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AUTOMATIC TAPE DISPENSER

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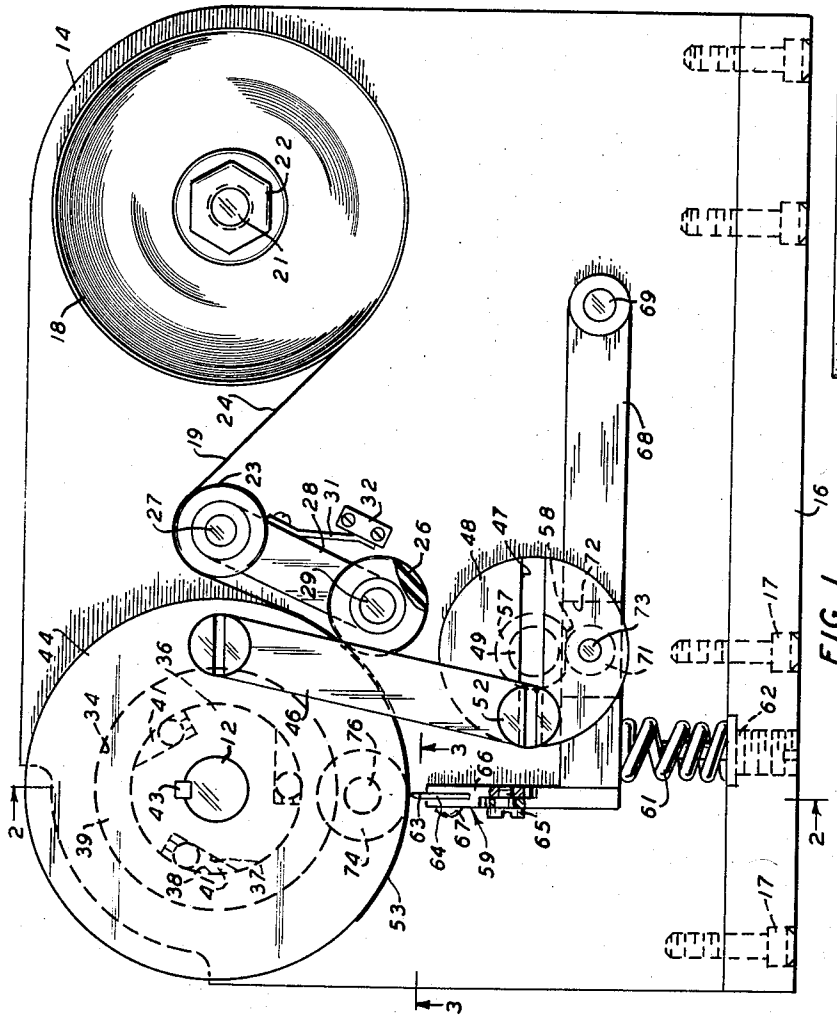


FIG. 1

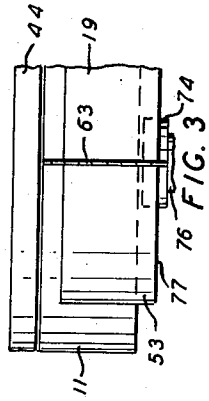


FIG. 3

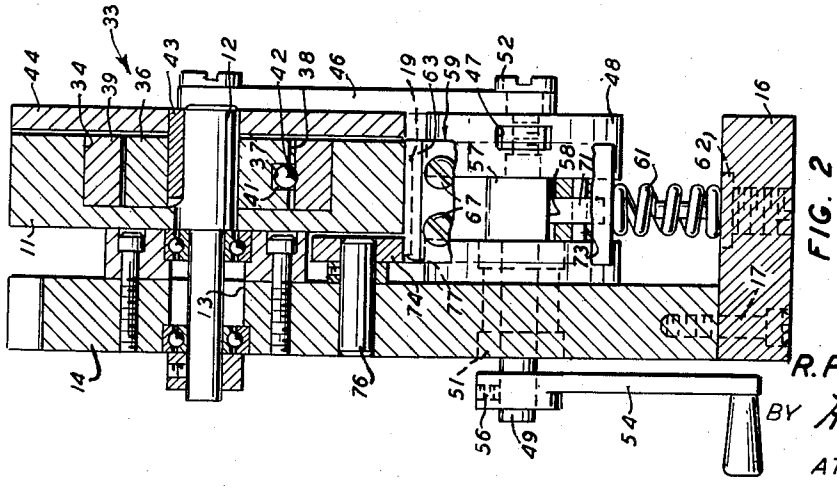


FIG. 2

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AUTOMATIC TAPE DISPENSER

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9 Claims. (Cl. 164—42)

The present invention relates to an improvement in apparatus for dispensing tape and particularly to an automatic tape dispenser which is adapted to dispense an adhesive surfaced tape which has previously been cut into sections of the same predetermined length.

