April 15, 1930. J. C. REDINGTON 1,754,769

VALVE BAG AND METHOD OF MAKING THE VALVE

Filed March 9, 1928 2 Sheets-Sheet 1

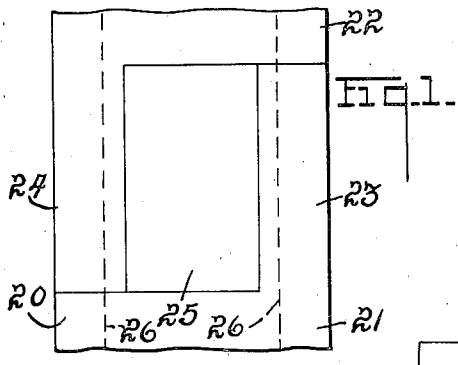


FIG. 1.

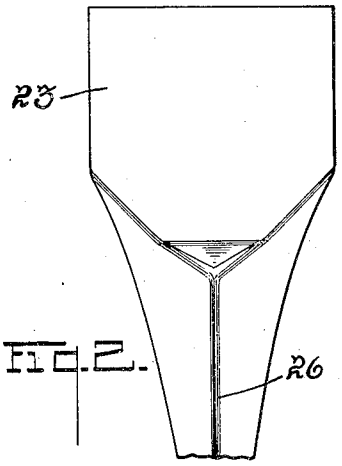


FIG. 2.

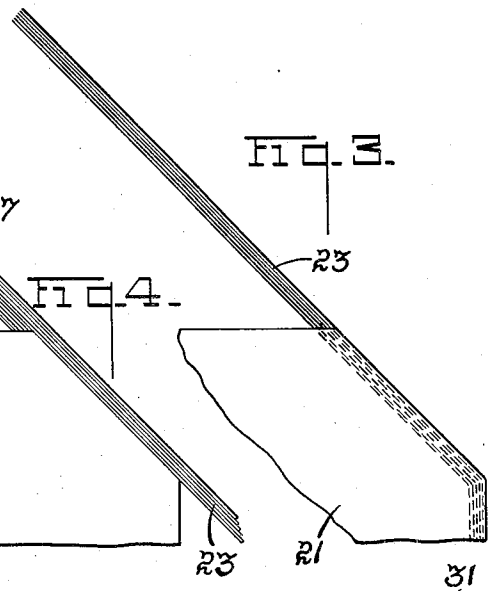


FIG. 3.

FIG. 4.

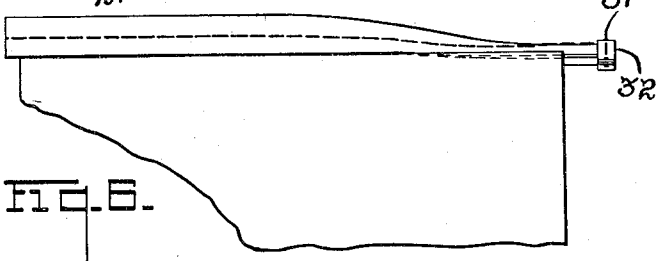


FIG. 6.

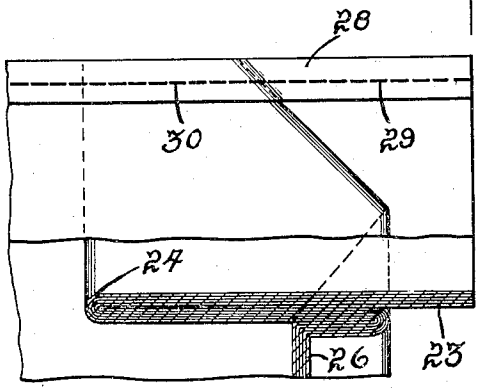


FIG. 5.

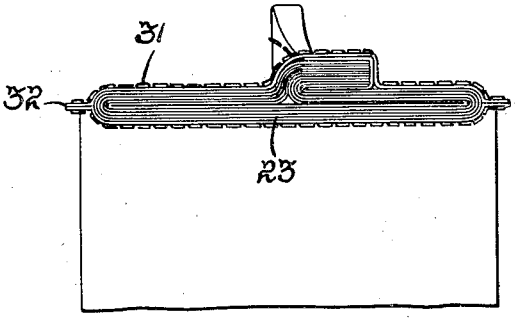


FIG. 7.

