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2,040,335

VALVE BAG

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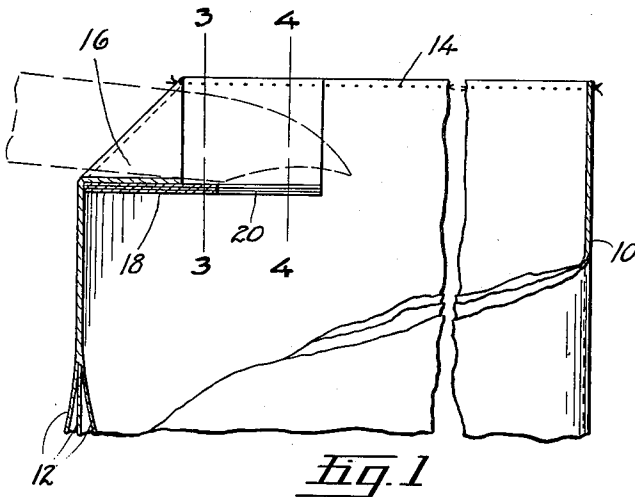


Fig. 1

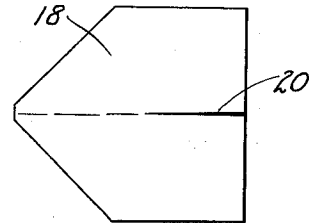


Fig. 2

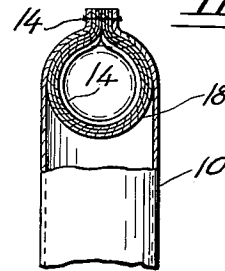


Fig. 3

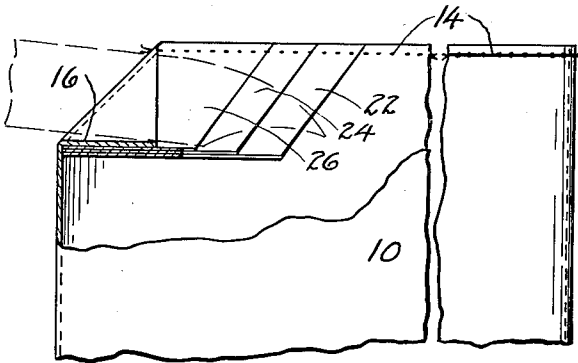


Fig. 5

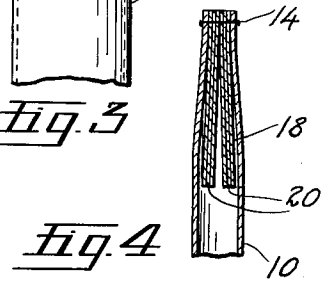


Fig. 4

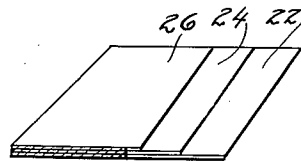


Fig. 6

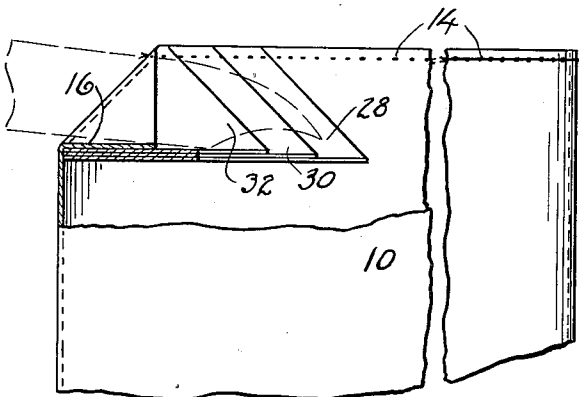


Fig. 8

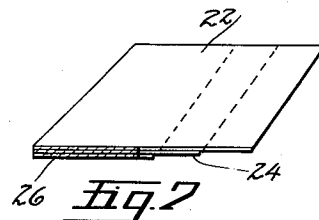


Fig. 7

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VALVE BAG

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Application April 26, 1935, Serial No. 18,311

10 Claims. (Cl. 150-9)

My invention relates to improvements in valve bags and particularly to multi-wall paper bags of the valve type.

5 An object is to provide a bag of this character with a valve controlling the filler opening, which valve is constructed to effectively close the opening against leakage.

10 A further object is to provide a valve bag which may be formed from a tube without wastage of the material and wherein the valve structure is formed of material separate from the material of which the bag walls are formed and is arranged in the shape of a tube to serve as an extension of the valve opening through the bag walls and is adapted to effectively seal such opening under the pressure of the bag contents.

15 In bags of this character the bag walls are generally folded inwardly at one corner to form the valve opening and my improved valve extends interiorly of the bag as a tubular continuation of such opening and to a substantially greater distance than the extension of such infolded corner portions of the bag walls. This valve tube extension is preferably slitted beyond the infolded corner portions of the bag walls to provide a passageway for the discharge of the material with which the bag is filled into the interior of the bag.

