Oct. 17, 1933. F. K. ARNOLD ET AL 1,931,369

LABEL DELIVERING MACHINE

Filed Oct. 1, 1930 6 Sheets-Sheet 1

Fig. 7.

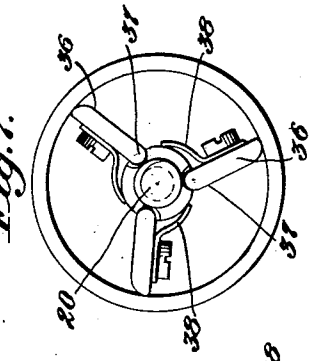


Fig. 1.

Inventors.
Frank K. Arnold and
Harry T. Kingsbury,
by
Attys.

Oct. 17, 1933. F. K. ARNOLD ET AL 1,931,369

LABEL DELIVERING MACHINE

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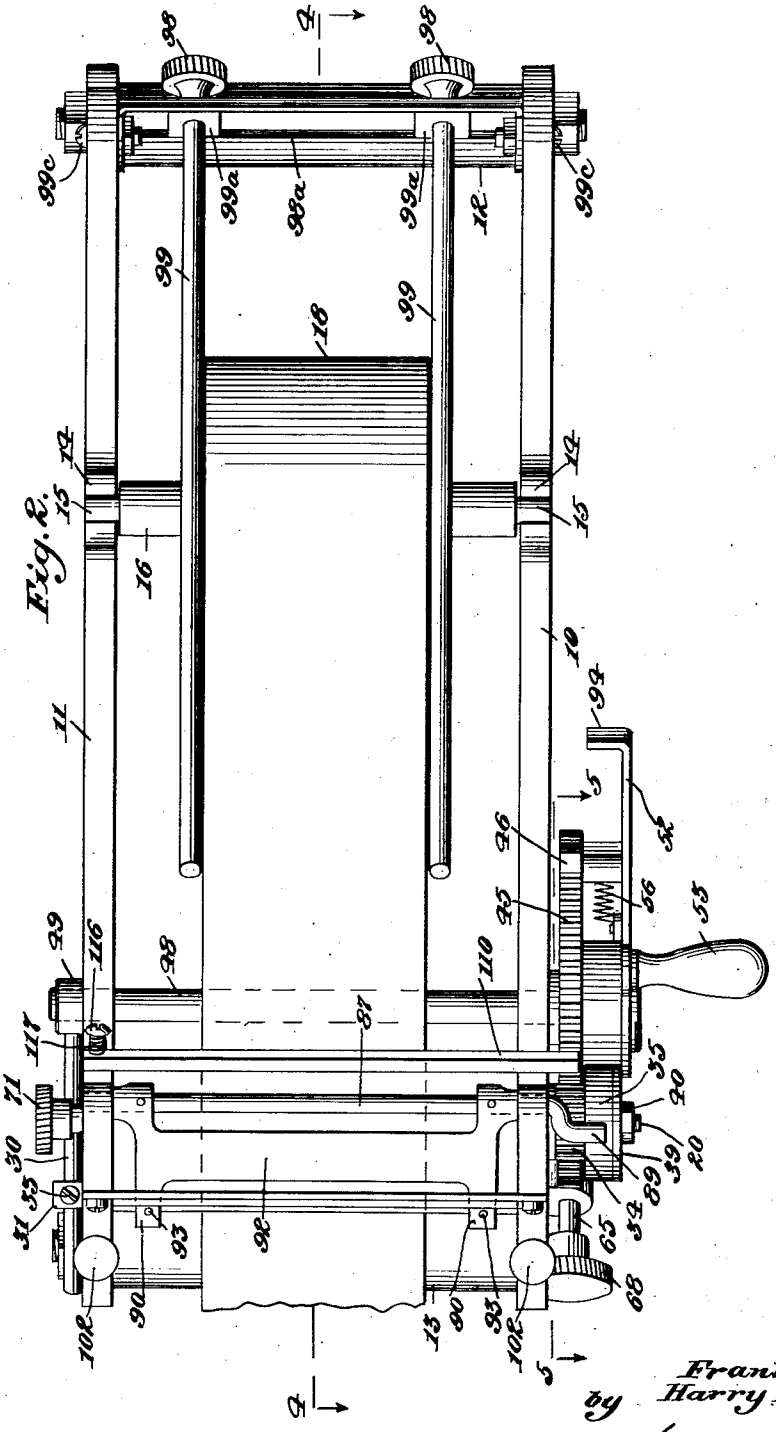


Fig. 2.

Inventors:
Frank K. Arnold and
Harry T. Kingsbury,
by
Atty's.

