

Dec. 25, 1945.

A. J. LEWIS ET AL

2,391,634

WASHING BARREL

Filed Jan. 12, 1942

3 Sheets-Sheet 1

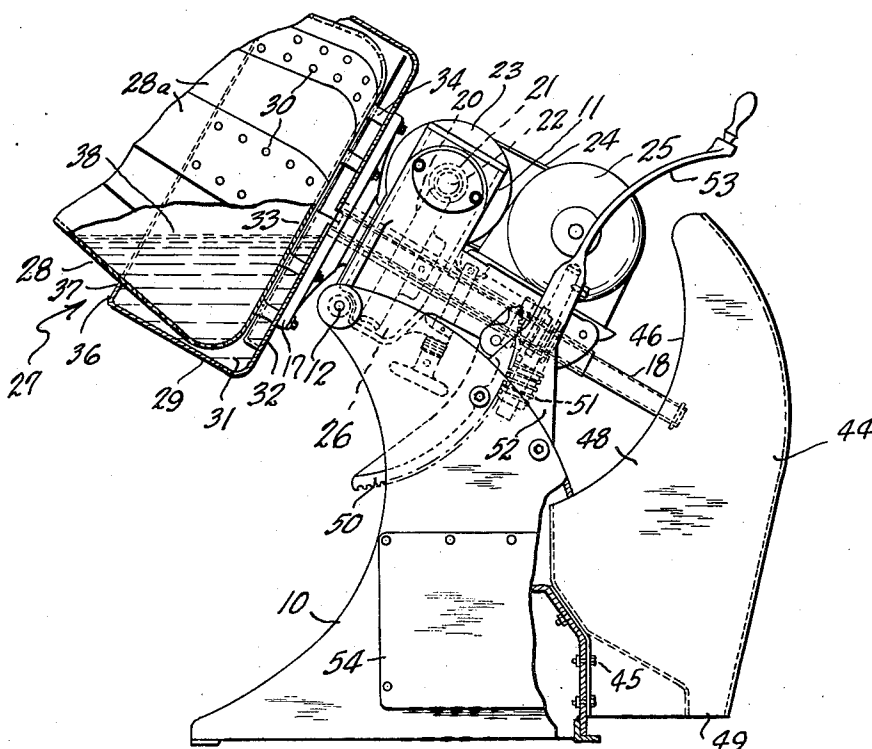


Fig. 1.

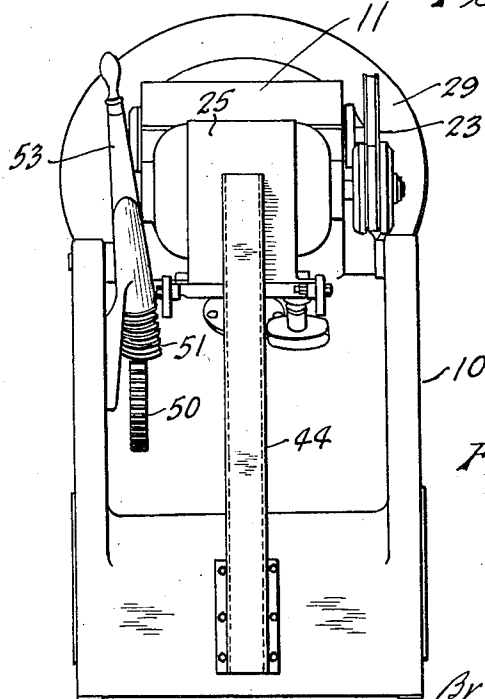


Fig. 2.

