

May 1, 1951

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2,551,044

BAG CLOSURE

Filed July 12, 1948

2 Sheets-Sheet 1

FIG. 1.

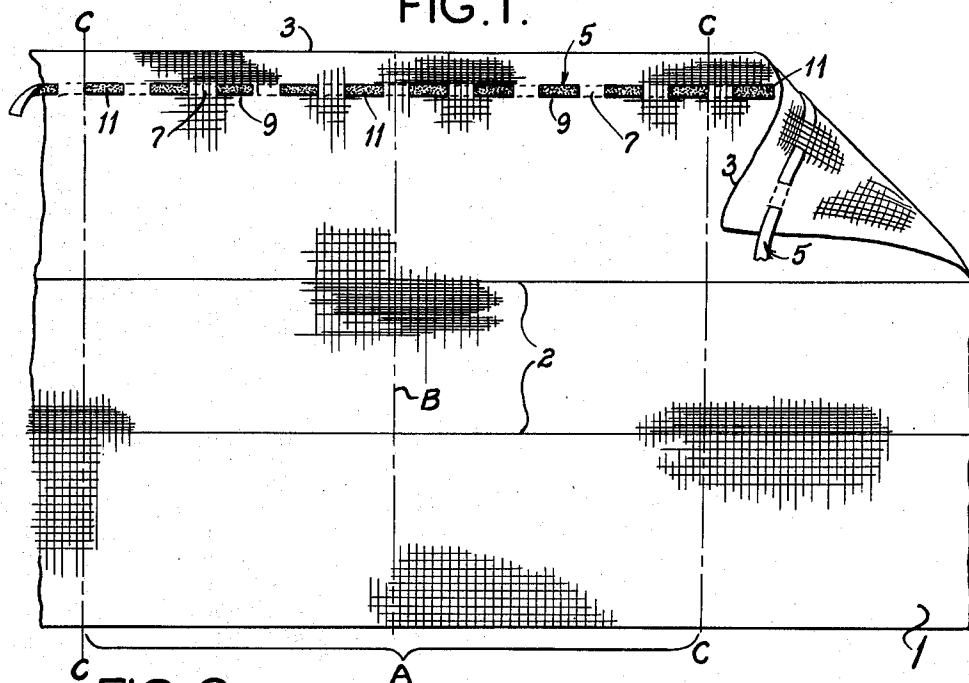


FIG. 2.

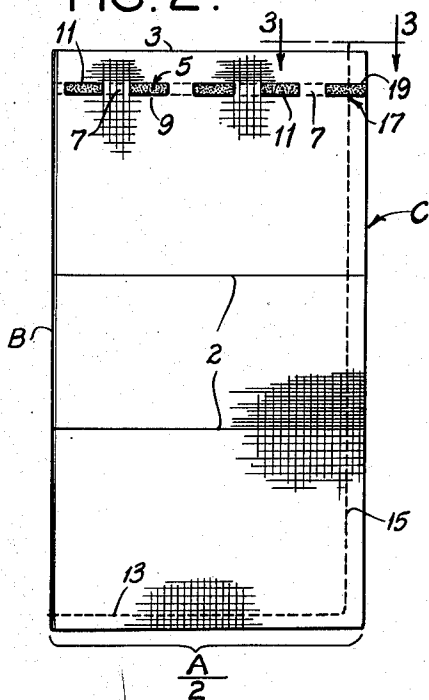


FIG. 3.

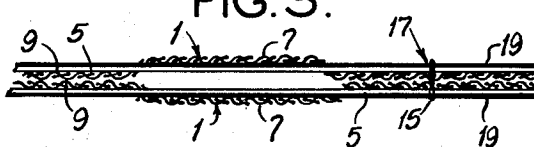
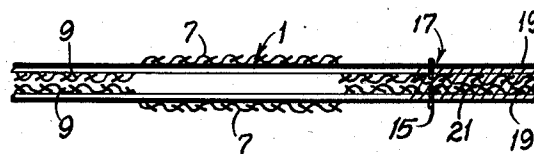


FIG. 4.



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FIG. 5.

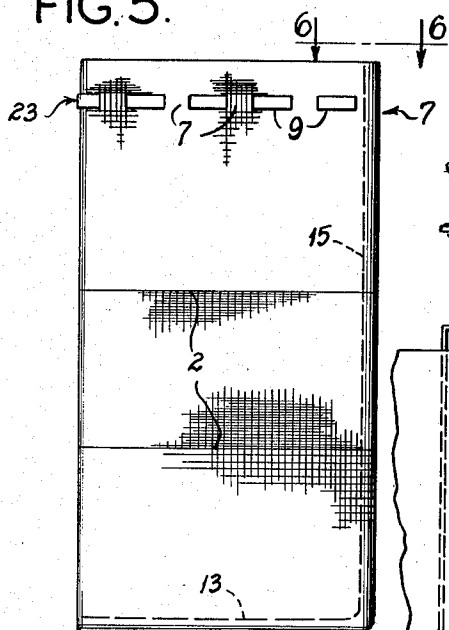


FIG. 6.

