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N. LABONTY.

DYEING MACHINE.

APPLICATION FILED JULY 10, 1906.

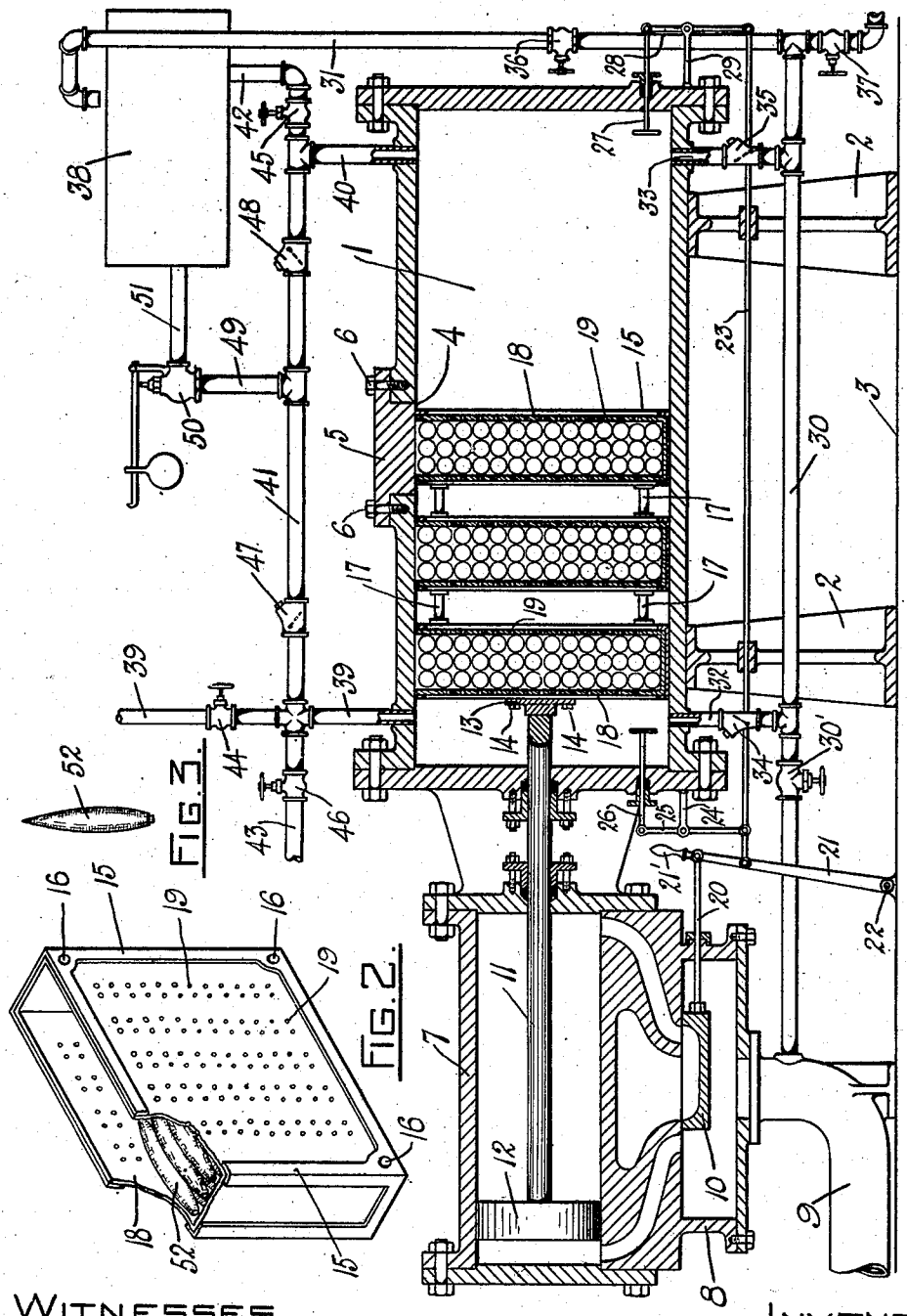


FIG. 1.

FIG. 3.

