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M. J. WEST

2,021,038

GUMMED TAPE SERVING MACHINE

Filed Feb. 24, 1933

2 Sheets-Sheet 1

Fig. 1.

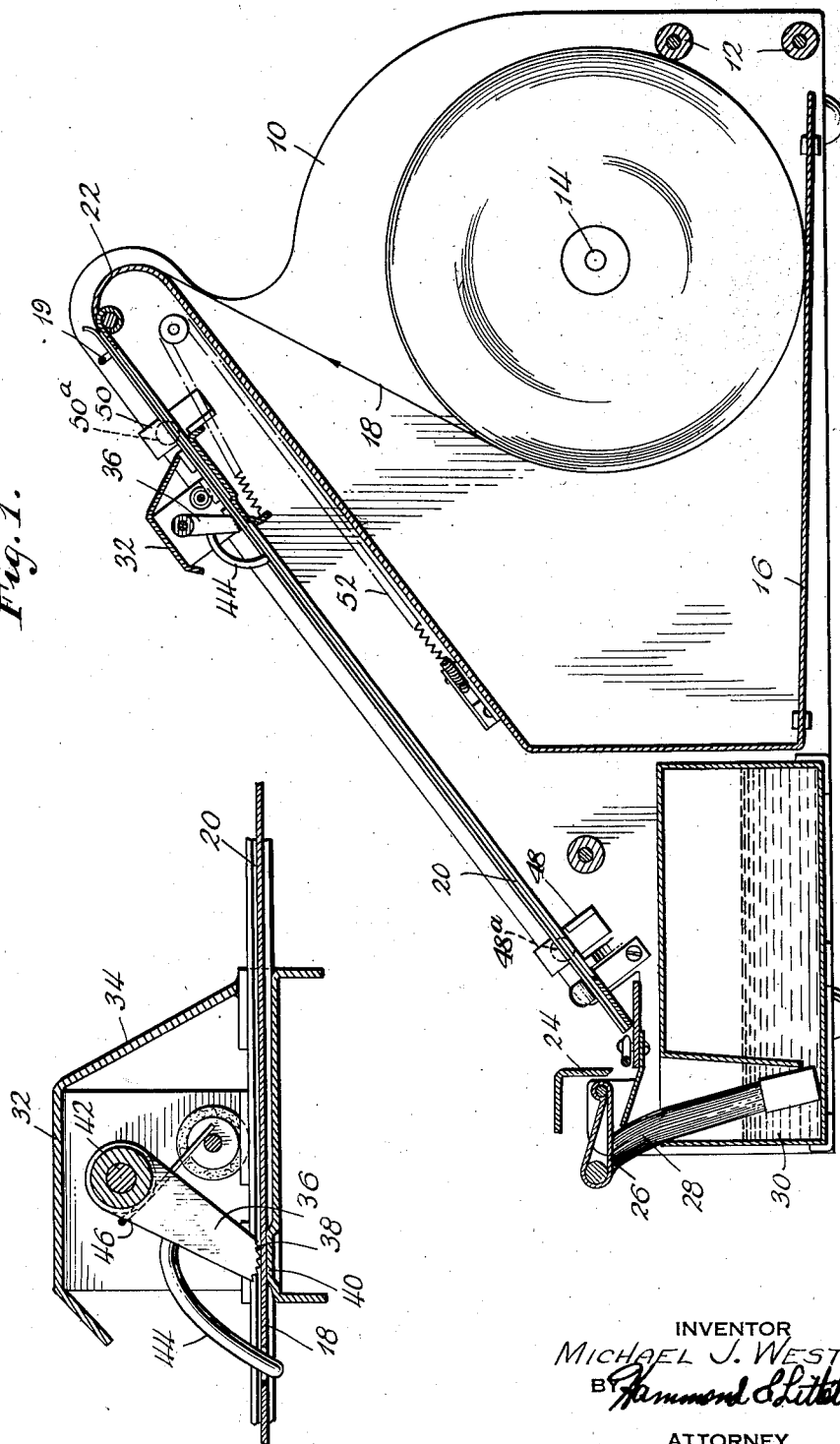


Fig. 2.

