Jan. 15, 1952 A. P. KRUEGER 2,582,705

TAPE-DISPENSING DEVICE

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Fig. 1.

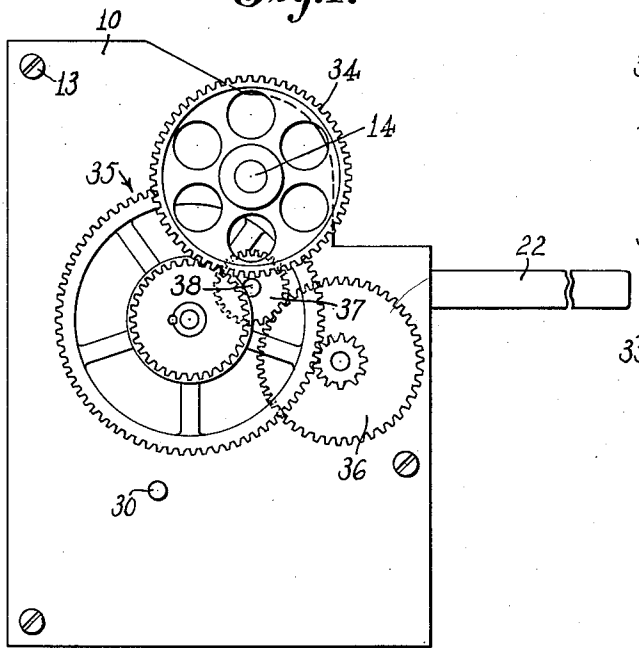


Fig. 2.

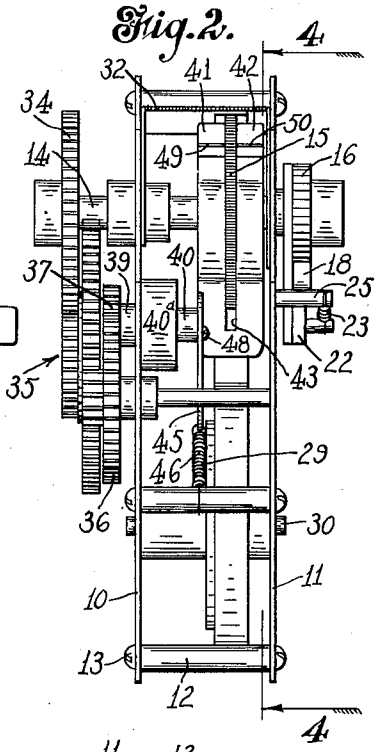
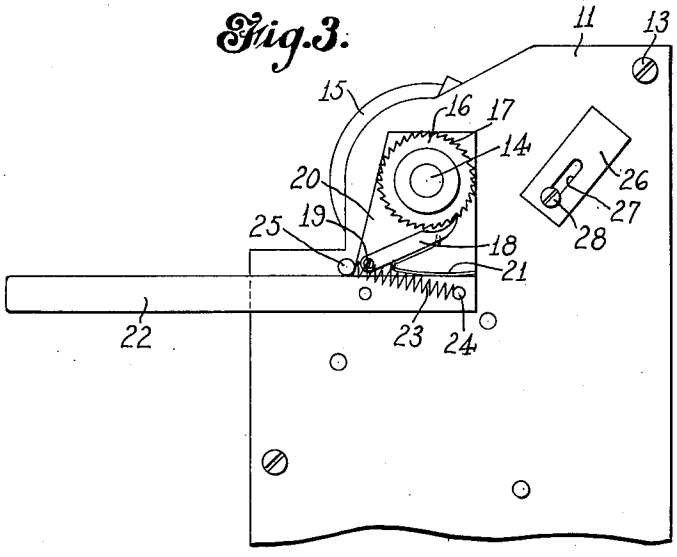


Fig. 3.