FIG. 2.

WITNESSES.

A.G. Pieczentkowski.

Harold E. Ball

INVENTOR

Napoleon Labonty

BY.

Horatio E. Bellows

ATTORNEY

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

NAPOLEON LABONTY, OF PAWTUCKET, RHODE ISLAND.

DYEING-MACHINE.

No. 853,700. Specification of Letters Patent. Patented May 14, 1907.

Application filed July 10, 1906. Serial No. 325,455.

To all whom it may concern:

Be it known that I, NAPOLEON LABONTY, a subject of the King of Great Britain, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Dyeing-Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to a machine for dyeing cops and has for its primary object a means for dyeing cops in large quantities in a short time.

A further object is to utilize the dyeing liquid for repeated use; and further, to afford facilities for maintaining or changing the temperature of the liquid. It is also desired to afford means for removing the sediment accumulating during the dyeing process.

To the above ends essentially my invention consists in providing a series of cop receptacles which are pervious to the dyeing liquid, and reciprocating these receptacles in a tank containing dye liquors. It further consists of means for maintaining the dye liquors at a high degree of temperature, and in other structural details which will be hereinafter set forth and claimed.

In the drawings which form a part of this specification, Figure 1 is a central longitudinal section of a machine embodying my invention. Fig. 2, a perspective view of a box and its holder with parts broken away, and Fig. 3, a side elevation of a cop.

Like reference characters indicate like parts throughout the views.

My novel machine may be operated by water, compressed air or steam, but in the form herein illustrated my machine is operated by steam.

The framework or body may be of any convenient form best adapted to carry out the purposes of structure, but the form thereof herein shown comprises a rectangular tank, 1, mounted upon supports, 2, fixed to the ground or floor, 3. An oblong rectangular opening, 4, in the roof of the tank, is closed by a removable cover, 5, attached thereto by screws, 6. Adjacent one end of the tank is mounted a steam cylinder, 7, its chest, 8, steam supply pipe, 9, and D-valve, 10. The piston rod, 11, of its piston, 12, enters the tank, 1, and carries upon its end an oblong rectangular plate, 13, fixed by screws, 14, or otherwise to the margins of a carrier frame, 15. A plurality of interspaced carrier frames, alike in every detail, are employed. In this instance, three. Each frame is rectangular to conform to the shape of the tank, 1, in which it is intended to loosely slide, and is provided upon both its front and rear sides with threaded openings 16, in each corner. Into the corresponding openings of each adjacent frame are inserted the ends of connecting bars, 17, whose ends are threaded in opposite directions. Any other convenient connecting means may be employed. In each frame rests a receptacle or box, 18, preferably of metal, whose front and rear wall are provided with perforations, 19. These boxes, which are identical in every respect, are rectangular, and their perforated sides are longer than their end walls, whereby the greatest dimension of the box is transverse to the length of the tank. If a cylindrical form of tank be preferred, obviously the frames and boxes should be circular in contour.

The end of the valve rod, 20, of valve, 10, is connected with a lever, 21, fulcrumed at 22, to the floor. The end of lever, 21, is extended to form an operating handle, 21′. Pivoted near one end to the lever, 21, is a horizontal connecting rod, 23, which is supported in the standards, 2. Fixed to the inner end of the tank, 1, is an arm or bracket, 24, to which is pivoted a lever, 25, one of whose ends engages the rod, 23, and whose other end is connected to a pin, 26, which traverses the end wall of the tank and projects therein some distance in the path of the frame, 15. A similar pin, 27, extends through the outer end wall into the tank in the path of the frames, and is connected with one end of a lever, 28, pivoted to an arm, 29, fixed to the tank wall. The other end of the lever, 28, is pivoted to the outer end of the rod, 23.

A steam pipe, 30, leads from pipe, 9, to a vertical pipe, 31. Pipes, 32, and 33, lead from pipe, 30, through the tank floor into the inner and outer ends of the tank respectively. Pipes 32 and 33 are provided respectively with check valves, 34 and 35. Pipe 30 has a globe valve, 30′, between pipes 9 and 32. Pipe, 31, is provided above and below the pipe, 30, respectively with globe valves, 36 and 37, and has its upper end arched to overhang a supply tank, 38, for dye liquids.

