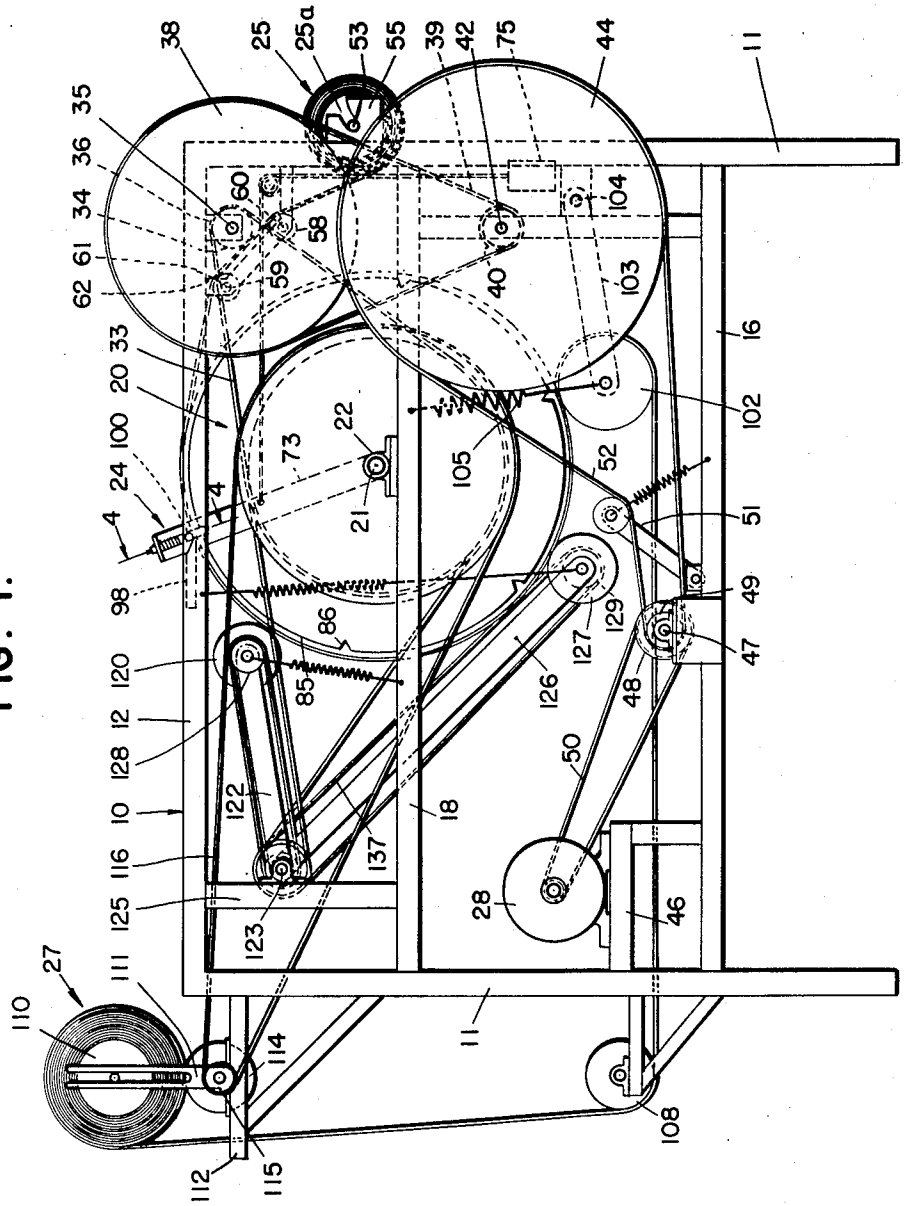
Feb. 13, 1951 L. N. STOREY ET AL 2,541,444

APPARATUS FOR APPLYING ADHESIVE TAPE TO CARDS

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FIG. 1.



