

J. H. GILES.
 DYEING APPARATUS.
 APPLICATION FILED SEPT. 28, 1912.

Patented Apr. 1, 1913.

1,057,635.

Fig-2-

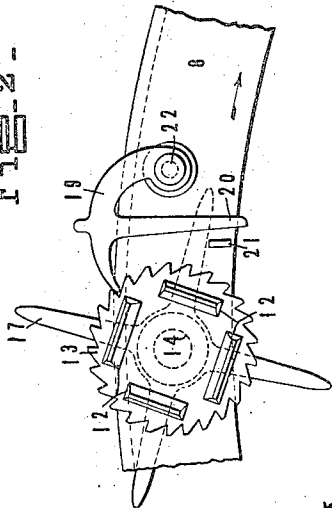


Fig-3-

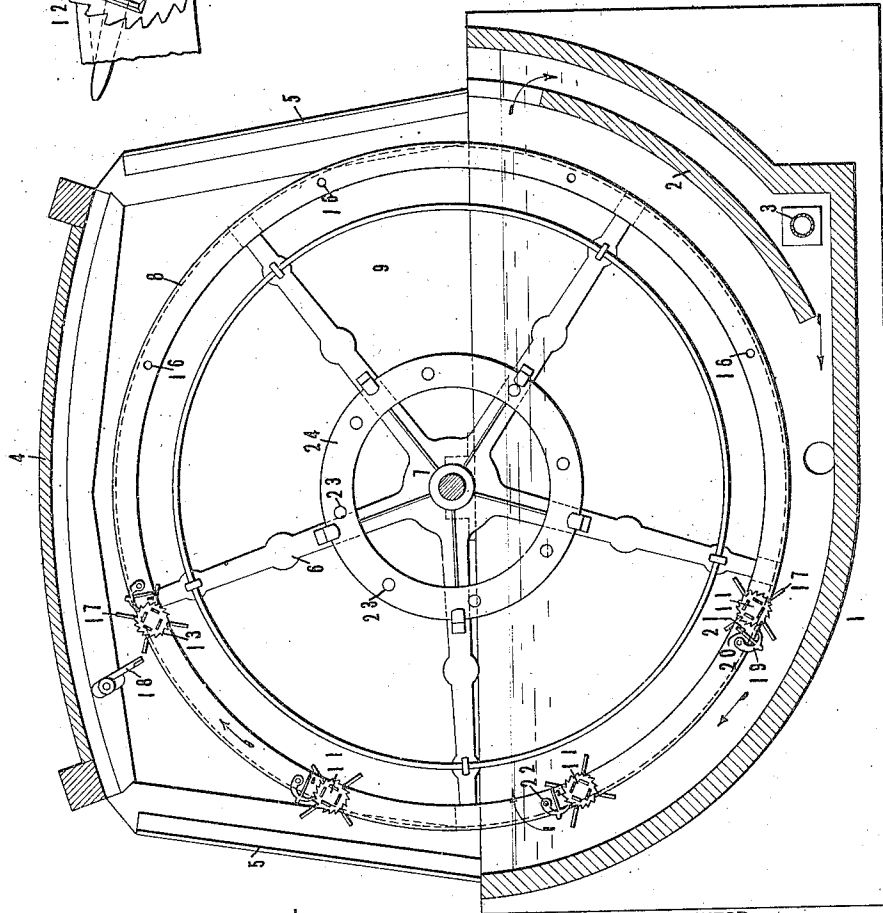
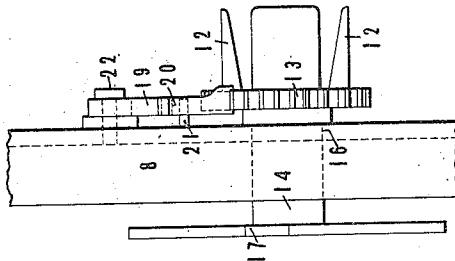


Fig-1-

WITNESSES

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UNITED STATES PATENT OFFICE.

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DYEING APPARATUS.

1,057,635.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed September 28, 1912. Serial No. 722,831.

To all whom it may concern:

Be it known that I, JOHN H. GILES, a citizen of the United States, residing at Amsterdam, in the county of Montgomery and State of New York, have invented certain new and useful Improvements in Dyeing Apparatus, 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 apparatus, and with regard to certain more specific features thereof, to mechanism for positively and progressively changing the relation of the material to be dyed to its support.

One of the objects of the present invention is to provide a simple and practical device of the above character.

Another object is to provide efficient mechanism for progressively moving the material to be dyed relatively to its support and maintaining the material in its altered position.

A further object is to provide an inexpensive device of the above character, the parts of which will be unaffected by contact with the dye liquor.

Other objects will be in part obvious and in part pointed out hereinafter.

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 drawing, wherein is shown one of various possible embodiments of this invention, Figure 1 is a longitudinal sectional view in elevation, showing such parts of a dyeing apparatus as are necessary to understand the present invention and its application; and Figs. 2 and 3 are detail elevational views at right angles to each other showing a portion of the present invention on an enlarged scale.

Similar reference characters refer to simi-

lar parts throughout the several views of the drawing.

In order that the present invention and certain objects thereof may be more readily understood, it may here be noted that in dyeing apparatus of the general character illustrated it is desirable to alter or change the position of the material to be dyed, such as, for example, skeins of yarn, at regular intervals in order that they may become thoroughly and equally permeated by the dye liquor, thus eliminating "stick" marks. If it be attempted to employ spring-actuated pawl and ratchet mechanism for maintaining the change in position, it will be found in practice that the springs used deteriorate rapidly from the action of the dye liquor thereon and their replacement is a source of constant annoyance and expense. In the present invention trouble of this character is obviated by providing a construction which is reliable in action and efficient in use.