20 A meritorious characteristic is the provision of a valve tube structure formed of a plurality of separate individually flexible and individually free laminations of sheet material arranged in overlapping shingled relationship and being individually of different length, and with successive laminations being of successively increased length from the valve opening downwardly within the bag whereby these several laminations are adapted to be individually crumpled against the bag walls to seal the intake opening.

25 Other objects, advantages, and meritorious features of my improved structure will more fully appear from the following specification, appended claims, and accompanying drawing, wherein:

30 Figure 1 is a side elevation of a fragment of a bag partly broken away embodying my invention.

Figure 2 is a plan of the sheet which is used to form the valve in the bag of Fig. 1.

35 Figure 3 is a cross-sectional view taken on line 3-3 of Fig. 1.

40 Figure 4 is a cross-sectional view taken on line 4-4 of Fig. 1.

45 Figure 5 is a side elevation of a fragment of the bag partly broken away embodying my invention in a slightly modified form.

Fig. 6 is a perspective of a slightly modified form of sheet used to make the valve.

Fig. 7 is a perspective of a second modified form of sheet used to make the valve, and

5 Fig. 8 is an elevation of a fragment of a bag partly broken away embodying my invention in a slightly modified form.

10 My invention is adapted for use in bags which are provided with valve openings through which the contents of the bag are deposited within the bag to fill the same. The valve is so constructed that under the influence of the content material it functions to close the filler opening and prevent leakage of the content material. These bags are commonly formed of paper and the paper wall of the bag is generally of a multi-ply character. Bags of this type are widely used in the cement and lime industry and the content material is in a powder form. It is deposited in the bag through filling mechanism which embodies a tubular discharge spout that is adapted to be received through the filler opening. The spout serves to distend the valve structure and the valve structure, which is of a tubular form, closely hugs the outside of the spout so that any appreciable leakage or discharge during the filling operation is not permitted. Ordinarily the air which is within the bag escapes through the paper wall of the bag during the filling of the bag though specific provision may be made for its escape. My improvement is shown in connection with a multi-wall paper bag of the non-gusseted type. The two side walls are fastened together at the bottom of the bag and at the top of the bag and at one corner these side walls are turned inwardly and provided with a valve opening.

35 In the several figures of the drawing the bag wall is indicated at 10. In Fig. 1, 12 indicates a plurality of laminations which go to make up the wall of the bag. In this figure in order to eliminate the showing of a large number of laminations at the valve the bag wall is there illustrated as if it were of a single layer, but it is to be understood that the ordinary practice is to provide a wall of a plurality of layers and this also applies to Figs. 5 and 8. These bags are generally formed from a paper tube which is cut off at suitable lengths and the opposite walls stitched together at the top and bottom to form the bag. The upper portion only of the bag is here shown but the construction of the lower half is the same except that the upper half is provided with the valve opening which is omitted from the lower half. It is conventional practice which is well understood.

In the figures of the drawing the two side walls are shown as secured together along the end by a line of stitching 14 and at one corner these side walls are turned inwardly as at 16 providing a valve control filler opening through which a spout of a suitable filling machine may be inserted. This spout is shown in dotted outline in Figs. 1, 5 and 8.

The inturned corner portion 16 of the side walls are relatively stiff due to the fact that the bag walls are formed of several laminations of strong tough paper suitable for carrying a substantial weight. My invention resides in the provision of auxiliary means which is secured within the bag in the described relationship with the inturned corner portion 16 and which serves to seal the valve filler opening against the escape of the content material of the bag. This valve structure is formed of a suitable sheet or sheets of flexible material, such as paper, which may have the general shape shown in Fig. 2 wherein one sheet is indicated as 18. This sheet of material is folded upon itself and its two edges are brought together between the upper edges of the side walls of the bag and stitched in place therebetween by the line of stitching 14. This sheet is so disposed within the bag that it freely encircles the inturned corners 16 as shown in Figs. 1, 5, and 8.

This valve structure is formed of a plurality of individually separate, superimposed, flexible sheets 18 which form a multi-wall valve structure wherein each of the several laminations is individually free and individually flexible so that they serve to be easily crumpled or crushed against the side walls of the bag to block escape of the bag content through the filler opening. The manner in which valve structures are crushed against the side walls of the bag by the action of the contents thereof, so as to close the filler opening, is well understood as the art has been extensively developed and there is no illustration showing this well understood functioning. Fig. 3 shows the valve distended with the filler spout therein and Fig. 4 shows the bag emptied with the valve structure as it might then be disposed.

Preferably the valve structure extends into the bag a substantial distance beyond the end of the inturned corner portion and is slitted as at 20 for a portion of its length spaced inwardly from the inturned corner 16 to permit the discharge of the content material into the interior of the bag. In Fig. 1 three layers or laminations of the tubular valve structure are shown. Each of these laminations is free and independent from the other and each is formed of a flexible sheet so that individually they may respond to be crushed against the side walls to seal the valve opening against leakage and will respond much more easily than if the three laminations were integrally connected. They possess substantially a greater degree of flexibility than the inturned corner portion 16 of the bag walls.

