Aug. 19, 1924.

1,505,781

L. P. HART

DYEING APPARATUS

Filed June 6, 1919

2 Sheets-Sheet 1

Fig 1

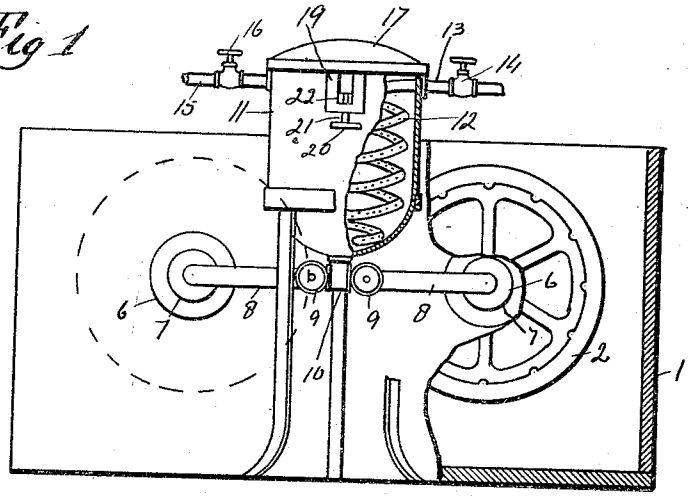
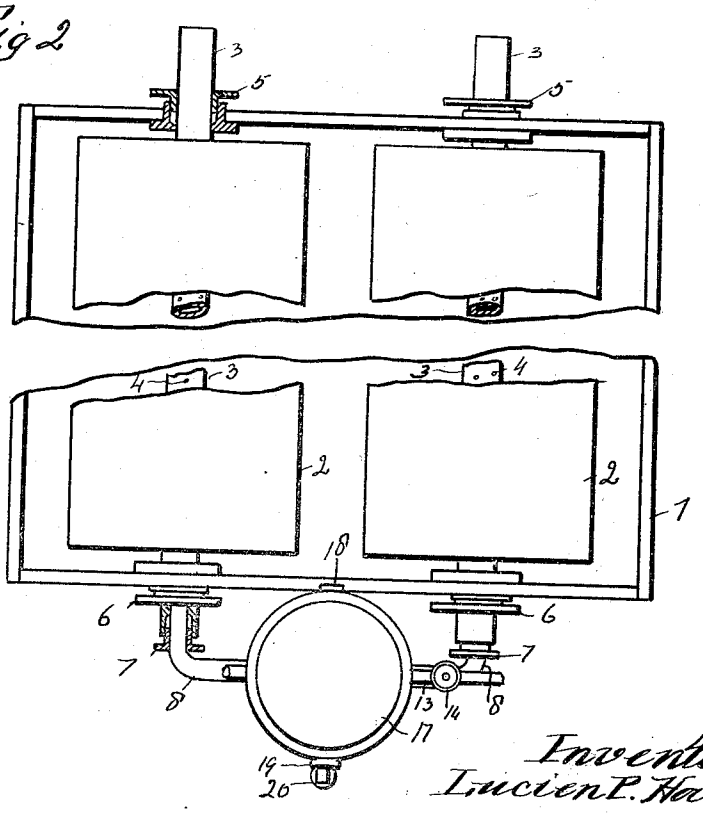


