

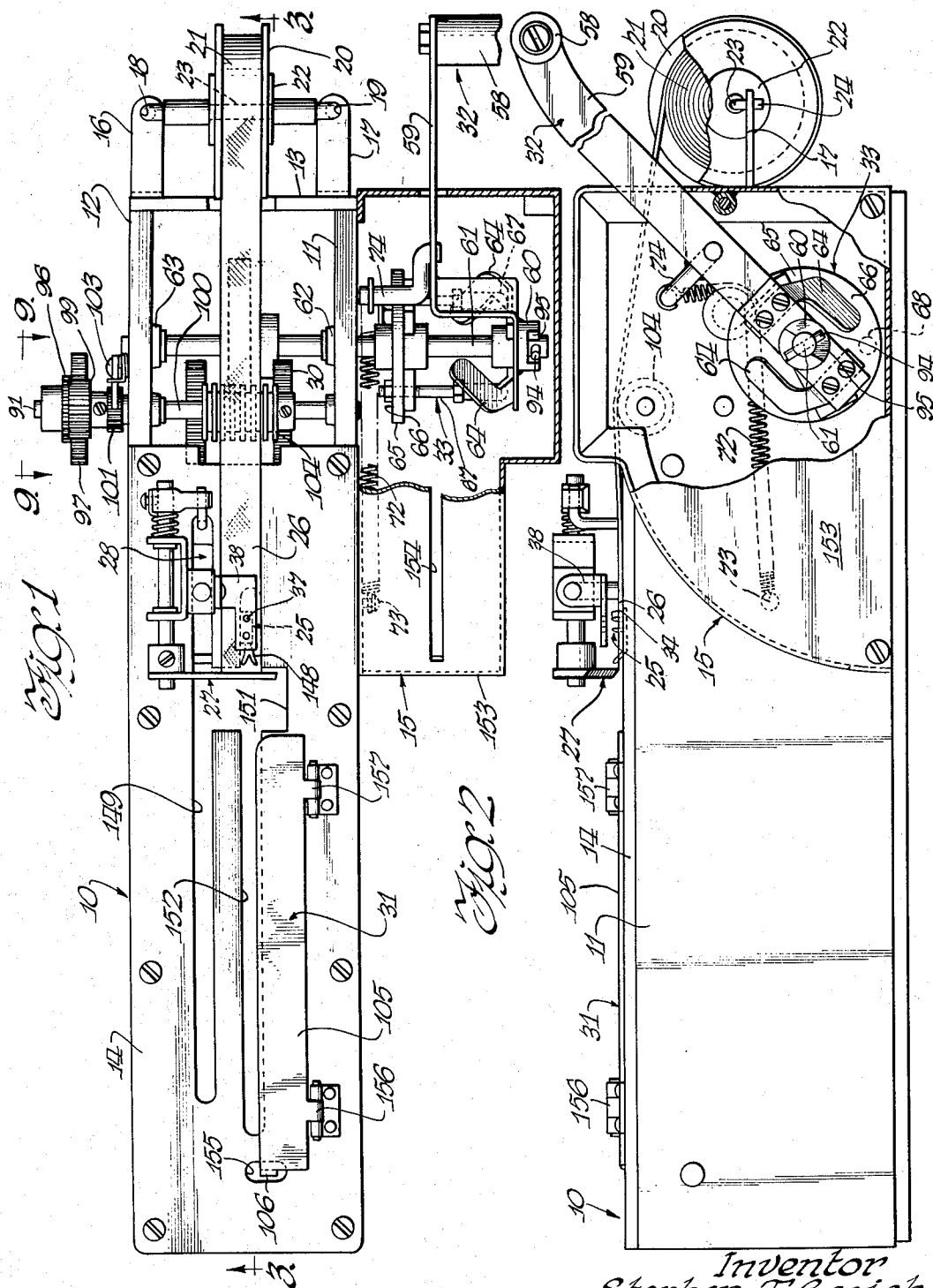
May 22, 1956

S. T. GEZICH
DISPENSER FOR DRAWING OUT AND SEVERING
A DESIRABLE LENGTH OF TAPE

2,746,543

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4 Sheets-Sheet 1



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4 Sheets-Sheet 2

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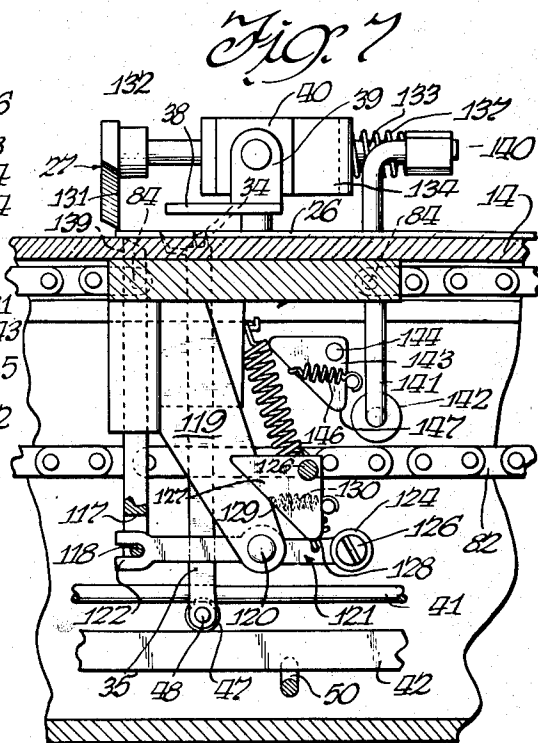
