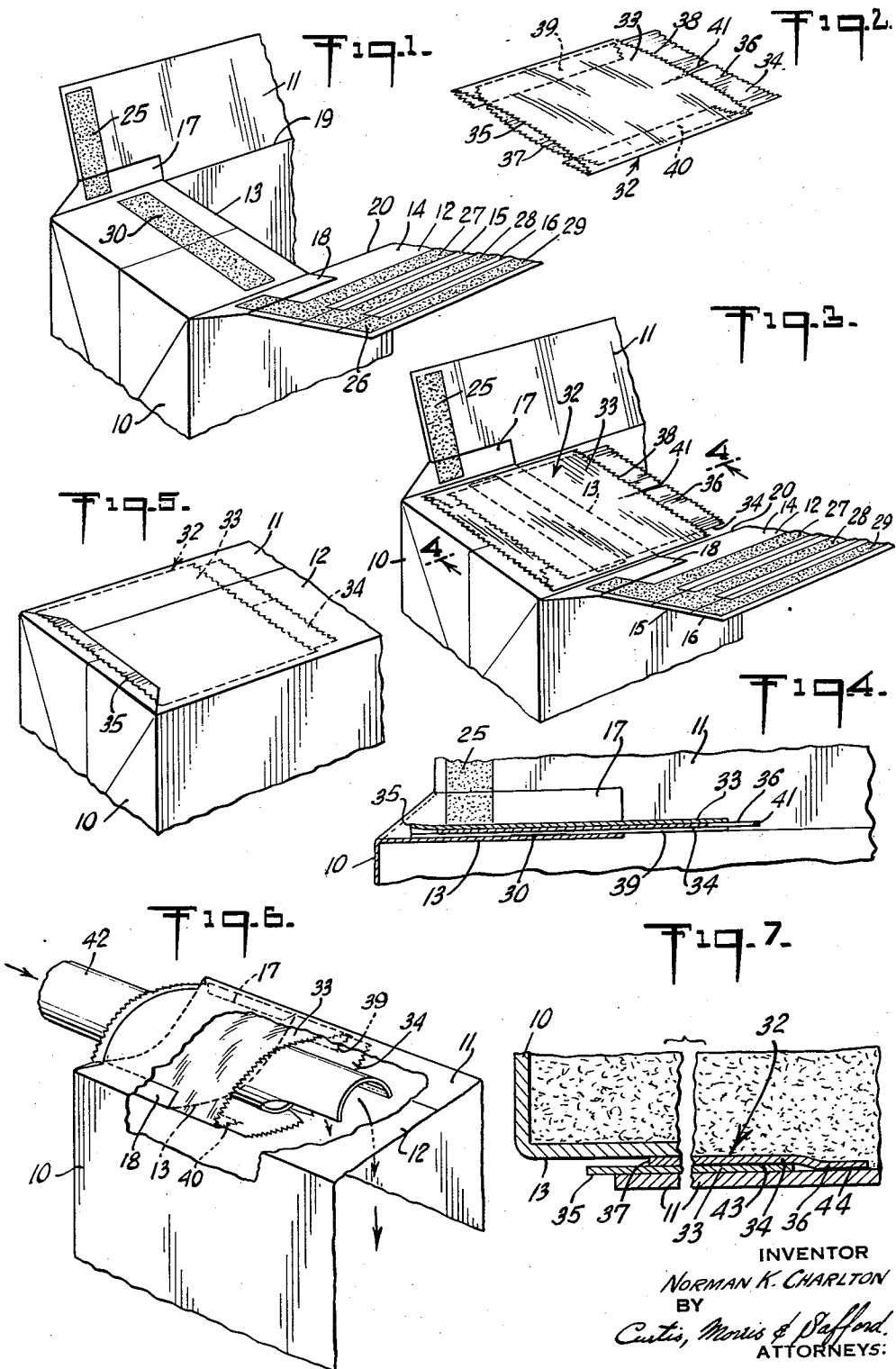


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VALVE SLEEVE FOR BAGS

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1

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VALVE SLEEVE FOR BAGS

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The present invention relates to bags of the type having a valved opening through which the bag is filled and more particularly to a flexible sleeve attached to and forming an extension of the valve.

Paper bags having valved filling openings are in common use for packaging bulk materials. Such bags are made of a tough and strong paper or other fibrous material, and usually have walls comprising multi-ply layers of paper to increase their strength. The bags are used for packaging many kinds of bulk materials such as, cement, fertilizer, feed grain, flour and the like and are filled by inserting a nozzle through the filling opening and blowing the material therein. When the bag has been filled, the nozzle is withdrawn and the valve flaps at the sides of the opening are automatically closed by the material in the bag.

