May 22, 1956 C. P. TAYLOR 2,746,546

DISPENSER HAVING A TAPE SEVERING KNIFE AND AUTOMATICALLY ACTING TAPE-BRAKE

Filed Aug. 25, 1952 2 Sheets-Sheet 1

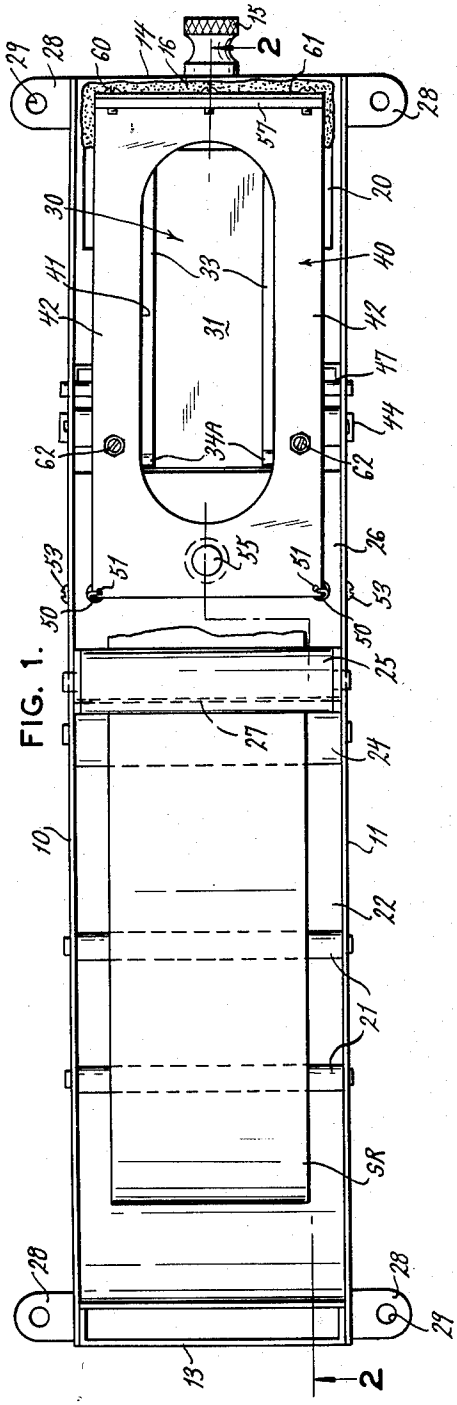

FIG. 1.

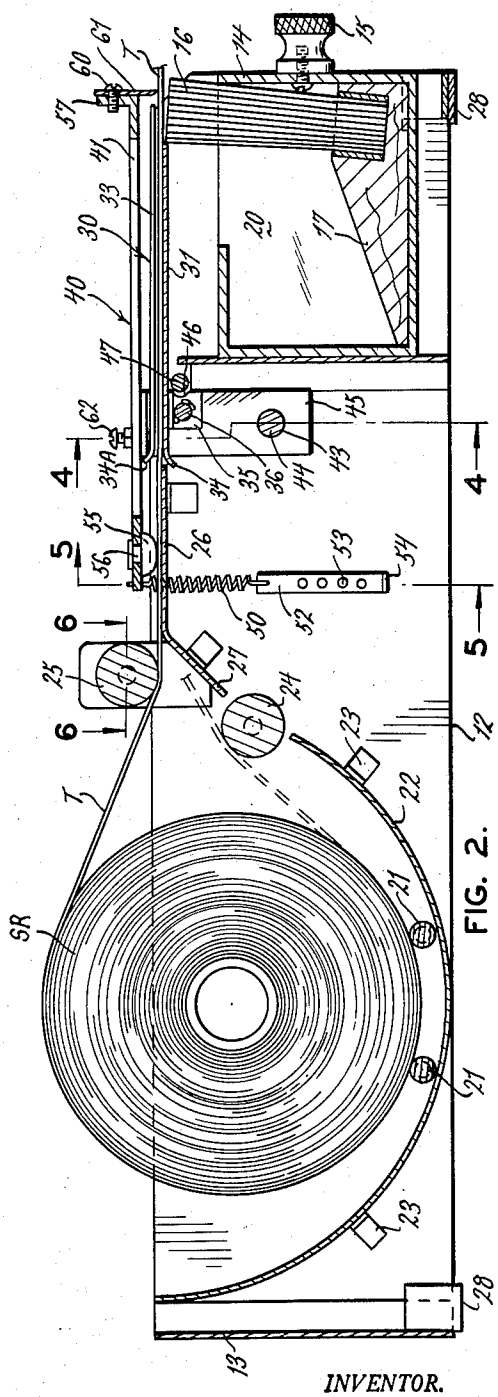

FIG. 2.

