Sept. 7, 1965 W. BRENNECKE ET AL 3,204,670

APPARATUS FOR FILLING VALVE BAGS WITH BULK GOODS

Filed March 20, 1963

FIG. 1

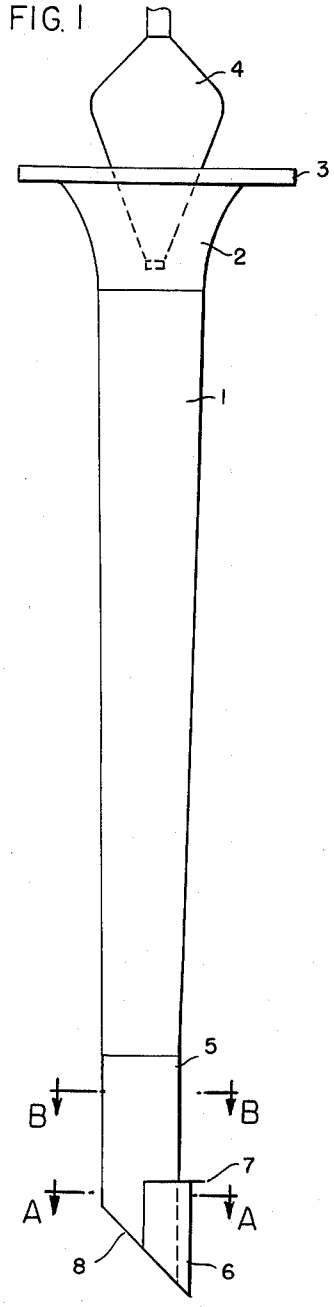


FIG. 3

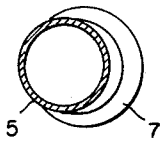


FIG. 2

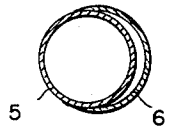
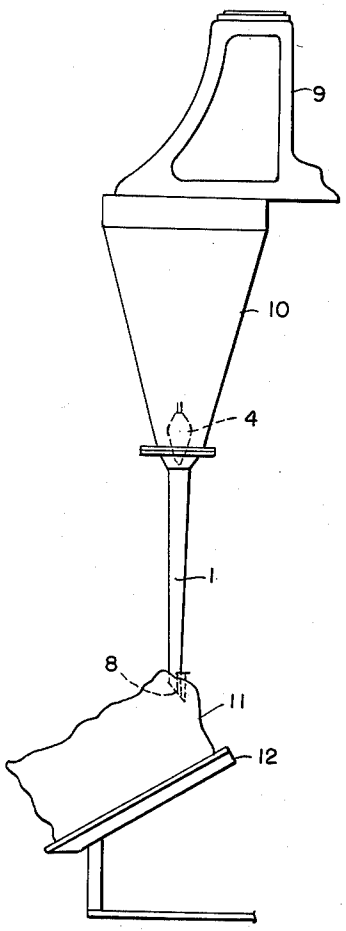


FIG. 4



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APPARATUS FOR FILLING VALVE BAGS WITH BULK GOODS

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Our invention relates generally to filling equipment and more particularly to an apparatus for filling bags with free-flowing bulk goods at a storage hopper outlet.

In order to fill valve bags with bulk goods, for example with granular or powdered products, equipment is used in which the material is accelerated by means of a running shaft provided with feeder blades in a manner similar to that in centrifugal pumps, and thus forced into the bag. The attrition which occurs in the case of soft products and thereby causes serious damage thereto is a disadvantage of this method.

Attempts have been made to avoid this difficulty by accelerating the material to be packed by using belt-type valve-bag filling machines. This method also does not provide a remedy because of the projecting friction surfaces.

Apparatus are also known which accelerate the product by means of a stream of air and thereafter convey it into the valve bag. This method, particularly when the products are dusty and gritty, requires adequate exhaustion of the conveying air laden with dust and subsequent separation of this dust.

The said difficulties in filling valve bags can be obviated by the use of a downspout as hereinafter described.

The downspout according to the present invention permits the filling of bulk goods into valve bags in a much shorter time than hitherto without the material being subjected to any damage, for example by attrition, during the filling operation. The downspout according to the present invention has the further advantage that no motor drive and no apparatus parts which are subject to heavy wear are required.

