Aug. 31, 1943. T. H. KRUEGER 2,328,022

TAPE SERVING MACHINE

Filed Jan. 20, 1942 3 Sheets-Sheet 1

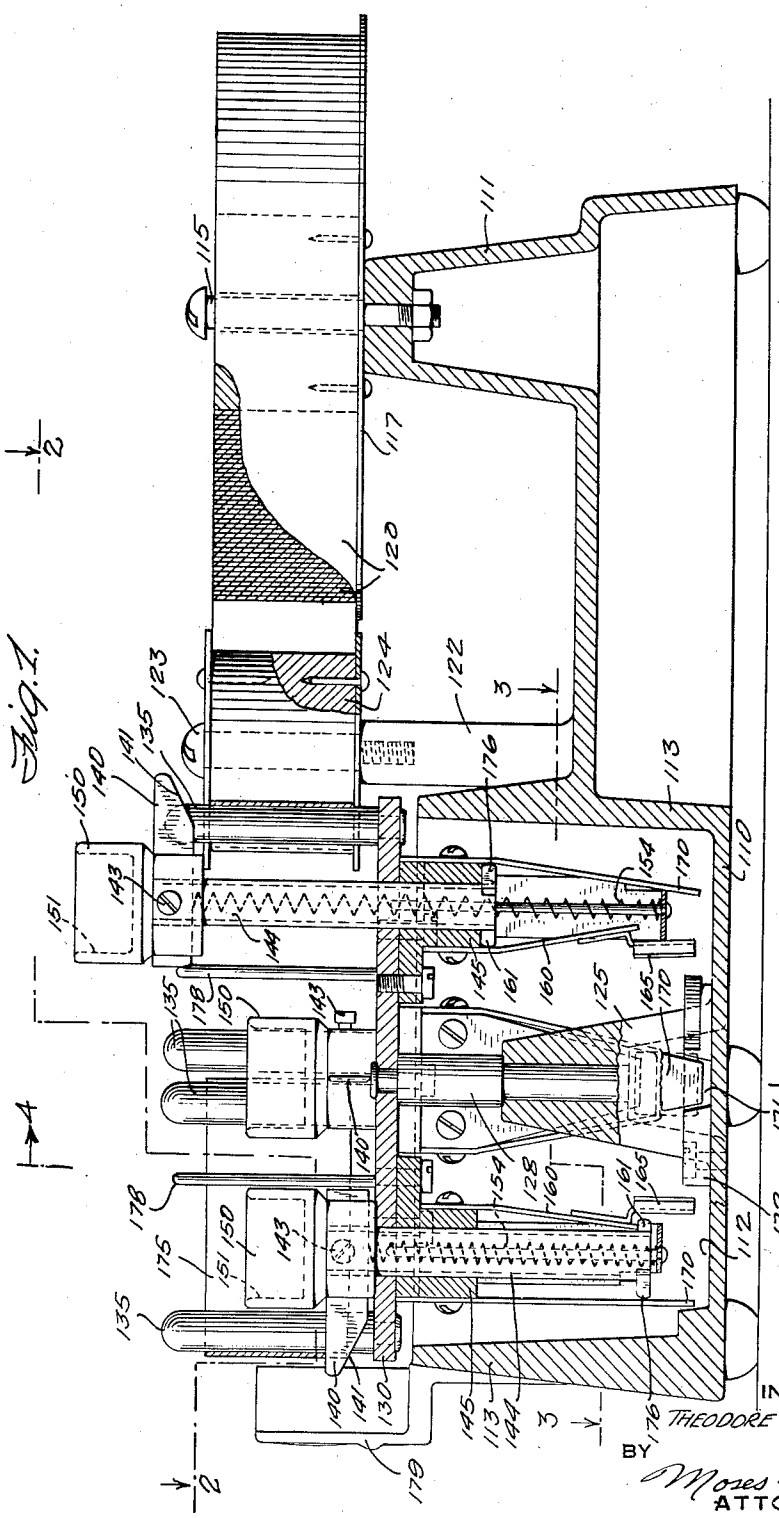


Fig. 1.