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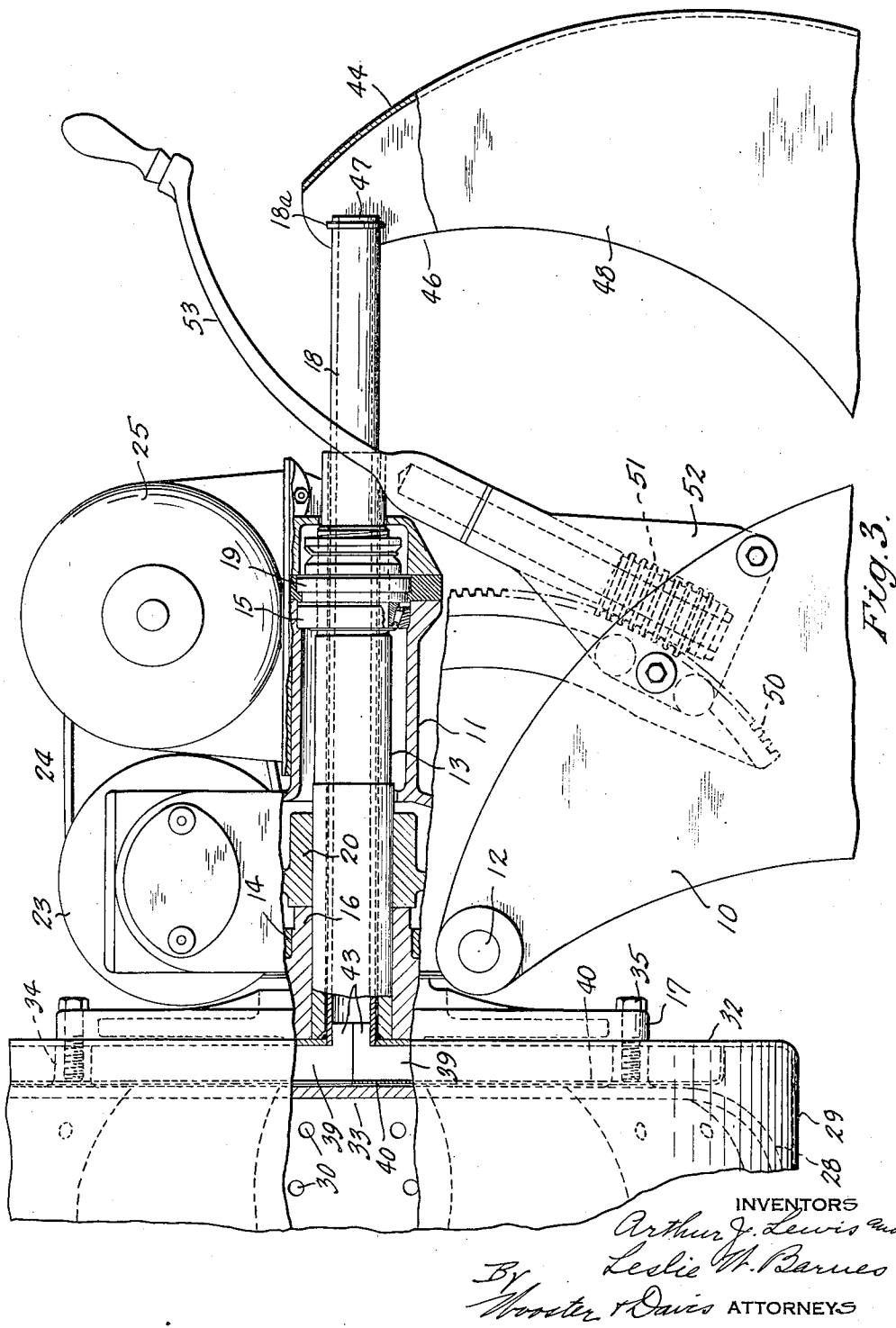
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