

Jan. 2, 1951

C. MILLER ET AL
BAG SEALER

2,536,455

Filed April 20, 1948

2 Sheets-Sheet 1

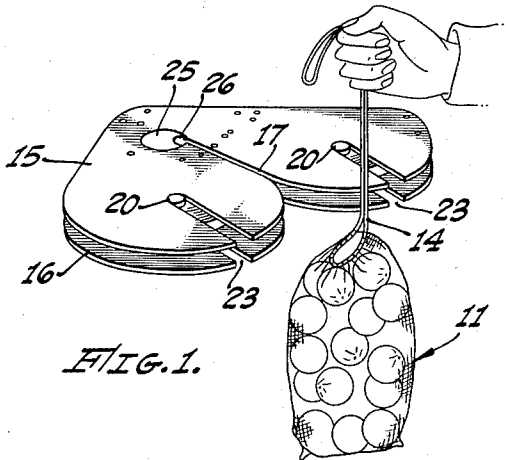


FIG. 1.

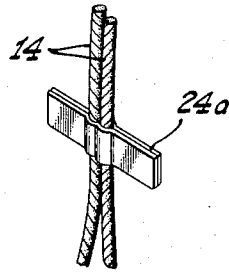


FIG. 2.

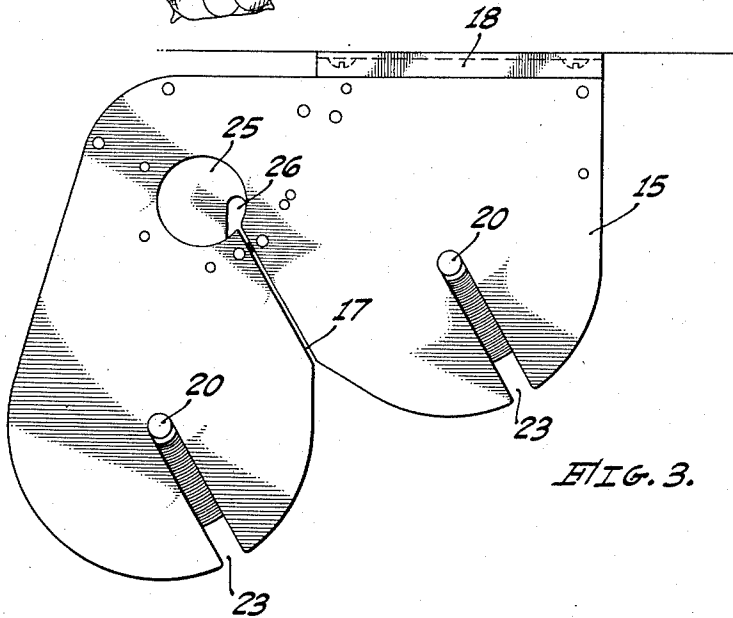


FIG. 3.

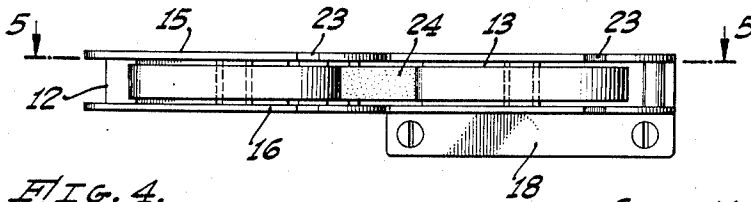


FIG. 4.

