

Nov. 30, 1937.

C. J. SHIMER

2,100,652

TAPE MACHINE

Filed Feb. 19, 1934

2 Sheets-Sheet 1

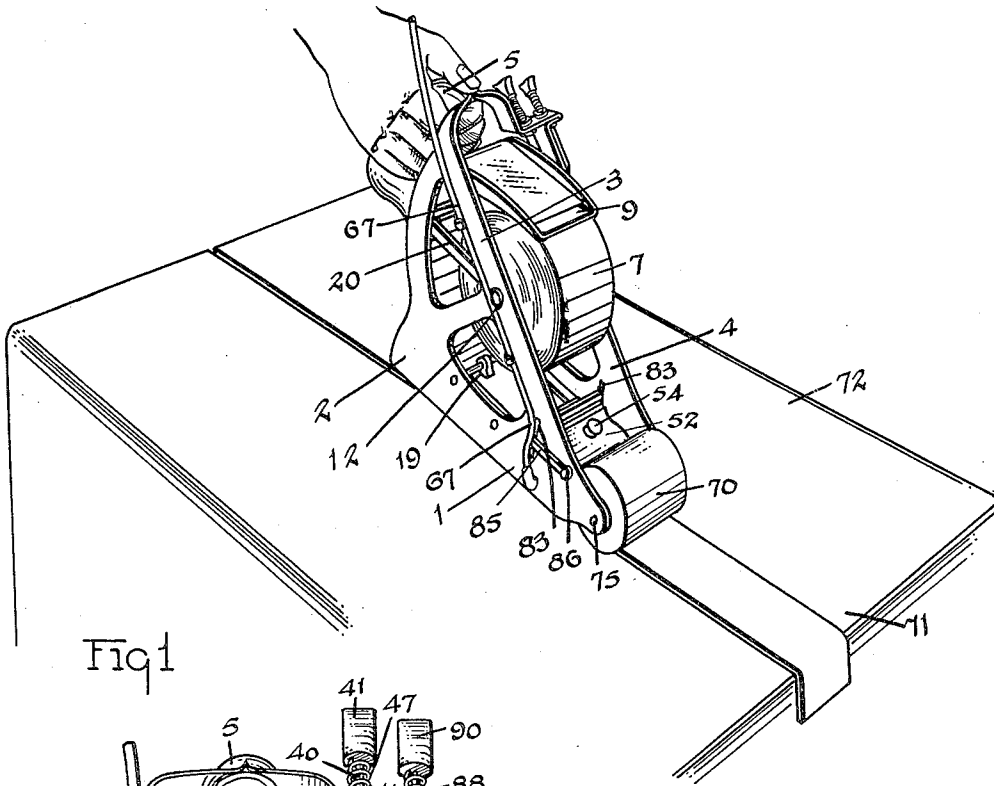


Fig 1

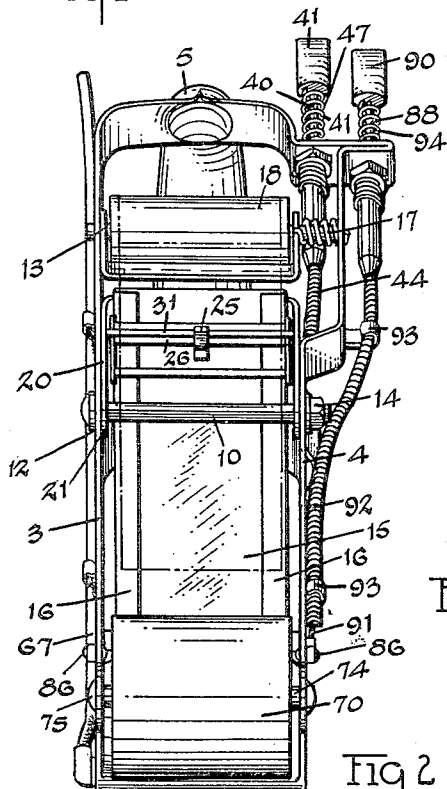


Fig 2

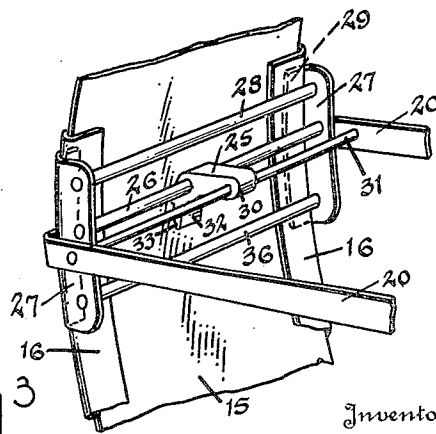


Fig 3

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2 Sheets-Sheet 2

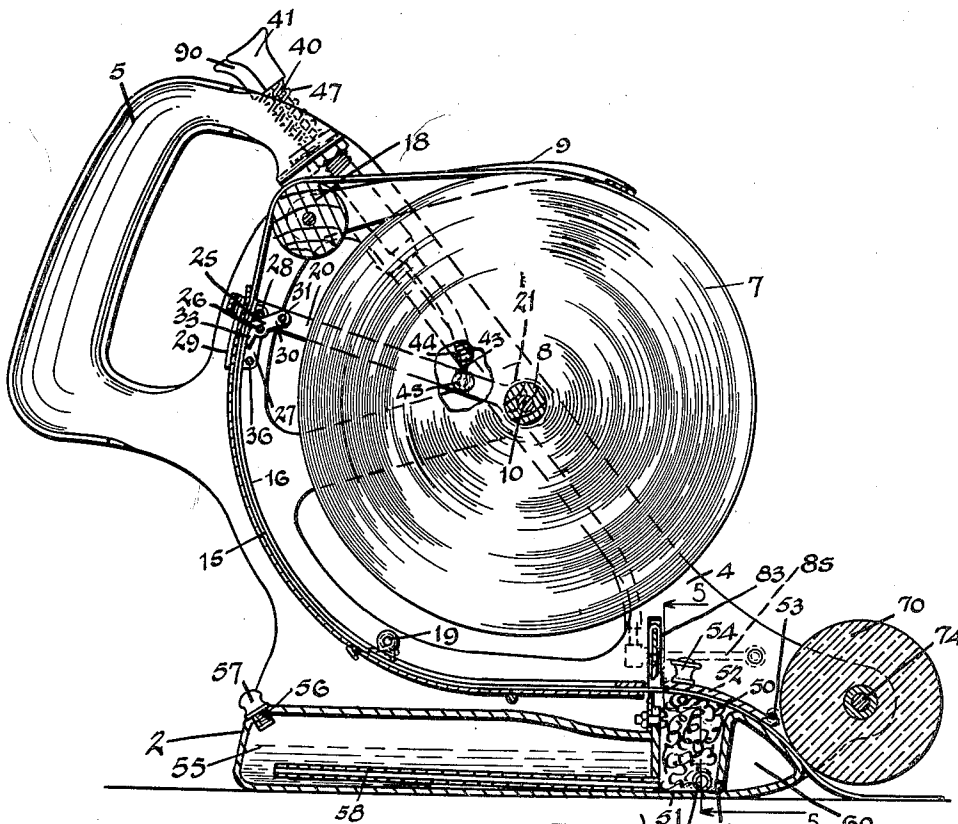


Fig. 1

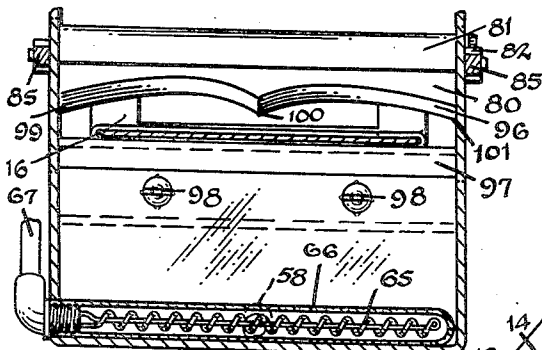


Fig. 5

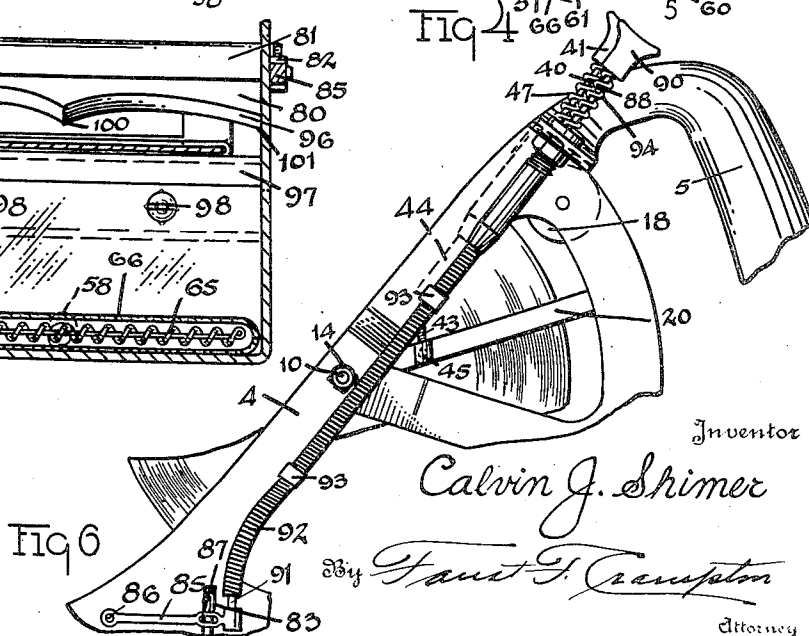


Fig. 6

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UNITED STATES PATENT OFFICE

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TAPE MACHINE

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6 Claims. (Cl. 216—23)

My invention relates to a machine for applying tape and the like to a surface, such as the surfaces of closed and abutting lids of a container or lapping sheets of wrapping paper of a package and the like, for effecting a sealing and closure of the container or package with the tape. The invention particularly relates to a machine for applying tape which machine is constructed and designed so that it may be readily manipulated by a user to effect the direct application of the tape coincidentally with the delivery thereof from the machine. The invention, therefore, provides a machine which is adapted to supply the required and substantially exact amount of tape in a condition for sealing a container or package when it is required, thereby resulting in saving of large quantities of tape in wrapping and sealing containers. The invention also provides a tape machine that may be manipulated with ease to apply the tape, thereby eliminating the usual intermediate and heretofore customary manual handling of tape between delivery of tape from a source and the affixing thereof to the surface desired, resulting in the saving of time and labor.