Oct. 17, 1933. F. K. ARNOLD ET AL 1,931,369

LABEL DELIVERING MACHINE

Filed Oct. 1, 1930 6 Sheets-Sheet 3

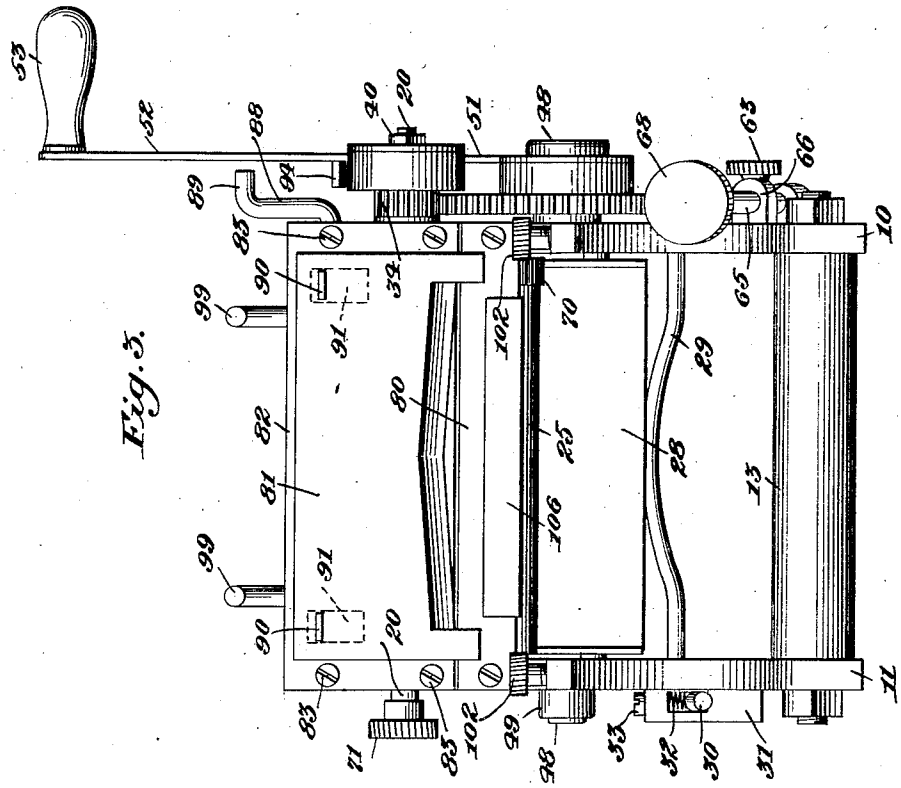


Fig. 3.

Inventors:
Frank K. Arnold and
Harry T. Kingsbury,
by
Attys.