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APPARATUS FOR APPLYING ADHESIVE TAPE TO CARDS

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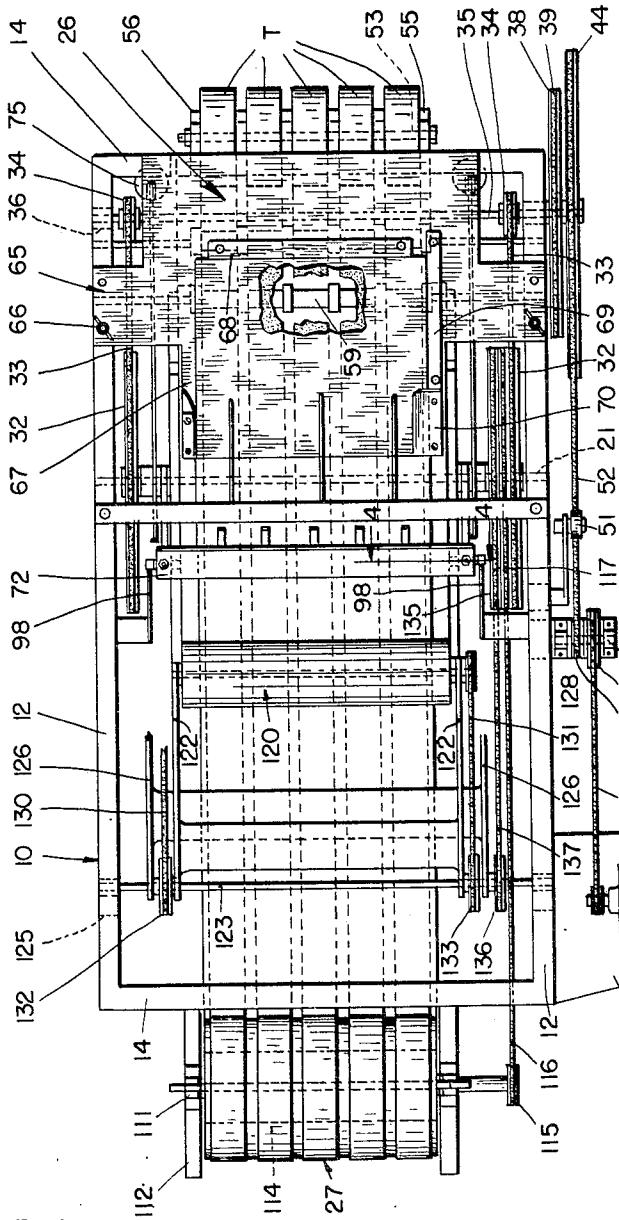


FIG. 2.

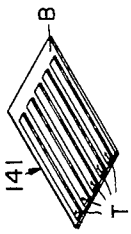


FIG. 9.

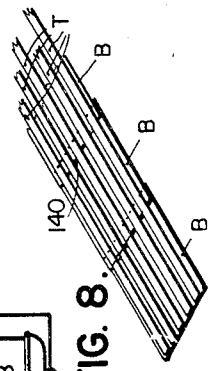


FIG. 8.

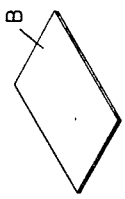


FIG. 7.

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FIG. 3.

