Aug. 11, 1953 A. R. RANDOLPH 2,648,344

MANUAL SHAKER-TYPE ARTICLE CLEANSING APPARATUS

Filed March 11, 1952

Fig. 1.

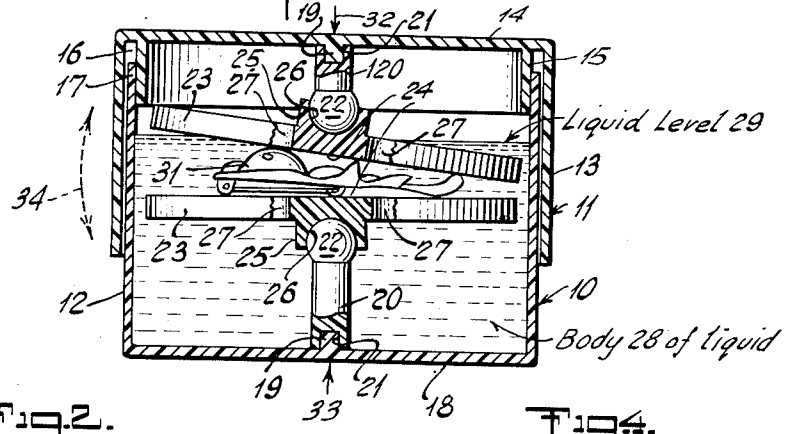


Fig. 2.

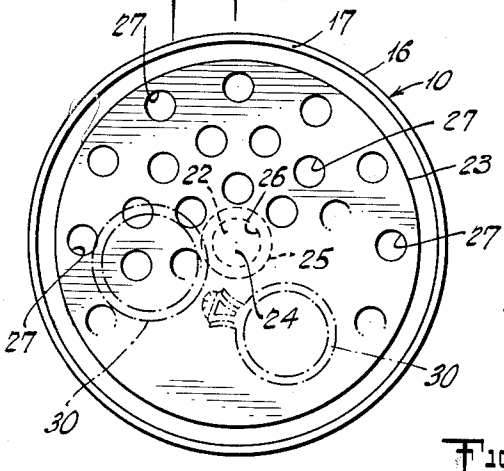


Fig. 4.

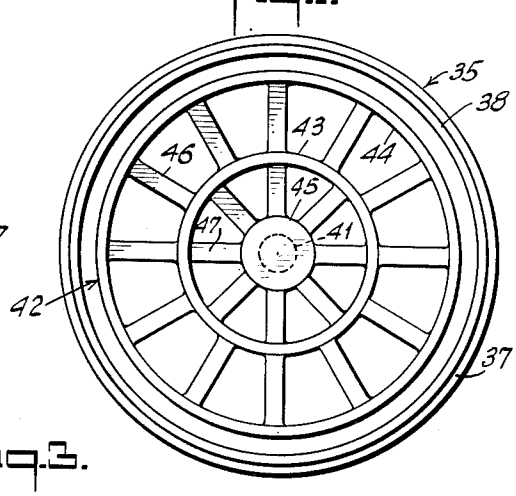
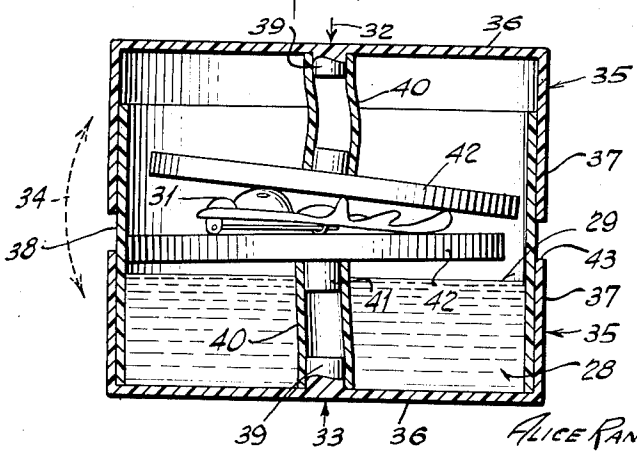


Fig. 3.



INVENTOR:
ALICE RANDOLPH RANDOLPH.

BY
Watson Johnson Leavenworth & Blair
ATTORNEYS:

Patented Aug. 11, 1953

2,648,344

UNITED STATES PATENT OFFICE

2,648,344

MANUAL SHAKER-TYPE ARTICLE CLEANSING APPARATUS

Alice Randolph Randolph, New York, N. Y.

