

Jan. 1, 1946.

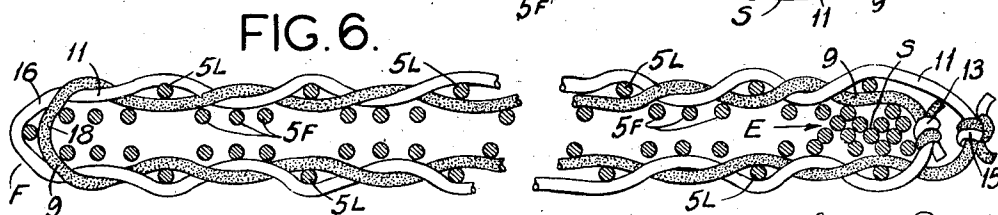
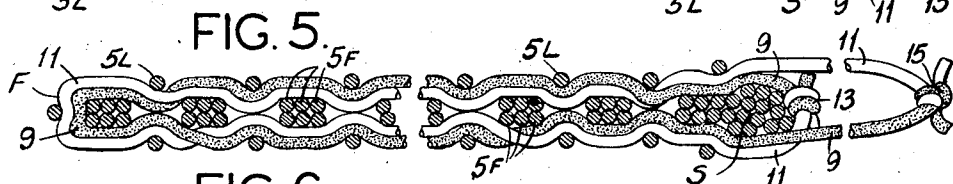
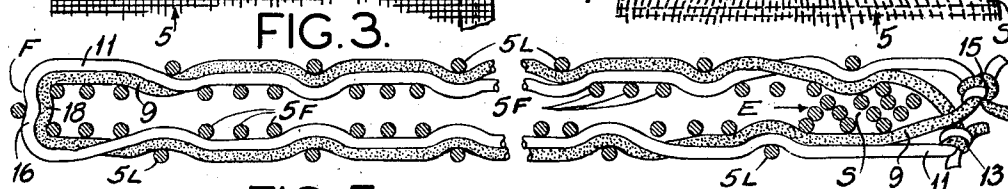
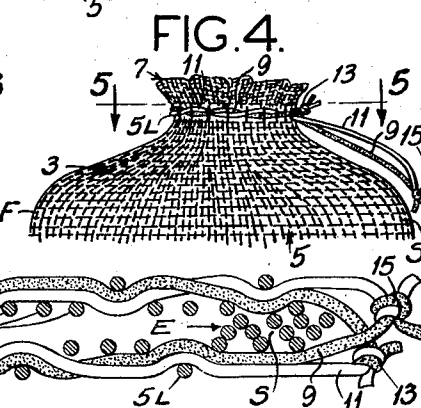
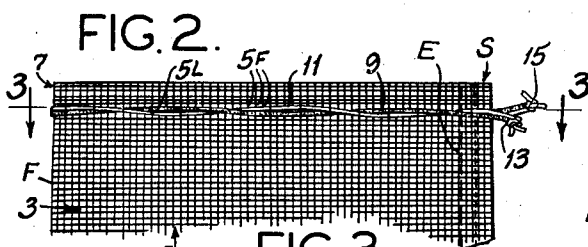
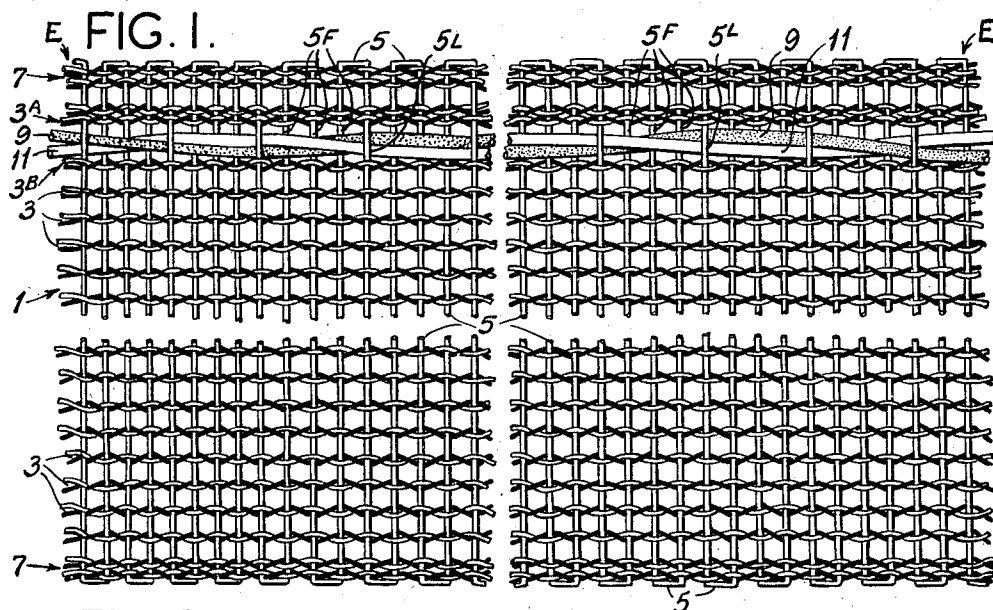
C. V. BRADY