Oct. 17, 1933. F. K. ARNOLD ET AL 1,931,369

LABEL DELIVERING MACHINE

Filed Oct. 1, 1930 6 Sheets-Sheet 4

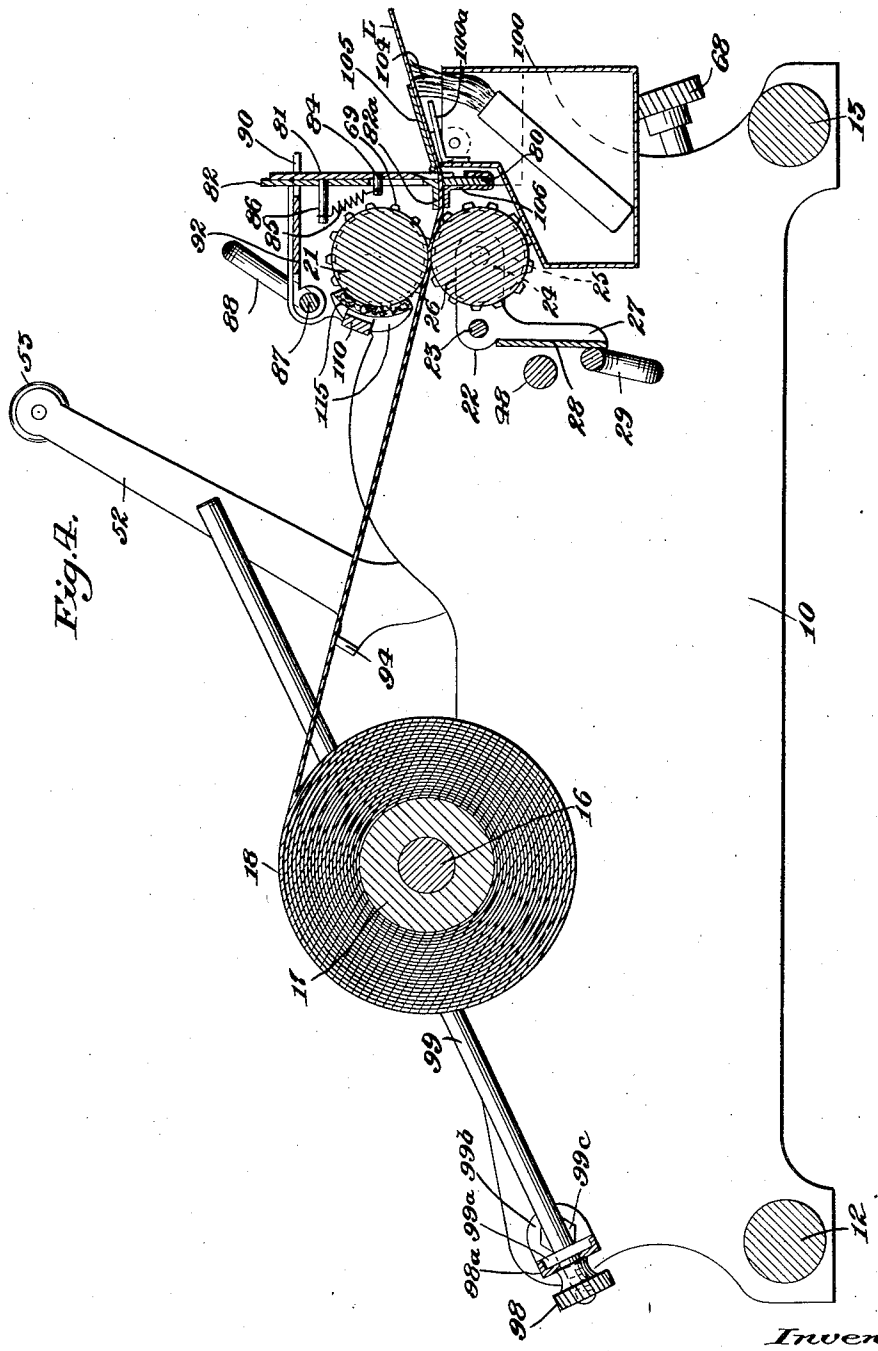


Fig. 4.

Inventors.
Frank K. Arnold and
Harry T. Kingsbury,
by Shumway Marmon & Co.
Attys.

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LABEL DELIVERING MACHINE

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Fig. 6.

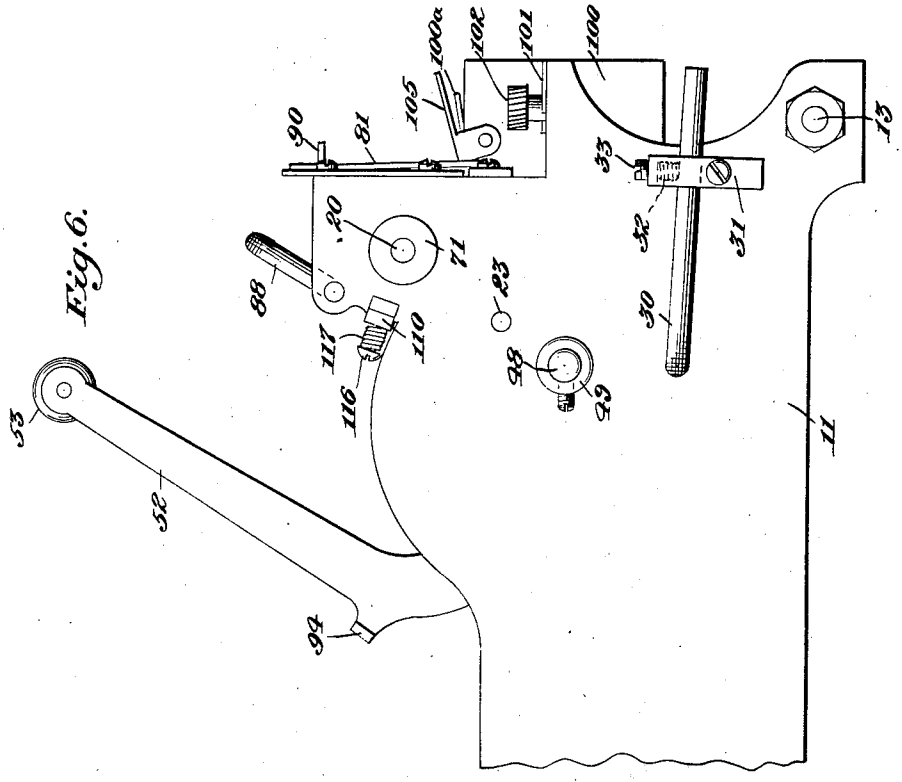
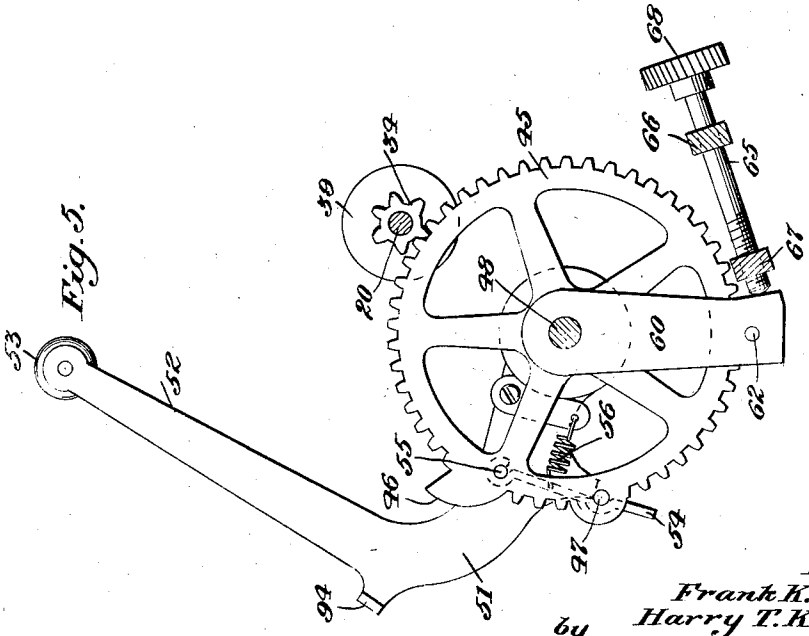


Fig. 5.



