

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) IMPROVEMENTS IN OR RELATING TO BAGS

(71) I, FRITS BUISE a subject of The Netherlands, of 11, Laan van Koot, Wassenaar, The Netherlands, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to bags consisting of an inner bag and a protective outer bag, both the inner and the outer bag at their lower ends being provided with a connection between opposed walls over the full width and at their upper ends provided with a connection between opposed walls on a part of the width and a filling opening on the rest of the width, which filling opening constitutes the mouth, inclined at 45° to the bag axis, of a valve which is self-closing when the bag is filled and which is obtained by cutting and folding inwards the material of the bag.

Such bags are known. In manufacturing such a bag, one starts from a tube of plastics material and a tubular plastics foil provided therein which both are divided into pieces, each piece having a straight and a stepped marginal end portion. The lower marginal end portion is straight and one connection is provided therein which closes the tubes and interconnects them. The valve is obtained by cutting out from the upper ends of the inner and outer tubes a rectangular piece over a height equal to the length of the desired valve and over the width of the connection to be formed there to leave a tongue remaining, followed by folding over the remaining tongues along folding lines making an angle of 45° with the upper edge of the bag in such a way that they are inserted between the front and back sides of the bag, whereupon a connecting thread is provided in the upper edges of inner and outer bag and in the still open upper end of the valve.

The length of the valve is determined by the height of the cut-out piece, measured in the longitudinal direction of the bag. The [Price 25p]

valve opens outwardly *via* a mouth piece consisting of four layers of material and constituting an isosceles right-angled triangle. The length of one of the perpendicular sides of this triangle constitutes the filling width of the valve and is equal to the width of the remaining tongue. The width of the remaining tongue is obviously equal to the difference between the width of the bag and half the length of the rectangular cut out piece.

When a bag is constructed in such a way, the connection should be of a type which is suitable for both the material of the inner bag and that of the outer bag. When, as may be desirable for strength reasons, the inner bag is made of polyethylene and the outer bag of polypropylene heat sealing is not possible so that a stitched seam should be used as a connecting seam. This is however disadvantageous in that in the foil of the inner bag, when a sudden and heavy load is applied thereto, tears develop at the locations of the perforations so that these bags are unfit for rather great filling weights and in practice often tear when they are filled fast, and a sudden load is applied to the inner bag.

According to the present invention a composite bag comprises an inner bag and a protective outer bag, both the inner and the outer bags at their lower ends being provided with a connection between opposed walls over their full width, and at their upper ends being provided with a connection between opposed walls over a part of their width and with a filling opening on the rest of the width, which filling opening constitutes the mouth, inclined at 45° to the bag axis, of a valve closing itself when the bag is filled and being obtained by cutting and folding inwards the material of the bag, which inner and outer bags are made of different materials, not suitable for the same type of connection, the two connections for the inner bag being closer to the central part of the composite bag than those for the outer bag, and the connection at the upper

end of the inner bag being shorter than the difference between the length of the upper edge of the outer bag and the length of the valve of the outer bag and longer than the difference between the length of the upper edge of the inner bag and the length of the valve of the inner bag.

In one embodiment, in order to leave over a free end of the material of the inner bag above the upper connection therein, which free end can be secured in the connection of the outer bag without perforating the inner bag in the functional area, it has been provided that the connection at the upper end of the outer bag lies at some distance under its upper edge, and the connection of the upper edge of the outer bag also extends over the length of the upper marginal portion of the inner bag. This measure is advantageous in that the upper end of the inner bag and the valve of the inner bag are secured to the upper end of the outer bag, so that in case of a partially filled inner bag the bag and/or the valve thereof do not sink into the outer bag.

A particularly firm connection between the upper end of the inner bag and the upper end of the outer bag is obtained when the upper marginal portion of the inner bag is below the upper edge of the outer bag and the connection at the upper end of the outer bag is provided over the marginal portion.

In order to enable the unfolding of the inner bag in the outer bag on filling the bag, the lower edge of the inner bag is preferably free from the connection at the lower end of the outer bag.

The invention may be performed in various ways and one specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:—

Fig. 1 is a side elevation of a cut out tubular foil with a shape suitable for the manufacture of an inner bag;

Fig. 2 is a side elevation of the inner bag manufactured by folding, inserting and sealing;

Fig. 3 is a perspective view of the upper end of the inner bag according to Fig. 1;

Fig. 4 is a perspective view of the upper end of the finished inner bag according to Fig. 2;

Fig. 5 is a view of the inner and outer bag laid one on the other; and

Fig. 6 is a view of the entirely finished combined inner and outer bag with valve.