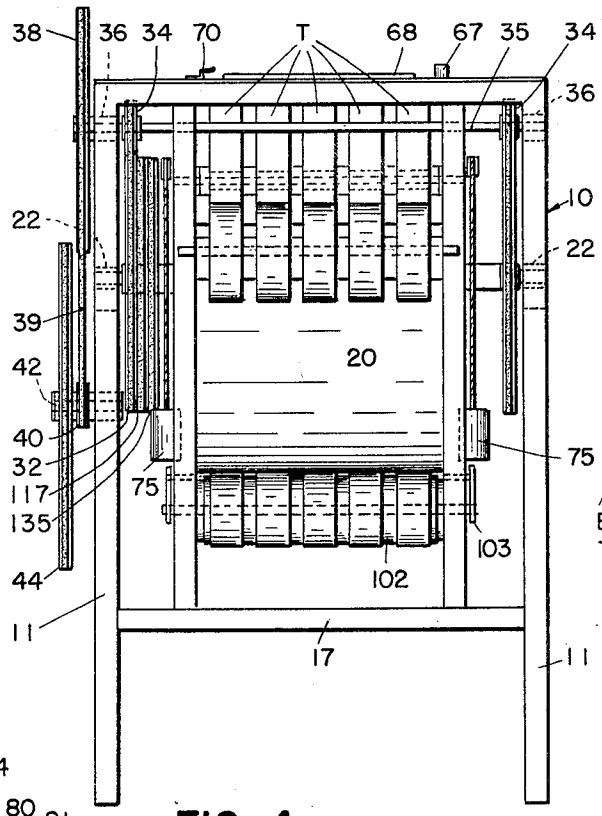


FIG. 6.

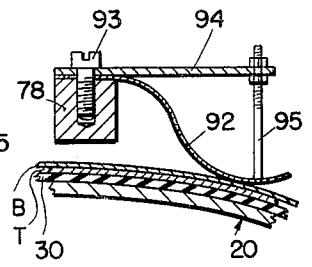


FIG. 4.

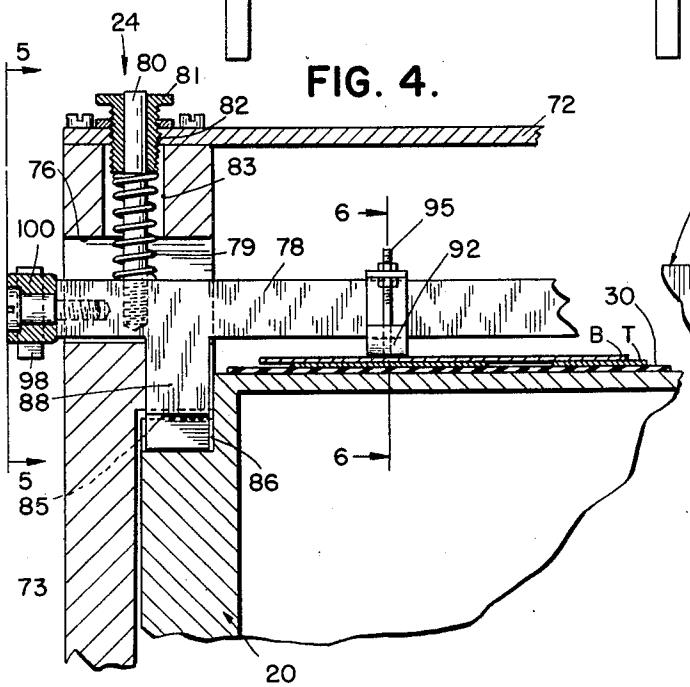
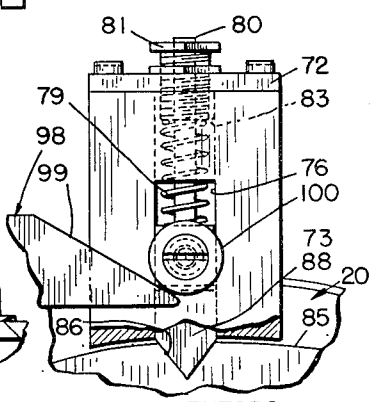


FIG. 5.



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UNITED STATES PATENT OFFICE

2,541,444

APPARATUS FOR APPLYING ADHESIVE TAPE TO CARDS

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Application January 20, 1947, Serial No. 722,994

7 Claims. (Cl. 154—1)

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This invention relates generally to devices for applying adhesive tape to backing sheets in the making of labels, and resides particularly in the provision of a method and a machine for applying the tapes to a series of backing sheets and for relatively so positioning the backing sheets as to provide on each a marginal space for the reception of printed matter. The invention is designed for performing this in the making of the type of label set forth in Patent No. 2,372,994.

