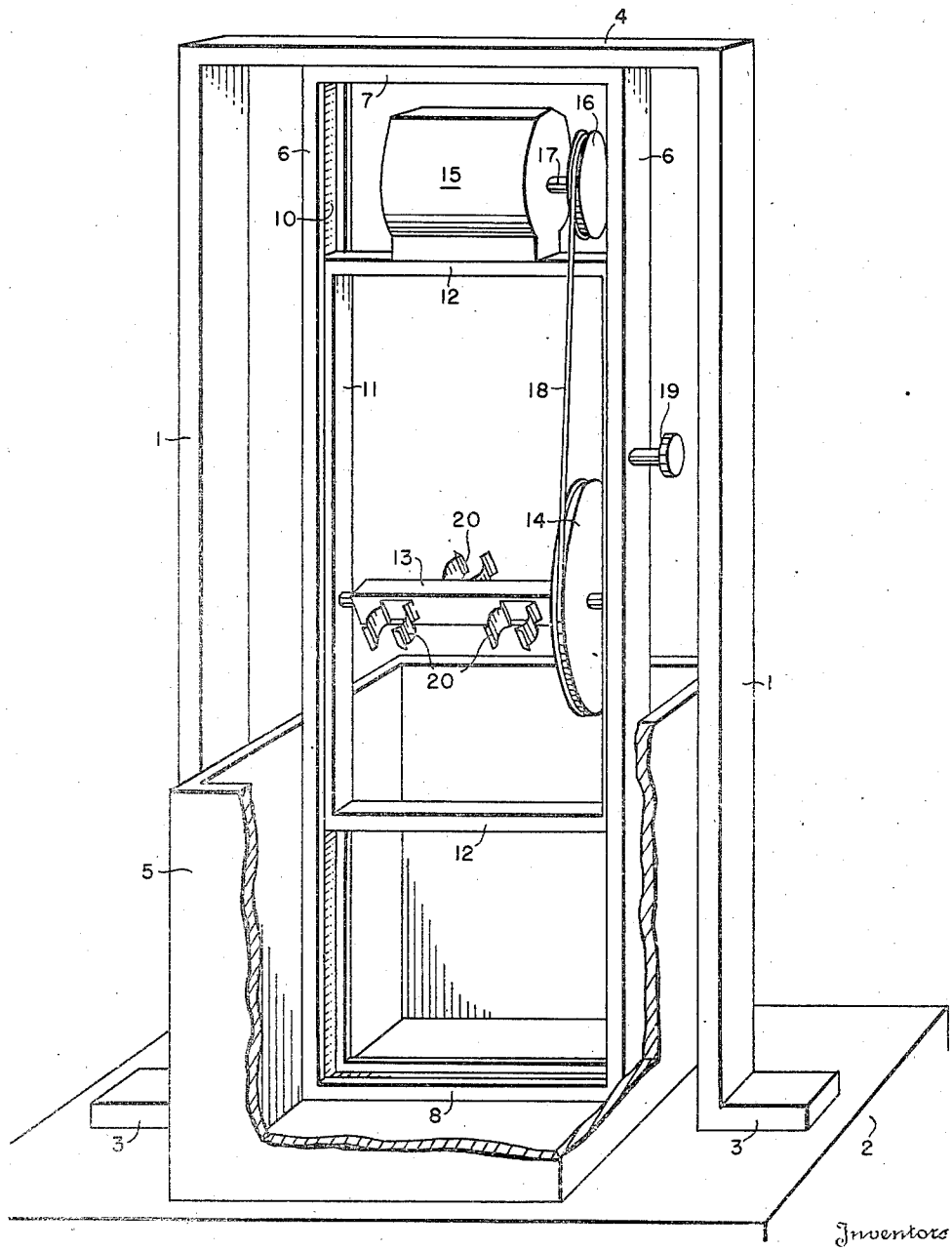
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ARTICLE SUPPORTING APPARATUS

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ARTICLE SUPPORTING APPARATUS

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This invention relates to article supporting apparatus, and more particularly to an apparatus whereby an article may be supported and immersed in a treating bath, and rotated while immersed.

In certain processes, and particularly in certain chemical processes it may be necessary that in combining a plurality of chemical compounds or elements the reagent vessel be immersed in a bath having a temperature or other characteristic such that it is desirable to avoid the necessity of the operator coming into contact with the bath. It may also be necessary that the vessel be agitated, as by rotation, to obtain effective mixing of the reagents in the vessel.

An object of this invention is to provide an effective and efficient article supporting apparatus and particularly an article supporting apparatus whereby an article, such as a reagent vessel, may be supported and immersed in a bath, and rotated while so immersed.

Another object of the present invention is to provide an efficient and effective apparatus whereby a reagent vessel may be immersed in a bath and rotated in the bath without the necessity of an operator coming into contact with the bath.

In accordance with one embodiment of this invention a rigidly supported overhead beam is provided on which two spaced, parallel, channel bars are mounted, the lower ends of which may extend into a suitable bath. A frame is slidably supported by the channel bars so as to be vertically movable between the bars and carries on its upper portion a motor which is drivably connected to a shaft rotatably supported on the frame below the motor. Means are provided on the shaft for supporting an article to be rotated. In operation the article is mounted on the shaft while the frame is in an elevated position, the frame is then slid downwardly to immerse the article in the bath and the motor turned on to cause the shaft to rotate the article in the bath. After the required period of immersion, the motor is turned off and the frame is slid upwardly to remove the article from the bath.

Other objects and advantages of the present invention will be apparent from the following detailed description taken in conjunction with the single figure wherein is shown a perspective view of an article supporting apparatus constructed in accordance with one embodiment of this invention and having its lower portion disposed in a tank. A portion of the front of the tank is broken away for purposes of illustration.