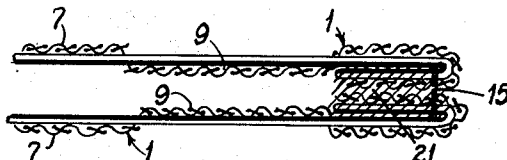


FIG. 9.

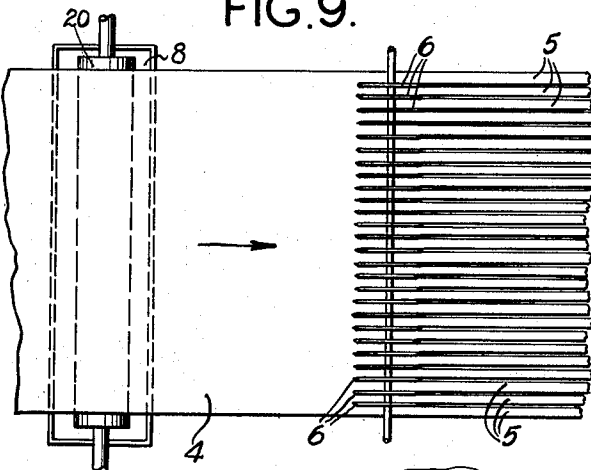


FIG. 7.

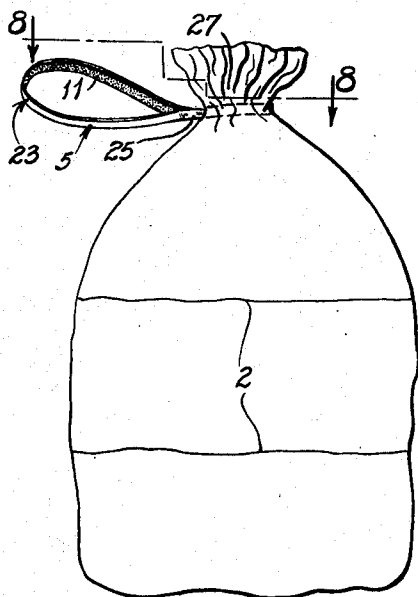
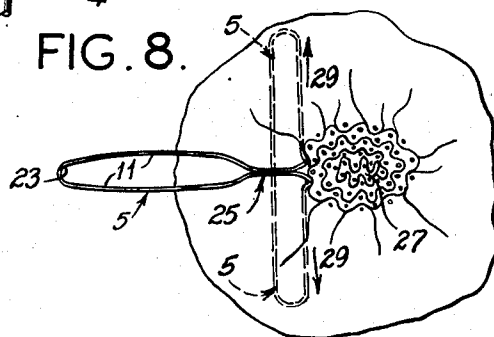


FIG. 8.



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UNITED STATES PATENT OFFICE

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BAG CLOSURE

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2 Claims. (Cl. 150—11)

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This invention relates to bag closures, and with regard to certain more specific features, to a draw-tape type of closure.

Among the several objects of the invention may be noted the provision of a strong draw-tape type of bag closure wherein a more economical form of tape is used; the provision of a closure of the class described wherein the tape may be more economically and securely anchored for purposes of attachment to the bag before closure, and for securing the mouth of the bag after filling; the provision of a closure of this class in which manufacturing and anchoring operations are simple and economical; and the provision of a closure of this class which may effectively be used as a bag handle. Other objects will be in part apparent and in part pointed out hereinafter.

The invention accordingly comprises the elements and combinations of elements, features of construction, and arrangements of parts which will be exemplified in the structures hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, in which several of various possible embodiments of the invention are illustrated,

Fig. 1 is a plan view of a web of open-mesh material, showing a woven-in draw tape, one corner being turned to show certain features;

Fig. 2 shows a segment of the web of Fig. 1 folded and seamed to form an inside-out bag;

Fig. 3 is an enlarged cross section taken on line 3—3 of Fig. 2, showing certain details.

Fig. 4 is a view similar to Fig. 3, showing an alternative form;

Fig. 5 is a plan view of a turned, complete but unfilled bag incorporating the form of the invention shown in Fig. 4;

Fig. 6 is an enlarged detail section taken on line 6—6 of Fig. 5;

Fig. 7 is a view similar to Fig. 5, but showing a filled bag with its mouth puckered shut;

Fig. 8 is an enlarged detail section taken on line 8—8 of Fig. 7 and showing in dotted lines an opening position of tape; and

Fig. 9 is a diagrammatic view showing the preparation of certain tape material used.

