Sept. 21, 1954 G. H. FRITZINGER 2,689,728

DISPENSING MECHANISM FOR PRESSURE-SENSITIVE TAPE

Filed Jan. 6, 1951 2 Sheets-Sheet 1

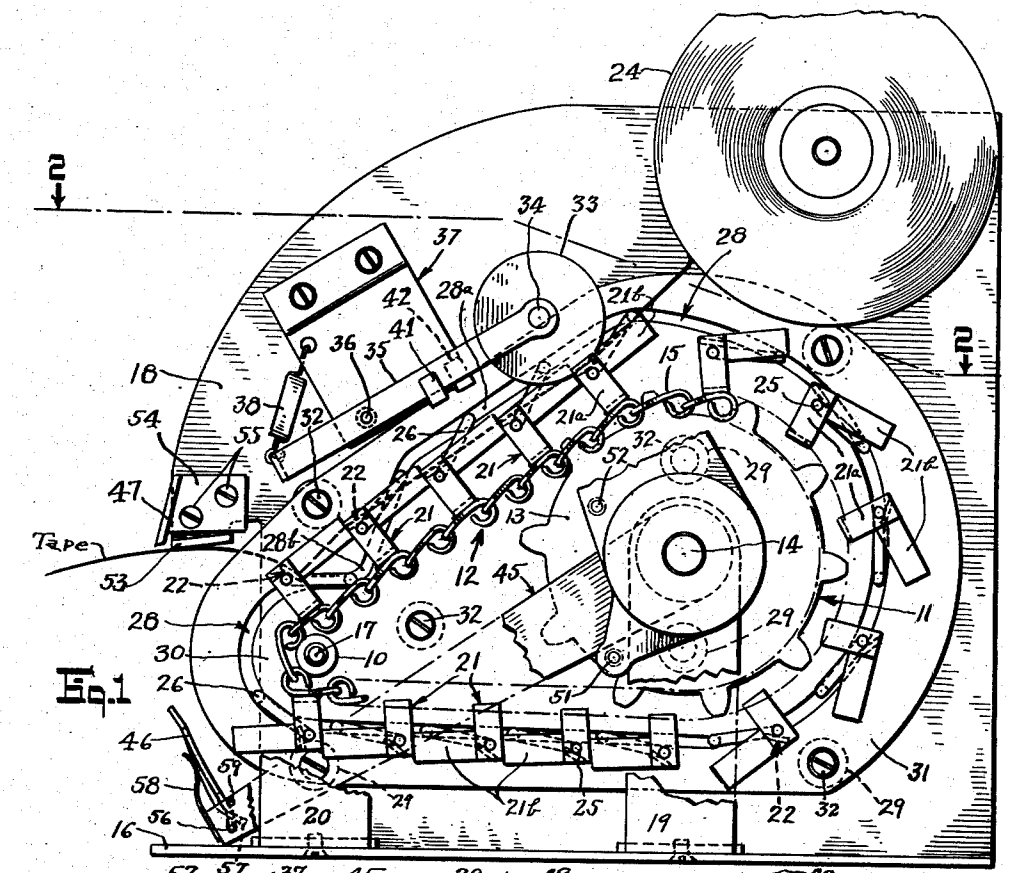


Fig. 1

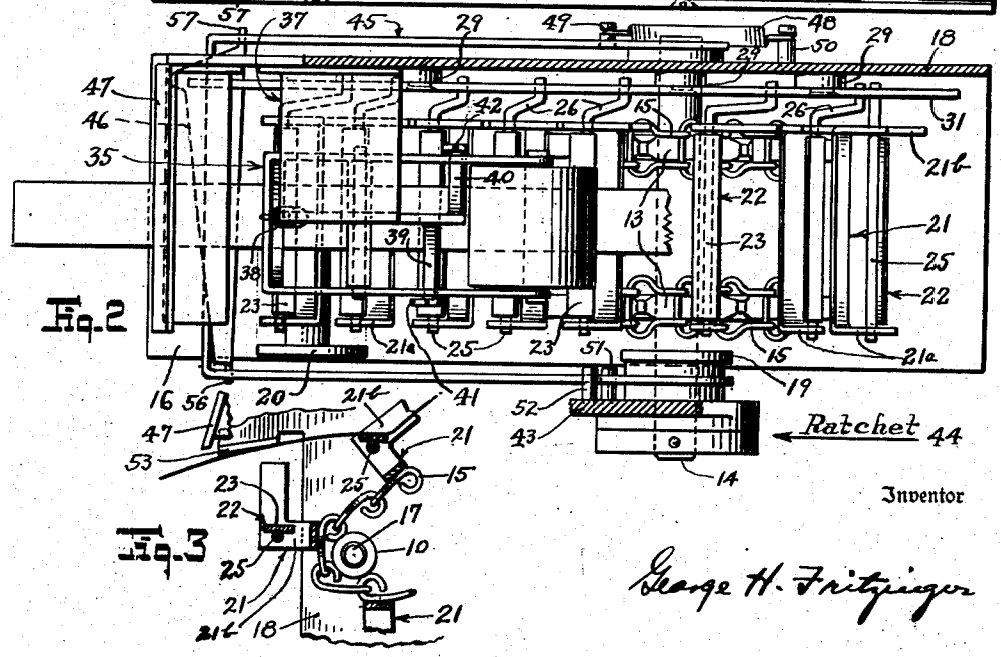


Fig. 2

Fig. 3

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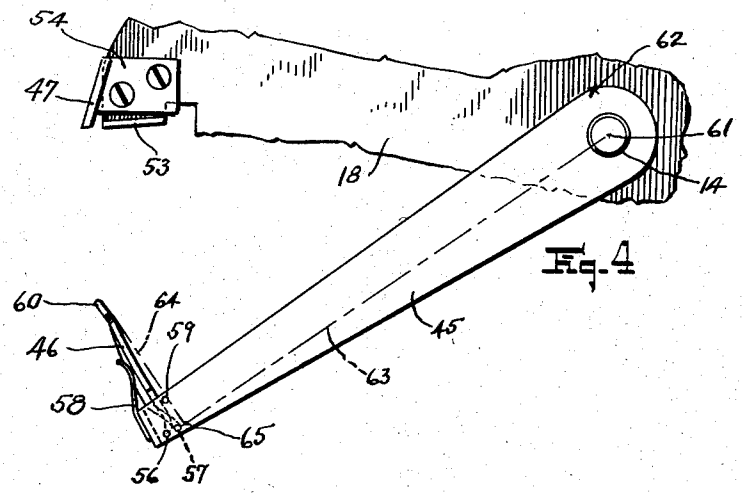


Fig. 4

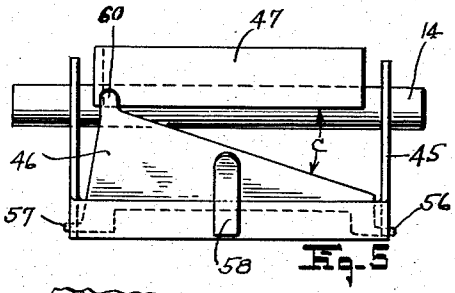


Fig. 5

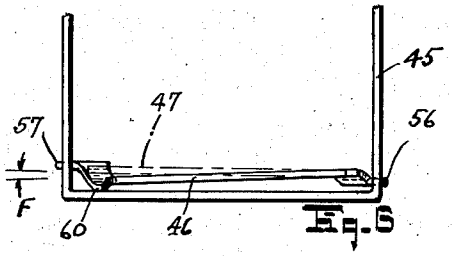


Fig. 6

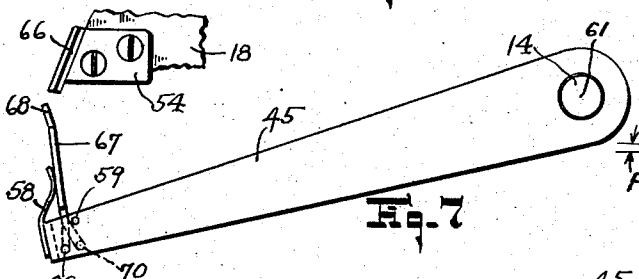


Fig. 7

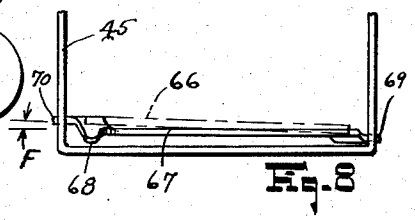
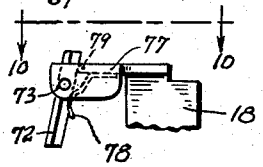


Fig. 8



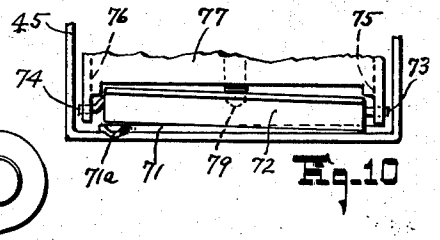


Fig. 10

Fig. 9

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UNITED STATES PATENT OFFICE

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DISPENSING MECHANISM FOR PRESSURE-SENSITIVE TAPE

George H. Fritzinger, West Orange, N. J., assignor of one-half to Harold G. Kendall, Brooklyn, N. Y.

