Dec. 9, 1924. 1,518,238

A. O. ABBOTT, JR

PROCESS AND APPARATUS FOR EMPTYING VULCANIZING BAGS

Filed Feb. 23, 1924

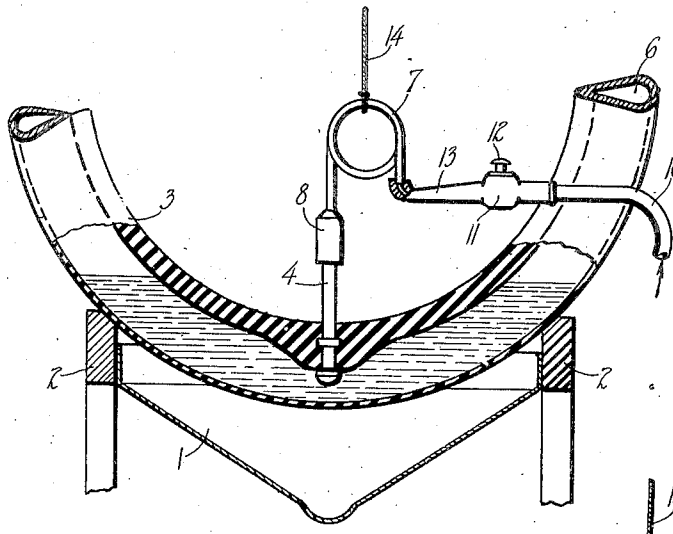


Fig. 1.

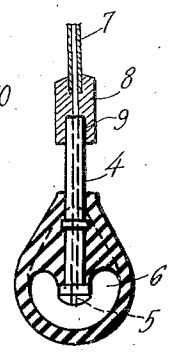


Fig. 2.

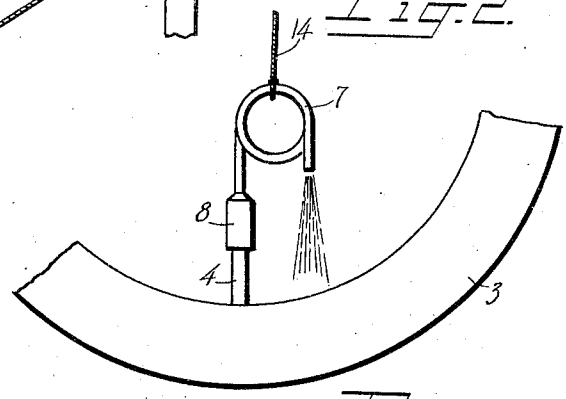


Fig. 3.

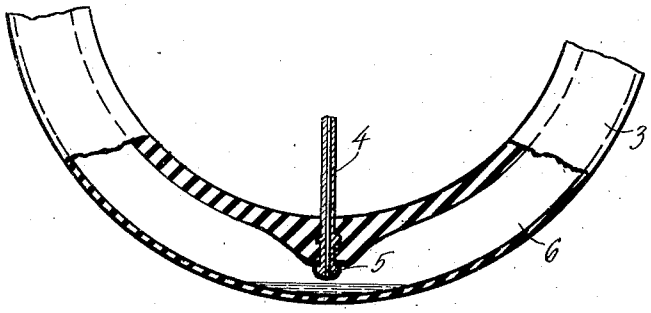


Fig. 4.

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UNITED STATES PATENT OFFICE.

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PROCESS AND APPARATUS FOR EMPTYING VULCANIZING BAGS.

Application filed February 23, 1924. Serial No. 694,456.

To all whom it may concern:

Be it known that I, ADRIAN O. ABBOTT, Jr., a citizen of the United States, and a resident of Detroit, county of Wayne, and State of Michigan, have invented a certain new and useful Process and Apparatus for Emptying Vulcanizing Bags, of which the following is a full, clear, and exact description.

This invention relates to the manufacture of rubber goods, and more particularly, to a process and apparatus for removing liquid from hollow vulcanizing equipment.

In connection with the manufacture of tires, for instance, it is desirable to employ a bag fitting the inside of the casings and adapted to be filled with water under pressure during vulcanization to compact the walls of the casings against outside rigid mold sections. After a casing has been vulcanized, the bag is removed and placed in an uncured casing. It has been found desirable to completely remove the water from the bags in order to have a definite volume to charge with water at the initiation of a curing operation in order to avoid there being present an uncertain quantity of cool, or relatively cool, water liable to introduce a variable factor into the precise conditions that must obtain during vulcanization, and also in order to facilitate manipulation of the bag, it being usual to bend or buckle it incident to insertion in a casing.