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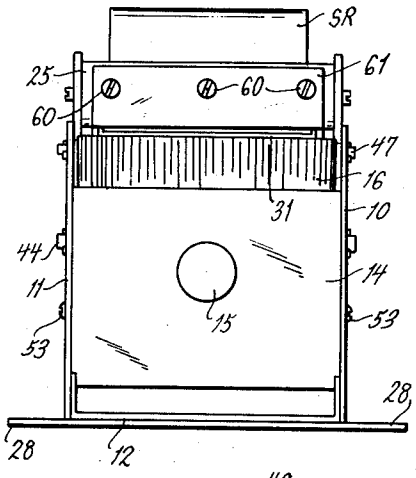
FIG. 3.



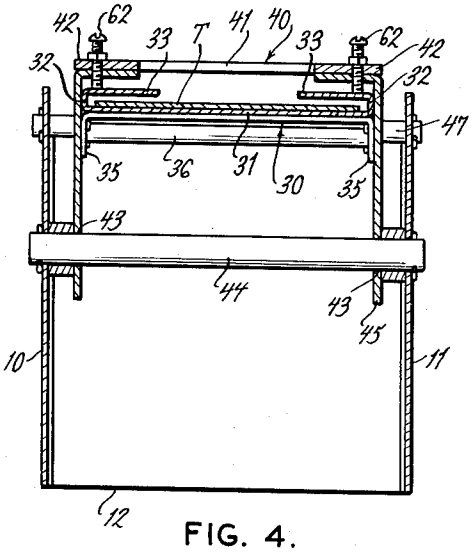


FIG. 4.

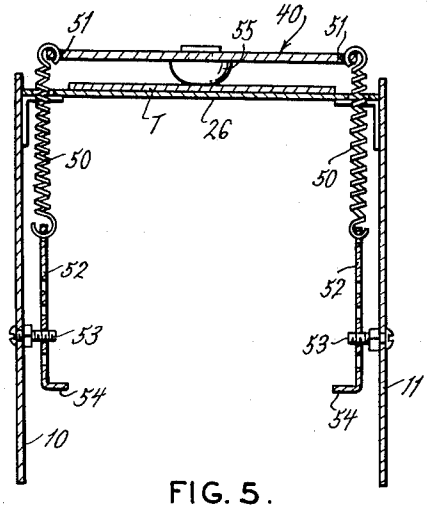


FIG. 5.

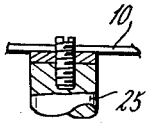


FIG. 6.

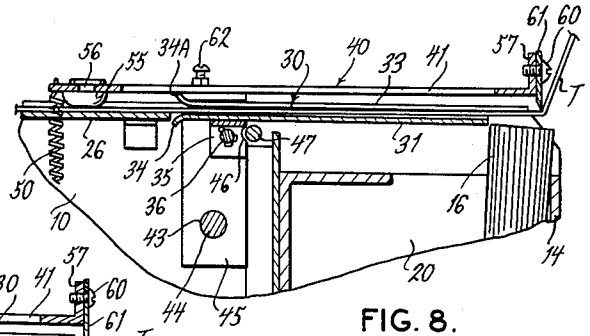


FIG. 8.

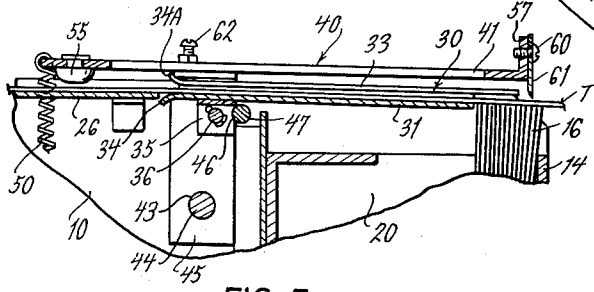


FIG. 7.