Fig 2



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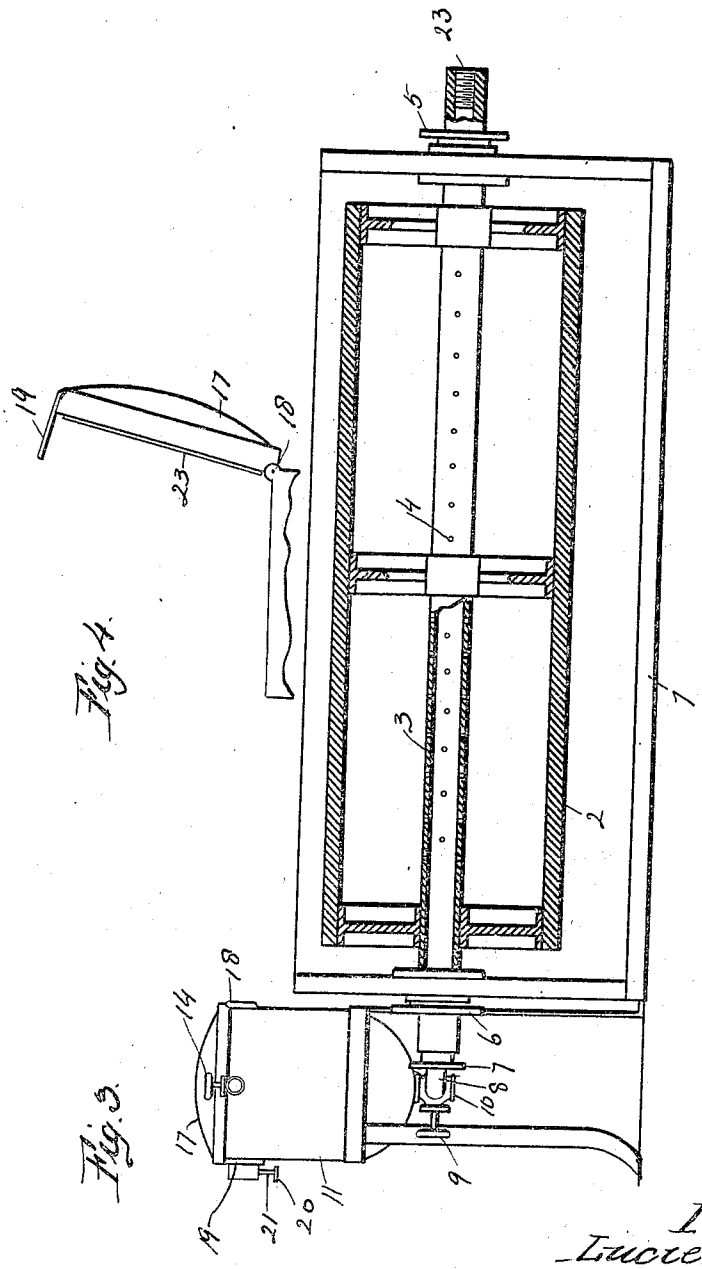


Fig. 4.

Fig. 3.

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Patented Aug. 19, 1924. 1,505,781

UNITED STATES PATENT OFFICE.

LUCIEN P. HART, OF PHILADELPHIA, PENNSYLVANIA.

DYEING APPARATUS.

Application filed June 6, 1919. Serial No. 302,200.

To all whom it may concern:

Be it known that I, LUCIEN P. HART, a citizen of France, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Dyeing Apparatus, of which the following is a specification.

My invention relates to a new and useful improvement in dyeing apparatus, and has for its object to so construct a device of this description that the dyeing material may be thoroughly mixed and heated and thereafter delivered under steam pressure to the interior of revolving cylinders, which latter serve to constantly change the position of the goods being dyed.

A further object of my invention is to provide for the delivery of the dyeing material in a finely divided state in the interior of the cylinders.

A further object of my invention is to provide means for controlling the heating and mixing of the dyeing material prior to its being delivered to the interior of the cylinders, and also means for controlling the delivery of this material to said cylinders.

A still further object of this invention is to improve the construction, arrangement and operation of dyeing apparatus described in my United States Letters Patent No. 1,033,584, dated July 23rd, 1912.

With these ends in view, my invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains, may understand how to make and use the same, I will describe its construction in detail, referring by numerals to the accompanying drawings forming a part of this application, in which:—

Fig. 1 is an end elevation of my improved dyeing apparatus, a portion of the tank being broken away to show the position of one of the cylinders therein, and also a portion of the heating and agitating kettle being broken away to show the perforated coil therein.