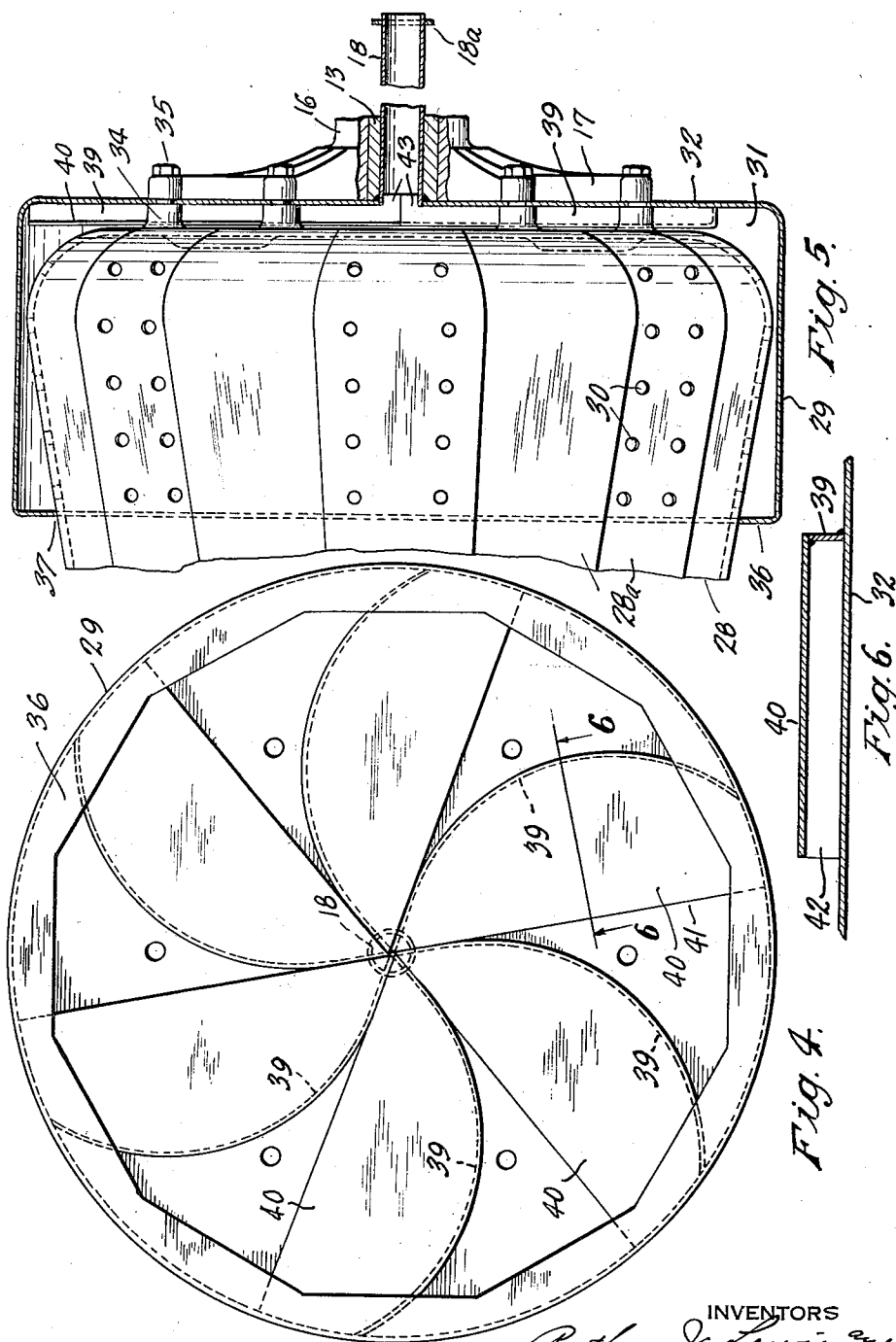
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UNITED STATES PATENT OFFICE