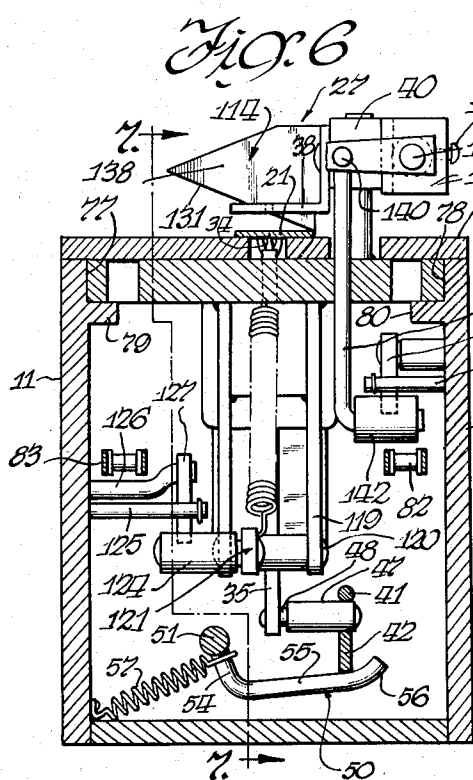
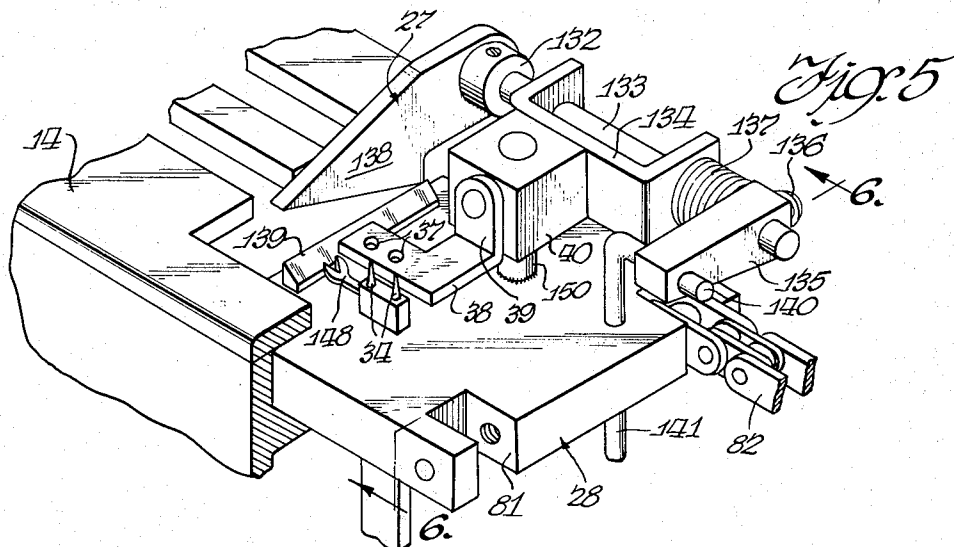
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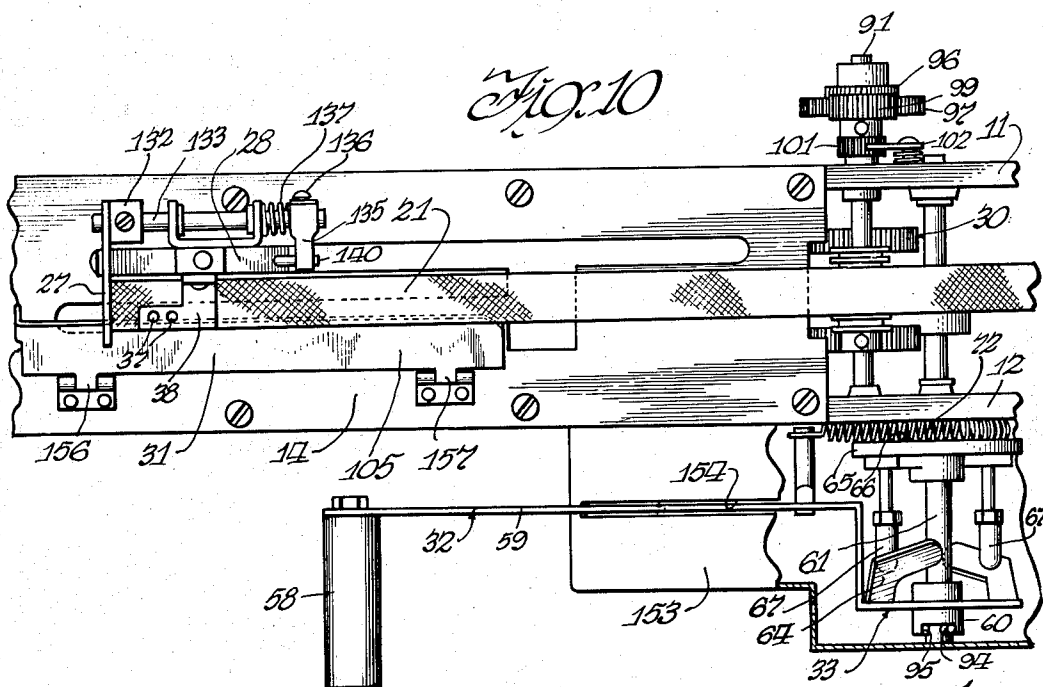
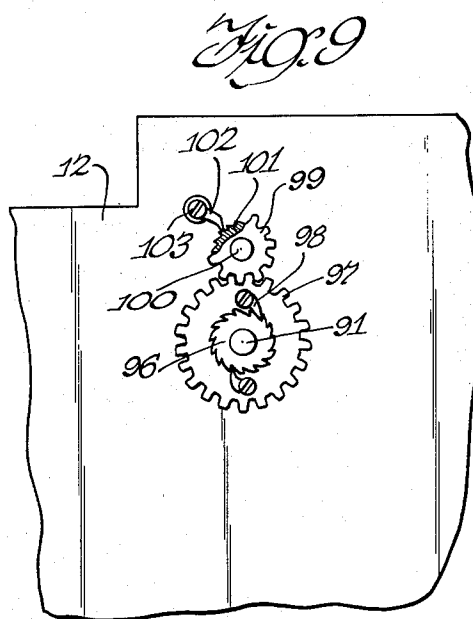
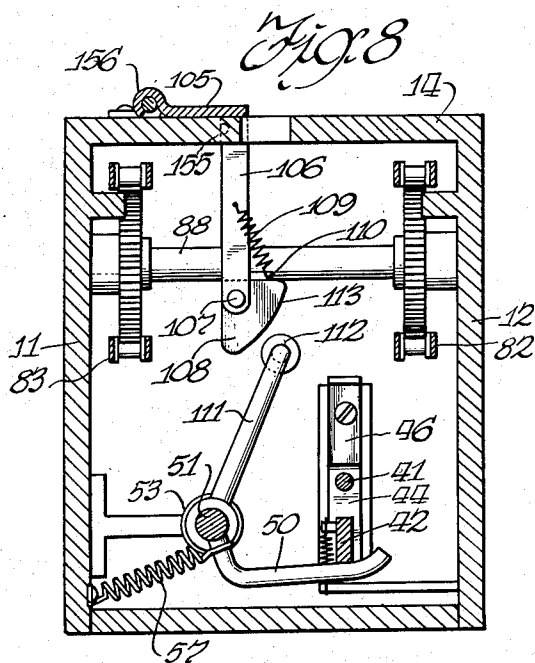
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DISPENSER FOR DRAWING OUT AND SEVERING A DESIRABLE LENGTH OF TAPE