2,392,221

BAG

Filed Dec. 31, 1942

2 Sheets-Sheet 1



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

Jan. 1, 1946.

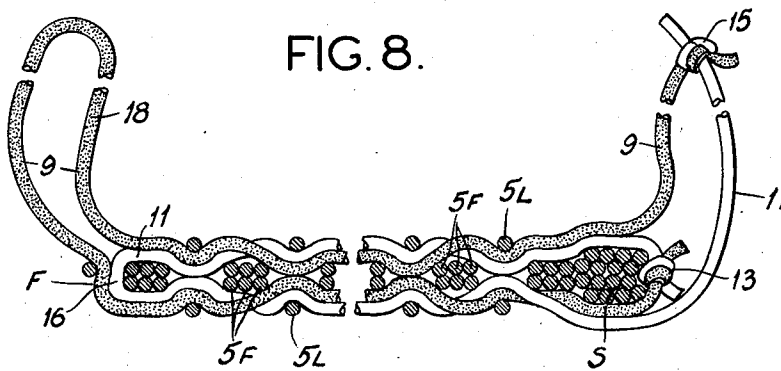
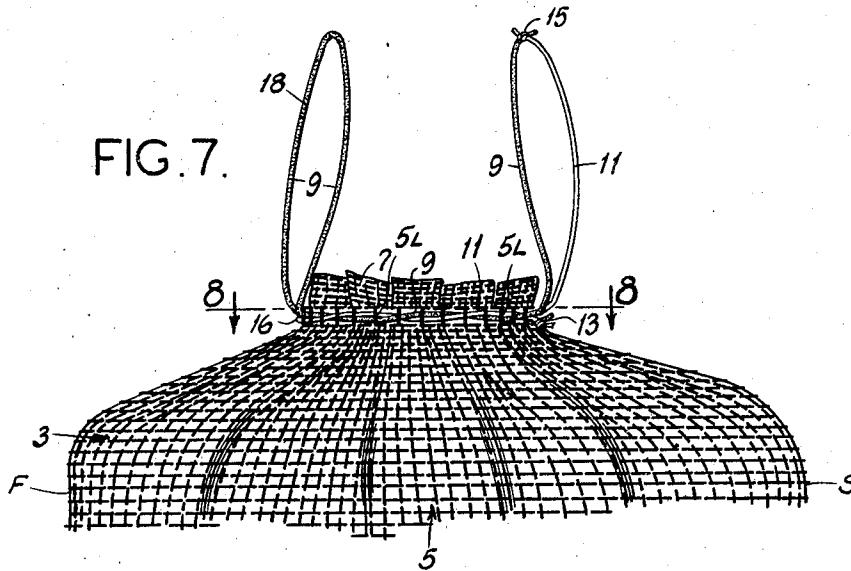
C. V. BRADY

2,392,221

BAG

Filed Dec. 31, 1942

2 Sheets-Sheet 2



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

UNITED STATES PATENT OFFICE

2,392,221

BAG

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

Application December 31, 1942, Serial No. 470,761

6 Claims. (Cl. 150—11)

This invention relates to bags, and with regard to certain more specific features, to bags having draw strings or cords.

The invention is an improvement upon the constructions shown in United States Reissue Patent 18,905, dated August 1, 1933, issued to H. H. Allen, for a bag; and United States Patent 2,263,346, dated November 18, 1941, issued to C. Arne, also for a bag.