Referring now to the drawing in detail, and more particularly to Fig. 1, 1 denotes a rectangular tank, provided with a false bottom 2, adapted to contain dye liquor, which is circulated about the tank in the direction of the arrows under the false bottom 2 by means of jets of steam issuing from openings in a transverse pipe 3. The upper part of the tank is provided with a suitable housing 4, having doors 5 at opposite sides thereof to permit the charging and discharging of a rotary skein-supporting frame 6 mounted on a shaft 7 extending transversely of the tank. This frame comprises two wheels, only one of which 8 is shown in the sectional view, revolving adjacent the side wall 9 of the tank. Between these wheels and extending parallel to the shaft 7 are a plurality of sticks, not shown, upon which are mounted the skeins of yarn to be dyed. As this general mechanism so far described is substantially the same as that shown in the patent to Klauder, No. 411,504, of September 24, 1889, it is thought that a further detail description thereof is unnecessary.

Mounted at regular intervals about the

periphery of the wheel 8 are a plurality of sockets 11, formed by four lugs 12, arranged to receive the square ends of the sticks. These lugs 12 are secured or made integral with a ratchet wheel 13, mounted upon a shaft 14 and extending through holes 16 in the periphery of the wheel 8. At the opposite or outside end of the shaft 14 is a star-wheel 17 adapted to coact with a detent 18 mounted on the housing 4. It will thus be seen that as the wheel 8 revolves, the star-wheel 17 will coact with the detent 18 and be turned through a quarter of a revolution.

In order to prevent a return of the star-wheel to its former position after passing the detent 18, there is provided a gravity-actuated pawl 19, moving in a vertical plane, adapted to coact with the teeth of the ratchet wheel 13. This pawl 19 is provided with a counterweight 20, preferably cast integrally therewith, projecting downwardly from the underside thereof, to shift the center of gravity of the pawl. This counterweight coacts with a projecting lug 21 on the wheel 8 to prevent the pawl 19 from swinging completely around its pivot 22 as the wheel revolves. From an inspection of the drawing it will be seen that the pawl engages the ratchet teeth for a material time before and after passing the detent 18, during which time the yarn is subjected to the greatest strain. For example, while the star-wheel is being turned by the detent 18 to turn the square stick and yarn supported thereby to a new position, the skein is slightly tensioned along one side temporarily and if it were not for the pawl engaging the ratchet there would be a tendency for the square stick to return to its former position. This tension, however, in the yarn is relieved almost immediately by the turning of the support or stick for the other end of the skein fitting within the round holes 23 located at regular intervals about an inner flange 24. As the wheel 8 continues to revolve to carry yarn into the dye liquor, the pawl automatically disengages itself from the ratchet teeth as its center of gravity shifts relatively to the other side of a vertical plane through the pivot, thereby permitting a certain freedom of movement to the yarn as it passes through the dye liquor.

As the construction and operation of machines of this character are well known to those familiar with the art, it is believed to be unnecessary to go into a detailed description thereof. It is sufficient to state that a construction of this character is reliable and efficient in operation and is cheap to manufacture and install. The construction does away with the use of springs and delicate parts which are so easily affected by the dye liquor and result in the constant annoyance and expense of replacing and repairing.

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 drawing 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 a dyeing apparatus, in combination, a frame adapted to rotate in a vertical plane, a rotatable socket carried thereby adapted to hold a yarn stick, and a pawl and ratchet mechanism associated with said socket, said pawl being gravity-actuated and adapted to hold said socket against rotation during a portion of the rotation of the frame and to swing out of engagement with the ratchet to permit freedom of movement of the socket during the remaining portion of the rotation of said frame.

2. In a dyeing apparatus, in combination, a tank, a rotating frame mounted thereon, a socket mounted on the frame, a ratchet wheel, a star-wheel and ratchet connected with said socket, means for engaging the star-wheel to turn the socket, and a gravity-actuated pawl coacting with the ratchet to permit rotation thereof in one direction only, said pawl being provided with a counterweight adapted to throw the pawl out of engagement with the ratchet during a portion of the rotation of the frame.

3. In a dyeing apparatus, in combination, a tank containing a dye liquor, a vertically disposed frame thereabove, a horizontally disposed socket mounted on said frame, a star-wheel and a ratchet associated with said socket, means for engaging the star-wheel to rotate the socket in one direction, and a gravity-actuated pawl coacting with the ratchet to prevent a rotation of the socket in an opposite direction, said pawl being mounted to swing in a vertical plane and having its center of gravity positioned to carry the pawl out of engagement with the ratchet during a portion of the revolution of the frame to permit freedom of movement of the socket while passing through the dye liquor.

4. In a dyeing apparatus, in combination, a tank adapted to contain a dye liquor, a rotating frame positioned above said tank adapted to carry the material to be dyed into and out of said tank, a socket mounted on the frame, means for rotating said socket at every revolution of the frame, and means

for preventing a reverse movement of the
socket, comprising a pawl and ratchet mech-
anism, said pawl being gravity-actuated to
disengage itself automatically from the
5 ratchet while passing through the dye
liquor.

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

JNO. H. GILES.

Witnesses:

NELLIE A. GREEN,
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