Aug. 22, 1939. M. J. GOODWIN 2,170,712

DYE WHEEL

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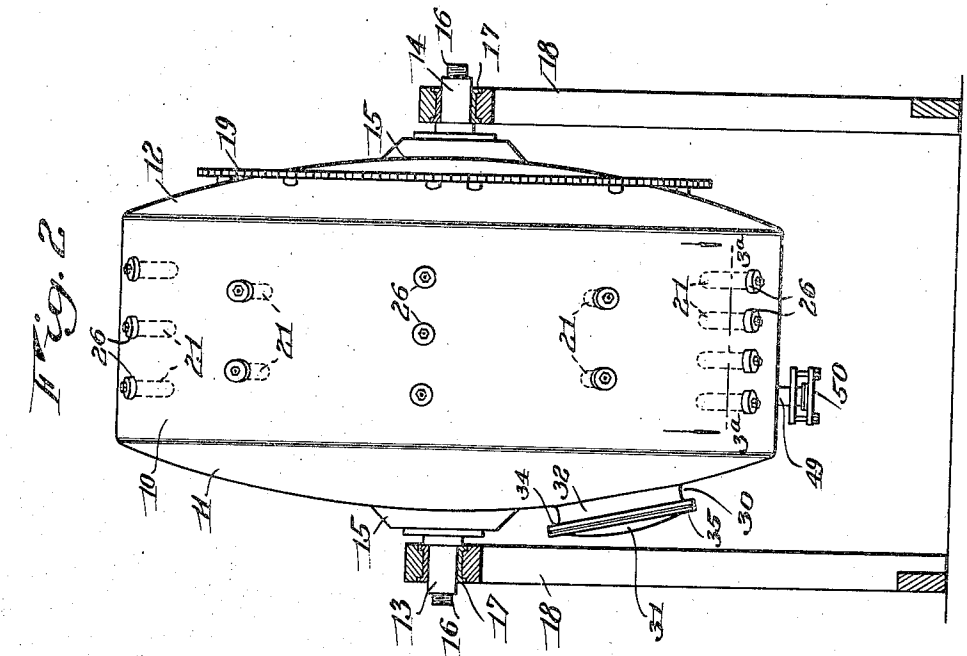


