Feb. 13, 1940. A. J. VERWYS 2,189,847

ADAPTER FOR VALVE BAGS

Original Filed Oct. 14, 1936

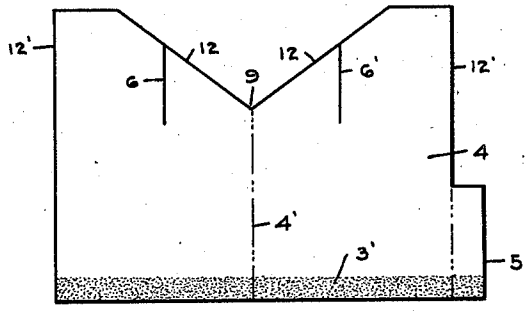


FIG. 1.

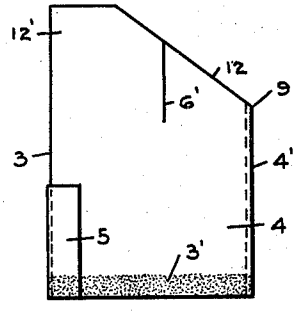


FIG. 2.

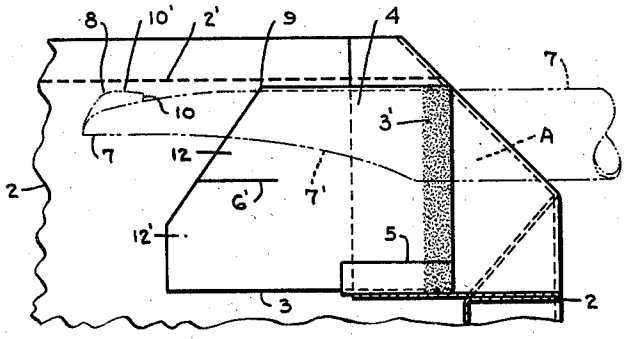


FIG. 3.

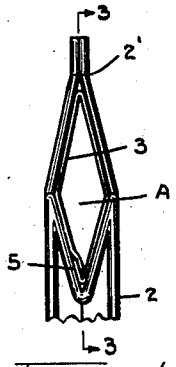


FIG. 4.

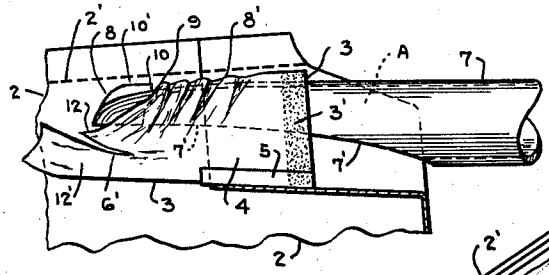


FIG. 5.

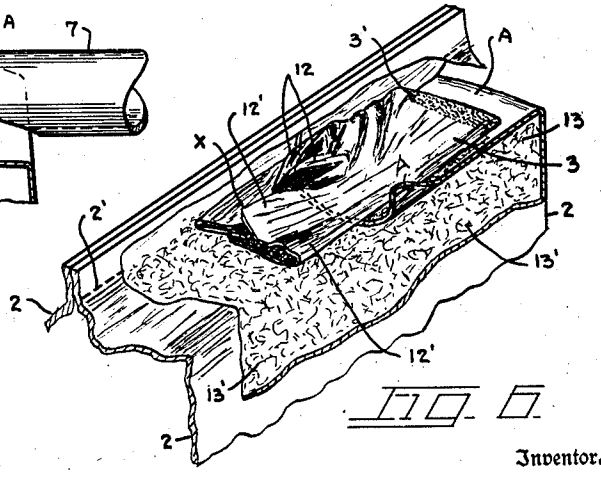


FIG. 6.

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Patented Feb. 13, 1940 2,189,847

UNITED STATES PATENT OFFICE

2,189,847

ADAPTER FOR VALVE BAGS

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Application October 14, 1936, Serial No. 105,548
Renewed June 22, 1939

4 Claims. (Cl. 229—62.5)

This invention relates to valve bags, and to novel and simple means for controlling the pneumatic filling of the bags, as well as obviating subsequent leaking or sifting of the contents of the bags through the valves.

