Nov. 2, 1943. A. P. KRUEGER ET AL 2,333,109

TAPE-SERVING MECHANISM

Filed Sept. 11, 1940 2 Sheets-Sheet 1

Fig. 1.

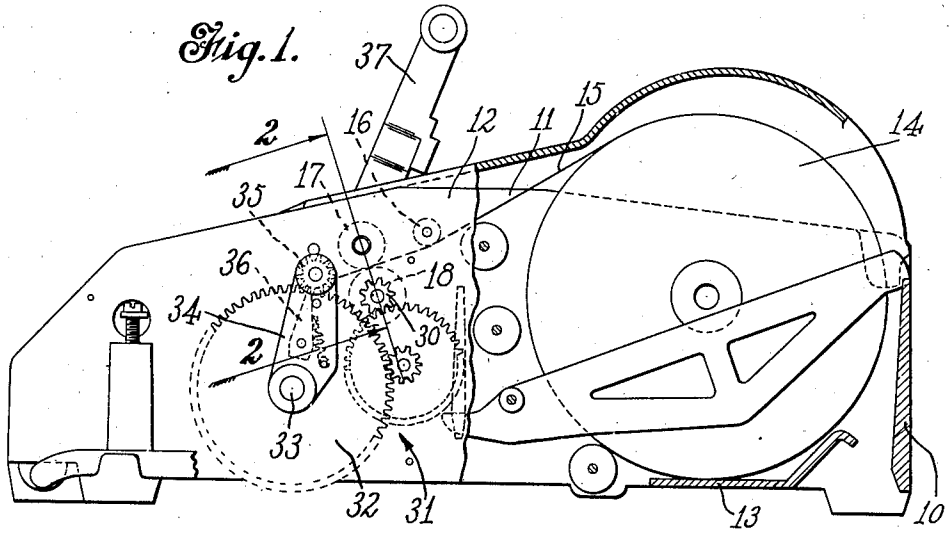


Fig. 2.

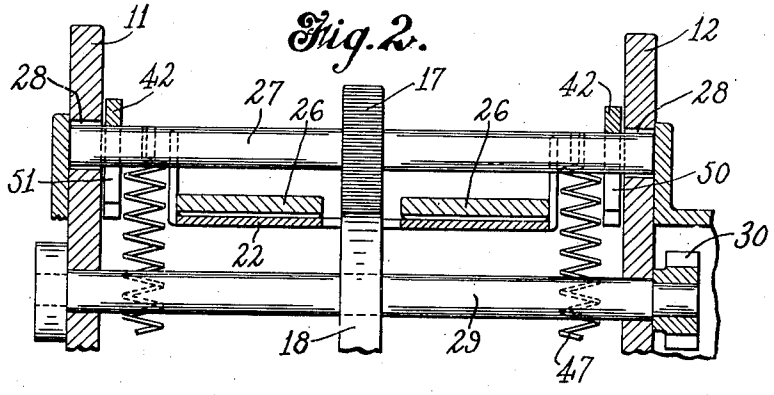
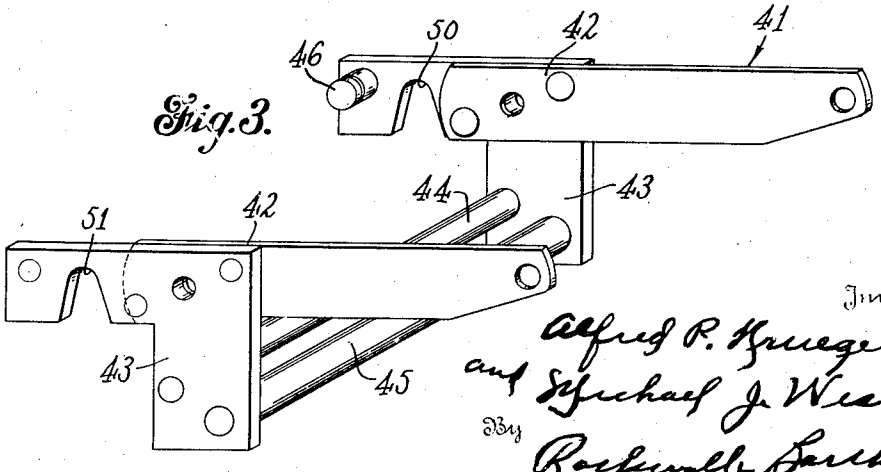


Fig. 3.