Similar reference characters indicate corresponding parts throughout the several views of the drawings.

Heretofore draw cords of various types have been used for puckering shut bag mouths. These have included the round and flat-cord types. The former are cheaper but more difficult to

anchor, particularly when used on open-mesh bags. The latter have been costly because of the necessity for making them of individually woven ribbon having selvage, in order to avoid raw edges which are obtained when the more economical cut or split forms of flat cords are used. By means of the present invention, not only is it possible to use said more economical flat cords (or ribbons) but they become superior to the former round-cord and the woven cord or ribbon types. This is for the reason, as will become clear, that improved strength in the ribbon itself and improved convenience and strength in the anchoring means is afforded by reason of the invention.

Referring now more particularly to Fig. 1, there is shown at numeral 1 a continuous web of material from which the invention is manufactured. This may be of a close-weave or open-weave nature. The invention will be described in connection with an open-weave construction. It may include a tight-weave central band 2 for receiving printing or the like.

At the time that the web 1 is woven, there is woven in near its upper selvage 3 a ribbon or tape 5. The weaving of this ribbon is preferably such that it passes under and over pluralities of open-mesh threads, such as shown at numerals 7 and 9, for example. This gives the tape a certain looseness of weave which is desirable, as will appear.

The tape 5 is composed preferably of a woven tight-weave fabric. However, it is not of the type wherein the weaving results directly in the tape form. The tape is cut or split from a wider web of tight-weave material such as cotton sheeting. Preparation of the tape is shown diagrammatically in Fig. 9, wherein numeral 20 shows an applicator roll for applying a size such as hot liquid thermoplastic from a supply 8 to the underface of a web. After leaving the roll, the thermoplastic impregnates and sets in the underface of the web 4, after which the web is split by means of known splitters 6. The resulting tapes 5 with thermoplastic in and on them are then woven into the open-mesh fabric 1 as the latter is itself woven. Details of this weaving-in process are not illustrated, since they are known in connection with the older forms of draw cords and tapes.

Thus tape 5 is impregnated with a thermoplastic material indicated by the stippling shown at numeral 11. Since the thermoplastic is applied to the sheet from which the tape is split, its application is economical. Impregnation may also be accomplished by dipping or coating on

both sides, resulting in a tape which is impregnated throughout its interstices. However, it is preferably that the coating be on one side only, as indicated in Fig. 1 by the turned corner. This minimizes the friction between the tape and the threads of the material of the web 1 with which the tape is woven. It has been found that the application of thermoplastic increases the tape friction and this is reduced by applying the plastic only to one side.

An advantage of placing the thermoplastic adhesively on or in the tape throughout its length is that the raw edges of the split type of tape are prevented from unraveling. In addition, thermoplastic is available at all locations along the tape so that regardless of whether the bag mouth is later puckered shut loosely or tightly, there will be available at the location for the anchor 25 thermoplastic which may be heat-sealed.

It will be understood that the thermoplastic is plastic only under conditions of elevated temperatures and not under those to which the bag is normally subjected. Thus by applying heat, the material may be made soft or plastic and when the heat is withdrawn, it again hardens. Exemplary plastics are polyvinyl and polystyrene resins, polyvinyl acetates, vinyl esters, vinyl chloride-acetate copolymers, vinyl aldehyde resins, and vinylidene chlorides.

The bag web of Fig. 1 is next cut, as along lines C, to produce segments of lengths A, each of which is folded on line B, as illustrated in Fig. 2. The folding is done in a direction such that the plastic surfaces of the folded tape 5 face outward and away from one another. As shown in Fig. 2, the width of each flat folded blank is A/2. Stitching is then applied to form a bottom seam 13 and a side seam 15, the latter being opposite the fold line B. This stitching forms an anchor at 17 for the end portions of the tape which were also cut along lines C. It is at this point that a tape has an advantage over a cord, since with relatively coarse stitching in the seam 15 there is assurance that the tape will be caught by the seam to become anchored. Fig. 3 shows in detail the relationship of parts at the anchor 17. If desired, a hot clamp iron may be applied to the free ends 19 of the tape, which melts the thermoplastic and drives it through the tape material for integration (see numeral 21 in Fig. 4). This not only makes the tape ends neat, but provides an auxiliary anchor in association with the intersecting stitching.