Referring to Figures 1 and 3, an inner bag 1 is manufactured from a length of tubular plastics foil, and a rectangular piece has been cut from the upper end. A tongue 2 left over in this way is folded along a folding line 3. The folding line 3 makes an angle of 45° with a longitudinal side 4 of the tubular foil. After the folding over of the tongue 2, the

edges 5 of the tongue coincide with the shortened upper edges 6 of the inner bag. The edge 7 of the tongue extends now parallel to the longitudinal edge 4 of the inner bag, while the elongation 4' of this longitudinal edge 4 is at right angles with the longitudinal edge 4. The length l of a valve is determined by the length of the edges 5 of the tongue, while the width of the valve is determined by the length of the edge 7. The imaginary, isosceles rectangular triangle with the hypotenuse-folding line 3 constitutes the mouth of the valve. The length of the shortened upper edge of the inner bag is equal to the length of the edges 6 of the tubular foil piece according to Figures 1 and 3.

After the valve 2 has been formed, a sealed joint 8 between wall portions is formed at some distance under the shortened upper edge 6 of the inner bag. This sealed joint 8 extends from the longitudinal wall 9 to beyond the open inner edge 7 of the valve 2. It is, however, provided for that the sealed joint 8 does not extend as far as the mouth piece of the valve defined hereinbefore. The length of the sealed joint 8 is therefore shorter than the length of the shortened edge 6 of the inner bag and longer than the difference between the length of the edge 6 and the length l of the valve. As appears from Fig. 4, the obtuse angles 10 at the left of the upper end of the depicted inner bag can be moved apart. The inner bag can be filled through the valve 2, the material flowing from the open end 11 of the valve into the inner bag.

At the lower end of the inner bag a sealed joint 12 is formed, so that the inner bag is closed at its lower end.

The outer bag, which is, for example, manufactured from circularly woven jute, is formed from a tubular piece which in principle has a shape as shown in Fig. 1. The height of the tongue 13 is, however, smaller than the height of the tongue 2 of the inner bag. The length of the shortened upper edge 14 of the outer bag is, however, preferably equal to the length of the shortened upper edge 6 of the inner bag. The diameter of the tubular piece used for the inner bag may be slightly smaller than the diameter of the tubular piece used for the outer bag.

Evidently, therefore, the length L of the valve of the outer bag will be shorter than the length l of the valve of the inner bag. This appears from Fig. 5 in which for the sake of clarity the inner and outer bags are laid one on the other in the position assumed with respect to each other in the finished combined bag according to Fig. 6.

In the process of manufacturing the combined bag, the finished bag according to Fig. 2 is inserted in the material of the outer bag which previously may be stitched up at its

lower end along the stitched seam 15. It should be noted that the stitched seam 15 does not contact the inner bag. The tongue 13 of the outer bag is now folded along the folding line 16 and inserted in the valve 2 of the inner bag. It should be noted that the open inner wall 17 of the valve 13 of the outer bag does not touch the sealed joint 8 and that nevertheless the length L of the valve of the outer bag is sufficiently large that when stitched seam 18 is provided in the shortened upper edge 14 of the outer bag, this fixes the valve 13 of the outer bag in position. It should be noted that the stitched seam 18 falls outside the functional part of the inner bag and that the free shortened upper edge of the inner bag upwards of the stitched seam 8 is stitched along with the shortened upper edge of the outer bag in the stitched seam 18. In this way the upper edge of the inner bag is coupled to that of the outer bag.

The valve 13 of the outer bag cannot be inserted when the sealed joint 8 extends over the overall width of the shortened upper edges of the inner and outer bag. In the latter case it would still be possible to form the mouthpiece for the valve of the outer bag, but such a mouthpiece cannot be stitched up and therefore cannot remain in the mouthpiece for the valve 2 of the inner bag. After the filling operation, this mouthpiece will loosen itself from the interior of the outer bag and stand out freely.

The fact that the valve of the outer bag is shorter than that of the inner bag means that during the filling of the bag no filling material is left over in a protruding collar of the valve of the outer bag, said collar lying within the bag. A structure comprising a composite bag has become possible due to the fact that the length of the connection of the inner bag lies within particular limits.

The connection at the upper end of the inner bag secures the valve of the inner bag to the walls of the inner bag, so that this valve cannot sag while there is on the other hand plenty of space to allow the insertion of the shorter valve of the outer bag and attach same by means of the connection in the upper edge of the outer bag to the material of the outer bag.

The structure of the bag is particularly adapted for an inner bag made from heat-sealable plastics tubular polyethylene foil. Such a tubular foil lends itself excellently for forming a bag with filling valve.

The outer bag is preferably manufactured from reinforcing material such as, for example, circularly woven jute or circularly woven polypropene fabric while the connections in the outer bag are stitched seams which do not perforate the functional part of the inner bag.