Fig. 2 is a plan view of the apparatus partly broken away to more clearly show the operating parts.

Fig. 3 is a side elevation of the apparatus, the front of the tank being removed, the revolving cylinder shown in section and a portion of the hollow shaft of said cylinder being broken and sectioned.

Fig. 4 is an enlarged view of the upper portion of the heating kettle showing the cover thereof swung open.

In carrying out my invention as here embodied, 1 represents a tank which may be of any desired shape or construction of proper size to carry on the process of dyeing, and within this tank are located any desired number of cylinders 2 here shown as two in number. Each of these cylinders is rigidly mounted upon a hollow shaft 3 which latter is perforated as indicated at 4, and this shaft passes through the end walls of the tank, being surrounded by the stuffing boxes 5 and 6 for preventing leakage at these points.

The inner ends of the hollow shafts are each provided with a stuffing box 7 through which passes the pipe 8, each of said pipes being provided with a stop cock 9 by which the flow through said pipes is controlled or cut off.

The pipes 8 through the coupling 10 communicate with the interior of the heating kettle 11 which latter is of such shape and size as to conveniently receive and heat the proper amount of dyeing material for the size tank to which it is coupled, and in this kettle is located the perforated coil 12 to which leads the steam pipe 13 controlled by the valve 14 in order that the proper amount of steam may be delivered to the kettle for heating and agitating the dyeing material to facilitate the mixing thereof. This kettle also has leading thereto a water supply pipe 15 provided with the controlling valve 16 for supplying the water to the kettle as occasion may require.

17 represents a cover which is hinged at 18 to the kettle, and this cover is provided with a latch 19 for holding the cover in its closed position and if found necessary the hand wheel 20 having a screw shank 21 may be threaded through a portion of the latch so as to bear against the lug 22 for drawing the cover tightly against the top of the kettle. A gasket 23 of rubber or other suitable material is carried by the cover of the kettle so that when said cover is closed upon the kettle a steam tight joint may be effected.

From the foregoing description the operation of my improved dyeing apparatus will be obviously as follows:—

The stop cocks 9 being closed the cover is swung open as shown in Fig. 4 when the dye-

ing material is poured into the kettle and the proper amount of water added thereto through the pipe 15 by the manipulation of the valve 16 after which live steam is projected into the contents of the kettle by the proper manipulation of the valve 14; the effective projecting of this steam being accomplished by its issuance through the perforations in the coil, thus agitating, mixing and heating the dyeing material in an effective manner, thereby lessening the time and labor necessary to produce highly satisfactory results.

After this dyeing material has been properly mixed and heated the cover is closed and latched so as to produce a steam tight joint after which the proper regulation of the valve 14 will create the desired pressure within the kettle to provide a motive force for driving the dyeing material through the pipes 8 so that it is only necessary to open the stop cocks 9 to the degree desired to cause the delivery of the proper amount of dyeing material to the hollow shafts 3. These hollow shafts being perforated as before described will permit the distribution of the dyeing material to the interior of the cylinders in a highly divided state thus causing it to thoroughly commingle with the contents of the tank and effect an even and uniform dyeing of the goods, said cylinders being revolved through any suitable means such as pulleys or gear wheels secured upon the projecting ends of the shafts 3.

The forcing of the dyeing material under steam pressure to the interior of the cylinders and the projecting of the same from the hollow shafts in a finely divided condition I have proved by demonstration is of great advantage in the process of dyeing, and the fact that the live steam is permitted to commingle with the dyeing material and is carried by said material to the contents of the tank gives an efficiency to the dyeing process which has heretofore not been attained.

The outer end of each of the hollow shafts 3 is closed in any suitable manner, here shown as a threaded plug 23 in order that the dyeing material and steam acting therewith may not escape at this point, thus permitting a certain amount of pressure to be created within each of the hollow shafts so as to give force to the finely divided projection of said material to the tank.