2,391,634

WASHING BARREL

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Application January 12, 1942, Serial No. 426,464

14 Claims. (Cl. 51—164)

This invention relates to a washing or tumbling barrel for treating various small articles with a liquid to wash them, or clean or otherwise treat them, as with water containing an acid or other treating or cleaning material, such as soap and the like, and has for an object to provide a construction including an improved means for removing the liquid from the barrel after treating the articles. More particularly it has for an object to provide a construction in which when the barrel is rotated in one direction the liquid is retained within the barrel for washing or treating the articles, and when the barrel is rotated in the opposite direction this movement will act to automatically remove the liquid from the barrel.

With the foregoing and other objects in view we have devised the construction illustrated in the accompanying drawings forming a part of this specification.

In these drawings:

Fig. 1 is a side elevation of the device showing it in operative position, with parts broken away to more clearly show the construction;

Fig. 2 is a rear elevation looking from the right of Fig. 1;

Fig. 3 is a partial side elevation and partial longitudinal section on a larger scale showing the mounting for the barrel or receptacle;

Fig. 4 is a view looking toward the open side of the jacket portion of the barrel or receptacle, with the barrel proper or body of the receptacle removed;

Fig. 5 is a longitudinal section thereof showing the closed end portion of the body of the receptacle seated in the jacket and in side elevation, and

Fig. 6 is a detail section substantially on line 6—6 of Fig. 4.

Our improved washing device comprises an upright base 10 in which is mounted a housing 11 to swing in the vertical plane about a horizontal pivot shaft 12. Mounted in this housing is a hollow shaft 13, the shaft being mounted in suitable antifriction bearings 14 and 15. Bearing 14, however, instead of being directly on the shaft is on the outer side of the hub 16 of a supporting flange 17 mounted on the shaft. The construction of the housing and the mounting for the bearings and means for driving the shaft are substantially the same as that disclosed in the patent of Leslie W. Barnes, No. 2,353,637, issued July 18, 1944, except that in the present case as the shaft is hollow and contains a pipe or conduit 18 for conducting liquid from the con-

tainer, as will later be described, the shaft and this conduit must project from the housing and therefore instead of the housing being closed at the end of the shaft, as shown in the prior application, the housing has an opening for passage of the shaft and conduit, and to prevent leakage of oil from the housing a suitable seal 19 is placed around the shaft between the bearing 15 and the opening in the housing. Otherwise the housing construction and arrangement and the mechanism for driving the shaft is substantially the same as that shown in the prior application mentioned. This comprises a worm gear 20 mounted on the shaft and secured to it meshing with a worm 21 at the top side of the gear on a drive shaft 22 extending transversely of the housing, which shaft is driven by a pulley 23 through a V-belt 24 from an electric motor 25. The lower side of the worm gear 20 runs in a bath of oil 26 in the lower part of the housing and carries this oil to the worm 21 by which it is thrown laterally against the inner walls of the housing and which conduct it to the antifriction bearings as described in said prior application.

The flange 17 mounted on the shaft carries the washing barrel or receptacle for the articles to be cleaned or treated. This barrel indicated at 27 includes a receptacle comprising two sections, that is, the barrel proper or body section 28 and the jacket section 29. The body section 28 is closed at its larger end and enclosed in the jacket section 29 but has any desired number of small perforations 30 through the wall of the body section to form communication from the interior of this section to the space in the interior of the jacket, the jacket being somewhat larger than the body section to form a space 31. The end wall 32 of the jacket is spaced from the bottom or end wall 33 of the body section by any suitable means such as extensions 34 on the end of the body section into which the securing screws 35 are threaded. The open side of the jacket is closed by the inwardly extending flange 36 which may be formed by bending in the free edge of the jacket after the section 28 has been secured therein, or it could be a separate flat member welded or otherwise fastened to the side walls of the jacket. Its free edge may also be welded at 37 to the member 28 or otherwise packed to make a liquid-tight connection to prevent leakage of liquid from the receptacle. The openings 30 form a communication between the space in the body 28 and the space 31 for transfer and circulation of the liquid between them. The body section 28 is preferably polygonal in cross section and

comprises any desired number of flat sides 28a made of flat strips of metal secured together at their edges by welding or other suitable means.