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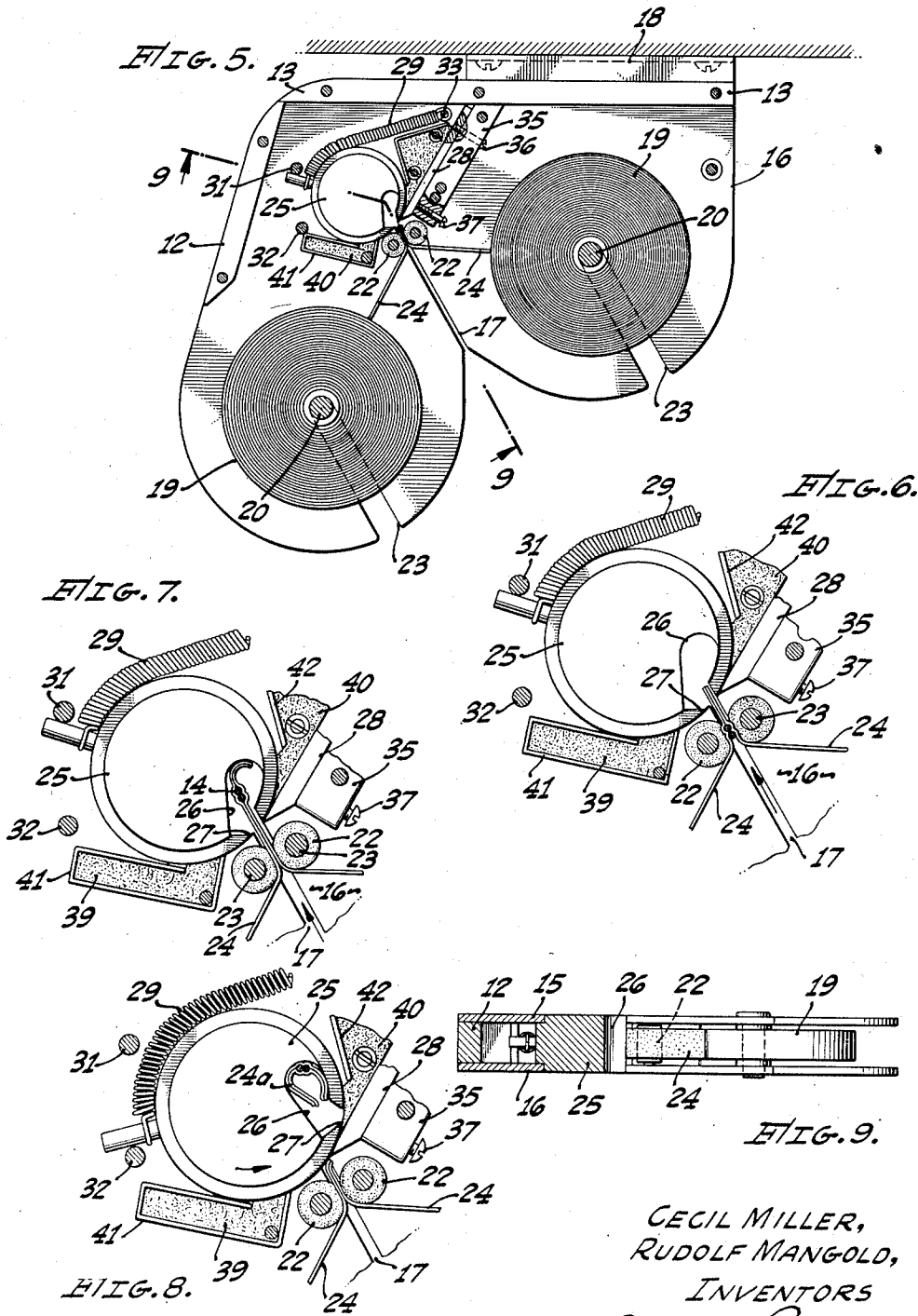
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UNITED STATES PATENT OFFICE

2,536,455

BAG SEALER

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Application April 20, 1948, Serial No. 22,185

15 Claims. (Cl. 216—22)

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The present invention relates generally to apparatus for sealing bags and other packages, and more particularly to apparatus of the class described which is adapted to secure drawstrings together, whereby to close the mouth of a sack or bag.

It is conventional practice in closing and sealing up the mouth of burlap or mesh bags to employ drawstrings which are pulled tight, closing the mouth of the bag and to thereafter tie the drawstrings together or secure them together with a wire clip in order to hold the mouth of the bag closed. In food packaging operations where many thousands of filled bags must be sealed, the time necessary to tie the drawstrings together becomes an extremely important factor.

Where wire clips are used to hold the drawstrings together, the expense of the wire and the high cost of constructing and maintaining the machinery necessary to apply the clips becomes an important factor in the cost of packaging.