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2,746,546

DISPENSER HAVING A TAPE SEVERING KNIFE AND AUTOMATICALLY ACTING TAPE-BRAKE

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Application August 25, 1952, Serial No. 306,208

9 Claims. (Cl. 164—84.5)

This invention relates to improvements in dispensers for strip materials, and more particularly to an improved device for use in a tape dispenser of pull-and-tear type, providing a better control of withdrawal and severance of certain types of mechanically dispensed adhesive tapes.

This applicant is aware that in many of the types of portable dispensing devices for use with gummed paper tape, as well as tape of so-called cloth or filled types, the prevalent practice is to withdraw by pulling a requisite length of tape or strip, moistening same incident to the pulling operation, if the tape be of adhesive coated type requiring moistening, then severing the strip. Particularly with the increasing usage of tapes of so-called filled types, considerable difficulty has been encountered with preexisting types of dispensers due to the high severance resistance of tapes of these types. It is accordingly a principal and major objective of the present invention to obviate the tendencies, when using conventional tape dispensers, toward ragged or incomplete severance of the tape, withdrawal in an excessive length, sometimes with waste or mutilation, and the requirement of rewinding the tape withdrawn in unneeded lengths incident to repeated incomplete severing operations.

More particularly expressed in reference to the function of the current improvements, the present invention objectively provides an automatically acting tape-brake which is instantly operable incident to the normal tape shearing operation, thus positively precluding waste of the tape and greatly reducing the effort of actual cutoff of the desired length of the material dispensed, particularly when employing filled tapes.

A further and highly important objective is realized in a novel tape guide having an embracing relation at least to the margins of the tape, and which serves positively to direct the tape to a zone between the moistening and cutoff regions.

A still further objective of major import is realized in a unique combination of a floating tape guide and the braking and cutoff elements, such that the brake serves normally to prevent casual or unwanted issuance of the tape, yet such that upon normal withdrawal of the tape, the brake is automatically released therefrom by a lost-motion connection between the tape guide and a combined brake and knife support.

Numerous other advantageous features are found in the relative arrangement, location and simplicity of the coacting tape control elements, together with other advantages and features of construction and function, all of which will more clearly appear from the following detailed description particularly when considered in connection with the accompanying drawing, in which:

Fig. 1 is a top or plan view of a tape dispenser of pull-and-tear type embodying the present improvements;

Fig. 2 is a longitudinal sectional view taken along staggered planes indicated by line 2—2 of Fig. 1;

Fig. 3 is an end elevational view of the front or tape-issuance end of the device;

Fig. 4 is a transverse sectional view in a vertical plane particularly located by line 4—4 of Fig. 2;

Fig. 5 is a vertical sectional view in a transverse plane located by line 5—5 of Fig. 2;

Fig. 6 is a sectional detail of a journalled portion of one of the tape guide rollers, as located by line 6—6 of Fig. 2, and

Figs. 7 and 8 are, respectively, fragmentary longitudinal sectional views partly in elevation through that portion of the device containing the floating tape guide together with the brake and knife mechanism and portions of the moistening arrangement, Fig. 7 showing the tape guide and the brake and knife arm as positioned during the first tape withdrawal and moistening operation, and Fig. 8 showing the same parts as positioned during the tear-off or tape severance step.

Referring now by characters of reference to the drawing, and first to Figs. 1 and 2, a supporting frame for and constituting part of the assembly, consists of a top-open metal receptacle of rectangular aspect, including side walls **10** and **11**, a bottom **12**, and end walls **13** and **14**. The end wall **14** may, as is preferred, constitute the front element of a removable receptacle in the form of a drawer open at its top, provided with a pull knob **15**, a bristle or other brush **16** supported in a brush block **17** within a chamber **20** containing a moistening liquid, usually water.

There is formed in the rear end region of the container or frame, a seat for rotatively supporting a supply roll of the tape to be dispensed, the roll being indicated at SR, and which bears upon a pair of transverse rollers **21** bridging and journalled in the side walls **10** and **11**. Below the rollers **21** is located a concave deflector indicated at **22**, and secured as by tabs **23**, being welded for example, to walls **10** and **11**.