Such a label comprises a backing sheet on which is disposed a strip of adhesive tape which has been provided with a plurality of transverse cuts to form numerous strips peelable from the backing sheet. The strips bear suitable indicia. It has been found desirable to leave a space between the end of the tape and the end of the sheet upon which the manufacturer's name and other data may be printed. It has also been found desirable in the manufacture of such labels to apply simultaneously one or more tapes to a succession of backing sheets in such a manner that the tapes may later be cut to provide a plurality of backing sheets each having one or more tapes thereon with a space between one end of each tape and the end of the sheet.

It is a primary object of this invention to provide novel means for and a method of continuously applying one or more tapes which have a coating of pressure sensitive adhesive on one side to a succession of backing sheets in such a manner that the edges of the sheets are disposed in overlapping relation.

It is also an object of the invention to provide in a machine for doing this a feeding mechanism which automatically successively feeds the sheets in proper relation to each other without requiring any particular skill on the part of the operator.

It is a further object of the invention to provide a machine which includes means for rolling up the sheets and affixed tape in a roll for storage or for further operations to be performed thereon.

These and other objects will be apparent from the drawings and the following description thereof. Referring to the drawings, which are merely for illustrative purposes:

Fig. 1 is a side elevation of a machine embodying the invention;

Fig. 2 is a plan view of the machine of Fig. 1;

Fig. 3 is an end elevation of the right end or feed end of the machine;

Fig. 4 is an enlarged fragmentary sectional

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view on line 4—4 of Fig. 2, the plane of the section also being indicated by line 4—4 of Fig. 1;

Fig. 5 is a fragmentary elevation on line 5—5 of Fig. 4;

Fig. 6 is an enlarged sectional view on line 6—6 of Fig. 4;

Fig. 7 is a perspective view of one backing sheet or card to which tape is to be applied;

Fig. 8 is a perspective view of the product of the machine; and

Fig. 9 is a perspective view of a single backing sheet with strips of adhesive tape thereon as the same appears after it has been severed from adjoining backing sheets.

More particularly describing the invention, the machine illustrated as embodying one form of the invention includes a frame generally indicated by numeral 10, the individual parts of which may be made of any suitable material but which for simplification have been shown as wood members which are square in cross section. The frame includes four upright corner members or legs 11, a pair of side top rails 12 and a pair of end top rails 14. Spaced above the lower end of the legs are a pair of lower side rails 16 and a pair of lower end rails 17. Intermediate the top and bottom rails are a pair of intermediate side rails 18. Further elements of the frame will be described later in connection with elements which they support.

The machine comprises generally a main drum 20 which is mounted on a shaft 21 journaled at each end at 22 on the intermediate side rails 18. Associated with the drum is a feed mechanism generally indicated by 24, a tape supply generally indicated at 25, a backing sheet holder used for initially positioning the backing sheets relative to the feed mechanism, a take-up roll 27, and a motor 28 for driving the various parts of the machine.

Referring now to the drum 20, this member may be a hollow metal drum, as shown, provided with a peripheral layer of a yieldable fabric or other material, such as the rubber sheathing 30. The drum serves as the main element about which the operation of attaching the adhesive coated tapes to the cards or backing sheets is performed.

The drum shaft 21 is provided with a pair of sheaves 32 rotatable with the drum and driven by a belt 33 extending about sheaves 34 fixedly mounted on a shaft 35 supported by the top rails of the frame at 36, 36. This shaft 35 is motor driven through the medium of the large sheave 38 thereon which in turn is driven by a belt 39

passing over a sheave 40 on a lower countershaft 42 carrying the large sheave 44. The motor 28, which is supported by an outwardly extending platform 46, drives a countershaft 47 on which are pulleys 48 and 49. A belt 50 connects the motor shaft to pulley 48. A belt 52 extends around the pulley 49 and the large sheave 44 mounted on the shaft 42. A belt tensioning means is indicated at 51. With this construction the drum is continuously rotated (counterclockwise as viewed in Fig. 1) during operation of the machine.

