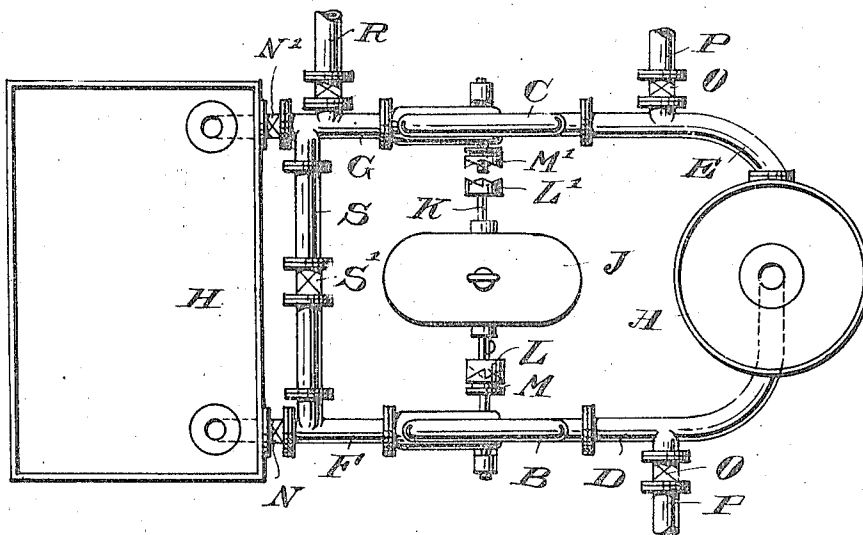


J., T. & E. BRANDWOOD.
 COMPACT DYEING AND LIKE MACHINERY.
 APPLICATION FILED OCT. 27, 1914.

1,145,858.

Patented July 6, 1915.



Witnesses:

Geo. C. Cheney
Waldo M. Chapin

Inventors:

John Brandwood
Thomas Brandwood
Edward Brandwood

By their Attorneys

Rensselaer Stockbridge & Son

UNITED STATES PATENT OFFICE.

JOHN BRANDWOOD, THOMAS BRANDWOOD, AND EDWARD BRANDWOOD, OF BURY,
ENGLAND.

COMPACT DYEING AND LIKE MACHINERY.

1,145,858.

Specification of Letters Patent.

Patented July 6, 1915.

Application filed October 27, 1914. Serial No. 868,843.

To all whom it may concern:

Be it known that we, JOHN BRANDWOOD, THOMAS BRANDWOOD, and EDWARD BRANDWOOD, subjects of the King of Great Britain and Ireland, and residents of Bury, in the county of Lancaster, England, have invented new and useful Improvements in Compact Dyeing and like Machinery, of which the following is a specification.

10 In apparatus for dyeing and similarly treating textile materials in cop, cheese or other compact form the dye or other liquid (hereinafter referred to as dye) is circulated and forced through the textile material by means of a single pump. The pumps used have been of the rotary vane type, or of the piston type or of the turbine or centrifugal type.

15 In carrying out the dyeing operation it is frequently desired to apply the dye to and force it through the material from the outside to the inside and then to force it through from the inside to the outside. A single pump of the rotary vane type permits this reversal of flow to be accomplished by reversal of drive of the pump but this type of pump is extremely objectionable for use with dye liquors and owing to its rubbing surfaces and the friction and wear set up by the presence of the dye such a pump soon loses its efficiency. The reversal of direction of drive necessitates a reversing driving gear entailing extra cost. A piston pump has the same objectionable rubbing surfaces and consequent defects and when it is to be used for pumping liquors in both directions it has to be fitted with special valves and cross over pipes which increase its cost, and decrease its efficiency.

20 A pump which is most suitable for use with a dyeing plant is of the centrifugal or turbine type but this pump has the disadvantage that it will only run and deliver its liquor in one direction, and to enable such a single pump to be used for reverse flow dyeing a complicated system of cross over pipes and valves is required, efficiency being thus reduced and power wasted.

25 In carrying this invention into effect we get the desired reversal of dye flow by employing two pumps of centrifugal or turbine type one of which only is driven at one time, and which are so disposed and arranged that one operates to circulate or force the dye through the dye chamber in

one direction, and the other operates to force or circulate the dye through the dye chamber in the other direction, both pumps being included in the same stream or current of dye and the one which is not driven having the liquor passing through it from the dyeing chamber to the suction of the driven pump. Thus to reverse the flow of dye it is only necessary to stop one pump and drive the other. This is preferably effected from a common motor and clutch or like gearing, without any reversing driving gear.