Application March 11, 1952, Serial No. 275,919

5 Claims. (Cl. 134—157)

1

The present invention relates to portable cleansing devices of the manual shaker type for washing small articles.

A general object of the present invention is to provide such a device which is of simple and economical construction characterized by few parts readily manufactured and assembled on a mass production basis; and which permits ready use and operation efficiently to cleanse fragile or delicate articles while effectively avoiding tendencies to damage them.

Prolonged preliminary soaking to loosen foreign matter or accumulated soil on small articles used for scientific, industrial and household purposes and as personal adornments and aids, such as delicate instruments, jewelry, dentures, etc., may be desired. Thereafter, active agitation in cleaning baths assures thorough cleansing. A combination of those steps may constitute a highly efficient cleansing procedure to the practice of which and either step thereof the device of the present invention is well adapted. A more specific object of the present invention is to provide such a device in the form of a sectioned container, telescopic parts of which may serve as companion trays, each adapted to such a soaking operation, and when assembled together in a simple manner form a shaker-type cleansing device in which opposed, perforate, contour-adaptable platform means or racks lightly hold the articles to be cleansed by such forceful agitation in a secure suspended manner without damage.

Another object of the invention is to provide such a device in a form featuring a pair of opposed, freely tiltable, clamping platform or rack means which may lightly engage and fully suspend fragile articles af various dimensions and shapes in an undamaging manner in response to readily calculated, manually applied pressure as the device is grasped in the hand for shaking agitation of cleaning solution contents to assure free access by the latter to and forceful cleansing impingement of practically all of the article surfaces. The tiltability of the platforms permits them readily to be accommodated to the contours of odd-shaped pieces of various thicknesses, with a maximum number of points of contact for safe distribution of clamping load while avoiding retraction storage of energy which upon release with opening of the device may tend to pop or forcibly propel the articles out of it in a damaging manner.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

2

The invention accordingly comprises the features of construction, combination of elements and arrangement of parts, which will be exemplified in the construction hereinafter set forth, and the scope of the invention will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing, in which:

Fig. 1 is a axial section of an embodiment of the present invention, showing certain internal parts including platform means and support means for the latter in elevation; indicating, by way of example, an unsymmetrically-contoured article clamped therein for cleansing; and illustrating manipulation of the device for sloshing cleansing;

Fig. 2 is a top plan view of the lower section of the apparatus shown in Fig. 1, with the top section thereof removed and illustrating in broken lines other articles disposed therein for a soaking procedure;

Fig. 3 is a sectional elevation similar to that shown in Fig. 1 of a modified form of the apparatus of the present invention; and

Fig. 4 is a top plan view similar to Fig. 2 of uncovered sections of the embodiment of Fig. 3, but without illustrating soaking of articles to be cleansed.

Referring to the drawing, in which like numerals identify similar parts throughout, it will be seen that the embodiment illustrated in Figs. 1 and 2 may comprise a pair of opposed cup structures or trays 10 and 11, preferably cylindrical as shown. The outer diameter of the side wall 12 of tray 10 is slightly less than the inner diameter of the side wall 13 of the tray 11 so that the latter may be easily telescoped over the former and to permit gas relief and vapor lock-avoiding passage of gaseous medium or air. However, the fit is close enough so as to minimize liquid leakage from the container. A minimum leakage of a few drops of contained cleaning solution is of no importance since the cleansing operation preferably will be performed over sinks and in other places where slight leakage presents no problem. Further, to minimize leakage of liquid during shaking operation, tray 11 may have its circular end wall 14 provided with an upstanding flange 15 concentric with side wall 13 to define therebetween a cylindrical space 16 to receive the top edge 17 of tray wall 12. Trays 10 and 11 and other parts of the device may be

formed of any suitable material, but preferably are formed of a selected moldable synthetic plastic which is immune to attack by common cleaning chemicals and solutions which would normally be used in such an apparatus, and thus, for example, may be molded from polystyrenes, polyethylenes, etc.

