

July 24, 1934.

T. H. KRUEGER

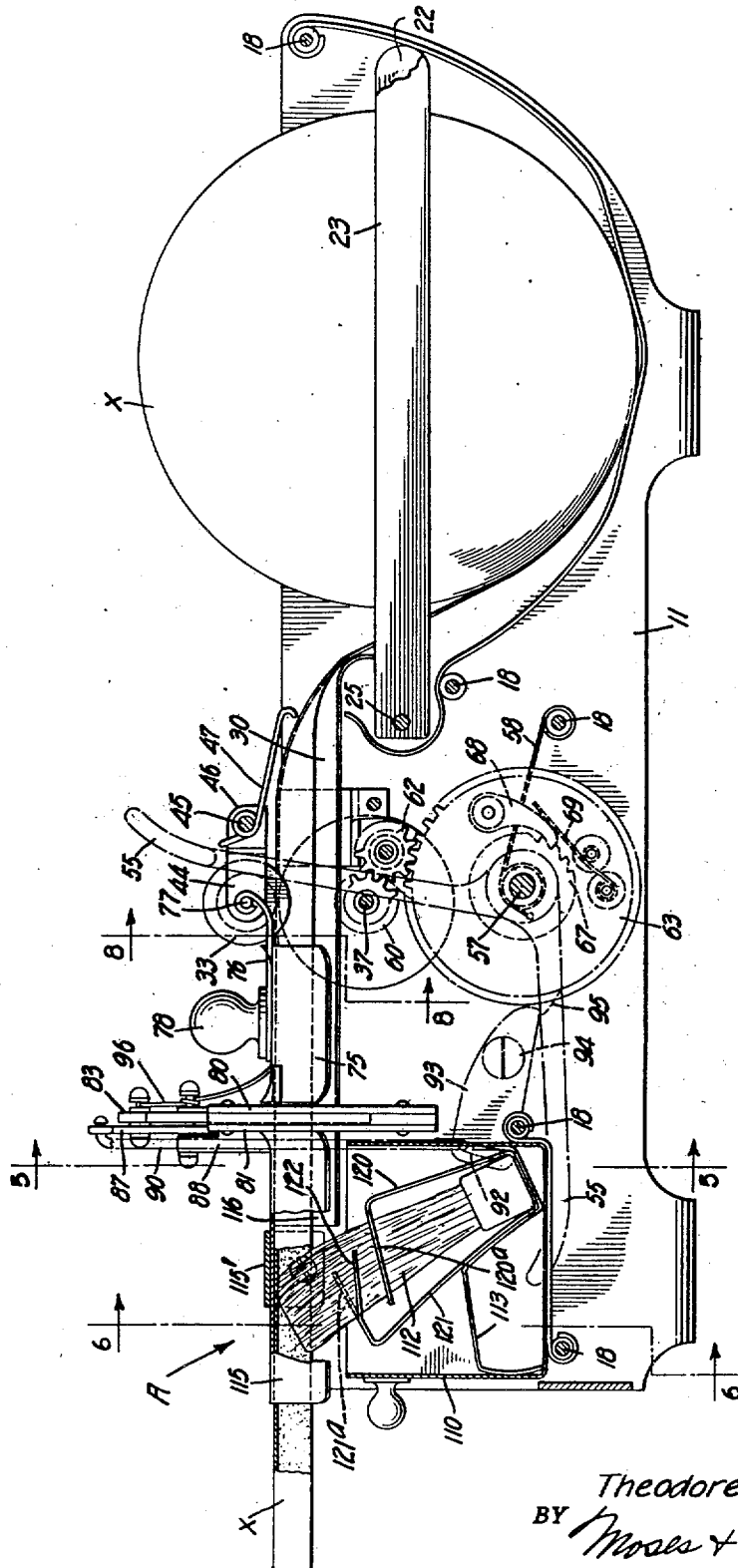
1,967,579

MACHINE FOR DISPENSING TAPE OF CHANNEL SHAPE

Filed May 2, 1930

3 Sheets-Sheet 1

Fig. 1.