Inventors:
Frank K. Arnold and
Harry T. Kingsbury,
by Whitman & Marshall
Attys.

Oct. 17, 1933. F. K. ARNOLD ET AL 1,931,369

LABEL DELIVERING MACHINE

Filed Oct. 1, 1930 6 Sheets-Sheet 6

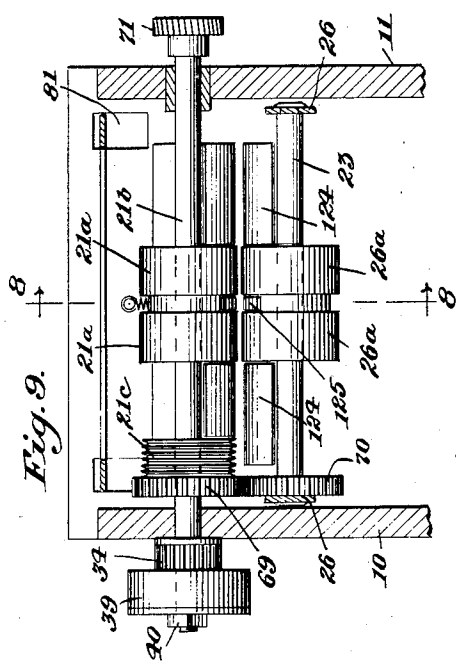


Fig. 9.

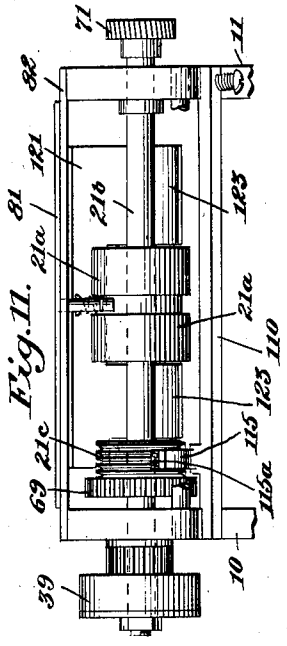


Fig. 11.

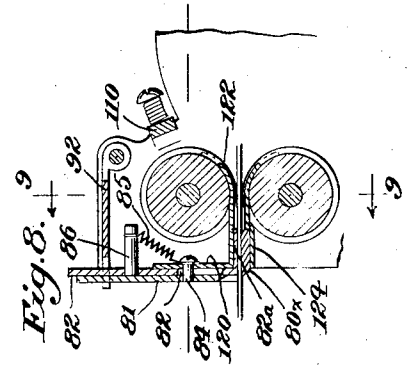


Fig. 8.

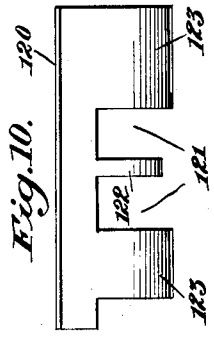


Fig. 10.

Inventors:
Frank K. Arnold and
Harry T. Kingsbury,
by Shumway Mann & Hofgren,
Att'y.

Patented Oct. 17, 1933 1,931,369

UNITED STATES PATENT OFFICE

1,931,369

LABEL DELIVERING MACHINE

Frank K. Arnold and Harry T. Kingsbury, Keene, N. H., assignors to Kingsbury Manufacturing Company, Keene, N. H., a corporation of New Hampshire

Application October 1, 1930. Serial No. 485,814

12 Claims. (Cl. 164—49)

This invention relates to improvements in machines for delivering labels, more particularly of the type in which a label coming from a printed strip is cut to a predetermined length and delivered with a moistened gum thereon ready for application to a container or the like.

One of the objects of the present invention is to provide a simple and rugged construction for such a mechanism whereby the label strip is advanced the required distance and then a severing means is operated to sever a label of the predetermined size by a continued movement of the operating mechanism.

Another object of the present invention is to provide means whereby the feeding mechanism may be adjusted to labels of different lengths, quickly and easily, and whereby any accumulating errors may be compensated accurately.

A further object of the present invention is the provision of means for releasing an operating handle from the advancing mechanism after the completion of a predetermined stroke of the latter, whereby the operating handle may drive the severing means without further operation of the advancing mechanism.

With these and other objects in view, as will appear in the course of the following specification and the drawings, an illustrative form of construction of a machine according to the present invention is set forth on the accompanying drawings in which:

Fig. 1 is a right hand side elevation of the machine;

Fig. 2 is a top plan view of the same;

Fig. 3 is an end elevation;

Fig. 4 is a sectional view on line 4, 4 of Fig. 2;

Fig. 5 is a fragmentary sectional view substantially on line 5, 5 of Fig. 2;

Fig. 6 is a fragmentary elevation of the left hand side of the machine.