My invention has for an object to provide a tape machine of a self-containing, readily wieldable type whereby the machine may be manipulated by the user and moved relative to and over a surface or surfaces applying tape as it is moved and as is desired by the user. A machine partaking of the features of my invention may be grasped in the hand of the user, in the manner one would grasp a wood planer, and moved over containers or packages of varying size and shape, and around contours, corners or bends of the containers or packages, applying tape as it is moved, and only in the amounts needed, thus effecting a taping operation with greater speed and facility.

The invention has for another object to provide a tape machine having a source of supply of tape carried in a wieldable housing frame, said source of supply of tape being readily replenishable from time to time as needed. Another object of the invention is to provide a tape machine having means for severing the tape and operable from a position of convenience to and at the will of the user. It will be apparent that my tape machine in its application to the work of taping containers or packages eliminates the heretofore necessary practice of measuring the longitudinal dimension of the surface to which tape was to be applied as a preliminary to withdrawing the tape from a machine. In using a machine of my invention, the machine is moved over the surface until the surface has been covered by the tape to the extent required or desired, and the tape being then cut by the cutting means provided.

Another object of the invention is to provide a tape machine having means for projecting a

portion of the tape to a point on the surface to which application of tape is to be made, said means being operable from a position of convenience to and at the will of the user. The tape projecting means operates to mechanically "thread" the machine with tape after it has become empty and also operates to project a quantity of tape toward a position of application after the tape has been cut, as by the cutting means provided. A taping operation may thus be completed and another one immediately started with my tape machine. A still further object of my invention is to provide a tape machine having means operative preliminary to delivery of the tape from the machine for preparing the tape with an adhesive, if the tape is not so furnished, or for rendering the adhesive sticky and cementitious, if the tape is already prepared with adhesive material.

The invention consists in other features and advantages which will appear from the following description, and upon examination of the drawings. Structures containing the invention may partake of different forms and may be varied in their detail and still embody the invention. To illustrate a practical application of the invention, I have selected a tape machine embodying the invention as an example of the various structures and details thereof that contain the invention, and shall describe the selected structure hereinafter, it being understood that variations may be made without departing from the spirit of the invention. The particular structure selected is shown in the accompanying drawings.