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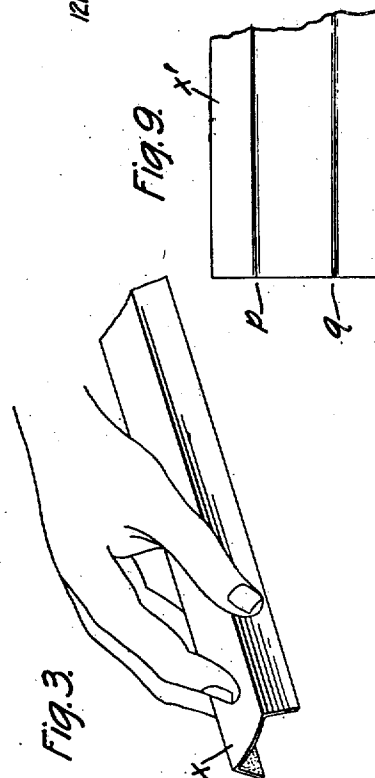
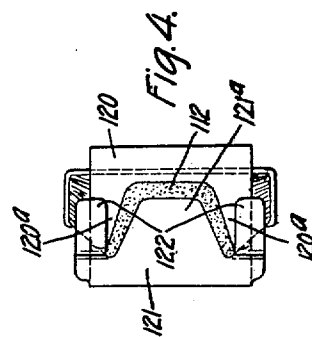
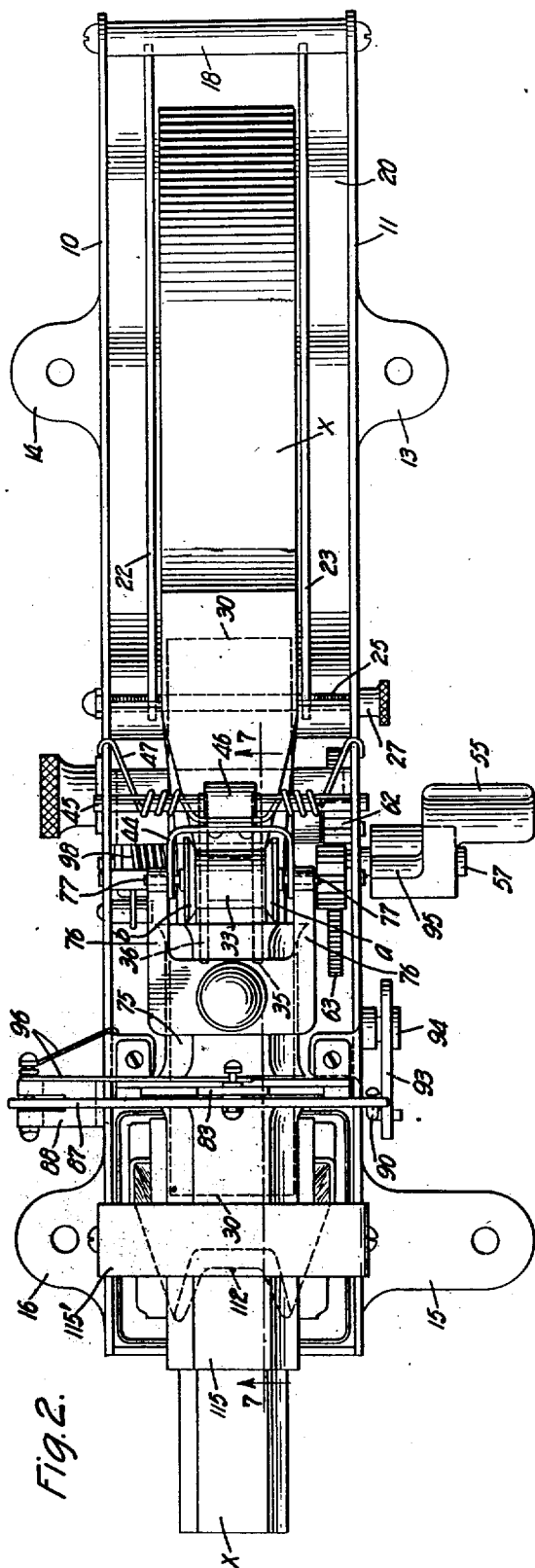
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3 Sheets-Sheet 2