A supply of tape indicated generally at 25 is contained on the individual rollers 25a mounted in spaced relation on a removable shaft 53 supported in the brackets 55 and 56 at the feed end of the machine. Each tape T from the rollers is fed to the drum over a pair of idler rollers 58 and 59 mounted on the shafts 60 and 61 supported by a pair of brackets 62. Preferably these rollers are provided with a slight crown to maintain the tape in the proper position.

The frame is adapted to support a backing sheet holder generally indicated at 65, which is mounted on the two top side rails 12 as by means of the bolts and thumb nuts 66 and rests on the top end rail 14 at the feed end of the machine. The backing sheet holder may be made of any suitable material and extends forwardly so as to overhang the roller and is substantially tangential thereto. The backing sheet holder has a rear stop bar 68, a guide bar 67, at one side, and a second guide bar 69 at the other side. At the forward end of the guide rail 69 a curved guide plate 70 is provided underneath which the backing sheet fits.

In use the operator places a backing sheet on the holder underneath the guide plate 70 and up against the rear stop bar 68. The sheet is also moved to abut the lateral guide bar 69. In this position the sheet extends forwardly of the inner edge of the holder and is in position to be engaged by the feeding mechanism which will now be described.

The feeding mechanism comprises a cross bar member 72 provided with a pair of arms 73 which are journaled to the drum shaft 21 so that the same may be pivoted thereon. A pair of counterweights 75 are employed for yieldably urging the arms toward the feed end of the mechanism. However, other suitable means may be used for this purpose. The arms 73 are slotted at 76 to accommodate a pressure bar 78 (see Figs. 4 and 5). This bar is pressed toward the face of the drum by a pair of coil springs 79 mounted about a pair of pins 80 mounted in the pressure bar. The pins are slidably received in bushings 81 mounted in threaded holes 82 at the ends of the cross bar 72. Each arm is bored at 83 to accommodate the bushings, pin and spring.

In order to operate the feeding mechanism, the drum is provided on each side with a circular track 85 which is interrupted at evenly spaced points by recesses or notches 86. The pressure bar is provided at each end with a downwardly extending projection 88 which rides on the peripheral surface of the track 85 except when it is received in one of the notches 86 into which it is forced by means of springs 79. The pressure bar has been shown with the projections received in the notches. When in this position the pressure bar firmly engages the backing sheet and presses the same into engagement with the strips of adhesive tape being pulled over the drum 20. This is accomplished by means of spring fingers 92 (see Figs. 4 and 6) which extend downwardly and forwardly of the pressure bar, being secured thereto by means of cap screws 93 and a plate 94. These fingers are made adjustable by means of the screw 95 received in a threaded opening extending through the plate 94.

Thus, when the depending projections 88 of the pressure bar are positioned in notches 86 of the track 85, the pressure bar and the remainder of the feed mechanism move with the drum which rotates counterclockwise as viewed in Fig. 1 and carry along one of the backing sheets held against the drum by means of the spring fingers 92.

The movement of the feed mechanism is limited by means of cam stop plates 98 mounted on the top rails 12 and provided with a cam face 99 which is engaged by a roller 100 mounted at each end of the pressure bar. When the feed mechanism reaches the position in which it is shown in Fig. 1, the rollers 100 ride up on the cam surface 99 (Figs. 1 and 5) and serve to lift the projections 88 out of the notches 86, thereby releasing the grip of the spring fingers on the backing sheet. Once the projections 88 are free of the notches, the counterweights 75 are effective to return the feed mechanism toward the feed end of the machine until such time as the pressure bar comes immediately above the next pair of notches in the two tracks. When this happens the pressure bar drops and causes the spring fingers 92 to engage the next succeeding backing sheet which up until that time has been held in proper position on the backing sheet holder 65 by an operator. This sheet is then carried around by the drum and the feed mechanism until the feed mechanism again reaches the cam stop elements 98.

It may be pointed out that the relationship between the notches 86 in the track, the speed of the drum and the speed at which the feed mechanism is returned is such that the backing sheets are taken by the feed mechanism disposed with the last fed sheets overlapping those just ahead. It may also be pointed out that each successive backing sheet is placed on the holder before the preceding sheet has entirely left the holder and overlapping such preceding sheet.