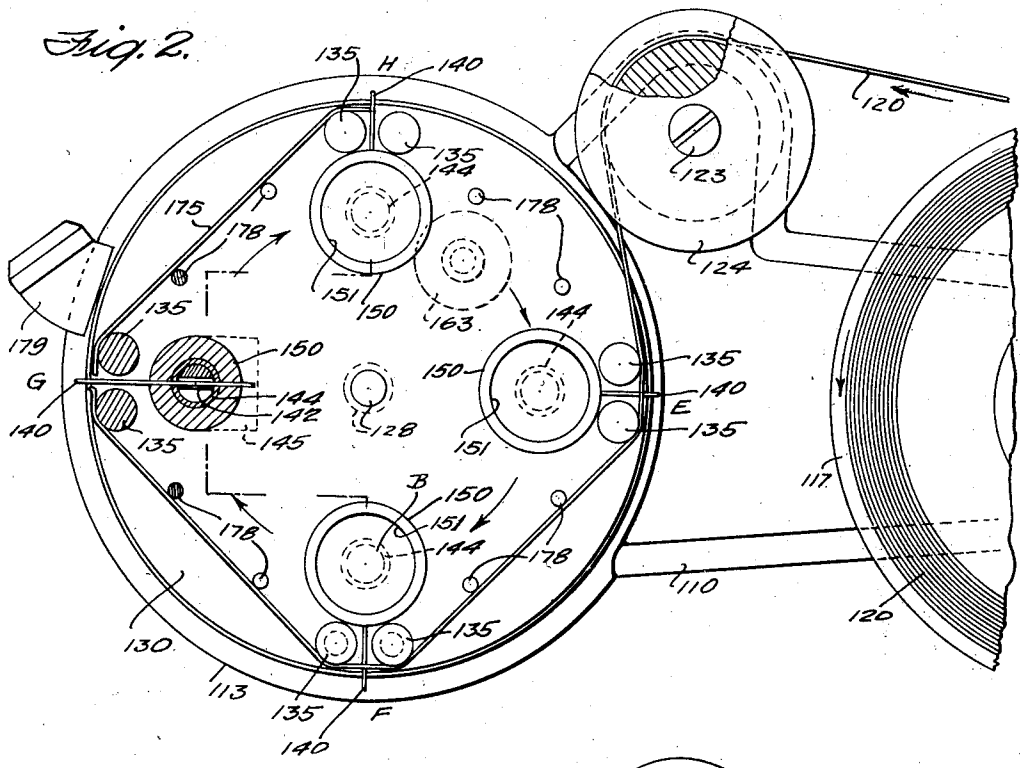
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Filed Jan. 20, 1942 3 Sheets-Sheet 2

Fig. 2.



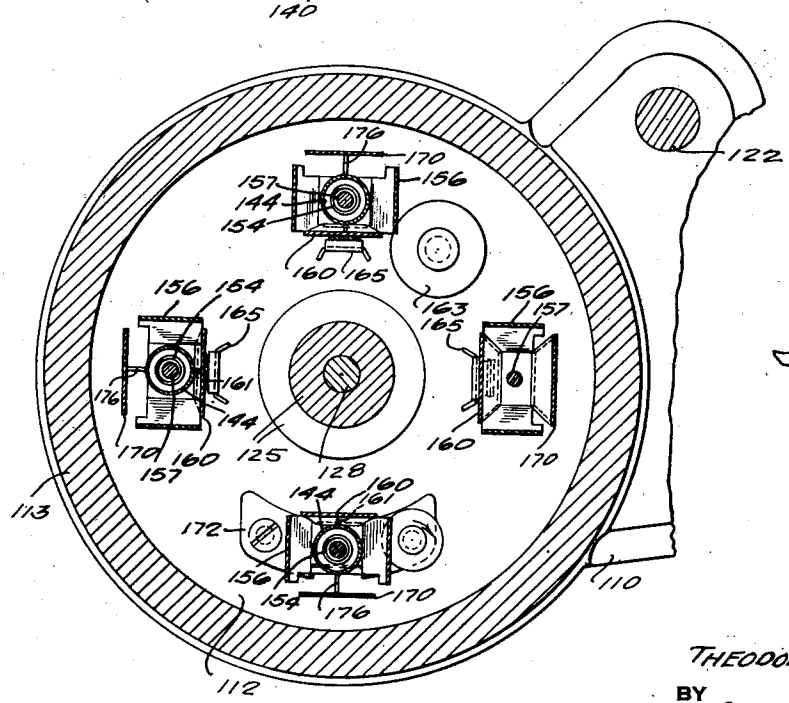


Fig. 3.

