Aug. 20, 1935. A. ANDREAS 2,012,116

FILLING NOZZLE

Filed Jan. 13, 1931

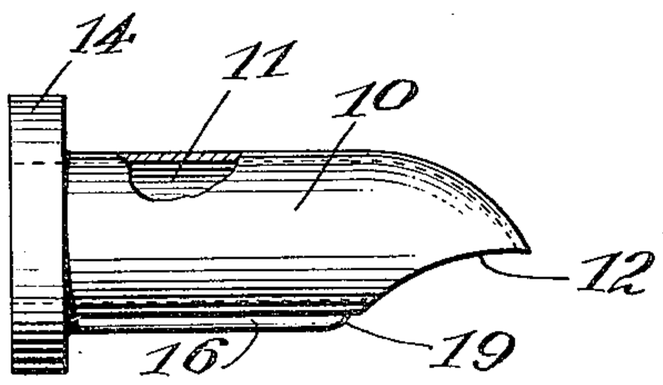

Fig. 1.

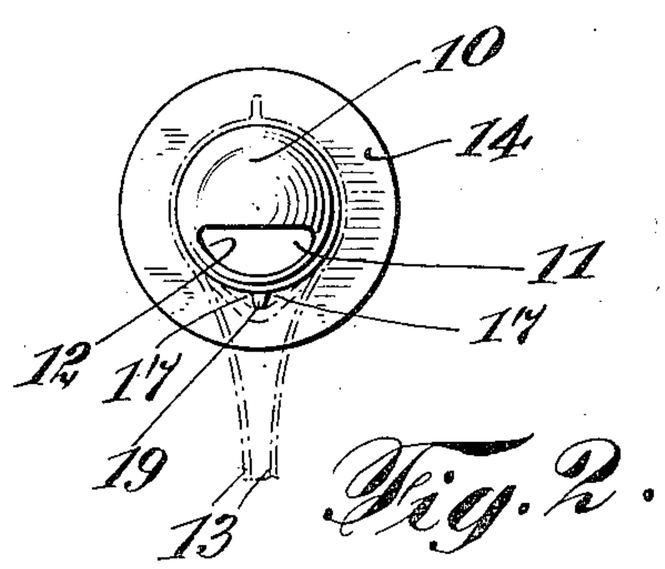

Fig. 2.