The apparatus serves measured lengths of strips of tape covered with an impregnated or pressure sensitive adhesive to an operator. The tape may be of the character which is made of paper, cellophane, cloth, foil or the like, treated or covered on one or both sides with the adhesive.

In the past, tape dispensers have been provided with wheels for the reception of the tacking or pressure sensitive side of the tape and having peripheral recesses on said wheel to facilitate removal of predetermined lengths of tape. Some tape dispensers are provided with peripheral recess for the reception of a cutting knife blade.

Certain devices have been employed in which the mechanism facilitates manual uncoiling of a roll of tape and tearing off a length of tape therefrom. However, during the use of such mechanisms, an operator usually pulls out too great a length whereby a large amount of tape is wasted or the operator may tear off too short a length of tape from a roller for the purpose desired, thereby necessitating tearing off a second strip with a waste of time and material. The present invention is aimed to obliviate these and certain other disadvantages of the prior practices.

One object of the present invention is to provide a tape dispenser and cutter which is adapted to pull an adhesive surface tape from a supply roller and deliver the same into small predetermined lengths.

Another object of the invention is to provide a tape dispenser of the type referred to in which the adhesive of the tape is utilized to support the same during the cutting and delivery operations.

A further object is to provide a tape dispenser of the type described wherein by the use of a single operating means a tape is properly fed by an anvil roller past a cutting knife and the knife is actuated at a time when the tape and anvil roller are at a standstill.

A still further object is to provide a tape dispenser of the type described in which the knife is pivotally mounted and spring-actuated, and the spring is placed under compression by the tape feeding member.

Another object is to provide a tape dispenser which can be actuated by one hand thus leaving the other hand for the removal of the cut tape from a roller of the dispenser whereby the speed at which the delivery can be actuated is limited only by the speed with which the operator can remove the cut tape therefrom.

A further object is to provide a tape dispenser which is driven by a motor which may be energized by means of a foot switch thereby enabling an operator to utilize both hands in the removal of the cut tape.

Another object is to provide a tape dispenser in which the tape is supported and held on a dispenser roller of the dispenser by the adhesive film on the tape and laterally projecting from the side of the roller to permit the operator to pick the pieces of cut tape off from the roller.

Another object is to provide a small auxiliary anvil roller to support the portion of the tape which projects from the dispenser roller during the cutting operation.

Still another object is to provide a tape dispenser and cutter of the type described which is simple in construction, efficient and rapid in operation, as well as cheap in manufacture.

The tape dispenser according to the invention comprises a dispenser roller having smooth circumferential surface thereon, a tape cutting blade, drive means to effect a cooperative rotation of the dispenser roller and actuation of the tape cutting blade, a small anvil roller adjacent the dispenser roller and positioned so that lines of tangency along the surfaces of the two rollers form a support against which the blade will strike during the cutting operation.

Other objects and features of the invention will be more readily understood from the following detailed description when read in conjunction with the accompanying drawings in which:

Fig. 1 is a fragmental side elevation view of a tape dispenser of one embodiment of the invention;

Fig. 2 is a vertical cross section of the tape dispenser taken substantially on line 2—2 of Fig. 1, and

Fig. 3 is a bottom view of a portion of the tape dispenser, the view being taken substantially on line 3—3 of Fig. 1.