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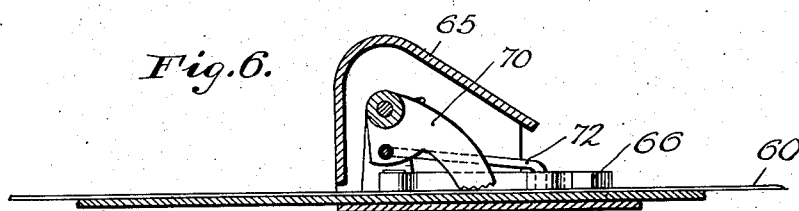
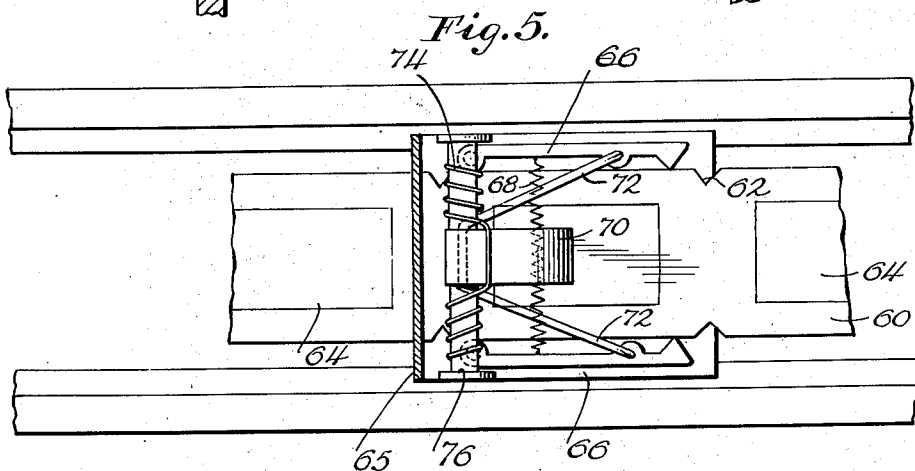
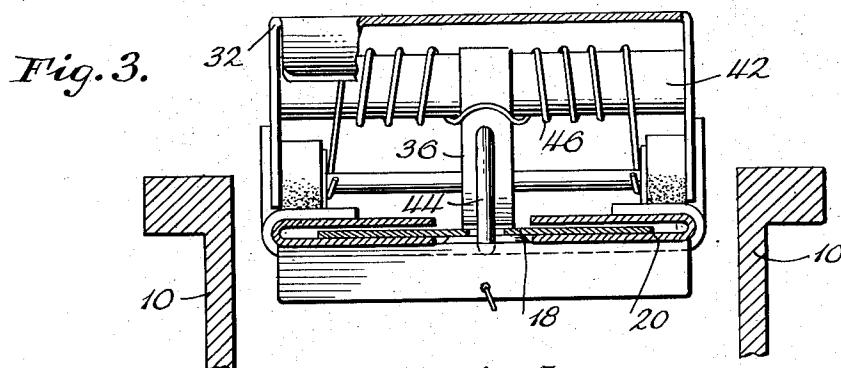
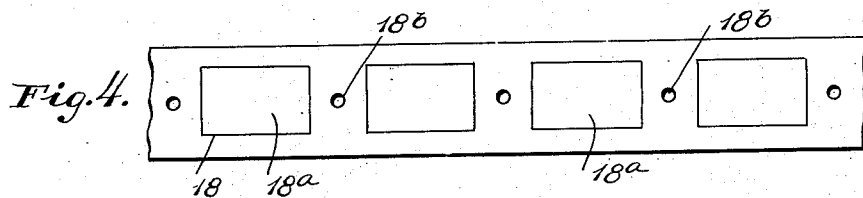
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2 Sheets-Sheet 2



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GUMMED TAPE SERVING MACHINE

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15 Claims. (Cl. 91—14.5)

This invention relates to improvements in gummed tape serving machines and in particular relates to improved tape feeding means for feeding printed gummed tape or labels so as to insure cutting of the tape or labels between the printed portions thereof.

The feeding of gummed, printed tape for wrapping packages in which the printing covers a specific portion of the tape or constitutes a label, from gummed tape serving machines has frequently been found unsatisfactory as the usual tape serving and moistening machine is not adapted to properly sever the tape between the printed portions and cutting through the middle portion of the printed tape or label wastes a part of the printing effect.

One of the objects of this invention is to provide a gummed tape serving machine, in which the feeding mechanism is controlled by the configuration of the tape or labels so as to feed only regulated lengths or complete label units whereby the tape served is not cut through a printed portion.