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Filed Jan. 20, 1942 3 Sheets-Sheet 3

Fig. 4.

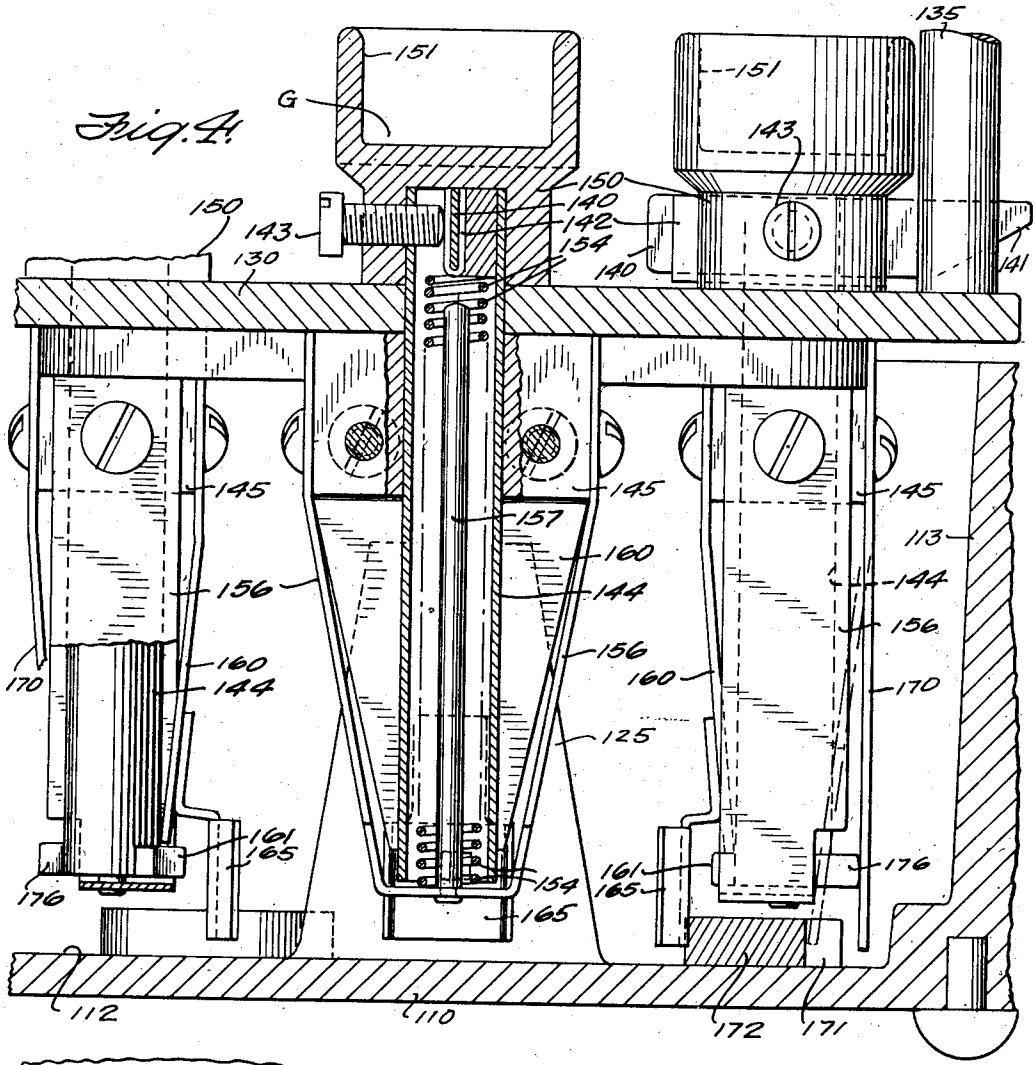
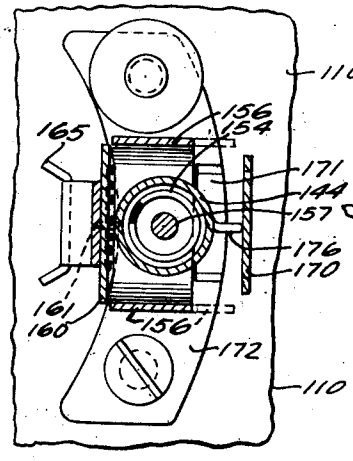


Fig. 5.