With a view to eliminating the difficulties just described, it is a major object of the present invention to provide bag sealing means with which the drawstrings of a filled bag may be attached together simply and quickly whereby to hold the bag closed.

It is another object of the invention to provide apparatus for applying an inexpensive bag sealing means which apparatus is simple and inexpensive to construct and maintain.

It is still another object of the invention to provide apparatus of the class described which may be operated by merely dragging the depending drawstrings into the apparatus and then releasing the same.

It is still further an object of the invention to provide bag sealing apparatus wherein the danger of injury to operating personnel is completely eliminated.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description of apparatus embodying the invention, such consideration being given also to the attached drawings in which:

Figure 1 is a perspective view of a bag sealer, embodying the invention, showing a bag of fruit about to be sealed therewith;

Figure 2 is an enlarged view of the drawstrings of the bag shown in Figure 1 after they have been secured and sealed by the apparatus shown therein;

Figure 3 is a top plan view of the apparatus illustrated in Figure 1;

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Figure 4 is a front elevational view of the device shown in Figure 3;

Figure 5 is a plan section taken on the line 5—5 in Figure 4;

Figures 6, 7 and 8 are sequential operational views of an enlarged portion of Figure 5, showing the operation of sealing a pair of drawstrings; and

Figure 9 is an elevational section taken on the line 9—9 in Figure 5.

Briefly described, the sealing operation performed by apparatus embodying our invention consists in applying to a pair of drawstrings, two face-to-face lengths of adhesive coated tape. The two lengths of tape adhere strongly to each other and secure the drawstrings therebetween, thus preventing the same from separating and allowing the bag to open. While adhesive tape applied in the manner just described is amply strong to prevent accidental opening of a bag of fruit or other material, such sealing means may be quickly and easily removed when it is desired to open the bag.

The tape forming the seal is supplied from continuous rolls and is applied and cut off into short lengths in two closely sequential operations. Mechanical power necessary to squeeze the tape together and to cut off the short lengths is supplied by moving the drawstrings in a direction transverse to their length and through the apparatus embodying the invention.

For a more detailed description of the apparatus, reference should now be had to the drawings, particularly Figures 1 through 5. The framework of the bag sealing apparatus comprises a pair of identical, vertically spaced plates 15 and 16 secured by means of an L-shaped support bracket 18 to a convenient vertical surface. The two plates 15 and 16 are held in parallel spaced position by two rearwardly positioned spacer blocks 12 and 13 seen best in Figure 5. As can be seen in Figure 3, the parallel plates 15 and 16 are approximately heart-shaped and each have a central and inwardly extending slot 17 therein, the slots being parallel and positioned one above the other and being of sufficient width to freely admit a pair of parallel drawstrings 14.

When a filled bag (11 in Figure 1) is to be sealed, it is grasped by the drawstrings 14, and the latter are drawn into the slot 17, the upper end of the bag 11 dragging along the under surface of the lower plate 16. This operation of drawing the drawstrings through the slot 17 applies and cuts off two short lengths 24a of tape to the drawstrings as will be hereinafter described.

The sealing tape employed in the apparatus herein described is supplied from a pair of rolls 19, the tape being wound adhesive side in, on cylindrical cores or axles 20. A pair of parallel slots 23 is formed in each of the plates 15 and 16, the slots 23 being of sufficient width to receive the projecting ends of the tape axles whereby to support the tape rolls 19 for free rotation as illustrated in Figures 5 and 9.

As can be seen best in Figure 5, a pair of rubber tired pressure rollers 22 is mounted adjacent the inner end of the slot 17, one roller 22 being located on either side of the slot. The rollers are in pressure contact with each other and are mounted for free rotation by means of axles 23 which are journaled in the plates 15 and 16.

