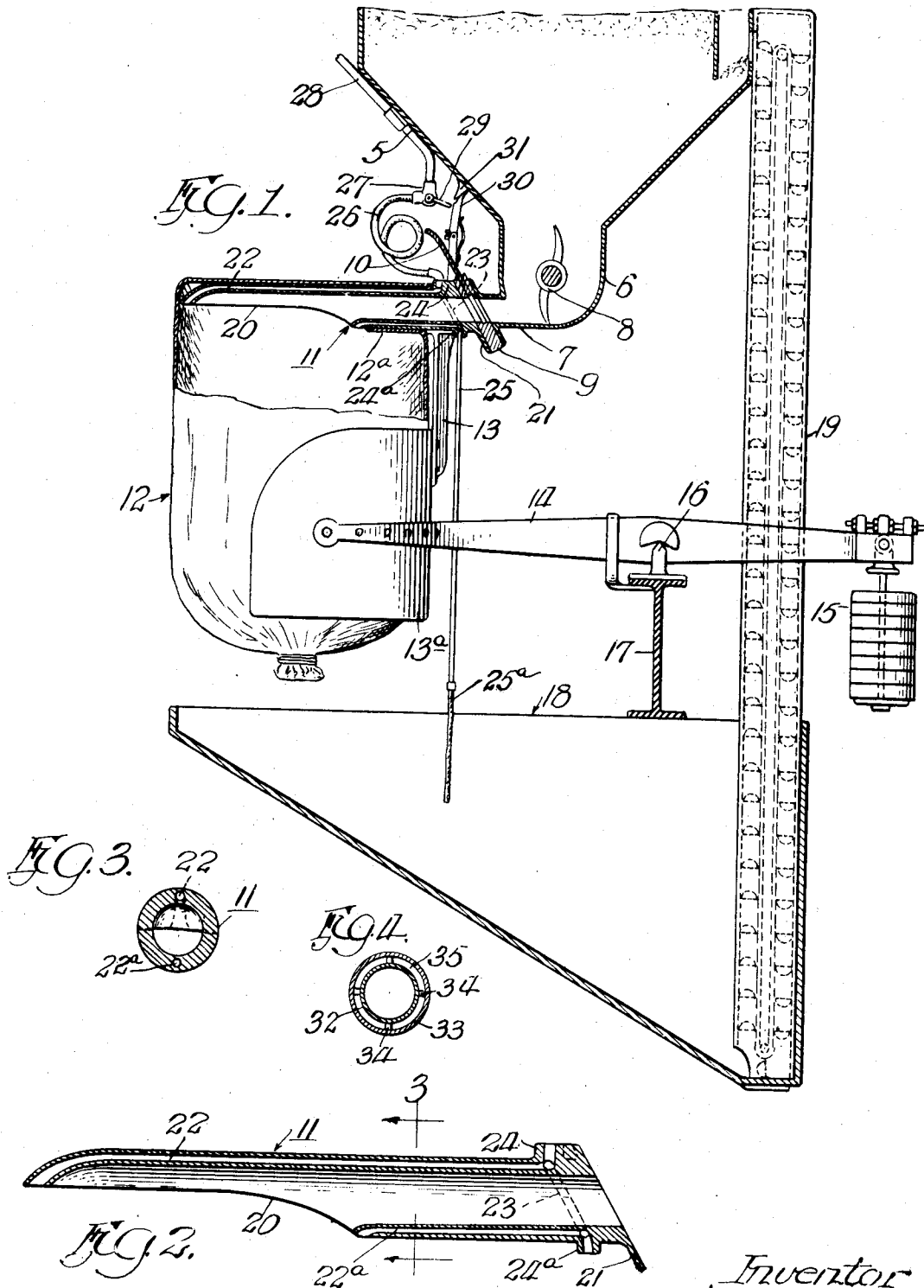


A. W. TYLER.  
MACHINE FOR FILLING VALVE BAGS.  
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Patented Dec. 5, 1922.



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# UNITED STATES PATENT OFFICE.

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MACHINE FOR FILLING VALVE BAGS.

Application filed March 20, 1920. Serial No. 367,462.

*To all whom it may concern:*

Be it known that I, ALVA W. TYLER, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Filling Valve Bags; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon, which form a part of this specification.

This invention relates to improvements in machines for filling valve bags and consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The object of the invention is to provide an improved filling device or tube so constructed, that when used in filling paper bags or bags made of like air-tight fabric, the air displaced in the bag by the material being fed thereinto, will be vented or permitted to escape, so that the bag may be completely filled. The several advantages of the invention will more fully appear as I proceed with my specification.

In the drawings:—

Fig. 1 is a view in side elevation, largely in section of a bag filling machine embodying my invention.

