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DEVICE FOR CLOSING AND SEALING OF VALVES IN VALVE BAGS

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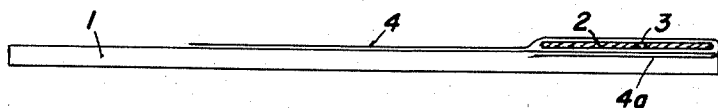


FIG. 1

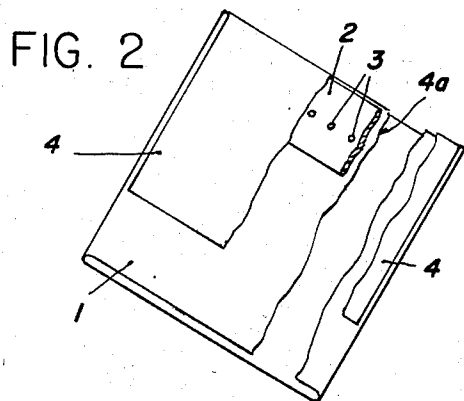


FIG. 2

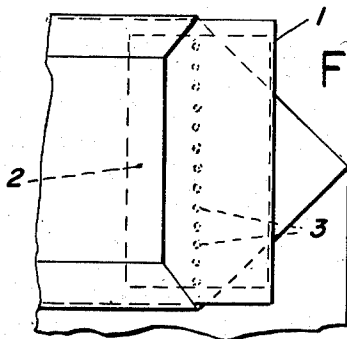


FIG. 3

FIG. 6

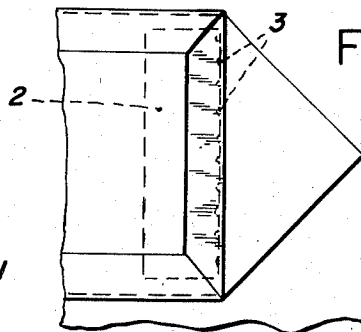
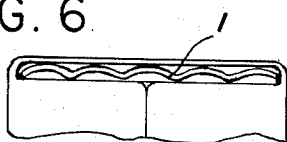


FIG. 4

FIG. 7

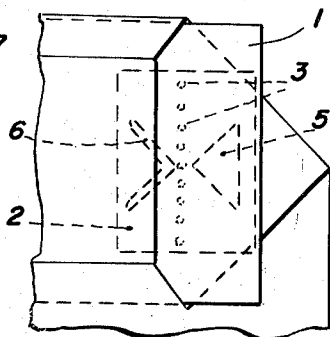


FIG. 5

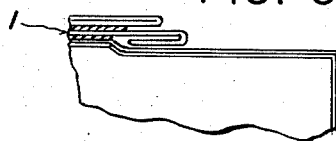


FIG. 9

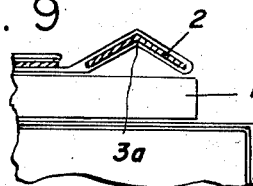
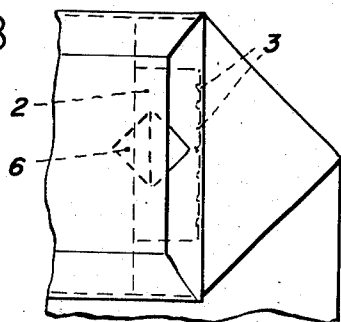


FIG. 8



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DEVICE FOR CLOSING AND SEALING OF
VALVES IN VALVE BAGS

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4 Claims. (Cl. 229—62.5)

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The present invention relates to valve bags constructed of a multi-ply tube of paper or the like, which is closed at both ends except for a filling valve in one bag corner formed by folding in said corner. More particularly, the invention relates to valve bags having a sleeve or tube of paper or the like fixed in the valve, through which sleeve or tube the bag is filled. The invention concerns a method and a device for closing and sealing this sleeve or tube after filling of the bag in order that none of the contents of the filled bag may leak out or be taken out through the valve opening without damaging the seal and closure. Any such damage being easily discovered. It is known from Swedish patent specification No. 78,730, after filling of the bag through the sleeve extending outside the valve, to close said outer end of the sleeve by sewing, gluing or stitching in order to prevent leakage of the bag contents or removing part thereof through the valve opening. These closing methods have however seldom been used in practice as they necessitate, especially so far as the sewing and gluing is concerned, a special operation for which extra workers are needed. Stitching can be effected immediately after the filled bag is taken off from the filling machine, by means of a pair of stitching tongs with a magazine for about fifty staples, but the risk of a staple sliding down in the bag or possibly becoming loosened later, on handling the bags, and getting into the material contained in the bag eliminates the use of this closing method so far as concerns bags containing such articles as flour, sugar, fodder etc.