The tape is unwound from the rolls 19, a web 24 from each roll extending inwardly and passing between the pressure rollers 22. The rolls 19 are so arranged in the apparatus that as the webs 24 pass between the pressure rollers 22 the tape is placed in face-to-face relationship, that is, the adhesive surfaces of the two tapes are brought together. Thus, as a pair of vertically hanging drawstrings is passed horizontally inwardly along the slot 17, the strings encounter the tapes at the apex of the webs 24 and as the drawstrings are forcibly drawn between the pressure rollers 22 which are in tangent contact, the drawstrings 14 are squeezed together between the tapes as can be seen best in Figure 6.

A circular rotary cutter member 25 is mounted for free rotation about a vertical axis, the cutter being located just beyond the inner end of the slot 17. As can be seen best in Figure 9, the rotary cutter member 25 is of generally cylindrical shape, being shouldered at its upper and lower ends whereby to be journally supported in the plates 15 and 16. The rotary cutter 25 is formed with a peripheral recess 26 which is initially and normally positioned adjacent the inner end of the central slot 17 whereby the drawstrings 14 surrounded by the tape webs 24 may enter the recess 26 after leaving the slot 17.

The axis of rotation of the cutter member 25 is offset laterally from the slot 17 so that when the drawstrings 14 are drawn forcibly into the recess 26, as shown in Figures 7 and 8, the pressure of the drawstrings against the inner end of the recess causes the rotary cutter 25 to rotate in a counter-clockwise direction. The rotary member 25 is provided with a sharp cutting edge portion 27 adjacent the mouth of the recess 26 and in position to tangentially engage a stationary cutter blade 28 which is adjustably secured to a mounting block 35 between the two plates 15 and 16. Thus as the rotary cutting member rotates in a counter-clockwise direction as indicated in Figure 8, the shearing engagement between the rotary cutting edge 27 and the stationary cutting blade 28 cuts off a short length 24a of the tape webs 24 leaving the severed portions 24a adhering to the drawstrings 14 as indicated in Figure 2. As can be seen best in Figure 8, the ends of the web 24 remain between the pressure rollers 22 in readiness for contact by the next pair of drawstrings that are drawn into the slot 17.

As soon as the end portions 24a have been severed from the web 24, the drawstrings may be released to drop through the recess 27, the bag then being sealed.

As shown in Figures 5 through 8, a coil spring 29 anchored to a fixed screw 33 in the lower plate 16 is attached at its forward end to a radially ex-

tending pin in the rotary cutter member 25. The tension of the spring 29 serves to return the rotary cutter member 25 to its normal position, wherein the recess 26 is contiguous with the slot 17. A pair of stop pins 31 and 32 fixed in the plates 15 and 16 serve to limit the rotary motion of the cutter member 25.

As was previously stated, the stationary cutter blade 28 is adjustably secured to a mounting block 35, which block is in turn secured between the plates 15 and 16. Adjustment of the stationary blade 28 is accomplished by virtue of the fact that its rearward end is secured to the block by a screw 36 threaded into the blade 28, while the forward end may be bent inwardly somewhat toward the rotary cutter 25 by means of an adjustment screw 37. Thus, by manipulating the forward adjustment screw 37 which is threaded into the block 35, the forward end of the blade 28 may be held in operational contact with the rotary cutting member 25.

While various types of tapes may be used to secure drawstrings in the manner just described, it has been found that tape of the non-moistening variety such as is used by draftsmen or by painters for masking tape is well suited for bag sealing as herein described. In using such tape, however, it is necessary to provide against "gumming" of the rotary cutter member 25 due to small amounts of adhesive which adhere thereto after a number of tape portions 24a have been cut off of the webs 24. It has been found furthermore that the provision of a very slight amount of solvent, such as kerosene or benzine, will keep the cutter member 25 clean and free from adhesive.

In order to continuously apply solvent to the peripheral surface of the cutting member 25, a pair of wicks 39 and 40 are held in peripheral contact with the cutter member 25 and are provided with surrounding retainer strips 41 and 42 respectively which form small reservoirs for retaining a supply of solvent absorbed in the wicks 39 and 40. The wicks 39 and 40 may be of cotton waste or similar material.