Inventor

Alfred P. Krueger

and Michael J. West

By Rockwell & Barlow

Attorneys

Nov. 2, 1943. A. P. KRUEGER ET AL 2,333,109

TAPE-SERVING MECHANISM

Filed Sept. 11, 1940 2 Sheets-Sheet 2

Fig. 4.

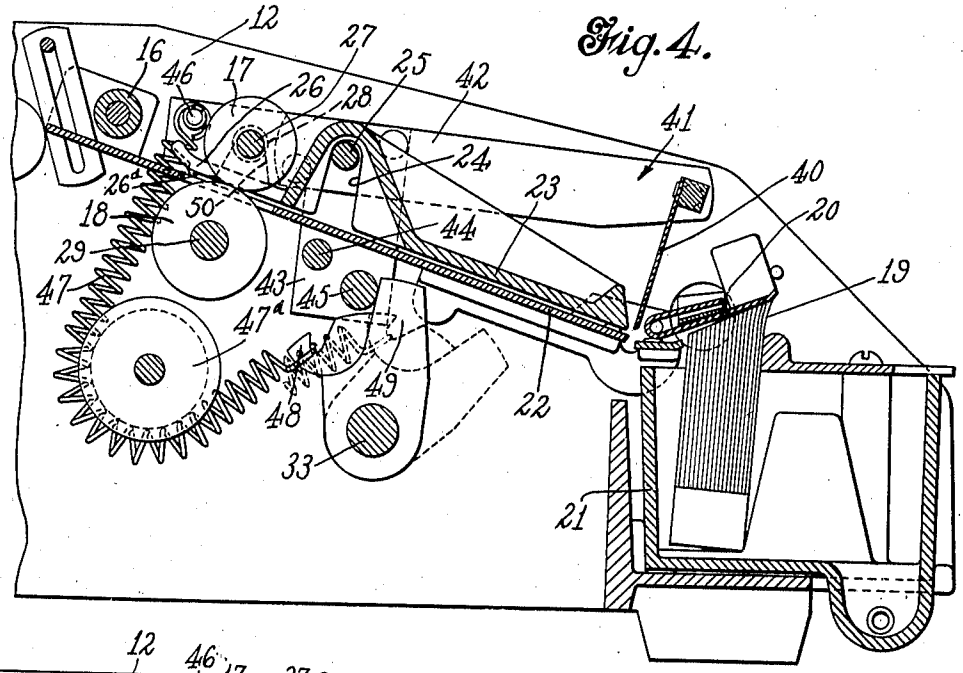


Fig. 5.

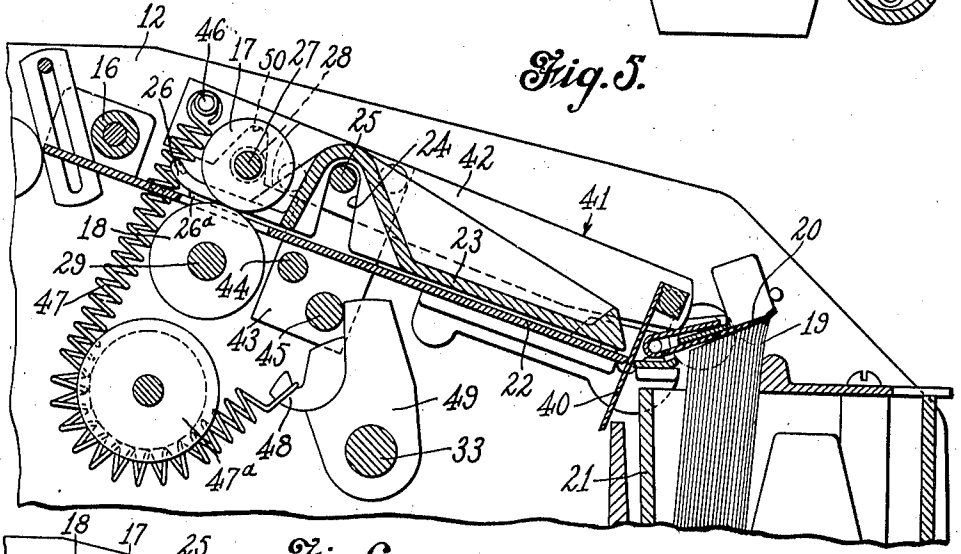
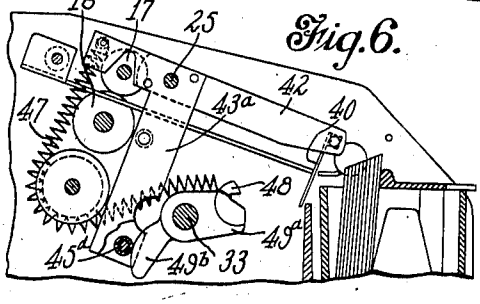


Fig. 6.