Entering the roof of the tank, at front and rear ends thereof, are the vertical pipes, 39

and 40, respectively, which enter a horizontal pipe, 41. One end of the latter, 42, is extended and upwardly directed to enter the bottom of the supply tank, 38. The opposite end of the pipe, 42, is continued, 43, to any convenient source of steam supply. The pipe sections, 39, 42, and 43, are respectively provided with globe valves, 44, 45 and 46. Near each end of the pipe section, 41, are check valves, 47 and 48; and rising upon its center is a pipe, 49, carrying a relief valve, 50, which is connected by a pipe, 51, with the supply tank, 38.

The operation of my machine is as follows: The cops to be dyed, 52, are packed longitudinally in superimposed layers in the boxes, 18. The cover, 5, of the tank is removed, and each box is dropped into its respective frame, 15, as the latter is brought beneath the opening, 4, of the tank. The movement of the carriers is effected by manually moving lever, 21. The cover, 5, is then replaced. The dye liquors are supplied from tank, 38, to the tank, 1, through the pipes, 42 and 40, until the operating tank is practically filled. Steam is then admitted to the cylinder, 7, by manually moving the handle, 21′, which reciprocates the piston rod, 11, and its connected carrier frames, 15, through the die liquids, which thereby are forced through the perforations, 19, in the sides of the boxes and thoroughly saturate the inclosed cops. Near the limits of the outward and inward travel of the piston rod, 11, the end carrier frames alternately contact with the pins, 26 and 27, thereby shifting through the rod, 23, lever 21, and rod 20, the valve 10; thus insuring the continuous reciprocation of the carriers in the tank. The temperature of the liquids in the tank, 1, is maintained at the necessary high temperature by the admission of steam through pipes 30, 32 and 33. The carriers and boxes slide very loosely in the tank 1, but notwithstanding this fact, the liquids are at the ends of the piston often excessively compressed. When such compression occurs, the dye liquors are forced up through the pipes, 39, 40, 41 and 49, and against the relief valve, 50, which at any predetermined pressure permits the excessive liquid to escape through pipe, 51 into tank, 38.

The contents of the operating tank are removed and the tank flushed after the dyeing operations as follows: The valves, 30′ and 37, are closed, and valve 36 opened to permit such dye liquors as are capable of second use to pass through pipes, 32, 33, 30 and 31, into supply tank 38. The liquid may be pumped up through pipe, 31, but I prefer to raise the same by the pressure of steam which is admitted by valve, 46, through pipes, 43 and 39, into the operating tank.

The useless liquors and sediment is removed and the tank flushed by closing valve, 36 and opening valve, 37, to permit the liquids to pass through pipes, 33, 30, and the lower end of pipe, 31, into the sewer. The flushing liquid, preferably cold water, is admitted to the operating tank through pipe, 39, by opening valve, 44, after valve, 46, is closed.

While only one storage tank, 38, is shown, in actual operation it is convenient to have a series of such tanks for different kinds of dye liquids, and provided with branch pipe connections with pipe 42.

Having described my invention, I claim,

1. In a machine of the type set forth, the combination with a closed tank for holding dye liquids and the materials to be dyed, of a movable receptacle in the closed tank for holding the articles to be dyed, a steam pipe entering the roof of the dyeing tank and means for moving the receptacle and means actuated by the reciprocation of said receptacle for automatically reversing its direction of motion and conduits through which the liquid may be returned from the bottom of the dyeing tank.

2. In a machine of the type set forth, the combination with a closed tank for holding dye liquids and the materials to be dyed, of a movable perforated receptacle in the closed tank for holding the articles to be dyed, a steam pipe entering the roof of the dyeing tank and means for moving the receptacle and means actuated by the reciprocation of said receptacle for automatically reversing its direction of motion and conduits through which the liquid may be returned from the bottom of the dyeing tank.