The sealed drawstrings are illustrated in Figure 2 wherein it will be noted that the extending ends 24a of the severed tape portion serve not only to afford means for easy removal of the tape seal, but also provide space in which various printed matter designating the date of packing the bag or other pertinent information may be printed. Such printed information can be applied in various ways, for example, by pre-printing the tape rolls 19, by printing the information on the tape as it moves through the apparatus, or by imprinting the severed portions 24a after the strings have been released from the machine.

It will be appreciated by those skilled in the art, that the sealing apparatus shown and described herein is not limited in its use to the sealing or fastening of drawstrings. Other extended members such as wires, tapes, ribbons, and the like, can be effectively secured together by the use of the same apparatus with little or no modification.

While the method and apparatus shown and described herein are fully capable of achieving the objects and providing the advantages hereinbefore stated, it will be realized that they are capable of considerable modification without departing from the spirit of the invention. For this reason, we do not mean to be limited to the method and apparatus in the forms shown and

described, but rather to the scope of the appended claims.

We claim:

1. In apparatus of the class described: support means including a body having a guiding edge to receive a pair of extended members and guide the same inwardly along a path of motion transverse to their length; means in said support means to hold a supply of adhesive tape; means to support an end portion of said tape adjacent said edge in position to encounter said members as the same are moved along said path of motion; normally stationary, movable pressure means adjacent said path, engaged with said tape portion, and positioned to be driven by said movement of said members to apply pressure to said tape against said members whereby to secure the same together; and cutting means including a normally stationary, movable member positioned and adapted to be operatively engaged by said extended members and moved by said inward motion whereby to sever said end portion from said supply of tape and permit withdrawal of said extended members secured by said end portion.

2. In apparatus of the class described: support means including a body having a guided edge to engage a pair of extended members and guide the same along a path of motion transverse to their length; means in said support means to hold a pair of supply lengths of adhesive tape, said lengths being terminally joined in adhesive contact and said juncture being positioned in said path whereby to encounter said members as the same are moved therealong; and movable pressure means adjacent said path and positioned to be driven by said movement of said members to apply pressure to said tape lengths whereby to press end portions thereof into face-to-face adhesive contact with said members secured therebetween.

3. In apparatus of the class described: support means including a body having a guide edge to engage a pair of extended members and guide the same inwardly along a path of motion transverse to their length; means in said support means to hold a pair of supply lengths of adhesive tape, said lengths being terminally joined in adhesive contact and said juncture being positioned in said path whereby to encounter said members as the same are moved therealong; movable pressure means adjacent said path and positioned to be driven by said movement of said members to apply pressure to said tape lengths whereby to press end portions thereof into face-to-face adhesive contact with said members secured therebetween; and cutting means in said support means adjacent an inner end of said path, said cutter means being adapted to sever said end portion from said supply of tape whereby to permit withdrawal of said members secured by said end portion.

4. In apparatus of the class described: support means including a body having a guide edge to engage a pair of extended members and guide the same inwardly along a path of motion transverse to their length; means in said support means to hold a pair of supply lengths of adhesive tape, said lengths being terminally joined in adhesive contact and said juncture being positioned in said path whereby to encounter said members as the same are moved therealong; movable pressure means adjacent said path positioned to be driven by said movement of said members to apply pressure to said tape lengths

whereby to press end portions thereof into face-to-face adhesive contact with said members secured therebetween; and cutting means including a normally stationary, movable member positioned and adapted to be operatively engaged by said extended members and moved by said inward motion thereof to sever said end portions of said tape from said supply length thereof whereby to permit withdrawal of said extended members secured between said end portions.

5. In apparatus of the class described: support means including a pair of vertically spaced horizontal plates, said plates each having a central and inwardly extending slot therein, said slots being aligned in parallel relationship whereby to receive a pair of pendant drawstrings and guide the same inwardly along a path of motion transverse to the length of said drawstrings; means to support a length of adhesive tape between said plates and adjacent said slots in position to encounter said drawstrings as the same are moved along said path of motion; and normally stationary, movable pressure means between said plates and adjacent said slot, said pressure means being positioned to be moved by said movement of said drawstrings to apply pressure to said tape against said drawstrings whereby to secure the same together.

