

H. HIGGS.
DYEING MACHINE.
APPLICATION FILED MAR. 9, 1914.

1,229,612.

Patented June 12, 1917.
2 SHEETS—SHEET 1.

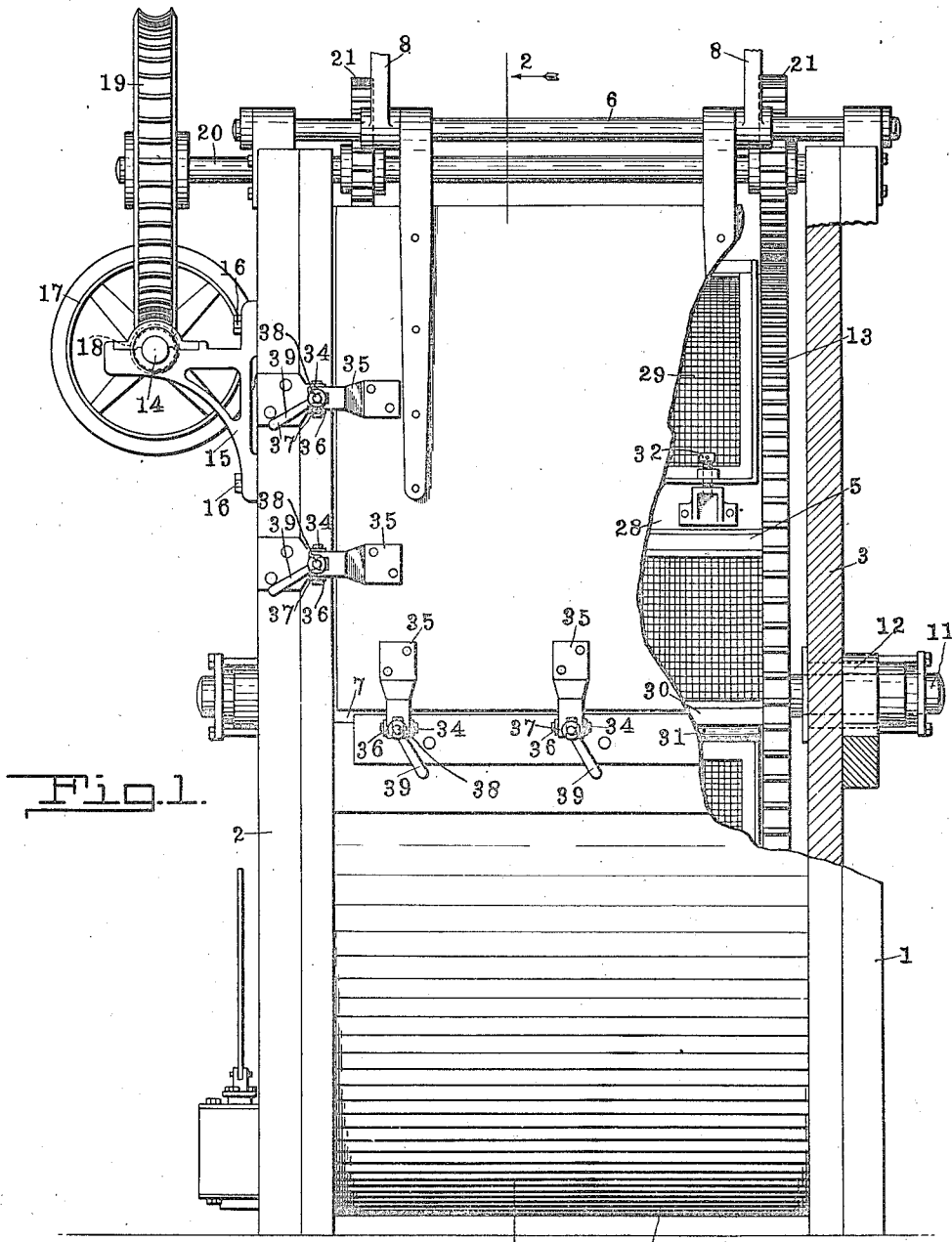


Fig. 1.

