

(No Model.)

2 Sheets—Sheet 1.

W. J. GLEASON & J. H. BOWER.
APPARATUS FOR DYEING SKEINS.

No. 569,453.

Patented Oct. 13, 1896.

Fig. 1.

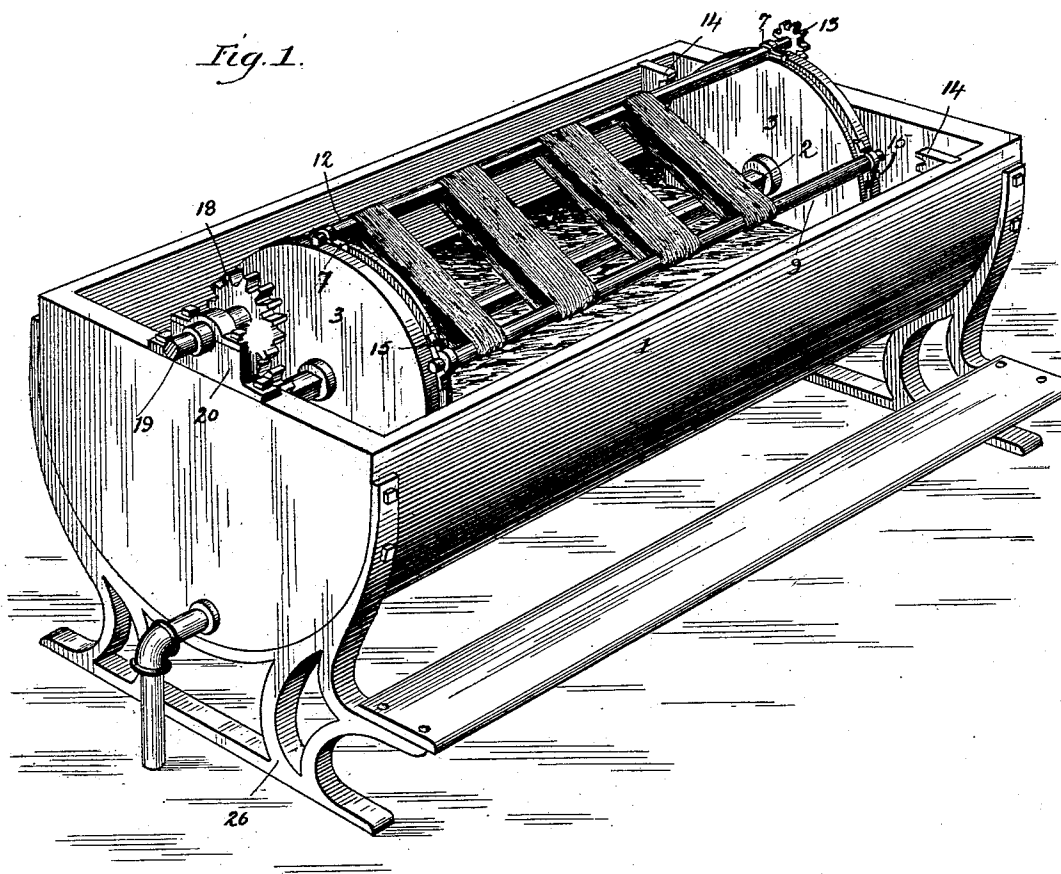
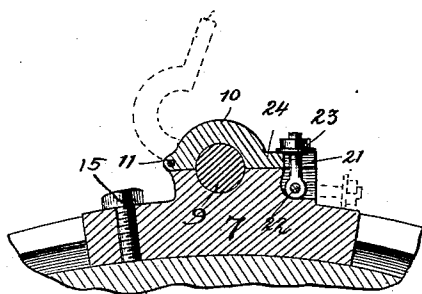


Fig. 4

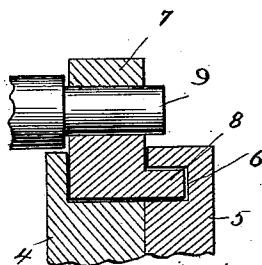


Witnesses:

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Fig. 5



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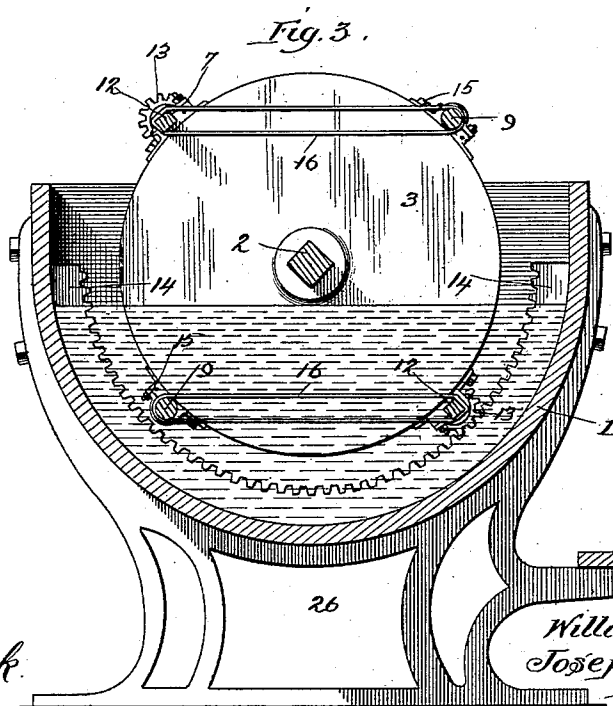
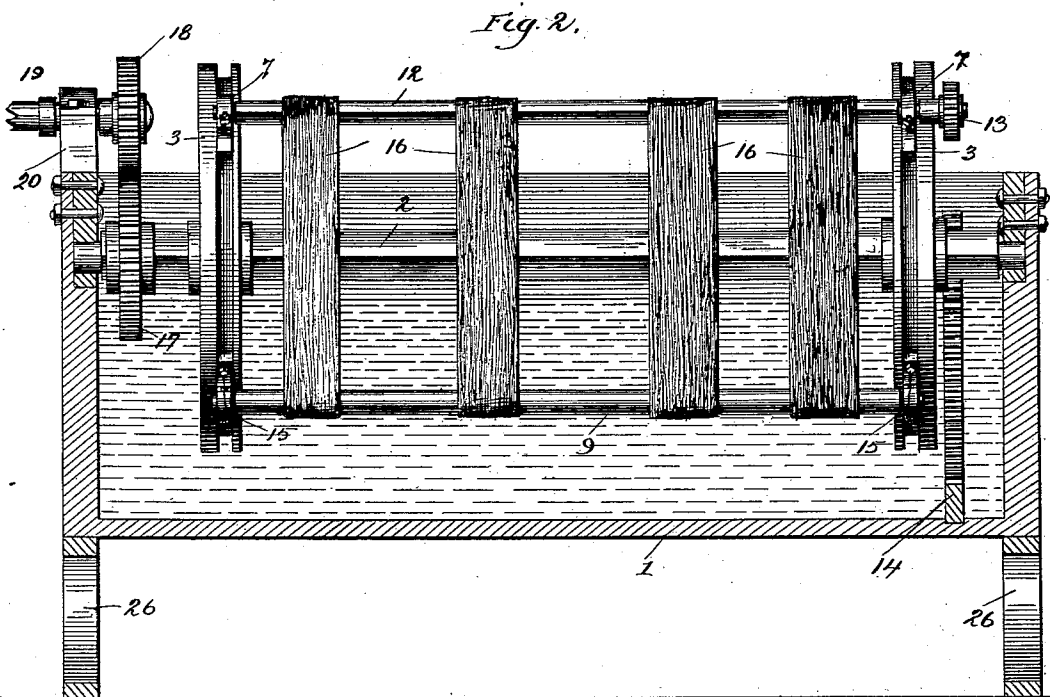
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UNITED STATES PATENT OFFICE.

WILLIAM J. GLEASON AND JOSEPH H. BOWER, OF PHILADELPHIA,
PENNSYLVANIA.

APPARATUS FOR DYEING SKEINS.

SPECIFICATION forming part of Letters Patent No. 569,453, dated October 13, 1896.

Application filed April 20, 1896. Serial No. 588,330. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM J. GLEASON and JOSEPH H. BOWER, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Methods of and Apparatus for Dyeing, of which the following is a specification.

Our invention relates to a new and useful improvement in apparatus for dyeing skeins of yarn and the like, and has for its object to produce a method of and apparatus for this description which will greatly facilitate the handling of yarns and the like for the purpose of treating with liquid dye, and which will obviate the necessity of manipulation by hand, and which will also increase the capacity of machines as heretofore designed, as well as improve the quality of the dyed article.

With these ends in view our 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, we will describe its construction and operation in detail, referring by number to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a perspective of a machine built in accordance with our improvement; Fig. 2, a central vertical longitudinal section of the same; Fig. 3, a cross-section thereof; Fig. 4, an enlarged detail of one of the bearings for the yarn-sticks; and Fig. 5, a detailed section of this bearing, showing the manner of attaching the same to one of the heads of the reel.

In carrying out our invention we provide a tank 1, preferably semicylindrical in shape, of sufficient capacity to hold the required amount of liquid dye, and in this tank is journaled the shaft 2, upon which are secured the reel-heads 3. Each of these heads is composed of two disks 4 and 5; the latter having an annular groove 6 formed upon its inner face, and the former is reduced in diameter near its outer edge, so that when the two disks are secured together in any convenient manner an L-shaped groove will be formed

extending around the circumference of the head.

7 are a number of boxes having offsets 8 formed upon their lower ends adapted to project within the groove 6, so that when these boxes are placed in this groove and the disks secured together to form the head said boxes will be held therein against withdrawal, but permitted to slide along in the groove. In these boxes are journaled yarn-sticks, some with pinions and others without. The former we term "feed-rods" and the latter "work-supporting rods."