The downspout according to the invention is mounted at the outlet of the discharge hopper of conventional filling equipment. The downspout is arranged vertically and may be attached to the discharge hopper by means of a flange. The downspout comprises an upper portion having a marked constriction downwardly and forming a mouthpiece, a central portion secured to the upper portion, a cylindrical lower portion secured to the central portion and having an inclined lower edge, a jacket partly surrounding the lower portion and strengthened at its upper edge, and a double-conical (pear-shaped) baffle suspended partly in the lower portion of the discharge hopper and having its lower portion, which tapers substantially to a point, projecting into the upper portion of the downspout.

The downspout according to this invention will now be described in greater detail with reference to the accompanying drawings in which:

FIGURE 1 is an elevation of the conical downspout having a flange forming the connecting means for the filling apparatus;

FIGURES 2 and 3 are sections on the lines A—A and B—B, respectively, of FIGURE 1; and

FIGURE 4 shows the downspout in conjunction with the filling apparatus and the conveyor belt for removal of the filled bags.

As may be seen in FIGURE 1, the downspout **1** has a generally tapering shape; the central portion is shown with a slight taper but may advantageously also be cylindrical. The upper portion of the downspout **1** is formed as a mouthpiece **2** having a flange **3** by means of which the downspout may be secured to the lower opening of the bagging means. A double tapering baffle **4** is arranged above the downspout and projects into and partly fills the mouthpiece. The function of the baffle **4** is to distribute the bulk goods uniformly into the downspout and direct it to the wall of the downspout.

The lower portion of the downspout **1** is formed as a cylinder **5**, the transition from the tapering central portion being uniform. The lower part of the cylinder **5** is provided with a jacket **6** surrounding about half of the periphery of the cylinder **5**. The jacket **6** is open both at the top and the bottom and is outwardly displaced parallel to the axis of the cylinder **5** by about one quarter of the diameter of the cylinder **5**. The lower end of the downspout including the jacket is cut off at an angle **8** so that the lowest point of the apparatus is in the middle of the jacket and smooth discharge of the bulk goods is ensured. To prevent closure of the upper opening of the jacket **6** by the valve bag, a flange **7** is provided around the opening (see also FIGURE 3). This flange is crescent-shaped.

The inner surface of the downspout which comes into contact with the bulk goods is smooth and polished or is lined with a plastic, for example polytetrafluoroethylene.

The operation of the downspout according to this invention is as follows:

A valve bag **11** to be filled is pushed upwardly onto the lower portion **5** of the downspout **1** to such an extent that the edge of the bag abuts the lower surface of the flange **7** (see FIGURE 4). After the amount of bulk goods to be filled into the bag has been weighed out in the weighing machine **9**, it is released by the latter and falls through a discharge hopper **10** into the downspout **1**. Upon entry into the mouthpiece **2** of the downspout **1**, the bulk goods is uniformly distributed by the baffle **4**. While the bulk goods is leaving the lower end **8** of the downspout and passing into the valve bag **11**, air can escape through the jacket **6** since this forms a path for the air from the interior of the bag to the atmosphere.

Usually the valve bag being filled is supported beneath the downspout on a conveyor belt **12** which removes the bag after it has been filled.

What we claim is:

1. Apparatus for filling valve bags with bulk goods in the form of solid particles and arranged at the lower end of a discharge hopper, said apparatus comprising a substantially vertical elongated tubular downspout secured to the lower end of the discharge hopper to form a continuous enclosed path for particle flow therethrough, said downspout having an upper portion formed as a mouthpiece having a marked constriction downwardly, a central portion connected to said upper portion, and a lower cylindrical portion for insertion into said valve bag connected to said middle portion and having its lower end

cut off at an angle; a jacket partly surrounding and spaced outwardly from the outer circumferential surface of said lower portion, said jacket being strengthened at its upper edge, and a double-conical baffle suspended in a fixed position in said lower part of said discharge hopper and having a lower inwardly tapered conical portion which projects into said upper portion of said downspout.

2. Apparatus as claimed in claim 1 wherein the central portion of the downspout is cylindrical.

3. Apparatus as claimed in claim 1 wherein the central portion of the downspout is tapered.

4. Apparatus as claimed in claim 1 wherein the jacket is strengthened at its upper edge by a crescent-shaped flange projecting outwardly from said jacket in a plane perpendicular to the axis of said downspout.

References Cited by the Examiner

UNITED STATES PATENTS

1,383,790	7/21	Curran	141—129 XR
2,012,116	8/35	Andreas	141—68
2,251,659	8/41	Bushman	141—68

FOREIGN PATENTS

100,959	1/99	Germany.
396,078	5/24	Germany.
282,678	2/31	Italy.

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