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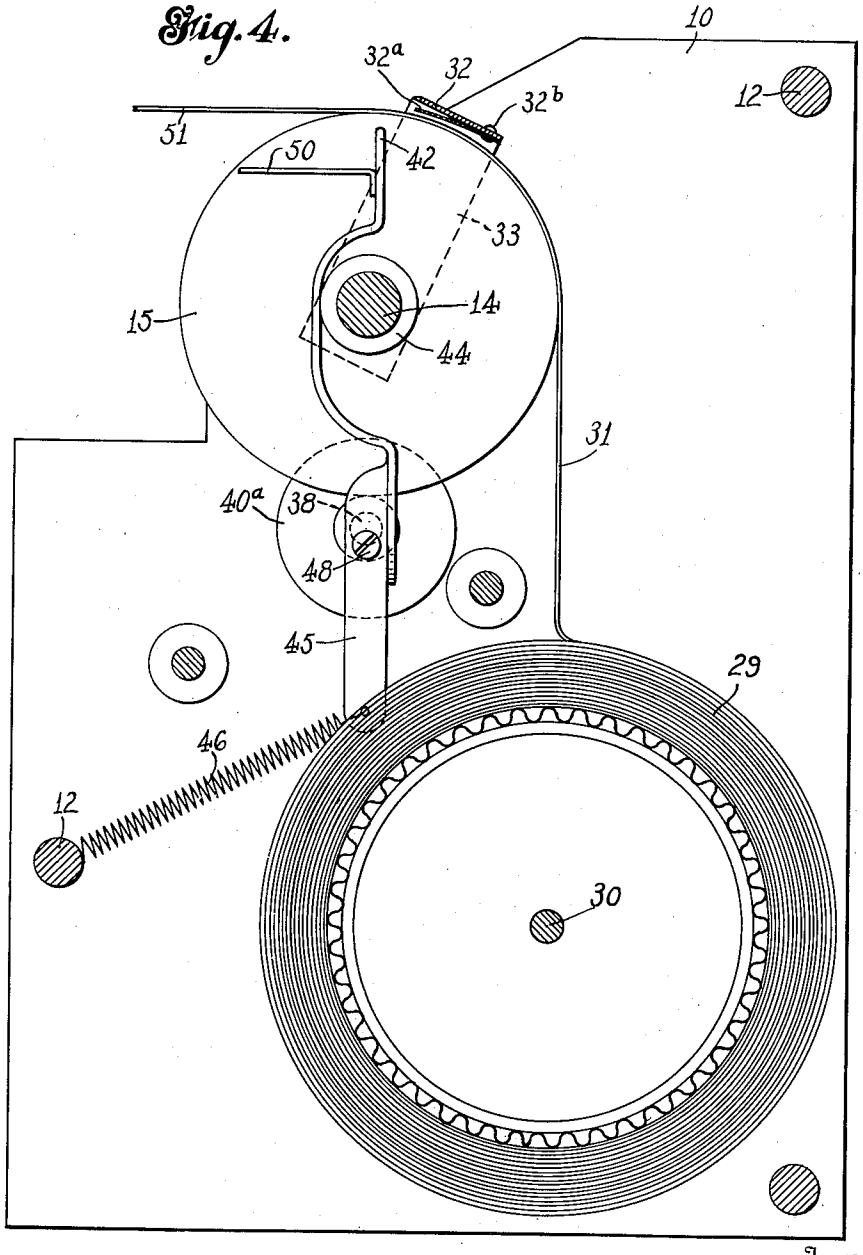
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Fig. 4.



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Fig. 5.

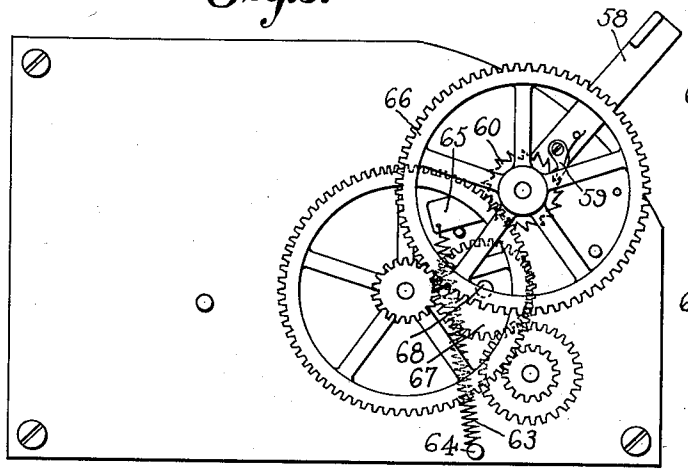


Fig. 6.

