

April 3, 1945.

C. V. BRADY

2,373,010

BAG CLOSURE

Filed May 23, 1942

FIG. 1.

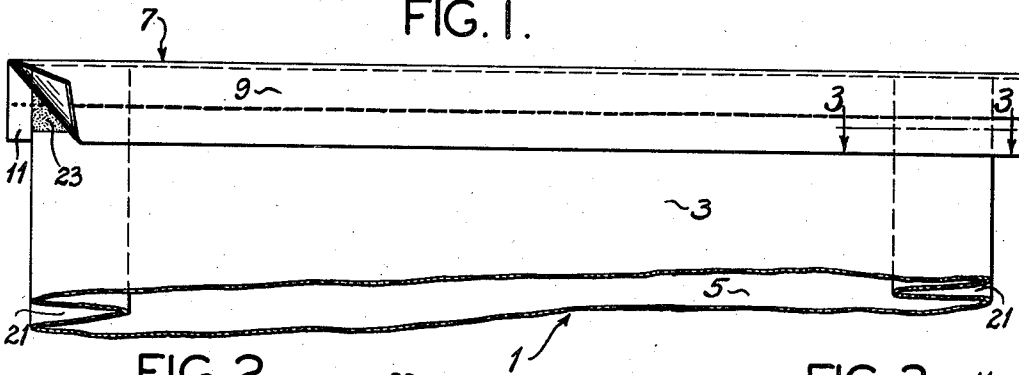


FIG. 2.

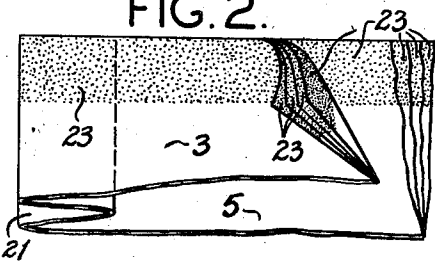


FIG. 3.

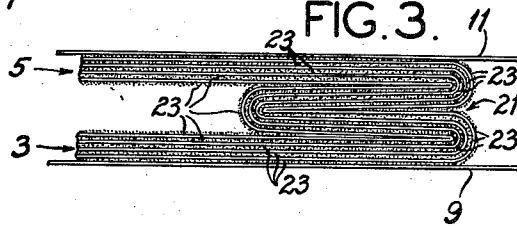


FIG. 4.

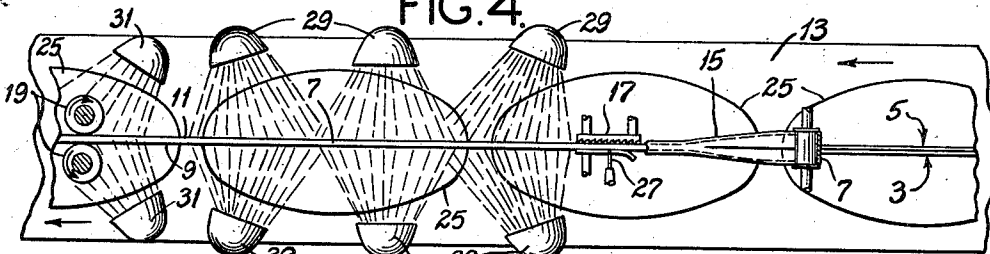
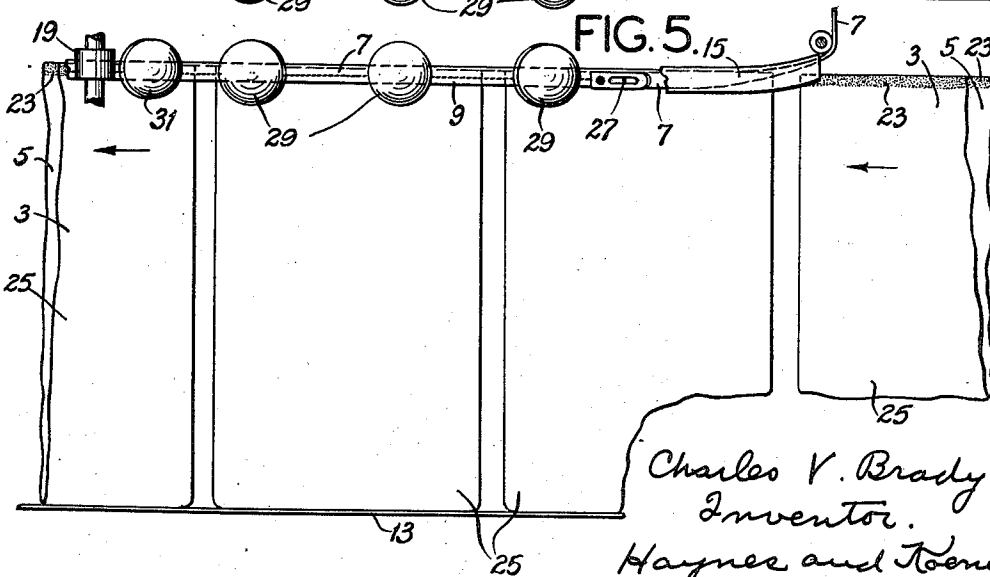