WITNESSES:

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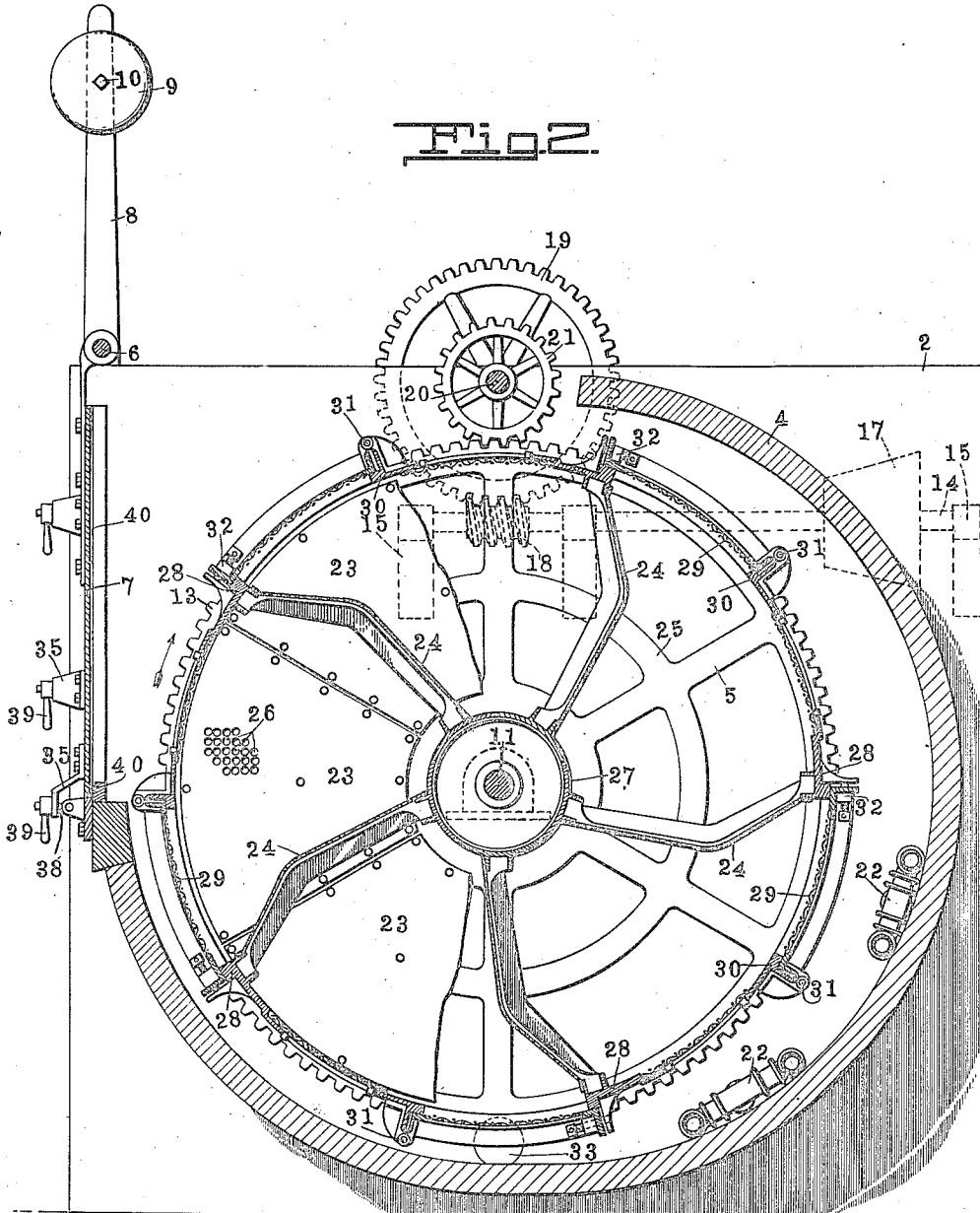
BY

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ATTORNEYS

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WITNESSES:

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UNITED STATES PATENT OFFICE.

HENRY HIGGS, OF AMSTERDAM, NEW YORK, ASSIGNOR TO KLAUDER-WELDON DYEING MACHINE COMPANY, OF AMSTERDAM, NEW YORK, A CORPORATION OF NEW YORK.

DYEING-MACHINE.

1,229,612.

Specification of Letters Patent.

Patented June 12, 1917.

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To all whom it may concern:

Be it known that I, HENRY HIGGS, a subject of the King of England, residing at Amsterdam, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Dyeing-Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to dyeing or washing machines, and with respect to certain more specific features thereof, to rotary dyeing or washing machines.