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Application December 2, 1953, Serial No. 395,721

10 Claims. (Cl. 164—42)

This invention relates to an apparatus for dispensing adhesive tape.

The greater portion of the adhesive tape dispensing apparatus now available is arranged to draw out a length of tape by the manipulation of a lever, but no provision is made for handling the tape in an orderly fashion after it is drawn out. The adhesive nature of the tape may then cause it to become tangled and the operator of the apparatus must then use both hands to untangle the tape. Where the tape handled is an antiseptic to hold bandages, its antiseptic qualities are destroyed by the handling necessary to untangle it. Furthermore, when the operator is a physician he must drop the bandage which he may have been holding upon the wound being dressed while he untangles the tape. Alternatively, the physician may cut various sizes of tape before applying the bandage and hang them on a string or other support until he is ready to use them. This latter is wasteful of the tape and also renders the tape subject to pollution while it is hanging on the string.

It is desirable in dispensing antiseptic adhesive tape that the dispenser not only draw out a desirable length of tape, but that the drawn tape also be cut off automatically. Due to the adhesive nature of the tape, its resistance to uncoiling is appreciable and accordingly it is desirable that the end of the tape be firmly gripped in the dispensing apparatus while the tape is being pulled off its roll. Where a long length of tape is to be cut, however, a machine which will grip one end of the tape and then pull it out for the desirable long length would itself have to be at least as long as the length of tape to be cut and would therefore be impractical.

With the foregoing end results in mind, it is an object of this invention to provide a dispenser for adhesive tape which requires only one hand for its operation and which will enable the user to draw out any desirable length of tape and automatically sever the length drawn out while at the same time leaving the tape in an orderly condition for immediate use.

A more specific object of this invention is to provide a tape dispensing apparatus for handling adhesive tape wherein a reciprocable gripping means is applied to the free end of the tape while the tape is being drawn out which may be released and drawn back to an intermediate point on the length of tape where it may again grip the tape for adding to the length of tape drawn out, this operation being repeated as often as desired and the length of tape drawn out being automatically severed when the dispenser is restored to its original or initial position.

This invention has for another object the provision of an adhesive tape dispensing machine having a frame member on which is mounted a roll of tape to be dispensed, a carriage slidable away from and back toward the roll of tape, with means on the carriage for gripping the adhesive tape while the carriage moves away from the source of tape but which releases the tape on the return movement of the carriage toward the tape, and a unitary

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control for moving the carriage and for operating the tape gripping means.

For another object this invention seeks to provide in a tape dispensing device, means for cutting off a length of tape automatically upon a return of the control member for the device to its initial position, the cutting off means being inoperable while the control is used, repeatedly if necessary, to pull a desired length of tape from the dispenser.

These and other objects of this invention will become apparent from the following detailed description when taken together with the accompanying drawings in which:

Fig. 1 is a plan view of the dispenser of this invention with a portion of the cover removed;

Fig. 2 is a side elevational view of the dispenser with a portion of the housing removed to show the details of the control mechanism;

Fig. 3 is a side elevational view in section of the dispenser of Fig. 1, the section being taken substantially along the line 3—3 of Fig. 1;

Fig. 4 is a bottom view of the dispenser of Fig. 1 with a portion of the cover of the control removed and with the carriage removed for clarity;

Fig. 5 is an enlarged plan view in perspective of the carriage of the dispenser and fragments of the parts of the mechanism pertinent thereto;

Fig. 6 is an enlarged end elevation in section of the dispenser, the section being taken along line 6—6 of Fig. 5;

Fig. 7 is an enlarged fragmentary side elevation of the carriage and its associated mechanism taken along line 7—7 of Fig. 6;

Fig. 8 is another elevation in section taken through the dispenser at substantially line 8—8 of Fig. 3 and looking in the same direction as Fig. 7;

Fig. 9 is a rear elevation of the portion of the dispenser which prevents reverse movement of the tape, the elevation being taken substantially from the position shown by line 9—9 of Fig. 1; and

Fig. 10 is a fragmentary plan view of the dispenser of Fig. 1 showing the dispenser in another phase of its operation.

Referring now to the drawings for a detailed description of the invention there is shown in Fig. 1 a frame 10 which is in the form of a rectangular container having side walls 11 and 12, which for the purposes of this description will be termed front and rear walls, respectively, an end wall 13 and a cover 14 which is secured to front and rear walls 11 and 12 by any suitable means. Secured to front wall 11 is a container 15 which houses the principal controls for the dispenser. Extending to the right from end wall 13 as viewed in Figs. 1 and 2 are support brackets 16 and 17 each having an opening 18, 19 respectively in the end region thereof.