Fig. 2 illustrates, on an enlarged scale, a longitudinal, vertical section through the filling tube thereof.

Fig. 3 illustrates a transverse, vertical section through the filling tube, the plane of the section being indicated by the line 3—3 of Fig. 2.

Fig. 4 illustrates a transverse vertical section through a modified form of filling tube.

The invention is herein illustrated and described as embodied in a machine for filling bags which have a small filling opening in the bottom end, which opening is closed after the bag has been filled, by a flap or valve forming a part of the bag, which valve is held in its closed position by the material within the bag.

Referring now in detail to that embodiment of the invention illustrated in Figs. 1 to 3 inclusive of the accompanying drawings; 5 indicates the hopper or bin for holding the dry, pulverulent material with which the bags are to be filled. The bottom end of

the hopper is formed to provide a cylindrical feed chamber 6, having a horizontally disposed discharge mouth 7. In the feed chamber is a rotary propeller 8, which forces the material from the feed chamber out through the discharge mouth 7. To the end of the mouth 7, is fixed a closure plate 9, in which slides a gate 10 for the purpose of opening or closing the discharge mouth 7. This plate and its gate are preferably arranged in a plane inclined to the perpendicular.

11 indicates the filling tube which also provides the support for the bag 12, being filled. As shown, said tube is fixed at its rear end to the top end of a bracket 13, carried by an apron 13<sup>a</sup> on one end of a scale beam 14 from the opposite end of which depends a scale weight 15. Said scale beam 14, is suitably mounted between its ends on a bearing 16, fixed on an I beam 17, that extends across the top of a spillage hopper 18, located in a plane beneath the storage hopper 5. A conveyor 19 of any suitable type, operates to transfer the spillage in the hopper 18, back into the storage hopper 5.

The filling tube 11 is cut away at one end to provide an elongated discharge mouth 20 and has an angularly disposed flange 21 at its opposite end which is adapted to engage against the mouth plate 9 before referred to, and to hold said filling tube in alignment with the discharge mouth 7, when the bag is being filled. The filling tube includes a central passageway of comparatively large diameter, through which the material passes from the discharge mouth into the bag being filled and also one or more parallel conduits spaced from the material passageway, to provide a vent for the air displaced from the bag by the filling material.

As shown in Figs. 1 to 3 inclusive, there are provided in the top and bottom wall parts of the tube 11, two smaller conduits 22—22<sup>a</sup>, which open at one end through the front or discharge end of the tube and connect at their other ends with annular channel 23, provided in the wall of the tube near its rear end. This annular channel has vertically, opposite openings in bosses 24—24<sup>a</sup> on the tube 11 near the flange 21. Connected to the opening in the bottom boss 24<sup>a</sup> is a pipe 25, the bottom end of which includes a flexible member 25<sup>a</sup> that extends into the

spillage hopper 18. Connected to the opening in the boss 24, is a hose 26 which is connected by a valve 27 to a compressed air pipe 28 supported on the storage hopper 5. The valve 27 has a spring controlled operating lever 29 which is adapted to be momentarily engaged and actuated in the upward swing of the tube, by a jointed arm 30 to permit a jet of compressed air to pass through the valve 27 and hose 26 and into the conduits 22, 22<sup>a</sup> and pipe 25. The arm 30 extends upwardly from the bracket 13 and is adapted to be tripped from engagement with valve lever 29, by a cam projection 31, on the hopper 5, as the filling tube moves into alignment with the discharge mouth 7.

In Fig. 4 is illustrated a cross section through a modified form of filling tube, which comprises radially arranged inner and outer tubes 32-33 which are held in spaced relation by means of spacing studs 34, or the like. In this construction, the inner tube 32 defines the material passageway and the annular space 35 between said tubes defines a conduit which functions in the same manner as do the conduits 22-22<sup>a</sup> before mentioned.

The operation is as follows: Assume that an empty paper valve bag 12, with its tied or otherwise closed top end arranged in an inverted position, is placed upon the filling tube with the tube extending through the usual filling opening in normally its bottom end, and with its flap or valve 12<sup>a</sup>, engaging the bottom side of said filling tube. The weight 15 will actuate the beam 14 to swing the filling tube 11 into a position whereupon its flange 21 will engage against the plate 9, thus bringing the filling tube into alignment with the discharge mouth 7, of the storage or filling hopper 5.

As the filling tube approaches the discharge mouth 7, the jointed arm 30 will engage the valve lever 29, and momentarily open the valve 27 to permit a jet of air to blow through the venting conduits to dislodge such material therein as tends to clog said conduits, and as the arm 30 engages the cam 31, said arm is tripped from the lever 29 and the valve 27 again closes.