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April 15, 1930. J. C. REDINGTON 1,754,769

VALVE BAG AND METHOD OF MAKING THE VALVE

Filed March 9, 1928 2 Sheets-Sheet 2

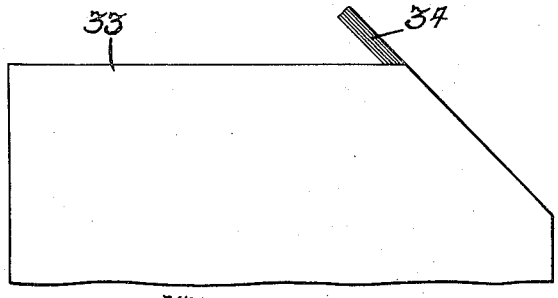


Fig. 8.

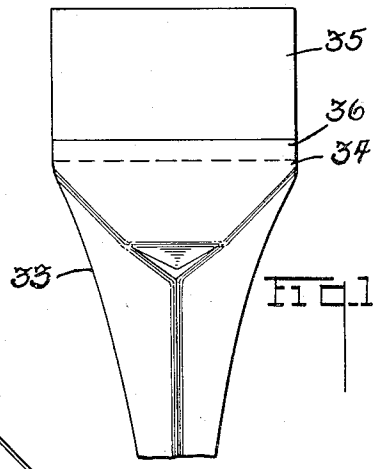


Fig. 10.

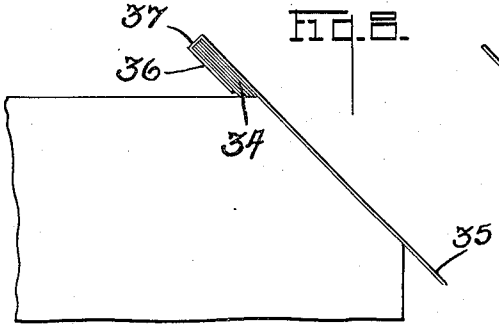


Fig. 11.

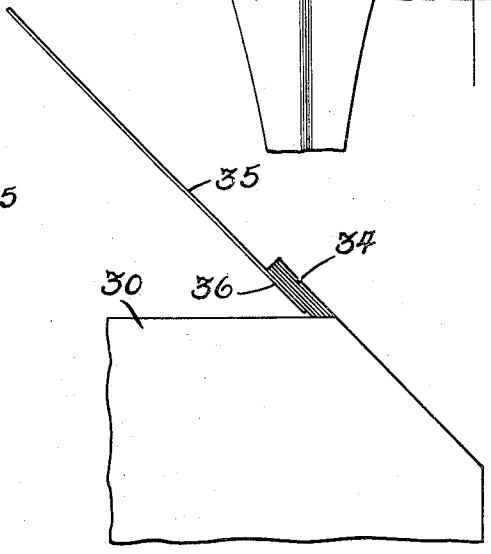


Fig. 9.

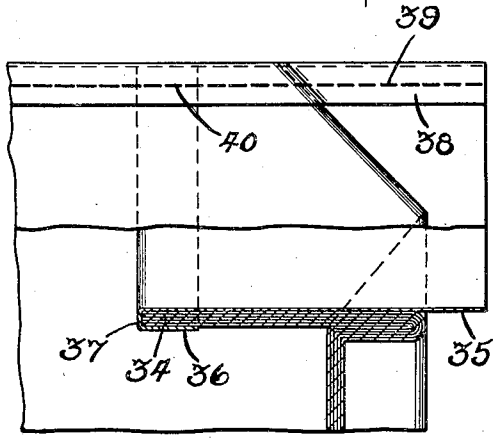


Fig. 12.