Journalled in rotative and bridging relation to the side walls **10—11** is a tape guide roller **24**, and a second such roller **25**. These rollers are usually alternately employed to direct the tape issuing from the roll SR toward a horizontal plane. The roller **24** will be utilized in the case of an outside-coated tape and the roll **25** in the case of an inside-coated tape, the coating having reference to the adhesive applied to one side of the strip or tape. Whichever of the rolls **24—25** be currently utilized, the tape will be directed therefrom toward and over a fixed guide platen **26** provided with a ramp portion **27**, portion **26** serving to direct the tape, as will appear, into a floating tape guide generally indicated at **30**, and later described in detail.

Just beyond the guide **30** the tape T reaches a zone of severance and issuance at the right hand or front end of the device as shown in Figs. 1 and 2. By reason of the somewhat greater tearing effort required, and other factors, it is sometimes expedient to locate the dispenser in a fixed position as on a table or the like, for which purpose the device is provided at its corners with hold-down flanges **28** each apertured as at **29** to receive a hold-down screw (not shown).

The foregoing description is included principally for completeness of understanding of the device as a whole, but referring now more particularly to the severance and braking provisions as well as the floating tape guide forming a part of the same assembly, it will appear particularly from the sectional view of Fig. 4, that the floating tape guide generally indicated at **30** includes a flat or planar bottom portion **31**. This may conveniently be formed of sheet metal and the sides thereof extended upwardly of the bottom **31** to constitute short vertical margins **32** inturned at about a right angle to form horizontal flanges **33**. Thus, as will appear from Fig. 4, the tape T is at least marginally embraced by the bottom and the side channel portions of the floating tape guide. From this arrangement it results that the tape T is kept at all times

substantially parallel to the plane of the bottom element **31** until issuance of the tape from the guide **30**.

To facilitate feeding the tape into the guide **30** the rear margin of piece **31** is provided with a sloping downturned margin or lip **34** and the rear margins of the flanges **33** are similarly formed but turned upwardly as indicated at **34A**. These sloping flanges collectively form an entrance mouth leading into the floating guide, as will appear.

The plate **31** of the floating tape guide is secured to or integrally formed to provide a pivotal structure including a pair of downturned apertured ears or projections **35**, the apertures therein serving to receive a pivot member **36** through which the tape guide is rockably mounted for a limited up and down movement about an axis defined by the element **36**.

The automatic brake and cutoff knife support are structurally and functionally combined for purposes of simplicity and positively coordinated action. In the arrangement shown, there is provided a plate or arm and appurtenant parts generally indicated at **40**. The assembly **40** is provided in its intermediate area with a large finger opening (Fig. 1) **41**, from which this arm or plate is characterized by two spaced side portions **42**. Each of a pair of L-shaped pivot arms has one leg **45** secured as by welding at each side of the assembly **40**, thence extends vertically downwardly into the housing or frame with its inner end apertured as at **43** to receive a pivot pin **44** bridging the side walls **10—11**, this provision being made to provide a limited vertical rocking movement of the assembly **40** about an axis identified with that of the pin **44**.

Somewhat forwardly of a vertical plane including the axis of the brake-knife assembly, each of the vertical legs designated at **45** is apertured to receive the pin **36** through which the floating tape guide **30** is pivotally and rockably supported. There is also to be noted that each of the legs **45** is provided in its upper and forward margin, with a recess **46**, the margin of this recessed portion engaging a fixed stop pin **47** bridging the side walls **10—11** of the frame, and acting to limit the forward and downward rocking movement of the assembly **40**. Upward and rearward tilting movement of the assembly **40** is limited by the brake, as will later appear.

Preferably at the extreme rear end of the arm constituting the upper plate assembly **40**, are a pair of tension springs **50**, the upper tang of each of which extends through a suitable spring aperture **51** and the lower tangs of which are similarly secured each to a serially apertured adjustment plate **52**, in such manner that a selected aperture of each member **52** may be drawn over the end of a pin or screw **53** projecting inwardly of the adjacent side wall **10** or **11** of the frame. A finger tab or flange **54** is formed on the lower end of each piece **52** to facilitate this adjustment.