Application January 6, 1951, Serial No. 204,714

9 Claims. (Cl. 271—2.1)

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This invention relates to improvements in dispensers for pressure-sensitive tape, and more particularly it relates to improvements in continuous-type feeding mechanisms such as are disclosed in my pending application Serial No. 791,402, filed December 12, 1947, now Patent No. 2,628,093, and to a novel and improved scissors cutter of the pivoted type having uniform cutting action along the length of the blades and permitting complete separation of the blades when the cutter is opened.

An object of my invention is to provide a continuous-type feeding mechanism for pressure-sensitive tape, which is adapted to project the tape outwardly from the feed mechanism at all times to enable such tape to be fed out with the adhesive side down.

Another object is to provide such improved feeding mechanism wherein the tape is fed from the supply roll to the dispensing station without being subjected to curvature which, if the machine is let stand, would cause the tape to take a set and be fed out without being projected outwardly as above noted.

Another object is to provide an improved mechanism for feeding pressure-sensitive tape wherein the feed members are turned about their longitudinal axes just prior to reaching the dispensing station to effect the outward projection above noted and are next advanced at a faster rate at the dispensing station to detach them from the tape.

Another object is to provide a pivoted-type scissors cutter of improved arrangement for tape dispensers which allows complete separation of the blades and which is adapted to cause the blades to close with constant cutting action in true scissors relation—i. e., with progressive point contact and point pressure between the blades varying according to the resisting shearing force of the material being cut.

These and other objects and features of my invention will be apparent from the following description and the appended claims, reference being had to the accompanying drawings, of which:

Figure 1 is a side elevational view, with parts broken away, of a dispenser embodying the features of my invention;

Figure 2 is a top view of the dispenser of Figure 1 as seen substantially from the line 2—2 of that figure;

Figure 3 is a fractional side elevation showing the relative positioning of parts of the feed mechanism at the dispensing station when the feed mechanism is advanced one-half the distance between successive feed members from the position it has in Figure 1;

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Figure 4 is a side view of the scissors cutter embodied in the dispenser of Figure 1;

Figure 5 is an end view of this scissors cutter;

Figure 6 is a fractional view taken along the medial plane of the lower blade of Figure 4 and showing in dash-dot lines the relative positioning of the cutting end of the other blade just as the blades are beginning to engage.

Figure 7 is a side elevation of a second embodiment of scissors cutter according to my invention;

Figure 8 is a fractional view taken along the lower blade of Figure 7 and showing in dash-dot lines the relative positioning of the cutting end of the other blade just as the blades are beginning to engage;

Figure 9 is a side elevational view of a third embodiment of scissors cutter according to my invention; and

Figure 10 is a partial plan view as seen from the line 10—10 of Figure 9 when the blades are beginning to engage.

The dispenser for pressure-sensitive tape shown in the accompanying drawings to illustrate the invention comprises a pair of rollers 10 and 11 of which the rearward roller 11 is preferably suitably larger than the other and constitutes a drive wheel for the mechanism. The forward roller 10 at the dispensing station has a relatively small diameter for effective detachment of the feed members from the tape as will appear. A belt 12 is held taut on these rollers. Specifically, the roller 11, as shown, constitutes a pair of spaced-apart sprocket wheels 13 fixedly mounted on the shaft 14, and the belt 12 constitutes a pair of chains 15 with alternate links of one chain bridged to alternate links of the other. The shaft 14 and shaft 17 for the roller 10 are carried at one side of the machine by a vertical frame plate 18 and at the other side of the machine by upstanding arms 19 and 20 of L brackets formed for instance from integral strips extending from the bottom edge of the frame plate. Secured as by screws to the horizontal portions of these L brackets is a base plate 16 for the machine.

By way of example, the alternate links may be bridged by U brackets 21 secured to the links as by welding. These brackets have arms 21*a* and 21*b* projecting outwardly from the belt 12. The arms 21*a* are straight, but the other arms 21*b* are L-shaped members which bridge the spaces between the brackets along the upper straight

portion of the belt so that these brackets are braced against one another to prevent them from being inclined rearwardly by the resisting feed force of the tape, as will appear. Between these arms there are feed members 22 in the form of bars. These feed members have feed surfaces 23 at their outer sides for adhesively engaging the tape to draw it from the supply roll 24 as the shaft 14 is turned counterclockwise as it appears in Figure 1. The feed members are secured at their inner sides to respective support rods 25 the ends of which pass through apertures in the arms 21*a* and 21*b* to pivot the feed members to the belt on transverse axes set just slightly inwardly from the longitudinal axes of the members.