In practice we prefer to form one set of the boxes as slide-bearings, in which the work-supporting rods 9 are journaled, and the opposite set of boxes we prefer to construct as split bearings, the upper halves 10 of which are hinged at 11 to the lower portions, so that the work-supporting rods may be readily removed from this set of bearings by the swinging back of the halves 10 for the purpose hereinafter set forth.

12 are the yarn-sticks, which are journaled in each alternate set of the boxes and are provided with the pinions 13, secured upon the outer ends thereof, and these pinions are arranged to mesh with the semicircular rack-bar 14 during a portion of the revolution of the wheel, the result of which will be to cause said feed-rods to revolve upon their axes, as will be readily understood by reference to Fig. 3.

The boxes in which the yarn-sticks are journaled are secured within the heads of the reel against movement by means of bolts or otherwise, and the boxes in which the work-supporting rods are journaled are adapted to be adjusted lengthwise in their grooves by the set-screws 15. By this arrangement when it is desired to place the skeins 16 of yarn or other material upon the reel they are first passed around one of the yarn-sticks 12 by the removal of one end thereof from one of its boxes, as before described, and the work-supporting stick is then passed through the several skeins and placed in position within its bearings, when these bearings may be adjusted to draw the skeins sufficiently taut, as clearly shown.

After the proper number of skeins have

been placed upon the reel, as just described, the latter by being caused to revolve will first carry the skeins into the dye liquid and then elevate them above the surface of said liquid, by means of which the material is first saturated with the dye and then brought into the atmosphere, where the action of the air will tend to set the dye, as is well understood in this art.

During the revolutions of the reel the pinions 13 will be caused to mesh with the rack-bar 14 as they pass downward into the liquid, thus revolving the yarn-sticks sufficiently to feed the skeins around said sticks and the work-supporting rods, after the manner of a belt, and the object of this is to present every portion of the material to be dyed to the liquid under the most favorable conditions, so that the entire material may be uniformly treated.

It is obvious that any suitable arrangement of drive mechanism may be utilized for giving the reel its rotary motion, but that which has proved satisfactory in practice is to secure upon the shaft 2 a gear-wheel 17 and provide a similar gear-wheel 18 upon the shaft 19, which latter is journaled in the box 20, and these wheels are adapted to mesh with each other, so that motion imparted to the shaft 19 will be transmitted to the shaft 2. Any suitable pulleys may be arranged upon the shaft 19 and power transmitted thereto by belt leading to the source of power. This arrangement prevents the overflow of the liquid through the bearings of the shaft 2, thereby permitting the filling of the tank to a higher level.

For convenience in removing the work-supporting rods and the yarn-sticks and also for securing them in place the hinged half 10 of each of the boxes may be locked into place by a swing-bolt 21, pivoted to the box at 22 and provided with a nut 23, adapted to bear against the upper side of the half 10 after said swing-bolt has been swung into the slot 24. It will be obvious that any form of support for the tank may be used, and we have here shown the frames 26 for this purpose.

We are aware that slight modifications might be made in the construction here described without departing from the spirit of our invention, which rests in the broad idea of automatically submerging skeins of yarn or the like in a dyeing liquid, withdrawing said skeins from the liquid, and simultaneously feeding said skeins, so as to present every portion of the material to the liquid, after the manner of hand-dyeing.

Having thus fully described our invention, what we claim as new and useful is—

1. In a device of the character described, a reel having heads each composed of two disks, one having an annular groove on its inner face, the other reduced in diameter at its outer edge forming, when placed together, an L-shaped groove, boxes having projections formed on their lower ends to slide in said groove and rods journaled in the boxes, as and for the purpose described.

2. The herein-described combination of a tank 1, a shaft 2 journaled therein, a reel composed of the heads 3 secured upon said shaft, work-supporting rods 9 journaled in suitable bearings made adjustable upon said heads, feed-rods 12 also journaled in bearings carried by said heads, gears 13 carried by the outer ends of said feed-rods, a semicircular rack-bar 14 secured within the tank with which said pinions are adapted to mesh, a gear 17 secured upon the shaft 2, a gear 18 adapted to mesh therewith, and a shaft 19 upon which the last-named gear is secured, all arranged substantially as and for the purposes set forth.

3. In a device of the character described a tank, a reel journaled therein having heads 3 each composed of two disks 4 and 5 so shaped as to form an annular groove and journal-boxes 7 fitting in the grooves, as and for the purpose described.

4. In a device of the character described a tank, a reel journaled therein having grooved heads, journal-boxes slidable in the grooves, work-supporting rods journaled in the boxes and having pinions on their ends and a semicircular rack-bar secured within the tank with which the pinions are adapted to mesh, as and for the purpose described.

5. In a device of the character described, a reel having circumferentially-grooved heads, boxes slidable in the grooves of the heads, set-screws on the boxes to secure them in place hinge-caps on the boxes having open slots on their ends, pivoted bolts adapted to swing into the slot and bind the cap and rods journaled between the cap and the box, as and for the purpose described.

In testimony whereof we have hereunto affixed our signatures in the presence of two subscribing witnesses.

WILLIAM J. GLEASON.
JOSEPH H. BOWER.

Witnesses:

S. S. WILLIAMSON,
MARK BUFORD.