Fig. 7 is a sectional view through the clutch.

Fig. 8 is a sectional view on line 8—8 of Fig. 9, of a modified form of construction of the feeding rollers and associated parts.

Fig. 9 is a sectional view on line 9—9 of Fig. 8.

Fig. 10 is a plan view of a guide shield.

Fig. 11 is a plan view of the modified form.

In the illustrated form of the machine a handle is provided with means whereby a forward and downward movement of the handle causes an advancement of the label strip by a distance equal to the length of an individual label, followed by a disengagement of the handle from the feeding mechanism whereby the handle is enabled to operate a severing means without further feeding of the label strip. The distance of feeding of the label strip is regulated by a system of adjustable stops, including a micrometric device for close adjustment. The positive feeding of the label strip is assured by pressure rollers and means are provided for relieving the rollers while inserting or adjusting the label strip. A moistening device is provided in close proximity to the severing means and as a guide incorporated therewith so that the end of the label strip is carried forward into engagement with the moistening means or similar device for assuring that the label has a layer of gum ready for attachment to a container or the like.

In the drawings the side frame members 10, 11 are held at the proper spaced intervals by the connecting bolt-pillar assemblies 12, 13. On the upper edges of these side members 10, 11 are provided guides 14 providing bearings for the reduced ends 15 of the label supply shaft 16 which has the centering cones 17 thereon, for supporting the roll 18 of printed, etc., labels in strip form.

These frame members likewise carry the upper feeding roll shaft 20 which is mounted on a fixed axis therein, and has the enlarged central portion 21 operating as an upper feed roll. Crank arms 22 are pivotally mounted by pin 23 in these side frames and have the arms 24 which extend substantially horizontally and receive the reduced stub ends 25 of the lower feeding roll 26, this roll and its stub ends being located wholly between the inner faces of the side plates so that it is free to be moved up and down. The downwardly extending arms 27 of the cranks are joined together by a web 28 extending transversely of the machine and adapted for engagement by the arcuately bent relieving shaft 29 which is journaled in the side plates and is provided exteriorly of the machine with a radially directed end 30 which passes through an aperture of the clip 31 on the side plate 11 and is normally forced downward by a compression spring 32 which may be adjusted by the screw 33.

The upper supply roll 21 has its shaft 20 extended through the right hand side plate, and loosely carries a gear 34 on the outside of the said plate. This gear is assembled rigidly with a clutch drum 35 having a plurality of dogs 36 located therein and engaged at their inner ends in grooves 37 of the shaft end 20. Each of these dogs has a spring and clamp member 38 engaging with the shaft to hold the respective dog in its proper position. An end plate 39 is secured to

the shaft by the clamping nut 40 which is threadedly engaged with the end of shaft 20.

The master circular rack 45 is provided with a plurality of teeth and is always in mesh with the gear 34. The master rack 45 has a radially outwardly projecting stop finger 46 to limit its movement as will be described more in detail hereafter. This master rack 45 also has an axially projecting pin 47 on its periphery. This master rack is loosely mounted on a shaft 48 which extends through the side plates 10, 11 and is journaled therein for accurate rotative movement, the left hand end of this shaft 48 being held by a clamping collar 49. Fixed to the right hand end of this shaft 48 is the hub 50, carrying a radially projecting arm 51 formed integral with the handle portion 52 extending substantially at right angles thereto and terminating in the operating handle 53 proper. A pawl member 54 is mounted on a pivot pin 55 fixed in the handle lever 51, 52, and is engaged by a coil spring 56 secured to this handle lever so that it is held in engagement with the pin 47 and thus obliges the master rack 45 to move with the operating handle 53 so long as only the normal resistance of feeding the label strip is opposed to such movement.

Loosely mounted on the shaft 48 is a radial arm 60 having a rebent end 61. A threaded member 62 joins the arm 60 with its rebent portion 61 and receives outside of the portion 61 a clamping thumb nut 63. When the thumb nut 63 is tightened down, the master rack gear 45 is clamped between the arm 60 and its rebent portion 61 so that the arm 60 is held rigid with the master rack 45. The radial arm 60 also has a portion 64 struck up therefrom to provide a strike plate to engage the end of the tangentially arranged micrometer adjusting screw 65 which is journaled at its cylindrical portion in a lug 66 of the side plate 10 and is engaged at its threaded portion with an internally threaded lug 67. The free end of the micrometer screw 65 carries the adjusting thumb piece 68.

Between the side plates 10, 11 the shaft 20 and its feed roll 21 is provided with a gear 69 normally in mesh with a gear 70 on one stub shaft 25 and its feed roll 24 so that movements are transmitted between the gears and shafts. The left hand end of the shaft 20 is provided with a thumb wheel 71 whereby this shaft may be moved by hand if so desired.