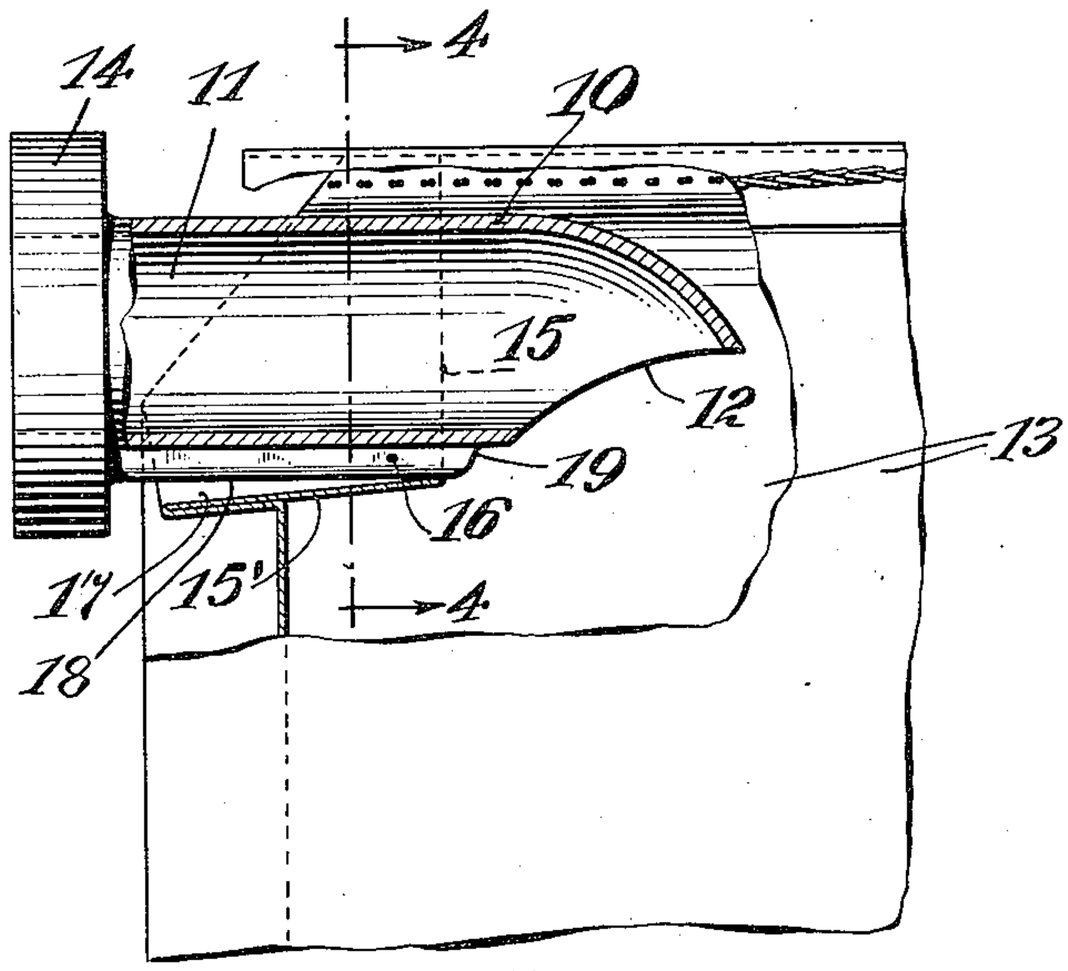

Fig. 3.

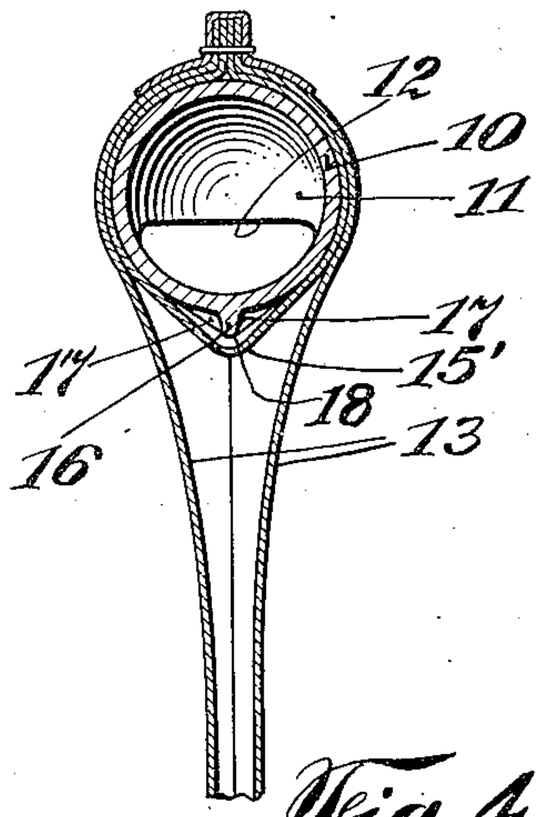

Fig. 4.

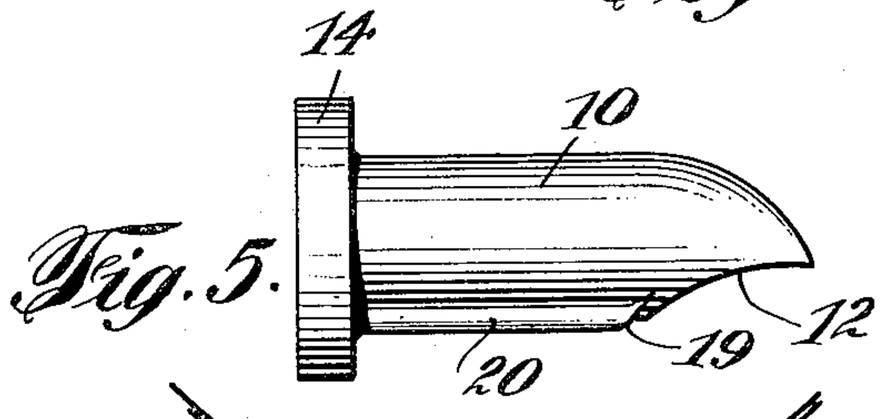

Fig. 5.

