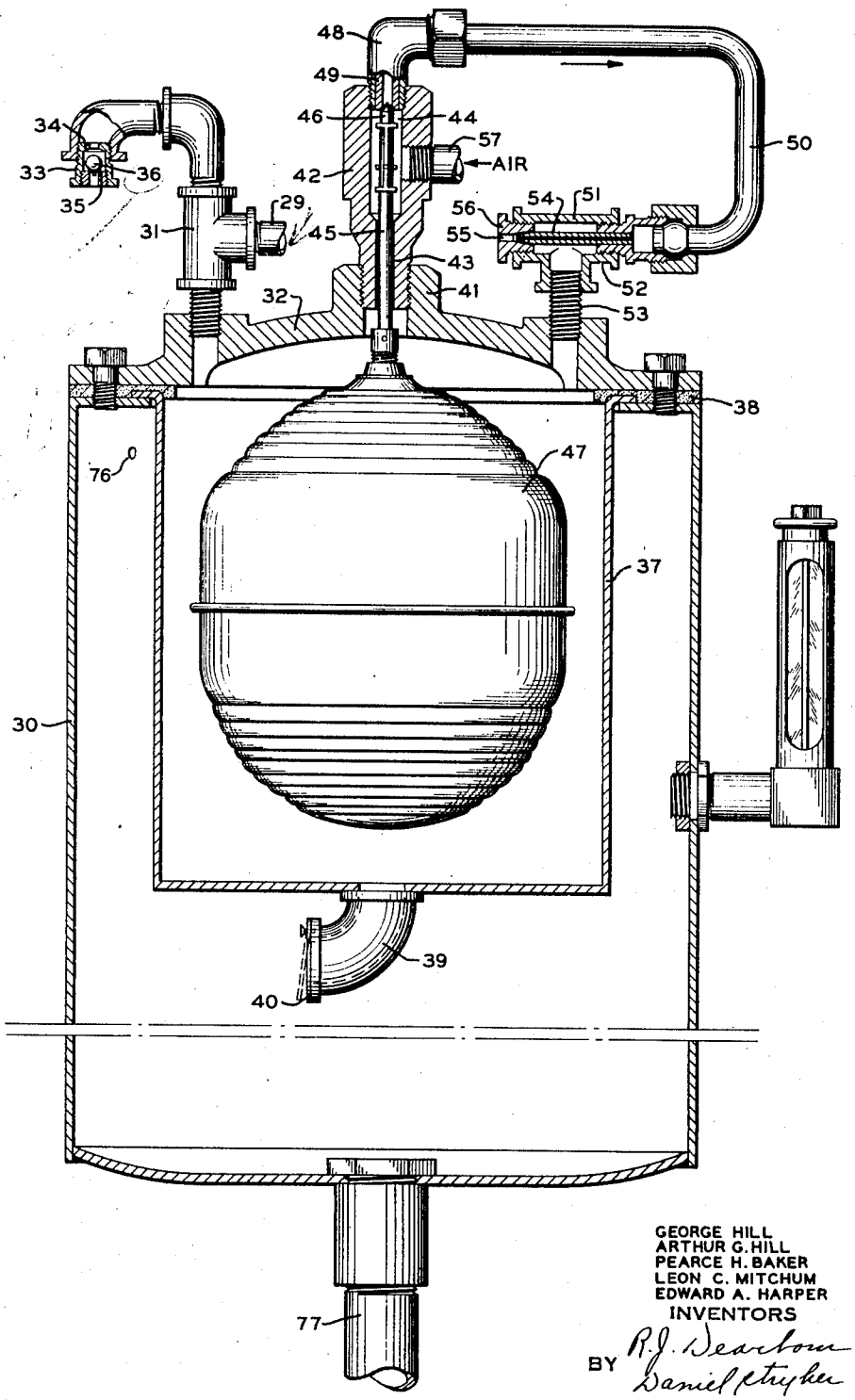
Search Room

Oct. 7, 1941. G. HILL ET AL 2,257,798

APPARATUS FOR USE IN CONDITIONING FIBROUS MATERIAL

Original Filed May 16, 1936



GEORGE HILL
ARTHUR G. HILL
PEARCE H. BAKER
LEON C. MITCHUM
EDWARD A. HARPER
INVENTORS

BY R. J. Dearborn
Daniel Stephen

THEIR ATTORNEYS

Patented Oct. 7, 1941

2,257,798

UNITED STATES PATENT OFFICE

2,257,798

APPARATUS FOR USE IN CONDITIONING FIBROUS MATERIAL

George Hill and Arthur G. Hill, Wellford, and Pearce H. Baker, Greenville, S. C., and Leon C. Mitchum and Edward A. Harper, Atlanta, Ga., assignors to The Texas Company, New York, N. Y., a corporation of Delaware

Original application May 16, 1936, Serial No. 80,114. Divided and this application May 10, 1939, Serial No. 272,820. In Canada April 12, 1938

2 Claims. (Cl. 103—236)

This invention relates to a mechanism for providing a positive and constant supply of oil or conditioning fluid to apparatus of the type illustrated and described in United States Patent No. 2,178,539, patented November 7, 1939, for Conditioning fibrous material. This application is a division of application Serial No. 80,114 filed May 16, 1936, which matured into said Patent No. 2,178,539.

It is an object of the invention to provide means for insuring a positive and constant oil supply to the apparatus for conditioning fibrous material by maintaining a uniform head on the oil supply line, thus insuring uniform distribution of the oil or conditioning fluid when sprayed. Other objects, features and advantages of the invention will appear as the description thereof, taken in connection with the accompanying drawing, proceeds. In the drawing the single figure is a partially sectional view of a vacuum operated constant head tank.

Referring to the drawing, there is illustrated a constant head tank which is connected by means of a pipe 29 to a source of oil supply. One end of the pipe 29 connects with a constant head tank 30 through a T fitting 31, one side of which connects directly with the head 32 of the tank 30 while the other is provided with a vacuum breaker 33 which includes upper and lower seats 34 and 35, respectively, for a ball valve 36, the operation of which will later be described.