Centrally of the transverse circular bottom wall 18 of tray 10 a small post or button 19 is mounted, preferably integral therewith. A separate elongated post 20 is provided with an end socket 21 receptive of the button 19 into which the latter is cemented. Post 20 extends coaxially with the cylindrical side wall 12 up toward but appreciably short of the lip 17. Such post 20 intentionally has a high degree of longitudinal rigidity or stiffness to avoid collapse or any appreciable axial foreshortening, which is important to efficient operation of the present device. Beyond the upper end 22 of the post 20 is hinged or mounted by any suitable pivoting or knuckle means a perforate platform or rack 23 shaped in contour similarly to a cross section of the tray 10, and thus in the preferred form it is circular. Platform or rack 23 has a central hub portion 24 provided with an axially extending stub post 25, preferably having in the free end thereof a socket 26. Preferably the end 22 of post 20 is formed as an enlarged ball head snapped into socket 26 for free ball and socket pivoting of platform 23. It is important that the support structure or post 20 prevent platform 23 under load from appreciably retracting or sinking down into tray 10 toward its end wall 18, while the platform is permitted appreciable tilting action in all directions so as to accommodate it and its companion platform to the contours of one or more odd-shaped articles which may be clamped therebetween for agitating wash thereof.

The inner face of end wall 14 of tray 11 also is provided centrally with a similar axially-extending post 120, likewise carrying an enlarged ball head 22 snapped into socket 26 in stub post 25 of the second platform 23 for like ball and socket pivoting of the latter.

As is more clearly illustrated in Fig. 2, each platform or rack 23 preferably is in the form of a disc provided with a plurality of apertures 27—27, evenly distributed over the face thereof. Thus platform 23 is perforate to permit free passage of cleaning liquid, but it will be understood, however, that each perforate platform may take various forms, such as rigid screens, spoked cradles, etc., which provide suitable planular support for various articles of jewelry, dentures, instruments, etc., to be cleansed. A showing of some of those holes 27—27 has been omitted from Fig. 2 for clarity.

In operation of the embodiment shown in Figs. 1 and 2, one may rest one of the cup structures, such as tray 10, upright in the position shown in Fig. 1 and place therein a bath or body 28 of cleansing liquid up to any desired level, such as that indicated at 29. Any articles to be cleansed may be submerged in the bath by placing or resting them on platform or rack 23 in that tray, such as, for example, rings, indicated in dot-dash outlines at 30 in Fig. 2, or a brooch, shown by way of examples at 31 in Fig. 1. Such articles may be soaked therein for any desired period, such as overnight, so that the cleaning agents in the solution will tend to loosen the accumulated dirt. Thereafter, one may then telescope the other cup structure or tray 11 down over tray 10 as illustrated in Fig. 1 so that the article, for example brooch 31, will be snugly contacted on both sides by the opposed clamping platforms or racks 23, 23. Manual pressure is applied endwise to the container in the direction of the arrows 32 and 33 by finger and thumb contact with the tray bottoms or end walls 14 and 18 as one grasps the assembled device in the hand for shaking. Such manually applied endwise pressure determines the degree of clamping applied by the platforms or racks 23, 23 to the article or brooch 31. Thus, of course, with delicate or fragile articles, such as jewelry having settings, such applied pressure will be light and of a degree merely sufficient securely to hold the articles between the clamping platforms, and is readily determined by feel. In applying such clamping pressure, the opposed clamping platforms or racks 23, 23 readily accommodate themselves to the contour of the article due to the free tilting thereof permitted by their knuckled or ball and socket mountings so as to distribute the light clamping load, thus minimizing possibility of damage to the fragile article. This contour-accommodating tilting action of the clamping platforms 23, 23 is readily permitted since the edges thereof are spaced appreciably from the inner face of tray wall 12, as graphically illustrated in Fig. 1.

The operator while so grasping the loaded apparatus then vigorously shakes it, preferably from end to end, in the direction of the double-ended arrow 34 shown in Fig. 1. Thus, the cleaning solution in the container is sloshed and swirled through and past the perforate platforms 23, 23 effectively all about the surfaces of the articles suspended in the container to flush away the soak-loosened dirt.

As illustrated in Fig. 3, the container of the present invention may be provided in a greater number of telescopic sections so as to permit molding of duplicate end sections from a single mold when making the device of plastic. For example, as shown in Fig. 3, two duplicate end sections may be provided in the form of trays 35, 35, each having a circular transverse end wall 36 and an upstanding cylindrical side wall 37 of certain internal diameter. The container proper is completed by a cylindrical section or sleeve 38, of plastic or like composition, compatible with or the same as that from which the trays are formed, and of an outer diameter slightly less than the internal diameters of the cylindrical walls 37, 37 so as to be readily telescoped therein as shown. The internal and external diameters of the trays 35, 35 and sleeve 38 respectively are such as to permit an interfitting which avoids appreciable liquid leakage while allowing gas relief and vapor lock-avoiding passage of gaseous medium mentioned above. Each end section or tray 35 alone or each tray with sleeve 38 nested therein, as proposed in Fig. 4, may constitute a cup structure for soaking purposes.