Referring now to the drawings wherein like reference numerals designate corresponding parts throughout the several views, the tape dispenser comprises a dispensing or anvil roller **11** having a smooth periphery thereon axially apertured to receive a shaft or pin **12** on which it is rotatably mounted. The shaft **12** is mounted in an aperture **13** in a plate **14** extending upwardly from a base **16** and rigidly secured thereto by bolt means **17** or any other appropriate means. The plate **14** also supports a supply reel **18** of adhesive tape **19**. The adhesive tape **19** is adapted to be fed from the supply reel **18**, secured to a shaft **21** by a nut **22**, over an idler or guide roller **23** and on to a cylindrical periphery of the dispensing or anvil roller **11** with the adhesive side **24** of the tape **19** delivered inwardly in the engagement with the cylindrical surface of the anvil roller **11** thus causing the tape **19** to adhere to and laterally project from one side of the anvil roller **11** which is aided by the use of a pressure roller **26** pivotally secured to a dowel pin **27**, supporting the idler roller **23**, through an arm **28**. The pressure roller **26** which is rotatably secured to the arm **28** by a dowel pin **29** is biased toward the dispensing roller **11** by means of a leaf spring **31** in juxtaposition with a stop member **32** secured to the plate **14**. The dispensing roller **11** is adapted to be rotated in a step by step motion and is provided with a conventional ratchet clutch element designated generally by the numeral **33**, which is rigidly secured by being in press fit in a cylindrical depression **34** in the anvil roller **11**. The clutch element **33** is formed of an inner cylindrical member **36** which is provided with peripheral triangular notch surfaces **37** which cooperate with the inner surface **38** of an outer race member **39** to form a wedge shape recess **41** in each of which are mounted spring biased spherical members **42**. The inner cylindrical member **36** of the clutch member **33** is oscillatable about the axis of the shaft **12** and is rigidly secured to the shaft **12** by a key **43**. A cover plate **44** is secured to the shaft **12** by the same key **43** and is moved by a pitman **46** pivotally secured adjacent the outer periphery thereof. The opposing end of the pitman **46** is adjustably secured in a transverse slot **47** in a cylindrical member **48** which is rigidly secured to one end of a shaft **49** mounted in an aperture **51** in the

plate member **14**. The pitman **46** may be adjusted by the use of bolt means **52** to any desired position with respect to the center of the cylindrical member **48** to adjust the effective length of the crank arm formed thereby and which, in turn, determines the length of the pieces of tape **53** to be cut. On the opposing end of the shaft **49** is a handle or crank **54** adjustably secured thereto by a set screw **56**. Intermediate the end of the shaft **49** and integral therewith is a cam member **57**. The cam member **57** is cylindrical and has a flat surface **58** on one side thereof but may be any desired shape. The cam member **57** is utilized to hold the cutting knife, designated generally by numeral **59**, away from the anvil roller **11** except at such times as it is desired to cut the tape **19**. The flat surface **58** of the cam member **57** is so positioned with respect to the end pitman **46** that as the cylindrical member **48** is rotated, which is always in a clockwise direction, as viewed in Fig. 1, the knife **59** will be actuated as the pitman **46** is in its upward motion and the ratchet clutch **33** is disengaged, thus, the anvil roller **11** and the tape **19** are at a standstill.

It will be seen from the description thus far, that under the control of the operator, the handle **54** may be rotated to oscillate the clutch member **33** and rotate the anvil roller **11** a predetermined arc to feed a predetermined length of tape **19** to be cut, during the return movement of the clutch member **33**, while the anvil roller **11** is held stationary due to the pressure thereon by the pressure roller **26**. After each increment of feeding movement of the anvil roller **11** the adhesive tape **19** thereon is severed at a point in a predetermined annular relation to the axis of the anvil roller **11** by the radial movement of the knife **59**. The knife **59** is actuated by a spiral spring **61**, positioned on an adjustable member **62** projected upwardly from the base member **16**, in response to the movement of the cam member **57**. The adjusting member is used to provide a greater or less amount of compression in the spring **61** to control the pressure of the knife **59** against the anvil roller **11**. The knife **59** in the embodiment illustrated herein comprises a razor blade **63** disposed in a recess **64** in a removable clamp member **66** and is clamped in position therein by a pair of screws **67—67**. The cutting edge of the knife blade **63** is maintained in parallel alignment with the surface of the dispensing or anvil roller **11** as a result of the clamping member **66** being pivotally mounted on a screw **65**. The clamp member **66** is secured to one end of an arm **68**, the opposing end of which is pivotally mounted to the plate member **14** by a shaft **69**. Immediate the ends of the arm **68** is a rotatable cam follower **71** secured in a longitudinal slot **72** in the arm **68** and on a pin **73** passing therethrough.