The principal object of the invention is therefore to provide a method and a device for enabling a more rapid and safer closing of the outer end of the sleeve or tube, so that the closing may be effected immediately after taking the bags off of the filling machine without any loss of time or any extra workers being needed at the filling machine or without the risk of the closing device or parts thereof being lost, or becoming loosened and falling down into the bag contents. At the same time, the invention contributes the important advantage that the closure effected also serves as a seal and has such mechanical strength and occupies such a well-protected position, that it will not be exposed to unintentional damage during the handling of the bags. Furthermore the seal is difficult to reach for unauthorized damaging and opening and presents a difficult problem for one to imperceptibly take out some of the bag contents through the valve opening. The last-mentioned fact is of very great importance,

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when the bag contains rationed articles. A further important advantage of the invention is that the closing means according to the invention is very simple and is very cheap to mass produce and consequently, also from the economic point of view is well adapted for the mass producing of paper bags.

It is known to have the sleeve or tube fixed in the valve opening extend with its outer end a good distance outside the valve and to arrange in the underneath side of the valve sleeve a stiffening insert of a flexible material which extends in the longitudinal direction of the valve sleeve and has the form of thin sheet metal strips or the like which, after folding of the extending outer portion of the sleeve into contact with the upper side of the upper wall of the valve (said wall being formed by the upper end wall of the bag which is most often cross-folded), maintain the folded portion in this closing position. However, the folded portion of the sleeve is thereby considerably exposed and very easily attainable, so that it may easily be displaced or damaged on handling the bags and may easily be folded back to enable removing part of the bag contents through the valve without being easily discovered and serve as evidence that the valve has been opened illegitimately. It has also been proposed to let the inner end of the valve sleeve extend a good distance past the valve into the bag and to arrange in the upper side of the sleeve such flexible thin sheet metal strips or the like, which after folding of the inner portion of the sleeve into contact with the underneath side of the lower wall of the valve, maintain the folded portion in this closing position. The folded portion will thereby lie protected within the bag but the folding will be rather difficult to effect, besides which it cannot serve as a seal or closure from which it is possible to determine, from outside, whether the valve closure has been opened illegitimately.

Further features and objects of the invention will appear from the following description, reference being had to the accompanying drawing, in which:

Fig. 1 is a longitudinal section of a sleeve or tube adapted to be fixed by gluing in the valve of a valve bag, which sleeve or tube is provided with a closing means according to the invention.

Fig. 2 is a perspective view of the sleeve, parts of said sleeve being omitted for the sake of clearness.

Figs. 3 and 4 are plan views of the valve corner of the bag with the sleeve fixed in the valve be-

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fore and after closing of the same, respectively.

Fig. 5 is a section of the valve corner of the bag with the sleeve fixed in the valve in the closed condition.

Fig. 6 shows the valve in the closed condition, as seen from the outer end.

Figs. 7 and 8, are views similar to Figs. 3 and 4, and show a modification of the closing means according to the invention.

Fig. 9 shows a further embodiment of the closing means in section through the valve corner of the bag before closing of the valve.

The sleeve 1 may preferably consist of a single-ply paper tube which in flattened condition has a width corresponding to the inner width of the valve formed in the bag corner in its normal flattened condition. On the upper side of the sleeve 1 there is fixed a thin sheet metal strip 2 extending with one longitudinal edge along the front edge of the sleeve. The strip 2 may preferably be approximately as long as the sleeve 1 is broad or, alternatively, shorter. The width of the strip 2 is preferably considerably smaller than its length, since the width, that is, the extent in the longitudinal direction of the sleeve 1, does not need to be and should not amount to more than one or two, or a small number of centimetres. The sheet metal strip 2 is adapted to be folded about its longitudinal center line running parallel with the front edge of the sleeve 1 or otherwise about a line situated at a distance from the longitudinal edge of the strip, running along the front edge of the sleeve and parallel with said longitudinal edge, along which line the strip is provided with a perforation 3 or the like facilitating the folding operation. The strip 2 is preferably fixed in position by means of a covering sheet 4 of paper arranged on the same and glued to the upper side of the sleeve 1 and preferably folded in front about the front edge of the upper wall of the sleeve and glued to the underneath side of said sleeve, as shown at 4a in Figs. 1 and 2, so that the sheet metal strip is completely covered with paper in the upper wall of the sleeve. The sleeve 1, provided with the strip 2, is glued into the valve in the valve corner in a position as appears from Fig. 3, so that the front edge of the sleeve only extends a relatively small distance outside the front edge of the upper side of the valve. The sleeve 1 can preferably be arranged in such a way that the folding line 3 more or less coincides with the front edge of the upper wall of the valve. The lower wall of the sleeve 1 is not glued to the lower wall of the valve entirely up to the front edge of the sleeve, since after filling of the bag, the closing operation is effected in such a manner that the front end portion of the sleeve 1, provided with the strip 2, is doubled by folding the portion situated outside the folding line 3 of the strip 2 downwardly and inwardly about the folding line 3 to the position shown in Figs. 4 and 5. This folding operation can easily be effected directly by hand or by means of some simple tool, and after the execution of this folding operation a special pair of tongs, the jaws of which are formed as two toothed plates engaging each other and having a length and width corresponding to the doubled sheet metal strip and with the teeth extending at right angles to the longitudinal direction of the plates, is introduced with one of its jaws in the "valve pocket" formed under the folded portion of the valve sleeve, while the other jaw is brought into engagement with the upper side of the valve sleeve. By a

