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2,040,338

VALVE BAG

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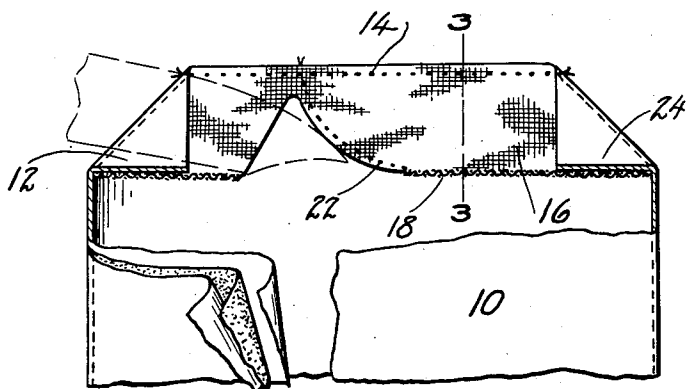


Fig. 1

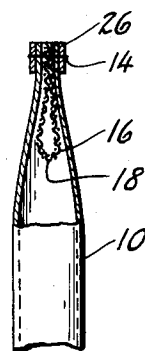


Fig. 3

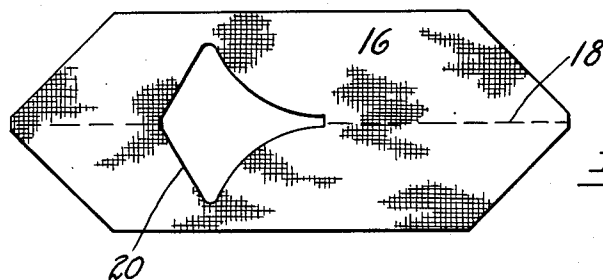


Fig. 2

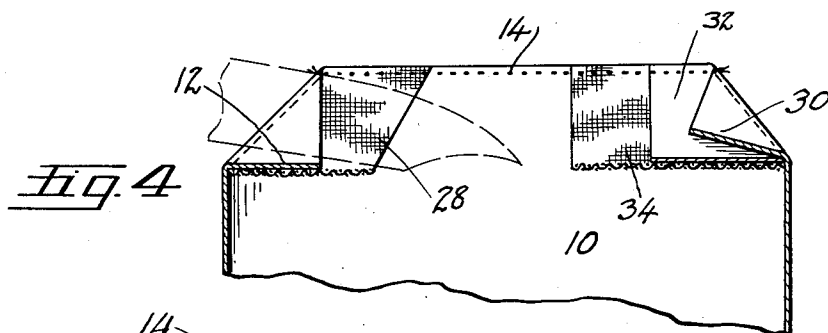


Fig. 4

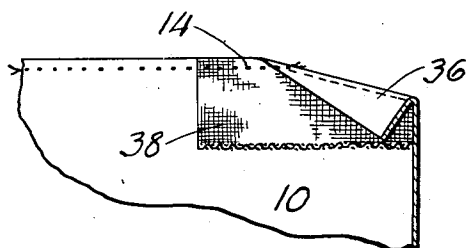


Fig. 5

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VALVE BAG

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10 Claims. (Cl. 150—9)

My invention relates to improvements in valve bags, and particularly to improvements in valve bags of the imperforate waterproof or moisture resistant wall type, the wall of which is substantially impervious to air as well as moisture.

An object is to provide a valve bag which has a wall substantially impervious to air with a suitable air escape valve through which the air within the bag may readily escape during filling of the bag through the valve filler opening.

My improved bag is characterized in that it is provided with a valve controlled filler opening and an air filler escape opening.

As illustrated, my improved bag is provided at one top corner with the valve filler inlet and at the other top corner with the air outlet. The air outlet is controlled by a valve which prevents leakage of the bag contents therethrough while permitting free escape of air therethrough.

An important feature is that my improved bag may be formed of multi-ply paper so treated or characterized in that it is substantially impervious to moisture. This resistance to moisture is generally accomplished in such a fashion, as by the provision of a moisture resistant layer or coating such as an asphalt composition layer or asphalt coated paper layer, that the bag wall is rendered impervious to the infiltration of air therethrough. The material which renders the wall impervious to moisture generally also renders it impervious to air.

My invention consists in the provision in a bag so constructed of an air escape valve through which the air may pass from the interior of the bag outwardly and the bag contents will be retained therein against leakage through such opening.

This object may be attained by folding each upper corner of the bag inwardly to provide at each upper corner a valve opening. A tubular valve element is provided as a continuation of one of these infolded corners. This constitutes the valve filler opening through which the bag contents are poured into the bag. These bags are commonly used in the cement and lime industry wherein the contents are of a powdered character.