The conduit or pipe 18 in the hollow shaft leads to the container, its inlet end leading from the space 31 between the jacket and the body section 28 at the center thereof, and the entrance to this conduit is above the normal level of the liquid in the container, indicated at 38, so that the liquid will be normally retained in the receptacle. Located between the end wall 33 of the body section and the end wall 32 of the jacket are means operative by rotation of the receptacle in one direction to carry liquid to the entrance to the conduit 18 but ineffective to do this when the receptacle is rotating in the opposite direction. In the present construction it comprises a series of curved vanes 39 extending radially from the axis of rotation, or that is the entrance to the conduit, along the inner surface of the end wall 32 of the jacket to the side walls of the jacket, and they are curved so as to be concavo-convex with the concave sides all facing laterally in the same direction. On the free edges of these vanes and spaced from and preferably substantially parallel to the end wall 32 are cover or side walls 40 stopping short of the next forward vane for the outer portion thereof toward the side walls of the jacket, as indicated at 41 Fig. 4, but thus providing with the end wall 32, the vane 39 and wall 40 a sort of bucket arranged with the open side 42 facing laterally. It will now be seen that if the receptacle is rotated counterclockwise, as viewed in Fig. 4, the liquid merely runs outwardly along the outer convex surface of the vanes 39 and is thus carried away or prevented from entering the conduit 18 as the vanes move upwardly on the right hand side of the axis, but if the receptacle is rotated clockwise, as viewed in Fig. 4, the liquid enters the open sides of the buckets and is retained therein, and as these buckets move upwardly on the left hand side of the axis the liquid will flow along the concave side of the vanes 39 and will be conducted to the entrance to the conduit 18 and will be carried from the receptacle. To facilitate the flow of the liquid into the conduit it is preferred to carry the inner ends of the vanes 39 part way across the entrance to the conduit and also a short distance into the conduit, as shown at 43 Fig. 5.

Thus when it is desired to wash or treat the articles the device is tipped to the proper angle, as indicated in Fig. 1, and the desired amount of liquid poured into the container through the open end thereof to bring it to the proper level. The container is then rotated counterclockwise as viewed in Fig. 4 for any desired length of time. After the articles have been sufficiently washed or treated the barrel or container is rotated in the opposite direction or clockwise as viewed in Fig. 4 which operation will cause the buckets and curved vanes 39 to pick up the liquid and carry it to the conduit by which it is conducted away and discharged, and the operation is a very effective and rapid one.

To facilitate collection of this liquid an upright trough 44 is mounted on the rear side of the base 10 by any suitable means such as the bolts 45 and has an open side 46 facing forwardly and the container into which the free end 47 of the conduit 18 projects, and the trough may be curved and the side walls 48 be carried forwardly sufficiently so that the end of the conduit projects into the trough in all positions of the container and the shaft to prevent splash-

ing of the liquid. An outlet 49 is provided at the lower end of the trough discharging into a suitable conduit, not shown, leading to a sewer or some suitable container, not shown, as desired. The end of the conduit may have a drip washer 18a to prevent liquid running back along the outside of the conduit when the barrel is tipped to dumping position.

Any suitable means may be provided for swinging the housing and the receptacle about the pivot shaft 12 to bring the receptacle to the proper angle for treating the articles or for inclining it with the open end downwardly for discharging the cleaned articles from the receptacle. In the present case this comprises a rack 50 mounted on the housing and meshing with a worm 51 mounted in a suitable bracket 52 and operated by a hand crank 53.

The device may be made of any suitable material such for example as stainless steel or other material to withstand the acids or other liquids used in the cleaning operation. The base 10 may have in it one or more compartments covered by closure 54 for the control mechanism for the motor including starting relays, reversing switches, etc., not shown, or the starting and control switches including the reversing switch may be mounted at any suitable location on the base where they are easily accessible. This device eliminates the necessity of using valves and other similar apparatus, or as in some constructions the discharge of the liquid to the floor or around the device, and thus protects the device and nearby articles from injury by the liquid. As indicated, in washing the articles the device is merely rotated in one direction during which the liquid is retained in the receptacle and then after the washing or treating operation is completed all that is necessary is to reverse the direction of rotation of the barrel or receptacle and the liquid is quickly and automatically removed from the receptacle and discharged to the desired location. During this operation rinsing water may, if desired, be poured into the receptacle by hose or other suitable means and continuously carried from the receptacle by the rotating movement, thoroughly rinsing off the treating liquid.