Brackets 16 and 17 are adapted to support a roll 20 containing adhesive tape 21 which is to be dispensed by the device. Said roll 20 is mounted on a spool 22 through which passes a supporting axle 23, the ends of which are bent at right angles to the axis of the axle as shown at 24 to be received in openings 18 and 19. Spool 22 is free to rotate about axle 23, and axle 23, by virtue of the bent ends 24 thereof being disposed in openings 18 and 19, is held at a fixed distance from end wall 13.

The dispensing mechanism includes a gripping device 25 shown disposed substantially centrally of cover 14 as viewed in Fig. 1, said gripping device being adapted to grip the end 26 of the tape 21; a shearing device 27 adapted to cut off the tape after the requisite amount has been pulled off roll 21, a carriage 28 shown more clearly in Fig. 3, said carriage carrying the gripping device 25 and the shearing device 27, a carriage drive mechanism 29, also shown more clearly in Fig. 3, said drive mechanism including a plurality of speed changing

gears 30, stripper 31, for stripping the adhesive tape from the gripping device 25, and a manually operated control 32 and control mechanism 33 operated thereby for operating the foregoing devices and mechanisms.

The gripping mechanism 25 is shown to better advantage in Figs. 3 and 5. In the form chosen to illustrate this invention it is comprised of two or more needles 34 mounted on the upper end of a vertical rod 35, said rod 35 being reciprocable in an opening 36 in carriage 28. Needles 34 are adapted to be pushed upwardly through the end 26 of the tape 21 and into openings 37 in a small L-shaped plate 38 having a flange 39 by which it is secured to a post 40 on carriage 28. It will be noted that plate 38 is disposed over end 26 of tape 21 and needles 34 are normally disposed below said tape end. Should the tape be relatively thick and resistant to piercing by the needles, the mere raising of rod 35 toward end 26 might not be sufficient to cause the needles to pierce the tape and secure a firm grip thereupon. By providing plate 38, however, an abutment is established for the tape in a vertical direction so that as the needles 34 progress upwardly, the tape end 26 is held by plate 38 against further movement upward, and needles 34 are then enabled to pierce tape end 26 and pass into openings 37 if necessary. Tape end 26 is thus positively gripped by the needles 34 and is also clamped to some extent between the end of rod 35 and the underside of plate 38.

The mechanism for reciprocating rod 35 in its opening 36 is comprised of vertically spaced rails 41 and 42, rail 41 being substantially circular in cross-section in the form chosen for illustrative purposes, and rail 42 being of substantially rectangular cross section, with the long axis of the section facing rail 41. The ends of rails 41 and 42 are secured to blocks 43 and 44 which are adapted to slide substantially vertically in guides 45 and 46, respectively. Rails 41 and 42 are held in parallel spaced relationship by blocks 43 and 44 and confine between them a roller 47 which is mounted for free rotation about a pin 48 extending horizontally, as viewed in Fig. 6 for example, from the lower end of rod 35.

Thus, as rails 41 and 42 may be moved vertically in guides 45 and 46, the motion is transmitted through roller 47 and pin 48 to rod 35, which in turn, transmits the motion to needles 34 to cause them to pierce and grip the free end 26 of tape 21. Because of the roller connection between rod 35 and rails 41 and 42 said rod 35 may be moved laterally between rails 41 and 42 to any position within the limits of the distance between blocks 43 and 44, or any other limitation which may be placed upon the lateral movement of rod 35, and yet at any point, said rod 35 may be raised and lowered when rails 41 and 42 are raised and lowered.

It may be observed that since the tape is pierced on the upward movement of rod 35, the reaction of the resistance to such piercing is taken by the lower rail 42, and it is for this reason that the lower rail is given a substantially rectangular cross section and is disposed with the long axis of the section disposed vertically of the device so that it will have the necessary stiffness in a vertical direction.

The vertical position of rails 41 and 42 is controlled by a pair of supporting arms 49 and 50 which, as shown in Fig. 6, are secured to an oscillatable rod 51 supported for such oscillation in journals 52 and 53 (Fig. 4) extending inwardly from wall 11. Each of the arms 49 and 50 is somewhat L-shaped as viewed in Fig. 6, with one leg 54 extending downward from rod 51 and leg 55 extending substantially horizontally below rail 42. A tension spring 57 is secured at one end to leg 54 and at its other end to a suitable point on frame 10 and continuously biases arm 50 in a clockwise direction as viewed in Fig. 6. In this direction arm 50 tends to become lowered so that rails 41 and 42 likewise fall and move roller 47 and its associated rod 35 downwardly to release the gripping mechanism. To equalize the forces acting on oscil-

latable rod 51 two such springs 57 may be used, one associated with arm 49 and the other with arm 50.

The external control for oscillatable rod 51 is comprised of a handle 58 mounted on an arm 59 secured to a hub 60. Said hub is in turn mounted for limited rotation about a shaft 61 which is disposed transversely of frame 10 and is mounted in suitable bearings 62 and 63 in walls 11 and 12 thereof. A pair of cam fingers 64 are secured to arm 59 on opposite sides of hub 60 and extend inwardly toward wall 11. Between cam fingers 64 and wall 11, and axially slidable on shaft 61, is a circular plate 65 keyed to shaft 61 to rotate with said shaft and having a substantially flat face 66 disposed on the side away from arm 59 and in a plane normal to the axis of shaft 61. On the side of plate 65 opposite face 66 are two rounded ended pins 67 which are secured to plate 65 to move therewith, the rounded ends bearing against cam finger 64. Thus, as arm 59 is oscillated about the axis of shaft 61, relative motion between cam fingers 64 and rounded ended pins 67 causes the latter to ride on said cam fingers and thereby push plate 65 toward wall 11.