A small auxiliary anvil roller **74** in juxtaposition with the large anvil roller **11** is rotatably secured to the plate member **14** by a shaft **76** and is provided to support a section of the portion of the tape **19** which extends beyond the large anvil roller **11** at the section where the knife blade **63** strikes the tape **19** to cut the same. Due to the differential in diameters of the two anvil rollers, **11** and **74**, as the large roller **11** rotates to carry the tape **19** to the upper lefthand portion of the dispenser as viewed in Fig. 1, the tape **19** will be moved away from the auxiliary roller **74**. An immovable auxiliary anvil could be utilized but, since the tape **19** has adhesive on one side **24** thereof which contacts the surface of the anvil it is desirable to have a movable surface supporting the tape **19** so that there is no frictional force therebetween.

In operation the adhesive or pressure sensitive tape **19** is withdrawn from the supply reel **18** by the large anvil roller **11** as it is indexed. The adhesive side **24** of the tape **19** is applied in detachable adhering relationship to the anvil roller **11** by means of the pressure roller **26**. The tape **19** is of such a width and is so applied to the anvil roller **11** that one edge **77** of the tape **19** projects laterally beyond the surface of the large anvil roller **11** which is adjacent the auxiliary anvil roller **74**. The tape **19** does not tend to adhere to the auxiliary anvil roller **74** due to the much smaller diameter thereof, which is theoretically only in a straight line contact with the tape **19** and because no pressure is exerted by roller **26** against the roller **74**. After the movement of the large anvil roller **11** has been completed in any one cycle, the tape cutting blade **63** oscillates and cuts through the tape **19** to contact both the anvil rollers **11** and **74** and then returns to a lower unoperated position. This leaves a predetermined length of tape **53** adhering to the main anvil roller **11** with one edge **77** of the tape **19** projecting beyond the edge of the anvil roller **11**. This position of the tape permits the operator to grasp the free corner of the tape **19** and strip the tape from the anvil roller **11**.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A tape dispenser which comprises an anvil roller, a pivotally mounted tape cutting blade, drive means adapted to effect a cooperating rotation of the anvil roller and oscillation of the tape cutting blade, a small auxiliary roller in juxtaposition with said anvil roller and so positioned that peripheral portions of said rollers form a substantially continuous straight line which is engaged by the tape cutting blade during a tape cutting operation.

2. In a tape dispenser for cutting and dispensing preselected lengths of tape having adhesive surfaces on at least one side thereof, a support, means to rotatably attach a supply of said tape to said support, a dispenser roller having an outer circumferential surface onto which the adhesive surface of the tape will detachably adhere, means for directing tape towards said dispenser roller so that the adhesive surface thereof is pressed onto said dispenser roller with one edge thereof projecting from one edge of said roller, an anvil roller rotatably secured to said support in juxtaposition with and having a smaller diameter than said dispenser roller, said anvil roller being so positioned that peripheral portions of said rollers form a substantially continuous straight line, the axis of rotation of said anvil roller being parallel to and spaced from the axis of rotation of said dispenser roller a distance equal to the difference in the lengths of the radii of said rollers, clutch means operatively connected to said dispenser roller and including an oscillatable member for intermittently rotating said dispenser roller in one direction through a predetermined arc, a manually movable handle means actuatable to advance the surface of said dispenser roller, a cutting member mounted adjacent said rollers, means operably connecting said dispenser roller to said cutting member to move said cutting member across the path of the tape to contact the anvil roller and the dispenser roller along said straight line and to cut the tape in predetermined lengths in timed relationship to the rotation of said dispenser roller, and means for causing said cutter to intermittently sever said tape while the latter is at rest in response to the movement of said handle and to return said cutter to an unoperated position to permit further movement of said tape.

3. In a tape dispenser for cutting and dispensing preselected lengths of tape having adhesive surface on at least one side thereof, a support, means to rotatably attach a supply of said tape to said support, a dispenser roller onto which the adhesive surface of the tape will detachably adhere, an anvil roller rotatably secured to said support in juxtaposition with and having a smaller diameter than said dispenser roller, said anvil roller being so positioned that peripheral portions of said rollers form a substantially continuous straight line, means for directing the tape toward said dispenser roller so that the adhesive surface thereof is pressed onto said dispenser roller

with one edge of the tape projecting from an edge of said dispenser roller and tangential to said anvil roller, clutch means operatively connected to said dispenser roller and including an oscillatable member for intermittently rotating said dispenser roller in one direction through a predetermined arc, means to advance the surface of said dispenser roller, and a cutting member operably connected to said dispenser roller and having a cutting edge adapted to move across the path of the tape to contact the anvil roller and the dispenser roller along said straight line and to cut the tape in predetermined lengths in timed relationship to the rotation of said dispenser roller.