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MACHINE FOR DISPENSING TAPE OF CHANNEL SHAPE

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3 Sheets-Sheet 3

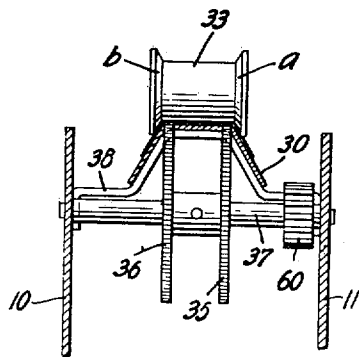
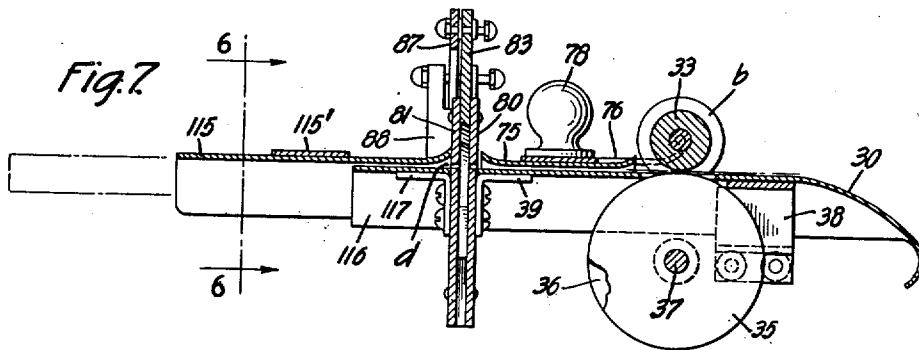
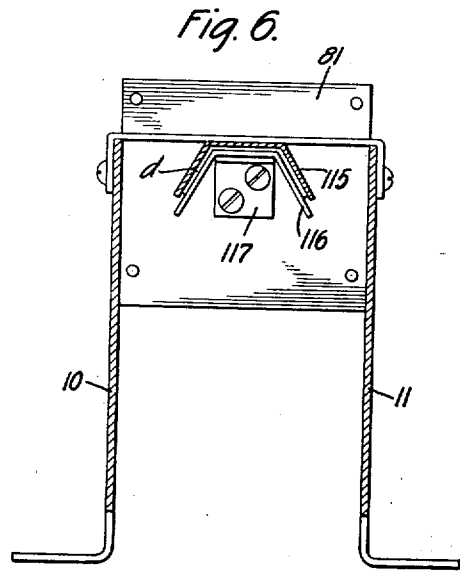
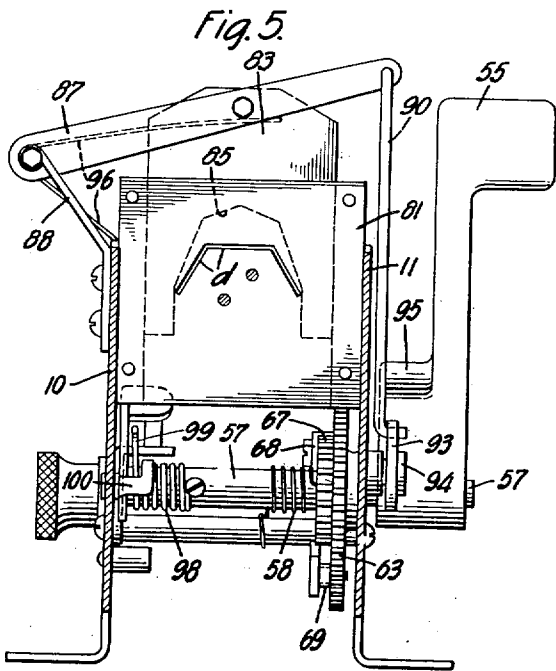


Fig. 8.

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UNITED STATES PATENT OFFICE

1,967,579

MACHINE FOR DISPENSING TAPE OF CHANNEL SHAPE

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a corporation of New York

Application May 2, 1930, Serial No. 449,152
In Great Britain May 13, 1929

17 Claims. (Cl. 91-14.5)

My present invention relates to apparatus for moistening and delivering gummed paper tape in condition to be immediately applied to a package or the like. In its preferred form it more particularly relates to apparatus of the type in which the strip of tape is moistened by being pushed (as opposed to being pulled) through a moistening device.