Fig. 1 illustrates a view in perspective of the tape machine chosen for purpose of illustration and shows the machine in a position of practice. Fig. 2 illustrates an end view of the machine shown in Fig. 1. Fig. 3 illustrates a view in perspective of the tape projecting means. Fig. 4 illustrates a view of a longitudinal section of the tape machine. Fig. 5 illustrates an enlarged view of a section taken along the plane of the line 5—5 indicated in Fig. 4. Fig. 6 illustrates a view of the control means for operating the parts of the taping machine.

A tape machine embodying the spirit of my invention has a frame having a base portion from each side of which project upstanding parallel side plate portions. Connected to and joining the side plate portions is a handle which may be readily grasped by the hand of a user. The parts of the frame and machine are preferably disposed so as to locate the center of mass of the machine at a point slightly forward of the handle, thereby giving balance and easy wieldability to the machine.

The upstanding side plate portions support a supply of tape which may be in the form of a

wound reel or spool of tape. The tape is fed from the spool through a slide or guiding trough supported between the side plate portions of the frame to a position of operative application of tape. Means for controllably and forcibly feeding the tape through the trough comprises a lever mounted for angular movements on the frame and having means for engaging the tape when moved in one direction to draw the tape through the trough and project the tape in advance of the point of engagement to a position beyond the trough. The movement of the lever is effected by a control located convenient to the thumb or finger of the user's hand that grasps the handle.

The trough directs the tape over a wick element for coating the tape with adhesive, if the tape has not been previously prepared, or for moistening the tape of an already gummed and prepared tape. In the device chosen for purposes of illustration, the use of already gummed tape is contemplated and the wick element is adapted to moisten the surface of the tape. The wick element is supplied with moisture from a reservoir which may be located in the base portion of the frame. Means is provided for limiting the quantities of moisture delivered from the reservoir to the element and for carrying off such excessive quantities of liquid from the element as may be or become present in the wick. Means is also provided for heating the wick element to increase the effectiveness of the moisture applied on the prepared surface of the tape and the resultant effectiveness of the tape.

Means for cutting the tape is supported on the frame, preferably at a position in advance of the operation of the wick element in the line of movement of the tape towards its point of delivery to prevent sticking of the tape to the cutting means. Said cutting means is operable by a push button conveniently disposed for operation to the thumb of the user's hand which grasps the handle. The cutting means has portions which in its initial action engages the tape at three points, one proximate to each edge and another in the substantial center of the tape and subsequently effects severing from the sides inwardly toward the center. A clean and sure cut is insured thereby with less tendency to chew and gnaw the tape.

Referring to the drawings and the embodiment of my invention shown therein, the machine has a frame 1 comprising a base portion 2 and upstanding side plate portions 3 and 4. The side plate portions are connected to and interjoined by a handle 5. The handle 5 is located in a position of apt accessibility to the user's hand and may be grasped to manipulate the machine and apply the tape as is hereinafter described.

A supply of tape 7, which may have been previously wound on a spool 8, may be supported for free rotatable movements on a shafting bolt 10. The bolt 10 is supported in openings, as at 12, formed in the side plate portions 3 and 4 of the frame, and be provided with a threaded nut 14 for holding the bolt and spool in position on the frame. If it is desired to substitute another spool of tape 7, the nut 14 may be removed and the bolt 10 slid from its supporting position permitting removal of the spool 8 and replacement thereof with another. A brake member 9 may be provided for yieldably preventing rotations of the spool except when tape is drawn off the spool for use as is described later herein. The brake member 9 may be pivotally mounted on the frame 1 at 13, and be biased by a suitable spring 17 to

slidably engage the spool of tape. The tape 7 is directed by a slide or trough 15 toward the point of application of the tape.

The trough 15 is preferably arcuate in form and may be mounted between the side plate portions of the frame 1. The trough has flange portions 16 which extend inwardly towards each other and serve to maintainably guide the tape 7 along the surface of the trough 15. Preferably, the tape 7 is fed to the trough 15 over an idler roller 18 mounted on the side plate portions of the frame. Thus, although an amount of tape on the spool 8 may be used, diminishing the effective diameter of the spool, the tape will be fed to the trough from a fixed point over the idler 18, preventing tearing of the tape on the edges of the trough or unthreading of the tape from the trough. If desired, a suitably biased monitor element 19 may be mounted on the frame and is adapted to resiliently bear against the tape carrying surface of the trough. The tape is adapted to be drawn between the monitor element and the trough surface, the monitor operating to keep the tape in place and on the surface of the trough.