Fig. 7.

Fig. 8.

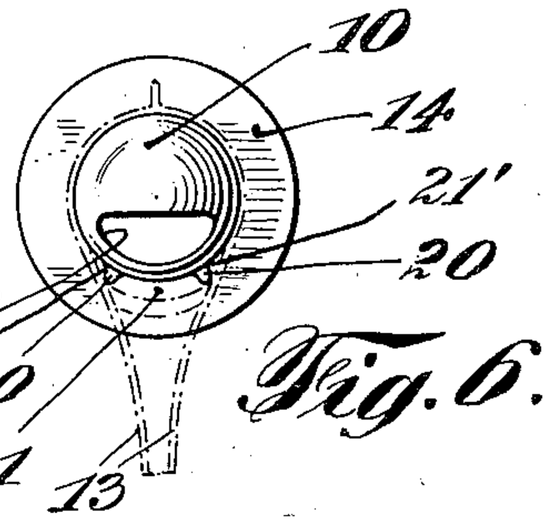

Fig. 6.

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Patented Aug. 20, 1935 2,012,116

UNITED STATES PATENT OFFICE

2,012,116

FILLING NOZZLE

Arno Andreas, Munster, Germany

Application January 13, 1931, Serial No. 508,450
In Germany July 28, 1930

1 Claim. (Cl. 226—48)

My present invention relates to filling nozzles or sprouts, such for example as are used in filling valve bags with powdered or granulated material as cement, sugar, salt, etc. Although herein particularly illustrated and described in connection with valve bags, the invention is not necessarily confined to such particular practice or use, but it may obviously be used in connection with any type of bag or container for which in practice it is found adaptable or advantageous, and it may also in practice find use as a filling instrumentality for materials other than those particularly characterized as powdered or granulated.

For quick filling of a valve bag, made of paper or other material impervious to the passage of air, it is known to make the valve opening somewhat larger than the filling nozzle, so that as the bag is filled, the air therein can escape through the space or channel intervening between the filling nozzle and adjacent valve wall. During the filling operation, with the nozzle entering the valve opening, the bag usually hangs pendant from the nozzle so that the air escape opening normally appears between the lower portion of the nozzle and the lower portion of the valve of the bag and where it is easily closed up by the raising of the valve wall itself against the nozzle.

It is the object and purpose of my present invention to provide an improved nozzle which, during the filling of the bag, will positively maintain an air escape channel between the valve wall and the exterior surface of the nozzle, and my invention consists in the provision on the nozzle of one or more ribs which will prevent the valve wall from being pushed against the exterior surface of the nozzle. According to my invention, one or more channels leading from the interior of the bag to the outside atmosphere are provided along the exterior of the nozzle and these channels afford passages through which the air escapes without restraint for the quick filling of the bag.

Another object of the invention is to so form the rib or ribs along the underneath portion of the nozzle that the dust carried by the escaping air will not lodge and accumulate thereon and will not pack in the channels, even when the material dealt with possesses adhering qualities as is sometimes the case with cement, powder, sugar, etc. Owing to the location and formation of the rib or ribs, if any material should collect thereon, it can readily be thrown off by shaking or jogging the nozzle either during the filling operation or during the time a filled bag is being replaced by an empty one.

With the foregoing objects and others in view, as will appear as the description proceeds, the invention consists in the improved nozzle and in the form, construction, and relative arrangement of its parts, as will be hereinafter more fully described and claimed.

The invention will best be understood by referring to the accompanying drawing, forming a material part of this application and wherein I have illustrated two simple and practical embodiments of the device.

In the drawing:—

Figure 1 represents a side elevational view of my improved filling nozzle, a part being broken away;

Fig. 2 is a front end elevation of the nozzle, fractionally showing by dash-dot lines the wall outline of a bag thereon;

Fig. 3 represents a longitudinal sectional view of the nozzle with a bag thereon fractionally shown;

Fig. 4 is a cross section taken on the line 4—4 of Fig. 3;

Figs. 5 and 6 are views similar to Figs. 1 and 2, respectively, showing a modified form of construction; and

Figs. 7 and 8 are diagrammatical views on a larger scale, illustrating the air channels produced by the one-rib and two-rib constructions, respectively.