It is a principal object of my invention to provide an apparatus to so deliver the moistened gummed tape to the operator as to enable him manually to remove from the apparatus a strip of such tape without the risk of soiling his fingers by contact with the moistened gum on the strip. It is a further object to enable this to be done without causing portions of the moistened gummed surface of the tape to adhere to one another. A further object of the invention is to provide gummed tape of a particular shape irrespective of any specific apparatus for so delivering it whereby the above desirable results are obtained and also that of enabling the moistened tape accurately and quickly to be placed on the package to be sealed, particularly where it is desired that the longitudinal center line of the tape should coincide with the "seam" of the package to be sealed.

With these and other objects in view, the apparatus in its preferred form, in accordance with this invention, is provided with means for causing the tape to assume or retain what may be termed a channelled cross section with the gum inward, so that there is presented to the operator a severed length of moistened adhesive tape of channel shape, whereby said length may be gripped by the fingers of the operator without touching the moistened gum. The transformation of the adhesive tape from a straight or flat to channelled cross-section may be effected by means which crease said tape or by means which fold or complete the creasing of a previously creased or partially creased tape, or which fold a tape which has previously been prepared by scratching the gum, and this channel forming operation may take place before the tape reaches the moistening device, at said moistening device or after the tape has been moistened and it is most desirable that once the transformation to channelled cross-section has been effected in the apparatus, the tape should not be flattened out again during the remainder of its passage through the apparatus. In order that my invention may be fully understood, reference may now be had to the following detailed description thereof taken with the annexed drawings, in which

Figure 1 is a view in side elevation of a preferred embodiment of the invention with a side plate removed, parts being shown in section;

Figure 2 is a plan view of said device;

Figure 3 is a view showing a severed length of the tape as fed from the machine and in the hand of the operator;

Figure 4 is a view of the brush and holder therefor as seen in the direction of the arrow A of Figure 1;

Figure 5 is a transverse section of the device taken along the line 5-5 of Figure 1, the brush holder being omitted;

Figure 6 is a similar section taken along the line 6-6 of Figure 1, the brush holder and other parts being omitted;

Figure 7 is a view in longitudinal section taken along the line 7-7 of Figure 2 with the moistening device omitted;

Figure 8 is a view of the feed mechanism taken in section along the line 8-8 of Figure 1; and

Figure 9 shows an alternative form of tape which is previously scored or otherwise weakened along the crease lines.

Referring to the drawings in detail and in particular to Figures 1 and 2: 10 and 11 denote the side frame members of the device which conveniently have portions 13, 14 and 15, 16 constituting feet affording a secure foundation for the apparatus; members 11 and 12 being secured together at various points including that indicated by spacing members 18. Cooperating with the side frame members 10 and 11 is a bottom member 20 which forms a cradle for a roll of tape X. Guide members 22, 23 whose distance apart is regulated by means of an adjusting screw 25 having right and left handed threads as shown, serve accurately to center the roll of tape X in the cradle. This is important in order that the sides of the channel formed by the tape may be of substantially equal width. To accommodate tape of varying widths, the guides are moved either toward or away from one another by operation of the thumb nut 27.

In the embodiment herein described, the roll of tape is wound with the gummed side out and the tape is fed from the roll from the bottom thereof and passes directly therefrom over a curved tape guide or former 30 which preferably extends uninterruptedly as far as the cutting element to be later described. For the purpose of feeding the tape over this guide, several co-acting instrumentalities are provided as follows: The tape to be fed is seized between preferably a spool-shaped roller 33 (see also Figure 8) above the tape and

a roller or a pair of knurled discs 35, 36 which are mounted on a shaft 37, the guide plate 30 being slotted at this point to provide contact of the tape with the discs 35, 36. By the action of the flanges a and b (see Figure 8) of the roll 33, the tape is at this point caused to be bent sharply along two longitudinal crease lines because of the flanges a and b and the somewhat steep sides of the channel shaped guide or former 30. For supporting the guide 30, spaced brackets 38, 39 are employed as seen in Fig. 7. Obviously instead of a pair of feed discs, a single roller of the equivalent length could be substituted.

It is desirable that the spool 33 be resiliently held against the discs 35, 36 and to accomplish this the spool 33 is mounted in a yoke 44, Figure 2, which is swingably supported with reference to the frame of the machine by a shaft 45 to which the yoke is held by means of a block 46. A spring 47 urges the spool 33 downwardly against the discs 35, 36 through the yoke 44.