This invention has for one of its objects to provide a rotary washing machine which will be efficient in action and highly practical. Another of the objects of the invention is to provide improved means to minimize the roughing up or felting of the goods. It is another object of this invention to provide simple and practical apparatus adapted to uniformly dye or wash goods. Other objects will be in part obvious and in part pointed out hereafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is shown one of various embodiments of the invention,—

Figure 1 is a view in front elevation of an improved rotary dyeing machine; and

Fig. 2 is a sectional view of the same, taken on the line 2—2 of Fig. 1, looking in the direction of the arrow.

Referring now more particularly to the drawings, in which similar reference characters refer to similar parts throughout the different views, the numeral 1 indicates a dye vat which may be constructed of wood or other suitable material and which comprises side walls 2 and 3, and a peripheral wall 4 preferably taking on the general shape of a rotatable frame 5, and connecting with said side walls to confine the dye liquor. At the front of the machine and pivotally mounted on a shaft 6, fixed and extending between the side walls 2 and 3, is a door 7. This door is adapted to be closed

and removably secured or clamped in engagement with the side walls 2 and 3 and with the peripheral wall 4, and when so closed and secured forms a part of the liquor retaining vat wall and is provided with means, which will be hereinafter described, to render the joint or joints between the before-mentioned walls of the vat and the door of a liquid-tight character. Fixed to the shaft 6 are a pair of arms 8 carrying counter-weights 9 adjustable, as indicated at 10, and adapted to render comparatively easy the opening and closing of the door 7. Journalled in the side walls 2 and 3 of the vat 1 is a shaft 11 which carries, in fixed engagement therewith, the rotatable frame or carrier 5. Stuffing boxes 12 or other suitable liquid-confining means are provided on both sides of the machine and serve to prevent the dye liquor from leaking out of the vat between the rotatable shaft 11 and the side walls 2 and 3. The rotatable frame 5 is preferably constructed with large peripheral gears 13, one on each end of the frame and, as shown, is permanently mounted in the vat.

The lower edge of the opening which is closed by the door 7, extends below the normal level of the treating liquor in the vat, the liquid tight arrangement preventing leak of the liquor when operating. Thus, when discharging goods from the carrier through the door 7, some liquor may be left in the vat below said opening so that any material not completely treated may not dry out and thereby become streaked or be defective.

A driving shaft 14 is supported in a bracket 15 fixed to the side wall 2 of the vat, as indicated at 16. The shaft 14 is equipped with a driving pulley 17 for obtaining variable speeds, and has also fixed thereto a worm 18 which meshes with a worm wheel 19 fixed on a shaft 20. The shaft 20 extends through suitable bearings in the side walls 2 and 3 of the vat, and has fixed thereto pinions 21 meshing with the large peripheral gears 13 on the frame 5. The vat 1 practically ensconces the rotatable frame 5 and when filled with dye liquor the frame 5 is substantially submerged in the liquor. Particular and important advantages arise from the use of a construction of this character. Inasmuch as the material is submerged in

the dye liquor during the entire revolution of the frame, the latter may be rotated much slower than would be practical if the material were only submerged in the dye about half of each revolution and by reason of this slower movement of the frame or drum the disturbance of the material is minimized, avoiding to a great extent the roughing up or felting of the goods. In the present embodiment a slight rolling or tumbling movement of the goods in the several compartments is given, as will hereinafter appear. By sustaining the goods in the bath while causing them to rotate about a point substantially within each chamber the goods will be more effectively treated because of the agitation caused by the shape and movement of the impelling walls of the compartments. When the goods are sustained by the bath the carrier may be more rapidly rotated without rubbing the goods to any substantial extent, and this more rapid rotation is possible, and comports with effective treatment, because the goods are influenced by the treating liquor during the entire rotation of the carrier. Furthermore, it will be perceived that a superior product will result, due to the foregoing, because as the goods are rotated or moved upon themselves in the chamber to cause more effective penetration of the dye liquor they are at the same time sustained by the bath and not heavily rubbed against each other, "felting" of the goods being thus avoided. Heating means are indicated at 22 in the form of steam pipes projected into the vat to bring the liquor to a proper temperature. The frame 5 comprises a plurality of compartments 23, shown in this preferred form as five in number. These compartments are formed by longitudinal perforate walls 24 extending between spiders 25, to which latter are secured end perforate walls 26 of sector-like appearance. The inner sides of the longitudinal walls 24 take into a small drum or core 27 approximate the shaft 11, and the outer sides of the walls 24 are secured to longitudinal struts 28 which may be integral with the spiders 5. There is secured to the frame 5, about the periphery thereof, a number of pivotally movable doors 29, one associated with each of the compartments 23. These doors are all similar in construction and correspondingly pivoted on longitudinal struts 30, as indicated at 31, and these doors are adapted to be secured in engagement with the longitudinal struts 28. Clamping means are provided, as indicated at 32, to effect the aforesaid liquid-tight engagement with the strut 28. By means of these doors the material being treated is retained in the compartments, and access may be had to any one of the chambers or compartments which make up the rotary drum, and accordingly the compartments may be loaded with goods