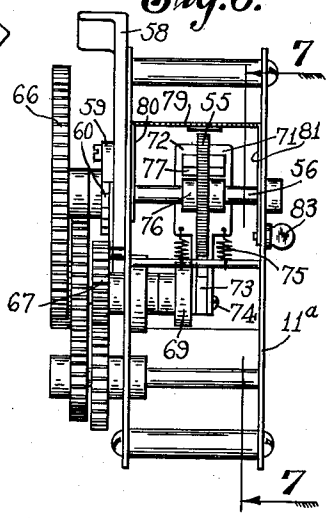


Fig. 7.

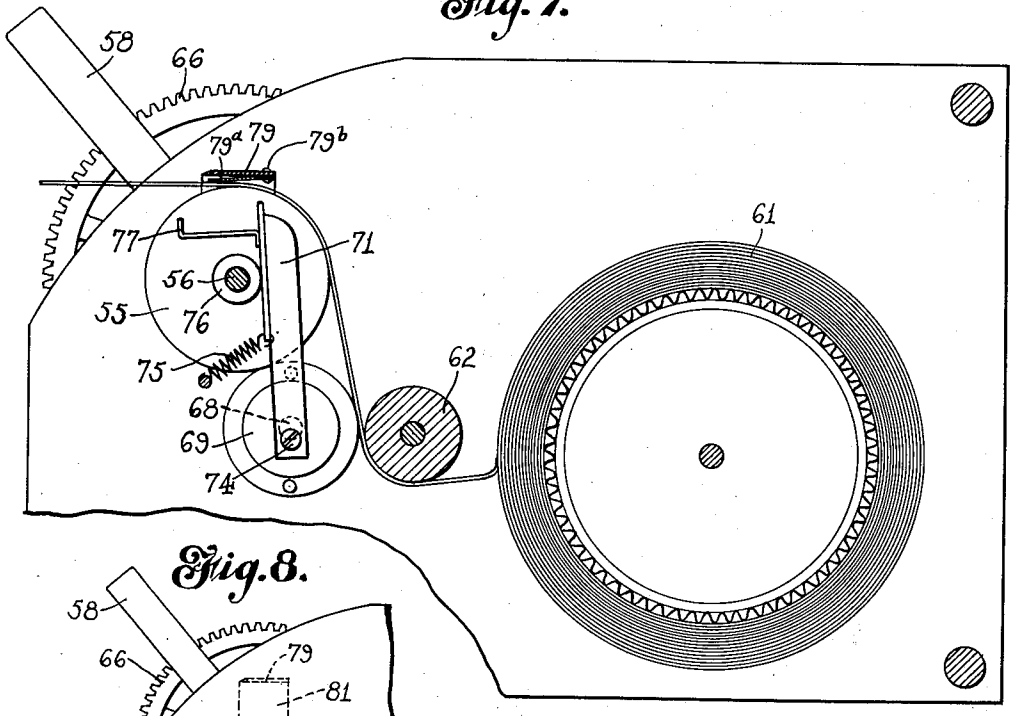
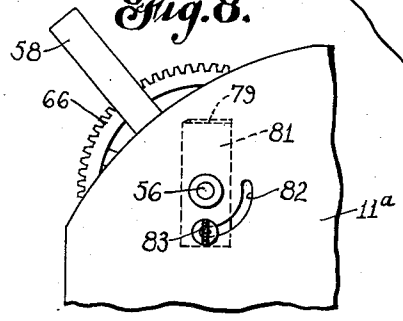


Fig. 8.



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UNITED STATES PATENT OFFICE

2,582,705

TAPE-DISPENSING DEVICE

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Application July 12, 1946, Serial No. 683,249

12 Claims. (Cl. 164—84.5)

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This invention relates to a tape-dispensing device, and more particularly to a device for dispensing pressure-sensitive tape.

Tape of the character referred to above is tacky or clingable upon one surface, and for this reason some difficulty has been encountered in providing a device which would draw or feed the tape from a supply roll thereof and present a free end projecting from the machine which could be grasped by the fingers of the user and torn off or severed in a convenient manner. While in the particular machine herein illustrated a tear-off blade is shown, certain principles of the invention may be employed in a machine which automatically severs the tape and dispenses the severed portion to the operator.

It has been found that tape of this character may be fed or drawn from the supply roll by a traveling feeding means having a surface to which the tacky side of the tape may cling, the tape adhering to the feeding means with sufficient force to draw it from the supply roll. The fact, however, that the tape will adhere to the feeding means with considerable force presents the problem of stripping it from this feeding means in order that there may be presented a free end which may be grasped by the operator.

