

June 30, 1959

A. J. LANGDON
METHOD AND MEANS FOR FOLDING AND SEALING THE
OPEN ENDS OF FLEXIBLE BAGS

2,892,293

Filed Nov. 5, 1957

2 Sheets-Sheet 1

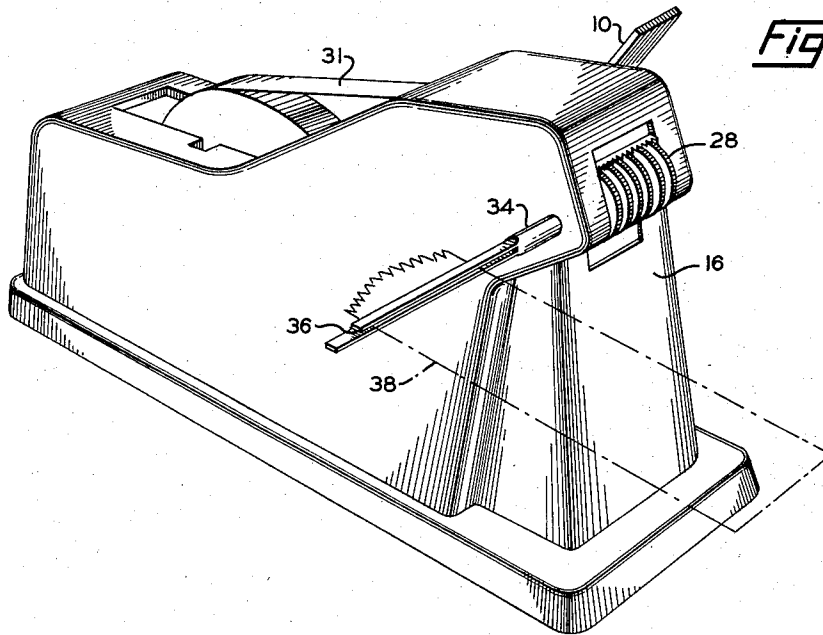


Fig. 1

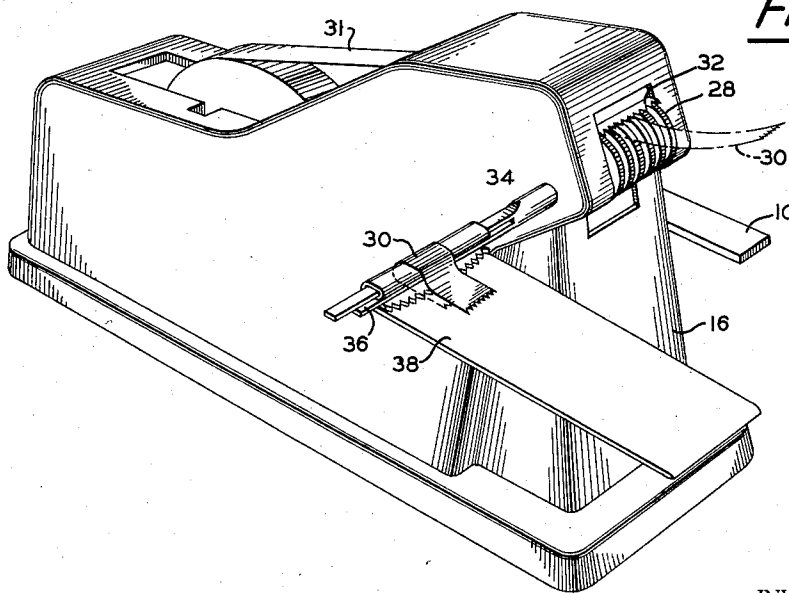


Fig. 2

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Fig. 3

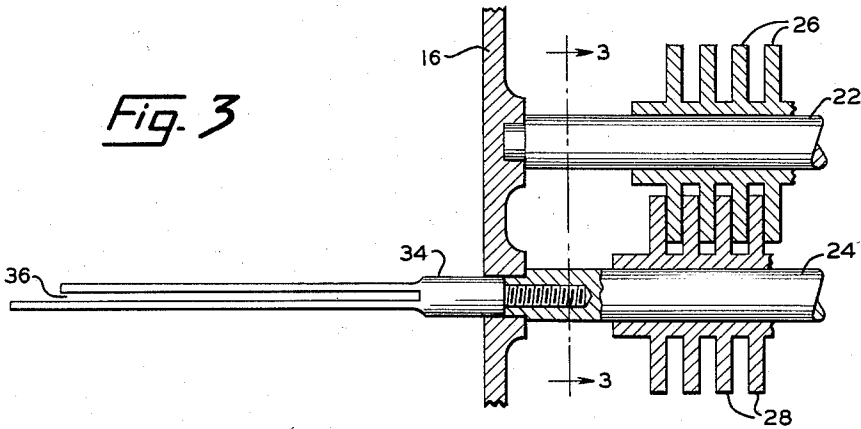


Fig. 4

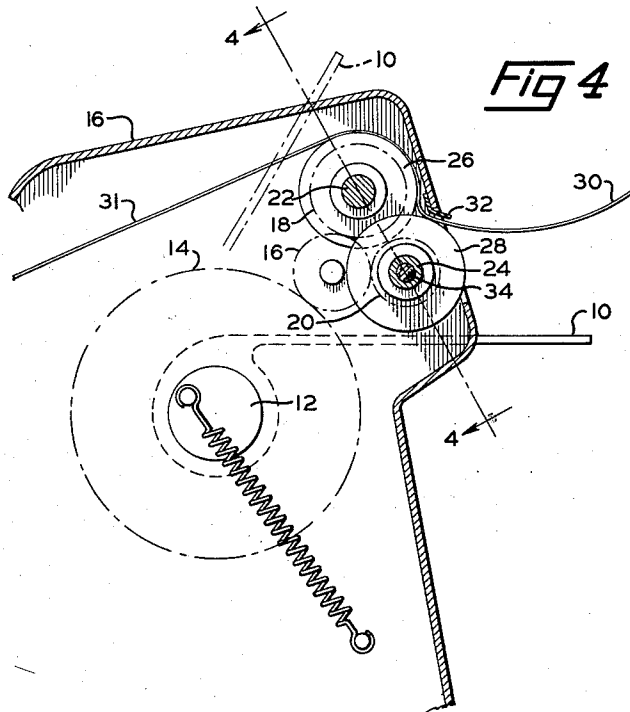


Fig. 5

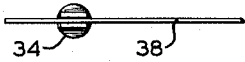


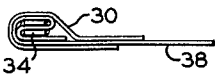
Fig. 6



Fig. 7



Fig. 8



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METHOD AND MEANS FOR FOLDING AND SEALING THE OPEN ENDS OF FLEXIBLE BAGS

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Application November 5, 1957, Serial No. 694,599

5 Claims. (Cl. 53—14)

This invention relates to packaging goods in paper or other flexible material bags and particularly to a method and means for packaging surgical instruments preliminary to sterilizing them as by autoclaving.

Heretofore it has been the practice to insert surgical instruments such as syringes into paper bags and manually fold over the open end of the bag several times after which a wire staple was clipped through the folded over portion to maintain a tight seal prior to and after sterilizing. This method of fastening did not prove satisfactory from the standpoint of maintaining a sterile condition within the bag because the holes formed by the wire staple admitted outside air and furthermore the staples sometimes rusted.

Whereas it was later found that sealing the folded over bag closure by applying a piece of pressure sensitive adhesive tape provided the sterile type of closure required, manually folding the open end of the bag remained a tedious time consuming operation.

In view of the foregoing, it is the principal object of the present invention to provide, as part of an adhesive tape dispensing machine, automatic means for folding over the open end of a bag to form a sterile-tight closure preliminary to sealing said closure by means of pressure sensitive adhesive tape.