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TAPE SERVING MACHINE

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Application January 20, 1942, Serial No. 427,413

17 Claims. (Cl. 164—48)

This invention relates to an improved apparatus for serving measured lengths of strips or tape which are covered or impregnated on one or both sides thereof with a pressure sensitive adhesive usually tacky or non-drying either permanently or during the period of use. The invention has particular utility in the various fields of use to which pressure sensitive adhesive tape is applied and especially is useful where the tape is required in short lengths such as fractional parts of a foot. It eliminates the tedious nuisance and waste involved in cutting inaccurate lengths with ordinary scissors and provides a simple and easy operating mechanism for speedily stripping from the roll, measuring, cutting and delivering at a point ready for use, the desired length of tape.

The improved apparatus contemplates mechanical means for stripping the material or tape from the roll in predetermined lengths and comprises generally a turntable having tape mounting pins or supports situated about its periphery, the pins being positioned at some time during the revolution of the turntable to engage the strip, grasping it by the inherent adhesive quality of tape and to strip it either directly from the roll, or pick it up as positioned in its path from the roll by a guide means. The invention also contemplates the provision of knife carrying plunger mechanism associated with the said tape mounting pins, the said association being effective to permit the severing of the tape strip by movement of the knife mounting plunger after the tape has been stripped from the roll and is held by its own adhesiveness on the tape mounting pins. The invention also contemplates the provision of stop actuated detents which present the plunger and its associated knife in the proper position for effective cutting at the proper time.

In the accompanying drawings which form a part of this specification and which illustrate one preferred embodiment of the invention,

Figure 1 is a longitudinal vertical section of an apparatus embodying the principles of the invention.

Figure 2 is a top view of this apparatus, parts being shown in section and a portion of the tape roll being broken away.

Figure 3 is a section taken on the line 3—3 of Figure 1.

Figure 4 is a section taken on the line 4—4 of Figure 1, parts being broken away; and

Figure 5 is an enlarged fragmentary view of the lower portion of Figure 3.

Referring to the drawings in detail, the construction comprises a base 110 which has a raised boss 111 near one end thereof, and a well 112 near the other end thereof, surrounded by a wall 113. The boss 111 carries a vertical stud 115, and rotatably mounted on this stud and resting on the top of the boss is a holder 117 on which rests a horizontally placed roll of tacky strip or tape 120. The base is also provided with a vertical standard 122 which carries a stud 123 upon which is pivoted a guide roller 124. From the bottom of the well 112 projects a boss 125 which carries a vertical rotatable stud 128 on the upper end of which is mounted a rotary table 130. The table 130 carries a plurality of pairs of tape supporting pins 135, four pairs of such pins being shown in the example of the invention illustrated. These pins are provided with tape engaging surfaces, they being preferably formed of smooth metal to which the tape will adhere, but from which it may be readily pulled by the operator when removing the severed sections of tape. As shown in Figure 2, the tape passes from the roll around the idler 124 and then is engaged with the pins 135. The tape adheres to the nearest pin and when the table is rotated in the direction of the arrow in Figure 2, the tape will be drawn from the roll and will contact the successive pairs of pins. The tape may be severed between the pairs of pins, and the pieces removed by hand.

In the construction illustrated knives are mounted on the turntable so as to cut the tape between each of the pairs of pins in succession. These knives designated 140 have edges 141 and are carried in U-shaped metal carriers 142 (Fig. 4) in which they are removably clamped by means of screws 143. Each carrier is mounted in the top of a plunger tube 144, which slides in a hole in the turntable and through a corresponding hole in a guide block 145 secured to the under side of the turntable. On the top of the plunger is mounted a key head 150 which is preferably provided with a finger recess 151. Each plunger is preferably urged into its upper position, as shown by the plunger on the right in Figure 1, by a coiled spring 154 which bears against the under side of the knife holder and at its bottom is supported upon a stirrup 156, the upper ends of which are secured to the guide block 145. The stirrup is shown as carrying a central guide roll 157 which keeps the spring 154 in alignment. When the key head 150 is depressed it forces down the knife 140 and causes the latter to sever the tape which is firmly held at each side of the point of severance by its engagement with adjacent pins 135. When the key head is depressed

it is preferably locked in depressed position by means of a spring 160 secured to the guide block 145 and the lower end of which engages a lug 161 formed at the bottom of the plunger tube. The plunger is held in the depressed position until it is released by a trip roller 163 mounted on the base plate at the bottom of the well which engages the trip piece 165 secured to the spring 160.