6. In apparatus of the class described: support means including a body having a guide edge to engage a pair of extended members and guide the same along a path of motion transverse to their length; means to support a length of adhesive tape adjacent said path in position to encounter said members as the same are moved along said path; and pressure means including a pair of normally non-rotating, rotatable resilient rollers in mutually tangent contact with each other and positioned in said support means adjacent said path whereby said members pass between said rollers when moved along said path of motion to rotate said rollers and apply pressure to said tape against said members whereby to secure the same together.

7. In apparatus of the class described: support means including a body having a guide edge to engage a pair of extended members and guide the same inwardly along a path of motion transverse to their length; means in said support means to hold a supply of adhesive tape; means to support an end portion of said tape adjacent said path in position to encounter said members as the same are moved along said path; movable pressure means adjacent said path and positioned to be driven by said movement of said members to apply pressure to said end tape portion against said members whereby to secure the same together; and cutting means including a normally non-rotating member supported for rotation adjacent an inner end of said guide means, said rotary member having a peripheral recess therein aligned with said path adapted to receive said extended members as they are moved inwardly along said path whereby to rotate said rotary member in response to said motion, said rotary member having a cutting edge formed therein positioned and adapted to be moved across said path of motion by rotation of said rotary member whereby to sever said end portion from said supply of tape, and permit withdrawal of said extended members secured by said end portion.

8. In apparatus of the class described: support means including a body having a guide edge to engage a pair of extended members and guide

the same along a path of motion transverse to their length; a pair of rolls of adhesive tape supported in said support means, one on either side of said path of motion, said rolls having lengths unwound therefrom, said lengths being terminally joined in adhesive contact with said juncture thereof positioned substantially in said path of motion whereby to encounter said members and adhere thereto as the latter are moved along said path of motion; and normally stationary, movable pressure means adjacent said path and positioned to be driven by said movement of said members to apply pressure to said tape lengths whereby to press end portions thereof into face-to-face adhesive contact with said members secured therebetween.

9. In apparatus of the class described: support means including a body having a guide edge to engage a pair of extended members and guide the same along a path of motion transverse to their length; a pair of rolls of adhesive tape supported in said support means, one on either side of said path of motion, said rolls having lengths unwound therefrom, said lengths being terminally joined in adhesive contact with said juncture thereof positioned substantially in said path of motion whereby to encounter said members and adhere thereto as the latter are moved along said path of motion; movable pressure means adjacent said guide means positioned to be driven by said movement of said members to apply pressure to said tape lengths whereby to press end portions thereof into face-to-face adhesive contact with said members secured therebetween; and cutting means including a normally stationary, movable member positioned substantially in said path of motion and adapted to be operatively engaged by said extended members and driven by said inward motion of said extended members to sever said end portions of said tape from said unwound lengths thereof, whereby to permit withdrawal of said extended members secured between said end portions leaving said unwound lengths terminally joined as before.

10. In apparatus of the class described: support means including a pair of vertically spaced horizontal plates, said plates each having a central and inwardly extending slot therein, said slots being aligned in parallel relationship whereby to receive a pair of pendant drawstrings and guide the same inwardly along a path of motion transverse to the length of said drawstrings; a roll of tape mounted for rotation about a vertical axis and positioned between said plates, said tape having an end portion thereof unwound from said roll and positioned adjacent said slot whereby to encounter said drawstrings as the same are moved along said path of motion; and pressure means including a pair of normally stationary, movable resilient members positioned in said support means, one on either side of said guide means whereby said path of movement extends between said resilient members and whereby said members are driven by said movement to squeeze said tape against said drawstrings as the same are moved along said path of motion.

11. In apparatus of the class described: support means including a pair of vertically spaced horizontal plates, said plates each having a central and inwardly extending slot therein, said slots being aligned in parallel relationship whereby to receive a pair of pendant drawstrings and guide the same inwardly along a path of motion transverse to the length of said drawstrings; a

pair of rolls of adhesive tape supported in said support means, one on either side of said path of motion, said rolls having lengths unwound therefrom, said lengths being terminally joined in adhesive contact with said juncture thereof positioned substantially in said path of motion whereby to encounter said drawstrings and adhere thereto as the latter are moved along said path of motion; and pressure means including a pair of normally non-rotating, rotatable, resilient rollers in tangent contact positioned in said support means adjacent said guide means whereby said drawstrings pass between said rollers when moved along said path of motion to rotate said rollers and apply pressure to said tape against said drawstrings whereby to secure the same together.