It will now be evident that by imparting rotation to the shaft 37, and discs 35, 36, the tape will be fed from the roll over the guide 30 and that turning the shaft a measured amount will deliver a proportionate length of tape. The mechanism for turning shaft 37 (which forms no part of the present invention) may now be described.

An operating lever 55 is disposed at one side of the machine and is fixedly supported by a transverse shaft 57 mounted in the frame members 10 and 11, Figure 5. A relatively light spring 58 around shaft 57 returns the lever when released, to its initial position. It is necessary that a one way movement only be imparted to the feed discs 35, 36 and for this purpose, the shaft 37 bearing said discs is connected to shaft 57 through a gear train (see Figure 1) comprising a gear 60 on shaft 37, stud gear 62 fastened to frame member 11 and a larger gear 63 loosely mounted on shaft 57. For operatively connecting shaft 57 and gear 63, a ratchet 67 is fixed to shaft 57, such ratchet co-operating with a pawl 68 carried by gear 63 and urged into engagement with said ratchet by means of a leaf spring 69. Thus, when lever 55 is pulled downwardly, the discs 35 and 36 will cause the tape to feed forwardly, whereas when the lever is released, it will return to its initial position by action of spring 58 without, however, affecting the tape since the pawl 68 will merely ride over the ratchet 67. By limiting the return throw of the lever 55 by any suitable means the amount of tape fed for each movement of the lever may be regulated.

For further maintaining the tape in its channelled shape, a tape saddle 75 preferably weighted as by a ball 78 is provided above the guide or tape mold 30 which may be attached in any convenient way as by means of arms 76 which engage trunnions 77 of the spool 33.

There now remains to be described means for severing the tape and for maintaining it in channelled shape until it is removed from the machine. The tape, after passing under the saddle 75, passes through slots d of channel shape in a pair of stationary cutter plates 80, 81, (see particularly Figures 7 and 8), between which is mounted a cutter blade 83 whose cutting edge 85 is preferably of the approximate contour shown in Fig. 5 so as to present an oblique angle to the paper to be cut. The cutter may be worked in any desired manner but preferably the following instrumentality is provided for automatically operating same by means of lever 55 when

the desired length of paper has been delivered: The blade 83 is pivotally mounted on a rocker bar 87 which in turn is pivoted on a bracket 88. The rocker bar 87 is connected at its opposite extremity with a rod 90, the latter having its lower end bent and engaged in a slot 92 of a latch 93, Figure 1, which is pivoted at 94. Co-acting with the latch 93 is a cam surface or trip 95 formed on the lever 55. When the lever 55 is depressed, the surface 95 rides over the curved tip of the latch merely causing same to move up a slight distance without moving rod 90 because of the slot connection 92. When, however, the operating lever 55 is released and the latter moves upward, the top edge of the cam surface 95 engages the lower edge of the latch 93 causing same to rock on its pivot 94 to depress the rod 90, and consequently the cutter blade 83, to sever the paper. The limit of travel of the knife is reached when the latch is rotated so far around as to cause the tip thereof to ride off the edge of the trip or cam surface 95, whereupon the knife is retracted by the action of a spring 96 (Figs. 2 and 5). For the purpose of supplying the power needed to operate the latch, a spring 98 which is stronger than the spring 58 is brought into play by the continued rotation of the shaft 57 when the end 99 of the spring 98 is brought against a stop 100 whereupon further rotation of the shaft 57 compresses this stronger spring (Fig. 5).

It is desirable that the tape be moistened in its curved or channelled state and for this purpose a brush holder 110, Figure 1, is provided for containing a brush 112 which is urged against the surface to be moistened by means of a spring 113. Co-acting with the brush is an upper tape mold 115 supported by a strap 115' secured to the side frame of the machine and a lower tape mold 116 forming a continuation of the guide and former member 30, the member 116 being secured by a bracket 117 (Fig. 6) and terminating short of brush 112 to provide for the contact thereof with the surface of the tape. To insure that the brush 112 supplies the entire area of the gummed surface uniformly with moisture, it is desirable that its bristles be constrained so that they assume an approximate channel shape and to accomplish this, shaped guide members 120, 121 are provided as seen best in Figures 4 and 1, member 121 preferably having a tongue 121a extending into the "channel" of the brush and ears 122 which extend around the bristles and aid in producing the desired shape of the brush and cooperate with ears 120a on member 120.