Immediately adjacent face 66 is a pin 68 slidable in a bearing 69 in wall 11 and extending through said bearing to the interior of the container and into contact with the end 70 of oscillatable rod 51. Said end 70 is bent radially outwardly with respect to the axis of oscillatable rod 51 and constitutes an arm by which said rod 51 may be oscillated. Springs 57 normally bias rod 51 and arm 70 to cause arm 70 to contact the inner end of pin 68 and force said pin 68 against face 66 on plate 65.

Thus, when arm 59 is oscillated, at least a portion of its oscillatory movement is utilized to effect relative rotation between said arm and pins 67 which, in turn, causes said pins 67 to ride on cams 64, thereby moving plate 65 axially along shaft 61. This axial movement is transmitted to pin 68 which moves axially to operate upon end 70 of oscillatable rod 51 to oscillate said rod. This oscillation is in a counterclockwise direction as viewed in Fig. 6 and hence results in a lifting of rails 41 and 42 and the roller 47 retained between them. The vertical movement of roller 47 in turn causes rod 35 and its associated needles 34 to move upward into piercing contact with the end 26 of the adhesive tape 21. Similarly, movement of arm 59 in the opposite direction relative to pins 67 results in a clockwise oscillation of oscillatable rod 51 as viewed in Fig. 6, to lower rails 41 and 42 and the needle operating mechanism associated therewith to lower said needles relative to tape end 26. Movement of plate 65 toward wall 11 is limited by contact of its face 66 with a grooved segment 71 secured to wall 11 and forming a direction changing means for a long spring 72, one end of which is secured to wall 11 as at 73 and the other end of which is secured to an extension 74 on arm 59 (Fig. 2) such that said spring continuously biases arm 59 in a clockwise direction as shown in Fig. 2 corresponding to the released position of said arm 59. Rail 42 is likewise continuously biased to a released position by a pair of spaced springs 75 which are anchored at one end to the bottom 76 of container 10 and at the other end are connected directly to rail 42 as shown in Fig. 3.

Carriage 28 (Figs. 5 and 6) is in the form of a plate which extends from across the container 10 and is slidable in grooves 77 and 78 in walls 11 and 12, respectively. Said grooves are formed in part by inwardly extending flanges 79 and 80 upon walls 11 and 12, respectively, and by cover 14. Flanges 79 and 80 extend lengthwise of the container substantially from the left hand end thereof as viewed in Fig. 1, to the right, approximately three-fourths of the length of the container.

Each of the opposed ends of the carriage has a pair of spaced notches such as is shown at 81 in which are received the ends of sprocket chains 82 and 83 (Fig. 4) the chain ends being anchored in said notches by suitable pins 84 (Fig. 7). Each chain passes around a pair of

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spaced sprockets 85 and 86 so as to form, with carriage 28, an endless loop. Sprockets 85 are mounted to rotate with a shaft 87 extending transversely of container 10 and supported for rotation in suitable bearings mounted in walls 11 and 12. Sprockets 86 may be mounted for rotation with a shaft 88 which extends transversely of container 10 in a direction parallel to shaft 81 and is supported in suitable bearings disposed in walls 11 and 12.

It may be observed from the description thus far given that if shaft 87 is rotated, sprockets 85 will rotate and will carry with them chains 82 and 83, and because of the connection between the ends of the chains and the carriage 28, will move carriage 28 in its grooves 77 and 78 either to the left or to the right as viewed in Fig. 1 depending upon the direction of rotation of said shaft 87.

The means for driving shaft 87 is comprised of a drive gear 89 mounted to rotate with shaft 61, said drive gear driving a relatively small driven gear 90 mounted for rotation with a cross shaft 91, said cross shaft 91 in turn driving a larger gear 92 and said larger gear 92 driving a final gear 93 mounted to rotate with shaft 87. It will be observed that the sizes of the gear are such that a considerable increase in speed will be effected between the speed of rotation of gear 89 and the final gear 93 so that for a relatively small angular movement of gear 89 a large angular movement of gear 93 will be effected. It is contemplated that with a movement of shaft 61 through an angle of substantially 90°, carriage 28 will be moved from one of its extreme positions to the other in container 10. It will also be observed that in addition to increasing the speed ratio between gears 89 and 93, intermediate gears 90 and 92 also serve as idlers to cause gear 93 to rotate in the same direction as gear 89.

Handle 58 and arm 59 were previously described in connection with their function as operating the means for oscillating rod 51 to raise and lower needles 34. Said handle and arm 59 are also connected to drive shaft 61 through a lost motion connection comprising a pin 94 extending radially outwardly from shaft 61 and a slot 95 embracing said pin and formed in the hub 60. It is contemplated that arm 59 will rotate relative to shaft 61 through an angle of about 10 to 15° while pin 94 is moving in slot 95 and that thereafter said pin 94 will contact hub 60 and the arm 59 and shaft 61 will move together in the same direction. When the direction of arm 59 is reversed to return carriage 28 to its initial position, pin 94 will ride in slot 95 to allow arm 59 to rotate in the opposite direction relative to shaft 61 until pin 94 contacts the opposite wall of slot 95 whereupon arm 59 and shaft 61 will continue to move together.

The lost motion connection 94, 95 provides a means for engaging needles 34 with tape end 26 prior to the movement of the carriage to the left as viewed in Figs. 1 to 4, and will cause the needles to move downwardly to withdraw from tape end 26 prior to a return of the carriage to its initial position so that whatever length of tape is drawn to the left, said length will remain drawn and will not be returned to its original position. This makes for an orderly storage of the tape as it is withdrawn.