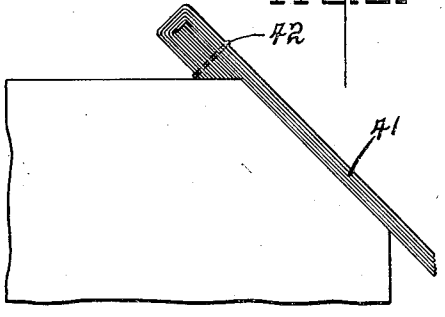


Fig. 13.

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UNITED STATES PATENT OFFICE

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VALVE BAG AND METHOD OF MAKING THE VALVE

Application filed March 9, 1928. Serial No. 260,437.

This invention relates to a valve bag and a method of making the valve. The details and objects of the invention will appear as the description proceeds.

In the accompanying drawings forming a part of this specification, Figure 1 is a diagrammatic view showing the manner in which a bag tube is cut to form blanks for bags in accordance with this invention; Fig. 2 is an edge view of a bag blank such as shown in Fig. 1, with the valve corner of the bag spread apart; Fig. 3 is a view of the valve corner of a bag looking at it from the left of Fig. 2; Fig. 4 is a view similar to Fig. 3, but showing another step in the formation of the valve; Fig. 5 is a view of the corner of a bag having the valve complete, partially broken away to show the lower portion of the valve; Fig. 6 is a view of the valve end of the bag after filling and closing; Fig. 7 is a side view of the valve end of a filled and closed bag viewed from the right of Fig. 6; Fig. 8 is a view similar to Fig. 3, but showing a bag blank with a shorter valve extension; Fig. 9 is a view similar to Fig. 8, showing a supplemental extension attached to the original valve extension of the bag; Figs. 10 and 11 are views similar to Figs. 3 and 4, but showing the modified form of valve extension; Fig. 12 is a view similar to Fig. 5, but showing the modified form of valve extension; Fig. 13 is a view similar to Fig. 9, but showing a multi-ply valve extension attached by sewing.

In Figure 1 there is shown a portion of a bag tube 20 cut so as to form the valve ends of two bag blanks 21 and 22. The cut is so formed as to leave comparatively long valve extensions 23 and 24 on the bag blanks, there being a rectangular piece 25 cut out from between these valve extensions. Gusset-folds on the two sides of the tube are indicated by dotted lines 26.

A valve such as is disclosed in Fig. 5 may be formed from this blank in various ways, but one convenient method is illustrated in Figs. 2, 3 and 4. First the gusset-fold adjacent the valve extension is spread apart, and the corner of the bag spread along diagonal lines so as to spread the extension out as a flat sheet extending diagonally from the valve corner of the bag towards the axial line of the bag, as shown in Figs. 2 and 3. Thereafter, the valve extension may be folded at 27 so that its free end extends outward beyond the edge of the bag. Thereafter the valve extension is folded inwardly and down along its median line and the sides of the bag are collapsed thereon so as to form the valve shown in Fig. 5. After the bag is folded into this shape, a reinforcing tape 28 is folded over the end of the bag and extended over the edges of the valve extension. Then a seam 29 is sewed through the tape and the intervening bag walls and bag extension. It will be readily seen that the folded valve extension will be sewed into the seam between the bag walls at 30, thereby forming a very strong seam at this point.

This type of valve might be formed in a single walled bag, but it is particularly adaptable to multi-wall bags. In the example shown, five thicknesses are illustrated by way of example. Of course, the relative thickness of the layers is exaggerated for purposes of illustration.

The bag is designed to be filled by a filling tube which is normally horizontal. The valve is thrust over the filling tube and at least part of the weight of the bag is suspended upon the tube. At this time the greatest strain on the bag comes at the point 30 where the bag is suspended from the filling tube, and a bag is liable to tear at this point unless especially strengthened. The form of bag shown will be very strong at this point. If it is a five wall bag, there are thirty plies sewed in between the opposite edges of reinforcing strip 28, at the point 30 where the greatest strain is applied.

When the bag is filled, gusset-fold 26 is straightened out, and after the bag is removed from the filling tube the end of the filled bag is square, as indicated in Fig. 6, and this results in spreading the valve extension 23 horizontally as shown in Figs. 6 and 7 instead of vertically, as shown in Fig. 5. The valve extension protruding beyond the edge of the bag may then be closed by a seam 31 reinforced by tape 32, if desired.