The tape may be drawn along the trough 15 when one end of the tape has been affixed to a point on a surface to which a strip is to be applied and the machine is moved away from the point, as is contemplated in the operation of the machine. However, in order to project the tape 7 along the trough 15 and to a position where it may be applied, a feeder member 20 is provided. Preferably, the feeder member 20 is U-shaped, the legs thereof being mounted, as at 21, for angular movements within the frame. The base of the feeder member is disposed to move in a path parallel with the arc described by and behind the trough 15. A feed dog 25 is carried by the feeder member and is adapted to engage the tape, on movement of the feeder member in a direction toward the base of the frame and disengage the tape on movement of the feed member in the opposite direction. The feed dog 25 is pivotally supported by a pin 26 on a carrier 27. The carrier 27 may have flanged portions 29 adapted to slidably engage the under side of the trough 15. The carrier 27 is provided with guide pins 28 and 36 which are adapted to ride the surfaces of the flanges 16 and guide the movement of feeding parts. The feed dog has an operating arm portion 30 which is pivotally connected by a pin 31 to the member 20. The feed dog has a foot portion 32 which may have a serrated tread surface, as at 33, and is adapted to engage the tape, when the member 20 is moved toward the base. The action of the feeding parts is in the first movements of the member 20 toward the base portion, to move the foot portion 32 of the dog toward the surface of the trough by reason of the angular movement of the dog about the pin 26 actuated through the pin 31 and arm 30. The foot portion 32 will be maintained in engaging relation with tape during the continued movement of the member 20 toward the base 2 but upon movement in the other direction will release the tape and be moved free thereof.

The member 20 is caused to move toward the base portion 2 of the frame by a plunger 40. The plunger 40 is mounted on the frame and has a push button 41 connected thereto. The push button 41 is disposed for convenient operation by the thumb or finger of the user's hand grasping the handle 5. The plunger 40 is connected to the member 20 by a flexible cable 43 which ex-

tends through a conduit 44. The conduit 44 may be suitably mounted on the frame. The cable 43 is connected to the member 20, as at 45. Upon pressing the push button 41, the member 20 will be moved downwardly toward the base portion 2, moving the tape as described.

In order to return the member 20 to its initial position whereby the feed dog 25 may reengage the tape for a subsequent movement of the tape, a spring 47 is connected to the plunger 40. The spring 47 tends to resist the movement of the plunger 40 to effect the above described downward movement of the member 20 and operates, on release of the button 41, to effect movement of the member 20 upwardly and in a direction away from the base portion 2. Thus, by repeated depressings and releasements of the button 41 a user may project a quantity of tape 7 through the trough 15.

The trough 15 directs and guides the tape to a wick element 50 which prepares the tape for application to a surface of a container or package. The element may, when unprepared or ungummed tape is used, apply a coating of cementitious material or, when a prepared or gummed tape is used, apply moisture to the gummed portion thereof. The wick element 50 is located in a compartment 51 formed in the base portion 2 of the frame and is disposed to wipingly engage the tape as it is projected over the wick element from the end of the trough 15. A plate 52 may be hingedly connected to the frame, as at 53, for holding and guiding the tape against and over the wick element 50. The plate 52 may also be used as an entry into the compartment 51 and is accordingly provided with a handle 54 for facilitating opening.

The wick element 50 is supplied with liquid from a reservoir 55 formed in the base portion 2 of the frame. The reservoir 55 has an opening 56 through which liquid may be introduced. The opening 56 is preferably provided with a threaded closure plug 57. The reservoir 55 communicates with the compartment 51, and the wick element 50 located therein, through a stem 58. The stem 58 extends from the compartment 51 well into the reservoir 55 so that when the machine is tipped forward, as in the position of use illustrated in Fig. 1, the end of the stem in the reservoir will project above the level of the liquid in the reservoir when tipped, thereby preventing further inflow of liquid from the reservoir into the compartment 51. The amount of liquid delivered to the compartment and wick 50 is thus limited and confined to prevent overload and over saturation. In order to carry off such excessive quantities of liquid as may be present in the compartment and to enable the later use thereof, an intermediate reservoir 60 is provided. The intermediate reservoir is formed in the base portion 2 of the frame and communicates with the compartment 50 through an opening or slit 61 located proximate to the bottom of the compartment 50. When the machine is tipped for use in a position as described, the excess liquids present in the compartment 50 will drain through the slit 61 into the intermediate reservoir 60, where they will be retained pending the complete operation of the machine and return thereof to normal horizontal position of rest.