Heretofore, evacuation by the application of a vacuum has been resorted to but as the bag is necessarily collapsed and its wall structure unduly flexed and strained, its life is unduly shortened. The present invention contemplates a new and improved process which may be practiced with simple equipment at a rapid rate.

With the illustrated embodiment in mind but without intention to unnecessarily limit its scope, the invention, briefly, consists in, introducing compressed air or steam so as to raise the pressure within the bag to about five pounds. The charge of gas seeks the space above the water in the bag and forces the water out through the stem.

An embodiment of the invention is illustrated in the accompanying drawings, in which:—

Figure 1 shows a bag in position over a trough and connections for supplying gas to the interior of the bag.

Figure 2 is a cross-section of the bag through the stem;

Figure 3 illustrates how the liquid discharges to one side of the bag; and

Figure 4 is a fragmentary section showing the bag substantially completely emptied.

Referring to the drawings, a trough is indicated at 1, having side bars 2, on which the water bag 3 may be positioned and supported in a more or less vertical plane, either by hand or against brackets (not shown). The bag 3 is equipped with an inflating stem 4, which may be mounted and supported within the bag in any suitable manner but, preferably, with its bore 5 terminating within the cavity in proximity to the outer periphery of the cavity or at any point such that the bag may be substantially completely drained in a position not exactly horizontal.

To supply gas, or compressed air, (the latter is preferred) to the bag, any suitable form of conduit, such as that indicated at 7, may be provided, preferably one having a connection 8, at one end equipped with a socket 9 adapted to be slipped readily on and off the protruding end of the stem 4. The opposite end of the conduit 7 is adapted to be placed in communication with a supply line 10, equipped with a nozzle valve 11, whose plunger 12 is normally held in a cut-off position. The attachment 13 in which the valve 11 is mounted is preferably shaped to fit the end of the diverting conduit 7 and so that the supply line 10 may be readily placed in communication with the interior of the bag. The diverting conduit 7 and the valve attachment 13 may be supported in any manner convenient, as, for instance, by a rope 14, which runs up over a pulley or pin to a counterweight (not shown).

Operation.—The bags are brought to the

emptying station and placed in a more or less upright position above the trough 1, being steadied either by hand or by resting against a bracket arm. When the valve stem 4 is opened, part of the water is drained out by gravity and leaves a not inconsiderable volume which must be removed. To expedite its removal without injuring the bag, it is charged with compressed air (or gas) under a moderate pressure, by suitably coupling the diverting conduit 7 and the valve attachment 13 to establish communication with the source of fluid pressure supply 10. The connections being readily attachable, this may be done quite rapidly. The operator charges the bag by depressing the plunger 12 until the pressure within the bag reaches say five pounds. This figure is given merely for illustration as it is obvious that the higher the pressure, the more rapid the displacement of the liquid contained within the bag. The bag being charged, the operator releases the plunger 12 and disconnects the attachment 13 from the diverting conduit 7, which is preferably arranged to deflect the water to one side of the bag and down into the trough 1. The water escapes to one side, as illustrated in Figure 3 of the drawings, until the bag is substantially completely emptied, as illustrated in Figure 4. Ordinarily, only one charge of gas is necessary to effect substantially complete removal of the water but, if need be, the bag may be charged again. The diverting conduit 7 is then disconnected and the bag thrown to one side and another mounted for treatment.

The invention may be practiced in various ways other than have been detailed above, and all changes and variations within the underlying principles are comprehended. Reference should therefore be made to the appended claims for an understanding of the full scope and breadth of the invention.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:—

1. A process for substantially completely emptying liquid from hollow annular vulcanizing bags having an outlet stem which consists in, introducing a charge of gas under pressure above that of the atmosphere into the bag and thereby displacing the liquid from the bag.

2. A process for substantially completely emptying liquid from hollow annular vulcanizing bags having an outlet stem which consists in, supporting the bag above a trough with its stem as low as possible, charging the bag with a quantity of gas at a pressure above that of the atmosphere, and allowing the liquid to escape from the bag into the trough.

3. A process for substantially completely emptying liquid from hollow annular vulcanizing bags having an outlet stem which consists in, supporting the bag with the opening in its stem located below substantially all of the cavity to be emptied, partially draining the bag by gravity, and substantially completely draining the bag with introduced gas under a moderate pressure above that of the atmosphere.

4. An apparatus for emptying tire vulcanizing bags equipped with an outlet opening comprising a diverting conduit, and a valve-controlled gas charging line, said conduit and line being provided with quickly operable connections for supplying gas to and removing water from the bags.

Signed at Detroit, county of Wayne, and State of Michigan, this 18th day of February, 1924.

ADRIAN O. ABBOTT, JR.