling machine having a rotatable table for supporting articles to be labeled, means to rotate said table, a gumming attachment including an adhesive reservoir, a gumming cylinder therein, a shaft for rotating said cylinder, a rotatable gumming roller, an arm to support said roller, and means to swing said arm and roller in synchronism with the rotation of said table so as to swing the roller into engagement with said cylinder to receive a coating of adhesive and thereafter to swing said roller into engagement with the article to be labeled to apply adhesive to a predetermined portion of the surface thereof.

5. In a labeling machine having a rotatable table for supporting articles to be labeled, means to rotate said table, a center gumming attachment including an adhesive reservoir, a rotatable gumming cylinder therein, means to rotate said cylinder, a rotatable gumming roller, means including an arm to support said roller, means to swing said arm in synchronism with rotation of said table so as to swing the gumming roller into engagement with said cylinder to receive a coating of adhesive and thereafter to swing said roller into engagement with an article to be labeled to apply adhesive to a predetermined portion of the surface thereof, and a yieldable joint in said arm to facilitate maintaining the gumming roller in engagement with the gumming cylinder a sufficient time interval so that the entire cylindrical surface of the roller is completely coated with adhesive.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,849,548	Oslund	Mar. 15, 1932