The other infolded corner is closed against the escape of the powdered material therethrough by the provision of means which is air permeable to permit the air to escape therethrough to pass out of the bag during the filling of the bag. The air permeable material may itself serve as the valve closure for such corner to prevent escape of the bag contents therethrough, or such in-

folded corner may be so formed as to provide a closure against the outward passage of powdered material while permitting the outward flow of air therethrough. The material associated with the infolded corner to serve this function may be of fabric or other air permeable foraminous material through which the air may readily pass.

Preferably the air permeable layer may be formed of a sheet of fabric which may be secured within the bag at the top between the bag walls, being folded upon itself. It is arranged in such a manner as to form a continuation of each infolded corner providing a valve seal for each corner adapted to prevent the escape of the bag contents while providing an air permeable area through which the air within the bag may be permitted to escape during the filling of the bag.

Other objects, advantages, and meritorious features of my invention will more fully appear from the following description, appended claims, and accompanying drawing, wherein:

Figure 1 is a side elevation of a bag embodying my invention with a portion of its side wall broken away.

Fig. 2 is a plan of one embodiment of an infolded valve strip.

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is an elevation partly in section of a fragment of a bag embodying my invention in a modified form, and

Fig. 5 is an elevation partly in section of a fragment of a bag embodying my invention in a slightly different modified form.

My improvement relates to bags of the valve type and particularly to such a bag the wall of which is moisture proof and as a result of this moisture resistant characteristic is substantially impervious to the passage of air therethrough. Bags of this type are widely used in certain industries to carry powdered material. The bag is filled through the valve filler opening. The material which forms the bag content serves to actuate the valve to seal the opening. It is necessary that the air be permitted to escape as the content material is deposited within the bag. This improvement relates to the provision of means whereby this air may be permitted to escape, which means forms a permanent part of the bag and is in the form of an air release valve.

In the several figures of the drawing the wall of the bag is indicated as 10. One satisfactory wall structure is a laminated paper construction. A multiplicity of plies of tough, strong, paper are used to form the bag wall. One of these plies

may be rendered waterproof by suitable treatment with asphalt, latex, or the like, or such ply may be of some suitable metallic foil which is impervious to moisture. However, the bag wall may be treated to render it water resistant. This treatment generally renders it substantially impervious to air. In the bag structure shown in the several figures the laminated characteristic does not appear in all the figures but it is to be understood that this is a suitable type of construction which might well apply to all the figures but that the improvement is applicable to any construction wherein the major portion of the bag wall is impermeable to air. These bags are commonly formed from a tube or tubes. The tube is cut off in desired lengths and these lengths are stitched together across the ends forming the bags. At one end one corner of the side walls is turned inwardly as at 12 forming a valve filler opening. The side walls are shown at that end as stitched together along the line 14. In several figures here shown there is illustrated in association with this inturned corner 12 suitable flexible valve structure which forms a tubular continuation of the inturned corner 12 and through which a filler spout may be projected to deposit the desired filling material into the interior of the bag, but which functions to seal the valve filler opening against leakage of such material therethrough.

In Fig. 1 a sheet 16 of suitable fabric is provided. This fabric may be cut to the shape shown in Fig. 2. It is folded along the line 18 and the opposite edges are stitched between the two side walls of the bag by the line of stitching 14 so that it is supported to depend within the bag overlying this line of stitching and forms a tubular continuation of the inturned corner 12. This material is cut out as at 20 so that when it is folded there is a notch through which the filler spout may project. The material may then be secured together along the line 22 so that the end of this tubular element opposite the end that is received over the inturned corner 12 is closed. At the opposite corner of this end of the bag the side walls are turned inwardly as at 24 and this folded over fabric cooperates with this infolded corner 24 so as to form a tubular continuation thereof as shown in Fig. 1. The construction also appears in Fig. 3 wherein reinforcement strips 26 may be provided as shown in Fig. 3, if desired.

In this figure of the drawing when the bag is filled air is permitted to pass out through the fabric 16 and out of the inturned corner opening 24, but the fabric is of such a weave that the content material is not permitted to escape there-through.

In Fig. 4 a slightly modified form is illustrated. In this construction the valve structure 28 which is associated with the inturned corner 12 may be formed of any suitable flexible material folded to form a tubular extension of the inturned corner 12 and secured in place within the bag by the line of stitching 14 between the side walls of the bag as illustrated in Fig. 4. In the construction of this figure the opposite corner of the bag is the same and has its side walls infolded as at 30. They are folded at a different angle from the corner 12 so as to indicate to the operator that such corner is an air escape valve rather than a filler valve opening. Associated with this inturned corner 30 is a valve structure 32 which is adapted to seal the opening against the discharge of the bag contents and there is also asso-

ciated therewith a strip of foraminous material 34 which permits air to escape, but which might not of itself be of sufficiently close mesh to wholly avoid the escape of the powdered content of the bag.