Means are also preferably provided to lock the turntable in successive positions corresponding with predetermined positions of the pairs of pins 135. The tape locking means shown comprises downwardly tapered springs 170 secured at their upper ends to the guide blocks 145 and adapted to successively engage a notch 171 in a keeper block 172 secured to the bottom of the well.

In order to prevent any portion of the tape, especially the severed portion thereof, in case it should become detached from the pins 135, from being pushed or blown over the turntable where it might become fouled with the plunger or other parts, a series of upright pins 178 may be provided which project upwardly from the turntable just inside of the line of the tape when stretched between the pins 135. In normal operation the tape will not become attached to these pins, but if it should touch the surfaces which are small, the tape will come right away from them. A guide plate 179 is also preferably provided adjacent to the position where the operator grasps the severed section of tape to remove the same, the plate assisting the operator in properly locating his fingers to grasp and remove the severed section.

The normal operation of the mechanism described is as follows: The successive positions of the four sets of pins 135 may be designated as stations E, F, G, and H, (Figure 2). The tape contacts the first set of pins at station E and passes around the pins at station F and terminates at the first pin at station G. In the course of normal operation of the device, a previously severed section of tape 175 will be in the machine between the second pin at station G and the first pin at station H. This section of tape is ready for removal by the operator who will pick it off with his fingers and apply it to the package being sealed or other article upon which it is to be used. At this time the table is locked against rotation by engagement of the spring 170 at station F in the notch in keeper block 172 which is located at station F. There is then no danger of displacing the table in the operation of removing the cut section of tape. To obtain another piece of tape the operator presses down the key at station F which will cause the knife at that station to be depressed and to sever the tape between the two pins at station F. The pressing down of the plunger also causes the lug 161 thereon to snap under the end of the spring 160 so that the key and plunger and knife are held in depressed position. The pressing down of the plunger also causes a second lug 176 at the lower end of the plunger to engage the tape holding spring 170 and force it out of its notch 171 in the keeper block, thereby permitting the table to be rotated by the operator, who keeps his finger in the recess 151 of the key at the station F and draws on the wall of this recess and thus rotates the table one-quarter of a turn and winds another measured length of tape upon the reel. The spring 170 on the next plunger then snaps into the recess in the keeper block again locking the table and insuring that no more than the measured length of tape can be drawn on to the reel. The section of tape which was severed by the depression of the key at station F now occupies the position 175 between stations G and H, and may be readily removed. The operator now depresses the next key which is at the station F, thus severing another strip and rotates the reel through another one-quarter turn. The keys at stations G and H remain locked in down position so that they are out of the way and do not interfere with the ready removal of the severed strip of tape. As the key moves from station H to station E, however, the trip piece 165 at the lower end of spring 160 contacts the trip roller 163 and is moved out so as to release the lug 161 on the plunger, which immediately springs up to its raised position. Thus when the plunger reaches station E the knife is up and the tape winds on the pins 135 below the knife, as shown in Figure 1, and the plunger and knife remain up until they reach station F, when they may be depressed, as already described. The apparatus thus serves accurately measured lengths of tape which are held in vertical position upon two of the pins 135. The fingers of the operator may be placed over this severed section which is readily accessible for removal.

The subject matter of this application represents in part an embodiment of and in part an improvement over the subject matter of invention disclosed and claimed in my copending application Serial No. 393,231, filed May 13, 1941. Those features of invention common to the two cases are claimed broadly in said copending application and are therefore not claimed herein.

While I have illustrated and described in detail certain forms of my invention, I do not wish to be understood as limiting myself to the use of such forms, as I realize that changes within the scope of the invention are possible, and I further intend each element or instrumentality recited in any of the following claims to be understood to refer to all equivalent elements or instrumentalities for accomplishing substantially the same result in substantially the same or equivalent manner, it being my purpose to cover my invention broadly in whatever form its principle may be utilized.

I claim:

1. In a machine for dispensing tacky tape, means for rotatably supporting a roll of tape with its axis vertical, and a reel mounted adjacent thereto for rotation about a vertical axis, said reel including spaced vertical tape supporting members to which the tape is adapted to be adhered.