The support rods have extending bell-crank levers 26 at one side of the belt which trail the respective feed members with respect to their direction of travel. On the ends of these crank levers are outwardly-extending fingers which engage slidably a track 28. This track is preferably an endless slot provided along the belt and formed by an inner plate 30 and an outer encompassing plate 31 held from the frame plate 18 by spacers 29 and secured thereto by screws 32. This track has a rectilinear portion 28*a* along the upper straight portion of the orbit of the feed members, which maintains all but the last of the feed members within this portion of their orbit in such angular position on their pivot axes that their feed surfaces are either in the same plane or else directed slightly forwardly in their direction of travel. In the travel of the last feed member, just prior to its entry into the curved path about the roller 10, through the distance of spacing between it and the next-succeeding feed member, the respective bell-crank lever engages an inwardly-curved portion 28*b* of the track to turn the feed member so that its feed surface is directed rearwardly. As will appear, this turning also places the feed surface at an angle greater than 180° from the adhesive side of the tape trailing therefrom to the next-succeeding feed member. The track 28 is maintained on a small radius around the roller 10 to hold the feed surfaces rearwardly directed as they pass through the curved portion of their path at the dispensing station. From here the track continues onwardly along the path of the feed members to meet with the rectilinear portion 28*a* abovementioned. The shape of this intermediate portion of the track is not critical since the feed members are not engaged with the tape while their bell-crank levers are engaged with this intermediate portion of the track.

A pressure roller 33 is provided for adhesively engaging the tape from the supply roll 24 with the feed members successively as they enter the upper rectilinear portion of their orbital travel. This pressure roller is journalled on a transverse shaft 34 carried by a U lever 35 which is pivoted on a transverse shaft 36. The shaft 36 is pivoted loosely at its central portion to a depending arm of a bracket 37 mounted on the frame plate 18. The pressure roller is urged towards the belt by a tension spring 38 connected between the outer end of the lever 35 and the upper portion of the bracket 37, but is stopped by two side fingers 39 and 40 bent laterally from the bracket arm 30. These lateral fingers have upstanding end portions 41 and 42 which lie just beyond the arms of the U lever 35 to limit the sidewise movement of the pressure roller. The tape from the supply roll is drawn preferably just slightly upwardly around the pressure roller so that it will not engage a feed member until it has entered the rectilinear orbital portion of its movement.

As the shaft 14 is turned counterclockwise, the pressure roller presses the tape into adhesive contact with successive feed members as they pass thereby, to cause the feed members to grip the tape and draw it from the supply roll. There may for example be three co-planar feed members in the rectilinear orbital portion of their path, each of which will hold strongly to the tape because its feed surface is at 180°, or less, from the tape trailing therefrom. In the turning of the last feed member about its pivot rod 25 prior to its entry into the curved orbital portion of its travel about the roller 10 at the dispensing station, the tape remains in adhesive contact therewith, particularly because the pivot axis of the feed member is set slightly inwardly as aforementioned. As each such feed member starts its curved orbital travel about the roller 10, it is advanced relative to the next-preceding feed member by reason of its being mounted at a distance from the outer periphery of the belt, to cause the tape to be peeled therefrom. By the time the tape is so peeled therefrom, the next-preceding feed member will have already been turned rearwardly to direct the free tape upwardly and outwardly away from the feed mechanism. This positive directing of the tape away from the feed mechanism permits the tape to be fed successfully with the adhesive side down. A further aid in permitting the tape to be fed successfully with the adhesive side down is the feature of drawing the tape from the roller and presenting it at the dispensing station while maintaining it in almost a straight line, or only with curvature which aids the outward projecting of the tape. Thus, the tape can in nowise take a set, while the machine is let stand idle, which would tend to cause the tape to follow the belt around the roller 10 at the dispensing station when operation of the machine is resumed. A basic feature of my machine which is instrumental in causing a positive outward directing of the tape from the feed mechanism is in turning each feed member rearwardly prior to the disengagement of the tape from the next feed member in advance thereof.

The shaft 14 may be turned intermittently to effect a step advance of the feed mechanism as by reciprocation of a handle 43 (fractionally shown) mounted on the right end portion of the shaft and coupled thereto by a suitable ratchet mechanism 44 which need not be herein described in detail and which is therefore shown only diagrammatically.

When cellophane tape or tapes of similar character are dispensed a tear-off cutter may be used such as is shown in my application aforementioned. However, when heavy, tough tapes are dispensed a scissors cutter is required. This scissors cutter should be of a type permitting complete separation of the blades to provide a wide clearance space therebetween for feed-through of the tape; also, the blades should be carried by frame members which are pivotally interconnected on an axis substantially parallel to the blades in order to conserve space laterally of the machine.

