United States Patent

Sasaki et al.

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[54] TAPE CUTTER

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[73] Assignee: **Sekisui Adoheya Kogya Kabushiki Kaisha**, Osaka-shi, Japan

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[52] **U.S. Cl.** **270/86**, 225/9, 225/19, 225/56, 225/80, 225/88, 225/91

[51] **Int. Cl.** **B65h 45/22**, B26f 3/02

[58] **Field of Search** 270/86; 225/56, 58, 9, 19, 225/80, 88, 89, 91

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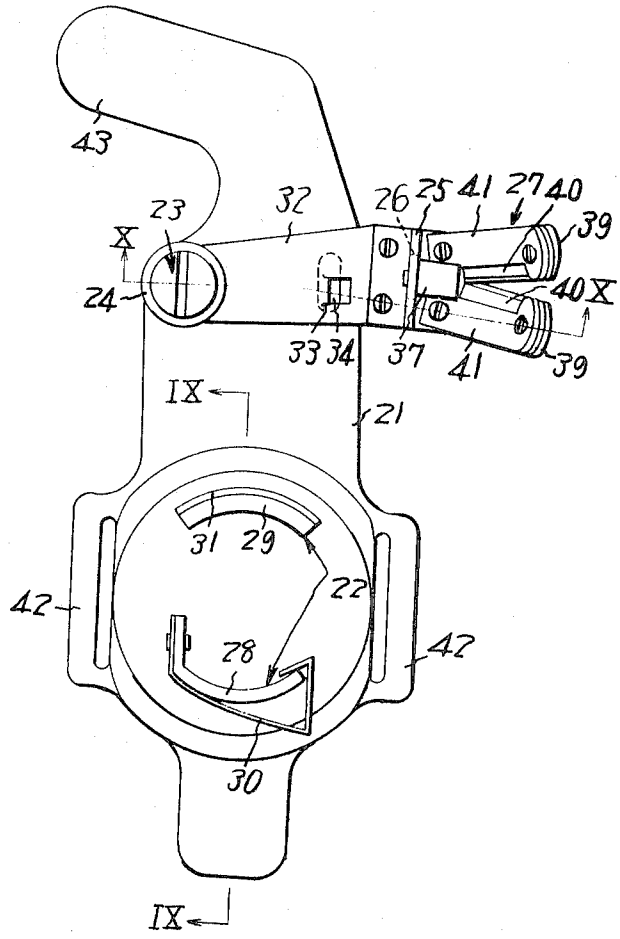
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Assistant Examiner—Leon Gilden
Attorney—Larson, Taylor & Hinds

[57] **ABSTRACT**

A tape cutter comprising a support and a pair of blades fixed to said support with the cutting edges thereof facing each other, said blades being spaced apart by a distance to permit the passage of a tape at their upper ends and brought closer toward each other downward into contact with each other at their lower ends.