If desired, a heating element 65 may be located in the compartment 50 and operates to heat the wick 50 and the liquid contained therein, thus, increasing the effectiveness and workability of the liquid on the tape. The heating element 65

may be enclosed in a suitable housing 66, removably secured by threading in the walls of the compartment 50. The heating element may be supplied with current from a suitable source of electricity through the extension cable 67.

The tape 7 is guided by the plate 52 over the wick element and the exterior wall of the intermediate reservoir 60 to a position proximate to a tape applying or affixing roller 70. The roller 70 is preferably formed of soft rubber and is adapted to make rolling contact with the tape thereby pressing it against and affixing it to a surface, such as the surface 71 of the container 72 illustrated in Fig. 1. The roller 70 is mounted for free rotation on a shaft 74 which may be journaled in the frame 1, as at 75. The shaft 74 is so located on the frame 1 that the surface of the roller 70 is tangential to a horizontal plane above the horizontal plane of the bottom of the base portion 2 of the frame when the machine is at rest. It is apparent therefore, that in order to bring the surface of the roller 70 against the surface of the container 72, the operator must tip the machine towards the roller thereby apportioning on the roller surface the entire weight of the machine, as well as the downward pressure exerted by the operator's hand. The pressure exerted through the surface of the roller effects increased adhesion of the tape to the surface. By locating the roller 70 in the described position, not only will the tape be sealed more efficiently, but also the machine may be more easily manipulated around the corners and bends of the containers to apply tape around such corners and bends.

In order to sever the tape 7, as when a sealing operation has been completed and it is desired to apply tape elsewhere, a guillotine blade 80 is provided and is operable to cut the tape as is desired or required. The blade 80 is mounted in a channel piece 81 having ear portions 82 extending from each end thereof. The ear portions 82 are slidably reciprocable in slots 83 formed in the side plate portions of the frame. Each ear portion is connected by a slot and pin connection 87 to a line 85, each of which is mounted for angular movements on the frame by a suitable pin 86. The blade 80 is caused to reciprocate by a plunger 88 mounted on the frame, as at 89, in convenient proximity to the handle 5. The plunger 88 has a push button 90 that may be easily depressed by the thumb of the hand of the user in which the handle is grasped.

One of the links 85 is connected to the plunger 88 by a flexible cable 91 which extends through a conduit 92. The conduit 92 may be mounted on the frame and held in position by bent over tab portions 93. A spring 94 is connected to the plunger 88 and tends to resist movement thereof in a direction to lower the blade 80 and operates upon release of the button 90 to return the plunger and blade to its initial position. Thus, the user may by manipulating the button 90, sever the tape and immediately thereafter, by manipulating the button 41 project a quantity of tape into position for a subsequent engagement with the roller preliminary to starting another taping operation.

The blade 80 preferably has a sharpened cutting edge 96 which is adapted to shearingly engage a sharpened straight edge 97. The edge 97 is preferably located intermediate the compartment 50 and the end of the slide 15 and may be removably held in position by suitable bolts 98. The cutting edge 96 partakes generally of the

form of an archer's bow having extending points 99, 100, and 101. The points 99, 100, and 101 engage, at the start of the cutting action, points on the side edges and center of the tape, that may be located across the edge 97, at one and the same time. The tape is thus locked as against further movement relative to the edge 97. The edge 96 between the point 99 and the point 100 is arcuately formed having a gradually decreasing radius as the edge approaches the point 100. The edge between the point 101 and the point 100 is of a corresponding arcuate form having a decreasing radius as the edge approaches the point 100. The cutting action of the blade 80 will thus be to first spot and lock the tape by engagement therewith of the points 99, 100, and 101. Then the tape is sheared from the point 99 along the cutting edge intermediate thereto and the point 100 and from the point 101 along the cutting edge intermediate thereto and the point 100, the two outer portions of the tape being cut inwardly towards portions of the tape located on either side of the center point 100. By so severing the tape, especially when gummed tape is used, binding and chewing of the tape is prevented and a clean cut is obtained.