FIG. 5.



Charles V. Brady,  
Inventor.  
Haynes and Koenig  
Attorneys.

## UNITED STATES PATENT OFFICE

2,373,010

## BAG CLOSURE

Charles V. Brady, Webster Groves, Mo., assignor  
to Bemis Bro. Bag Company, St. Louis, Mo., a  
corporation of Missouri

Application May 23, 1942, Serial No. 444,284

4 Claims. (Cl. 229-62)

This invention relates to bag closures, and with regard to certain more specific features to closures for bags which are to contain hygroscopic or like materials.

Among the several objects of the invention may be noted the provision of a moisture-proofing seal in and around needle-holes, which under all temperature conditions avoids a sticky or tacky characteristic on the bag exterior although the sealing material retains the usual tacky or like characteristics which go with a desired permanent flexibility in the closure; the provision of a seal of the class described in which optimum placement and distribution of sealing material is obtained for more effective sealing in and around the needle holes; and the provision of a seal of this class which is simple and economical to carry out in practice. Other objects will be in part obvious 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 drawing, in which is illustrated one of various possible embodiments of the invention,

Fig. 1 is a plan view of a gusseted, multi-ply, paper bag showing the complete closure in position, a corner of a cover strip being turned back to indicate certain details;

Fig. 2 is a fragmentary view of a bag corner without the cover strip but showing a sealing compound in place;

Fig. 3 is an enlarged exaggerated diagrammatic detail section taken on line 3-3 of Fig. 1;

Fig. 4 is a diagrammatic plan of certain closing operations; and,

Fig. 5 is a front elevation of Fig. 4.

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

It has been common practice to close bags, including paper bags, by bringing together the opposite sides of the bag mouth, applying a V-shaped covering tape, and sewing through the opposite sides of the tape and bag. For bag bottoms, the operation has been performed prior to filling, and for bag tops, after filling. This operation has involved punching needle holes through the tape and through the bag material, which holes although partially filled with thread or twine, are not hygroscopically tight. Since it

is often intended that this type of bag contain material which should be kept dry and which may take up moisture (is hygroscopic) these bags heretofore have had their taped and sewn ends dipped into a low melting point wax which substantially covered the outside of the tape and the stitched thread. This was intended to enter the needle holes from the outside, thus to plug the holes against entry of moisture.

This procedure has had several disadvantages, the first of which was that in the case of a closure for a filled bag, the bag needed to be turned upside down in order to apply the wax, since spraying or brushing was not satisfactory. Besides, the dipping was difficult, and particularly so with heavy materials and large bags. The contained materials tended to deform the bag end when the bag was inverted and made more difficult a dipping operation.

Another disadvantage of the former method was that the wax only entered the needle holes superficially from the outside, and in addition the tacky wax was located on the outside of the bag ends where subsequently it caused difficulties.

The present invention avoids all of the above troubles and produces a much more water-tight seal throughout the whole interior of the closure. Referring now more particularly to Fig. 1, there is shown at numeral 1 a four-ply, gusseted bag, but it is to be understood that the invention is equally applicable to non-gusseted and single-ply bags, both of the tubular and seamed varieties, and also to valved bags.