Inventor

Alfred P. Krueger

and Richard J. West

By Bakewell & Bartholow

Attorneys

Patented Nov. 2, 1943

2,333,109

UNITED STATES PATENT OFFICE

2,333,109

TAPE-SERVING MECHANISM

Alfred P. Krueger, Stratford, and Michael J. West, Shelton, Conn., assignors, by mesne assignments, to Better Packages, Inc., Shelton, Conn., a corporation of New York

Application September 11, 1940, Serial No. 356,312

11 Claims. (Cl. 164—43)

This invention relates to tape-serving machines, and more particularly to a device designed to deliver a strip of gummed tape for sealing packages, parcels, boxes or the like. Such tape is commonly made of paper, and is furnished in rolls, the tape being gummed upon one surface and wound up in the roll so that the gummed surface may either be on the inner or outer side of the strip when in the roll.

As the tape is in a continuous strip, it is advantageous to provide a device which will not only deliver the strip of tape with the gummed side properly moistened for adhering to the package or parcel, but also to provide for the cutting off of a length of the strip to save the operator the necessity of tearing it or cutting it manually. Moreover, it is desirable that the cutting off operation be performed in a substantially automatic manner by the machine, that is, that the cutting off operation will be performed by the device when it is operating in the usual manner to deliver the strip of tape from the machine, and without any additional operations performed specifically for the cutting off of the strip.

A machine of this character is usually provided with tape-feeding means, such as a pair of feed rolls between which the tape passes to feed the tape from the roll through the moistening element so that it may be delivered in moistened condition, and while the parts of the machine should normally be in a feeding position so that the feed will begin immediately upon the operation of the device, it is also advantageous to provide means for stopping the feed during and after the operation of the cut-off mechanism, so that there will be no forward movement of the tape while the knife is across the path of the tape.

The present invention relates particularly to the feeding mechanism of a machine of the character described, and comprises in the embodiment illustrated a pair of feed rolls which are at all times in contact with the tape, one above and the other below the same. However, mere contact of the rolls with the tape is not sufficient to bring about the feeding operation, and spring-pressed means are provided to place the rolls under tension so that the tape will be positively gripped therebetween and fed when the rolls are rotated. Upon operation of the cut-off mechanism this tension is relieved, so that, while the position of the rolls is not changed, there is no longer a positive gripping of the tape between them, and hence the tape is not fed forwardly until the knife is raised and the rolls again placed under tension. It may be stated that the device shown in the present application is in many respects similar to the device shown in our application Serial No. 332,948, filed May 2, 1940, which differs therefrom principally in the arrangement of the feed rolls and cut-off mechanism and the associated parts.

One object of the invention is the provision of an improved tape-serving machine having mechanism for cutting off a length of tape after delivery of the same from the machine, the device having feeding mechanism arranged to be rendered inoperative upon the operation of the cut-off mechanism.

A still further object of the invention is the provision of a tape-serving machine of the character described, having feed rolls which are spring pressed into gripping relation with the tape, and means associated with the cut-off mechanism to remove this spring pressure from the rolls during the operation of the cut-off mechanism.

Still another object of the invention is the provision of a tape-serving machine having a feeding mechanism comprising a pair of rolls between which the tape passes, and spring-pressed means associated with one of said rolls to urge it into contact with the surface of the tape during the feeding operation, and means associated with a cut-off device for severing the tape to remove the spring tension from this roll so as to arrest the feeding operation during the time and immediately after a length of tape is being severed.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a side elevational view of a tape-serving mechanism embodying our invention;

Fig. 2 is a sectional view through the feed rolls of the mechanism on line 2—2 of Fig. 1;

Fig. 3 is a perspective view of the swinging knife frame employed in the machine;

Fig. 4 is a longitudinal sectional view through the forward portion of the device;

Fig. 5 is a view similar to Fig. 4 but showing the parts in another position; and

Fig. 6 is a fragmentary sectional view of a modified form of our device, the section being taken just within the frame member 11.