In carrying out the present invention there is provided an open ended slotted mandrel which may be attached to or formed integrally with one of the feed rolls of a pressure sensitive adhesive tape dispensing machine such as the commercially available "Derby Grip-A-Tab" which has a manually operable lever which when actuated causes a predetermined amount of tape to be dispensed from a supply roll. By slipping the open end of the bag to be folded and sealed into the slot of the mandrel and depressing the tape feed lever to dispense a piece of tape, the bag folding operation will be automatically effected simultaneously with the dispensing of the tape. Thereafter it is a relatively simple matter to tear off the extruded piece of tape and apply it to the fold of the bag while it is still on the fold-forming mandrel.

Other objects and structural details will become apparent from the following description when read in conjunction with the accompanying drawings wherein:

Figure 1 is a perspective view of a tape dispensing machine with the mandrel of the present invention in bag receiving position.

Figure 2 is a view similar to Figure 1 but showing the tape dispenser lever in actuated position and the open end of the bag folded over and the dispensed tape applied.

Figure 3 is an enlarged fragmentary sectional view taken from the front on line 4—4 of Figure 4 and shows one method of applying the mandrel of the present invention.

Figure 4 is a fragmentary side sectional view taken on line 3—3 of Figure 3 and shows the dispenser actu-

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ating lever in operated position and a piece of tape protruded.

Figures 5, 6, 7, and 8 are fragmentary detailed flow views tracing the method, from inserting the open end of the bag into the slot of the folding mandrel, through the rotation of the mandrel and finally showing the tape applied to the bag.