To assist in preventing the return of tape end 26 to its original position after a length has been drawn out, the mechanism shown in Figs. 1, 9 and 10 is used. This mechanism is comprised of a ratchet 96 mounted for rotation with shaft 91, said shaft 91 extending through wall 12 to the exterior of container 10 to reach said ratchet 96 which is mounted outside of the container. Between ratchet 96 and wall 12 is disposed a gear 97 which is mounted for free rotation relative to shaft 91. A pair of spring biased pawls 98 mounted on the side of gear 97 and adapted to contact ratchet 96 form a one-way drive connection between shaft 91 and gear 97. Meshing with gear 97 is a small gear 99, said gear 99 being mounted on a shaft 100 disposed immediately

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above shaft 91. Small gear 99 has fixed thereto a ratchet 101 which is adapted to cooperate with a pawl 102, spring biased into engagement with ratchet 101 and mounted on a pivot 103 fixed to wall 12.

Shaft 100 extends transversely of container 10 and has a multi-grooved roller 104 mounted thereon for rotation therewith. Said roller 104 supports tape end 26 above the cover 14 of container 10. The diameter of roller 104 is so selected relative to the pitch diameters of gears 97 and 99 that the linear velocity of the surface of roller 104 will be substantially the same as the linear velocity of carriage 28 as it moves from right to left as viewed in Figs. 1 to 4 to extend or pull out a length of tape from roll 21. The disposition of ratchets 96 and 101 and their associated pawls is such that after a length of tape has been pulled out, pawl 102 prevents a reverse rotation of gear 99 and its associated shaft 100, so that roller 104 is held against reverse rotation, and the tape contacting the roller remains at rest despite reverse rotation of shaft 91 and the associated gearing including the reverse or return movement of carriage 28.

In view of the relatively soft nature of the tape dispensed by the present device the downward movement of needles 34 may not result in the withdrawal of needles 34 from the tape end 26 unless a stripping device is used. Such a stripping device is indicated at 31 and is comprised of a flap 105 hinged at 156 and 157 to the top surface of cover 14. Said flap is shown in section in Fig. 8 and is formed with an arm 106 extending through an opening 155 in cover 14 into the interior of container 10. The lower end of arm 106 is provided with a pin 107 on which is pivoted a cam 108 biased in a counterclockwise direction by a tension spring 109, the movement in such counterclockwise direction being limited by a stop 110 formed in cam 108 which extends transversely across arm 106 and also constitutes the support to which one end of spring 109 is anchored. Oscillatable rod 51 has secured thereto an arm 111 which extends upwardly from said rod 51 in the direction of cam 108. A roller 112 mounted on the end of arm 111 contacts the curved edge 113 of cam 108, said curved edge terminating in a peak at the lowermost region of cam 108 as viewed in Fig. 8. Interference will be had between roller 112 and cam 108 when oscillatable rod 51 is rotated in a counterclockwise direction as viewed in Fig. 8. Under this condition of interference, however, cam 108 will simply pivot around its pivot 107 to allow roller 112 to pass to the other side of said peak. This action takes place when rod 51 is oscillated to raise needles 34 into piercing contact with the end 26 of the tape. When rod 51 is oscillated in a clockwise direction as viewed in Fig. 8 to release or withdraw needles from tape end 26, roller 112 will strike the edge of cam 108, and because of the stop 110, rotation of cam 108 in a counterclockwise direction relative to pin 107 as viewed in Fig. 8 is prevented. Accordingly, continued oscillation of rod 51 in a clockwise direction will cause cam 108 to rise over roller 112, and as it rises, flap 105 will be rotated in a counterclockwise direction about its hinges 156 and 157 to a lifted position relative to cover 14.

Referring particularly to Fig. 10, tape end 26, as it is drawn to the left by the carriage mechanism, including needles 34, will be drawn over the top of flap 105. When rod 51 is oscillated to withdraw needles 34 from tape end 26, said needles will be lowered relative to cover 14, but roller 112 and cam 108 will cause flap 105 to rise relative to said cover so that it will lift the tape off the needles 34. It is contemplated that the lifting movement of flap 105 will take place while needles 34 are being lowered and before carriage 28 commences its return movement.

The final operation performed upon tape end 26 after it has been drawn out to the desired length, is the operation of severing the drawn portion from the portion remaining on the roll. This severing operation is performed by a pair of oppositely disposed shearing knives

114 and 115 (Figs. 1, 5 and 7) mounted on carriage 28. Lower shearing knife 115 is reciprocable in a rectangular opening 116 disposed substantially vertically in carriage 28. The upper end of knife 115 is sharpened and contains the cutting edge, and the lower end is formed with a slot 117 across which is disposed a pin 118. A bracket 119 is secured to carriage 28 and extends downwardly to terminate in a pivot pin 120 on which is mounted a lever 121. One end 122 of lever 121 is forked to receive pin 118 and the opposite end supports a roller 124.

As seen in Fig. 6, roller 124 extends laterally from arm 121 toward wall 11 on which is mounted a pin 125 and a pivoted cam carrier 126, the cam 127 carried thereby being mounted on the end thereof and having a rounded point 128 and a sloping cam surface 129. The point 128 and sloping surface 129 are seen to better advantage in Fig. 7. A tension spring 130 is anchored at one end to pin 125 and at the other end is secured to pivoted cam 127 and continuously biases cam 127 in a counterclockwise direction as viewed in Fig. 7 against pin 125.

It will be observed that point 128 is lower than the upper portion of roller 124 so that when carriage 28 is moved to the left as seen in Fig. 7, roller 124 will strike the point 128 and will simply rotate cam 127 clockwise against the action of spring 130 until roller 124 clears point 128. It is unnecessary for lever 121 to rotate about its pivot 120 to effect this clearance, and hence knife 115 will not be raised relative to the surface of cover 14 when the carriage moves to the left. When the motion of carriage 28 is reversed, however, so that roller 124 strikes the sloping side 129, cam 127 will then bear against pin 125 and will be prevented from rotating upward out of the way of roller 124. The result of this action is to cause roller 124 to be depressed around point 128, thereby rocking lever 121 about its pivot 120 in a clockwise direction which in turn raises forked end 122 and with it, pin 118 and knife 115.