Among the several objects of the invention may be noted the provision of an improved form of bag with a woven-indraw cord, and more particularly an open mesh bag which may be closed by a simple pulling operation, yet which will never automatically reopen in response to pressure from the bag contents; the provision of a draw-cord bag of the class described which, while holding shut against pressure from the contents, may be readily reopened by a lateral pulling operation at the bag mouth, without damage to the bag mouth or the draw cord; and the provision of a construction of the class described which is simple in form and operation and which may be economically organized during weaving with the open-mesh fabric from which bags are generally formed. 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 drawings, in which are illustrated several of various possible embodiments of the invention,

Fig. 1 is a broken plan view of an area of open weave flat fabric incorporating the invention;

Fig. 2 is a fragmentary plan view of a finished bag mouth;

Fig. 3 is a horizontal diagrammatic section on an enlarged scale taken on line 3—3 of Fig. 2;

Fig. 4 is a view similar to Fig. 2, but illustrating the bag filled and closed;

Fig. 5 is a view similar to Fig. 3, showing the bag mouth closed;

Fig. 6 is a view similar to Fig. 3, showing another form of the invention;

Fig. 7 is a view similar to Fig. 4, showing another manner of effecting a closure; and,

Fig. 8 is a diagrammatic view taken on line 8—8 of Fig. 7.

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

It should be noted that Figs. 2 and 4 are on approximately the same reduced scale. Fig. 1 is on a larger scale; Fig. 7 is also on a larger scale. Figs. 3, 5, 6 and 8 are on a still larger scale, and in these figures the drawings are diagrammatic,

and irregular bunching of strands has been avoided in order to make a more orderly showing of principles.

In the Allen patent is shown a simple draw cord woven into the loose weave fabric, from which a bag is later formed. This is done in such a way that the draw cord becomes located at the bag mouth. This construction is satisfactory in cases where bags are loaded, the draw cord pulled tight, and then permanently fastened, as by knotting. The draw cord must be permanently made fast, since there is otherwise not enough friction between it and the fabric weave to hold the bag shut. This means that if it is desired to open the bag, the knots must be untied or the cord cut. In many cases bags are filled, for example, with fruit, and then presented to an inspector who may want to replace a damaged piece. In such cases, it is quite desirable that the bag be readily opened manually without untying knots or the like, and that subsequently closure can be readily effected. Nevertheless the bag must not open automatically under pressure from its contents.

In the Arne patent, bag closure and reopening are effected by a draw cord without requiring the tying or untying of any knots, but the effect of holding shut the bag depends upon crinkling of a tubular hem which is costly and impracticable in the case of open mesh bags. When used on open mesh bags, this construction does not have enough friction effectively to maintain closure. In addition, it is difficult to hem an open mesh fabric.

Referring now more particularly to Fig. 1, there is shown at numeral 1 an open mesh fabric having double leno-woven warp threads 3 and single filling threads (indicated generically at 5) with selvage edges 7 parallel to the warp threads. During weaving one of the double warp threads 3A is offset from what would be its normal position, thus leaving a larger distance to the next warp threads 3B. Into the resulting space between threads 3A and 3B, there is woven in, during the weaving process, a pair of helically twisted draw cords 9 and 11. As indicated in the drawings for purposes of example, but not limitation, this pair of twisted cords is woven over three filling threads 5F and under one filling thread 5L repeatedly throughout the length of the fabric strip. The purpose of not weaving this pair of draw cords over and under adjacent single filling threads is to avoid too tight a weave between the draw cords and said filling threads which might later resist proper closure.

Preferably, the two draw cords 9 and 11 are distinguished from one another by color; thus for example draw cord 9 being gray and draw cord 11 being white, but this is not absolutely

necessary. The purpose of this color differentiation will appear.

A length of the cloth thus formed is cut off as indicated at the left and right of Fig. 1. It is to be noted that Fig. 1 shows sections of cloth broken away from one another, but it is intended that the figure show a continuous rectangle of fabric which is long enough to extend around the bag girth, and of height enough between selvages 7, to bring about the proper bag length. In cutting off a length of the fabric the woven-in draw cords 9 and 11 are cut off along with cutting of the warp threads 3.

The cloth is folded at about its center, placing the edges E together. Before seaming these edges together as indicated at S in Fig. 2, they are turned under, the turned-under portions becoming adjacent one another, thus forming selvage for seaming, as shown.

The bag is also closed at the bottom by a suitable seam. It is to be understood that seaming may also be accomplished by pasted cover strips or the like, as is known in the art.

The resulting bag has the seam line S on one side and a fold line F on the other, with the woven-in twisted pair of draw cords 9 and 11 arranged peripherally of the bag mouth. The ends of the draw cords at this stage extend from the bag edge by reason of the fact that they have been cleared by the folded-in portions of the edges E, required for selvage formation at the seam.

Next, as shown in Fig. 2, the draw cords 9 and 11, which theretofore have formed individual lengths, are knotted or otherwise fastened at two points, 13 and 15. Each knot joins different colored threads, so that, as shown in Fig. 3, we have a double loop of continuous draw cord around the bag mouth, including the knots 13 and 15. However, the double loop, instead of being composed of simple parallel cords as in the prior art, is composed of twisted cords, which are also woven into the bag fabric. This twisting effect is of some importance, as will appear.