Referring to Figure 4 wherein is shown the drive mechanism of an adhesive-tape dispensing machine there is provided a manually operable feed lever 10 connected through a one way clutch 12 to a large drive gear 14 located inside of the dispenser housing 16. The feed lever is spring biased in such manner as to be automatically returned to normal position when released. In mesh with drive gear 14 is a small idler gear 16 which also meshes with an upper gear 18 and a lower gear 20 the gears 18 and 20 being fixedly mounted on rotatable shafts 22 and 24 respectively. Also, fixedly mounted on shafts 22 and 24 are upper and lower grooved tape feed rolls 26 and 28 the tape engaging rims of which are knurled. From the foregoing it may readily be seen that when feed lever 10 is moved from the dot-dash position to the full line position shown in Figure 4, drive gear 14, through idler gear 16 and gears 18 and 20, will cause both of the tape feed rolls 26 and 28 to rotate in a clockwise direction and thus cause a portion of tape 30 to be protruded from the main supply web 31, after which it may be detached by tearing against the serrated cutter bar 32.

According to the present invention, the left-hand bearing of lower shaft 24 of the tape dispenser is continued through the wall of housing 16, as shown in Figure 3, and a left-hand internal thread is provided in the left-hand end of shaft 24. Also, a forked mandrel 34 is provided with a complementary left-hand thread whereby it is threadedly connected to the shaft 24. One tine of forked mandrel 34 is made shorter than the other to facilitate insertion of a bag into slot 36.

It is, of course, to be understood that mandrel 34 may be attached to shaft 24 by any other suitable method and might even be formed as an integral part thereof. The form illustrated was chosen for the present disclosure because it best demonstrates the ease with which a commercial dispenser can be modified to incorporate the present invention.

Operation

To practice the present invention, the surgical instrument is placed in a paper or other suitable flexible bag 38, which is usually of the "gusset" type, after which the open end of the bag is manually inserted in slot 36 in mandrel 34 as shown in dot-dash lines in Figure 1. The operator then, while holding the bag loosely, depresses feed lever 10 to the position shown in Figure 2, thereby causing a portion of adhesive tape 30 to be protruded and simultaneously causing mandrel 34 to rotate and consequently cause several folds to be made in the open end of bag 38. The sequence of these folds is shown in Figures 5—7 wherein the proportions of the elements have been exaggerated to facilitate the disclosure. In actual practice the fold is very compact and flat. While holding the bag in its folded condition, and without removing it from mandrel 34, the operator tears the protruding piece of tape 30 against cutter bar 32 and applies it over the fold as shown in Figures 2 and 8. The bag may then be slipped off the end of the mandrel and subjected to a sterilizing process such as autoclaving.

While there is above described but one embodiment of this invention, it is possible to produce still other embodiments without departure from the inventive concept above disclosed, and it is, therefore, desired that only

such limitations shall be imposed on the appended claims as are stated therein, or required by the prior art.

What I claim is:

1. A method of sealing article containing bags having open ends, comprising the steps of attaching a mandrel having a slot opening at one end thereof to a shaft of an adhesive-tape dispensing machine which rotates as said machine is actuated to dispense a length of tape, inserting the open end of a bag into said slot of the mandrel, actuating said machine to simultaneously dispense a length of tape and to turn said mandrel for folding the open end of the bag around the latter, applying the dispensed length of tape across the folded end of the bag while the latter is still engaged with the mandrel, and slidably removing the bag from the mandrel at said one end of the latter.

2. The combination of an adhesive-tape dispensing machine having an actuating member and feed rolls which are rotated to dispense a predetermined length of tape in response to manipulation of said actuating member, and a mandrel affixed to one of said feed rolls and having a longitudinal slot opening at one end of the mandrel so that the open end of a bag can be inserted in said slot and folded about the mandrel by rotation of the latter simultaneously with the dispensing of a length of tape, and that length of tape can then be applied across the folded end of the bag prior to sliding the latter off said one end of mandrel.

3. In combination with an adhesive-tape dispensing machine having a housing with an opening therein through which a length of tape is dispensed in response to actu-

ation of the machine and a part projecting to the outside of said housing and being rotated during the dispensing of a length of tape, an elongated mandrel having a longitudinal slot opening axially at one end, and cooperative means on the other end of said mandrel and on said rotated part mounting said mandrel at the outside of said housing for rotation with said part during dispensing of a length of tape by actuation of the machine so that an open bag end inserted in said slot will be folded about the rotated mandrel and the simultaneously dispensed length of tape can be applied across the folded bag end to seal the latter prior to sliding the folded bag end off said mandrel.

4. The combination as in claim 3; wherein said mandrel has legs of unequal length defining said slot therebetween to facilitate the insertion of an open bag end into said slot.

5. The combination as in claim 3; wherein said rotated part of the dispensing machine is a shaft carrying a feed roller within said housing and having an axial, tapped bore at one end opening to the outside of said housing, and said cooperating means includes a threaded extension at said other end of the mandrel engageable in said tapped bore of the shaft to support said mandrel in axial alignment with said shaft.

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