or material to be dyed without removing the frame from the vat. An outlet for the dye liquor is provided at 33.

It is to be noted that the drum or frame 5 is quite extensively composed of perforate walls which may be of wire screening or other suitable penetrable material in order to permit the dye liquor to pass freely in and through the compartments and act upon the material or goods contained therein. An important advantage of this invention is that the goods being dyed are in a measure sustained by the bath during the rotation of the frame, thereby to a great degree preventing the roughing up of the goods. A plurality of clamping means are provided, as indicated at 34, between the walls of the vat and the door 7. Each of these clamping means preferably comprises a member 35 fixed to the door 7, having a projecting portion 36 adapted to be engaged by a clamping screw 37, which is associated with a threaded member 38 fixed to one of the confining walls of the vat. A handle 39 is provided for the convenience of the operator in tightening or loosening the clamp.

In loading the machine with material to be dyed, the door 7 is unclamped from its engagement with the confining walls of the vat and moved about the pivot shaft 6 into a position allowing easy access to the rotary frame or drum 5 from the front of the machine. The frame is then turned to permit the operator to unclamp one of the doors 29 of a compartment 23, whereupon the operator swings this door into its open position and fills the compartment with material. The door is then locked and the frame is rotated to bring the next compartment into filling position, and there the aforesaid operation is repeated, and so on, until the desired number of compartments have been made ready for the dyeing operation. The front door 7 is then locked and clamped in position against the walls of the vat, a liquid-tight relation therewith being secured by means of squeegee or packing strips 40, and the dye liquor introduced to a level sufficient to submerge any material in any of the compartments in the frame 5. The heating means 22 is then operated to bring the temperature of the dye liquor to the proper point for dyeing and the drum is slowly rotated to cause slight disturbance of the goods to facilitate the action of the dye liquor. As the carrier 5 rotates the doors of the respective compartments move into and out of position opposite the vat door 7, and when the material in any compartment is sufficiently treated, it may be removed without disturbing the material in another compartment. The longitudinal perforate walls 24 are concavo-convex, the inner portions extending radially and the outer portions extending chordally and as said walls impel

the goods toward and through the upper portion of the vat they cooperate with gravity to give a slight rolling or tumbling movement of the goods. This rolling or epicyclic movement of the material also enables the dye liquor to penetrate the goods at every angle and thus enhances the uniformity of the work as well as expediting the operation.

It will be seen, therefore, from the foregoing that there is provided a device which accomplishes, among others, all the objects and advantages hereinbefore set forth.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In dyeing apparatus or the like, in combination, a rotary member comprising a plurality of compartments adapted to contain material, said compartments comprising longitudinally extending concavo-convex walls, transverse end walls and peripheral walls, and a vat in which said member is

disposed for rotation adapted to contain liquor to a point where the said longitudinally extending walls are substantially continuously submerged during a complete rotation of said member.

2. In dyeing apparatus or the like, in combination, a rotary member comprising a plurality of compartments adapted to contain material, said compartments comprising longitudinally extending concavo-convex perforate walls, transverse end walls and peripheral walls, and a vat in which said member is disposed for rotation adapted to contain liquor to a point where the said longitudinally extending walls are substantially continuously submerged during a complete rotation of said member.

3. In dyeing apparatus or the like, in combination, a rotary member comprising a plurality of compartments adapted to contain material, said compartments comprising longitudinally extending concavo-convex walls, the concavity of one wall facing the convexity of an adjacent wall, transverse end walls and peripheral walls, and a vat in which said member is disposed for rotation adapted to contain liquor to a point where the said longitudinally extending walls are substantially continuously submerged during a complete rotation of said member.

In testimony whereof I affix my signature, in the presence of two witnesses.

HENRY HIGGS.

Witnesses:

R. W. EMERSON,
W. A. GROAT.