If now the bag be filled, and one of the knots 15 for example is pulled as indicated at the right in Fig. 5, while the opposite side of the bag is held, both loops are pulled tight and the bag mouth is drawn shut by a pucker, shown in Fig. 4, as it actually is, but shown schematically in Fig. 5. The pulling tight of the loops involves not only drawing the cords frictionally through filling threads F, but also involves frictional engagement between adjacent cords in the twisted pair 9, 11. The result is that although the drawing shut of the bag mouth may be readily accomplished because of the very loose weaving in of the pair of twisted draw cords through filling threads (under one and over three) nevertheless a good frictional effect is obtained between the twisted cords themselves. This holds against any tendency to automatic opening of the bag in response to pressure from its contents.

At the same time, if it is desired to reopen the bag at any time, this is readily accomplished simply by pulling upon the knot which is close to the bag (13 for example in the present description, Fig. 4). This requires only a small force directly along the draw cords to effect the reopening which could not be accomplished by pressure from the bag contents below. This again places the bag back in the position shown in Figs. 2 and 3. Reclosure and reopening can be accomplished repeatedly without tying or un-

tying knots, or cutting or the like, and without substantial damage to the construction.

Instead of so-called draw strings or cords being used, it is to be understood that tapes or the like may be substituted, in which event the adjacent tape ends may be joined by sewing, gluing, or the like.

In Fig. 6 is shown another form of the invention in which one is assured that any predetermined spacing of the twists between the draw cords is positively maintained throughout the life of the bag. Like numerals designate like parts. In this case the pair of twisted draw cords is woven partially with a so-called leno weave. In such a weave, instead of the twisted cords being woven as a pair over and under filling threads, the adjacent draw cords are repeatedly separated and passed around filling threads during the weaving process. In the present case, the leno weave is carried out only partially with respect to the filling threads, as indicated in Fig. 6. That is, one of the twisted draw cords (the white one) passes over all of the filling threads, but the other draw cord (the gray one) passes under only certain (every fourth) filling thread. The result is the desired degree of looseness for easy pulling shut of the bag mouth, along with the frictional locking effect due to twist in the pair of draw cords; and in addition there is obtained the locking effect of certain of the filling threads 5L against bunching of the twist of the pair of draw cords while in place on the bag. It is to be understood that bunching of the twist is not great, but that for repeated use of the bag it is desirable positively to maintain any initial arrangement of spacing of twists.

Incidentally, it will be seen that the main areas of the bag sides are composed of leno weave, in which the single filling threads 5 are employed with double warp threads 3 twisted to surround every filling thread, thus maintaining a predetermined spacing of the filling threads even with a quite open weave characteristic.

In Figs. 7 and 8 I show a modified operation of the invention in connection with the form of draw cords indicated in Figs. 1-5, but it should be understood that this modified use is also applicable to the form shown in Fig. 6. Like numerals designate like parts. In this case, instead of pulling one knot, such as knot 15 in Fig. 5, after the bag is filled, one knot (15 or 13) is pulled along with either opposite unknotted loop (16 or 18). This draws shut the bag as before with a double loop, but instead of having one long loose extension on the side as indicated in Fig. 4, there are two shorter ones as indicated in Fig. 7. These may be brought together and used as a bag handle. While the single free extension of Fig. 4 may also be used as a bag handle, it is unnecessarily long, and of course not as strong as the two extensions composed of four strands shown in Fig. 7.

It will be noted in respect to the mode of operation indicated in Figs. 7 and 8, that this cannot be accomplished with the construction shown in the Arne patent, because the unknotted loops of Arne are not open to the operator's grasp.

It should be understood that the different colors of the two draw cords are for the purpose of readily effecting the knotting of proper ends to obtain the double loop feature. This knotting is done at the bag factory and not by those in the field, one of the purposes of the invention being to relieve persons in the field of any tying or untying of knots. It will be understood that other means for joining the draw cord ends may be employed besides knots, as for example, splicing, or sewing.

In any event, the purpose of the connection is to bring about a continuous endless double loop around the bag mouth, the double loop being woven in place. Whether the knots or splicing or the equivalent effect the continuity is unimportant, except that the knotting scheme is simplest.

Differentiating cord coloring is not necessary for the above forms of the invention if, in the bag factory, an equivalent scheme is provided for identifying the proper cords to be tied for effecting a continuous double loop.