Fig. 2

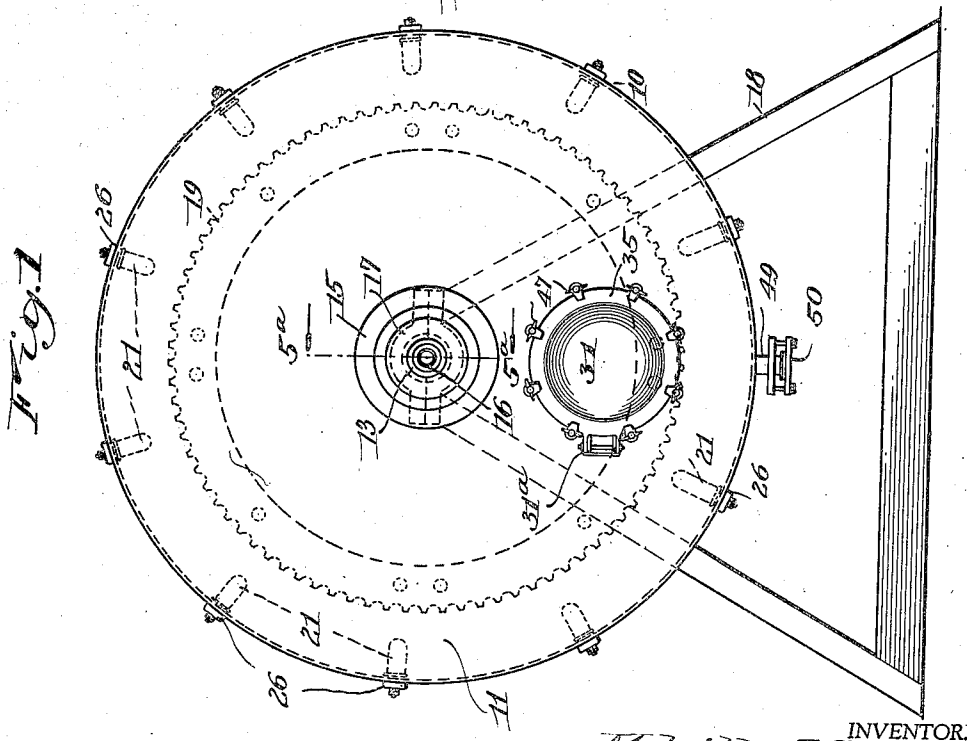


Fig. 1

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Fig. 3

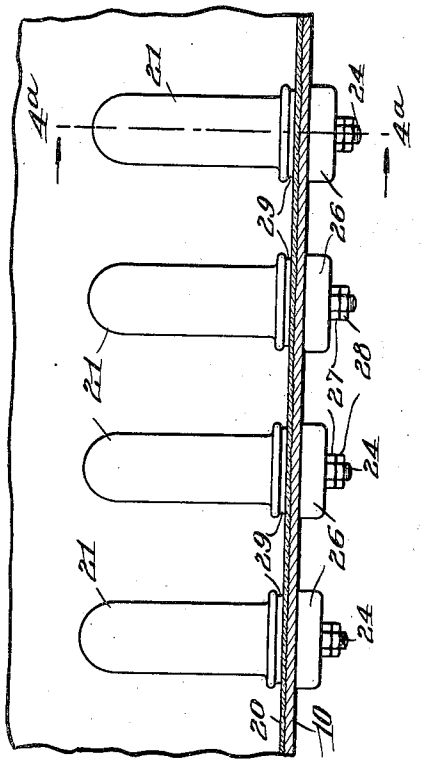


Fig. 4

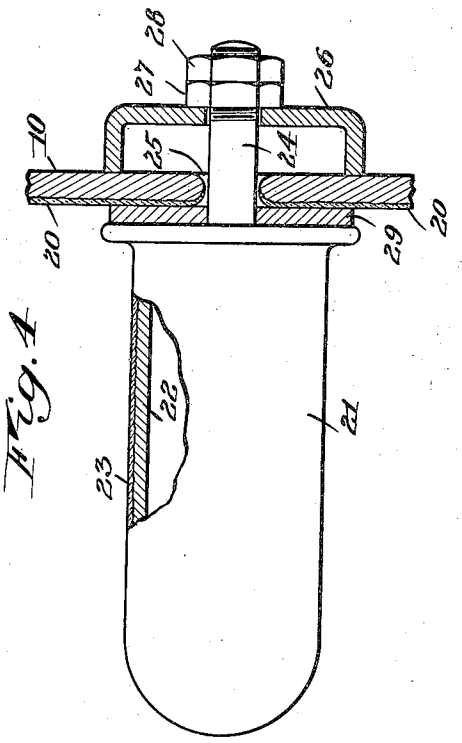
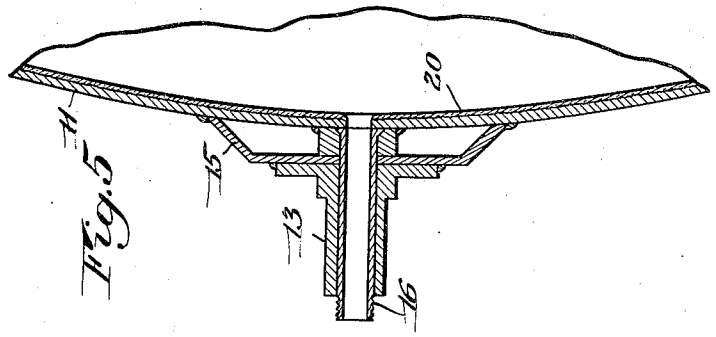