The backing sheets with the strips of tape pressed thereon are carried around the drum until they reach a reversing roller 102 mounted on arms 103 pivotally mounted at 104 and urged by means of springs 105 toward the drum. From this reversing roller the product moves to the opposite end of the frame and over an idler roller 108 up to a take-up or storage roll 110 which is mounted in the slotted bracket 111 on a shelf 112. This storage roll is driven by a drive roll 114 mounted on a suitable shaft journaled in the bracket 111 and carrying the pulley 115. This latter is driven through the medium of a belt 116 from the large sheave 117 mounted on the drum shaft 118. A pair of pressure rollers are employed intermediate the reversing roller and the point at which the tape and backing sheet first meet and these comprise the upper roller 120 mounted on a pair of arms 122 which are journaled on the shaft 123 mounted on the uprights 125. A second pair of arms 126 carry a lower roller 127. The shafts carrying the rollers are each provided with a pulley, as indicated at 128 and 129, respectively, and these are driven by means of belts 130—131 (see Fig. 2) extending around the pulleys 132 and 133 on the aforementioned shaft 123. This shaft is driven from the

sheave 135 on the drum shaft by means of a pulley 136 and crossed belt 137.

In the operation of the machine a supply of adhesive tape on rolls 25a is provided. Once the machine is threaded the operation thereof consists in placing the backing sheets one by one on the holder 65, each overlapping the preceding one from which they are taken by the feed mechanism 24 in proper overlapping relation one to the other and carried part way around the drum in contact with the tape T, the adhesive or coated side of which is outermost on the drum. As the cards and the tape proceed around the drum, they are pressed together by means of the pressure rollers 120, 127 and the reversing roller 102, after which the product proceeds to the take up roll 110 in a manner heretofore described.

While a particular form of machine has been shown and described for use in applying several lengths of tape to backing sheets, it is contemplated that various changes and modifications can be made in the apparatus without departing from the scope of the invention as set forth in the claims.

The invention is obviously broader than the machine disclosed and includes a method of forming what may be termed an intermediate product in the making of the type of labels hereinbefore described. This method comprises moving longitudinally one or more tapes coated on one side with a pressure sensitive adhesive, feeding a succession of backing sheets to bring them into contact with the coated side of the tape and orienting the sheets during feeding in such a manner that they are disposed with a predetermined amount of overlapping relation at their ends and finally pressing the tape and the backing sheets together to join the two and thereby produce a product which consists of a succession of backing sheets connected by a tape.

In performing the method, it is preferable to simultaneously apply several tapes to the backing sheets in laterally spaced relation to each other in the manner illustrated in order to produce a product such as that shown in Fig. 8, wherein the backing sheets are indicated by B and the tapes indicated by T.

The method also includes one further step, namely, the severing of the tapes along the line 140 for the purpose of producing a plurality of backing sheets with the tapes disposed thereon with their ends spaced away from one end of the backing sheet, as generally indicated by numeral 141 in Fig. 9. These articles 141 may have further steps performed upon them in order to produce the finished label of the type hereinabove indicated, such steps forming no part of this invention.

We claim:

1. In a machine of the type described, a rotatable drum, means for driving said drum, means for holding a roll of tape having a coating of pressure sensitive adhesive on one side, means for guiding said tape to said drum with the coated side of the tape outermost of the drum, reciprocating means operatively associated with said drum for feeding a plurality of backing sheets to said drum in predetermined relation to each other in a manner to position said sheets against the coated side of the tape, said means for feeding including a structure pivotally mounted on the axis of rotation of the drum having a member for urging the individual backing sheet into pressure engagement with the tape on the drum, interengaging means on said drum and said structure for causing said structure to move with said drum for a limited distance, means for causing said tape to be drawn around a portion of said drum, and means for pressing said sheets against said tape to join the sheets and tape.

