

BAG PROVIDED WITH A SPOUT

BACKGROUND OF THE INVENTION

Field of the Invention

5 The present invention relates to a bag provided with a spout and, more specifically, to a rigid pouring structure for a synthetic resin bag provided with a spout.

Description of the Related Art

10 Most conventional containers for containing contents in the form of a liquid or gel or the like have been solid, shaped containers of glass, synthetic resins and the like. Recently those conventional containers have been replaced with flexible bags in view of environmental protection, effective exploitation of resources, reduction of waste and
15 improvement of economy of materials.

20 In a flexible bag having a square upper portion which has become used prevalently as an alternative to the conventional solid, fixed-shape containers, an oblique spout is formed in one of upper corners of the bag where side edges and an upper edge of the bag are joined, and the corner in which the spout is formed is to be cut to open the spout when you pour contents contained in the flexible bag.

25 Flexible bags are available in various shapes. For instance, a most simple flexible bag is formed by superposing two films and welding together four sides of the two films, or a self-standing flexible bag has an expanded bottom of a substantially oval shape. However, most flexible bags have the same spout which is formed in
30 one of corners of a square upper end.

35 In a state where contents are filled in such a flexible bag and the flexible bag is sealed, the spout is formed in a flat structure formed by widely welding an upper end portion of the flexible bag. Therefore, it is possible, when such flexible bags containing contents is packed in a package, that the flexible bags are stacked up in the package with the flat structure bent and superposed. If

the bent structure is thus kept compressed for a relatively long time in the package, it is possible that time longer than that for which the structure has been compressed is necessary for the structure to restore its original shape by resilience. If the bent and compressed portion of the structure corresponds to the spout, the spout remains bent or collapsed in some cases when the spout is opened to pour out the contents. If the flexible bag is compressed to pour out the contents with the spout in a bent or collapsed state, the contents are often discharged in an unexpected direction and the contents cannot be poured toward a desired position.

Some flexible bag formed by superposing two films and welding together the peripheries of the two films, has a relatively wide welded portion, and a spout is formed by securing a non-welded region in the welded portion. Portions of the two films corresponding to the non-welded portion are held close to each other by the agency of the peripheral welded portion when any pressure to pour out the contents contained in the flexible bag is not applied to the flexible bag. When a pressure is applied to the flexible bag to pour out the contents through the spout, the non-welded portions of the two films are separated forcibly from each other to form the spout into a tubular shape, and the contents are discharged from the flexible bag through the tubular spout.

The spout which thus forcibly expanded in a tubular shape by the dynamic pressure of the contents are continuous in the direction of the tubular diameter with the welded portion having a twice thickness as the wall forming the tubular spout. Therefore, if the welded portion has a uneven portion, such as a distorted, curved or bent portion, it is possible that the wall forming the tubular spout and being thinner than the welded portion is collapsed by the uneven welded portion and, even if the tubular spout is not completely collapsed and closed, the effective sectional area of the tubular spout is reduced

and, if the spout is irregularly collapsed, the fluid contents flow in an abnormal mode in which the fluid contents twist through the spout or the pressure of the fluid contents vary as it flows through the spout. Consequently, the fluid contents are discharged in an unexpected direction, sprayed, or sprayed in unexpected directions.

Since the thickness of the wall of the spout is smaller than that of the welded portion contiguous with the wall of the spout, the shape of the tubular spout tends to be subject to the abnormal condition of the welded portion. Since the wall of the spout is weak, a slight deformation of the welded portion will cause the tubular spout to be deformed greatly.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide a bag for sealing fluid contents therein provided with a spout formed in a welded portion thereof, capable of suppressing an influence of the deforming action and its propagation of an external force in the welded portion with the spout so that the spout is maintained in a normal shape when sealing the fluid contents therein, and capable of nullifying deforming action resulting from a structural characteristic of a region of the welded portion around the spout to form the spout into a normal tubular shape when pouring out the fluid contents contained therein so that the fluid matter can be smoothly poured out.