Fig. 5



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Fig. 6

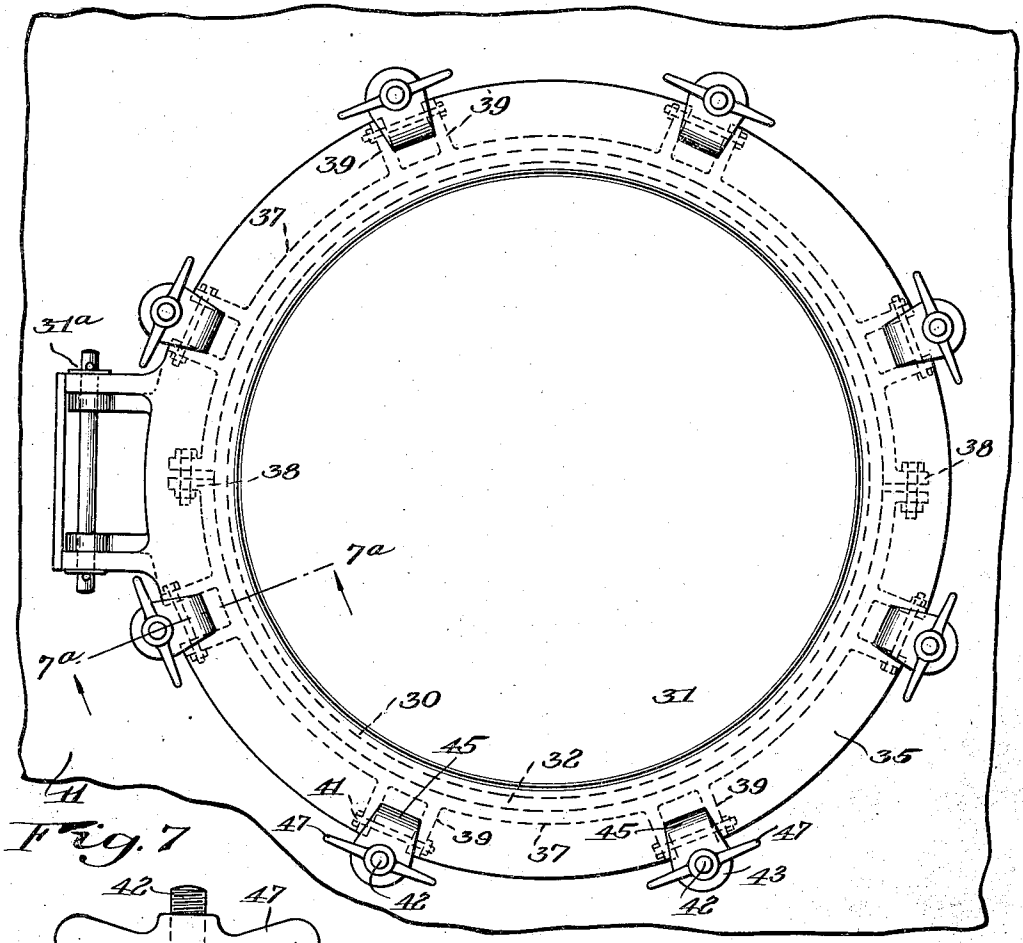


Fig. 7

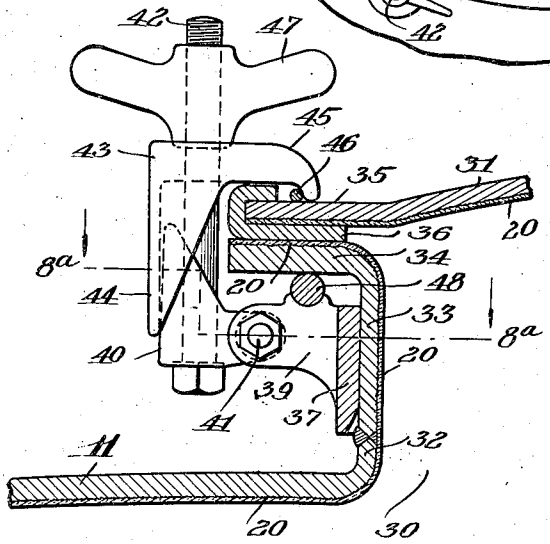
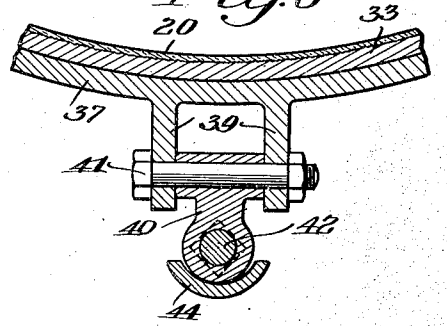


Fig. 8



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Patented Aug. 22, 1939 2,170,712

UNITED STATES PATENT OFFICE

2,170,712

DYE WHEEL

Melville J. Goodwin, Needham, Mass., assignor to The Pfaudler Co., Rochester, N. Y., a corporation of New York

Application September 9, 1937, Serial No. 163,088

2 Claims. (Cl. 68—144)

This invention relates to dye wheels, or drums, for tanning, dyeing or otherwise treating leather, fabric and other materials, one object of the invention being to provide an improved device of this nature having an non-corrosive type of construction impervious to attack by the treating fluids and incapable of injuring the materials to be treated.