Having thus set forth the nature of our invention, what we claim is:

1. A washing barrel comprising a rotatable receptacle to hold the articles to be treated and liquid for treating the articles, means for mounting the receptacle so that it may be rotated about an inclined axis, a conduit on said axis for conducting liquid from the receptacle, means constructed and arranged to operate through rotative movement of the receptacle to cause the liquid to flow away from the conduit when the receptacle is rotating in one direction, said latter means being also constructed and arranged to operate through rotative movement of the receptacle to conduct the liquid to said conduit when the receptacle is rotating in the other direction, and means for rotating the receptacle in opposite directions.

2. A washing barrel comprising a rotatable receptacle to hold the articles to be treated and liquid for treating the articles, means mounting the receptacle to rotate about an inclined axis, a conduit arranged with its inlet above the normal level of liquid in the receptacle at all times during the treating operation, means constructed and arranged to be effective through rotative movement of the receptacle to conduct the liquid

to said inlet while the receptacle is rotating in one direction, said latter means being also constructed and arranged to be ineffective for this purpose through rotative movement of the receptacle when the receptacle is rotating in the other direction, and means for rotating the receptacle in opposite directions.

3. A washing barrel comprising a rotatable receptacle to hold the articles to be treated and liquid for treating the articles, means mounting the receptacle to rotate about an inclined axis, a conduit leading from the receptacle arranged with its inlet above the normal level of liquid in the receptacle at all times during the treating operation, a series of vanes each having one end adjacent said inlet and curved laterally away therefrom and arranged to pick up the liquid and through rotative action of the receptacle direct it to said inlet while the receptacle is rotating in one direction only, said vanes being also arranged so that they are ineffective to direct the liquid to the conduit while the receptacle is rotating in the opposite direction, and means for rotating the receptacle in opposite directions.

4. A washing barrel comprising a rotatable receptacle to hold the articles to be treated and liquid for treating the articles, a conduit for conducting liquid from the receptacle arranged with its inlet above the normal level of the liquid in the receptacle at all times during the treating operation, a bucket extending radially from said inlet in a direction laterally from the axis of rotation and arranged with its open side facing in a direction transversely of the axis of rotation so that when the receptacle is rotating in one direction the bucket will collect the liquid and conduct it to said inlet and when the receptacle is rotating in the opposite direction is inoperative to collect the liquid, and means for rotating the receptacle in opposite directions.

5. A washing barrel comprising a rotatable receptacle comprising a body portion closed at one end to hold the articles to be treated and a jacket portion enclosing said closed end to form a space for liquid, said body being perforated to form communication between the interior of the body and said space, a conduit leading from said space above the normal level of liquid therein, and a curved vane extending radially from said conduit in said space adapted to pick up the liquid as the barrel rotates in one direction and guide it to said conduit.

6. A washing barrel comprising a rotatable receptacle including a body portion closed at one end to hold the articles to be treated and a jacket portion enclosing said closed end having an end wall spaced from the end of the body portion, said body portion being perforated to form a communication between the interior of the body and said space, a conduit leading through the end wall of the jacket above the normal level of liquid therein, a series of curved vanes on the end wall of the jacket extending radially from the conduit, walls over the concave sides of the vanes and spaced from the end wall of the jacket to form buckets with the open sides facing laterally, and means for rotating the receptacle.

7. A washing barrel comprising a base, a housing mounted on said base to swing in a vertical plane, a hollow shaft mounted in bearings in said housing, means for rotating the shaft, a receptacle mounted on the shaft to hold articles to be treated and liquid for treating the articles, a conduit leading from said receptacle through the shaft to conduct the liquid from the receptacle

and having a free discharge end, and an upright trough secured to the base and having an open side facing the receptacle in alignment with the free end of the conduit in the various positions of the housing to receive the liquid from the conduit.

