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PLASTIC VALVE BAG

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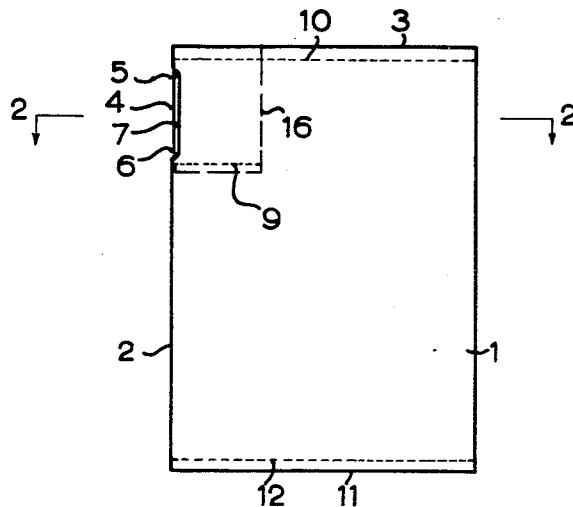


FIG. 1

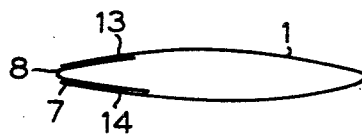


FIG. 2

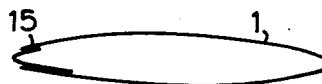


FIG. 3

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PLASTIC VALVE BAG

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6 Claims. (Cl. 229—62.5)

The present invention relates to a valve bag made of organic thermoplastic material and provided with a flap formed of a piece of film heat sealed or welded onto the inner side of the bag behind the filling opening.

After the bag has been filled, the flap is pressed against the wall of the bag by the material contained in the bag, so that a good closure is obtained. There is, however, the drawback that, owing to the pressure exerted by the material, the flap may bulge out through the filling opening and consequently is liable to be damaged, as a result of which the desired closure effect is lost. To avoid this hazard, the known construction of the bag is provided on the outside with a cover strip of strong material which covers the filling opening. As a result of this, however, the bag is much more expensive. Furthermore, owing to this construction the impression is created that the strip should serve as a handle for transporting the bag. The welding seams, however, cannot take such high stresses, so that the bag may tear when transported in this way. Moreover, the welded-on cover strip causes complications when the bag is being filled, in that the filling tube must first be inserted between the strip and the wall of the bag and subsequently be slipped through the filling opening, between the flap and the inner side of the bag, until it reaches into the interior of the bag. This involves the danger that the filling tube may slide over the filling opening when being applied, so that the tube does not reach into the interior of the bag when the filling machine is put into operation, which has many undesirable consequences.

The invention provides a simple and cheap construction which does not possess the abovementioned drawbacks. According to the invention the filling opening is provided in or near the side edge of the bag, and the flap is folded double at this edge, while the edges of the folded parts which are turned towards the end of the bag are welded both to the wall of the bag and to each other, whereas the opposite edges of these parts are welded to the wall of the bag only. Since now the flap is not only fastened to the wall of the bag, but also the folded parts thereof are fastened to each other on one side by the same welding seam, the flap is so tightly fastened in the bag that it is virtually impossible for it to bulge out through the filling opening.

The wall of the known valve bag is slit a certain distance to provide a filling opening, the incision being located between the side edges of the bag and starting at the bag end. This has the drawback that the incision may tear when the bag has been filled. The filling opening according to the invention can be made by cutting an oblong strip with rounded corners from the wall of the bag at the side edge. As a result, tearing of a filled bag is practically out of the question. The closing flap seals the filled bag and also takes the place of the bag wall in the place where it has been cut away to make the opening. As the load acting on the wall of the bag is lower near the side edges than in the vicinity of the middle of the bag, the flap will be sufficiently strong, even if the flap material is thinner than the material of which the bag is made. If necessary, the flap may be thicker at its central portion covering the filling opening than at its edges, so that both a good closure effect and sufficient strength will be guaranteed; in most cases, however, the normal

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film material will be strong enough, so that this is not necessary.

As the bag is in fact provided with two openings, part of the air present in the bag will, when the bag is being filled through one of the openings, be capable of escaping through the other opening. Under certain conditions, for instance when powdery material is being filled into the bag, this may decrease the amount of dust raised. However, in the case of granulated materials containing a smaller amount of dust, such as plastic granules, this additional vent is less important. In this case the folded parts of the flap may be unequal in length, the shorter part being fastened to the wall of the bag by means of a third welding seam connecting the two others.

The invention will be further explained with reference to the exemplary embodiment shown in the drawing, in which:

FIGURE 1 is a front elevational view of a bag according to the invention;

FIGURE 2 is a sectional view of the bag of FIGURE 1, taken on the line 2—2 thereof which extends through the filling opening, and

FIGURE 3 is a sectional view similar to FIGURE 2, showing a modified flap structure.