2 Claims, 10 Drawing Figures



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SHEET 1 OF 3

Fig. 1

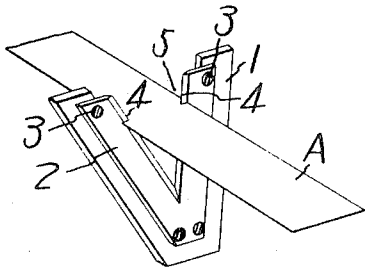


Fig. 2

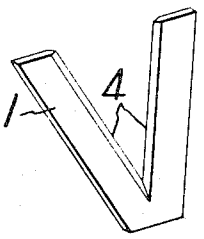


Fig. 3

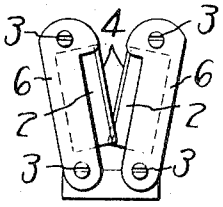


Fig. 4

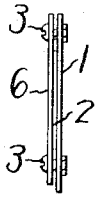


Fig. 5

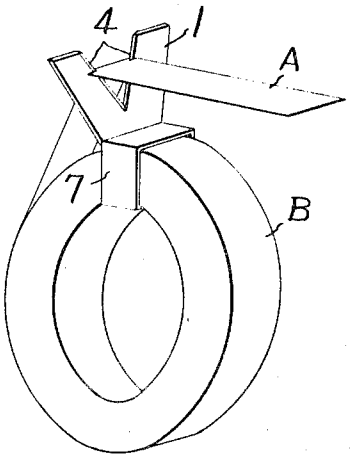


Fig. 6

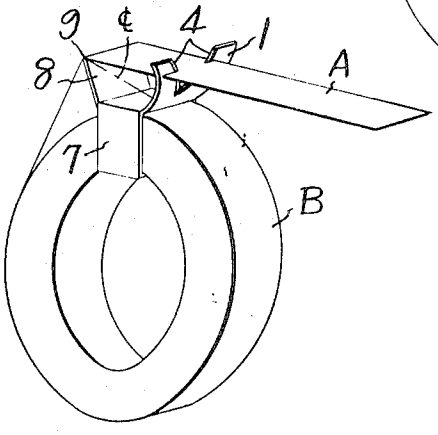


Fig. 7

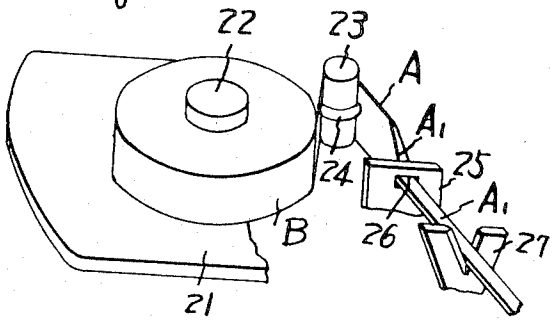

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23
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A1
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A1
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Fig. 8

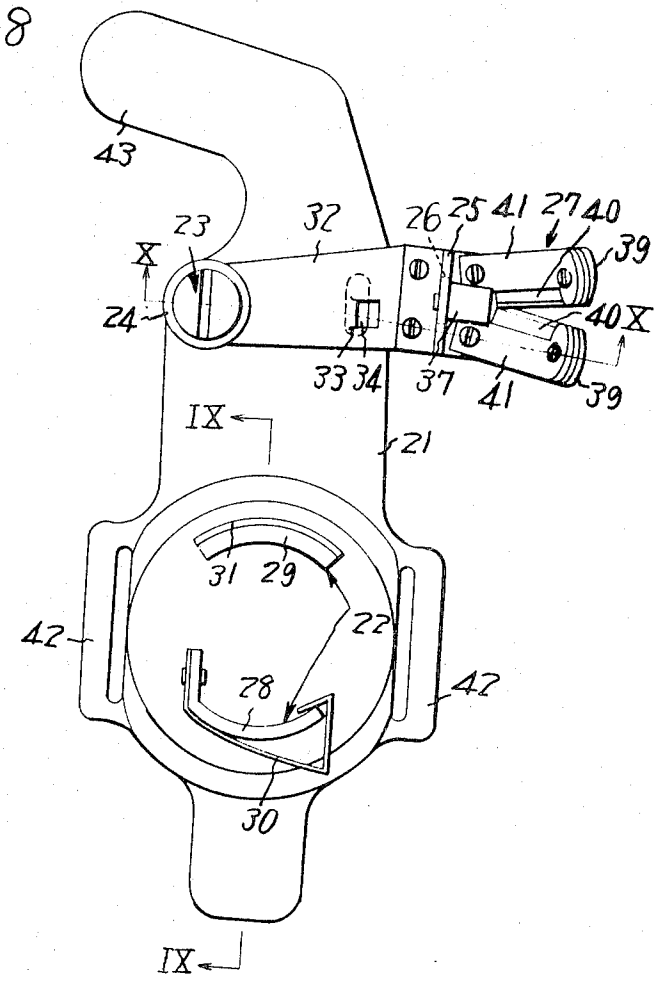

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IX

Fig. 9

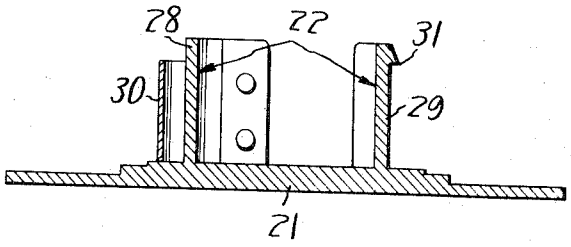
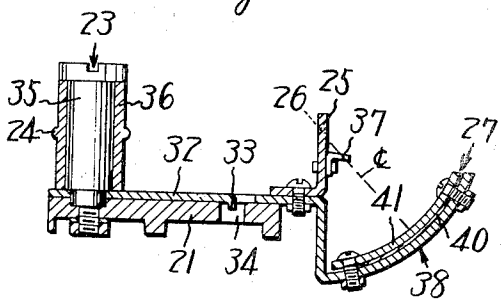


Fig. 10



TAPE CUTTER

The present invention relates to a tape cutter and more particularly to an improved cutter for cutting off tapes such as paper tapes, cellophane tapes, vinyl tapes, adhesive tapes or the like.