Assume that the gate 10 has now been opened and the propeller 8 is rotating to feed the material through the mouth 7 into the tube 11 and out through its discharge mouth 20 into said bag. The material falls into the lowest part of the bag and such air as is in the bag and which is now being displaced by the filling material entering the bag, cannot pass out through the walls of the bag but will pass into the venting conduits in the filling tube, out through pipe 25 and into the spillage hopper, such fine dust-like particles as are carried out by said air being deposited in the spillage hopper to mix with such other material as is there-

This material is, of course, delivered back into the hopper 5 by the conveyor 19. As rapidly as the material enters the bag, the displaced air is vented from the bag, so that the material may properly pack therein. When the bag has thus been filled, its weight will depress the long arm of the scale beam against the action of the weight 15 and the filling tube with the filled bag thereon will move away from the discharge mouth 7 of the hopper 5. The gate 10 is closed and the filled bag is removed from the tube and placed on its bottom end, when the material in the bag will close the valve 12<sup>a</sup> against the filling opening. Another empty bag is placed on the filling tube and the weight 15 will act to swing the beam 14 into a position wherein the filling tube is again engaged against the discharge mouth 7, after which the gate 10 is opened and the filling of the bag proceeds as before described. Such material as is spilled in the filling of the bag, falls into the hopper 18 and is transferred to the storage hopper by the conveyor 19. When the filled bag moves away from the mouth 7, the flexible end 25<sup>a</sup> of the pipe 25, will assume such a position as the material in the spillage hopper 18 compels it to.

Should any material be deposited in the venting conduits or pipe 25 in the venting of the bag, this material is blown out of said tube, just before the start of the filling of each bag as before mentioned.

When cloth bags are being filled, instead of paper bags, the air is vented in the same manner, thus preventing the displaced air from passing out through the interstices of the cloth bag and carrying with it such finer parts of the material as will pass through said interstices. Thus no material is wasted in dust clouds to settle down on the surrounding community, nor does the operator have to work in an atmosphere, heavily laden with such dust particles.

My improved bag filling machine has many advantages:—it vents the bags so that they may be completely filled with material, and will have the solidarity required for the bags to withstand the handling to which they are subjected. This does away with the necessity of jiggling or shaking the bag to produce a settlement of the material therein. The bags are easily applied to and removed from the tube, and this without in any manner changing the movements of the operator attending the same.

While in describing my invention, I have referred to certain details of mechanical construction and arrangement of parts, I do not wish to be limited thereto, except as may be pointed out in the appended claims.

I claim as my invention:

1. In a valve bag filling machine, a filling tube adapted to be inserted into the valve

opening in one end of the bag, said filling tube having a passageway for the material with which the bag is to be filled, and a venting conduit which opens at one end within the bag, and opens at its other end outside of the bag, and means for cleaning out said conduit.

2. In a valve bag filling machine, a filling tube adapted to be inserted into the valve opening in one end of the bag, said filling tube having a passageway for the material with which the bag is to be filled, and a venting conduit which opens at one end within the bag, and opens at its other end outside of the bag, and means providing a connection for a fluid under pressure, with one end of said venting conduit.

3. In a bag filling machine, the combination of a storage hopper having a discharge mouth, a filling tube adapted to be inserted into one end of a bag to be filled, means for moving said filling tube toward and away from the hopper discharge mouth, and means carried by the filling tube for venting the bag.

4. In a bag filling machine, the combination of a storage hopper having a discharge mouth, a filling tube adapted to be inserted into one end of the bag to be filled, said filling tube having a material passageway and a bag venting conduit, means for moving said filling tube toward and away from the hopper discharge mouth, and means operable as the filling tube approaches the hopper discharge mouth for discharging a

jet of compressed air into said venting conduit.

5. In a bag filling machine, the combination of a storage hopper having a discharge mouth, a filling tube adapted to be inserted into one end of the bag to be filled, said filling tube having a material passageway and a bag venting conduit, means for moving said filling tube toward and away from the hopper discharge mouth, a compressed air pipe, a valve connected thereto and means operable as the filling tube approaches the hopper discharge mouth, for momentarily opening said valve to discharge a jet of compressed air into said venting conduit.

6. In a bag filling machine, the combination of a storage hopper having a discharge mouth, a spillage hopper below said storage hopper, a filling tube adapted to be inserted into one end of a bag to be filled, means for moving said filling tube toward and away from the hopper discharge mouth, said filling tube having a venting conduit which opens at one end within the bag and its other end without the bag, and means connecting said venting passageway with the spillage hopper.

In testimony that I claim the foregoing as my invention, I affix my signature in the presence of two witnesses, this 24th day of November A. D., 1919.

ALVA W. TYLER.

Witnesses:

H. H. VAN HAGAN,  
T. H. ALFREDS.