The assembly **40**, considered as a pivoted arm or as a lever, having its pivot axis identified with member **44**, comprises a rearmost short lever arm and a forwardmost longer arm. Carried by the end of the arm is an element shown as consisting of a button of rubber or a rubber-like material and designated at **55** and which is located so as normally to engage as a brake shoe, the tape T immediately above the fixed platen **26**. Thus, between periods of movement of the tape T the springs **50** will urge the brake button **55** downwardly against the tape T sufficiently to prevent its casual or unintended withdrawal. The brake element **55** is provided with a headed stem or shank **56** projecting through a suitable aperture therefor in the inner end of the plate or arm of assembly **40**.

At the opposite end of the assembly **40**, the plate constituting the longer end of the lever arm, is turned upwardly as indicated at **57** to form a transverse flange suitably tapped to receive knife holding screws **60** engaging apertures therefor in a razor-type bevelled edge knife **61**, the edge of which is disposed across the tape at the issuance zone thereof as a convenient shearing element.

Due to the fact that the floating tape guide **30** is pivoted by pin **36** to the vertical legs **45** of the rockable knife-brake assembly, the arrangement is such that the tape guide **30** has a limited lost-motion movement within the assembly **40**. This movement will, incident to usual tape issuance and severance operations, be imparted to the member **30** by the hand of the operator acting through the unissued but unrolled length of tape.

As a means for adjustably limiting the permissive (downward) movement of the tape and hence of the tape guide **30**, each with respect to assembly **40**, there are provided a pair of adjustable abutments comprised of screws **62** extended through tapped apertures therefor in the rear ends of the respective side portions **42**. Each of screws **62** is provided with a lock nut so as to maintain the adjustment thereof. Those portions of the adjustment screws **62** which project below the side portions **42** serve to abut the rearmost portions of the floating tape guide **30**, and thus act to limit the free downward movement of the guide within the brake-knife assembly. It may be noted that the permissive range of upward movement of this guide relative to the assembly **40**, is determined by abutment of the outer end of the guide adjacent the lower or inner surface of the plate portion of assembly **40**.

The brake-knife assembly is limited as to range of its rocking movement, as follows:

Downward movement of the knife end of the assembly **40** is determined by the engagement of the recessed portions **46** with the limit pin **47**, as above described, and limit of movement of the rockable assembly **40** in the opposite direction is established by engagement of the brake button or shoe **55** with the tape, the member **40** being normally biased into this tape-braking position by the tension of springs **50**.

Although the operation of the device incident to its normal usage is thought to have become apparent from the foregoing detailed description of its components, it may be noted for completeness that the top opening **41** in the plate constituting elements **42**, together with the spaced relation of the two flanges **33** of the tape guide, permits finger access directly to the uppermost surface of the tape T in the guide **30**. There is thus exposed to access a length of say 4″ or 5″ of the tape, permitting an equal range of movement of the tape, by frictional engagement thereof with the fingers. The tape end then protruding forwardly of the knife is readily pulled to feed forwardly of the knife the requisite additional length of tape. It will be noted that, incident to the downward manual pressure on the exposed tape surface, whether the tape be pushed or pulled to propel same outwardly of the issuance zone, the resulting downward movement of the tape will bring its gummed surface over the brush **16** for moistening same, when required. Also, as will best appear from a comparison of Figs. 7 and 8, the downward movement of the tape guide, i. e., clockwise about its pivot **36**, will cause the tail of the tape guide to engage the stop screws **62** with the effect of lifting the tail of the assembly **40**, and hence releasing the brake element **55** from the strip.

When the requisite length of tape is withdrawn, the tape is, for purposes of severance, lifted against the knife **61**. The first result of this lifting action is to impart to the assembly **40** a turning moment, counterclockwise in direction (Figs. 2, 7 and 8) with the immediate effect of bringing the brake element **55** and the platen **26** into gripping relation to the tape. Thus, irrespective of the pull imparted to the tape incident to severance thereof, it is impossible to withdraw inadvertently or otherwise, any more than the wanted length of the strip. This feature thus overcomes a prevalent difficulty frequently encountered particularly with those types of tape which include fibers of other than the usual paper or cellulose materials rendering the tape somewhat more difficult to cut or tear, than is the case with less resistant, wholly paper products.