Another object is to provide a more efficient apparatus of this nature which may be easily and thoroughly cleaned to prevent contamination of the contents, and so that it may be quickly and conveniently prepared for different successive treatments of materials.

A further object is to provide such an apparatus requiring a minimum amount of power for operation and a minimum amount of maintenance, labor and expense during use.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a front elevation of a dye wheel embodying the present invention;

Fig. 2 is a side elevation of the same partly in section;

Fig. 3 is an enlarged sectional view on the line 3*a* in Fig. 2;

Fig. 4 is a further enlarged sectional view on the line 4*a* in Fig. 3;

Fig. 5 is a sectional view on the line 5*a* in Fig. 1;

Fig. 6 is an enlarged elevation of a manhole shown in Fig. 1;

Fig. 7 is a sectional view on the line 7*a* in Fig. 6, and

Fig. 8 is an enlarged sectional view on the line 8*a* in Fig. 7.

The same reference numerals throughout the several views indicate the same parts.

In the embodiment herein disclosed by way of illustration, the invention is shown as applied to a wheel or drum particularly adapted for tanning and dyeing leathers. The operation of such machines hitherto has been accompanied by a considerable loss of material, due to the scarring of the skins by wood or metal-lined wheels. The operation of such machines has also been hampered by the difficulty, after use, of thoroughly cleaning them of all dyes, fleshy deposits, grease, and the like, to prevent contamination of one batch by another and so that the same machine may be conveniently used for successive batches of varying colors and treating solutions.

It has been found that these and other difficulties in the use of prior machines have been overcome by employing a type of construction in which the inside of the wheel presents a substantially continuous and impervious glass surface to the contents. This has been accomplished by employing, preferably, a one-piece steel drum having cylindrical side walls 10 and dished end walls 11 and 12, the drum being mounted for rotation about its cylindrical axis disposed horizontally in suitable bearings.

The supporting means comprise trunnions 13 and 14, both of which in the present instance are of hollow construction for supplying the treating fluid. One of these trunnions, as shown in detail in Fig. 5, comprises a bearing member secured by suitable brackets 15 to the corresponding end of the drum. Extending through the bearing member and communicating with the interior of the drum is a sleeve 16 of stainless steel, or other suitable non-corrosive material, threaded at its end for attachment by any known or suitable means to a pipe line. Such bearing members are mounted in journal boxes 17 on supporting frames 18, and suitable means are provided for rotating the drum, such as the annular gear wheel 19, for connection with a pinion (not shown) driven by a suitable source of power, as well understood in the art.

The inner surface of the drum is provided with a glass lining or coating 20 (Figs. 5, 7, and 8) of any of the suitable varieties well known in the art and adapted to resist the action of corrosive materials generally such, for example, as acid dyes, even at substantial temperatures. The term "glass" is intended to include all such vitreous coatings generally.

The walls of the drum are equipped with fingers or pins for lifting, dropping and otherwise stirring the skins during the rotation of the drum and these pins likewise are constructed with glass surfaces. In the preferred embodiment, each of these pins 21 has a hollow metal core construction, as shown in Fig. 4. The metal wall 22 is provided with a glass lining 23, such as described above, covering the whole exposed surface of the pin. The metal body of the pin has rigidly fixed in its base a bolt 24 passing through an opening 25 in the cylindrical wall of the drum and equipped with a washer 26 and a nut and lock nut 27 and 28, respectively. Interposed between the base of the pin and the glass lining of the drum is a gasket 29 of any suitable

material, and it will be apparent from this construction that by clamping the nuts 27 and 28, the pin 21 may be rigidly secured to project inwardly from the drum wall. A series of any desired number of such pins is employed and spaced around the periphery of the drum so as to engage, lift and drop the skins into the treating fluid and bring about thorough working and treatment. While a glass coated hollow metal pin is shown in the present instance, it is obvious that other equivalent structures may be employed.