According to one aspect of the present invention, a bag provided with a spout comprising a first member, and a second member partially welded to the first member so as to form a welded portion, and a non-welded portion forming a spout. In this bag, an opening is formed in the vicinity of said spout in the welded portion formed by welding together portions of the first and the second member.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will become more apparent from the following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a sectional view of an upper portion of a bag provided with a spout; and

Fig. 2 is an enlarged front view of an essential portion of the bag of Fig. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figs. 1 and 2, a synthetic resin bag A provided with a spout is formed by welding together edge portions of two synthetic resin films (members). The synthetic resin bag A has a containing portion 1, and a spout 2 connected to the containing portion 1. A portion of the non-welded portion forms a filling-opening 4 connected to the spout 2 and the containing portion 1.

The spout 2 has a pouring end near a corner formed by one end portion of an upper edge of the synthetic resin bag A and an upper end portion of one side edge of the same. In a state before the synthetic resin bag A is opened to use contents contained therein, the pouring end of the spout 2 is closed by a welded portion 5 formed by welding together the two synthetic resin films. A part (welded pouring passage part) around the spout 2 are welded together into one structure to form the spout 2.

Various techniques have been used so that the contents contained in the synthetic resin bag A can be properly poured out when a part of the welded portion 5 closing the pouring end of the spout 2 is cut off to open the spout 2. The mode of discharge of the contents contained in the synthetic resin bag A is dependent on a shape of the spout 2, and a shape of the pouring end of the spout 2 formed by cutting the part of the welded portion 5.

The welded portion 5 is so formed that portions of the synthetic resin films forming the spout 2 come naturally

into close contact with each other to form a simple cap when the synthetic resin bag A containing the residual contents is set upright. The spilling of a large amount of the residual contents from the synthetic resin bag A through the spout 2, the entrance of dust through the spout 2 into the synthetic resin bag A, and the oxidation of the residual contents can be prevented because of forming such a simple cap.

Only if the spout 2 is in a normal state, the portions of the synthetic resin films forming the spout 2 are able to come naturally into close contact with each other to close the spout 2 and the contents can be poured out normally after the part of the welded portion 5 is cut to open the spout 2. The spout 2 can be kept in a normal state if the welded pouring passage part 3, i.e., a welded part around the spout 2 of the welded portion 5 is in a normal state. That is, the spout 2 before being opened is in a normal state if the pouring passage part 3 is in the shape of a straight, flat plate and is not warped, folded, bent or creased at all. While, the spout 2 after being opened is in a normal state if the effective sectional area of the spout 2 is fully available. It is desirable that the spout 2 is in a normal state from the time of filling the contents in the synthetic resin bag A till the time of discharge of all the matter from the synthetic resin bag A.

The present invention enables keeping the welded pouring passage part 3 including the spout 2 in a normal state, i.e., in the shape of a straight, flat plate, without padding the films or without using any additional members.

As mentioned above, the synthetic resin bag A is formed by welding together the two superposed films, wherein the welded portion 5 is formed by welding together edge portions of the two films excluding predetermined non-welded portions. The predetermined non-welded portions include the portion corresponding to the spout 2. The

spout 2 has an inlet end connected to the upper portion of the containing portion 1 which is surrounded by the welded portion 5 and an spouting end closed by a part of the welded portion 5.

5 The spout 2 is formed in the welded pouring passage part 3 formed in one of the upper corners of the synthetic resin bag A where side edges and an upper edge are joined, so that the spouting end is inside the corner. The welded pouring passage part 3 is a part of the welded portion 5.
10 Openings 6 are formed in the welded pouring passage part 3 in the vicinity of the spout 2 without contact of the same.

 It is desirable that by forming the two openings 6 on the opposite sides of the spout 2, respectively, the welded
15 pouring passage part 3 formed in one upper corner of the synthetic resin bag A is divided into three sections which consists of a partial upper side, a partial vertical side, and a partial passage part including the spout 2 positioned in the center thereof.

20 The openings 6 may be formed on either side of the spout 2 or the welded pouring passage part 3 may be provided with three or more openings in the vicinity of the spout 2.

 The openings 6 enable the spout 2 and the welded
25 pouring passage part 3 to be kept in a normal state, that is, a narrow part of the welded portion 5 around the spout 2 and the spout 2 itself are kept in a straight shape.