It should be noted that the assembly as described may be constructed as a fully operative structure by utilizing a tape guide approximating that indicated at **30**, but which is fixedly related to the rockable knife and brake assembly **40**. However experiments have shown that better results are had by providing for an appreciable range of movement of the tape T downwardly against the moistening agency such as brush **16**, and likewise permitting a substantial movement of the tape upwardly to the knife **61**, intervening any corresponding movements of the structure **40**. Such a latitude of permissive movement of the tape upwardly or downwardly, renders the brake control much less critical, and assures against undesirable actuation of the assembly **40** under certain conditions. Furthermore, the fact that the tape T may be thus lifted and lowered, while it is substantially fully embraced by the floating tape guide assembly **30**, assures against any hazard of twisting, wrinkling or other distortion of the tape in this region. Still further, the floating support of the tape guide structure **30** renders much less critical the exact height of the moistening agency such as brush **16**, and the provision for lifting the member **30** facilitates removal of the moistening reservoir and brush endwise of the receptacle-frame.

The floating tape guide or chute serves a further valuable purpose viz., in normally keeping that portion of the tape just ahead of the knife, from engaging the brush **16** except when the tape is drawn downwardly for moistening. This provision precludes spoilage of adhesive, with resultant "dead" areas, during out-of-action periods. The downward and forward tilt of the tape chute prevents moisture flow by gravity back to the unrolled but unissued portions of the tape.

From the foregoing it will have appeared that the embodiment described serves fully to realize the several objects and advantages expressed and implied. Although the invention has been described by particularized reference to a single embodiment, the detail of description should be understood as instructive rather than limiting, many variants being possible within the fair scope of the claims hereunto appended.

I claim as my invention:

1. In a dispenser, a frame, a fixed horizontal platen on said frame, a knife and brake support disposed over said platen, means for pivotally connecting said brake and knife support to said frame, a knife carried by the support at its forward end, a brake carried by the support at its rearward end, a tape guide mounted beneath the knife and brake support, and located forwardly of said platen, pivot means pivotally connecting said tape guide to said knife and brake support, spring means connected to the knife and brake support, said spring means tending to urge the brake downwardly against the platen, and an abutment between the rear end of the tape guide and the knife and brake support, said abutment being located rearwardly of the pivotal connection between the knife and brake support and the frame.

2. In a dispenser, a frame, a fixed horizontal platen on said frame, a knife and brake support disposed over said platen, means for pivotally connecting said knife and brake support to said frame, a knife carried by the support at its forward end, a brake carried by said support at its rearward end, a tape guide mounted beneath the knife and brake support, and located forwardly of said platen, pivot means pivotally connecting said tape guide to said knife and brake support at a point forwardly of the pivotal connection between the knife and brake support and the frame, spring means connected to the knife and brake support, said spring means tending to urge the brake downwardly against the platen, and an abutment between the rear end of the tape guide and the knife and brake support, said abutment being rearwardly of the pivotal connection between the tape guide and the knife and brake support.

3. In a dispenser, a frame, a fixed horizontal platen on said frame, a knife and brake support disposed over said platen, means for pivotally connecting said knife and brake support to said frame, a knife carried by the support at its forward end, a brake carried by the support at its rearward end, a tape guide mounted beneath the knife and brake support, and located forwardly of said platen, pivot means pivotally connecting said tape guide to said knife and brake support, the knife and brake support being provided with an opening extending over the tape guide, spring means connecting said knife and brake support to said frame, said spring means tending to urge the brake downwardly against the platen, and an abutment between the rear end of the tape guide and the knife and brake support, said abutment being rearwardly of the pivotal connection between the knife and brake support and the frame.

4. In a dispenser, a frame, a fixed horizontal platen on said frame, a knife and brake support disposed over said platen, arms extending downwardly from said support, pivot means for pivotally connecting said arms to said frame, a knife carried by the support at its forward end, a brake carried by the support at its rearward end, a tape guide mounted beneath the knife and brake support, and located forwardly of said platen, pivot means pivotally connecting said tape guide to the arms of said knife and brake support, spring means connected to the knife and brake support, said spring means tending to urge the brake downwardly against the platen, and an abutment between the rear end of the tape guide and the knife and brake support, said abutment being rearwardly of the pivotal connection between the tape guide and the knife and brake support.