2. In a machine for dispensing tacky tape, means for rotatably supporting a roll of tape with its axis vertical, and a reel mounted adjacent thereto for rotation about a vertical axis, said reel including spaced vertical tape supporting members to which the tape is adapted to be adhered, and vertically movable knife means for severing the tape while adhered to said supports.

3. In a device for dispensing tacky tape, means rotatably supporting a roll of tape and a reel mounted adjacent thereto for rotation about an axis parallel with the axis of rotation of the roll of tape, said reel having spaced supports thereon adapted to successively engage and adhere to the tape as the reel is rotated, means for severing the tape adjacent to said supports, and releasable means for locking the reel against rotation with the tape engaging supports at predetermined stations.

4. In a device for dispensing tacky tape, means rotatably supporting a roll of tape, and a reel mounted adjacent thereto for rotation about an axis parallel with the axis of rotation of the roll of tape, said reel having spaced supports thereon adapted to successively engage and adhere to the tape as the reel is rotated, means for severing the tape adjacent to said supports, and releasable means for locking the reel against rotation with the tape engaging supports at predetermined stations, said tape severing means comprising knife means movable parallel to the axis of rotation of the reel, and means movable with said knife means when actuated to sever the tape for releasing the reel locking means.

5. In a device for dispensing tacky tape, means rotatably supporting a roll of tape, and a reel mounted adjacent thereto for rotation about an axis parallel with the axis of rotation of the roll of tape, said reel having spaced supports thereon adapted to successively engage and adhere to the tape as the reel is rotated, means for severing the tape adjacent to said supports, and releasable means for locking the reel against rotation with the tape engaging supports at predetermined stations, said tape severing means comprising knife means movable parallel to the axis of rotation of the reel, means movable with said knife means when actuated to sever the tape for releasing the reel locking means, and means for releasably locking the knife means at the limit of its cutting motion after it has been actuated to sever the tape.

6. In a device for dispensing tacky tape, means rotatably supporting a roll of tape, and a reel mounted adjacent thereto for rotation about an axis parallel with the axis of rotation of the roll of tape, said reel having spaced supports thereon adapted to successively engage and adhere to the tape as the reel is rotated, means for severing the tape adjacent to said supports, and releasable means for locking the reel against rotation with the tape engaging supports at predetermined stations, said tape severing means comprising knife means movable parallel to the axis of rotation of the reel, means movable with said knife means when actuated to sever the tape for releasing the reel locking means, means for releasably locking the knife means at the limit of its cutting motion after it has been actuated to sever the tape, and means for releasing said knife means and restoring the same to initial position after the reel has rotated through a predetermined portion of a complete revolution.

7. In an apparatus for dispensing tacky tape, means for supporting a roll of tape, a turntable rotatable about a substantially vertical axis and upright supports mounted on said turntable and spaced at intervals about the same, said supports having surfaces to which the tape may be adhered by its own adhesive qualities, the adherence between the tape and said supports acting to unwind the tape from the roll and wind it about said supports as the turntable is turned.

8. In an apparatus for dispensing tacky tape, means for supporting a roll of tape, a turntable rotatable about a substantially vertical axis and upright supports mounted on said turntable and spaced at intervals about the same, said supports having surfaces to which the tape may be adhered by its own adhesive qualities, the adherence between the tape and said supports acting to unwind the tape from the roll and wind it about said supports as the turntable is turned, said supports being mounted in pairs circumferentially arranged on the turntable, the supports of each pair being placed close together with a narrow space between them.

9. In an apparatus for dispensing tacky tape, means for supporting a roll of tape, a turntable rotatable about a substantially vertical axis and upright supports mounted on said turntable and spaced at intervals about the same, said supports having surfaces to which the tape may be adhered by its own adhesive qualities, the adherence between the tape and said supports acting to unwind the tape from the roll and wind it about said supports as the turntable is turned, said supports being mounted in pairs circumferentially arranged on the turntable, the supports of each pair being placed close together, and knife means mounted on the turntable adjacent to each pair of supports and movable between the supports of each pair to sever the tape transversely between such pair of supports.