 Usually, the spout 2 yields to an external pressure applied thereto if the spout 2 has a less durability. The
30 external pressure is applied to the upper edge, the side edge or the corner of the welded pouring passage part 3 in most cases, and is seldom applied to a portion near the corner from one side of two films. If the external force is applied as described above, the welded pouring passage
35 part 3 around the spout 2 is liable to be warped, bent, folded or distorted.

 The external pressure rarely acts directly on the spout

2, but in most cases, acts on the edge portion or the corner of the welded pouring passage part 3. If the edge portion or the corner of the welded passage part 3 is strained, the deformation of the strained portion will be propagated to the spout 2 to deform the spout 2 indirectly. The capability of the spout 2 to remain in a normal state can be greatly improved by intercepting the propagation of the deformation to the spout 2.

After cutting the portion of the welded portion 5 closing the spout 2 to open the spout 2, the containing portion 1 is compressed to pour out the contents contained in the containing portion 1 through the spout 2.

The spout 2 is expanded in a tubular shape by the pressure of the flowing matter. When the pressure of the flowing contents is increased, the sectional area of the tubular spout 2 approaches a full effective sectional area. Since the thickness of the wall forming the spout 2, i.e., the thickness of the film, is half as the welded pouring passage part 3 around the spout 2, the shape of the spout 2 is liable to be affected by deformation of the welded pouring passage part 3. If the welded pouring passage part 3 is strained, warped, bent or folded, the shape of the tubular spout 2 will be deformed and the tubular spout 2 will not be expanded in a full effective sectional area. If things come to the worst, the spout 2 may be closed, collapsed or compressed in a small sectional area, so that the contents cannot be poured smoothly. Since the openings 6 are formed in the vicinity of the spout 2 in the welded pouring passage part 3, the propagation of the deformation of a portion of the welded pouring passage part 3 to the spout 2 is intercepted by the openings 6 and the spout 2 is able to remain unaffected by the deformation.

Thus, the spout 2 can be expanded in the shape of a rigid pipe by the matter being discharged through the spout 2 and is not affected by the deformation of a portion of the welded pouring passage part 3 and, consequently, the matter can be normally poured out through the spout 2 by

the pressure applied to the containing portion 1.

Even when the spout 2 is closed and the contents do not pass through the spout 2, the spout 2 is not affected by the deformation of a portion of the part 3 because the
5 openings 6 can prevent the propagation of the deformation.

The present invention enables keeping the welded pouring passage part 3 including the spout 2 in a normal state, i.e., in the shape of a straight, flat plate, without padding the films or without using any additional
10 members.

Although the invention has been described in its preferred form with a certain degree of particularity, obviously many changes and variations are possible therein. It is therefore to be understood that the present invention
15 may be practiced otherwise than as specifically described herein without departing from the scope and spirit thereof.



THIS SHEET HAS BEEN
REPLACED

-9-

What is claimed is:

1. A bag provided with a spout comprising:
a first member, and
a second member partially welded to the first member so as to form a welded portion, and a non-welded portion forming a spout;
wherein a opening is formed in the vicinity of said spout in the welded portion of the first and second members.
2. The bag according to claim 1, wherein
the first and the second member are flexible, flat members.
3. The bag according to claim 2, wherein
the first and the second member are synthetic resin films.
4. The bag according to claim 2, wherein
the first and the second member are the same in shape and area.
5. The bag according to claim 4, wherein
corresponding edges of the first and the second member are welded together.
6. The bag according to claim 5, wherein
both of the first and the second member have a rectangular shape.
7. The bag according to claim 6, wherein
the welded portion including the spout is formed by welding together corresponding corner portions of the first and the second member.

This Sheet Has Been Replaced





THIS SHEET HAS BEEN
REPLACED

-10-

8. The bag according to claim 1, wherein the spout has a straight shape.
9. The bag according to claim 1, wherein an additional opening is formed, one of the openings is formed on one side of the spout and the other opening is formed on the other side of the spout.
10. The bag according to claim 1, wherein the openings extend along the spout.
11. The bag according to claim 1, wherein a portion of the non-welded portion serves as a containing portion connected to the spout.
12. The bag according to claim 11, wherein a portion of the non-welded portion forms a filling-opening connected to the spout and the containing portion.

This Sheet Has Been Replaced