During the dyeing operation one end of the material which is in a single strip, is placed on one of the cylinders 2, then that cylinder is revolved, drawing the material through the dye, and when all the material has been wound on the cylinder it is stopped. The other end of the material is now placed on the adjacent cylinder and the latter revolved to wind the material thereon and unwind it from the first cylinder, which is allowed to run reasonably free.

When the material has been drawn through the dye, first onto one cylinder and then the other in the manner described and illustrated in my Patent No. 1,033,584, dated July 23, 1912, for a sufficient length of time to secure the desired shade, it is then drawn through a wringer, folded and dried as will be obvious.

Of course I do not wish to be limited to the exact details of construction as herein shown, nor to the particular design or outline of the machine, nor the arrangement of the parts relative to each other as these may be varied within the limits of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is:—

1. A dyeing apparatus comprising in combination, a tank to contain a dye liquor, a hollow perforated shaft journalled in said tank, an imperforate open ended cylinder on said shaft to revolve therewith and house the perforated portion thereof, and means for introducing dyeing material under steam pressure to the perforated shaft.

2. A dyeing apparatus comprising in combination, a tank to contain a dye liquor, a hollow perforated shaft journalled in said tank, an imperforate open ended cylinder on said shaft to revolve therewith and house the perforated portion thereof, and means for introducing dyeing material under steam pressure to the perforated shaft, said means consisting of a steam tight mixing kettle located outside of the tank and connected to the perforated shaft and provided with pipes leading from sources of water and steam supply.

3. A dyeing apparatus comprising in combination, a tank to contain a dye liquor, a hollow perforated shaft journalled in said tank, an imperforate open ended cylinder on said shaft to revolve therewith and house the perforated portion thereof, and means for introducing dyeing material under steam pressure to the perforated shaft, said means consisting of a steam tight mixing kettle located outside of the tank and connected to the perforated shaft and provided with pipes leading from sources of water and steam supply, the pipe leading from the steam supply source being connected to a perforated coil within the mixing kettle.

4. A dyeing apparatus comprising a tank to contain a dye liquor, an imperforate open end cylinder for conducting the material to be dyed through the dye liquor, the interior of said cylinder communicating with said tank at points considerably inside of the periphery of said cylinder and a hollow perforated shaft on which the cylinder is mounted to house the perforated portion thereof, said shaft being journalled to revolve and carry the cylinder therewith.

5. A dyeing apparatus comprising a tank to contain a dye liquor, an imperforate open end cylinder for conducting the material to be dyed through the dye liquor, the interior of said cylinder communicating with said tank at points considerably inside of the periphery of said chamber and a hollow shaft journalled in the tank and on which the cylinder is mounted, that portion of said shaft within the cylinder being perforated for introducing dye liquor under steam pressure within the cylinder whereby it will be gradually and thoroughly mixed with the contents of the tank.

6. A dyeing apparatus comprising a tank to contain a dye liquor, an imperforate open end cylinder for conducting the material to be dyed through the dye liquor, the interior of said cylinder communicating with said tank at points considerably inside of the periphery of said cylinder, a hollow shaft journalled in the tank and on which the cylinder is mounted, that portion of said shaft within the cylinder being perforated for introducing dye liquor under steam pressure within the cylinder whereby it will be gradually and thoroughly mixed with the contents of the tank, a steam tight mixing kettle on the outside of the tank and communicating with the hollow shaft, a pipe leading from a source of water supply to said kettle, a pipe leading from a source of steam supply to said kettle to provide the necessary steam pressure for forcing the contents of the kettle into the tank through the hollow perforated shaft and a perforated coil within the kettle and connected to the steam pipe to cause the steam to issue in jets for agitating and thoroughly mixing the dye liquor in said kettle.

In testimony whereof, I have hereunto affixed my signature.

LUCIEN P. HART.