The front and rear sides or faces of the bag are shown at 3 and 5. The V-shaped covering tape is shown generally at 7, the same having opposite sides 9 and 11 folded toward one another and enclosing the bag mouth. As indicated in Fig. 4, where bags have already been filled, it is the practice to bring together the ends of the faces 3 and 5, the filled bag being on a movable belt 13. The successive filled bags are brought beneath a running supply of the tape 7 which is turned into a V-shape in the folder 15, the assembly then proceeding to the sewing machine indicated at 17. At 19 are indicated draw rolls which, in conjunction with the presser foot of the sewing machine, draw the tape through the sewing machine. It is to be understood that after passing through the draw rolls 19 the continuous sewn tape is cut between bags.

When the closure forms a bottom, the bag is of course flat when the closure is made, which is necessarily prior to filling.

Prior to filling or covering with tape and sew-

ing, each bag, according to the present invention, has its open end dipped into melted, low melting point wax, the results of which on a multi-ply bag are indicated in Fig. 2. The dipping is carried out, for example, to a depth of about one inch into the wax, that is to say, beyond the point at which the sewing is to take place. At room temperature, the wax solidifies but retains enough tackiness to flex with the bag material. Sewing is ordinarily accomplished at a distance of about five-eighths to three-quarters of an inch from the end of the bag. As indicated in Fig. 2, the wax under these conditions is deposited on both faces of the bag mouth and also on all faces and inter faces of each ply. Thus all faces of all plies are provided with a wax surface or coating which at room temperature, before sewing, solidifies more or less without becoming hard. The wax is shown by stippled dots in the drawing, and is provided with the index character 23. It may be composed, for example, of paraffin, thinned with enough petrolatum to maintain tackiness or stickiness and to prevent cracking upon solidification. The temperature for melting to a flowing liquid may be around 150° F.

Either or both ends of the bag may be treated as above indicated, and the tape is then sewn on, but in the case of the top, the bag is filled prior to applying the tape.

Assuming that we are dealing with a bag top, the bag is filled after dipping and hardening but before applying tape 7. It is then advanced toward the sewing machine 17 and the supply of tape 7. The opposite ends of the faces 5 and 3 are suitably brought together by hand, as indicated at the right in Fig. 4. The tape 9, which in the present example is made of paper, is then folded in the folder 15 and applied over the bag end. The assembly then proceeds to the sewing machine 17. It is to be understood that the folded tape 9 is not covered with wax, but is dry paper so that the presser foot of the sewing machine 17 operates on a dry surface. However, the presser foot squeezes the wax inside of the tape. The needle 27 of the sewing machine reciprocates through the opposite sides of the tape 9 and through the bag plies, including the wax, and performs its sewing operation as usual. The dry tape strips clean the needle as it reciprocates.

The proper operation of the stitching is not interfered with, because the wax is not in a running condition, being more or less solidified though tacky at ordinary room temperatures.

After leaving the sewing machine 17, the sewn tape is subjected to heat, as indicated by the infra red lamps 29, which serve again to melt the wax so that it proceeds to infill the needle holes around the thread passing through said holes, thus sealing them from the inside. In addition, the squeezing draw rolls 19 may be kept warm by means of additional lamps 31. The squeezing action of these rolls 19, as also the squeezing of the presser foot at 17, aids in forcing the wax into sealing position. Either or both sets of lamps 29 or 31 may be made to provide the heating step, or other heating means may be used. The heat should only be enough to melt the wax without damaging the bag or tape material, such as paper or waterproof fabric.

It is to be understood that when the invention is applied to providing a similar closure at the other end of the bag to form its bottom, the

bottom closure is made prior to filling the bag on suitable machinery for the purpose.

From the above, it will be seen that, instead of a superficial closure of the needle holes, there is an interior closure or plugging of the same. In addition, instead of a large area of wax being exposed on the exterior of the bag, none is exposed because the exterior surface of the cover tape 7 has no wax on it, and the exterior loops of the thread entirely cover the outer ends of the needle holes, substantially preventing outflow of wax. Thus the bag mouths are exteriorly dry, even when warmed, and they do not tend to stick to adjacent bags or articles. In addition, the appearance of the bag is much neater, since there is no dipping mark of wax on the exterior.