In accordance with the foregoing desideratum, the scissors cutter embodied in the dispenser of Figures 1 and 2 comprises a U lever 45 which straddles the forward part of the machine and which is pivoted on the shaft 14. Mounted on the forward portion of this lever is a transverse blade 46, and mounted on the forward portion of

the frame plate 18 is a cooperating transverse blade 47. The lever 45 is urged downwardly against the base plate 16 by a tension spring 48 connected between a lug 49 on the left leg of the lever and a stud pin 50 on the frame plate 18. Upward actuation of the lever 45 to engage the blades may be effected by the handle 43. For this purpose the handle is provided with a pin 51 which, when the handle is swung rearwardly from the neutral position it occupies in Figure 1, will abut against the under side of the right leg of the lever 45 and swing the lever upwardly. Also, to assure positive disengagement of the blades, another side pin 52 is provided on the handle 43 in position to abut against the top side of the right leg of the lever 45 as the handle is returned through the end portion of its forward movement to its neutral position. Thus, the operation of the machine is as follows: the operator will reciprocate the handle back and forth within its range of travel ahead of its neutral position to effect a step advance of the feed mechanism until the desired length of tape is fed out, and will then reciprocate the handle once through its range behind its neutral position to engage the blades and sever the fed-out length from the tape supply and to return the movable blade next to its lowered position wherefore to provide a wide clearance space for feed-through of the next succeeding length. My invention is however not concerned with any particular mode of operation of the machine, this particular mode of operation being shown only to illustrate a complete machine embodying the features of my invention.

Positioned to the rear of the blade 47 is a stationary transverse member 53 on the side frame plate 18. This member 53 serves as a guide for directing the tape past the blade 47 when feeding is resumed after the tape is cut.

In the type of scissors cutter shown, which, however, is not claimed herein since the same is claimed in my continuation-in-part application, S. N. 355,680, filed May 18, 1953, and entitled "Scissors Cutters," one of the blades is fixedly secured to its carrying member but the other is yieldably mounted on its carrying member so that binding action will not take place between the blades as they are engaged. In the present embodiment the blade 47 is fixedly mounted on the frame plate 18 as on a bracket 54 secured to the plate by screws 55. The outer edge of this blade, which is its cutting edge, is preferably positioned parallel to the shaft 14 so that the tape will not be cut on a bias. The blade 46 is pivoted to the U lever 45 on a transverse axis by providing the blade with ears 56 and 57 at the opposite ends thereof which engage respective apertures in the opposite legs of the U lever. The cutting edge of this blade is its inner edge, and so that the two cutting edges may engage along a progressive point contact, this latter edge is inclined to the horizontal as indicated in Figure 1 and as is shown more clearly in Figure 5. For point pressure between the blades, blade 46 is urged inwardly, by a leaf spring 58 on the outer end of the U lever, against a stop pin 59 on the U lever, this stop pin being so positioned that the blades will first meet at the ends of their cutting edges as the U lever is swung upwardly. However, to alleviate critical positioning of the blades, one of the blades—in this case the blade 46—is set slightly inwardly about its pivot axis beyond a position for engagement of its cutting edge with that of the blade 47 and is provided with a guide lug 60 at its point of initial contact with the blade 47, which lug is inclined outwardly to cam the pivoted blade slightly outwardly into scissors relation with the blade 47 as the blades come into engagement.

It is not known that any scissors cutter of the type shown has heretofore been provided which has a uniform cutting action along the full lengths of the blades. In accordance with the present invention, however, such uniform cutting action is achieved—i. e., a progressive point contact is obtained between the blades with a point pressure that varies directly with the resisting shearing force of the material being cut—so as to cut the tape positively, regardless of the toughness or thickness thereof, in response to a minimum actuating force. This improved action is obtained by pivoting the yieldably-mounted blade to its carrying member on a transverse axis which lies in a plane which is fixed in relation to the carrying member and which contains also the line of progressive point contact between the blades as the blades are engaged. When hollow ground blades are used, the axis of the pivoted blade and its cutting edge lie in a common plane. These underlying principles will be apparent from the following detailed description of this scissors cutter with reference to the detailed views of this cutter as shown in Figures 4, 5 and 6.