To illustrate a preferred embodiment of our invention we have shown in Fig. 1 of the drawings a tape-serving mechanism comprising a frame 10 having upstanding side walls 11 and 12 by which the working parts of the mechanism are supported. At the rear part of the machine means are provided such as a support 13 for sup-

porting a roll of tape 14, the strip of tape 15 issuing from the roll being guided below a roller 16 to pass between a pair of feed rolls 17 and 18 and thence over a moistening device 19 against which the tape is pressed by a plate 20.

The moistener 19 may consist of the usual brush moistener which is disposed in a container 21, which may contain water or other suitable moistening fluid to be carried to the tape by the brush 19. Between the feed rolls 17 and 18 and the moistener 19 the tape passes over a tape-supporting table 22 which may be carried in any desired way between the side walls 11 and 12 of the frame. Above the table 22 is a cooperating cover plate 23 provided with a slot 24 by which it may be placed over and supported by a rod 25 extending between the side plates. This cover plate is provided with a rearwardly extending bifurcated portion providing legs 26 which have depending lugs 26a bearing upon the upper surface of the tape rearwardly of the bite of the feed rolls 17 and 18. Forwardly of these rolls the cover plate and tape-supporting table provide therebetween a horizontal guide slot through which the tape passes in flat condition.

As shown in Fig. 2, the feed roller 17 is mounted upon a shaft 27, and will preferably be rotatably mounted upon this shaft. The shaft is supported at its ends in openings 28 in the frame members 11 and 12, and it will be observed that these openings are slightly larger in diameter than the shaft, so that the rollers may be separated in order that the tape may be slipped between them. As the roller 17 is above the roller 18, the former would be urged toward the latter by gravity, and the two will normally stand in contact when there is no tape between them, and when the tape is passed between them the upper roller will bear against the upper surface of the tape. This slight pressure of the upper roller due to its weight will not, however, be sufficient to effect a proper feed of the tape, and means are provided, as will be described hereinafter, to effect proper cooperation between the two rollers for proper feeding.

The roller 18 is secured to a shaft 29 rotatably mounted in the side frames 11 and 12, which shaft carries at one end a pinion 30, the pinion being driven by a gear train, designated generally by the numeral 31, from a gear 32 rotatably mounted on a shaft 33. Secured on one end of the shaft 33 is an arm 34 carrying a pinion 35 which is in mesh with the teeth of the pinion 32 and held against rotation in one direction by the pawl 36, so that when the shaft 33 is rotated the gear 32 will likewise be rotated, thus causing rotation of the shaft 29 and feed roller 18 to effect the forward feed of the tape. On the other end of the shaft 33 is secured a handle 37 by which the shaft is operated.

To provide for the severing of the tape when a desired length has been fed from the device, a cut-off knife 40 is provided, which knife is pivoted to a swinging frame, designated generally by the numeral 41, which frame is pivoted upon the shaft 25. This frame is shown more especially in Fig. 3 of the drawings, and comprises a pair of side members generally T-shaped in form, these members having horizontally disposed portions 42 and downwardly extending portions 43, the latter being connected by brace rods 44 and 45. It will be understood that the side members 42 are, as shown, for example, in Fig. 2 of the drawings, located adjacent the side plates 11 and 12. The particular construction by which the knife blade 40 is mounted in the frame 41 is not claimed in this case as the same form as the subject-matter of certain claims in our application, Serial No. 332,948, above referred to.

The side members 42 of the knife frame are provided adjacent their rear ends with studs 46 to which springs 47 are connected at one end, which springs pass around idler rollers 47a and have their other ends secured to hooks 48 carried by arms 49 fixed upon the shaft 33, one adjacent each side wall of the frame.

The horizontally extending portions 42 of the knife frame are provided with slots 50 and 51, which slots embrace the shaft 27 of the roller 17, so that the rear ends of the arms of the knife frame bear upon this shaft and, under tension of the springs 47, urge this shaft downwardly, thereby urging the feed roller 17 toward the surface of the roller 18 or against the tape when the latter is between these rollers. Therefore, under tension of the spring 47 the feed rollers are held in proper feeding relation to positively and efficiently feed the tape from between them. When, however, the rear ends of the horizontal arms of the knife frame are swung upwardly about the shaft 25, i. e., when the knife 40 is swung downwardly, the shaft 27 will be relieved of the pressure of the arms of the knife frame, and will no longer be held in feeding relation with the roller 18.