This invention has particular relation to important improvements in the adapters for valve bags shown and described in my former patents numbered 2,031,915, dated February 25, 1936, and 2,034,217, dated March 17, 1936.

The primary object of this invention like my former patents, is to prevent the supercharging of multiply valve bags, for example, during the filling operations, with an excess of pressure that tends to unduly inflate and distort the bags beyond the extent normal to the proper filling thereof, and the clogging and sealing of the valves following the filling operations, by crumpling certain parts of the adapters, and then stuffing the same into the normal valve openings to prevent leakage or sifting.

The adapters of said patents, as well as, of the present case comprise flexible or pliable and tough fibrous elements, having generally the form of flat or collapsed tubes, that are normally partially split at their bottom edges, and which may be telescopically and permanently inserted in the filling openings or valves of the bags, before or after the bag ends are sewed or pasted; the adapters of both styles of valve bags being preferably made from common blanks, and having their outer end portions pasted to the corresponding inner surfaces of the valves, while their opposite or inner ends preferably project beyond the inner ends of the valves and remain loose throughout the filling of the bags. This enables the main bodies of said adapters to freely expand and contract with the valves when the filling pipes are inserted therein to provide substantially free V-shaped vents between the pipes and the adapters for the escape of any excess or accumulated pressure, which may bleed away through the bushed valves while the bags are being filled.

After the bags are filled, the filling pipes are withdrawn, and at the start of the withdrawal movements, hooks or grappling means formed at the tips of the pipes engage a free and unpasted crotch, which defines and separates the protruding ends or wings of the adapters, that extend inwardly beyond and aline with the inner ends of the valves, and draw or push said wings back with a slight puckering, towards and across the inner ends of the valves, and in so doing, the loose upper wings are partially crumpled to prevent any of the contents of the bags from entering and passing through the valves during and after the filling operations. This leaves the passages through the valves substantially empty and the inner ends closed without resort to the formation of the bulky waddings of crumpled fiber, as taught by said former patents.

An important improvement of the present adapters over those of the said patents consists of creating a circular pocket that substantially surrounds the main valve body as well as the adapter within the body, and into which there is a constant feed of the powdered contents of the bags during the final filling periods that tends to expand the adjacent parts immediately below the stitches. Another important improvement consists of forming weakening slits in the protruding integral wings parallel to the axis of the filling spout, instead of being perpendicular to said axis, as shown in said patents.

The filling pipes are usually cylindrical with pointed free ends, which permit the bags to be placed over the pipes with ease, by holding them with one hand. When a bag fitted with this modified adapter is disposed over a spout, the valve and adapter take the form of the pipe at their tops, while their bottom portions assume the normal diamond-shape of the valve openings.

This new adapter supplants the corresponding parts of both my former patents, wherein the adapters are designed especially for providing relatively bulky crumplings which are created by the hooks or teeth of the filling spouts and are dragged part way through the valves to co-act with said circular pockets to clog and prevent the escape of the contents of the bags, as explained. The supplanting of the perpendicular weakening slits by the parallel slits of the present adapters, the slight crumplings of the crotches which tend to slightly pucker the upper and lower wings, prevents them from bodily entering and packing the passages of the valves, as shown in said patents, but the disposing of the said upper wings across the gaping inner ends of the valve openings, also affords a buffer against which the larger lower wings may be crowded by the contents, and forms a substantially circular pocket into which portions of the contents of the bags are forced by the loading pressure during the final filling of the bags, and which effects the perfect sealing of the valves, as shown in Fig. 6. When the material is forced towards the valve corner of the bag, it lifts the adjacent innermost sheet or ply of the valve to which the adapter is pasted, thus making a V-shape of the

material that exerts pressure upon the wings of the adapter which closes the valves tighter and tighter, in case the loaded bags are shipped on cars or trucks, or when the bags are stacked in storage.