Valve sleeves of a relatively thin, flexible paper also have been used to insure a tight closure of the filling opening and prevent material from sifting through the valve. Such valve sleeves are attached to and extend beyond the valve flaps. The sleeves are usually made of a single sheet of paper folded to form a tube and adhesively secured to the valve flaps. When valve sleeves are used with bags having pasted ends, the sleeve is adhesively secured between the overlapping pasted flaps of the bag. One common type of sleeved valve has the outer end of the sleeve located at the outer end of the filling opening and the opposite end of the sleeve projecting into the closed bag. The opposite sides of the inwardly projecting end of the sleeve of relatively thin paper are more apt to flex into sealing engagement with each other and seal the filling opening than the valve flaps of the thicker and stiffer paper material forming the side walls of the bag.

In order to fill a bag of the kind described, it is necessary for the attendant to spread the opposite flaps of the valve and sleeve attached thereto before he can insert a nozzle through the filling opening. As the ends of the opposite sides of the sleeve overlie each other, the attendant may have difficulty in separating them and especially so if he is wearing gloves. Thus, bags having valve sleeves are sometimes a nuisance in the filling operation and require the time and attention of the attendant.

One of the objects of the present invention is to provide a valve sleeve in a bag of the type indicated which facilitates the separation of the valve flaps for the insertion of a filling nozzle.

Another object is to provide a valve sleeve of the type indicated which provides a double seal for reducing the possibility of any material sifting from the bag.

Another object is to provide a valve sleeve of the type indicated in which one side projects beyond the other side at each end to facilitate the insertion of a filling nozzle and provide an additional seal of the filling opening.

Still another object is to provide a valve sleeve of the type indicated which is of simple and compact construction, economical to manufacture and reliable in operation.

These and other objects will become more apparent from the following description and drawing in which like reference characters denote like parts throughout the several views. It is to be expressly understood, however, that the drawing is for the purpose of illustration only and is not a definition of the limits of the invention,

2

reference being had for this purpose to the appended claims.

In the drawings:

FIGURE 1 is a perspective view of a portion of a partially formed bag of the pasted end type and showing the relationship of the end and side flaps;

FIGURE 2 is a perspective view of a valve sleeve of two piece construction having offset ends;

FIGURE 3 is a view similar to FIGURE 1 showing the valve sleeve in position on the inwardly folded end flap of the bag;

FIGURE 4 is a sectional view taken on line 4-4 of FIGURE 3 to show the offset relationship of the ends of the upper and lower parts of the sleeve;

FIGURE 5 is a view similar to FIGURE 1 showing the side flaps of the bag folded into overlying relationship and the forwardly projecting edge of the upper part of the valve sleeve;

FIGURE 6 is a perspective view of the closed bag partly in section to show how the nozzle is inserted through the sleeve to fill the bag; and

FIGURE 7 is a sectional through an end of the filled bag to show the double seal of the valve sleeve with the bottom of the bag and opposite side of the sleeve, respectively.

FIGURE 1 illustrates a conventional bag 10 of the pasted end type to which the sleeve of the present invention is applied. Such a bag is made from a single sheet or a plurality of sheets of paper by conventional machines which fold the opposite edge portions of the sheet or sheets into overlapping relationship and adhesively secures the overlapping edges to form a continuous tube. The paper tube so formed is folded flat and sections of the tube corresponding to the length of the bags to be formed are severed successively from the tube. The opposite ends of each severed bag section are then cut, folded, and pasted to form closed boxed ends which fold against the side of the bag. In the illustrated embodiment the bag 10 is a multiwall type comprising a plurality of superimposed layers of paper.

The end structure at each end of the bag is formed by cutting the wall on spaced lines extending axially from each end of the tube to form opposite side flaps 11 and 12 and end flaps 13. Only one end flap 13 is illustrated in FIGURE 1, but it will be understood that a similar end flap is provided at the opposite side of the bag. As will be observed by reference to FIGURE 1, the different plies 14, 15 and 16 of the multi-ply bag wall are cut at progressively shorter lengths from the outer to the inner plies on the flap 12 to provide a tapered flap. Also, the ends of the tube are so cut and the end flap 13 so folded inwardly on a line below the ends of the cuts forming the flaps 11, 12 and 13 as to provide short folds 17 and 18 at each side of the end flap 13 which overlie the side flaps 11 and 12 and provided inclined folded edges extending from the corners of the end flap to the edges of the side flaps 11 and 12. Thus, when the side flaps 11 and 12 are folded on the lines 19 and 20 to overlie the end flap 13 in overlapping relationship the short folds 17 and 18 on the end flaps which fold inwardly with the side flaps provide webbed corners to prevent material from sifting therefrom.