In describing this scissors cutter, the term "cutting angle" is used to mean the angle which is between the cutting edges of the two blades when the blades are partially engaged. This cutting angle, which is typically of the order of 15° to 20°, appears clearly in Figure 5 as the angle C. The term "face angle" is herein used to mean the angle which is between the confronting faces of the blades when they are engaged. This angle is required—unless the blades are hollow ground, so that the blades engage with progressive point contact. It is a small angle—of the order of 1°—and appears in Figure 6 as the angle F between the two lines extending from the cutting edges of the two blades. Further, the term "active portion" is herein used to mean the portion of each blade that is moved past the other as the blades come into full engagement.

As aforestated, it is desirable that the cutting edge of the stationary blade 47 be parallel to the shaft 14 so that the tape will not be cut on a bias. Accordingly, in order to get the needed clearance for point contact of the blades, the active portion of the movable blade 46 is inclined to the shaft 14 by the face angle F. For instance, the portion of the blade 46 extending from the leading guide lug 60 back to the pivot 57 may be arcuate about the center 61 of the shaft 14, as shown; or alternatively, it may be straight and be tangential to an arc from the guide lug 60 about the center 61. However, the cutting edge of the blade 46 is not arcuate or tangential with respect to the same center 61 as the edge appears in Figure 4, but is instead arcuate, or tangential as the case may be, with respect to a center 62 displaced upwardly from the center 61 because of inclination of the blade required to provide the face angle F above described.

In order to understand the need for inclining the pivot axis of the blade 46 on the carrying lever 45, the blade 46 is herein next considered as comprising a series of incremental elements leading back from successive points of its cutting edge. As to the first such element leading from the edge at the guide lug 60, reference is had in Figure 4 to a radius line 63 which extends from the pivot

center 61 through the pivot 57, and to a chord line 64 which extends from the leading edge of this first element at right angles to this radius line to intersect therewith at 65.

Were the first incremental element pivoted to the carrying member 45 at the intersection point 65, the resisting force from sliding friction of this element with the stationary blade 47, during the incremental movement of the element to move its cutting edge past the stationary blade, would be in line with the element and would not affect the point pressure produced by the spring 58. When material is being cut the resisting shearing force tends to cam this element from the stationary blade. The spring 58 resists such disengagement but spring pressure alone is not sufficient for positive cutting action since a hard spot in the material would overcome the spring force or else the spring would have to be made so stiff that hard action would result. To prevent the need for strong spring pressure, and yet to obtain positive cutting action of this first element with the stationary blade, the pivot axis of this element is positioned on the radius line 63 beyond the intersection point 65 at the pivot 57. In so doing, the resisting shearing-force effect can be just neutralized or can be made to increase the point pressure substantially in direct proportion to the resisting shearing force, depending on the distance the pivot point 57 is set beyond the intersection point 65.

Were the pivot axis for all of the incremental elements of the blade 46 parallel to the shaft 14 at the pivot point 57, the first incremental elements whose chord lines are not beyond this axis would cut positively but the remaining portion of the blade would not cut positively since only spring pressure would be available to maintain contact of this remaining portion with the blade 47. If this parallel pivot axis were set sufficiently beyond the intersection point 65 to be beyond the chord line of even the last incremental element of the blade 46, as at the pivot point 56, then the first incremental element would be at such a steep angle to its chord line as to lock with the blade 47 especially if the blades have a substantial width, as shown, or if the distance of the blade 46 from the shaft 14 was relatively small.

However, when the pivot point for each incremental element of the blade 46 is determined in the manner explained in the preceding penultimate paragraph, the successive pivot points define a line which is in a plane common with the cutting edge of the blade, or with the medial line of the cutting edge if the edge is curved, except for the face angle F. Because of this face angle the pivot line will be in a plane which is inclined farther from the shaft 14 by the extent of the face angle. From another viewpoint, the pivot line will be in a plane moved with the carrying lever 45 and containing the line of progressive point contact of the blade 46 with the stationary blade 47 as the blades engage.

Since each incremental element of the blade 46 is in effect pivoted to the carrying lever 45 in the same relation to its point of contact with the stationary blade 47, when the pivot axis is inclined from pivot point 56 to point 57 in the manner just explained, there is obtained a uniform cutting action along the full length of the blades to give positive cutting at all points of the blades with minimum actuating force.