I attain these objects by the means set forth in the detailed description which follows, and as illustrated by the accompanying drawing, in which—

Figure 1 is a diagrammatical plan of the common blank from which the adapters may be formed prior to their insertion in the bags. Fig. 2 is a view showing the folding of the blank for insertion in a sewed bag. Fig. 3 is a fragmentary sectional view, taken on line 3—3 of Fig. 4, showing the adapter in the form of a flattened tube inserted in the valve. Fig. 4 is a broken elevation of a sewed bag with the adapter of Fig. 2 operatively disposed in the valve. Fig. 5 is a central vertical section also taken on line 3—3 of Fig. 4, showing the pipe being withdrawn and in the act of lightly crumpling and folding the free end of the adapter. Fig. 6 is a broken side elevation of the bag after it has been filled and the filling pipe removed, showing the two upper and lower wings loosely crumpled and distributed throughout the extent of the valve opening to prevent leakage of the valve, also showing the powdered contents 13' partially filling the circular pocket 13 that surrounds the adapter and presses the several wings towards each other to seal the inner open end of the adapter.

In the drawing, Figs. 3 to 5 inclusive, show similar broken fragments, as 2, of a sewed bag, the stitches being indicated at 2', and the tube of the bag being folded inwardly at one corner in the usual manner to form the normally open valve A.

The means for controlling the pneumatic filling of the sewed bag 2, as well as obviating the sifting or leaking of the contents of the bags, consists of a novel and simple pliable adapter or element, preferably in the form of a substantially flat crinkly paper tube, as 3, which may be telescopically and permanently disposed in the valve A, either before or after the valve end of the bag is sewed; the said adapter having its outer portion pasted to the corresponding adjacent mouth of the valve, as shown at 3'. The present adapter is preferably formed from a peculiarly shaped standardized blank, as 4, shown diagrammatically in Fig. 1. which when folded upon a central crease 4' and upon a parallel lateral crease 4a, produces the reinforced adapter or bushing 3; the said lateral crease defining an integral oblong flap or wing 5, that is foldable upon and pasted to the adjacent web 4 of the blank and combining with the two plies of the body, to produce a substantially perfect flat tube, as shown in Figs. 3 and 4; the said body being formed near its free end with similar weakening slits 6 and 6' that parallel the axis of the filling pipe 7, whose purpose will be explained later on. In Fig. 4 the valve A and also the adapter 3 are shown expanded so as to facilitate the proper and quick insertion of the pipe 7, by which the filling of the bag is effected, usually by the aid of a strong air pressure.

The pipe 7 is of the usual type, that is formed at its underside with a relatively long tapered opening 7' through which cement, lime or other pulverized or granulated products may be blown downwardly into the bag. The free end of the pipe 7 is preferably formed beak-shaped, and adjacent its tip, said end is also formed with an upstanding tooth or hook 8, that faces the mouths of the valve and adapter 3. During the filling operation, the pipe 7 is usually inserted in the valve to the extent shown by dotted lines in Fig. 3. When the bags are loaded with the material 13', the pressure is shut off and pipe 7 is withdrawn from the valve A, and at the start of this movement, the hook 8 engages a crotch 9 of the free end of the adapter, and slightly crumples and draws the crotch portion towards the inner end of the valve, as at 8' in Fig. 5, and in so doing, causes the free end to telescope the valve and the pasted end of the adapter, until the hook becomes free. This leaves the mouth of the valve substantially free of the bulky waddings of the said patents.

The hook 8 on the filling pipe that engages and draws the crotch 9 towards the adjacent opening of the valve, is formed with a vertical shoulder 10 about one sixteenth to one eighth of an inch in height (see Fig. 5), that induces a cam action, which enables the adapter 3 to release itself from the vertical tooth 10 after the short upper wings are puckered, and the lower wings 12' are pulled or moved towards each other to prevent the contents of the bag 7 passing between said lower wings, as shown in Fig. 6.