A vacuum cup 37 is secured inside the tank 30 and to the underside of the head 32 by means of screws, bolts or the like, suitable packing 38 being provided to insure an air-tight connection. An outlet pipe 39 is secured in the bottom of the vacuum cup 37 and on its free end a flap valve 40 is hingedly mounted. Whenever a partial vacuum is maintained in the cup 37 the valve 40 is held in a closed position but when the vacuum is broken the valve 40 responds to the head of oil acting upon it within the cup 37 and opens to permit the oil to flow into the main tank 30.

The head 32 is formed to provide a centrally disposed and internally threaded boss 41 in which there is secured a valve housing 42. Housing 42 is bored longitudinally at two diameters as indicated at 43 and 44. The lower and smaller bore 43 is adapted to support a stem 45 which extends upwardly into the upper and larger bore 44. A tapered valve 46 is secured on the upper end of the stem 45, and on the lower end of the stem which extends downwardly into the vacuum cup 37 there is secured a hollow float 47.

One end of an elbow fitting 48 is secured in the upper end of valve housing 42. A bushing 49 is secured in this end of the fitting 48 to provide a restricted orifice for the passage of air and also to provide at its end a seat for the tapered valve 46. The opposite end of the fitting 48 connects with a pipe 50 which extends to and connects with a vacuum creator or entrainment nozzle 51 which includes a T fitting 52 secured by a nipple 53 to the head 32 through which communication is made with the interior of the vacuum cup 37. The vacuum creator 51 is provided with a tube 54 of restricted diameter through which air from the pipe 50 passes under pressure at high velocity. One end of the tube 54 is tapered and extends in spaced relation into a correspondingly tapered portion of an orifice 55 in a plug 56 which is screwed into an end of the T fitting 52. Thus air passing from tube 54 through the orifice 55 of plug 56 entrains with it air from the vacuum cup 37 and thereby creates a partial vacuum in the cup. The air thus used to create a partial vacuum in the cup 37 may be taken from any convenient source of air supply and is introduced into the enlarged portion of valve housing 42 through a pipe 57.