WHAT I CLAIM IS:—

1. A composite bag comprising an inner bag and a protective outer bag, both the inner and the outer bags at their lower ends being provided with a connection between opposed walls over their full width, and at their upper ends being provided with a connection between opposed walls over a part of their width and with a filling opening on the rest of the width, which filling opening constitutes the mouth, inclined at 45° to the bag axis, of a valve closing itself when the bag is filled and being obtained by cutting and folding inwards the material of the bag, which inner and outer bags are made of different materials, not suitable for the same type of connection, the two connections for the inner bag being closer to the central part of the composite bag than those for the outer bag, and the connection at the upper end of the inner bag being shorter than the difference between the length of the upper edge of the outer bag and the length of the valve of the outer bag and longer than the difference between the length of the upper edge of the inner bag and the length of the valve of the inner bag.
2. A composite bag as claimed in claim 1, wherein the connection of the upper end of the outer bag also extends over the length of the upper marginal portion of the inner bag.
3. A composite bag as claimed in claim 2, wherein the upper marginal portion of the inner bag is below the upper edge of the outer bag and the connection at the upper end of the outer bag is provided over the marginal portion.
4. A composite bag as claimed in any one of the preceding claims, wherein the lower edge of the inner bag is free from the connection at the lower end of the outer bag.
5. A composite bag as claimed in any one of the preceding claims, wherein the inner bag is manufactured from seamless, plastics tubular foil and the connections of the inner bag are seals.
6. A composite bag as claimed in claim 5, wherein the plastics is polyethylene.
7. A composite bag as claimed in any one of the preceding claims, wherein the outer bag consists of reinforcing material while the connections in the outer bag are stitched seams, which do not perforate the inner bag between the connections of the inner bag.
8. A composite bag as claimed in claim 7, wherein the reinforcing material is circularly woven jute or circularly woven polypropene fabric.
9. A composite bag substantially as hereinbefore described with reference to the accompanying drawings.



lower end along the stitched seam 15. It should be noted that the stitched seam 15 does not contact the inner bag. The tongue 13 of the outer bag is now folded along the folding line 16 and inserted in the valve 2 of the inner bag. It should be noted that the open inner wall 17 of the valve 13 of the outer bag does not touch the sealed joint 8 and that nevertheless the length L of the valve of the outer bag is sufficiently large that when stitched seam 18 is provided in the shortened upper edge 14 of the outer bag, this fixes the valve 13 of the outer bag in position. It should be noted that the stitched seam 18 falls outside the functional part of the inner bag and that the free shortened upper edge of the inner bag upwards of the stitched seam 8 is stitched along with the shortened upper edge of the outer bag in the stitched seam 18. In this way the upper edge of the inner bag is coupled to that of the outer bag.

The valve 13 of the outer bag cannot be inserted when the sealed joint 8 extends over the overall width of the shortened upper edges of the inner and outer bag. In the latter case it would still be possible to form the mouthpiece for the valve of the outer bag, but such a mouthpiece cannot be stitched up and therefore cannot remain in the mouthpiece for the valve 2 of the inner bag. After the filling operation, this mouthpiece will loosen itself from the interior of the outer bag and stand out freely.

The fact that the valve of the outer bag is shorter than that of the inner bag means that during the filling of the bag no filling material is left over in a protruding collar of the valve of the outer bag, said collar lying within the bag. A structure comprising a composite bag has become possible due to the fact that the length of the connection of the inner bag lies within particular limits.

The connection at the upper end of the inner bag secures the valve of the inner bag to the walls of the inner bag, so that this valve cannot sag while there is on the other hand plenty of space to allow the insertion of the shorter valve of the outer bag and attach same by means of the connection in the upper edge of the outer bag to the material of the outer bag.

The structure of the bag is particularly adapted for an inner bag made from heat-sealable plastics tubular polyethylene foil. Such a tubular foil lends itself excellently for forming a bag with filling valve.

The outer bag is preferably manufactured from reinforcing material such as, for example, circularly woven jute or circularly woven polypropene fabric while the connections in the outer bag are stitched seams which do not perforate the functional part of the inner bag.

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2. A composite bag as claimed in claim 1, wherein the connection of the upper end of the outer bag also extends over the length of the upper marginal portion of the inner bag.

3. A composite bag as claimed in claim 2, wherein the upper marginal portion of the inner bag is below the upper edge of the outer bag and the connection at the upper end of the outer bag is provided over the marginal portion.

4. A composite bag as claimed in any one of the preceding claims, wherein the lower edge of the inner bag is free from the connection at the lower end of the outer bag.

5. A composite bag as claimed in any one of the preceding claims, wherein the inner bag is manufactured from seamless, plastics tubular foil and the connections of the inner bag are seals.

6. A composite bag as claimed in claim 5, wherein the plastics is polyethylene.

7. A composite bag as claimed in any one of the preceding claims, wherein the outer bag consists of reinforcing material while the connections in the outer bag are stitched seams, which do not perforate the inner bag between the connections of the inner bag.

8. A composite bag as claimed in claim 7, wherein the reinforcing material is circularly woven jute or circularly woven polypropene fabric.

9. A composite bag substantially as hereinbefore described with reference to the accompanying drawings.



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