Conventionally, a thin metal plate with a saw-toothed edge has been used most extensively as a tape cutter. In cutting off a tape with a cutter of this type, the tape is first pressed against the saw-toothed edge to perforate the tape therewith and the tape is then torn off along the perforations. However, in case an expandable tape like a vinyl tape is to be cut off with a cutter of such structure, it is difficult to perforate the tape with the toothed edge and accordingly the tape has to be pulled forcibly. As a result, the tape gets stretched and the moment it is cut off the contraction of the stretched portion causes the adhesive side thereof to stick to itself, making the severed piece unfit for use. Another disadvantage of this type of cutter is that in cutting off an adhesive tape made of cloth, some of the yarns are frequently left uncut to pull part of the tape and produce wrinkles therein, with the result that the cut off portion becomes unapplicable.

In an attempt to overcome these disadvantages various improvements have so far been made, but the tape cutters conventionally proposed were complex in structure.

An object of the present invention is to provide a tape cutter of a simple structure with which a wide variety of tapes can be cut off easily and which is therefore capable of cutting off even an expandable tape or a cloth tape without causing the tape to stretch or producing a fray therein.

Another object of the present invention is to provide a tape cutter with replaceable cutting blades so that it can be used over a long period.

Another object of the present invention is to provide a tape cutter which is safe to use despite the provision of the sharp cutting blade.

Still another object of the present invention is to provide a cutter which has the features set forth above and with which an adhesive tape of self-bonding type can be severed in the shape ready to serve various bonding purposes peculiar to this type of tape.

In accordance with the present invention, a tape cutter comprises a blade support and a pair of blades fixed to the support with the cutting edges thereof facing each other, the blades being spaced apart by a distance to permit the passage of a tape at their upper ends and brought closer toward each other downward into contact with each other at their lower ends.

In accordance with the present invention, the cutter may be mounted slidably on a roll or tape by suitable holding means or it may be fixed to a base on which a roll or tape is mounted rotatably.

In another mode of the present invention, the cutter is provided with a guide for supporting an unwound portion of the tape at a desired position so as to allow the tape to be cut off more easily by the blades pivotally on the supporting portion. To cut off the tape at a right angle with the longitudinal direction of the tape, the blades may preferably be fixed to the blade support in curved shape along a circle which has its center at the supporting portion on the guide.

Preferred embodiments of the present invention will be hereinafter described in detail with reference to the accompanying drawings, in which:

FIG. 1 is a perspective view of a cutter illustrating the structure of an embodiment of the present invention;

FIG. 2 is a perspective view of another embodiment of the present invention;

FIG. 3 is a front view of another embodiment of this invention in which a razor blade is utilized as the cutting blade;

FIG. 4 is a side elevation of the cutter shown in FIG. 3;

FIG. 5 is a schematic perspective view showing a cutter of the present invention as it is attached to a roll or tape;

FIG. 6 is a schematic perspective view showing another embodiment of the present invention as it is mounted on a roll of tape;

FIG. 7 is a schematic perspective view illustrating the principle of a cutting device of the present invention for cutting off a self-bonding adhesive tape with a cutter and a tape roll mounted on a base;

FIG. 8 is a plan view showing a preferred embodiment of the cutting device for self-bonding adhesive tape;

FIG. 9 is a view in section taken along the line IX–IX in FIG. 8; and

FIG. 10 is a view in section taken along the line X—X in FIG. 8.

Referring to FIG. 1, a cutter of the present invention comprises a V-shaped support 1 and a V-shaped blade 2 fixed to the support 1 with screws 3 and provided with cutting edges 4 along its inner edges. The upper portion of a V-shaped space 5 formed between the cutting edges 4 has a width to permit the passage of a tape A to be cut off and the cutting edges 4 meet each other at its lowermost portion.

To cut off a tape with this cutter, the end of the tape A pulled out is passed through the V-shaped space 5 with the opposite side edges of the tape A brought into contact with the opposite cutting edges 4 crosswise. The tape A is then brought downward. It is therefore progressively cut from the opposite side edges inward and is cut off completely at the junction of the cutting edges 4.

In an embodiment shown in FIG. 2, the support 1 and blades 2 in FIG. 1 are made integrally, with cutting edges 4 formed directly along the inner edges of the support 1. Instead of providing the cutting edges in the above-mentioned manner, a razor may be utilized as the cutting blade 2. In this case, as shown in FIGS. 3 and 4, two blade pieces 2 obtained by breaking the razor blade longitudinally are respectively fixed to the opposite arms of a substantially V-shaped support 1 by means of fastening plates 6 and screws 3, the blades 2 facing each other in V-shaped arrangement.