As will be noted from Figs. 4 and 5, the upper ends of the arms 49 are in position to engage the rod 45 when the shaft 33 is turned so that the handle 37 is in its extreme rearward position, as shown in Fig. 5. This engagement swings the knife frame about the shaft 25 so as to effect release of the shaft 27 from pressure of the springs 47, and to bring the knife 40 downwardly, as shown in this figure, to sever the tape at the front edge of the tape-supporting table 22. When the handle 37, and therefore the arm 49 is moved away from the rearward position shown in this figure, the springs 47 are tensioned to raise the knife and bring the rear end of the knife frame into engagement with the rod 27 to again bring the rollers 17 and 18 into feeding relation. It will be understood that the position of the roller 18 is not changed, but the pressure of the arms 42 upon the shaft 27 of the roller 17 will cause the roller to bear against the upper surface of the tape with sufficient friction to effect positive feeding, while, when the shaft is relieved from the pressure of this arm, no feeding will be effected, as the upper roller will bear only lightly upon the tape due to its weight, and the lugs 26a on the cover plate 23 will bear upon the surface of the tape and exert a drag thereon to resist any tendency of the rollers to feed when free of tension.

The normal position of the parts is that shown in full lines in Fig. 4, and it will be noted that the feed rollers are pressed together in tape-feeding relation by the springs 47. When the handle 37, and therefore the arms 49, are moved forwardly to effect feed of the tape, this feeding relation will, of course, be maintained, and the tension of the springs 47 even increased, as these springs are stretched as the arms 49 move to their forward or dotted line position shown in this figure. When the handle has been moved forwardly to a sufficient extent to feed a desired length of tape, it is released, whereupon the spring 47 moves the handle rearwardly with considerable momentum, and carries it beyond the full-line position of Fig. 4 to the position shown

in Fig. 5. During the latter part of this movement the arms **49** strike the rod **45** to swing the knife downwardly and raise the arms of the knife frame from the shaft **27** so as to relieve the tension on the roller **18** and insure that no feeding of the tape will result until the knife is returned to its normal position shown in Fig. 4.

In Fig. 6 of the drawings we have shown a modification of our invention wherein the parts are so arranged that the feed rollers are relieved from tension during the final portion of the movement of the lever **37** in its forward or feeding direction. In other words, while, as shown in Figs. 1 to 5 of the drawings, the feed roller **17** is under tension until the lever **37** has proceeded on its return stroke to such a point that the arm **49** will strike the rod **45** and thus swing the rear end of the knife carrier upwardly, in the form of our invention shown in Fig. 6, when the lever has proceeded forwardly on its feed stroke to a predetermined point, the knife frame will be swung about its pivot to relieve the tension on the rollers and effect the severing operation, all prior to the beginning of the return stroke of the lever.

To this end the knife-carrying frame and associated parts are similar to the corresponding parts previously described, this frame having the horizontal members **42**, and depending members **43a**, which are somewhat longer than the corresponding parts **43** previously described. These depending members **43a** are joined by a rod **45a** below the shaft **33** on which the operating lever (not shown) is secured. Arms **49a** secured upon the shaft **33** are provided with tail or cam portions **49b** which are adapted to strike the rod **45a** when the shaft **33** has been rotated in a forward or feeding direction a predetermined amount. It will be understood that the arms **49a** correspond to the arms **49** of the modification first described, and carry hooks **48** to which the springs **47** are secured.

It will be apparent that with this construction, when the operating lever is drawn forwardly tape will be fed from the device by the feed rollers **17** and **18**. However, when this arm arrives at a predetermined position in its forward movement the cams **49b** will strike the rod **45a** and swing the knife carrier about its pivot **25** to bring the knife downwardly and sever the paper and raise the rear end of the knife-carrying frame from the shaft of the roller **17**, so that this roller will no longer be under tension and feeding movement will be stopped. The rollers **17** will, of course, be relieved of tension immediately upon the beginning of the pivotal movement of the knife frame, so that there will be no feeding of the tape while the knife is across the path of the tape.

While we have shown and described preferred embodiments of our invention, it will be understood that it is not to be limited to all the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the appended claims.