When the crotch 9 at the top of the adapter is puckered, it causes the wings 12' to come together, but the resistance is too great for the hook or tooth 8 to turn back the adapter within itself, but it rides upwardly over the face 10 of the hook, because the bag is being discharged from the pipe 7, and when the bag drops down clear of the machine, the material 13' in the bag pushes the puckered and closed wings 12 up to the top of the circular pocket 13 to make the desired seal.

The blank 4 of the present adapter is made from less paper than my former ones, and as the same is not dragged through the valve, it will make a neater bag end.

It requires a leftward movement of the bag on the spout 7, to effect the engagement of portion 10 of the hook with the crotch 9, and the valve being located at the extreme upper right corner of the bag, after a short movement, tends to sag at the lower left corner (see Fig. 5), and the pipe being stationary during this semi-rotary movement, the discharging bag pivots at the point of engagement of the hook 8 and the crotch, but this leftward saging of the bag enables the crumpled portion of the crotch to slide up the vertical face or edge 10 of the hook, and thence over its curved top 10', that frees the bag from the clutch of the hook and crotch, which ends the filling and sealing cycle.

When a filled bag is being removed from the spout 7, the hook or tooth 8 draws along the inside of the sewed top of the bag until it encounters the crotch 9 of the adapter and puckers and draws the crotch portion towards and past the mouth of the valve until the spout is freed from the bag. The parallel weakening slits enable the upper and lower angular wing portions 12 and 12' formed by the hook to finally come together to prevent leaking or sifting at the end of the filling periods, as shown at X in Fig. 6

The pocket 13 begins at the inner end of the valve A, and thence extends between the upper and lower wings 12 and 12' and the unpasted portions of said wings; thence towards the right until it is stopped by the pasted outer ends of the adapters. This, owing to the stiffness of the valve stops the outward progress of the material 13',

and immediately begins to exert a pressure that forces the lower wings 12' transversely to bring said wings into overlapped contact, to effectually seal the opening through the valve and prevent any of the powdered material from finding a free passage through the valve towards the mouth of same.

Having thus described my invention, what I claim, is—

1. An adapter for valve bags composed of a tubular member for securement at its outer portion to the mouth of the valve, said member having sides provided with slits that extend longitudinally thereof and through the front ends of the sides of the member, and having portions of its sides extending downwardly and outwardly at an angle and terminating at points below the slits, whereby upon outward movement of the front of the member and of the valve by engagement with a projection on a filling pipe, the sides of the member above the slits will be puckered and the sides below the slits will be moved toward each other into overlapped relation.

2. An adapter for valve bags composed of a tubular member for securement at its outer portion to the mouth of the valve, said member having sides which are unconnected throughout a portion of their lower edges, and said sides being provided with slits that extend longitudinally thereof and through the upper ends of the sides of the members, and having portions of its sides extending downwardly and outwardly at an angle and terminating at points below the slits, whereby upon outward movement of the front of the member and of the valve by engagement with a projection on a filling pipe, the sides of the member above the slits will be puckered, and the sides below the slits will be moved toward each other into overlapped relation.

3. An adapter for valve bags composed of tubular member for securement at its outer portion to the mouth of the valve, said member having sides which are unconnected throughout the major portion of the bottom edges of the sides and said sides being provided with slits that extend longitudinally thereof and through the front ends of the sides of the member, and having portions of its sides extending downwardly and outwardly at an angle and terminating at points below the slits, whereby upon outward movement of the front of the member and of the valve by engagement with a projection on a filling pipe, the sides of the member above the slits will be puckered and the sides below the slits will be moved toward each other into overlapping relation.

4. An adapter for valve bags composed of a sheet that, when spread flat, is substantially rectangular in shape with a V-shaped notch in one side and with a slit running from each side of the notch and substantially parallel with the ends of the sheet, the ends of the sheet being secured together to form a tubular member.

ANDREW J. VERWYS.