Another object of the invention is to provide a gummed tape serving and moistening machine adapted to dispense printed tape, with a feeding mechanism normally feeding by contact with the tape but with the feeding mechanism operative only on certain parts of the tape, due to the presence of controlling members so that dispensed tape will always be served in proper lengths and the tape will not be inadvertently cut in the printed portions.

Another object of the invention is to provide a new method of feeding labels or tape from a continuous web of tape which has detent receiving portions at intervals corresponding to the length of the individual labels and with which a feeding carriage cooperates in such manner that the severing of labels will always occur between labels.

Another object of the invention is to provide a push feed tape feeding mechanism with an automatically operated engaging finger to regulate the point of contact of the feeding mechanism with printed tape and so arranged with respect to a limit stop that any one or more pull movements of the tape beginning at the predetermined point on the tape will in every case pass a full printed portion beneath the severing device so that the tape will not be cut in the printed matter.

Another object of the invention is to provide a severing device which cooperates with a tape feeding element arranged so that it will move

in synchrony only with respect to certain portions of tape with the result that the severing device will only operate after a full printed label section of tape has passed.

Further objects and advantages of the invention will appear from the following description thereof, taken in connection with the attached drawings which illustrate a preferred form of embodiment thereof and in which:

Figure 1 is a sectional view of a tape serving device with the improved feeding mechanism,

Fig. 2 is a vertical section through the feeding mechanism in the operative position,

Fig. 3 is a vertical section at 90° to Fig. 2, showing the front of the feeding mechanism,

Fig. 4 is a plan view of a piece of tape to illustrate one form of operating aperture, and

Figs. 5 and 6 are a plan view and a central vertical sectional view respectively, of a modified form of construction.

The present invention consists in the correlation of the feeding means and tape severing means, with an independent feeler device which is sensitive to preform impressions in the tape so that the tape will be gripped and fed in units of a full label or printed section or multiples thereof, before the tape severing device will sever the tape. This is desirable where the gummed tape is to be used for package wrapping as well as in label serving machines, as the erroneously cut printed sections are unsightly and the effect of the printing in the cut section is entirely lost.

In one form of embodiment of the device, the feeler mechanism is incorporated in the feeding mechanism so that the feeding mechanism will operate only on certain portions of the tape, namely, the same relative point on each label so that on a full stroke, a full label or plurality of full labels will be discharged.

It is also to be understood however, that on automatic feed machines, the feeler would likewise be adapted to cooperate with the predetermined notches, perforations, etc., in the tape so that when sufficient tape has been dispensed, the feeler would engage the next preformed point and cause actuation of the severing device at the desired point.

The general principles of the invention may thus be incorporated in either the manually operated, reciprocating feed machine or the automatic feed type. In either case the feeler mechanism acts only to detect the particular form of label measuring element such as a notch in the edge of the tape or a perforation in the tape, or other device. These label measuring elements

are preferably placed in the tape during printing to insure proper location and prevent accumulation of creep normally existent in prior forms. Furthermore, the feeler mechanism does not of itself feed the tape and only moves synchronously with the tape due to the actuation of gripper members set in motion by the feeler.

One embodiment of the invention is shown in connection with a manually operated gummed tape serving machine which comprises generally a pair of substantially triangular side frame members 10 connected by suitable cross members 12, the frame members supporting a roll of tape 14 therebetween. The roll of tape rests on a bottom strip or supporting pan 16, the tape being arranged to roll rearwardly as the tape 18 is drawn forward, thus rolling the tape roll 14 against one of the guides 12 which with the supporting pan 16 act as a frictional brake to prevent over-running of the tape.

The inclined face of the machine is provided with a tape guide 20 which is composed of substantially U-shape channel members having side portions 20a and 20b to guide the tape 18 there-through as more clearly shown in Figure 4. The tape passes over a strip receiving apron 22 at the top of the machine then down the tape guide 20 and finally passes out of the machine past the tape severing device 24 and through the moistening couple consisting of the pivoted pressure plate 26 and brush 28. The brush 28 is normally adapted to rest in the water reservoir 30 from which it draws water by capillary attraction and sufficiently moistens the gummed surface of the tape 18 after the tape passes the severing device.

This general construction of machine is more clearly shown in a previous patent to Theodore H. Krueger, No. 1,638,816, patented August 9, 1927.