30 It is preferred to arrange between the two pumps a large reserve tank for dye, from which reserve tank the working pump draws its dye. With such an arrangement the pipe system is reduced to the simplest form, the driving gear is of the simplest nature, and the power required is practically only that required to work the one driven pump as the pump which is out of use offers very little resistance to the return flow of liquor through it.

35 The accompanying drawing illustrates in plan one type of dyeing plant disposed and arranged according to our invention.

A represents the dyeing chamber through which the liquor has to be forced in either of two directions and in which the cheeses, cops, or the like are placed for treatment. It may be of any well known construction.

40 B and C are two centrifugal or turbine pumps, connected by pipes D and E to the dyeing chamber, and by pipes F and G to a large open reserve tank H. Each pump is so disposed that when it is driven it delivers dye to the chamber A and sucks it from the tank H.

45 J is a motor, driving wheel, or the like source of power situated between the two pumps. It has a shaft K which is constantly rotated, and the ends of this shaft are provided with tooth clutches L L¹ to gear with corresponding tooth clutches M M¹ sliding on the ends of the pump shafts. The shaft K is not long enough to drive both clutches M and M¹ at once. The clutches M M¹ are so combined and operated and connected that they cannot both be in engagement with their opposed clutches L or L¹ at one and the same time.

50 As shown in the drawing the clutch M of the pump B is in gear with the motor shaft K and this pump is consequently driven,

while the pump C is not driven. The pump B forces dye through the pipe D to the chamber A, from which it emerges through the pipe E and thence takes its course
5 through the pump C and through pipe G to the reserve tank H. From the reserve tank it again enters the pump B through the pipe F. As long as the pump B is driven the circulation of the dye continues as described.

When a reversal in dye flows is required the clutch M is slid along its shaft until it is out of engagement with the clutch L. When it is free of this latter clutch its continued movement results in the connected clutch M¹ being slid into engagement with the clutch L¹ and the pump C is now driven. This pump delivers the dye through the pipe E to the chamber A whence it emerges
20 through the pipe D and thence takes its course through the pump B and through the pipe F to the reserve tank H. From the reserve tank it again enters the pump C through the pipe G. A reverse flow of the dye is thus obtained to that effected by driving the pump B, and so long as the pump C is driven this reverse flow is maintained. Both clutches M and M¹ may be moved to intermediate positions in which neither engages with its driving clutch. Both pumps
30 are then stationary and there is no flow of dye.

N N¹ indicate valves by means of which the volume of flow may be controlled.

35 O O are valves controlling let-off or drain pipes P.

R is a pipe by means of which dye may be introduced to the dyeing system from any convenient storage tank.

40 S is a cross pipe connecting the pipes F and G and provided with a valve S¹. This pipe is normally closed when the apparatus

is working in the manner already described, but it may have its valve S¹ opened (when the valves N N¹ are closed) so as to permit
45 the proper circulation of liquor to take place without passing into the reserve tank H.

What we claim is:—

1. Dyeing and like apparatus, comprising a dyeing chamber, two centrifugal pumps, 50 one of the said pumps being adapted to circulate the dye through the dye chamber in one direction and the other in the opposite direction in communication with such chamber, and means connecting the pumps, substantially as described.

2. Dyeing and like apparatus, comprising a dyeing chamber, two centrifugal pumps in communication therewith, and a reserve tank with which the pumps are also in communication, substantially as described.

3. Dyeing and like apparatus comprising a dyeing chamber, two centrifugal pumps in communication with such chamber, means of communication between such pumps, and means for driving the pumps alternately, 65 substantially as described.

4. Dyeing and the like apparatus, comprising a dyeing chamber, two centrifugal pumps, a reserve tank, pipes connecting the pumps with the dyeing chamber, pipes connecting the pumps with the reserve tank, and motor for the two pumps, substantially as hereinbefore described.

In witness whereof we have hereunto set our hands in the presence of two subscribing witnesses. 75

JOHN BRANDWOOD.
THOMAS BRANDWOOD.
EDWARD BRANDWOOD.

Witnesses:

FRANK ADDEYS,
MALCOLM SMITHURST.