Therefore, one feature of the present invention is the provision of stripping means to positively strip the tape from the feeding means as it is being advanced by the latter. This stripping means is so positioned relatively to the feeding means that the tape will have a sufficient contact with the latter in order to adhere thereto with sufficient force to be drawn from the supply roll and will be stripped from the supply roll at a point such that substantially the entire portion of the free or stripped end will be severed for use.

In some instances, this stripped end of the tape will tend to drop into contact with the feeding means after being stripped therefrom, and in such case might readhere to the latter. For this reason, it may be desirable to have the stripping means engage the tape at more than one point along its length so that the stripped end will be kept free of the feeding means and not permitted to readhere thereto.

One object of the present invention is to provide a new and improved device for dispensing pressure-sensitive tape.

A further object of the invention is to provide a dispensing device for pressure-sensitive tape, comprising a traveling feeding member to which the tape is adapted to adhere and an oscillating

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stripping member adapted to be moved in a closed curved path against and from the surface of the tape on the feeding member to strip the tape therefrom.

A further object of the invention is to provide a dispensing device for pressure-sensitive tape having a rotating feeding member, to the surface of which the tape is adapted to adhere, so that it may be drawn from the supply roll and a stripping member or members adjacent the feeding member and positioned on both sides thereof, the stripping member or members being intermittently moved against and withdrawn from the surface of the tape by a movement in a closed curved path to effectively strip the tape from the feeding member and cause a free end of the tape to project therefrom to be grasped by the operator.

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-dispensing machine embodying my invention;

Fig. 2 is a front elevational view thereof;

Fig. 3 is a side elevational view of the machine showing the side opposite that shown in Fig. 1;

Fig. 4 is an enlarged sectional view on line 4—4 of Fig. 2;

Fig. 5 is a side elevational view of a modified form of my invention;

Fig. 6 is a front elevational view thereof;

Fig. 7 is a partial sectional view on line 7—7 of Fig. 6; and

Fig. 8 is a partial side elevational view showing the side opposite that shown in Fig. 5.

To illustrate a preferred embodiment of my invention, I have shown a tape-dispensing machine comprising a pair of supporting frame members 10 and 11, which members may be secured in spaced relation by spacing blocks 12 and screws 13. These frame members serve to support the working parts of the device, and the particular construction of the frame members is relatively unimportant.

Rotatably mounted in the frame members 10 and 11 is a shaft 14 upon which is mounted a feed roll 15 which preferably is provided with a roughened surface so that the tape will properly adhere thereto.

The shaft 14 extends through the frame member 11, and secured to this extended end is a ratchet wheel 16 having ratchet teeth 17 (Fig. 3) designed to be engaged by a pawl 18 pivoted at 19 to a pawl carrier 20 loosely mounted on the shaft 14. The pawl is normally urged into engage-

ment with the teeth of the ratchet wheel by a spring 21.

A lever or operating handle 22 is secured to the pawl carrier 20, which handle projects from the machine and is adapted to be actuated by the operator to effect intermittent rotation of the shaft 14. A spring 23 is secured at 24 to the handle 22, and at its other end is secured to a stop member 25 mounted on the frame member 11 so that this spring will normally urge the pawl carrier 20 to the position shown in Fig. 3 in which it is engaged with the stop 25.

It will be seen that the handle 22 will normally be moved in a counterclockwise position from its position of rest shown in Fig. 3, and to limit the movement of the handle and pawl carrier 20 and, therefore, limit the angle through which the shaft 14 is rotated by one stroke of the handle, a stop 26 is mounted on the frame member 11, this stop member being provided with a slot 27 within which is disposed a screw 28 engaging the frame member so that the stop may be adjusted in position relatively to the pawl carrier. Thus the stroke of the latter is not only limited but also may be adjusted so that the length of the piece of tape delivered from the machine at one operation of the lever 22 may be varied. It will, of course, be understood that during a return or clockwise movement of the handle 22 the pawl rides freely over the teeth 17 of the ratchet wheel and does not effect reverse movement of the shaft 14. Reverse movement of the shaft 14 and ratchet wheel 16 is prevented by the friction of the gearing 35 and by the friction of the element 45 on the collar 44.