In Figures 7 and 8 there is shown a second embodiment of scissors cutter according to my invention wherein there is a stationary blade 66 mounted on the side plate 18 fractionally shown and the lever 45 pivoted again on the shaft 14. As before, a blade 67 having a guide lug 68 is pivoted to the lever 45 on a transverse axis by means of ears 69 and 70 extending from the blade and engaging respective apertures in the lever 45; also, this blade 67 is urged inwardly by the spring 58 against the stop 59. However, in this embodiment the face angle F is obtained by inclining the stationary blade 66 to the pivot shaft 14. The entire active portion of the pivoted blade 67 is in this embodiment either arcuate about the center 61 of the shaft 14 or flat on a tangent from an arc through the guide lug 68 about the center 61, the flat shape being shown by way of illustration. As the blades are engaged the pivoted blade 67 is cammed slightly outwardly about its transverse axis on the lever 45, due to the inclination of the stationary blade 66 by the face angle F. As in the previous embodiment, the transverse axis of the pivoted blade on the pivots 69 and 70 is in a common plane with the line of progressive point contact defined between the blades; or from another viewpoint, this transverse axis of the blade is inclined farther away from the shaft 14 by the face angle F than is a plane including the cutting edge of the pivoted blade.

In the third embodiment shown in Figures 9 and 10, the lever 45 on shaft 14 has fixedly mounted thereon a blade 71 the active portion of which may be flat and which has a guide lug 71a each as in the next preceding embodiment. The other blade 72 may also be flat and is provided with ears 73 and 74 that are pivoted in opposite legs 75 and 76 of a U bracket 77 that is carried by the side frame plate 18 again only fractionally shown. The blade 72 is urged outwardly about the pivot axis by a leaf spring 78 on the bracket 77 against a stop formed by the abutment of the upper portion of the blade against a lug 79 on the bracket, as shown in Figure 10. The blade 72 may be inclined to the shaft 14 to the extent of the needed face angle F. Its pivot axis on the bracket 77 is however then parallel with the shaft 14 and at the face angle F to the blade, since the active portion of the other blade 71 is also parallel to this shaft, which is in accord with the principle of my invention that the pivot axis of the pivotally supported blade shall be in a plane which is fixed with respect to the carrying member of that blade and common with the line of progressive point contact defined between the blades as they are engaged.

It will be understood from the foregoing description that the inclination of the pivot axis of the pivoted blade on its carrying member is greater as the distance of the blades from the pivot axis of the carrying members is made shorter and as the cutting angle between the edges is made greater. On the other hand, the face angle required when the blades are not hollow ground, and which may be desirable even when the blades are hollow ground, is always small as of the order of a degree. The principle set forth that the transverse pivot axis and pivoted blade be in a common plane with the line of progressive point contact between the blades instead of with the cutting edge of the pivoted blade is desirable from the standpoint of achieving maximum uniformity of cutting action along the full length of the blades. However, from a practical standpoint, variations of inclination of the transverse pivot axis of the pivoted blade are ofttimes permissible

by the amount of the small face angle, or more. Accordingly, the pivot axis of the pivoted blade may to a first approximation be in a common plane with the cutting edge of the pivoted blade even when the blades are not hollow ground.

The scissors cutters above described have a wide variety of uses especially where the problems simulate those present in the dispenser herein described, and are useful particularly in dispensers and applicators for pressure-sensitive tape because of the ever-tacky character of the adhesive side of such tape and the flexible nature of the tape which makes it impossible to direct such tape through narrow clearance spaces.

The embodiments of my invention above described are illustrative and not limitative of my invention since the same are subject to many changes and modifications without departure from the scope of my invention, which I endeavor to express according to the following claims.

I claim:

1. A mechanism for feeding pressure-sensitive tape comprising a series of spaced-apart parallel feed members having feed surfaces for holding to the tape by adhesive contact, endless carrying means supporting said feed members on the outer periphery thereof for movement in a closed orbit, one portion of said orbit being rectilinear and including a plurality of said feed members and an immediately-succeeding portion of said orbit being sharply curved, said carrying means including means to produce an increased separation of each feed member relative to the next preceding feed member as it is moved from said rectilinear portion into said curved portion of said orbit, and said carrying means further including means for supporting said respective feed members for pivotal movement on axes longitudinal thereof; and guide means along said rectilinear portion of said orbit for turning said feed members on their pivot axes rearwardly relative to their travelling movement in succession as they approach said curved portion of said orbit.

2. The combination set forth in claim 1, including a pressure roller for adhesively engaging the tape with said feed surfaces in succession as the same are advanced through said rectilinear portion of said orbit, wherein said guide means includes means to hold each feed member, as it is advanced beyond said pressure roller, in position on its longitudinal axis wherein the feed surface thereof is at 180 degrees or less from the adhesive side of the tape trailing therefrom, and wherein said guide means further includes means to turn each feed member on its longitudinal axis to place the feed surface thereof at more than 180 degrees from the adhesive side of the tape trailing therefrom as the feed member is moved through the end of said rectilinear portion of said orbit just preceding said curved orbital portion.