The operation of the device will be clear from the foregoing. To load the machine with tape, the operator lays the roll of tape X into the tape cradle or basket 20 and brings the guide members 22 and 23 into proximity with the roll of tape by means of the screw 27. He then passes the forward end of the tape under shaft 45 and yoke 44 until it touches the feed discs 35, 36 and feed roller 33. The operator now pulls the operating lever 55 forward, such action starting the feeding of the tape. The latter then travels beneath the saddle 75 through the inverted U-shaped slots d of the stationary cutter blades 80, 81, thence over moistening brush 112, beneath guide plate 115 and thence out of the machine, there to be grasped by the operator and removed manually after the cutting has occurred. It will be noted, however, that the severed tape merely projects from the end of the machine, in which position it is held until the operator is ready to grasp it.

During this time the tape has been supported from beneath by means of the tape guide and former 30 from the time it left the tape basket until it reached the cutter section. From there on forward until just before it reached the brush it has been supported underneath by the converted U-shaped guide or table 116. Because of the action of the feed unit, namely, the feed discs 35, 36, and the surfaces *a* and *b* of the spool 33, the tape is folded into channel shape and this action is facilitated by the former member 30 which is of corresponding shape.

The tape is grasped preferably as shown in Figure 3, and it will be noted that by pressure applied to the middle section or top of the channel, the tape is kept from collapsing, and the side edges of the channel are maintained away from one another.

The distance between the lines along which the tape is creased and which the machine should be designed to produce depends, to some extent, upon the average size of the operator's finger tip and, to some extent, upon the width of the tape itself and should be at least one-eighth of the width of the strip and not less than approximately one-quarter of an inch (whichever is the greater), and not more than seven-eighths of said width or about three and one-half inches (whichever is the less). This spacing of the crease lines may also be influenced somewhat by the stiffness of the paper, thin paper requiring a somewhat closer spacing, other conditions being equal. By virtue of the shape of the tape, all danger from rolling the operator's fingers by contact with the moist gum is eliminated and furthermore the fold lines of the tape facilitate the accurate disposition of the tape to the article upon which it is applied and the channelled tape is particularly useful when the seam of the package is to run beneath the central line of the strip. It will also be noted that by virtue of having two spaced creases, a comparatively light crease may be used without weakening the strip, whereas if one crease were relied upon, a sharp crease would be required which would reduce the strength of the strip. Furthermore, in the case of the single crease the gummed sides of the strip would be apt to come together and hinder the application of the strip to the work.

In Figure 9, I have shown tape *X'* which prior to the introduction into the machine is scored or otherwise weakened along two parallel lines *p* and *q* in order to facilitate bending of the tape along these lines into channelled shape. This tape may be wound in a roll and used in the machine shown or in machines of different type. These lines of weakness may be formed by initial or preliminary creasing, scoring or other suitable weakening of the tape itself before the gum or the like is applied thereto, or by creasing and bending the tape after the gum has been applied thereto thus causing the dried gum to be cracked along the predetermined lines, or the gum may be scored or scratched along such lines.

While I have illustrated and described in detail certain preferred forms of my invention, it is to be understood that changes may be made therein and the invention embodied in other structures. I do not, therefore, desire to limit myself to the specific constructions illustrated, but intend to cover my invention broadly in whatever form its principle may be utilized.

I claim:

1. In a machine for dispensing moistened gummed tape, means for holding a supply of

such tape, means for feeding the tape through the machine and simultaneously imparting thereto a pair of creases parallel to the length of the tape, said means last mentioned comprising opposed cylindrical feed rollers, the roller for engaging the ungummed side of the tape having spaced flanges projecting abruptly from the cylindrical surface thereof to assist in the creasing action.

2. In a machine for dispensing gummed tape, means for holding a supply of such tape, means for severing the tape, means for holding the tape so as to give thereto a cross section of substantially channel shape, means for moistening the tape so shaped comprising a guide of the approximate shape of the tape, and a brush co-operating therewith, means for supplying water to said brush and means for constraining the bristles of the brush into a substantially channel shape and means for feeding the tape from the supply and between said guide and brush.