In Figs. 5 to 8, inclusive, the several layers which make up the valve per se are shown as being of different length and as arranged in an overlapping shingled relationship. These layers are indicated in Fig. 5 as 22, 24, and 26. In this structure the two longer layers only are slitted and the longest layer is arranged underneath so that it would tend to be crushed upwardly over the two innermost layers to form an effective closure and the valve structure itself is increasingly flexible from the inturned corner portion interiorly of the bag. This type of shingled over-

lap is shown in Fig. 6 where the same layers are similarly numbered.

Fig. 7 illustrates a reversal of the construction of Fig. 6 with the longest layer being arranged on top instead of on the bottom. Fig. 8 illustrates a slightly modified form of construction wherein the valve structure is cut on an angle as shown which increases the tendency to readily crush against the side walls of the bag to seal the filler opening. In this construction each of the layers is slitted, though to different lengths, and the layers are indicated as 28, 30, and 32.

In this type of structure there is no wastage of material in the manufacture of the bags due to the fact that the bag tube from which sections are severed to form the bags may be cut straight across. The valve structure is formed of separate pieces which are secured in place as shown. The tubular valve element forms an extension of the inturned corner portion of the bag and telescopes at one end thereof but is supported entirely from the line of stitching which secures the side walls of the bag together. It is highly flexible but readily deformed to seal the valve filler opening. In the preferred form it is increasingly flexible as it extends from the inturned corner portion of the bag interiorly thereof.

What I claim:

1. A valve bag having its opposite side walls secured together along one end except for a short distance at one corner, said side walls inturned at such corner providing a valve opening, a sheet of material folded upon itself and having its juxtaposed edges secured together between said side walls by the line of securement thereof forming a tube depending within the bag and extending along said end and having one end telescoped over said inturned corner but being free therefrom, said tube being slitted lengthwise along its lower edge spaced from the valve opening to permit the discharge of content material through the valve opening and directly into the interior of the bag.

2. A valve bag having its side walls inturned at one corner forming a valve opening, a valve tube secured within said bag to form a tubular extension over said opening and itself formed of a plurality of superimposed individually free and individually flexible laminations, said laminated tube being slitted lengthwise along its lower edge spaced from the valve opening.

3. A valve bag having its side walls inturned at one corner forming a valve opening, a valve tube secured within said bag to form a tubular extension over said opening and itself formed of a plurality of individually flexible laminations arranged in shingled overlapping relationship with the individual laminations having individually different tubular lengths.

4. A valve bag having its side walls inturned at one corner forming a valve opening, a valve tube secured within said bag to form a tubular extension over said opening and itself formed of a plurality of individually flexible laminations arranged in shingled overlapping relationship with successive laminations being of successively increased tubular length.

5. A valve bag having its side walls inturned at one corner forming a valve opening, a valve tube secured within said bag to form a tubular extension over said opening and itself formed of a plurality of individually flexible laminations arranged in shingled overlapping relationship with successive laminations being of successively increased tubular length from the interior of the

laminated tubular extension downwardly within the bag.

5 6. A valve bag having a filler opening on one side adjacent to the corner of the bag, a valve tube arranged within the bag forming a tubular extension of said opening and comprising a plurality of laminations of sheet material arranged in superimposed shingled relationship, the several laminations being individually flexible and
10 of relatively varying length.

7. A valve bag having a filler opening on one side adjacent to the corner of the bag, a valve tube arranged within the bag forming a tubular extension of said opening and comprising a plurality of laminations of sheet material arranged
15 in superimposed shingled relationship, the several laminations being individually flexible and of relatively varying length, and the lamination of greatest length being slitted lengthwise along its lower edge spaced from the filler opening.
20

8. A valve bag having its side walls inturned at one corner forming a valve opening, a valve tube secured within said bag to form a tubular extension over said opening and itself formed of a
25 plurality of individually flexible laminations arranged in shingled overlapping relationship with certain laminations being slitted for a portion of

their length from the end within the bag toward the valve opening.

9. A valve bag having its side walls inturned at one corner forming a valve opening, a valve tube secured within such bag to form a tubular
5 extension of such opening and received at one end over said inturned corner, said valve tube comprising a plurality of individually flexible laminations arranged in shingled overlapping relationship, the successive laminations from the interior
10 of the tube downwardly within the bag being of successively greater length, and the lamination of greatest length being provided with an opening along its lower edge adjacent to but spaced inwardly from the end of the inturned corner of
15 the bag.

10. A valve bag having its side walls inturned at one corner forming a filler opening, a sheet of flexible material folded upon itself and secured
20 within the bag surrounding said inturned corners of the bag side walls and projecting interiorly of the bag as a tubular extension of said filler opening, said tubular extension having a thickness at its end spaced interiorly from said inturned
25 corner substantially less than its thickness adjacent to said corner.

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