The gummed tape 18 may be printed in any predetermined way such as in labels, slogans or distinctive advertising sections 18a. The entire strip however, is continuous and is adapted to be used for wrapping cartons, or for labeling packages, etc., and thus is preferably cut between the labels for best appearance. Obviously, a single section may be dispensed as well as whole multiples thereof. To facilitate this, the tape 18 is formed with selector portions 18b which may take the form of apertures, notches, grooves, ridges or other formations. Each selector portion 18b is located in the tape, for example between printed portions 18a and usually these selector portions 18b are placed in the tape during printing.

The tape feeding mechanism which causes the proper feed of the tape is generally indicated at 32 and may preferably be in the form of a carriage surrounding the tape guide 20 previously described and slidable thereon. For convenience the rear face 34 of the carriage may be inclined to permit easy grasp by the operator who will draw the carriage along the guide to dispense the tape. This carriage is substantially rigid as distinguished from the pivoted carriage of the Krueger patent heretofore mentioned.

The feeding carriage 32 is provided with additional elements for feeding including a tape gripping dog 36 having a serrated nose 38 which cooperates with a raised section 40 in the under-surface of the tape carriage, to grip the tape therebetween. The gripping lever 36 may be pivoted on a suitable cross shaft 42 so that when free to drop it will contact the tape 18 against

the raised portion 40 on the tape carriage to permit feeding the gummed tape 18 forward.

The movement of the tape gripping dog to insure the delivery of a complete unit of length of tape is controlled by the feeler dog 44 secured to the operating dog 36. This feeler dog normally contacts with the surface of the gummed tape 18 and holds the gripper lever out of tape engagement. When the feeler 44, reaches an aperture or perforation in the tape it will fall and through its connection with the gripper dog 36, the nose 38 on the tape gripping dog 36 will contact with the tape and on forward movement of the tape carriage, will feed tape from the feeding end of the machine. At all other points the feeler 44 will ride on the top surface of the tape 18 thus holding the feeding nose out of contact to prevent the feeding of tape. A spring 46 may be used to press the gripping dog 36 into contact with the tape when the feeler permits such movement.

In operation the feeler 44 does not push or pull the tape forward but merely falls into the opening in the tape to permit the gripper member to come into contact with the tape before the feeler contacts with the forward end of the aperture. This prevents tearing of the tape in the apertures because gummed tape is of such thin quality that the feeler member would destroy the tape rather than feed it, if the feeler members were relied upon as feeding members. Tape rolls containing as much as 500 linear feet of tape are substantially heavy and considerable pressure is required to draw the tape forward. The feeler therefore merely serves to lower the feeding dog into gripping relation with the tape at the correct predetermined place with respect to the printed matter.

The method of securing the detent or feeler 44 to gripping dog 36, is subject to variation, and it will be obvious that the number, size and shape of the apertures 18b in the tape 18 may be readily varied, it being obvious that the detent or feeler could be secured to the shaft 42 in such manner that though indirectly connected it would control the operation of the gripping dog 36.

A lower limit stop 48 adjustable through the screw 48a is provided to contact with the tape carriage 32 at the end of the stroke and an adjustable upper limit stop 50 adjustable through the screw 50a, regulates the upper length of the stroke so that only a complete unit of printing or multiples thereof may be fed. This is due to the fact that by starting at the same relative place with respect to any label and ending at the same point, a complete unit is always fed. The upper stop 50 will limit the upper or return movement of the carriage to control the number of units fed, whereas, the lower stop 48 is adjustable for different length labels and its position determines that only complete units will be fed. The position of the stop 48 is arranged in accordance with the distance between the end of the travel of the feed carriage 32 and the knife blade 24 so that when the feed stroke is stopped at the stop 48 the space approximately midway between the printing on the tape 18 is under the knife 24. A spring 52 returns the carriage to the upper limit of its stroke.

The feeler 44 is preferably, although not necessarily, in advance of the gripping arm and its preliminary movement causes a final gripping movement of the gripping arm which grips on a solid portion of the tape to prevent tearing. An important result of this construction is that the

printed material is always fed according to the way in which the punched holes are spaced along the web and since these holes are punched at the same time the web is printed, there can be no creeping due to excess or insufficient travel of the feed member.

The feeding is therefore independent of any feeding mechanism or sprocket and there is no objectionable effect due to stretching because of changes of temperature, humidity or thickness. The spacing is determined by the apertures in the tape and there is therefore no lack of registry. The holes need not be regularly spaced unless the labels are so printed on the tape, the holes being placed according to the size of each label or printed portion.