Next the inside-out bag of Fig. 2 (either with the Fig. 3 or the Fig. 4 anchor variation) is turned, producing the final bag shown in Fig. 5. This operation causes the seams 13 and 15 to be inturned. Parts 19 and 21 of Figs. 3 or 4 (depending upon which is used) also become inturned. The bag is now ready for filling, which may be accomplished in the usual way by hand, or on a filler spout or the like. A point to be noted is that in the completed bag the plastic surfaces 11 of the folded tape segments face one another. This is true in the case of a tape having plastic on one side because of the choice which was made in the direction of the original fold on line B. On the inside-out bag of Fig. 2, this plastic is outside. But on the finished bag this plastic is inside (compare Figs. 3 and 6).

The bag may now be filled and the tape grasped at point 23 while pushing and tucking back the mouth parts of the bag fabric to the position shown in Fig. 7. Then by pressing together the opposite sides of the tape at region 25 under

heated conditions, as by means of heated metal clamp irons, the thermoplastic will soften and opposite faces of the tape in this region will adhere to one another. Upon removal of the clamps, the heated plastic solidifies to hold the mouth of the bag shut, as shown at 27. The tape then forms a loop by means of which the bag may thereafter be carried as desired.

When it is desired to open the bag, the tape 10 may be pulled apart, as indicated at the arrows 29 in Fig. 8, which causes the adhered portions at 25 to separate, whereupon the puckered portion 27 may be reopened for access to the bag contents.

In view of the above, it will be seen that the plastic-impregnated or surfaced tape permits the use of tape which has been split from a larger web, the resulting raw edges being integrated by the plastic so that they are the equivalent of the selvage of more costly individually woven tapes. The cost of applying the plastic does not increase the cost of the tape above that of the individually woven type, and the saving is considerable when the plastic is applied to one side, as illustrated in the drawings. By handling the folding, seaming and turning of the bag as above described, this one-sided plastic application is as satisfactory as a two-sided application or a complete impregnation. In fact, it is preferable, since less friction is presented toward sliding of the bag fabric along the tape when the closing operation shown in Fig. 7 is performed.

The term impregnation as used in the claims is not to be understood as being limited to impregnation of the tape fabric throughout its entirety. This term is to be understood as applying to the case wherein the thermoplastic is applied to one or both faces of the tape, as well as interstitially. Naturally, when the thermoplastic is applied to one face of the fabric from which the tape is made, there will be some, if not complete, original interstitial penetration.

An advantage of the invention is that the auxiliary plastic anchor at 17, in addition to the anchor formed by the traverse of the seam across the tape, increases the anchor strength. The bag mouth is properly held shut after the second plastic anchor 25 is established, even when the bag is supported by the loop, because the force along the tape due to the weight is not applied normally to the plastic attachment surface of 25. However, it is quite easy to open the anchor 25 at will by pulling laterally so as to apply force normally to the anchor surface 25. The plastic covered or impregnated tape also makes a better carrying handle for the bag than former woven tapes because, unlike the latter, the present tape is not so likely to roll into a string-like form.

Although the invention is shown in connection with the tape woven into the open-mesh fabric of an open-mesh bag, it will be understood that it is also applicable to tight-weave bags wherein the tape is threaded through a tubular hem in the bag mouth.

It will be understood that the tape 5 may be treated with size materials other than thermoplastic material for preventing unraveling of the non-selvaged edges of the tape. The tape may be coated with rubber, cellulose or some non-thermoplastic synthetic plastic material. Where non-thermoplastic material is used, since the tape cannot be heat sealed at 25 it may be sealed by other suitable means, such as stapling.

In view of the above, it will be seen that the

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several objects of the invention are achieved and other advantageous results attained.

As many changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. A bag composed of woven material and having a draw-type closure comprising a length of raw-edged flat woven fabric woven with the material of the bag, said length of fabric encompassing the bag girthwise adjacent its mouth and being arranged flatwise with respect to the bag body, means securing together the ends of the fabric, the fabric being of such width as readily to be secured by said means, and the fabric being coated along its length with a hardened adhesive material which binds its raw edges to prevent unraveling of the fabrics.

2. A bag composed of open-mesh woven material and having a folded edge and a seamed edge and having a draw-type closure, said closure comprising a length of raw-edged flat relatively tight-woven fabric, said length of fabric being woven into the bag girthwise adjacent to its mouth and arranged flatwise with respect to the

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bag body, the ends of said length of fabric being caught in said seam, the fabric being coated throughout its length at least along its raw edges with a hardened thermoplastically adhesive material adapted to bind said raw edges to prevent unraveling of the fabric, also adapted under heat and pressure to adhere the ends of the length of fabric adjacent said seam, and adapted under heat and pressure to adhere together other portions of the length of fabric adjacent to the mouth of the bag when the latter is puckered.

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