As shown in Fig. 4, a supply roll of tape 29 is adapted to be rotatably carried by a shaft 30 mounted in the frames 10 and 11, this roll being generally below the level of the feed roll 15, so that the tape 31 issuing from the roll will contact a substantial length of the surface of the feed roll so as to adhere thereto with the necessary force to draw it from the supply roll. A severing or tear-off member 32 is also mounted on the frame above the tape 31, the forward edge of this member being adapted to be used as a tear-off blade against which the free end of the tape may be severed. This blade may be a part of a member of substantially U-shaped form provided with legs 33 by which the member is retained in place.

The shaft 14 also extends through the frame member 10, and secured on this projecting end is a gear 34 which, through a chain of speed-increasing gearing 35, drives a gear 36 which in turn meshes with a gear 37 secured to a stub shaft 38 rotatably mounted in the frame member 10. The shaft 38 may be held in position by collars 39 and 40 disposed on opposite sides of a bearing block 40a secured to the member 10.

Mounted adjacent the feed roll 15 is a slotted or bifurcated stripping member having stripping arms or elements 41 and 42 lying one on either side of slot 43, this member being so disposed that the feed roll 15 is received in the slot 43 so that one of the stripping elements lies on each side and close to the lateral face of the feed roll. The members 41 and 42 are bowed forwardly, as shown in Fig. 4, so as to lie against an abutment formed by a collar 44 on the shaft 14.

Secured to and depending downwardly from this stripper element is a tailpiece 45, to the lower end of which is secured a spring 46, the other end of the spring being secured to one of the spacing members 12. The tension of the spring 46 normally holds the bowed parts of the stripping elements 41 and 42 against the collar 44. The tailpiece 45 is eccentrically connected to the shaft 38 by a pin or screw 48 so that, when this shaft is rotated, the stripping members will be oscillated. It will be seen that as the point 48 will be moved in a circular path by the rotation of the shaft 38 and, as the bowed portion of the stripper elements will be maintained against the collar 44, the upper or operative end of the stripping elements 41 and 42 will be oscillated or moved in a closed curved path in what may be termed a gyratory motion. Thus the upper edges of the elements 42 will be moved upwardly against the tape as shown in Fig. 4 and then to the left, in the same direction as the tape is moved over the surface of the feed roll. The stripper elements are then moved downwardly away from the tape and again returned in a closed circular path to strike the tape at a point further back along its length and again strip it from the roll.

If desired, auxiliary forwardly extending stripping elements 49 and 50 may be secured to the elements 41 and 42 which, as shown in Fig. 4, project forwardly from the latter, and as the forward edges of these elements will be moved over paths of substantially the same shape as the elements 41 and 42 they will, if the tape tends to drop upon the surface of the feed roll and readhere thereto, strike the tape and prevent such readherence. Thus it will be assured that the stripped end of the tape shown at 51 in Fig. 4 will project freely from the feed roll 15 where it may be readily grasped by the operator and torn off against the severing blade 32.

It will be noted that, as shown in Fig. 4, the stripping elements 41 and 42 are disposed forwardly of the shaft 14 and are urged rearwardly toward this shaft by the spring 46. In Figs. 5 to 8 of the drawings I have shown a slightly modified form of my invention wherein the stripping elements are mounted rearwardly of the shaft which carries the feed roll. This modified form of my invention is similar in principles to the form previously described.

As shown in Figs. 5 to 8, a feed roll 55 is carried upon a shaft 56 operated intermittently in a counterclockwise direction, as shown in Fig. 7, by an actuating lever 58 loosely mounted on the shaft 56 and carrying a pawl 59 engaging a ratchet wheel 60 secured to the shaft 56. The supply roll of tape is shown at 61, the tape issuing therefrom being trained about a guide roll 62 so as to make proper contact with the surface of the feed roll. A spring 63 connected to a post 64 on the frame of the machine and secured at its other end to a tail portion 65 of the lever 58 tends to maintain this lever in the position shown in Figs. 5 and 7.

Secured upon one end of the feed shaft 56 is a gear 66 connected through a chain of speed-increasing gears to a gear 67 mounted upon a shaft 68 rotatably carried by the frame of the machine. Secured to the shaft 68 is a crank disk 69.

A pair of stripper members 71 and 72 are mounted one upon each side of the feed roll 55 and relatively close to the lateral surfaces thereof, these members being connected at their lower ends by a spacing block 73 and secured eccentrically to the crank disk 69 by a screw 74. Springs 75 hold the strippers against collars 76 on the shaft 56.