2. In a device of the type described, a drum over which an adhesive coated tape can be drawn, means for driving the drum, a backing sheet holder adapted to hold a backing sheet disposed substantially tangentially of the drum, a reciprocating feed mechanism including a structure pivotally mounted on the axis of rotation of the drum having means for holding a backing sheet pressed against said drum, interengaging means on said drum and said feed mechanism for causing said mechanism to be carried with the drum for a limited distance away from said holder, said means for holding a backing sheet pressed against the drum being operative during movement of the feed mechanism with the drum, and means for returning said feed mechanism to said holder.

3. In a device of the type described, a drum over which an adhesive coated tape can be drawn, means for driving the drum, a backing sheet holder adapted to hold a backing sheet disposed substantially tangentially of the drum, a feed mechanism pivotally mounted on the axis of rotation of the drum, said mechanism including a pressure bar having means for holding a backing sheet against the periphery of the drum, a circular track on said drum interrupted by a plurality of spaced recesses, said bar having a projection constructed and arranged to ride on said track and to be received in the recesses thereof whereby said feed mechanism is carried with said drum away from said holder, means for disengaging said pressure bar from a recess in said track, and means for returning said feed mechanism toward said holder.

4. In a device of the type described having a driven drum over which an adhesive coated tape can be drawn, a circular track mounted on said drum, said track being interrupted by a plurality of notches, a pair of arms pivotally mounted at each end of the drum on the pivotal axis of the drum, a cross bar connecting said arms and extending across said drum radially outward thereof, a pressure bar mounted on and extending between said arms intermediate the periphery of the drum and said cross bar, said pressure bar being movable for a limited distance radially of the arms and drum, means yieldably urging said bar radially inwardly of the drum, said bar having a projection adapted to ride on said track and receivable in a notch thereof to cause said arms and parts mounted thereon to rotate with said drum, means on said pressure bar engaging and pressing a backing sheet against the periphery of said drum when the projection on said bar is in a notch of said track, means for disengaging said pressure bar from a notch in said track at a predetermined point, and means for returning said arms and parts mounted thereon in a direction opposite to the rotation of said drum.

5. In a device of the type described, a frame, a drum rotatably mounted on said frame, means for driving the drum, a circular track mounted on said drum, said track being interrupted by a plurality of notches, a pair of arms pivotally mounted at each end of the drum on the pivotal axis of the drum, a cross bar connecting said arms and extending across said drum radially outward thereof, a pressure bar mounted on and extending between said arms intermediate the periphery of the drum and said cross bar, said

pressure bar being movable for a limited distance radially of the arms and drum, means yieldably urging said bar radially inwardly of the drum, said bar having a projection adapted to ride on said track and receivable in a notch thereof to cause said arms and parts mounted thereon to rotate with said drum, means on said pressure bar engaging and pressing a backing sheet against the periphery of said drum when the projection on said bar is in a notch of said track, interengaging cam and roller means carried by said frame and said pressure bar for lifting said bar out of engagement with a notch in said recess at a predetermined point, and means for returning said arms and parts mounted thereon in a direction opposite to the rotation of said drums.

6. In a device of the type described, a drum over which an adhesive coated tape can be drawn, means for driving the drum, a feed mechanism pivotally mounted on the axis of rotation of the drum, said mechanism including a pressure bar having means for holding a backing sheet against the periphery of the drum, a circular track on said drum interrupted by a plurality of spaced recesses, said bar having a projection constructed and arranged to ride on said track and to be received in the recesses thereof whereby said feed mechanism is carried with said drum away from said holder, means for disengaging said pressure bar from a recess in said track, and means for returning said feed mechanism to a given point.

7. In a device of the type described, a drum

over which an adhesive coated tape can be drawn, means for driving the drum, a feed mechanism pivotally mounted on the axis of rotation of the drum, said mechanism including a pressure bar for holding a sheet in pressure engagement with a tape about the periphery of the drum, interengaging means on said drum and said bar for causing said feed mechanism to be carried with said drum, release means for disengaging said interengaging means, and means for returning said feed mechanism to a given point.

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