What we claim is:

1. A tape-serving machine comprising tape-feeding means, tape-severing means, a carrier for said severing means, said carrier exerting pressure on a part of said feeding means to render the same operative to feed tape, and means to free said feeding means from the pressure of said carrier to render the feeding means inoperative.

2. A tape-serving machine comprising tape-feeding means, tape-severing means, a carrier for said severing means, said carrier exerting pressure on a part of said feeding means to render the same operative to feed tape, and means to move said carrier to effect the severing of the tape by said severing means and simultaneously free the feeding means from pressure of the carrier.

3. A tape-serving machine comprising tape-feeding means, tape-severing means, a carrier for said severing means, spring means to hold said carrier in engagement with a part of said feeding means to render the same operative to feed tape, and means for moving said carrier out of such engagement and simultaneously operate the tape-severing means.

4. A tape-serving machine comprising a frame, a pair of cooperating tape-feeding rollers mounted in the frame, a shaft upon which one of said rollers is mounted, said shaft being loosely mounted in the frame, a member pivoted to the frame and adapted to engage said shaft, a spring urging said member into said engagement, tape-severing means carried by said member, and means for simultaneously operating the tape-severing means and moving said member out of engagement with said shaft against the tension of its spring.

5. A tape serving machine having tape feeding means and tape severing means, said tape feeding means including a feed roll in constant engagement with the tape, means to exert pressure on said roll to render the tape feeding means operative, said means also holding the tape severing means inoperative during feeding, said pressure means being releasable to render said tape feeding means inoperative when said tape severing means is operated.

6. A tape severing device having a frame, a pair of shafts mounted therein carrying cooperating feed rollers, one of said shafts being mounted for relative movement in the frame toward and away from the other to move its roller into and out of feeding relation with the other roller, said relative movement being limited so that said movable roller remains in constant contact with the tape passing between the rollers, a reciprocating handle for operating one of said rollers in tape feeding direction and a spring acting to move said handle in non-tape feeding direction, said spring acting on said relatively movable shaft to urge the roller thereon into feeding relation with the tape when said reciprocating handle is operated in tape feeding direction.

7. A tape serving machine having a frame, a shaft carried by the frame having a tape feeding roller mounted thereon, a cooperating feed roller mounted to act with said first feed roller, said shaft being mounted for movement toward and away from said cooperating feed roller, a knife carrier pivotally connected to said frame, said carrier being mounted for contact with said shaft and a spring urging said carrier against said shaft whereby the roller on said shaft is urged into feeding relation with the other roller.

8. A tape serving machine having a frame, said frame having parallel walls, a rotatable shaft mounted in said parallel walls, said shaft having a tape feeding roller, a cooperating tape feeding roller mounted in the frame, said shaft being mounted to move said first mentioned roller into and out of tape feeding relation, a knife carrying frame pivotally mounted in said shaft having a knife in the forward portion thereof and having slots in the rear portion thereof engaging said shaft when the knife is in non-operative position, a spring urging said carrier against said

shaft to urge the roller thereon against the tape and a reciprocating handle for operating said rollers, said carrier spring acting upon said handle to move it in non-tape feeding direction and a lever acting with said handle and engaging a part of said carrier to relieve said shaft from pressure whereby tape feeding relation of the rollers is lost and then to operate the knife on the carrier.

9. In a tape serving machine, tape feeding means comprising a reciprocating feed handle and a pair of rollers between which the tape passes, said rollers being in constant contact with the tape, means for applying feeding pressure to said rollers when said reciprocating handle is operated in tape feeding direction and means for releasing said feeding pressure before the end of the feed stroke of said handle.

10. In a tape serving machine having feed means including an oscillating feed handle, and a pair of feed rolls in constant contact with the tape, means for applying feeding pressure to said rolls during the feeding stroke of said handle and relieving pressure during the idling stroke of said oscillating feed handle.

11. A tape serving machine having an oscillating feed handle, a pair of feed rolls in constant contact with the tape, and driving connections between said feed handle and at least one of said rolls for rotating one of said rolls, the upper roll being light in weight and resting on the tape by gravity when tape is not being fed, means for applying feeding pressure to said rolls during the feed stroke of said handle and means for relieving said pressure on the non-feed stroke of said handle.

ALFRED P. KRUEGER.
MICHAEL J. WEST.