The ticket severing device comprises a stationary lower knife 80 and a movable upper knife 81 having a cutting edge in the form of a flat inverted V. The upper movable knife rests against a guide plate 82 secured upward to the extensions of the side plates 10, 11 by the screws 83. A pin 84 fixed in the upper knife receives the lower end of an obliquely upwardly and rearwardly extending tension coil spring 85 whose upper end is engaged by a pin 86 carried on the fixed frame plate 82, so that this spring holds the upper knife 81 in engagement with the guide plate 82 and also returns the upper knife after it has been moved downward to sever a label.

A severing shaft 87 is journaled in the side plates 10, 11 of the machine and has a radial extension 88 at the right hand side of the machine, which terminates in an axial crank pin 89 (Fig. 3). Fixed to the shaft 87 between the side plates 10, 11 are a pair of crank arms 90 which extend through slots 91 in the guide plate 82 and fit closely in apertures of the upper movable knife 81 (Fig. 3). The two crank arms 90 are preferably joined by a central web 92 for greater strength, and the projecting ends of these arms may be provided with small pins 93 in front of the movable knife 81 to prevent accidental displacement of this knife without the prior removal of the pins.

The handle lever 51, 52 is provided with an offset and axially extending finger 94 which during the movement of the operating crank handle 53 is brought into contact with the axial crank pin 89 of the severing means.

It is usual to provide a supply 18 of labels in strip form having printing on one side, being the upper or outer side in the drawings, while the lower or inner side of the strip is coated with gum. It is preferred to provide means of moistening such gum or for placing a coating of gum upon the lower side of an uncoated label. For this purpose a liquid tank 100 is provided with laterally extending arms 101 having apertures to receive the reduced threaded portions of the clamp screws 102 which are threadedly engaged in the upper surfaces of ledges 103 on the side plates 10, 11. A wick or brush 104 in the liquids tank passes through a top aperture of the same and is presented for engagement by the end label L (Fig. 1) of the label strip. A guide member 105 is pivotally mounted on the liquids tank, and has its inner end rounded upwardly and carried opposite the inwardly turned end 82*a* of the end plate 82, so that as a label is fed forward by the supply rolls 21, 24, this label is forced between the cover 105 and the top of the liquids tank, and is thereby brought into engagement with the brush 104. A guide clip 106 is secured around the lower knife 80 and is located opposite the upper guide 82*a*.

The method of operation of this mechanism is as follows:

A roll 18 comprising a strip of labels of any desired width and having a certain predetermined length for the individual labels is placed on the locating cones 17 and the shaft 16 passed therethrough and dropped into the bearing brackets 14. The guide arms 99 are then adjusted into guiding relationship with the faces of the rolls (Fig. 2) by releasing the clamping nuts 98 at their ends and sliding the rods along the slotted guide channel 98*a* until they are in the proper position and then tightening them again. This guide channel fits around the flanges 99*a* on the respective rods 99, and itself is supported by the bent ends 99*b* which are pivotally mounted by bolts 99*c* in the face plates 10, 11. It is preferred to center the label strip in the machine during this adjusting operation.

To regulate the machine in case a different predetermined length of individual label is to be delivered and cut, the moistener box or tank 100 is removed. The label strip is drawn out and fed forward between the supply rolls 21, 25 by rotating the thumb wheel 71 until three label lengths have passed through. The exposed part of the strip is then split and one side is torn off. The clamp nut 63 is released. The releasing lever 30 is raised so that the lower roll 25 frees the strip.

The handle 53 is now drawn forwardly until the finger 46 is in close engagement with the stop bar 110, while the spring pawl 54 is yet engaged with the pin 47 as this latter detail is shown in Fig. 1. The arm 60 is swung downward until the plate 64 is against the micrometer plate 65. The label strip is now moved until the proper line for severing is flush with the cutting edges of the knives 80, 81, and then the lever 30 is released. The thumb wheel 71 is now rotated so that the handle 53 and the master rack gear 45 are moved

backwardly until the other cutting edge of the label which has thus been moved backward in the machine is brought opposite the knives 80, 81. During this movement the plate 64 has been retained by the end of the micrometer screw 65, while the master rack 45 has been free to move between the portions 60, 61 of the radial arm supporting the clamping nut 63. When the full length of the label has been fed backward in the machine, the movement of the thumb wheel 71 is discontinued and the clamping nut 63 is tightened. The machine is now adjusted for the proper distance for the cutting. It is obvious that any predetermined corresponding portions of two labels may be employed for regulating the machine, and thereafter the label strip may be moved upon raising the lever 30 so that the proper portion of the label strip comes between the knives for severing.

With the machine thus adjusted, the moistening box is replaced.

To employ the machine, the operator stands in front of the left hand end of the machine in Fig. 1, which has been referred to as the front of the machine. The handle 53 is drawn forward, so that the spring pawl 54 carries the pin 47 with it and thereby rotates the master rack 45 in a counter-clockwise direction until the radially projecting finger 46 encounters the stop bar 110, and the master rack 45 is prevented from further forward movement. During this movement of the master rack 45, however, its gear teeth have been in mesh with the gear 34 on the shaft 20 and have caused a rotation of this shaft and therewith of the upper supply roll 21, in a clockwise direction in Fig. 1. The gears 69 and 70 are likewise in mesh and hence the lower supply roll 25 is driven in the opposite direction while in pressing contact with the label strip, which is thus advanced through a distance determined by the movement of the master rack prior to the engagement of finger 46 with the stop bar 110.