3. In a machine for dispensing gummed tape, means for holding a roll of such tape, means for drawing out the tape from the roll and pushing it through the rest of the machine, means disposed subsequent to the feeding means for severing the tape, means for moistening the severed tape, said means last mentioned also forming and maintaining the tape in channel shape.

4. In a machine for dispensing package sealing tape in channelled form, means for holding a supply of flat tape, means for forming the tape into a channel and feeding the same through the machine, means for severing the tape, and means for supporting the severed piece of tape in channelled form with portions of the exterior walls thereof exposed so that it may be grasped by the fingers of the operator.

5. In a machine for dispensing package sealing tape in channelled form, means for holding a supply of flat tape, means for forming the tape into three-sided channelled form and for feeding the tape through the machine, means for severing the tape, means for supporting the severed section of tape in channelled form with the flanges projecting downwardly and with sufficient of the outer surface of the severed channelled piece of tape being exposed to enable the same to be grasped by the fingers of the operator so that the severed piece of tape may be removed from the machine without the operator's fingers coming in contact with the inside of the channel.

6. In a machine for dispensing gummed package sealing tape in channelled form, means for holding a supply of flat tape, tape severing means, means for forming the tape into a channel and feeding the same to said severing means, and means in alignment with said tape feeding means and tape severing means for holding the severed tape in channel form with sufficient of the outer surface of the channelled tape exposed to enable the same to be grasped by the fingers of the operator.

7. In a machine for dispensing package sealing tape in channelled form, means for holding a supply of flat tape gummed on one side, means for feeding the tape through the machine and for forming the tape into three sided channelled form with the gummed side of the tape inside of the channel, means for severing the tape, means for holding the severed tape in channelled form with sufficient of the outer ungummed surface of the channelled tape exposed to enable the same to be grasped by the fingers of the operator, and means for moistening the inner gummed surface of the

channelled tape after the same has been fed past the severing means.

8. In a machine for dispensing gummed package sealing tape, means for holding a supply of flat tape gummed on one side, and means for feeding said tape horizontally through the machine and simultaneously bending the side portions of the tape along two spaced longitudinal lines so as to form the tape into an inverted three sided channel with the gummed side of the tape inside comprising means for guiding the central zone of the tape bounded by said spaced longitudinal lines substantially in one plane and deflectors for folding the opposite marginal portions of the tape downward.

9. In a machine for dispensing gummed package sealing tape, means for holding a supply of flat tape gummed on one side, means for feeding said tape horizontally through the machine and simultaneously bending the side portions of the tape along two spaced longitudinal lines so as to form the tape into an inverted three sided channel with the gummed side of the tape inside comprising means for guiding the central zone of the tape bounded by said spaced longitudinal lines substantially in one plane and deflectors for folding the opposite marginal portions of the tape downward, means for severing the tape and means for moistening the gummed inner side of the channelled tape after it has been fed past the severing means.

10. In a machine for dispensing gummed package sealing tape, means for holding a supply of flat tape gummed on one side, means for feeding said tape horizontally through the machine and simultaneously bending the side portions of the tape downward along two spaced longitudinal lines so as to form the tape into an inverted three sided channel with the gummed side of the tape inside, means for severing the tape, means for moistening the gummed inner side of the channelled tape after it has been fed past the severing means, and means for supporting a severed section of the inverted channelled tape with a portion thereof projecting from the machine to enable the same to be grasped upon the outside of the channel by the fingers of the operator.

11. In a machine for dispensing gummed package sealing tape, means for holding a supply of flat tape gummed on one side, means for feeding said tape through the machine with the gummed side thereof facing downward, means for forming said tape into an inverted channelled shape with the gum on the lower inside of the channel comprising means for guiding the central zone of the tape bounded by said spaced longitudinal lines substantially in one plane and deflectors for folding the opposite marginal portions of the tape downward, and means for moistening said tape including a water reservoir and a brush mounted therein having its bristles extending upwardly and contacting with the gummed surface of the tape, said brush being formed so that its bristles will engage the entire inner gummed surface of the channelled tape and apply moisture thereto.