5. In a dispenser, a frame, a fixed horizontal platen on said frame, a knife and brake support disposed over said platen, arms extending downwardly from said support, means for pivotally connecting said arms to said frame, a knife carried by the support at its forward end, a brake carried by the support at its rearward end, a tape guide mounted beneath the knife and brake support, and located forwardly of said platen, pivot means pivotally connecting said tape guide to the arms of said knife and brake support at a point forwardly of the pivotal connection between the knife and brake support and the frame, spring means connected to the knife and brake support, said spring means tending to urge the brake downwardly against the platen, and an abutment between the rear end of the tape guide and the knife and brake support, said abutment being rearwardly of the pivotal connection between the tape guide and the knife and brake support.

6. In a dispenser, a frame, a fixed horizontal platen on said frame, a knife and brake support disposed over said platen, arms extending downwardly from said support, pivot means for pivotally connecting said arms to said frame, a knife carried by the support at its forward end, a brake carried by the support at its rearward end and extending downwardly toward the platen, a tape guide mounted beneath the knife and brake support, and located forwardly of said platen, pivot means pivotally connecting said tape guide to the arms of said knife and brake support at a point forwardly of the pivotal connection between the knife and brake support and the frame, spring means connecting the rearward end of said knife and brake support to said frame, said spring means tending to urge the brake downwardlly against the platen, and an abutment between the rear end of the tape guide and the knife and brake support, said abutment being rearwardly of the pivotal connection between the tape guide and the knife and brake support.

7. In a dispenser, a frame, a fixed horizontal platen on said frame, a knife and brake support disposed over said platen, arms extending downwardly from said support, pivot means pivotally connecting said arms to said frame, a knife carried by said support at its forward end, a brake carried by said support at its rearward end,

said brake extending downwardly toward the platen, a tape guide mounted beneath the knife and brake support, and located forwardly of said platen, pivot means pivotally connecting said tape guide to the arms of the knife and brake support at a point forwardly of the pivotal connection between the arms and said frame, the knife and brake support being provided with an opening extending over the tape guide, spring means connecting the brake carrying end of the knife and brake support to said frame, said spring means tending to urge the brake downwardly against the platen, and an abutment between the rear end of the tape guide and the knife and brake support, said abutment being rearwardly of the pivotal connection between the tape guide and knife and brake support.

8. In a dispenser, a frame, a fixed horizontal platen on said frame, a knife and brake support disposed over said platen, arms extending downwardly from each side of said support, means for pivotally connecting said arms to said frame, a knife carried by the support forwardly of said pivotal connection, a brake carried by said support rearwardly of said pivotal connection, a tape guide mounted beneath the knife and brake support, and located forwardly of said platen, pivot means pivotally connecting said tape guide to the arms of the knife and brake support at a point upwardly and forwardly of the pivotal connection between the arms and said frame, a spring means connected to the support rearwardly of the pivotal connection of said arm to said frame, and connected to said frame, said spring means tending to urge the brake downwardly against the platen, and an abutment between the rear end of the tape guide and the knife and brake support, said abutment being rearwardly of the pivotal connection between the tape guide and the knife and brake support.

9. In a dispenser, a frame, a fixed horizontal platen

on said frame, a knife and brake support disposed over said platen, arms extending downwardly from each side of said support, means for pivotally connecting said arms to said frame, a knife carried by the support forwardly of said pivotal connection, a brake carried by said support rearwardly of said pivotal connection, and extending downwardly toward said platen, a tape guide mounted beneath the knife and brake support, and located forwardly of said platen, pivot means pivotally connecting said tape guide to the arms of the knife and brake support at a point upwardly and forwardly of the pivotal connection between the arms and said frame, the knife and brake support having an opening extending over the tape guide, a spring means connected to the knife and brake support rearwardly of the pivotal connection of said arm to said frame, and connected to said frame, said spring means tending to urge the brake downwardly against the platen, and an abutment between the rear end of the tape guide and the knife and brake support, said abutment being rearwardly of the pivotal connection between the tape guide and the knife and brake support.

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