3. In a machine of the type set forth, the combination with a closed tank for holding dye liquids and the materials to be dyed, of a receptacle for holding the articles to be dyed slidably mounted in the closed tank, a steam pipe entering the roof of the dyeing tank and means for reciprocating the receptacle and means actuated by the reciprocation of said receptacle for automatically reversing its direction of motion and conduits through which the liquid may be returned from the bottom of the dyeing tank.

4. In a machine of the type set forth, the combination with a closed tank for holding dye liquids and the materials to be dyed, of a perforated receptacle for holding the articles to be dyed slidably mounted in the closed tank, a steam pipe entering the roof of the dyeing tank and means for reciprocating the receptacle and means actuated by the reciprocation of said receptacle for automatically reversing its direction of motion and conduits through which the liquid may be returned from the bottom of the dyeing tank.

5. In a machine of the type set forth, the combination with a closed dyeing tank, of a carrier frame slidably mounted in the tank, a steam pipe entering the roof of the dyeing tank a receptacle for holding the articles to

be dyed provided with openings in its walls mounted in the frame, and means for reciprocating the frame and for automatically reversing the same and conduits through which the liquid may be returned from the bottom of the dyeing tank.

6. In a machine of the type set forth, the combination with an engine cylinder, piston, and piston rod, of a closed dyeing tank adjacent the cylinder, a steam pipe entering the roof of the dyeing tank a carrier frame slidably mounted in the tank and fixed to the piston rod, and a receptacle for holding the articles to be dyed provided with openings in its walls mounted in the frame and means for automatically reversing the direction of motion of said frame and conduits through which the liquid may be returned from the bottom of the dyeing tank.

7. In a machine of the type set forth, the combination with an engine cylinder, valve, valve rod, piston, and piston rod, of a closed dyeing tank adjacent and in axial alinement with the cylinder, a carrier frame slidably mounted in the tank and fixed to the piston rod, a steam pipe entering the roof of the dyeing tank a perforated receptacle for holding the articles to be dyed mounted in the frame, a slidable pin in each end of the tank in the path of the carrier and pivotal connections between the pins and the valve rod and conduits through which the liquid may be returned from the bottom of the dyeing tank.

8. In a machine of the type set forth, the combination with a closed dyeing tank, of a perforated receptacle for holding the articles to be dyed slidably mounted in the tank, means for reciprocating the receptacle, a storage tank, pipes connecting the dyeing and storage tanks, and a relief valve in said pipes.

9. In a machine of the type set forth, the combination with a closed dyeing tank, of a receptacle for holding the articles to be dyed slidably mounted in the tank, a steam pipe entering the roof of the dyeing tank means for reciprocating the receptacle, and means for maintaining the contents of the dyeing tank at the proper degree of temperature and conduits through which the liquid may be returned from the bottom of the dyeing tank.

10. In a machine of the type set forth, the combination with a steam engine cylinder, piston, piston rod, and steam supply pipe therefor, of a closed dyeing tank adjacent the cylinder, a steam pipe entering the roof of the dyeing tank sliding means in the dyeing tank fixed to the piston rod for holding the articles to be dyed, openings in the floor of the tank, pipes connecting the openings with the steam supply pipes, and means in the connecting pipes for admitting and cutting off the steam from the tank, and conduits through which the liquid may be returned from the bottom of the dyeing tank.

11. In a machine of the type set forth, the combination with a closed dyeing tank, receptacles in the tank for holding the articles to be dyed, and means for reciprocating the receptacles, of a storage tank adjacent the dyeing tank, a steam pipe entering the roof of the dyeing tank, and a discharge pipe leading from the floor of the dyeing tank to the storage tank.

12. In a machine of the type set forth, the combination with a closed dyeing tank, receptacles in the tank for holding the articles to be dyed, and means for reciprocating the receptacles, of a valved supply pipe entering the roof of the tank, and a discharge pipe in the floor of the tank.

In testimony whereof I have affixed my signature in presence of two witnesses.

NAPOLEON LABONTY.

Witnesses:
HORATIO E. BELLOWS,
HAROLD E. BALL.