The inner face of each tray end wall 36 centrally carries an axially-extending post or stud 39 over one end of which is snugly fitted a section of elastic tubing 40 which has substantial longitudinal rigidity or stiffness while being laterally flexible. Tubing of suitably flexible and indissolvable rubber or polyethylene composition is admirably suited to this purpose. Elastic tubing section 40 snugly receives in its upper end a similar post 41 extending from the hub of a suitable platform 42 which may be of a construction similar to platform 23 of the Fig. 1 embodiment. However, as indicated in Fig. 4, such a platform 42 may be in the form of a wheel

structure. Concentric circular rings **43** and **44** coaxially arranged about a hub **45** are connected together and to the latter by radiating spokes **46** and **47**, preferably molded integral therewith, to form a one-piece perforate platform or rack structure. Platform or rack **42** provides secure planular support for articles to be cleansed while permitting free passage of cleaning solution therethrough in shaking agitation of the liquid contents.

As will be seen from Fig. 3, such supporting means comprising the sections **40**, **40** of elastic tubing, permit application of light clamping pressure to the article to be cleansed, such as brooch **31**, without damage thereto while allowing ready tilting adaptation of the platforms **42**, **42** to the contours thereof automatically to accommodate them to the shape of the article. The lateral flexibility of each tube section **40** readily permits such tilting action of the clamping platforms **42**, **42** while resisting longitudinal collapse and platform retraction so that the light clamping pressure applied in the direction of arrows **32** and **33** by the operator's hand will be effective in holding the article in suitable suspended position without damage.

It will be understood that due to the delicacy of many articles that are to be cleansed in a device of the type herein illustrated, it is essential that one avoid loose tossing about within the container during shaking since that would tend to knock the articles against each other and against the walls of the container. However, such delicacy and fragility of construction of the articles also limits the amount of clamping pressure that may be safely applied thereto and thus it is important that such clamping action be solely within the control of the operator, who automatically by feel will avoid application of any crushing pressure. Tiltability of the platforms, of course, further assures secure clamping with a minimum application of clamping pressure due to the fact that there are a major number of points of contact, and that there is a minimizing of tendencies to pivot or swing the articles about and to concentrate clamping pressure at one or a few points of contact, which might tend damagingly to strain or overload the fragile article at such points. Further, the substantially longitudinal rigid characteristic or stiffness of the means supporting the tiltable platforms avoids the use of any resilient structure which, due to application of clamping pressure, might well be retracted to cocked position and tend to propel or pop articles out of one section of the container when the other is removed. Spring support of such platform structure has been found to be subject to such objection and, of course, such spring propulsion of fragile articles is destructively dangerous since forceful contact with the floor, walls, furniture, etc., is quite apt to break them, as has proven to be the case in the use of a device equiped with a spring supporting a platform.

As suggested at **28** and **29** in Fig. 3, a relatively small bath or quantity of cleaning liquid or solution may be used by preference. This may permit a more forceful circulation and more effective cleansing impingement of article surfaces during shaking of the cleansing apparatus. As a result, the platform **42** supported in the lower tray **35** may not be submerged for soaking articles resting thereon in such a small bath. A relatively large bath may be stored for soaking articles on one of the platforms **42** by leaving nested or telescoped in one tray **35** the intermediate container section or sleeve **38** which with the tray constitutes a cup structure. When the bath surface **29** is thus above the top edge **43** of the tray wall to form a hydraulic head, the relatively long lap of section or sleeve **38** by tray wall **37** minimizes leakage therebetween even though the fit is intentionally loose. And as previously indicated, such leakage is of no annoyance or consequence since soaking will normally be carried out in or on a sink or other location in a bathroom where drops of cleaning solution create no problems. Excess liquid may then be poured out to carry out the agitating washing in a smaller bath. Separate loads may be placed to soak simultaneously on the platforms **42**, **42** in the two trays **35**, **35**, by using with each a sleeve such as **38**, an extra one thereof being provided for that purpose if desired. Also, such platform and flexible tube supporting structure of Fig. 3 may be used, if desired, in trays of the Fig. 1 type which are deep enough to accommodate submerging baths. Thus, if desired, two loads may be put to soak in both trays, and after soaking separately cleansed by two successive agitating shaking procedures, each load being clamped for its shaking cleansing between the platforms **42**, **42**.