12. In a machine for dispensing gummed package sealing tape in channelled form, means for holding a supply of flat gummed tape, a tape mold having a wide substantially flat top wall and downwardly extending side walls, means for supporting the tape against said top wall, and means for feeding the tape over said mold with the gummed side adjacent thereto, and for bending the side portions of the tape downwardly against

the side wall portions of the mold so as to form said tape into a three sided channel with the gummed side of the tape inside.

13. In a machine for dispensing gummed package sealing tape in channelled form, means for holding a supply of flat gummed tape, a tape mold having a wide substantially flat top wall, and downwardly extending side walls, means for supporting the tape against said top wall, and means for feeding the tape over said mold with the gummed side adjacent thereto, and for bending the side portions of the tape downwardly against the side wall portions of the mold so as to form said tape into a three sided channel with the gummed side of the tape inside, a shear plate mounted adjacent to the end of said mold and having a channel shaped slot therein through which the channelled tape is adapted to be passed, and a movable shear blade having cutting edges thereon adapted to engage and cut the channelled tape angularly with respect to the planes of the three walls of the tape constituting the channel.

14. In a machine for dispensing gummed package sealing tape in channelled form, means for holding a supply of flat gummed tape, a tape mold having a substantially flat top portion and downwardly extending side walls, means for feeding the tape over said mold with the gummed side adjacent thereto, and for bending the side portions of the tape downwardly against the side wall portions of the mold so as to form said tape into a three sided channel with the gummed side of the tape inside, a shear plate mounted adjacent to the end of said mold and having a channel shaped slot therein through which the channelled tape is adapted to be passed, and a movable shear blade having cutting edges thereon adapted to engage and cut the channelled tape angularly with respect to the planes of the three walls of the tape constituting the channel, and male and female channel shaped members mounted beyond said tape severing means for supporting the severed tape in channelled form.

15. In a machine for dispensing gummed package sealing tape in channelled form, means for holding a supply of flat gummed tape, a tape mold having a substantially flat top portion and downwardly extending side walls, means for feeding the tape over said mold with the gummed side adjacent thereto, and for bending the side portions of the tape downwardly against the side wall portions of the mold so as to form said tape into a three-sided channel with the gummed side of the tape inside, a shear plate mounted adjacent to the end of said mold and having a channel shaped slot therein through which the channelled tape is adapted to be passed, and a movable shear blade having cutting edges thereon adapted to engage and cut the channelled tape angularly with respect to the planes of the three walls of the tape constituting the channel, and male and female channel shaped members mounted beyond said tape severing means for supporting the severed tape in channelled form, the male channel shaped supporting member being cut away so as to expose the inner gummed surface of the channelled tape while said portion of the tape is supported externally by the female channelled supporting member, and a moistening brush mounted beneath said exposed portion of the tape and having its bristles in engagement with the gummed surface thereof.

16. In a machine for dispensing package sealing tape in channelled form, means for holding a supply of flat gummed tape, a tape mold compris-

ing a channel having a substantially flat middle section and side walls, and having a portion of the middle section cut away, a tape feeding roller having its periphery being adapted to engage the tape through said cut away portion, and a flanged tape feeding roller adapted to cooperate with said first tape feeding roller to feed the tape, the flanges of said flanged tape feeding roller adapted to bend the side portions of said tape over said tape mold.

17. In a machine for dispensing package sealing tape in channelled form, means for holding a supply of flat gummed tape, a tape mold com-

prising a channel having a substantially flat middle section and side walls, and having a portion of the middle section cut away, a tape feeding roller having its periphery adapted to engage the tape through said cut away portion, and a flanged tape feeding roller adapted to cooperate with said first tape feeding roller to feed the tape, the flanges of said flanged tape feeding roller being adapted to bend the side portions of said tape over said tape mold, and a channel shaped guide located beyond said feed rollers adapted to hold the tape in engagement with said tape mold.

THEODORE H. KRUEGER.

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CERTIFICATE OF CORRECTION.

Patent No. 1,967,579.

July 24, 1934.

THEODORE H. KRUEGER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, line 4, claim 16, strike out the word "being" and insert the same after "roller" in line 8, of said claim; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of September, A. D. 1934.

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Leslie Frazer

(Seal)

Acting Commissioner of Patents.

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