12. Bag sealing apparatus of the class described comprising in combination: a pair of vertically spaced horizontal support plates each plate having a central inwardly extending slot, said slots being positioned in parallel alignment whereby to receive a pair of pendant drawstrings and guide the same inwardly along a horizontal path of motion; a pair of normally non-rotating resilient pressure rollers mounted for rotation about vertical axes between said plates, said rollers being positioned on either side of said path of motion and adapted to make mutually tangent contact; and a laterally spaced pair of rolls of adhesive tape mounted for free rotation on vertical axes positioned between said plates and on either side of said path of motion, said tape rolls having lengths unwound therefrom, said unwound lengths being terminally joined in adhesive contact, and said terminal junction thereof being held between said pressure rollers whereby said drawstrings when moved inwardly along said slots encounter said tapes at the adhesive surfaces thereof and pass between said rollers causing the latter to rotate and press end portions of said tape lengths together with said drawstrings secured therebetween.

13. Bag sealing apparatus of the class described comprising in combination: a pair of vertically spaced horizontal support plates each plate having a central inwardly extending slot, said slot being positioned in parallel alignment whereby to receive a pair of pendant drawstrings and guide the same inwardly along a horizontal path of motion; a pair of resilient pressure rollers mounted for rotation about vertical axes between said plates, said rollers being positioned on either side of said path of motion and adapted to make mutually tangent contact; a laterally spaced pair of rolls of adhesive tape mounted for free rotation on vertical axes positioned between said plates and on either side of said path of motion, said tape rolls having lengths unwound therefrom, said unwound lengths being terminally joined in adhesive contact, and said terminal junction thereof being held between said pressure rollers whereby said drawstrings when moved inwardly along said slots encounter said tapes at the adhesive surfaces thereof and pass between said rollers causing the latter to rotate and press end portions of said tape lengths together with said drawstrings secured therebetween; and severing means including a fixed cutter member mounted adjacent the inner end of said slot and a rotary member journaled in said plates and having a cutting edge formed therein positioned and adapted for cooperative shearing action with said fixed cutting member upon rotation of said rotary member, said rotary member having a

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peripheral recess therein normally aligned with said path of motion whereby to receive said drawstrings with said end tape portions secured thereto and whereby motion of said drawstrings along said path of motion when in said recess rotates said rotary member to sever said end portions from said unwound lengths.

14. In apparatus of the class described for sealing a closure member: means to support a supply of adhesive tape having a length thereof extended from said supply; means including a body having an edge adapted to guide said closure member in inward motion against said length whereby to adhesively attach said tape to said normally stationary member; movable cutting means positioned and adapted to sever a portion of said tape from said length whereby to leave said portion attached to said member; and means to actuate said cutting means, said actuating means including an element aligned with the path of movement of said closure member and engageable by said closure member to move said last element and operate said cutting means.

15. In apparatus of the class described for sealing a closure member: means to support a supply of adhesive tape having a length thereof extended from said supply; means including a body having an edge to guide said closure member in inward motion against said length whereby to

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adhesively attach said tape to said member; movable cutting means positioned and adapted to sever a portion of said tape from said length whereby to leave said portion attached to said member; and means to actuate said cutting means, said actuating means including a rotatable member having said cutting means secured thereon, said rotatable member having a peripheral recess therein adapted to receive said closure member with said tape attached thereto, and said rotatable member being adapted to be rotated by tangential pressure exerted by said closure member whereby to sever said tape portion as aforesaid.

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The following references are of record in the file of this patent:

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Certificate of Correction

Patent No. 2,536,455

January 2, 1951

CECIL MILLER ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 5, line 27, for the word "guided" read *guiding*; column 9, line 15, for "normally stationary member;" read *member; normally stationary;* and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of March, A. D. 1951.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.