An outlet is provided in the bottom of the constant head tank 30 and to it there is connected one end of a pipe 77 through which oil is supplied to the oil manifold as shown in Patent No. 2,178,539.

From the foregoing it will be seen that by reason of the partial vacuum created in the vacuum cup 37 by the action of the air passing through the vacuum creator 51, oil is supplied from the source of supply to the conditioning apparatus. As air is withdrawn from the vacuum cup 37 oil is drawn from the course of supply which is maintained at atmospheric pressure. As the oil level rises within the vacuum cup 37 the float 47 rises and when a predetermined and desired level has been reached the tapered valve 46 closes the opening in the end of bushing 49 and shuts off the supply of air to the vacuum creator 51. During the period that a partial vacuum is maintained in the vacuum cup 37 the ball valve 36 of the vacuum breaker 33 is pulled upwardly and held against the upper valve seat 34, thus preventing the admission of any air to the vacuum cup. When the air supplied to vacuum creator 51 is discontinued by the closing of valve 46, the ball valve 36 quickly drops to the lower valve seat 35 which is suitably slotted to permit ready access of air which quickly enters the vacuum cup 37 and breaks the vacuum. Also, when the vacuum is broken the flap valve 40 in the outlet

pipe 39 responds to the head of liquid acting upon it and opens to permit the oil in the vacuum cup to flow into the main tank 30 which is vented to the atmosphere through a suitable opening 76 in the wall of the tank. As soon as the oil level falls in the vacuum cup the tapered valve is drawn away from the opening in the end of the bushing 49 and once again air is allowed to pass to the vacuum creator to start another cycle in the operation of the constant head tank.

Obviously, many modifications and variations of the invention as herein described may be made without departing from the spirit and scope thereof, and therefore only such limitations should be imposed as are indicated in the appended claims.

We claim:

1. In a constant head tank having a head formed with a plurality of openings, a vacuum cup secured to one underside of said head, a pipe connecting one of said openings to a source of oil supply, an entrainment nozzle connected to another of said openings through which communication is had with said vacuum cup, a pipe connected with said entrainment nozzle through which air under pressure is supplied to said nozzle to evacuate air from said vacuum cup and permit the entry of oil from said source of supply, a float in said vacuum cup, a valved stem secured to said float and extending through an opening in said head and into said air supply pipe, a valve seat in said air supply line adapted to cooperate with the valved end of said stem to interrupt the passage of air through said air line and said entrainment nozzle whenever sufficient oil has entered the vacuum cup to raise the float and bring the valved stem into engagement with said valve seat, and means for discharging oil from said vacuum cup when said entrainment nozzle ceases to evacuate air from said vacuum cup.

2. In a constant head tank having a head formed with a plurality of openings, a vacuum cup secured to the underside of said head, a pipe connecting one of said openings to a source of oil supply, an entrainment nozzle connected to another of said openings through which communication is had with said vacuum cup, a pipe connected with said entrainment nozzle through which air under pressure is supplied to said nozzle to evacuate air from said vacuum cup and permit the entry of oil from said source of supply, a float in said vacuum cup, a valved stem secured to said float and extending through an opening in said head and into said air supply pipe, a valve seat in said air supply line adapted to cooperate with the valved end of said stem to interrupt the passage of air through said air line and said entrainment nozzle whenever sufficient oil has entered the vacuum cup to raise the float and bring the valved stem into engagement with said valve seat, and means associated with said head for quickly admitting atmospheric air to said vacuum cup when the supply of compressed air to the entrainment nozzle is interrupted.

GEORGE HILL.
ARTHUR G. HILL.
PEARCE H. BAKER.
LEON C. MITCHUM.
EDWARD A. HARPER.