In one mode of practical use, the cutter of the present invention may be attached to a roll of tape. A holder 7 fixed to the lower end of the V-shaped support 1 is mounted slidably on the tape roll B as seen in FIG. 5.

For more accurate and easier cutting off operation, the cutter of this invention may be provided with a guide for the tape. An embodiment shown in FIG. 6 comprises a guide 8 for supporting the tape A and a cutter. In this embodiment, any of the foregoing cutters may be used. However, in this application the cutter is formed in curved shape along the circumference of a circle which has its center on the upper edge 9 of the guide 8 where the tape is supported. Both of the guide 8 and blade support 1 are fixed to the holder 7. With this arrangement, the position at which the tape is cut is always equidistant from the supporting edge 9, so that the tape A is moved pivotally downward while it is being cut and can be cut off along a straight line perpendicular to the longitudinal direction of the tape A with greater ease and high accuracy.

It will be apparent from the above description that the cutter of this invention insures a smooth and reliable cutting off operation. This is due to the fact that unlike in a conventional tape cutter which is provided with a saw-toothed edge to "tear off" a tape, the present invention employs sharp cutting blades and that throughout the cutting operation, the cutting blades are always positioned crosswise against the plane of the tape which is held taut, the advantage of the sharp blade thus being fully utilized to minimize the force conventionally required for "tearing off" the tape. With the cutter of this invention, previously mentioned difficulties such as stretch of the tape or fray therein which were heretofore experienced can perfectly be precluded. The cutter of the present invention has further advantages that, in spite of the provision of sharp blades, it is safe to use since the blades are so disposed as to face inwardly toward each other. In case where the razor blade is used as the cutting blade, it can be readily replaced at home, offices or at whatever places the cutter may be used; a distinguished advantage of the invention.

While the foregoing description is made with respect to embodiments to be mounted on a tape roll, the cutter of the present invention may be fixed to a base and a roll of tape to be cut off is also mounted on the same base rotatably.

FIGS. 7 to 10 illustrate a cutting device of this type which is intended for use with a self-bonding adhesive tape having a coating of self-bonding adhesive on one side of a backing such as paper, cloth, resin film or the like.

An adhesive of self-bonding type is already known which is made by emulsifying a synthetic resin into a natural rubber latex and which forms a self-supporting film on a sheet material when it is applied thereto and dried, the coating having no adhesive property with other materials but being capable of bonding to itself when stuck together.

The principle of the cutting device will be described with reference to FIG. 7. Designated at B is a roll of self-bonding tape rotatably supported on a base 21 by a holder 22. A tape A unwound from the tape roll B is passed over a guide roller 23 and led into a slit 26 in a guide 25. The slit 26 is formed in laterally elongated shape and has a size to permit the passage of the tape folded longitudinally into two with the adhesive side A_1 out. To facilitate folding in this form a projection 24 is provided at the longitudinally middle portion of the roller 23 on its outer side surface. The tape thus folded is further passed through the slit 26, led to a cutter 27 of the invention and cut off into a desired length.

FIGS. 8 to 10 illustrate a preferred embodiment of the cutting device of the above-mentioned type. Designated at 21 is a base and at 22, a holder projecting from the base 21 for supporting a roll of tape in rotatable manner. The holder 22 comprises two circular arc plates 28, 29 formed on the base 21 and facing each other, the plate 28 being provided with a plate spring 30, the other plate 29 being formed with a projecting edge 31 for preventing the tape roll B from disengagement. By fitting the tape roll B around the plates 28, 29 against the action of the plate spring 30, the tape roll is mounted on the holder 22 and adapted for frictional rotation in response to the unwinding of the tape. Since the tape roll is pressed against the outer side of the plate 29 all the time under the action of the plate spring 30, the roll is retained by the projecting edge 31 against disengagement. The structure of the tape holder is not limited to that illustrated in the drawings, but some other structure may also be employed. In place of the plates 28, 29, for instance, another holder may be used which comprises at least one pin and a collar rotatably mounted on the pin and formed with a rugged surface which serves to prevent the removal of the tape roll on the holder.