When the finger 46 engages and thus arrests the master rack 45, the spring pawl 54 is released from the pin 47 by the continued forward movement of the handle 53. The handle lever 51, 52 is therefore free to make a further movement until its projecting portion 94 engages the end 89 of the severing mechanism and causes a counter-clockwise movement of the shaft 87 thereof in Fig. 1. This results in a downward movement of the ends of the crank arms 90, and therewith a downward movement of the upper movable knife 81 against the action of the return spring 85, until this knife has severed a label from the strip, by cooperation with the lower knife 80.

During the forward movement of the label strip, its end has been forced between the cover 105 and the internal guides 100*a* of the moistening box 100, and its lower side has been brought into engagement with the moistening brush 104, so that upon the completion of the severing movement, a label is presented ready for application to a container, being momentarily held by the engagement of the brush 104 with its lower side and the cover 105 with its upper side.

The operator now pushes the handle 53 backward away from himself, so that the handle lever 51, 52 through its spring pawl 54 now operates upon the pin 47 to rotate the master rack 45 in a clockwise direction until the plate 64 is engaged by the end of the micrometer screw 65. If the pawl 54 has not previously returned to the position shown in Fig. 1 during this movement of the handle lever 51, 52, this position is now attained by the slight continued movement of this handle lever after the master rack has been stopped.

The continued reciprocation of the handle 54 results for each cycle in the delivery, moistening, and severing of a single label of the proper length from the label strip.

The adjustment thus attainable on the master rack 45 by releasing and retightening the clamping screw 63 may lead to slight accumulating errors. This, however, may be compensated and such errors are eliminated by adjustment of the hand wheel 68 of the micrometer screw 65 which regulates the position of arrest of the plate 64.

During the initial return movement of the handle lever 51, 52, the spring 85 operates to move the knife 81 upwardly, and therewith restores the crank pin end 89 of the severing shaft 87 to its proper position.

A particular feature is the provision on the stop bar 110 of a brake shoe 115 for engagement with the upper supply roll 21. This stop bar is held in position by a screw 116 passing through its other end. A coil spring 117 is located between the head of this screw and the bar 110 to hold this bar in position so that a slight retarding or braking effect may be exerted by the shoe 115. When the finger 46 encounters the end of the stop bar 110, however, this braking pressure is increased, so that there is no continued feeding of the strip by rotational inertia of the supply rolls 21, 25.

In the modified form of construction shown in Figs. 8 to 11, the upper cylinder roll is replaced by a pair of rolls 21*a*, spaced apart and preferably formed integrally with the shaft 21*b* which carries the drum 39 of the clutch device, the driving gear 34 and the gear 69, as well as a brake drum 21*c* which is of greater diameter than the shaft. This shaft 21*b* also carries the hand wheel 71 by which the shaft may be revolved for manual adjustment.

The lower shaft 23 likewise carries a pair of narrow drums 26*a* which are separated by a central groove. This shaft 23 carries the gear 70 in mesh with gear 69 and is supported by the crank arms 26.

The upper or movable knife 81 is provided as before with an inwardly extending pin 86 for the return spring 85. The front plate 82 has the inwardly extending bottom flange 82*a*. The lower knife in this form of construction is shown as a horizontal plate 80*x*.

Connected to the upper knife 81 by the pin 84, is a guide plate 120 which extends inwardly and has its inner edge cut away to provide the space 121 to receive the rolls 21*a*, 21*a* with a tongue 122 therebetween, to fit in the groove between these rolls. The side wings 123 of the guide plate 120 guide the edges of wide labels. The tongue 122 and the wings 123 are curved relatively upwardly to facilitate the entry of the end of a label strip.

A similar guide plate 124, having the downwardly curved central tongue 25 and side wings, is provided, with cut away portions to receive the lower rolls 26*a*, 26*a*. The stop bar 110 has a brake shoe 115 as before, provided with a leather facing 115*a* and cooperates with the grooved brake drum 21*c*.

This modified form of construction is designed to avoid any creeping or false movement of the label strip as a result of inertia. For this purpose it is preferred to form the narrow rolls 21*a*,

26a, of aluminum. The operation is the same as before.

It is obvious that the invention may be employed in many other ways than that specifically illustrated and disclosed without departing from the scope of the appended claims.

Having thus described the invention, what is claimed as new, to be secured by Letters Patent, is—

1. In a label delivering machine, an operating handle, a master rack, means whereby said handle moves said rack, feeding rolls for a label strip, a clutch having one of its elements fixed to one of said rolls and the other of its elements connected for driving by said master rack, so that said master rack moves said feeding roll in one direction and is released thereafter from said clutch for a free return movement, means to limit the movement of said master rack, a handle, means to couple said handle to said master rack, said coupling means being released upon the engagement of said master rack with said limiting means, and a severing mechanism operable by said handle after said master rack has been uncoupled therefrom.