Referring to the drawings, the bag 1 may be made from a seamless polyethylene tube with a wall thickness of 0.2 mm. In the flat state, the bag may be 45 cm. in width and 65 cm. in height. At the side edge 2 of the bag, and at some distance from the upper end 3, a strip of material has been punched out, so that there is a slot-shaped opening 4 in the wall of the bag. The opening may be for example 140 mm. in height and 20 mm. in width, and located at a distance of 25 mm. from the bag end 3. The ends of the slot are desirably rounded off, as shown at 5 and 6. After the slot has been cut out, a doubled flap 7 with a thickness of, for instance, 0.1 mm. is inserted in the tube in such a way that the folding edge 8 rests against the side edge 2 at the position of the slot 4. The upper edge of the flap coincides with the end 3 of the bag, the lower edge being at some distance below the lower end of the slot. The height of the flap may be, for example, 190 mm. and the total width 400 mm.

The lower edge of the flap is now fastened to the inner wall of the tube by means of a welding seam 9. It must be seen to that these edges of the folded parts of the flap are not welded to each other, for which purpose cellophane, talcum powder, or another separating medium is provided between them during the heat sealing operation. After that, the upper edges of the flap are welded to the bag end 3 and to each other by means of a welding seam 10, so that this end of the bag is closed and the flap is effectively supported and fastened therein. Finally, the lower end 11 of the bag is closed by a welding seam 12. The sequence of these operations may of course be varied.

Between the folded parts of the flap and the inner wall of the bag there are two openings 13 and 14, as indicated in FIGURE 2. To fill the bag, the filling tube is inserted through one of these openings, and the bag is blown up. After that, the material is filled into the bag. A considerable part of the air displaced during filling escapes through the other opening, so that the bag is rapidly emptied of air. When the bag has been filled, the two folded parts of the flap are pushed against the inner wall of the bag by the material, as a result of which the openings are closed and no material can escape from the bag.

The two flap parts may also be unequal in length, as is shown in FIGURE 3. In that case the shorter part may be welded onto the wall of the bag by means of a welding seam 15, so that the interior of the bag can only be reached through one opening. Unequal length of the upper edges of the flap parts has the advantage that in

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welding the seam 10 it is not necessary to bridge at once the whole difference in material thickness in the place where the flap is welded to the bag; this can now be done in two steps. As a result, the quality of the welding seam in the transition points will be increased.

The flap may be made thinner at its edges than in the middle, for instance by stretching the material at the edges or by welding a strip of thinner material onto the edge. In this way, the flap may be made sufficiently strong at the slot 4, while at the same time quite flexible at its ends. Furthermore, the edge 16 of the flap (FIGURE 1), and also the lower edge at 9, may be cut off along an oblique or any other line.

The bag may of course also be made of a flat film, which is transformed into a tube by folding it double and welding the side edges to each other.

The bag described above may serve for packing powdered or granulated material, such as cement, fertilizers, plastic granules, animal feeds, etc., and may be made from homopolymer or copolymer polyalkenes, including polyethylene and polypropylene, and also of mixtures thereof, or of other plastics or mixtures of plastics, such as polyvinyl chloride, and may, if necessary, be reinforced with fibrous materials, such as rayon, glass fiber, nylon, etc. The flap 7 may be made of the same material as the bag, or other plastic material capable of heat sealing to the bag material and to itself.

It will thus be seen that there has been provided by this invention an article in which the various objects hereinbefore set forth, together with many practical advantages are successfully achieved. As various possible embodiments may be made of the several features of the above invention, all without departing from the scope thereof, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawing is to be interpreted as illustrative, and not in a limiting sense.

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What is claimed is:

1. A flat plastic bag comprising two film walls joined to each other along their side edges and heat sealed at both ends, said bag having a filling opening extending along one side edge of the bag near but spaced from one end thereof, and a closure flap inside the bag behind said filling opening, said flap being folded double along the side edge of the bag to form two inwardly extending flap parts, the upper edges of said flap parts being welded to each other and to the bag walls along the near end seal of the bag, the lower edges of said flap parts being welded to the bag walls only.
2. A plastic bag as defined in claim 1, wherein the filling opening is an oblong cutout with rounded corners.
3. A plastic bag as defined in claim 1, wherein the inwardly extending flap parts are unequal in length, and the shorter of the two is welded to the bag wall by a third weld extending between the upper and lower edge welds thereof.
4. A plastic bag as defined in claim 1, wherein the central portion of said closure flap is thicker than the inward edge portions thereof.
5. A plastic bag as defined in claim 1, wherein said bag and flap are both made of polyethylene film.
6. A plastic bag as defined in claim 1, wherein the closure flap is thinner than the film walls of the bag.

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