Bands of adhesive paste 25 and 26 are applied across the flaps 11 and 12 and bands of adhesive 27, 28 and 29 are applied to the edges of each of the plies 14, 15 and 16 along the flap 12. A band of adhesive 30 also is applied across the end flap 13 inwardly of the bands 25 and 26 on flaps 11 and 12. Thus, when the flap 11 is folded over the flap 13 and the flap 12 is folded over the flap 11, the bands of adhesive 25 to 30 on the respective

flaps engage adjacent flaps to seal them together in a partial diamond fold closure, as illustrated in FIGURE 5. With such an end closure construction, the material in the bag is prevented from sifting between the overlying pasted flaps 11, 12 and 13 and the short folds 17 and 18 on the end flap 13 overlying the side flap 17 and 18 prevents sifting of the material at the corners.

In accordance with the present invention a sleeve 32 of thin, flexible material is provided between the end flap 13 and overlying side flaps 11 and 12 at one corner of the bag. The sleeve 32, as illustrated in FIGURE 2, has opposite sides 33 and 34 so formed as to provide a continuous tubular liner between the overlapping flaps 11, 12 and 13 to which it is attached by the adhesive bands 25, 26 and 30. One of the opposite sides 33 and 34 of the sleeve 32 extends beyond the other side at least at one end of the sleeve. Preferably, the side 33 of the sleeve 32 adjacent the flap 11 extends beyond the side 34 adjacent the flap 13 to provide an outwardly projecting tab 35 adapted to be easily grasped by the fingers independently of the side 34, and the side 34 adjacent the flap 13 projects beyond the end of the side 33 to provide an extension 36 for sealing engagement with the flap 11.

In the illustrated embodiment, the sides 33 and 34 comprise separate sheets of the same length, but offset from each other. Thus, they end forming the finger gripping tab 35 of the sheet 33 projects beyond the end 37 of the sheet 34 and the end forming the extension 36 of sheet 34 projects beyond the end 38 of the sheet 33. Sheet 34 is of a width corresponding to the width of the valved opening, but sheet 33 is of greater width with its side edges 39 and 40 folded over the side edges of the sheet 34 to form a unitary sleeve 32. The assembled sleeve units 32 of offset sheets 33 and 34 are adapted to be fed between the closure flaps 11 and 13 of partially formed bags by sleeve feeding apparatus as disclosed in the pending application for United States Letters Patent of George W. Mossor, Serial No. 676,342, filed August 5, 1957. The rearwardly projecting extension 36 of sheet 34 is also slit longitudinally at 41 to increase its flexibility.

The sleeve 32, illustrated in FIGURE 2, is positioned on the inwardly folded end flap 13, as illustrated in FIGURE 3, so that the end of sheet 34 overlies the band of adhesive 30 with the finger gripping tab 35 of the sheet 33 projecting forwardly beyond its end 37. Thus, when the flap 11 is folded downwardly from the position illustrated in FIGURE 3 to that illustrated in FIGURE 5, the band of adhesive 25 thereon will overlie the sheet 33 of the sleeve 32 to seal the sleeve between it and the end flap 13. When the side flap 14 is folded over the side flap 11 the bands of adhesive 26, 27, 28 and 29 will attach the flaps together and the sleeve 32 therebetween to complete the closure of the end of the bag, as illustrated in FIGURE 5. The sleeve 32 projects inwardly beyond the end of the flap 13 and the extension 36 of sheet 34 projects inwardly beyond the end 38 of the sheet 33. The inwardly projecting ends of the relatively thin paper sheets 33 and 34 flex into contacting engagement with each other independently of the flaps 11 and 13 to which they are attached and themselves forming valve flaps.