In operation, the lids or flaps of the particular container or package to be operated on are located in close abutment or overlapping relation and the tape machine is grasped in the hand of the user. The button 41 is depressed to project an end of the tape from the machine to a position under the roller 70. The user may temporarily place his free hand on the projected end to temporarily hold said end to the adjoining or overlapping surfaces of the lids or flaps. The machine is then moved by the user away and backwards from said point of initial fixing, guiding the roller 70 over the surfaces which presses the tape into sealed position, as shown in Fig. 1 of the drawings. The user may remove his hand from the tape as the machine progresses, the fixed portion of the tape serving to draw the tape from the machine. The movement of the machine may be continued over the lids or flaps until the end of the particular lid or flap has been reached. The roller may then be rolled around the end edges of the flaps or lids to lock the same to the side walls of the container or package. The button 90 is then depressed to sever the tape and the roller continued in its movement until the severed end has been affixed to the surfaces.

I claim:

1. A tape machine having a frame, a handle connected to the frame for manual manipulation of the machine, means for rotatably mounting a spool of tape within the frame, a pressure exerting member mounted on the frame and adapted to pressingly engage tape, a controllable means operable from a point of convenience to the handle, for severing tape, and a second controllable means operable from a second point of convenience to the handle for projecting tape from said spool of tape to a position adjacent to and in pressure receiving relation to the pressure exerting member comprising a U-shaped member mounted for angular movements on the frame, a plunger connected to the U-shaped member, a push button mounted on one end of the plunger, a feed dog connected to the U-shaped member, the feed dog having a surface adapted to frictionally engage and move tape from the spool on movement of the U-shaped member.

2. A tape machine having a frame, a pressure exerting tape applying member mounted on the

frame, a handle connected to the frame for manipulating the machine, and means for supporting a supply of tape so that its center of mass is located approximately on a line between the points of connection of the handle and the tape applying member to the frame whereby the tape applying member may bear the weight of the supply of tape when the frame is moved into a tape applying position.

3. A tape machine having a frame, a tape applying member mounted on the frame and adapted to pressingly engage tape, a handle connected to the frame for manipulating the machine, and means for supporting a supply of tape so that its center of mass is located approximately on a line between the points of connection of the handle and the pressure exerting member to the frame and at a point on a line joining said points of connection whereby the frame may be manipulated to locate said tape applying member in weight bearing relation to the supply of tape when the said handle is in a convenient gripping position for manipulation.

4. A tape machine having a frame, a handle formed on the frame, means for rotatably mounting a spool of tape within the frame, a controllable means conveniently operable from the handle for projecting tape from said spool of tape, a second controllable means operable from the handle for shearing tape, a moistening element, a compartment formed in the frame for receiving said moistening element, a fluid reservoir, a stem extending into the reservoir and having a passageway connecting the reservoir with said compartment whereby measurable quantities of fluid will be conveyed from the said reservoir when the frame is moved to a tape applying position, and means located in the said compartment for raising the fluid retained therein to a desired temperature.

5. A tape machine having a frame, a handle formed on the frame, means for rotatably mounting a spool of tape within the frame, a controllable means conveniently operable from the handle for projecting tape from said spool of tape, a second controllable means operable from the handle for shearing tape, a moistening element, a compartment formed in the frame for receiving said moistening element, a liquid reservoir, a stem extending well into the reservoir and having a passageway connecting the reservoir with said compartment whereby measurable quantities of liquid will be conveyed from the said reservoir to the compartment when the frame is moved to a tape applying position, a heating element located in the said compartment for heating the moistening element whereby the reaction of the said liquor on the tape will be accelerated.

6. A tape machine having a frame, a handle formed on the frame, means for rotatably mounting a spool of tape within the frame, a controllable means conveniently operable from the handle for projecting tape from the said spool of tape, a second controllable means operable from the handle for shearing tape, a moistening element, a compartment formed in the frame for containing said moistening element, a fluid reservoir, and a stem extending into the fluid reservoir and having a passageway connecting the reservoir with the said compartment whereby measured quantities of the fluid contained in the reservoir will be conveyed to the compartment when the frame is moved to a tape applying position.

CALVIN J. SHIMER.