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Referring now to the drawing, it will be seen that this apparatus includes a pair of spaced, parallel, supporting standards 1, which are substantially vertically disposed and the lower ends of which may be rigidly mounted on a suitable base 2 by associated pedestal numbers 3. A cross-beam 4 is supported between the upper ends of the standards 1 and is made of a length sufficient so that the lower ends of the two standards 1 may be, respectively, located outside a tank 5, and substantially on opposite sides thereof, as shown in the drawing. The standards 1 are sufficiently long so that the beam 4 is mounted substantially above the tank. For purposes of illustration, the tank 5 has been shown of rectangular cross section; however, it will be understood that this shape is merely illustrative and that any convenient shape may be substituted therefor. The purpose of the tank 5 is to provide a container for a treating bath.

The supporting structure described provides a rigid support for a substantially vertically disposed rectangular frame comprising a pair of spaced, parallel, channel bars 6, an upper cross bar 7 and a lower cross bar 8, the upper cross bar 7 being suitably secured to the under side of the cross beam 4. The lower ends of the channel bars 6 extend downwardly into the tank 5 and, as shown in the drawing, may extend substantially to the base thereof, thus positioning the lower cross bar 8 of the channel bar frame along the upper surface of the base of the tank. Grooves 10 are formed in the inner sides of the channel bars 6 and extend the length thereof to receive, respectively, opposite side members 11 of a second rectangular frame which is movable relatively thereto and comprises the spaced, parallel, side members 11 and upper and lower cross members 12. The outer edges of the members 11 extend into and frictionally engage the sides of the grooves 10, the tightness of fit being such that while the frame may be slid relatively to the channel bars 6, it will remain in the position to which it is so adjusted by reason of the frictional engagement. Where, however, a positive lock is required, a set screw 19 may be mounted on one of the channel bars 6 and be adjustable to bear against a side member 11 of the slidable frame and thereby to lock it in any desired position. Alternatively, a suitable detent mechanism, not shown, may be employed. By employing a locking mechanism the necessity of making the slidable frame frictionally engage the sides of the grooves 10 to retain the frame in position is avoided. The sides of the grooves 10 serve also

as guides for the second frame so that the frame may be moved in the plane of the channel bars 6.

A rotatable shaft 13 has its ends suitably journalled in the inner sides of the side members 11 and is provided adjacent one end with a pulley 14, which is suitably keyed to the shaft. In order to rotate the shaft 13, a motor 15 is mounted on the upper side of the upper cross member 12 and has a pulley 16 keyed to the drive shaft 17 thereof. A belt 18 drivably connects the upper pulley 16 with the shaft pulley 14. It will be understood that while the driving connection between the motor 15 and the shaft 13 has been described as a belt and pulley combination, where a positive drive is required, it would involve no departure from the present invention to substitute for the pulleys 14 and 16, sprocket wheels, and for the belt 18 a suitable sprocket chain. A number of spring clips 20 are mounted on the shaft 13 to receive and engage an article to be rotatably supported by this apparatus.

In using the present apparatus, the articles to be supported by the apparatus, which may be reagent vessels, are mounted on the shaft 13 by the clips 20 while the slidable frame is in its upper position. The frame is then slid downwardly a suitable distance to immerse the article in a bath which may be provided in the tank 5 and the motor 15 is actuated to cause the article to be rotated. It will be understood that rotation need not be continuous in one direction but may be oscillatory to increase the turbulence in the vessel. After the required period of immersion, and agitation, the motor is stopped, the slidable frame is slid upwardly and the article is removed.

While but one embodiment of this invention has been shown and described it will be understood that many changes and modifications may be made therein without departing from the spirit or scope of the present invention.

The invention shown and described herein may be manufactured or used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed is:

1. In an apparatus for immersing an article in a tank and for rotating the article while positioned in the tank, a tank, a pair of spaced standards, a cross beam mounted between the upper ends of said standards, a base for supporting the lower ends of said standards, a pair of spaced channel bars mounted on the under side

of said cross beam and extending into said tank, a frame slidably supported between channel bars and movable therealong into or out of said tank, a rotatable shaft journalled in the sides of said frame and immersible in said tank when said frame is moved to its lower position, means mounted on said slidable frame for rotating said shaft, and means on said shaft for engaging and supporting an article.

2. In an apparatus for immersing an article in a tank and for rotating the article while positioned in the tank, a tank, a pair of spaced standards, a cross beam mounted between the upper ends of said standards, the lower ends of said standards being mounted adjacent the sides of said tank, a pair of spaced channel bars mounted on the underside of said cross beam, the lower ends of said channel bars extending into said tank, a frame slidably mounted between said channel bars and movable therealong into or out of said tank, a rotatable shaft journalled in the sides of said frame and immersible in said tank when said frame is moved to its lower position, means mounted on said frame for rotating said shaft, and means on said shaft for engaging and supporting an article.

3. In an apparatus for immersing an article in a tank and for rotating the article while immersed in the tank, a cross beam mounted above the tank, a pair of spaced channel bars extending downwardly from said cross beam into said tank, a frame mounted between said channel bars and slidable relatively thereto, a rotatable shaft mounted between the sides of said frame and adjacent the lower end thereof, means mounted on said frame for rotating said shaft, and means associated with said shaft for supporting an article.

4. In an apparatus for immersing an article in a tank and for rotating the article while immersed in the tank, a cross beam mounted above the tank, a pair of spaced channel bars extending downwardly from said cross beam into said tank, a frame mounted between said channel bars and slidable relatively thereto, a rotatable shaft mounted between the sides of said frame and adjacent the lower end thereof, means mounted on said frame for rotating said shaft, means associated with said shaft for supporting an article, and means associated with said channel bars for locking said slidable frame in position thereon.

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