The base 21 is further provided with a guide roller 23 for guiding the tape unwound from the tape roll. The guide roller 23 also serves as a pivot for rotatably supporting a guide 25 and a cutter 27 on the base 21. This arrangement is illustrated in detail in FIG. 10, in which it will be seen that the cutter 27 has a support plate 32 extending backward. The support plate 32 carries the guide 25 fixed thereto by screws and formed with a slit 26. At a position behind the guide 25, the support plate 32 is further provided with a downwardly stamped-out projection 33 for limiting the pivotal movement of the support plate 32. At the rear end, the support plate 32 is pivotally mounted on a pin 35 of the guide roller 23 and the projection 33 is received in a slit 34 formed in the base 21 so as to limit the pivotal movement of the support plate 32. The guide 25 and the cutter 27, being pivotally mounted on the base 21 in the above-described manner, are adapted to be moved in whatever direction the tape may be pulled when it is cut off, a reliable cutting off operation thereby being insured.

The guide roller 23 consists of the pin 35 and a collar 36 free to rotate thereon, serving to guide the tape unwound from the tape roll B to the guide 25 which is formed with a laterally elongated slit 26. In order to make it easier to fold the tape into two, the collar 36 is formed with a projection 24, at its longitudinally middle portion on the side surface. As apparent in FIG. 7, the tape passed over the guide roller 23 is drawn out through the slit 26 while being longitudinally folded by the slit 26 into two with the adhesive side A_1 out. To effect continuous folding, the leader end of the tape is at first folded into two with the adhesive side A_1 out and passed through the slit 26. The folded tape will thereafter be obtained automatically simply by drawing it out through the slit 26. The guide 25 may be provided, below the slit 26, with a resilient member 37 such as bellows or plate spring so that a new leader end of the tape, after the preceding portion has been cut off, may be brought to the predetermined position which permits the user to draw out the tape with ease. Furthermore, instead of a slit 26, two or more slits which vary in length may be provided for use with tapes of various widths.

As to how the cutter is to be mounted in this cutting device, any one of the foregoing embodiments shown in FIGS. 1 to 3 may be employed. Preferably the cutting blade may be formed in circular arc form as described below. In the illustrated embodiment of the cutting device, a cutter 27 substantially the same as one shown in FIG. 3 is used. The cutter 27 comprises a V-shaped support 38 formed integrally with the support plate 32 and having opposite arms 39 and cutting blades 40 fixed respectively to the arms 39 by fastening plates 41 and screws. As in the embodiment shown in FIG. 6, the cutter 27 is formed in curved shape along the circumference of a circle having its center on the lower edge of the slit 26. Accordingly, when the tape drawn out through the slit 26 in folded state is passed between the cutting blades 40 at the upper portion and moved pivotally downward, it can be cut off progressively from the opposite edges of the tape. It will readily be understood that the cutting operation thus effected has various advantages as already described.

The cutoff piece of the tape, being folded into two with the adhesive side out, can be used, for instance, as a band for papers or banknotes since the overlapping portions at the opposite ends can be easily bonded together simply by pressing them together with the finger. With the self-bonding adhesive tape bands cut off in desired length and folded in the above-mentioned manner, the troubles conventionally encountered with a tape of water-soluble adhesive coating can be precluded to effect a highly efficient binding operation. Furthermore, in case where the tape cut off by this device is to be used in fastening vegetables, flowers, vines or stems of trees and other plants to supporting stakes, the tape is wound around the holding portions and the overlapping ends are pressed together by the finger to effect bonding between the external adhesive faces. Thus, the above-mentioned work can be carried out with extremely high efficiency.

The cutter described above is a portable type. As shown in FIG. 8, band attaching portions 42 are provided, to which, when desired, a band is attached. To carry the cutter, the band is fitted around the wrist and a grip 43 at the forward end of the base 21 is grasped by the hand. The cutter of the present invention thus constructed achieves a remarkable improvement of efficiency in a wide variety of uses in which the advantages of the self-bonding adhesive tape can be utilized.

What we claim is:

1. A tape cutter comprising a support and a pair of blades fixed to said support with the cutting edges facing each other, said blades being spaced apart by a distance to permit the passage of a tape at their upper ends and brought closer toward each other downward into contact with each other at their lower ends, wherein said cutter is provided with a guide for supporting an unwound portion of the tape at a desired position so as to allow the unwound tape to be moved pivotally downward on the supporting portion and said blades are bent along a circle having its center at the supporting portion on said guide.

2. The tape cutter for cutting off a self-bonding adhesive tape as claimed in claim 1 wherein said guide is provided with a slit for guiding the self-bonding tape while folding it longitudinally into two with the adhesive side out.

* * * * *