It will be noted that the illustrated embodiments feature opposed cup structures or trays which have elongated telescopic lap fits with each other or an intermediate section forming with either tray a cup structure. Each cup structure supports therein an elevated platform effectively to suspend articles in soaking baths to assure free access of cleaning solution to all surfaces, and like suspension during the shaking wash also assures maximum efficiency in impingement and laving of all of the article surfaces by the cleansing solution to assure complete cleansing. Thus, all of the soil including that in crevices is thoroughly loosened and washed away. Each platform or rack is tiltably supported in one of the trays by means having substantial longitudinal rigidity or stiffness. Such support means is characterized by inherent ability to flex or bend laterally, or by a hinging joint in the nature of knuckle means or ball and socket connection with the rack or platform means, to permit the latter to tilt. Thus, articles placed between the platforms or racks are securely but lightly clamped therebetween when pressure is applied manually to opposite ends of the container to telescope the sections toward each other. Such telescoping pressure does not appreciably retract or depress the platforms or racks into their respective supporting trays so that when the container is opened there is no appreciable stored recovery energy to pop or propel the articles out in a damaging manner particularly hazardous to delicate and fragile articles, such as dentures, jewelry with settings, etc. The loose telescopic fit of container sections with appreciable overlap avoids vapor lock and assures gas relief without permitting an annoying degree of liquid leakage, particularly during shaking agitation. The constructions are readily adapted to economical molding operation so that, if desired, the parts may be made from molded plastic compositions or other suitable materials which may be chemically inert with respect to or immune from attack by certain cleaning agents one may wish to employ.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and,

since certain changes may be made in the above construction and different embodiments of the 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 following claims are 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. A manual shaker-type article cleansing apparatus comprising, in combination; a sectioned closed container having telescoping parts and end walls; a pair of opposed tiltable perforate, article-clamping platform means located between and spaced appreciably from said end walls of lateral dimensions appreciably less than transverse dimensions of container parts laterally opposite thereto to permit free tilting; and a pair of support means each tiltably mounting one of said platform means on one of said end walls having substantial longitudinal rigidity whereby the platform means are substantially non-rectractable toward said end walls with external application of telescoping pressure to said container parts while permitting tilting action of said platform means for accommodating them to the contours of articles clamped therebetween.

2. A manual shaker-type article cleansing apparatus comprising, in combination; a closable container comprising telescopic sections interfittable in a minimum liquid leakage manner while permitting gas relief and vapor lock-avoiding passage of gaseous medium and including opposed end portions; a pair of opposed, tiltable, perforate, clamping platform means each supported in spaced relation on the inner side of one of said end portions and of lateral dimensions appreciably smaller than the transverse dimensions of said container to permit appreciable article contour-accommodating tilting action; and a pair of support means each having substantial longitudinal rigidity and tiltably supporting one of said platform means on one of said end portions in appreciable spaced relation thereto while substantially preventing appreciable reduction of said spacing.

3. A manual shaker-type article cleansing apparatus comprising, in combination; a cleaning solution container comprising a pair of opposed, substantially cylindrical, relatively deep cup structures having substantially cylindrical side wall sections telescopically associated, and facing circular end walls manually to be moved toward each other with external manual application thereto of opposing pressure by endwise grasp of the apparatus in an operator's hand; a pair of opposed, perforate, transversely extending, circular, tiltable platform racks each located within one of said cup structures and of an outer diameter appreciably less than the internal diameter of the cylindrical side wall section surrounding it to permit free tilting of both of said racks; and a pair of elongated, substantially aligned, longitudinally stiff supports each mounted substantially coaxially on the inner side of one of said end walls and tiltably supporting one of said racks in a substantially non-retractable manner thereon whereby articles may be securely but harmlessly clamped between said opposed racks with light external application of the endwise grasping pressure tending to telescope said cup structures toward each other; the telescoping cylindrical side wall sections of said cup structures having relatively wide overlap with relatively loose fit to permit gas passage with minimum leakage of contained solution.

4. The cleansing apparatus as defined in claim 3 characterized by said supports being substantially rigid and having pivotal connection with said racks to permit the tilting action of the latter.

5. The cleansing apparatus as defined in claim 3 characterized by said supports being laterally and elastically flexible while being substantially longitudinally stiff to permit the non-rectactable tilting action of said racks.

ALICE RANDOLPH RANDOLPH.

No references cited.