2. In a label delivering machine, a manually operable member, a master rack, a feeding mechanism, means operated by said master rack to move said feeding mechanism in one direction only, releasable inter-engaging means on said manually operable member and on said rack, stops to arrest the movement of said rack whereby said interengaging means are disengaged by a further movement of said member after the rack has been arrested, a handle, means to couple said handle to said master rack, said coupling means being released upon the engagement of said master rack with said limiting means, and a severing mechanism operable by said handle after said master rack has been uncoupled therefrom.

3. In a label delivering machine, a manually operable member, a master rack having a projection thereon, a spring pawl on said manually operable member adapted to engage said projection, means to limit the movement of said rack in one direction, a feeding mechanism operated by said rack, said pawl being disengaged from said pin by a movement of said handle after said rack has been arrested by said stopping means, and a severing mechanism actuated by said member after such disengagement.

4. In a label delivering machine, a manually operable member, a master rack having a stop finger rigid therewith, a strike plate, means to fix said plate to said rack at a predetermined distance from the stop finger, and fixed stops adapted to be engaged by said stop finger and said strike plate to limit the movement of said rack.

5. A label delivering machine as in claim 4 in which the fixed stop for said plate is a screw mounted in the machine frame so that the point of arresting said plate may be accurately adjusted to correspond to the length of the label.

6. In a label delivering machine, a manually operable member, feed rolls for a label strip, a brake for said feed rolls, means operated by said member to revolve said rolls for feeding, means to limit the feeding movement of said member including a stop device, and a connection between said stop device and said brake whereby the braking load is increased at the completion of the feeding movement.

7. In a label delivering machine, a feeding mechanism including a feed roller, a brake shoe for said roller, an actuating device for said roller, a relatively fixed stop to limit the movement of said device and means connecting said stop to said brake shoe whereby a braking load is applied to said shoe by the engagement of said device with said stop.

8. In a label delivering machine, a frame, a fixed knife on said frame, a movable knife, said frame including means to guide a movable knife, and a tension spring engaging said knife and frame to hold said movable knife against said fixed knife and to return said movable knife after a severing movement.

9. In a label delivering machine, a frame, a manually operable member, a rockable measuring member having a stop finger rigid therewith, a fixed stop on said frame for engagement by said finger, a strike plate, means to fix said plate to said measuring member at a predetermined angular distance from the stop finger, and a screw mounted on the machine frame tangentially to said measuring member and operative as a stop to limit the movement of said strike plate.

10. In a label delivering machine for a label strip, a feeding mechanism including a feeding device for said strip and a ball clutch for driving the device in one direction, an operating mechanism, means to couple said operating mechanism to said clutch whereby to drive said feeding device in said one direction, means to arrest the movement of said feeding mechanism after a predetermined travel in said one direction and thereupon to effect the uncoupling of the said operating mechanism from said clutch, a severing mechanism, interengaging means on said operating and severing mechanism whereby said operating mechanism will actuate said severing mechanism after the operating mechanism has been uncoupled from said feeding mechanism, said operating mechanism during its return movement engaging said ball clutch whereby to return the same to an initial position without movement of the feeding device, and a stop adjustable by small increments to limit the return movement of said ball clutch, whereby said feeding device will be operated only through the distance determined by the movement of the ball clutch from its position limited by said stop to the position limited by said arresting means so that definite lengths of the label strip are delivered during each complete operation of the operating mechanism.

11. In a label delivering machine for a label strip, a feeding mechanism including a feeding device to advance the label strip and means including a ball clutch for moving said feeding device, a manually operable lever, means to couple said lever to the ball clutch whereby to actuate the latter through a predetermined distance of movement whereby to move said feeding device to advance said label strip, severing means including a severing shaft having an offset crank pin, means for arresting the movement of said feeding mechanism operative to effect the uncoupling of said lever from said clutch, means on said lever for engaging said crank pin after the lever has been released from said clutch whereby to operate said severing means, and a stop adjustable by small increments to limit the return movement of said lever, said lever operating to reestablish its coupling with the ball clutch at the point where said uncoupling was effected, whereby the ball clutch is operated by the lever during movement of the latter in one direction to cause said feeding device to move a predetermined dis-

tance for accurately feeding a predetermined length of said strip, and is returned a like distance during the return movement of the lever without movement of the feeding device whereby to prepare for the advancing of the label strip during the next lever operation.

12. In a label delivering machine, a frame, a feed roll mounted on a fixed axis on said frame, a movable feed roll, a transverse web extending in the direction of said fixed axis and having its ends bent into parallelism and pivoted to said frame for movement about an axis parallel to said fixed axis, said ends providing supports for said movable roll so that it may turn about an axis parallel to said fixed axis, and a relieving shaft journaled in said frame parallel to said fixed axis and having a bent portion intermediate its length adapted to engage said web and thereby control the relative position of said rollers.

FRANK K. ARNOLD.
HARRY T. KINGSBURY.