In the operation of feeding the tape the carriage at the upper limit of its travel is grasped by the operator, if the feeler or feelers 44 are not then in an aperture 18b, the feeler 44 and gripping dog 36 merely slide over the surface of the tape until the feeler 44 drops into an aperture 18b whereupon the dog 36 grips the tape between the toothed end 38 and the raised portion 40 of the carriage 32 and feeding of the tape starts, when the carriage 32 reaches the stop 48 an unprinted portion of the tape is under the knife 24. The carriage 32 is then released by the operator and returned to the upper stop 50 by the spring 52, and the operator actuates the knife 24 to sever the tape fed out, between printed portions thereon.

The return movement of the feed carriage 32 has no effect on the tape for even if the feeler does drop into an aperture, the dog end of the gripper arm merely slides by the tape due to the shape of the teeth and pivoted relation.

A modified form of construction with parts omitted is more particularly shown in Figures 5 and 6. In this form of embodiment, the tape 60 is notched as at 62 on the edges thereof and between the label portions 64. Cooperating with these notches are feeler members 66 which are drawn inwardly toward each other by means of the spring 68.

The feed pawl 70 is held out of contact with the tape 60 by the feelers 66 through the action of links 72 which are at such an angle to the feelers 66 that when the feelers press together as into the notches 62, the feed pawl 70 will contact with the tape 60 to feed such tape by the movement of the feed carriage. A spring 74 cooperates to force the feed pawl into position by partial rotation of the pawl about the pivot axis 76.

It will thus be seen that the tape may be provided with notches, ridges, apertures or the like, in the body of the tape or in the edge thereof to actuate the gripper dogs. Different forms of feeler mechanism may be used as desired, the principal feature being that the relation of the point of engagement of the tape with respect to the printed portions 18a or 64 and the point of contact of the feeding carriage with the lower stop must be such that a full label or multiple thereof be dispensed.

In automatic types of machines in which the tape feed is by the movement of driven rollers contacting with tape, similar feeler members may be used to control the gripping and feeding of the tape. In such case feeler members will either determine the point of initial engagement with tape as herein described or will determine the final point of cutting. This may be brought about by an automatic release of the knife by the movement of the synchronously moving feeler

element which is placed in operation by control means on the tape in proper relation with the imprinted portions on the tape. As the feeler and carriage move at the proper point in the tape, the knife may similarly be released to cut at the proper point between printed portions, at which time the feeding is also stopped to prevent buckling. It will thus be seen that my invention is not limited to manually operated, reciprocating feed machines but may have a general application.

Other forms of embodiment may also be made within the scope and spirit of my invention and I therefore desire a broad interpretation of my invention within the scope and spirit of the description herein and of the claims appended hereto.

I claim:

1. In a tape serving device of the class described having a tape supporting means, tape 20 guiding means, and tape severing means, the combination of tape feeding means to feed definite multiples of length of tape comprising a carriage, a feeler, said tape having perforations, said feeler cooperating with said perforations, 25 and tape gripping means held out of contact with said tape by said feeler, said tape gripping means engaging said tape and dispensing said tape on movement of said carriage when said feeler has entered a perforation.

2. In a strip server of the type described, a strip guide, means to advance the strip there-through, said means including a normally inoperative strip gripping element, and means on the strip advancing means normally holding the 35 gripping element out of contact with the strip and automatically cooperating with particular portions of the strip whereby the strip advancing means will engage the strip only at definite points at relatively fixed distances with respect to the 40 particular portions of the strip.

3. A strip serving device for apertured tape comprising a pair of substantially triangular frame members, means connecting the two members, a strip serving mechanism therebetween including a strip guide and a strip server movable 45 along said guide and engaging said strip, and tape contacting means to normally keep said strip server out of strip serving engagement, said tape contacting means being depressible into apertures 50 in said strip whereby said strip server will contact with the tape and only fixed lengths of strip may be dispensed.

4. In a tape serving device of the class described for feeding unit lengths of printed tape 55 having preformed portions between the labels, tape feeding means, a tape feeler normally holding said tape feeding means out of tape contact, said feeler cooperating with the preformed portion to permit the tape feeding means to contact with the tape, and a fixed stop at the end 60 of the tape feeding travel.

5. A printed gummed tape having a plurality of printed label sections, and a plurality of similarly spaced detent elements therein, and means 65 to feed said tape including a feeding dog and a feeler member, said feeler member cooperating with said detent elements to move said feeding dog into tape contacting position.