Differentiating coloring is however also useful in case it is desired to attach both of the loops to the bag fabric at one point, as for example, by the stitching or other fastening which forms the seam S. This avoids the necessity for any knotting or the like. In such event, closing of the bag mouth is best effected by pulling at opposite single cords on opposite sides of the bag with the stitched fastening about midway. Then the differential coloring prevents ineffectively pulling the same cord. When this attachment and closing procedure is adopted, the operator is given suitable directions to close the bag by pulling differently identified (colored) cords. In this case the advantage of the twisted double draw cord is retained.

The weaving of several draw cords 9, 11 over several filling threads at one time, as for example the several filling threads 5F in Figs. 1, 3, 5 and 6, is referred to herein as a basket weave of the draw cords. The surrounding of a filling thread such as 5L in Fig. 6 by members of the pair of draw cords is referred to herein as leno weave of the draw cords. Thus in Figs. 1-5, as well as 7 and 8, we have a basket weave of the twisted draw cords, and in the case of Fig. 6 we have the combination of basket and leno weaves of the draw cords and the filling threads.

As already made clear, the purpose of the basket weave is to obtain enough looseness between the pair of draw cords and the filling threads to obtain an easy puckering action when the bag is closed; and the purpose of the leno component of the weave, as indicated in Fig. 6, is to maintain predetermined spacing of twists in the draw cord.

Also, the purpose of the twist in any event is to obtain the final locking friction for holding the bag shut against pressure from its contents, which friction may readily be released for opening purposes by pulling the close-in knot or its equivalent while holding the opposite edge of the bag mouth.

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 drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a bag composed of open mesh warp and filling threads and having a mouth, a draw cord woven into the open mesh adjacent said mouth, said draw cord being composed of a pair of cords one of which is helically twisted about the other, the ends of each of which are joined to the ends of the other to form a continuous double loop of cord around said mouth, whereby upon closing of the loaded bag by oppositely pulling different members of the double loop the helical twist is

tightened to effect such friction between said loop members that the bag mouth is normally held shut against any force of the load but is readily manually openable.

2. In a bag composed of open mesh warp and filling threads and having a mouth, a draw cord woven into the open mesh adjacent said mouth, said draw cord being composed of a pair of cords one of which is helically twisted about the other, the ends of each of which are joined to the ends of the other to form a continuous double loop around said mouth, the pair of twisted draw cords having a basket type of weave with respect to at least some of the filling threads of said fabric wherein interweaving with the pair of draw cords is effected by spaced groups of the filling threads, whereby upon closing of the loaded bag by oppositely pulling different members of the double loop the helical twist is tightened to effect such friction between said loop members that the bag mouth is normally held shut against any force of the load but is readily manually openable.

3. In a bag composed of open mesh warp and filling threads and having a mouth, a draw cord woven into the open mesh adjacent said mouth, said draw cord being composed of a pair of twisted cords, both ends of each of which are joined to the ends of the other to form a continuous double loop around said mouth, the pair of twisted draw cords having a basket weave with respect to at least some of the filling threads of said fabric, and having a leno weave with respect to at least some of the remaining filling threads.

4. In a bag composed of open mesh warp and filling threads and having a mouth, a draw cord woven into the open mesh adjacent said mouth, said draw cord being composed of a pair of twisted cords, the ends of the cords being fastened to form two loops around said mouth, the pair of cords as twisted having a basket weave with respect to at least some of the threads of said fabric, and having a leno weave with respect to at least some of the remaining threads.

5. In a bag composed of open mesh warp and filling threads and having a mouth, a draw cord woven into the open mesh adjacent said mouth, said draw cord being composed of a pair of cords one of which is helically twisted about the other, the ends of each of which are anchored relatively to the ends of the other to form a double loop of cord around said mouth, whereby upon closing of the loaded bag by oppositely pulling different members of the double loop the helical twist is tightened to effect such friction between said loop members that the bag mouth is normally held shut against any force of the load but is readily manually openable.

6. In a bag composed of open mesh warp and filling threads and having a mouth, a draw cord woven into the open mesh adjacent said mouth, said draw cord being composed of a pair of cords one of which is helically twisted about the other, the ends of each of which are anchored relatively to the ends of the other to form a double loop of cord around said mouth, the pair of draw cords as twisted having a basket weave with respect to some of the filling threads of said fabric, whereby upon closing of the loaded bag by oppositely pulling different members of the double loop the helical twist is tightened to effect such friction between said loop members that the bag mouth is normally held shut against any force of the load but is readily manually openable.

CHARLES V. BRADY.