The distribution of wax is much better because it flows inside and outside of the bag plies as well as between the plies, and therefore makes a better distribution for effective sealing.

It will be seen that dipping is the best manner of applying the substance to the bag end, particularly in the case of a multi-ply paper bag wherein the dipping operation at once covers all of the faces and inter faces at the ply ends. In the case of gusseted bags, the distribution of material into the gussets is also made easier to accomplish by dipping. For example, it is difficult to brush or spray material between plies or in gussets. However, some of the advantages of the invention may be obtained by applying the wax by other methods when this is effective and possible, as for example on non-gusseted, single-ply bag bottoms.

The invention is most useful in the case of paper bags, or bags lined with treated paper or similar waterproofing substances. Paper is a class example of materials which protect against moisture when properly treated. Thus, if the bags are made of cloth suitably treated to close the interstitial spaces, such bags could advantageously be used to carry out the present invention.

In this specification it is intended that the phrase "low melting point" be construed to mean that the substance to which it applies may be made liquid at a temperature low enough that a bag treated therewith will not be deteriorated by the temperature required for melting. Wax is exemplary of any material which is properly amorphous, waterproof and of low melting point. The intention is to cover broadly sealing materials which retain their properties of sealing against moisture when located upon a flexible base such as the material of the bag, cover tape, and stitching. Low melting point asphalt would be an exemplary equivalent for wax for certain uses.

The term "tubular bag" as used herein is intended to cover bags having (broadly) tubular bodies whether seamed, unseamed, gusseted, multi-ply, valved, or not, unless otherwise qualified.

In view of the above, it will be seen that the 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 drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A bag closure comprising adjacently located multi-ply bag end portions, a layer of low melt-

ing point flexible sealing substance covering all faces and inter faces of said plies near the bag end, a V-shaped covering tape enclosing said bag ends and presenting dry exterior faces, and stitching passing through the tape and said bag ends, the holes in all plies formed by said stitching being completely penetrated from two sides and sealed by said substance within the interior of the tape, said sealing substance being substantially confined to locations inside the tape whereby the dry exterior faces of the tape are substantially free of said sealing substance.

2. The method of making a bag closure for a tubular multi-ply bag, comprising dipping the end of the bag into low melting point flexible sealing substance in such a manner that the faces and inter faces of the multi-ply portions are entirely covered for a predetermined distance from said ends, allowing said substance to solidify, bringing the bag ends adjacent to one another, applying an enclosing cover tape over the bag end, said tape being free of adhesive prior to application to the bag end, the width of the tape on each side being such as to cover the entire treated area, stitching through the tape and the bag end within said area while the substance is solid, and thereafter heating the bag through the tape to render said substance temporarily liquid interiorly to plug the holes caused by sewing substantially without exuding to the outside of the tape.

3. A bag closure comprising adjacently located bag end portions, a layer of low melting point sealing substance covering the outer faces and interfaces of said end portions, a V-shaped

cover tape enclosing said bag end and attached thereto by the sealing substance on the outside of the outer faces, stitching passing through the tape and said bag end portions, the holes formed by said stitching in the bag end portions being completely penetrated from two sides and sealed by said substance, but the holes through the tape being merely backed by said substance without substantial penetration to the exterior, whereby a closure is provided with all internal stitching openings completely closed from two sides by the sealing substance which is substantially confined to locations inside the tape, the outside of the tape being substantially free of said sealing substance.

4. A bag closure comprising adjacently located multi-ply bag end portions, a layer of low melting point fusible sealing substance covering adjacent bands on all faces and inter-faces of said plies, a V-shaped cover tape enclosing said bag end and attached thereto by the sealing substance on the outside of the outer plies, stitching passing through the tape and said bag end, the holes in all plies formed by said stitching being completely penetrated from two sides and sealed by said substance, but the holes through the tape being merely backed by said substance without substantial penetration to the exterior, whereby a closure is provided with all internal stitching openings completely closed from two sides by the sealing substance which is substantially confined to locations inside the tape, the outside of the tape being substantially free of said sealing substance.

CHARLES V. BRADY.