6. In apparatus of the class described, means 70 to prevent the cutting of printed labels of gummed tape in the printed portion thereof which comprises the coaction of a feeler member moving in synchrony with the tape, said tape having detent receiving portions, said feeler 75

member engaging said detent receiving portions, and other means operated by said feeler mechanism for feeding engagement with the tape.

7. In a tape serving machine adapted to serve and cut printed tape between the printed portion thereof, means on the printed tape to determine the feeding and cutting thereof, frictional feed means for feeding the tape, means to sever the tape and means on the machine controlled by the means on the tape to start and stop the frictional feed means for feeding of the tape in predetermined relationship to the cutting means, whereby the tape will always be severed between printed portions thereof.

8. A gummed tape serving device of the class described for serving measured amounts of printed tape in which the printing is repeated, said tape being deformed at measured intervals, including means to support the tape, means to sever the tape, and means for feeding the tape in one direction only including a tape feeding dog, and a non-feeding feeler member holding said tape feeding dog out of contact with the tape when said feeler member is in contact with an undeformed part of the tape, and means to move said feeding dog into feeding position when said feeler member is adjacent a deformed portion of the tape, said feeler member being out of feeding contact with said tape when said tape is being fed.

9. The method of dispensing units or multiples thereof of printed tape, the unit of which is the distance between perforations in respective portions of adjacent labels, which comprises the steps of setting a stop approximately corresponding to the number of units desired, gripping the tape at a predetermined point relative to the perforations in the unit, setting a stop at a fixed distance from the severing device depending on the length of the unit, feeding the tape in one direction only against said second stop whereby the end of the unit is adjacent the severing device, and finally severing the tape between the adjacent units.

10. A printed gummed tape serving device for serving unit lengths of tape comprising a feeding means, a synchronously moving feeler element, and a severing means, said tape having a deformed portion in predetermined relation to the unit lengths of tape, said feeler element engaging with said deformed element to release said feeding means for engagement with the tape after engagement with said deformed element, whereby said feeding means will move synchronously with the tape, and stop means engaged by the feeding means, said stop means being located in a predetermined point with respect to the severing means.

11. In a gummed tape serving machine for dispensing printed gummed tape, means to grip the tape and feed it forward from the machine, and means to sever the fed tape, said gripping means being normally inoperative to grip the tape, means associated with the gripping means and cooperating with preformed portions of the tape to release the gripping means to grip the tape,

and means to stop the feeding in predetermined relation with respect to the printed portion on the tape and to the severing means whereby the tape will always be severed at the predetermined place with respect to the printed portion.

12. In a printed tape serving device of the class described for serving one or more complete printed unit lengths of tape, said tape having preformed selector portions, said device having a tape supporting means, tape guiding means, and tape severing means, the combination of tape feeding means comprising a carriage having a tape gripping means and a feeler, said feeler holding said gripping means out of contact with the tape, said feeler cooperating with the selector portions of said tape, and causing said gripping means to come into gripping relation with the tape at predetermined points with respect to the printed units thereon, said tape gripping means engaging said tape and dispensing said tape on movement of said carriage, and means to stop the movement of said carriage at a predetermined point so that the severing means will cut the tape at a predetermined point.

13. In a tape serving device of the class described for feeding unit lengths of printed tape having preformed portions at spaced points on the labels, tape feeding means, a tape feeler normally holding said tape feeding means out of tape contact, said feeler cooperating with the preformed portion to permit the tape feeding means to contact with the tape and a stop in a predetermined position for the end of the travel of the tape feeding means.

14. A tape serving machine for dispensing printed gummed label units from a roll of tape having preformed deformations at spaced points corresponding to the length of the label unit which includes a tape severing means, a feed member, a feeler member to hold said feed member out of feeding contact, said feeler member releasing the feed member to tape feeding position when the feeler member engages a deformation, a stop adjacent one end of the path of travel of the feed member, means to adjust the stop in accordance with the number of labels desired, a second stop, and means to adjust the second stop in accordance with the size of the label so that only complete labels are severed and dispensed from the machine.

15. Apparatus for dispensing one or more printed labels of unit size from a continuous roll of periodically deformed tape which comprises a frame to support the tape, a feeding mechanism for engagement with said tape and a severing means for separating the dispensed labels from the remaining labels on the strip, means to render said feeding means inoperative including a tape feeler mechanism to engage deformities in the tape, said feeler mechanism permitting the feeding of the tape when it reaches a deformity and stop means in preadjusted position so that the severing means severs the tape in a predetermined position and a second stop means controlling the whole number of labels dispensed.

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