Normally there is no great strain on this closed end of the bag as the projecting inner portion of the valve substantially closes the bag. However, especially where the valve opening is comparatively large and the contents of the bag flow readily, the additional closure represented by 31 may be advantageous. This valve extension may be closed by any other convenient means, if desired, as by tying or stapling, for example.

In the modified form shown in Figs. 8 to 12, a bag blank 33 is shown similar to blank 20, except that valve extension 34 is much shorter than valve extension 23. This avoids the waste of as large a rectangle 25 as is necessary with the long valve extension shown in Fig. 1.

After valve extension 34 is straightened out as shown in Fig. 10, a supplemental extension 35 may be pasted to the extension 34, as indicated at 36. Preferably, supplemental extension 35 is pasted to the inside of extension 34, so that when the supplemental extension is folded downward as shown in Fig. 11, it folds over the ends of the plies of extension 34, as shown at 37. This prevents any material from entering between the plies of extension 34 after the bag is filled.

If desired, supplemental extension 35 may be folded along line 37 to hook form and hung over extension 34, as shown in Fig. 11, without being attached otherwise to extension 34. After the supplemental extension has been placed in the position in which it is shown in Fig. 11, the valve may be folded in as previously described, and thereafter the end of the bag is closed by a reinforcing tape 38 and seam 39. In this form the corner seam of the bag is reinforced not only by extension 34, but also by both folds of extension 35 at point 40.

It will be readily understood that a valve so formed may be left open after filling where the size of the valve or the character of the material renders the normal closing of the valve along line 37 rigidly secure; but where supplemental closure is needed the outward extending portion of the valve may be closed by sewing, tying, stapling or any other convenient means.

Where the type of bag shown in Figs. 1 to 7 and that shown in Figs. 8 to 12 are being made, it is sometimes advantageous to proportion the parts so that a sheet cut from rectangle 25 shown in Fig. 1 may be used as the valve extension 35 shown in Figs. 9 to 12.

In Fig. 13 there is shown the use of a multiply extension 41, similar to the extension 35, except that it is made of a plurality of sheets of paper. These may be sheets cut from rectangle 25, if desired. Attaching such a multi-ply extension by means of adhesive results in an objectionable stiffening of the line of attachment, and, therefore, it is preferable to secure the extension in place by a sewed seam 42, stapled or similar means that will not objectionably stiffen the line of attachment. When a sewed seam is employed, the ends of which are caught in the bag-closing seam, the bag is further strengthened at this point by that seam; and it will be noted that when an extension is fastened in place as indicated in Fig. 13, there will be in the bag-closing seam above the inlet opening the side walls of the bag, two layers of the integral valve extension of the side walls and four layers of the added valve extension. If each is of five ply, this will make a total of forty plies of paper in the closing seam at this point, as well as the ends of seam 42.

It will be obvious that between cuts such as shown in Fig. 1, the tube 20 is cut off squarely to form the bottoms of the bags, the bag length 22 thus formed having its extension 24 folded in in the same manner as extension 23. When the parts are properly proportioned and the paper cut from rectangle 25 is used as extensions 35 or 41, there is little waste.

While a one ply extension 35 is shown in Figs. 9 to 12, and a five ply extension is shown in Fig. 13, it will be understood that a greater or less number of plies may be used if desired.

In some cases it may be found preferable to omit attaching seam 42 and merely fold the end of extension 41 and hook it into place and depend upon the bag-closing seam to secure the extension in position.

While some variations of the invention have been described, it will be readily understood that other obvious changes may be made within the scope of the appended claims.

What I claim is:

1. A valve bag having a valve-forming flap folded on a transverse line and doubled back on itself and folded on a median longitudinal line and the folds tucked in between the bag walls and forming an inwardly extending valve and the end of the flap extending outward.

2. A valve bag having a valve-forming flap folded on a transverse line and doubled back on itself and folded on a median longitudinal line and the folds tucked in between the bag walls and forming an inwardly extending valve and the end of the flap extending outward beyond the side of the bag.