Supplemental or auxiliary strippers 77 may be secured to the strippers 71 and 72 if desired, these

members extending forwardly from the main stripper elements so as to contact the tape at a position forwardly of that contacted by the members 71 and 72. As shown in Figs. 6 and 8, a severing element in the form of a tear-off blade 79 may be mounted on the frame of the machine, this member having downwardly extending legs 80 and 81 pivoted on the shaft 56. The frame member 11a is provided with an arcuate slot 82 in which moves a set screw 83 threaded into the arm 81 so that the tear-off blade 79 may be adjusted pivotally about the shaft 56 to the extent provided by the slot 82 and locked in any adjusted position. Thus the tear-off blade may be moved forwardly to an out-of-the-way position to expose a greater area of the feed roll to facilitate the effecting of engagement between the free end of the tape and the feed roll when putting a fresh supply of tape in the machine.

It is believed that the operation of the device will be clear without further description thereof. As will be obvious, the lower end of the stripper elements 71 will be moved in a circular path by rotation of the shaft 68 which will be rotated when the shaft 56 is rotated, and that as the spring 75 holds the stripper elements against the collar 76 on the shaft 56 the operative ends of the stripper elements will be moved in a closed curved or oval path with an oscillatory or gyratory motion.

The gearing between shafts 14 and 56 on the one hand, and the shafts 38 and 68, respectively, on the other hand, is such that, while the feed roll shafts rotate in a counterclockwise direction, as viewed in Figs. 4 and 7, the crank shafts 38 and 68 rotate in a clockwise direction, as viewed in these figures. Therefore, the upper end of each of the stripper elements moves upwardly against the tape, stripping it from the feed roll, and then forwardly in the same direction as that of the movement of the tape but at a speed preferably greater than that of the tape, so that the stripper elements will, in turn, be stripped from the tape. After each of the stripper elements moves forwardly, it is then moved downwardly and rearwardly, and again upwardly and forwardly to repeat the stripping operation.

It will be apparent that the amplitude of the movement of each of the stripper elements in the direction of travel of the tape may be varied by the relative positions of the crank shafts with respect to the feed roll shafts, thus changing the effective length of the lever arms through which the cranks operate. That is, for example, if in Fig. 4 the shaft 38 is moved closer to the shaft 14, the upper end of the stripper element 42 will be given a greater throw in a horizontal direction. The vertical throw of the stripper elements will remain constant, depending upon the eccentricity of the crank pin 48.

It sometimes occurs that upon continued use of the device the tape will be found to adhere to the severing members 32 or 79. In order to prevent the possibility of any such occurrence, I have shown a resilient stripping member 32a associated with the blade 32 and a resilient stripping member 79a associated with the blade 79. These stripping members may consist of resilient sheet metal plates secured to the severing members by the rivets 32b and 79b, respectively, so that their forward ends normally stand in spaced relation to the forward ends of the severing blades. When the tape is moved upwardly against the blades to be torn off these stripping members will be carried with it and will offer only slight resistance to such movement, and hence

will not interfere with this operation. When the tape has been severed, however, their inherent resilience will be sufficient to restore them to their normal positions, shown in Figs. 4 and 7, and cause the unsevered end of the tape to be stripped from the respective blades.

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

What I claim is:

1. In a machine for feeding pressure-sensitive tape, a frame, feeding means rotatably mounted thereon, including a tape-advancing member having a surface to which the tape adheres, a stripping member mounted on the frame having a portion adjacent one end thereof to extend to said surface of the tape-advancing member to engage the tape and strip it from the tape-advancing member, means for rotating the other end of said stripping member, and means on the frame engaging an intermediate portion of said stripping member to permit sliding movement thereof and restrain it from movement transversely of its length.

2. In a machine for feeding pressure-sensitive tape, a frame, feeding means rotatably mounted thereon, including a tape-advancing member having a surface to which the tape adheres, a stripping member mounted on the frame having a portion adjacent one end thereof to extend to said surface of the tape-advancing member to engage the tape and strip it from the tape-advancing member, an abutment carried by the frame, means for urging an intermediate portion of said stripping member against said abutment, and means for actuating said stripping member.