Upper knife 114 is comprised of a hardened steel plate having a sloping cutting edge 131, said plate being secured to a hub member 132 mounted for rotation with a shaft 133 extending longitudinally of container 10 and disposed above the surface of cover 14. Said shaft 133 is rotatably mounted in the sides of a U-shaped support 134 secured to post 40. As shown to better advantage in Fig. 5, shaft 133 extends to the right beyond the sides of the U-shaped support 134 and has secured to the end thereof an arm 135 which is spaced from support 134. The axial position of arm 135 on shaft 133 may be adjusted by a set screw 136. Between arm 135 and support 134 is a compression spring 137 the function of which is to urge the front face 138 against the cutting edge 139 of lower shearing knife 115.

The free end of arm 135 is connected to the horizontal portion 140 of a bent rod 141 which is supported for vertical movement in carriage 28 and extends below carriage 28 and then at right angles to its axis in the direction of wall 12 to form a support for a roller 142 (Figs. 6 and 7).

Disposed in proximity to roller 142 is a triangular shaped cam 143 pivotally mounted on a pin 114 secured to wall 12. A combination stop and spring support 145 extends inwardly from wall 12 parallel to pin 144 and into the path of movement of cam 143. A tension spring 146 is secured at one end to stop 145 and at its other end to cam 143 at a point thereon designed to cause a counterclockwise rotation of the cam around pin 144, said rotation being limited by a stop 145. Cam 143 is similar to cam 127 in that it is provided with a point 147 extending in the path of movement of roller 142. Thus, when carriage 28, rod 141 and roller 142 are moved to the left as viewed in Fig. 7, cam 143 will be rotated clockwise about pin 144 by contact between point 147 and roller 142 until roller 142 clears the cam. On the return movement of carriage 28, however, the roller

142 will strike the sloping left hand side of cam 143, and since rotation in a counterclockwise direction is prevented by stop 145, roller 142 will be forced downwardly until it clears point 147. This downward movement of roller 142 will cause rod 141 to reciprocate vertically relative to carriage 28 thereby rotating arm 135 about the axis of shaft 133, rotating said shaft, hub 132 and upper shearing knife 114 therewith.

For the best shearing action, it is desirable that the upper and lower shearing knives move toward one another simultaneously, and therefore the location of cams 127 and 143 should be selected to achieve this result. It is understood, however, that, if desired, only one of the knives may be made movable with the other acting as a stationary blade or anvil. It is desirable, however, that both blades clear the tape to be dispensed so that when carriage 28 is moved back to substantially its starting point, the knives will not catch and drag the tape back with the carriage.

To prevent the severed and unsupported end of the tape from curling under and possibly becoming caught in the lower shearing knife, a small forked support 148 is secured to the top of carriage 28 adjacent rod 35 on which the needles 34 are mounted, said support holding the severed end in raised position above the surface of cover 14.

Inasmuch as certain portions of carriage 28 extend from the exterior of container 10 through cover 14 to the interior of the container, cover 14 is provided with suitable slots and openings through which the various vertical members of carriage 28 may move as the carriage is reciprocated. Thus there is provided a longitudinal slot 149 for the cylindrical portion 150 of post 40 and for rod 141, a cross slot 151 in which the shearing knives 114 and 115 may operate, and a longitudinal slot 152 through which rod 35 may pass. The mechanism in front of wall 11 as viewed in Fig. 2 and comprising the handle 58 and arm 59 and associated mechanism may be enclosed in a suitable housing 153 in which a slot 154 is provided through which arm 59 extends and in which said arm may reciprocate.

The operation of the device is as follows:

A roll of tape is mounted on spool 22 and the spool is then properly located on support brackets 16 and 17. The free end of the tape is passed over multi-grooved roller 104 under L-shaped plate 38 (over needles 34) and approximately to the shearing knives. It is desirable to have as little of the tape overhang the needles as possible. Handle 58 is then pulled from right to left as viewed in Figs. 1 and 2, during the first portion of the movement of which, that is, until the lost motion between pin 94 and slot 95 is taken up, rod 35 with its needles 34 are raised to cause needles 34 to pierce the tape, said tape being held by plate 38 against vertical movement with rod 35 during the piercing operation. During the remainder of the movement of handle 58, shaft 61 is rotated to rotate the chain of gears between said shaft and sprockets 85, the latter in turn causing the upper strands of chains 82 and 83 to travel horizontally, thereby pulling carriage 28 with them. The constant pressure of the operator upon handle 58 is transmitted to the pin and slot connection and also through the cam fingers 64 to the needle operating mechanism, so that the needles are continuously in a raised position as long as carriage 28 is moving to the left. When an appropriate length of tape has been pulled across the device, pressure on handle 58 is reversed, or rather released, so that the return spring 72 may function to return the handle to its original position. The first portion of the return movement has no effect on the movement of the carriage, due to the pin and slot connection 94, 95, but it serves to withdraw needles 34 from tape 26. Roller 104, being held against reverse rotation by the ratchet mechanism 96, 98, 101 and 102, assists in holding tape end 26 extended while the carriage is being re-

turned to its original position. Just prior to its return to the original position, however, rollers 124 and 142 of the shear operating mechanism will contact their respective cams and will cause the shearing knives 114 and 115 to come together, thereby severing the extended portion of the tape.

In the event that a length of tape greater than the length of slot 152 is desired, it may be had by halting the reverse movement of handle 58 just before rollers 124 and 142 contact their respective cams, and then again pulling handle 58 to the left as viewed in Figs. 1 and 2. By again pulling handle 58 to the left needles 34 are caused to move upward to pierce the tape again, and continued movement of the handle in this direction will resume the pulling of the tape to the left to add to the part already extended. This operation may be repeated as often as is necessary to pull the desired length of tape out of the machine. When the entire length has been pulled the handle may then be restored to its initial position, whereupon the rollers 124 and 142 are permitted to cooperate with their respective cams to cause the shearing knives to come together and sever the pulled portion of the tape.