4. In a tape dispenser for cutting and dispensing preselected lengths of tape having adhesive surface on at least one side thereof, a support, means to rotatably attach a supply of said tape to said support, a dispenser roller having an outer circumferential surface onto which the adhesive surface of the tape will detachably adhere, an anvil roller rotatably secured to said support in juxtaposition with and having a smaller diameter than said dispenser roller, said anvil roller being so positioned that peripheral portions of said rollers form a substantially straight line, the axis of rotation of said anvil roller being parallel to and spaced from the axis of rotation of said dispenser roller a distance equal to the difference in the lengths of the radii of said rollers, means operatively connected to said dispenser roller for intermittently rotating said dispenser roller in one direction through a predetermined arc, a cutting member having a cutting edge adapted to move across the path of the tape to contact the anvil roller and the dispenser roller along said straight line, and means for causing said cutter to intermittently sever said tape while said dispenser roller is at rest.

5. A tape dispenser comprising means for rotatably supporting a supply of tape, a cutting member, a rotatable dispensing roller for pulling said tape in a strip form from said supply reel and adapted to carry said tape in strip form past said cutting member where it is cut into short predetermined lengths, said dispensing roller being adapted to deliver said short lengths of tape to a position for removal from said dispenser roller, means for directing said tape toward said dispenser roller so that the adhesive surface thereof is pressed onto and in detachable adhesive contact with said dispenser roller and a portion of said tape projects from one edge of said dispenser roller, an anvil roller in juxtaposition with and of a smaller diameter than said dispenser roller to support the projecting portion of said tape, said anvil roller being so positioned that peripheral portions of said rollers form a substantially straight line, means for intermittently advancing said dispenser roller whereby the tape supported thereby is fed past said straight line, and means operably connected to the dispenser roller for intermittently operating said cutting member along said straight line whereby the cutting member is adapted to cut the tape in timed relationship with the operation of said dispenser roller.

6. A tape dispenser comprising a frame, a tape feeding supply removably mounted on said frame, a plurality of anvil rollers mounted on said frame and provided with outer circumferential surfaces, one of said anvil rollers having a smaller diameter than the other and so positioned that peripheral portions of two of said rollers form a substantially straight line, an oscillatable drive member to impart unidirectional rotation to the larger of said anvil rollers, a cutting blade removably mounted on a second oscillatable member, and means to move said cutting blade intermittently across the path of said tape and in contact with said anvil rollers along said straight line to sever the tape in timed relationship with the movement of said larger roller.

7. A tape dispenser comprising a tape supply, a dispensing roller, an anvil roller having a diameter smaller than said dispensing roller, said anvil roller being mounted with respect to said dispensing roller so that one portion of each of the peripheries of said rollers form substantially a straight line, means to feed said tape to jointly engage the peripheries of both of said rollers, and cutting means for engaging both of said rollers at the portions where their peripheries form substantially a straight line for severing the tape.

8. A tape dispenser comprising a tape supply, a dispensing roller, an anvil roller having a diameter smaller than said dispensing roller, said anvil roller being mounted with respect to said dispensing roller so that one portion of each of the peripheries of said rollers form substantially a straight line, means to feed said tape to jointly engage the peripheries of both of said rollers, means to intermittently rotate said dispensing roller to advance said tape, cutting means for engaging both of said rollers at the portions where their peripheries form substantially a straight line for severing the tape, and means for actuating said cutting means in timed relationship to the intermittent rotation of said dispensing roller.

9. A tape dispenser which comprises an anvil roller, a movable tape cutting blade, drive means for effecting a cooperating rotation of the anvil roller and movement of the tape cutting blade toward and away from said anvil roller, a small auxiliary roller in juxtaposition with said anvil roller and so positioned that peripheral portions of the anvil and auxiliary rollers form a substantially straight line which is engaged by the tape cutting blade when the blade is moved toward the anvil roller.

References Cited in the file of this patent

UNITED STATES PATENTS

2,326,917	Anderson	Aug. 17, 1943
2,384,575	Stull	Sept. 11, 1945
2,492,593	Quinlan	Dec. 27, 1949
2,540,694	Sieg	Feb. 6, 1951
2,595,060	Dixon et al.	Apr. 29, 1952