3. A valve bag comprising a tubular portion having one corner folded in to form an inlet opening and a valve-flap extending from the folded-in corner, said flap having its end extending outward through said opening.

4. A valve bag comprising a tubular portion having one corner folded in to form a filling opening, a seam closing the end of the bag except for said opening, and a valve-flap extending from the tucked-in corner, the end of the flap extending outward through

said opening and the sides of the flap being caught in said seam.

5. A valve bag comprising a gusset-folded tube having the end of a gusset folded in to form a filling opening and having a valve extension on the end of said gusset, said extension being folded and having its end extending outward through said opening.

6. A valve bag comprising a gusset-folded tube having the end of a gusset folded in to form a filling opening, a seam closing the end of the tube except for said opening, and a valve flap extending from the tucked-in end of the gusset, the end of the flap extending outward through said opening and the edges of the flap being caught in said seam.

7. A valve bag comprising a tube formed of a plurality of relatively movable layers of paper, one corner of the tube being folded in to form a filling opening, and a valve flap extending from said folded-in corner, said flap preventing the entrance of material from within the bag between the layers of the bag-wall at the folded-in corner, and the end of the flap being directed outward through said opening.

8. A valve bag comprising a tube formed of a plurality of relatively movable layers of paper, one corner of the tube being folded in to form a filling opening, a seam closing the end of the tube except for said opening, and a valve flap extending from said folded-in corner, said flap preventing the entrance of material from within the tube between the layers of the wall at the folded-in corner, and the end of the flap being turned outward through said opening and the edges of the flap being caught in said seam.

9. A valve bag comprising a tube formed of a plurality of relatively movable layers of paper, one corner of the tube being folded in to form a filling opening, and the inner layer having a valve flap extending from the folded-in corner thereof, said flap being folded over the outer layers of the wall and having its end directed outward through said opening.

10. A valve bag comprising a tube formed of a plurality of relatively movable layers of paper, one corner of the tube being folded in to form a filling opening, and the layers of the wall being extended at said folded-in corner and the extensions being turned with their ends directed outward through said opening.

11. A valve bag comprising a tube formed of a plurality of relatively movable layers of paper, one corner of the tube being folded in to form a filling opening, a seam closing the end of the tube except for said opening, and the layers of the wall being extended at said folded-in corner and the extensions being folded and having their ends extending out through said opening and their sides caught in said seam.

12. The method of forming an inlet opening for a bag, which consists in forming a tube with an extension from one corner thereof, spreading said corner and flattening said extension, folding the extension about a transverse line, and then folding the extension on a median longitudinal line and tucking it in between the walls of the bag to form a filling opening.

13. The method of forming an inlet opening for a bag, which consists in forming a tube with an extension from one corner thereof, spreading said corner and flattening said extension, folding the extension about a transverse line, and then folding the extension on a median longitudinal line and tucking it in between the walls of the bag to form a filling opening with its end extending outward and its sides substantially parallel with the end of the tube, and sewing a seam across the end of the tube and through the sides of said extension.

14. The method of forming an inlet opening for a bag, which consists in forming a tube of a plurality of layers of paper and having the layers extended at one corner to form a valve flap, spreading said corner to flatten the flap, folding the flap along a transverse line, folding the flap along a median longitudinal line and tucking it in between the bag walls to form an inlet opening, with the ends of the several layers of the flap extending outward through the opening and with their edges substantially parallel with the end of the tube, and sewing a seam across the end of the tube and along the edges of the flap, the folds being made so that the edges of the flap doubled on itself extend for a ways between the walls of the bag along the line of the seam.

15. The method which consists in cutting a bag tube along zigzag lines to form a rectangular extension from the adjacent portions of the tube on opposite sides thereof and a rectangular cut out portion between said extensions of substantially the same size as said extensions, cutting the tube at other points with comparatively short extensions from the opposite sides of the tube attaching said cut out rectangular portions to said comparatively short extensions and thereby making them of substantially the same length as the first extensions, and thereafter folding and positioning the extensions to form filling sleeves for bag ends.

In testimony whereof, I have hereunto signed my name to this specification.

JOHN C. REDINGTON.