It is understood that the foregoing description is merely illustrative of a preferred embodiment of the invention, and that the scope of the invention is not to be limited thereto but is to be determined by the appended claims.

I claim:

1. In an adhesive tape dispensing apparatus having a source of tape thereon, piercing means for gripping the tape, means for reciprocating the piercing means away from and toward the source of tape, said means including a manually operable control, means intermediate the manual control and the piercing means to transmit movement from the control to the piercing means, means operable upon a change in the direction of movement of the control means to push the piercing means toward or pull the piercing means away from the tape, and means for stripping the tape from the piercing means, said stripping means comprising a hinged plate disposed beneath the tape and on the same side of the tape as the means for pushing the piercing means toward the tape, and common operating means for the piercing means and the stripping means, said operating means including means for reversing the relative direction of motion of the piercing means and stripping means such that the stripping means raises the tape while the piercing means is being lowered relative to said tape.

2. In an adhesive tape dispensing apparatus having a source of tape thereon, piercing means for gripping the tape, means for reciprocating the piercing means away from and toward the source of tape, said means including a manually operable control, means intermediate the manual control and the piercing means to transmit movement from the control to the piercing means, means operable upon a change in the direction of movement of the control means to push the piercing means toward or pull the piercing means away from the tape, and means for stripping the tape from the piercing means, said stripping means comprising a hinged plate disposed beneath the tape and on the same side of the tape as the means for pushing the piercing means toward the tape, said stripping means being operable upon a change in the direction of movement of the control, means to push the piercing means toward or pull the piercing means away from the tape comprising an oscillatable rod, a lost motion connection between the rod and the manual control and means connecting the rod to the piercing means, said connecting means including an arm extending radially from said oscillatable rod, a track extending substantially parallel to the axis of the oscillatable rod, a roller mounted on the track and means connecting the roller to the piercing means, said track being adapted to rise and fall as the arm is rotated about the axis of the

oscillatable rod in response to movement of the control means through its lost motion connection.

3. Apparatus as described in claim 2, said stripping means also including an arm operated by the oscillatable rod, and cam means interposed between the arm and the stripping means for causing the stripping means to raise the tape while the piercing means is being lowered relative to said tape.

4. In an adhesive tape dispensing apparatus a source of tape, a carriage movable away from and toward the source of tape, means for gripping the tape mounted on the carriage, a drive shaft, positive means connecting the drive shaft to the carriage for moving said carriage as aforesaid, a handle mounted for limited free rotation relative to the drive shaft, and means connecting the handle to the gripping means to engage or release said gripping means at any position of the carriage relative to the source of tape, said last-mentioned means comprising a pair of rails co-extensive with the distance traveled by the carriage and disposed parallel with the line of travel of said carriage, means mounting said rails for movement toward and away from the tape on the carriage, a roller disposed between and contacting one of said rails in one direction of movement of said rails and the other of said rails in the other direction of movement of said rails, and means connecting the roller with the gripping means to operate the gripping means in accordance with the position of the roller; a pivoted arm mounted beneath the lowermost rail of the pair of rails and contacting said lowermost rail for moving said rails toward or away from the tape on the carriage, cam means on the handle, follower means contacting the cam means, and means connecting the follower means with the arm to transmit movement from the follower means to the arm to rotate said arm about its pivot, said cam being operable during the free limited movement of the handle about the shaft whereby the gripping means is operated while the carriage is substantially stationary.

5. Apparatus as described in claim 4, said carriage having mounted thereon upper and lower knives constituting a shear means for cutting off the tape, means mounting the lower knife for movement toward and away from the tape, means mounting the upper knife for oscillatory movement toward and away from the lower knife, pivoted cam means mounted on the container, and means cooperating with the mounting means for the knives and with the pivoted cam means for causing the knives to come together to shear the tape as the carriage moves on its return movement toward the source of tape through a predetermined portion of its travel.

6. In an adhesive tape dispensing apparatus having a source of tape thereon, means for gripping the tape, means for severing the tape, means for reciprocating the gripping means away from and toward the source of tape, said reciprocating means having a normal starting position at the end of its reciprocation nearest the source of tape, said reciprocating means including a manually operable control reciprocable in timed relation with the gripping means, means intermediate the manual control and the gripping means to transmit movement from the control to the gripping means, means operable upon a change in the direction of movement of the control means at any position of the reciprocating means and independently of the severing means to engage and disengage the gripping means from the tape, and means operable upon return movement of the gripping means to a position just prior to its reaching the same normal starting position for operating the tape severing means.

7. In an adhesive tape dispensing apparatus having a source of tape thereon, means for gripping the tape, means for severing the tape, means for reciprocating the gripping means away from and toward the source of tape through a tape severing zone and a tape pulling zone, said reciprocating means being operable through the tape pulling zone repeatedly independently of its

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operation in the tape severing zone to dispense varying lengths of tape, said reciprocating means including a manually operable control reciprocable in timed relation with the gripping means, means intermediate the manual control and the gripping means to transmit movement from the control to the gripping means, and means operable upon movement of the gripping means through the severing zone toward the source of tape for severing the tape.

8. The combination in an adhesive tape dispensing apparatus as described in claim 7, and means operable by the control for operating the gripping means.

9. The combination in an adhesive tape dispensing apparatus as described in claim 7, means for operating the gripping means to grip or release the tape, said means being connected to the control and operable upon movement of the control in one direction to grip the tape and in the other direction to release the tape.

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10. The combination in an adhesive tape dispensing apparatus as described in claim 7, a roller supporting the tape between the source and the gripping means, means connected to the reciprocating means for driving the roller in timed relation to the gripping means, and means for preventing reverse rotation of said roller.

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