Referring in detail to the accompanying drawing, it will be seen that the filling nozzle is made in the form of a tube or conduit 10 having an interior passageway 11 through which powdered or granulated material passes for discharge through the open front delivery end 12 to fall into the valve bag 13.

At its rear end, the nozzle may be equipped with a flange structure 14 or equivalent means whereby to be supported in horizontal or approximately horizontal position from a filling machine, feed pipe or the like for flowing the material through the nozzle into the bag.

The bag is of the automatic closing type and is applied to the nozzle to hang thereon at one corner in a manner well known in the art, with the nozzle projecting through the opening formed by the encompassing wall 15 which includes the valve of the bag.

In the form of construction illustrated in Figs. 1 to 4, the nozzle is represented as provided on its exterior surface, centrally along its underneath side, with a lengthwise extending rib 16.

By means of this rib, the lower portion 15' of the valve wall is held in spaced relation to the exterior underneath surface of the nozzle, and two air channels 17, 17 one being on each side of the rib, are provided for the escape of air from the interior of the bag to the outside atmosphere. As will be evident, the rib serves as a spacer between the lower portion 15' of the valve wall by passing over the valve along the underneath surface of the nozzle and it is of a length to insure that the channels 17, 17 will be through channels from the inside to the outside of the bag for the escape of air from the bag during the filling operation. This rib, at the same time serves to restrain the upward closing of the valve of the automatic closing type of valve bag. The rib also serves as an abutment for the valve.

To avoid cutting or tearing the valve wall during the application or removal of the bag and during the filling operation, the free edge of the rib is rounded as at 18 and the front end 19 thereof is curved upwardly under the nozzle and merges with the surface thereof.

In the exemplification shown in Figs. 5 and 6, the nozzle is represented as having two ribs 20, 20, located at opposite sides of the center line of the nozzle and projecting in opposite directions from each other. With this arrangement of the spacer ribs a channel 21 of relatively large cross section is provided between the lower portion of the valve wall and exterior surface of the nozzle. Also, smaller channels 21' are formed along the outer sides of the ribs. These ribs, like the rib 16 in the first described arrangement, have their free edges rounded and their front ends curved upwardly along the nozzle surface and merged with the surface thereof, to avoid any injury to the valve wall.

In both forms of construction, the ribs may be and preferably are, narrowed in cross sectional area from the nozzle surface to their free edges. Since the projection of the ribs is in a direction downwardly from the underneath surface of the nozzle and since in cross sectional form they narrow and round downwardly, the dust in the escaping air can find no place to lodge and accumulate, and if any material should cling to the ribs or to the underneath surface of the nozzle, it can be readily thrown off by shaking or jogging the nozzle or by causing the nozzle to vibrate under a blow or blows delivered thereon or upon the bag. Where the nozzle is attached to a filling machine, the vibrations resulting from the operation of the machine are usually sufficient to keep the ribs and underneath surface of the nozzle clear of adhering material. Beneath the nozzle, and between it and the valve of the bag, a conical space may be formed which, in cross sectional area, gets larger towards the outside of the bag.

Another advantage of the present invention resides in the fact that the ribs, being arranged on the underneath side of the nozzle, do not interfere in any way with any clamping device, necessary for application upon the top side of the nozzle for securing the bag in place upon the nozzle for the filling operation.

The invention disclosed evidences in its simplest form a spacer means between the filling tube of the nozzle and the bag wall to assure a permanent non-cloggable air escape channel.

While I have shown and described the preferred arrangement of the ribs and the preferred forms thereof as reduced to practice, it is, of course, to be understood that the arrangements and forms disclosed are susceptible of change and modification and I, therefore, reserve the privilege of adopting all such legitimate changes or modifications as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:—

In a machine for filling a bag having an infolded corner providing a valve; a horizontal filling nozzle inserted through said infolded corner, and a longitudinal rib extending along the bottom surface of said nozzle, said rib engaging the material of said infolded corner and spacing said material away from the bottom surface of said nozzle, the said rib being narrowed and rounded in cross section downwardly from the nozzle surface to its free edge, the free edge of said rib being rounded and the front end being curved upwardly under the nozzle and merging with the surface thereof.

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