3. A machine for feeding pressure-sensitive tape comprising a frame, feeding means on the frame including a rotatable tape-advancing member having a surface to which the tape adheres, a stripping member slidably mounted on the frame, an abutment carried by the frame against which an intermediate portion of said stripping member engages, means engaging the lower portion of said stripping member to move it in a circular path, and the upper portion of said stripping member being disposed adjacent the tape on the tape-advancing member to strip the tape from the latter.

4. In a machine for feeding pressure-sensitive tape, feeding means including a rotatable member having a surface to which the tape adheres, an oscillatory stripping member having adjacent end portions adapted to intermittently engage the tape adjacent the surface of said rotatable member and on both sides thereof to strip the tape from the feeding means, and means to rotate the other end portion of said stripping member and cause the first end portions to move in a closed curved path across the path of the tape.

5. In a machine for feeding pressure-sensitive tape, a frame, a rotatable member to the surface of which the tape adheres, a shaft carried by the frame on which said member is mounted, a stripping member on one side of said rotatable member having an end portion to engage the tape and strip it therefrom, means to rotate the other end portion of said stripping member, and means to urge an intermediate part of said stripping member against the shaft.

6. An apparatus as in claim 5, wherein said

stripping member has an end portion on each side of the rotatable member to engage the tape.

7. An apparatus as in claim 5, wherein said stripping member has an end portion on each side of the rotatable member to engage the tape and said stripping element is bifurcated to provide said end portions, and the rotatable member is received in the space between the forks thereof.

8. In a machine for feeding pressure-sensitive tape, a frame, a rotatable member having a surface to which the tape adheres, a shaft rotatably carried by the frame on which said member is mounted, means for intermittently rotating said shaft to advance the tape, a bifurcated stripping element having a fork projecting on each side of said rotatable member, the end portions of which forks are adapted to engage the tape on the surface of said rotatable member and strip it therefrom, a tailpiece provided on said stripping element, means for urging an intermediate portion of said stripping element between the tailpiece and the tape-engaging portions thereof against said shaft, and means for rotating the tail portion of said element to move the tape-engaging portions thereof in a closed curved path.

9. In a machine for feeding pressure-sensitive tape, a frame, a rotatable member having a surface to which the tape adheres, a shaft rotatably carried by the frame on which said member is mounted, means for intermittently rotating said shaft to advance the tape, a bifurcated stripping element having a fork projecting on each side of said rotatable member, the end portions of which forks are adapted to engage the tape on the surface of said rotatable member and strip it therefrom, a tailpiece provided on said stripping element, means for urging an intermediate portion of said stripping element between the tailpiece and the tape-engaging portions thereof against said shaft, and means for rotating the tail portion of said element to move the tape-engaging portions thereof in a closed curved path, said last-named means comprising a shaft rotatably mounted in the frame to which said tail portion is eccentrically connected.

10. In a machine for feeding pressure-sensitive tape, a frame, a rotatable member having a surface to which the tape adheres, a shaft rotatably carried by the frame on which said member is mounted, means for intermittently rotating said shaft to advance the tape, a bifurcated stripping element having a fork projecting on each side of said rotatable member, the end portions of which forks are adapted to engage the tape on the surface of said rotatable member and strip it therefrom, a tailpiece provided on said stripping element, a spring for urging an intermediate portion of said stripping element between the tailpiece and the tape-engaging portions thereof against said shaft, and means for rotating the tail portion of said element to move the tape-engaging portions thereof in a closed curved path.

11. In a machine for dispensing pressure-sensitive tape, a frame, means for mounting a supply roll of tape thereon, a feeding roll carried by the frame around which the tape is trained to draw it from the supply roll, means to rotate said feed roll, lever means for actuating a feeding roll, a severing blade adjacent the feed roll, and means pivotally mounting said blade on the frame coaxially with said feeding roll whereby it may be moved with respect to the feed roll to expose a greater part of the surface of the latter adjacent the supply roll.

12. In a mechanism for dispensing pressure-sensitive tape, frame means for mounting a supply roll of tape thereon, a feeding roll rotatably mounted on the frame in a position spaced from the supply roll whereby the end of the tape extends from the supply roll to the feeding roll, lever means for actuating the feeding roll, a severing blade adjacent the feeding roll and in spaced relation therefrom whereby the tape travels between the feeding roll and the blade, means pivotally mounting said blade on the frame coaxially with said feeding roll whereby it may be adjusted along the surface of the feeding roll to expose a greater portion of the latter adjacent the supply roll and means for securing said blade in adjusted position.

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