10. In a device for dispensing tacky tape, means for supporting a roll of tape, a turntable mounted for rotation about a substantially vertical axis, upright supports carried by said turntable at spaced intervals about the circumference thereof, vertically movable plungers carried by said turntable adjacent to said supports, and knife means carried by said plungers movable across the path of the tape adjacent the supports.

11. In a device for dispensing tacky tape, means for supporting a roll of tape, a turntable mounted for rotation about a substantially vertical axis, upright supports carried by said turntable at spaced intervals about the circumference thereof, vertically movable plungers carried by said turntable adjacent to said supports, knife means carried by said plungers movable across the path of the tape adjacent the supports, latch means for locking each plunger at one limit of its movement, means for unlatching said latch means at a predetermined point of the movement of the turntable, and spring means for returning the plungers to initial position when said latch means are released.

12. In a device for dispensing tacky tape, means for supporting a roll of tape, a turntable mounted for rotation about a substantially vertical axis, upright supports carried by said turntable at spaced intervals about the circumference thereof, vertically movable plungers carried by said turntable adjacent to said supports, knife means carried by said plungers movable across the path of the tape adjacent the supports, latch means for locking each plunger at one limit of its movement, means for unlatching said latch means at a predetermined point of the movement of the turntable, spring means for returning the plunger to its initial position when said latch means are released, and means for locking the turntable against rotation in predetermined positions of such rotation, said means being releasable by movement of the plungers in tape cutting direction.

13. In an apparatus for dispensing tacky tape, a base, means thereon for supporting a roll of tape for rotation about a substantially vertical axis, a turntable mounted on said base for rotation about a substantially vertical axis, tape supporting pins projecting upwardly from said turntable, said pins being arranged in pairs spaced circumferentially about said turntable, the pins of each pair being arranged side by side circumferentially with respect to said table, plungers mounted on said turntable adjacent to each pair of pins and movable vertically through

holes in said turntable, a knife carried by each plunger near the upper end thereof and movable transversely between a pair of pins so as to sever the tape supported thereon when the plunger is moved downward through its hole in the turntable, a finger key mounted on the top of each plunger, spring means for urging each plunger upwardly, latch means for locking each plunger in its depressed position, trip means for releasing said latch means at a predetermined position of the turntable, a keeper mounted on the base of the apparatus, and a plurality of locking devices on the turntable, one associated with each plunger, said locking devices being adapted to successively engage said keeper for temporarily locking the turntable against movement, each of said locking devices being releasable by depression of its plunger to release the turntable when the plunger is depressed to actuate the knife means carried thereby to sever the strip of tape.

14. Mechanism for dispensing adhesive tape from a roll comprising a rotatable element, means rotatable with the element and to which the adhesive face of the tape will adhere, for unwinding the tape from the roll, and a plurality of cutting devices carried by and rotatable with the element, each cutting device being movably mounted on the element and manually shiftable for severing a strip from the tape adhering to the wheel.

15. Mechanism for dispensing adhesive tape from a roll comprising a rotatable wheel, means rotatable with the wheel and to which the adhesive face of the tape will adhere, for unwinding the tape from the roll, and a plurality of cutting devices carried by and rotatable with the wheel, each cutting device being movably mounted on the wheel and manually shiftable for severing a strip from the tape adhering to the wheel.

16. In tape dispensing mechanism, the combination with a support provided with means for rotatably supporting a roll of adhesive tape, of a rotatable wheel on said support, peripheral surfaces, spaced apart circumferentially, rotatable with the wheel and to which the adhesive face of the tape will adhere for unwinding the tape from the roll, said surfaces being rotatable in the plane of the roll, and a plurality of cutting devices carried by and rotatable with the wheel, each cutting device comprising a cutter which is manually shiftable through the tape on the wheel at a point adjacent to, but more advanced in the direction of rotation of the wheel than a peripheral surface to which the tape is adhered, for severing a strip from the tape.

17. In a device for dispensing tacky tape, means rotatably supporting a roll of tape, and a reel mounted adjacent thereto for rotation about an axis parallel with the axis of rotation of the roll of tape, said reel having spaced supports thereon adapted to successively engage and adhere to the tape as the reel is rotated, means for severing the tape adjacent to said supports, and releasable means for locking the reel against rotation with the tape engaging supports at predetermined stations, said tape severing means comprising movable knife means and means movable with said knife means when actuated to sever the tape for releasing the reel locking means.

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