3. The combination set forth in claim 1 wherein said feed members have substantially flat feed surfaces, and said guide means includes means to maintain in substantial alignment with each other all but the last of the feed surfaces which are within said rectilinear orbital portion, and said guide means further includes means to turn the last feed member so that its feed surface is at an angle greater than 180 degrees from the adhesive side of the tape trailing therefrom as said last feed surface is moved into said curved orbital portion whereby the last feed surface in said rectilinear orbital portion tends to direct the tape outwardly from said orbit and to cause the tape to be peeled therefrom as this last feed surface is advanced relative to the next-preceding feed surface.

4. In a mechanism for feeding pressure-sensitive tape from a supply roll including a series of spaced-apart transverse feed members having feed surfaces which adhesively hold to the tape, and carrying means for said feed members movable to advance said feed members through a rectilinear path while maintaining them in fixed relative spacing and to advance them further in succession into a curved path while increasing said spacing: the combination of means mounting said feed members on said carrying means for pivotal movement on axes parallel to their respective longitudinal axes; guide means associated with said feed members including means for maintaining in substantial alignment all but the last of said feed surfaces within said rectilinear path and means for turning said last feed member to direct its feed surface rearwardly relative to its traveling movement prior to its entry into said curved path; and a pressure roller at a station along said rectilinear path for pressing the tape from said supply roll into adhesive contact with said feed members in succession as they are moved thereby.

5. The combination set forth in claim 4 wherein said feed surfaces are set outwardly from said respective pivot axes with respect to said carrying means whereby said turning movement of said last feed member will reduce the effective spacing between it and the next-succeeding feed member prior to its entry into said curved path.

6. The combination set forth in claim 4 wherein said guide means includes bell-crank levers extending from said feed members and trailing therefrom, and a guide track along said path engaged by said bell-crank levers, wherein said guide track has a portion curved inwardly relative to said path to turn each feed member relative to said carrying means, to place its feed surface at an angle greater than 180 degrees from the adhesive side of the tape trailing therefrom, as said feed member is moved through the distance of spacing between it and the next-succeeding feed member just prior to its entry into said curved path.

7. A mechanism for feeding pressure-sensitive tape from a supply roll, comprising a pair of spaced-apart axially-parallel rollers, a belt held taut on said rollers to have a rectilinear portion between said rollers and curved portions around said rollers, support elements on the outer periphery of said belt at fixed intervals therealong, a series of transverse feed members mounted on said support elements respectively at a distance from the outer periphery of said belt, means for adhesively engaging the following portions of the tape from said roll with succeeding feed members as the latter are carried through a rectilinear portion of their path of movement, and bracing elements on said support elements adapted to abut against adjacent ones of the support elements within the rectilinear portion of said belt to hold said support elements from yielding to the resisting feed force of the tape.

8. A mechanism for feeding pressure-sensitive tape from a supply roll, comprising a pair of spaced-apart axially-parallel rollers, a belt held taut on said rollers to have a rectilinear portion between said rollers and curved portions around said rollers, a series of transverse U-brackets mounted on the outer periphery of said belt at fixed intervals therealong, tape-feed members supported between the arms of said brackets for

pivotal movement about substantially their longitudinal axes, means for maintaining fixed on their axes the feed members on one of said rectilinear belt portions and for turning rearwardly relative to their travelling movement the feed members in succession at the end of said one rectilinear belt portion as the belt is advanced, and means for rolling tape from said supply roll into adhesive contact with said feed members in succession at the point where said one rectilinear belt portion begins as said belt is advanced.

9. A mechanism for feeding pressure-sensitive tape from a supply roll, comprising a pair of sprocket wheels fixedly secured together on a common axis, a roller of relatively small radius the axis of which is parallel with that of said sprocket wheels and spaced therefrom, a pair of chains about said roller and respective sprocket wheels, said chains comprising alternate links having pairs of outwardly-projecting arms spaced from each other along said axes, transverse feed members pivoted to said arms for movement about substantially their longitudinal axes, guide means associated with said feed members including means for maintaining in substantial alignment all but the last of the feed surfaces of the feed members within a straight portion of said chains, and further including means for turning said last feed member to direct its feed surface rearwardly with respect to its direction of travel prior to its movement about said roller, and means for adhesively contacting following portions of the tape from said supply roll with successive ones of said feed members within the rectilinear portion of said chains during rotation of said sprocket wheels.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
Re. 22,945	Engberg	Dec. 2, 1947
868,977	Elliott	Oct. 22, 1907
1,675,196	Uttz	June 26, 1928
1,958,443	Phillips	May 15, 1934
2,275,064	Moore	Mar. 3, 1942
2,277,693	Dybvig	May 31, 1942
2,290,941	Gauther	July 14, 1942
2,333,108	Krueger et al.	Nov. 2, 1943