The separate sheets 33 and 34 of the sleeve 32 thus provide an opening through which a filling nozzle 42 can be inserted, as illustrated in FIGURE 6. Furthermore, it will be observed in FIGURES 4, 5 and 6 that the forwardly projecting end of sheet 33 of sleeve 32 forming the finger gripping tab 35 projects outwardly beyond the edges of the overlapping bag flaps 11 and 13 to facilitate engagement by the attendant and the spreading of the flaps for the insertion of the filling nozzle 42. It will also be observed by reference to FIGURES 4, 5, 6 and 7 that the sheet 34 of sleeve 32 engages the sheet 33 at 43 to close the opening and that the flexible extension 36 engages the flaps 11 and 12 at 44 to provide a double seal. One form of the invention having now been described in detail, the mode of operation is explained as follows:

Assuming for the purposes of description that the bag 10 has been formed in the manner explained with the sleeve 32 positioned between and pasted to the flaps 11, 12 and 13, as illustrated in FIGURE 5. When the bag 10 is to be filled, the attendant grasps the forwardly projecting tab edge 35 of the sleeve 32 and lifts it upwardly to spread it from the other sheet 36 attached to the flap 19. Because of the forwardly projecting tab 35, the attendant does not have to separate the edge of sheet 33 from sheet 34. The filling nozzle 42 is then inserted in the filling opening between the sheets 33 and 34 of the sleeve 32, as illustrated in FIGURE 6.

The material is then blown into the closed bag until it has been filled. After the bag has been filled, the nozzle 42 is withdrawn. When the filled bag 10 is turned from its upright position, the contents fall against the flap 13 and force it against the flaps 11 and 12 to close the opening therebetween. Also the weight of the material acting on the portion of the sheet 34 of sleeve 32 extending beyond flap 13 forces it into sealing engagement with the sheet 33, as indicated at 43 in FIGURE 7, to further seal the opening. As the sheets 33 and 34 of sleeve 32 are thin and flexible, they readily conform to the shape of the overlapping flaps 11 and 12 to at all times maintain a seal. Furthermore, the extension 36 of the sheet 34 which projects beyond the edge 38 of the sheet 33 engages the flaps 17 and 18 to make an additional seal, as indicated at 44 in FIGURE 7, with the end of the bag. Thus, the sleeve 32 provides a double seal, one with the end flaps 11 and 12 of the bag 10 and the other between the sheets 33 and 34 of the sleeve. The slit 41 in the extending portion 36 provides additional flexibility to insure sealing engagement.

It will now be observed that the present invention provides a valve sleeve construction in a bag which facilitates the separation of the valved flaps for the insertion of a filling nozzle. It will also be observed that the sleeve of the present invention provides a double seal to prevent material from sifting from the bag. It will still further be observed that the present invention provides a sleeve of simple and compact construction which may be economically manufactured and one which is reliable in operation.

While a single embodiment of the invention is herein illustrated and described, it will be understood that changes may be made in the construction and arrangement of elements without departing from the spirit or scope of the invention. Therefore, without limitation in this respect, the invention is defined by the following claims.

I claim:

1. A pasted-end bag having a tubular wall, at least one end of the tubular wall of said bag being folded at opposite sides to provide inwardly extending inner flaps, and outer flaps folded one over the other and over the inner flaps in generally parallel planes, the outer overlapping flaps being pasted to each other and cooperating with at least one inner flap to provide a valve opening therebetween through which material is delivered to the interior of the bag, said inner flap forming a valve for closing the valve opening, a valve sleeve between the overlapping pasted flaps and inner valve flap and pasted thereto, said valve sleeve having an outer portion and an inner portion with the inner surface of each portion being continuous and without seams and extending throughout the entire width of the inner valve flap to provide a tubular liner in the valve opening, and the inner portion of the sleeve adjacent the inner valve flap extending into the bag beyond the inner edge thereof and beyond the inner edge of the outer portion of the sleeve throughout the entire width of the latter to engage the outer overlapping flaps of the bag and provide a double seal between the two portions of the sleeve and between the sleeve and pasted overlapping outer flaps, respectively, and the outer portion of the sleeve adjacent the pasted overlapping outer flaps extending outwardly from the valve opening be-

yond the outer edge of the inner portion of the sleeve to provide a finger grip for the sleeve at the outside of the bag.

2. A bag in accordance with claim 1 in which the inner and outer portions of said valve sleeve comprise separate sheets of the same length and offset lengthwise so that the sheet adjacent the inner flap projects into the bag beyond the other sheet to engage the pasted overlapping outer flaps, and the other sheet of the sleeve projects beyond the edge of the first sheet to provide the finger grip at the outside of the bag.

3. A bag in accordance with claim 2 in which one of the sheets of the valve sleeve is wider than the other sheet and folded over the side edges thereof to form a unitary sleeve.

5

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