In Fig. 5 the illustration shows only the air escape valve. The infolded corner 36 is so folded as to provide an opening of relatively great extent. The foraminous fabric 38 which is secured thereabout is held in place by the line of stitching 14 as hereinabove described with respect to the other constructions. The functioning is the same. In each of the constructions the air escape valve mechanism operates to permit the air to flow outwardly therethrough as the bag is being filled, but to prevent escape of the bag content material therethrough after the bag is filled.

What I claim:

1. A valve bag having a valve filler opening, said bag also provided with an air escape opening, and valve structure associated with said air escape opening formed of a sheet of air permeable foraminous material extending across said air escape opening preventing escape of bag contents adapted to permit the escape of air therethrough while preventing the escape of powdered material outwardly therethrough.

2. A valve bag having its side walls inturned at one end at opposite corners forming valve openings, a sheet of flexible material associated with one inturned corner forming a tubular continuation thereof adapted to seal said corner opening against the escape of powdered material from the interior of the bag outwardly therethrough while permitting filling of the bag therethrough, a sheet of flexible material associated with the opposite inturned corner adapted to seal said corner opening against the escape of powdered material from the interior of the bag outwardly therethrough while permitting free passage of air outwardly therethrough.

3. A valve bag the side walls of which are inturned at one corner forming the valve filler opening, a sheet of flexible material arranged within the bag at such end forming a tubular continuation of such inturned corner providing a valve therefor adapted to prevent the escape of powdered material outwardly therethrough from the interior of the bag, said bag having its side walls inturned at the opposite corner of the same and providing an air escape opening, a sheet of air permeable material closing said inturned corner opening adapted to permit the escape of air outwardly therethrough, said sheet of air permeable material adapted to prevent the passage of powdered material outwardly therethrough from the interior of the bag.

4. A valve bag having its side walls inturned at opposite corners at one end forming a valve opening at each corner, a sheet of fabric folded upon itself and secured between the side walls of the bag within the bag at such end encircling each of said inturned corners forming a closure for one inturned corner adapted to prevent the escape of powdered material outwardly therethrough while permitting air to pass outwardly therethrough, said fabric sheet forming a continuation within the bag of the opposite inturned corner and provided with an opening through which the bag may be filled.

5. A valve bag having its side walls secured together at one end closing the bag at such end except for a short distance adjacent each corner of the bag at such end along which said side walls

are not secured together, said unsecured portions of the side walls folded inwardly at each of said corners forming a valve opening at each corner and folded inwardly at different angles with respect to the end of the bag, one of said valve openings having a greater fold along said secured end than along the side edge of the bag to provide more area for escape of air, and a sheet of air permeable material covering said last mentioned valve opening.

6. A valve bag having its side walls secured together at one end closing the bag at such end except for a short distance adjacent each corner of the bag at such end along which said side walls are not secured together, said unsecured portions of the side walls folded inwardly at each of said corners forming a valve opening at each corner, a sheet of flexible material associated as a tubular continuation of one infolded corner having an opening through which the bag may be filled but adapted to prevent the escape of powdered material outwardly therethrough.

7. A valve bag having its side walls secured together at one end closing the bag at such end except for a short distance adjacent each corner of the bag at such end along which said side walls are not secured together, said unsecured portions of the side walls folded inwardly at each of said corners forming a valve opening at each corner, a sheet of flexible material associated as a tubular continuation of one infolded corner having an opening through which the bag may be filled but adapted to prevent the escape of powdered material outwardly therethrough, a sheet of foraminous material associated with the opposite intumed corner adapted to permit the escape of air outwardly therethrough.

8. A valve bag having its side walls secured together at one end closing the bag at such end except for a short distance adjacent each corner of the bag at such end along which said side walls are not secured together, said unsecured portions

of the side walls folded inwardly at each of said corners forming a valve opening at each corner, a sheet of flexible material permeable to air folded upon itself and extending across the ends of the bag within the bag and secured together between the side walls of the bag between said intumed corner portions and associated at each end with the intumed corner portions, sealing the same against the passage of powdered material outwardly therethrough, said sheet of flexible material having an opening adjacent to but spaced from one intumed corner portion providing an opening through which the bag may be filled.

9. A valve bag having its side walls secured together at one end closing the bag at such end except for a short distance adjacent each corner of the bag at such end along which said side walls are not secured together, said unsecured portions of the side walls folded inwardly at each of said corners forming a valve opening at each corner, a sheet of flexible material permeable to air folded upon itself and extending across the ends of the bag within the bag and secured together between the side walls of the bag between said intumed corner portions and associated at each end with the intumed corner portions forming a tubular continuation thereof, said sheet of material being notched adjacent to one intumed corner portion providing an opening through which the bag may be filled, said material being secured together along the opposite side of the notch closing the opposite intumed corner portion.

10. A valve bag having side walls composed of paper and intumed at two of its corners to form a filler opening and an air escape opening, and air permeable fabric material arranged between said side walls and about said openings adapted to prevent the escape of powdered material from the bag while permitting free passage of air outwardly therethrough.

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