For the insertion and removal of the skins or other articles to be treated, one end of the drum is provided with a manhole or opening 30 and a closure 31 for the same, pivoted as at 31*a*, as best shown in Figs. 6, 7, and 8. To form the opening, the drum wall is flanged outwardly as at 32 and has welded thereto an extension flange 33, the outer end of which is turned back substantially parallel with the adjacent end wall of the drum, as at 34, to form a seat for the closure 31. The glass lining is continued as shown to the extremity of this flange. The closure 31 is formed, as shown, with a flat marginal flange portion 35, which is provided with a gasket 36 of any suitable material.

The means for clamping the closure or cover 31 on the manhole comprises preferably a yoke, or ring, 37, which is in the form of two semicircles embracing the outer periphery of the manhole flange with their ends bolted together as at 38. This yoke carries pairs of spaced lugs 39 and between the lugs of each of these pairs a bracket 40 is secured as by means of a bolt 41. A swinging clamping bolt 42 is mounted in each bracket as shown and carries a clamping bar 43. Each bar 43 is extended as at 44 to provide a sliding supporting bearing on its bracket 40, and has also an extension 45 over the flange 35 of the cover 31. A rod 46 is welded on the flange of the cover to provide a lip over which the extension 45 of the clamping bar is engaged. Each bolt 42 is equipped with a wing nut 47 by means of which the cover may be clamped down to close the manhole, or released by unscrewing the nut and swinging the clamp outwardly about the bolt 41 as a pivot, after which the cover may be swung open about its own pivot 31*a*. At 48 is a brass rod brazed to the lugs 39 on each half of the yoke 37, to provide a seat for the yoke against the under side of the manhole flange 34.

An outlet for draining the drum is provided by means of the discharge pipe 49, shown in Figs. 1 and 2, for any known or suitable closing means indicated generally at 50.

In operation, the skins or other articles to be tanned, dyed, or otherwise treated, are inserted through the manhole, which is then closed, and the treating fluids are supplied through one of the hollow trunnions. The drum is slowly rotated by means of the gear ring 19, and, as it rotates, the glass coated pins, 21, pick up and elevate the skins and drop them into the fluid so that they are thoroughly stirred and treated. The friction generates sufficient heat for the treatment, although a heating medium may be supplied through the trunnions 13 and 14, but the glass lining and metal construction limit and distribute the heating effect, so that the skins are not scorched, scarred or otherwise injured.

It will be seen from the above description that the wheel is so constructed as to have a substantially continuous inner surface of glass, which is non-corrosive and impervious to attack by acids or other treating fluids. The smooth, non-corrosive glass surface is incapable of injury to skins or other articles during treatment, and after the treatment is completed the wheel is capable of being readily and thoroughly cleaned of dyes, acids, fleshy deposits and other soiling substances, so that it will not contaminate the materials of the next treatment. For this reason the wheel is adapted to be readily employed for a succession of different treatments, using different colors or other fluids, without contaminating one batch by another. These advantages are contributed in part by an efficient type of pin construction in which at least the exposed portions of the pins are glass coated, and the pins are ruggedly made and rigidly secured to the drum. The manhole and closure, supply and discharge connections, and other auxiliary features of the drum are efficiently constructed and arranged, so that the apparatus as a whole is exceedingly convenient, durable and efficient in character.

I claim:

1. A dye wheel comprising a rotary, glass-lined, metal drum having in its walls a series of openings, a series of bolts extending through said openings, glass-coated, hollow metal stirring pins on the ends of said bolts inside said drum, means for sealing said openings around said bolts, and securing means on the ends of said bolts outside said drum for rigidly securing said bolts and pins in position on said walls.

2. A dye wheel comprising a rotary, glass-lined, metal drum having in its walls a series of openings, glass stirring devices on the inside of said drum, elements extending through the wall openings for supporting the stirring devices, and means on the outside of the wall for clamping said elements to the outside of the wall and thereby rigidly supporting the stirring devices on the inside of the wall, said stirring devices and inner wall of the drum presenting a substantially continuous impervious glass coating to the contents of said drum.

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