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light pressure the doubled sheet metal strip 2, and the parts of the sleeve 1 surrounding said strip, are compressed between the tong jaws to a wave form or the like with ridges and grooves running at right angles to the longitudinal direction of the strip, which is shown in Figs. 4 and 6. The thickness and material combination of the sheet metal strip 2 are so dimensioned that this operation does not demand any great force. Owing to the pressing of the doubled strip 2, it will be practically impossible to open or separate the strip by hand and then again completely compress the two halves of the seal obtained in this manner. The seal cannot be broken without damaging it, or the paper of the sleeve 1 enclosed in the same, in such a way that irremovable traces are left which are easily discovered and serve as evidence of the damage. As is evident, the closure, serving at the same time as a seal, occupies an extremely well-protected position in which it is difficult to get at for manipulations attempting to imperceptibly remove part of the bag contents through the valve opening.

This combined closure and seal thus provides a very good protection against attempted thefts of the contents of the bags during transport, storage, etc. and makes it possible to prove a possible illegitimate manipulation of the closure, which is of very great importance when rationed articles are concerned.

The construction of the closing means may be modified within the scope of the invention in various ways as it shown in Figs. 7 and 8 and Fig. 9. In the modification shown in Figs. 7 and 8, the sheet metal strip 2 is provided in one half, adjacent the front edge of the sleeve 1, with a triangular recess 5 and, in the other half, with a stamped-out triangular tongue 6 which, on folding of the sheet metal strip about the folding line 3, will be situated opposite the recess 5. After this folding operation, the tongue 6 situated on the upper side of the valve sleeve is pressed down through the intermediate paper layers and through the recess 5 and is folded about the basis edge of the same to the position shown in Fig. 8 by means of the pair of sealing tongs adapted for this purpose. By providing the pair of sealing tongs with cutting edges, it is possible, so far as the sheet metal strip 2 is chosen of a suitable material and of a suitable thickness, to make the recess 5 and the tongue 6 directly by means of the pair of tongs, so that the sheet metal strip 2 does not need to be provided with the recess and the tongue beforehand. The tongue may naturally be varied as to form and as to the number used in various ways.

In the embodiment shown in Fig. 9 the sheet metal strip 2 is initially bent in an angle about its longitudinal center line extending at right angles to the longitudinal direction of the sleeve 1, so that the angle corner 3a forms a folding line for the complete doubling occurring in the closing operation. The doubling is thus facilitated, so that even if the width of the strip 2 is very small this operation may easily be effected directly with the fingers. In this doubling operation the flattened outer end of the sleeve 1 is folded, so that the folding line of the sleeve will approximately coincide with the folding line on the sheet metal strip 2, the two halves of which, similar to that of the preceding embodiments, are compressed by means of a suitable pair of sealing tongs and are thereby deformed in a manner adapted to maintain the two halves of the sheet metal strip in the mutual compressed position

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with sufficient mechanical strength. It may be pointed out in this connection that it will then be more difficult to separate the two halves of the sheet metal strip from each other, the narrower the sheet metal strip is made. The sheet metal strip 2 of Fig. 9 is fixed immediately above the outer end of the sleeve 1, extending a short distance out of the valve opening, so that the outer longitudinal edge of the sheet metal strip runs parallel with and adjacent to or in proximity to the outer end edge (front edge) of the sleeve. The sheet metal strip 2 is preferably so fixed by means of the covering sheet 4 of paper or the like enclosing the same that the sheet hingedly connects the sheet metal strip with the upper wall of the valve and the sleeve, respectively, at the longitudinal back edge of the sheet metal strip.

What I claim and desire to secure by Letters Patent is:

1. In a valve bag the combination comprising a sleeve secured in the valve and having an outer end portion projecting only a short distance outside the valve opening, a foldable metal strip of a relatively small width as compared with the length of said strip and of a length approximately equal to the width of said sleeve when this is in normal flattened condition, the width of said strip being adapted to fold along the median longitudinal line thereof and the folded edge thereby forming an outer edge, said strip being embedded in and secured to the top wall of said sleeve adjacent the outer end thereof and extending transversely of said sleeve, said strip being adapted to be longitudinally folded substantially along the median longitudinal line thereof whereby the outer half of the strip being folded downwardly and inwardly against the

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inner half of the strip folds the projecting outer end of the sleeve and clamps said end in folded position between the two halves of the strip by the doubling thereof.

2. In a valve bag as claimed in claim 1, the additional feature that the distance by which the outer end of the sleeve projects outside the valve opening of the bag is a little shorter than the width of the metal strip.

3. In a valve bag as claimed in claim 1, the additional feature that the metal strip is of angle cross section, the angle corner forming the folding line for the doubling of the strip.

4. In a valve bag as claimed in claim 1 and including perforations along the median longitudinal fold line for facilitating the folding over of said strip.

JOHN JOHNSON.

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