8. A washing barrel comprising a base, a housing mounted on the base to swing in a vertical plane, a hollow shaft mounted on bearings in the housing and extending through one end of the housing, a receptacle mounted on the shaft at the other end of the housing to hold articles to be treated and liquid for treating the articles, a conduit leading from the receptacle through the shaft to conduct the liquid therefrom and having its inlet above the normal level of liquid in the receptacle, means operative by rotative movement of the receptacle in one direction only to conduct the liquid in the receptacle to the conduit, and means for rotating the receptacle in opposite directions.

9. A washing barrel comprising a rotatable receptacle comprising a body portion closed at one end to hold the articles to be treated and a jacket portion enclosing said closed end to form a space for liquid, said body being perforated to form communication between the interior of the body and said space, means for conducting the liquid from said space, means arranged in said space to prevent the liquid entering the conducting means when the receptacle is rotated in one direction and adapted to cause the liquid to flow to said conducting means when the receptacle is rotated in the opposite direction, and means for rotating the receptacle in opposite directions.

10. A washing barrel comprising a rotatable receptacle comprising a body portion closed at one end to hold the articles to be treated and a jacket portion enclosing said closed end to form a space for liquid, said body being perforated to form communication between the interior of the body and said space, means for mounting the receptacle so that it may be rotated about an inclined axis, a conduit on said axis for conducting liquid from said space, means in said space arranged to cause the liquid to flow away from the conduit when the receptacle is rotated in one direction and to conduct the liquid to said conduit when the receptacle is rotated in the other direction, and means for rotating the receptacle in opposite directions.

11. A washing barrel comprising a rotatable receptacle comprising a body portion closed at one end to hold the articles to be treated and a jacket portion enclosing said closed end to form a space for liquid, said body being perforated to form communication between the interior of the body and said space, means for conducting liquid from said space so located as to be ineffective for this purpose when the receptacle is rotating in one direction, means in said space effective by movement of the receptacle to conduct liquid to said conducting means when the receptacle is rotating in the opposite direction, and means for rotating the receptacle in opposite directions.

12. A washing barrel comprising a rotatable receptacle comprising a body portion closed at one end to hold the articles to be treated and a jacket portion enclosing said closed end to form a space for liquid, said body being perforated to form communication between the interior of the body and said space, a conduit leading from said space above the normal level of liquid therein, means effective to conduct the liquid to said conduit while the receptacle is rotating in one

direction and ineffective for this purpose when the receptacle is rotating in the other direction, and means for rotating the receptacle in opposite directions.

13. A washing barrel comprising a rotatable receptacle comprising a body portion closed at one end to hold the articles to be treated and a jacket portion enclosing said closed end to form a space for liquid, said body being perforated to form communication between the interior of the body and said space, means mounting the receptacle to rotate about an inclined axis, a conduit leading from said space arranged with its inlet above the normal level of liquid in the receptacle at all times during the treating operation, a series of vanes in said space each having one end adjacent said inlet and curved laterally away therefrom and arranged to pick up the liquid and direct it to said inlet while the receptacle is rotating in one direction, and means for rotating the receptacle in opposite directions.

14. A washing barrel comprising a rotatable receptacle comprising a body portion closed at one end to hold the articles to be treated and a jacket portion enclosing said closed end to form a space for liquid, said body being perforated to form communication between the interior of the body and said space, a conduit leading from said space for conducting liquid from the receptacle and arranged with its inlet above the normal level of the liquid in the receptacle at all times during the treating operation, a bucket in said space extending radially from said inlet in a direction laterally from the axis of rotation and arranged with its open side facing in a direction transversely of the axis of rotation so that when the receptacle is rotating in one direction the bucket will collect the liquid and conduct it to said inlet, and means for rotating the receptacle.

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