United States Patent

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[54] **VESSEL AND CLOSURE FOR HYDRAULIC AGITATION OF DENTURES AND THE LIKE**
10 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **259/4**
[51] **Int. Cl.** **B01f 5/10**
[50] **Field of Search** 259/4, 18, 36, 60; 134/154, 182

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ABSTRACT: A vessel having a removable closure that is apertured for the reception of a stream of fluid and for the discharge thereof, and provided with means to direct the fluid for efficient agitation of articles contained in the vessel. This invention is particularly useful in the care of dentures that require thorough cleansing and rinsing in scalding water, and comprises a lightweight insulating vessel with means for attachment to the smooth interior surface of a porcelain or similar basin. The closure is characterized by a marginal aperture therein that permits the jetting of fluid from a faucet so as to enter the vessel, and by a central aperture for discharge of fluid after it is spent to agitate the articles contained in the vessel, the first-mentioned means being a nozzle aligned with the first-mentioned aperture to direct the fluid through the vessel and thereby agitate the dentures or other articles therein.

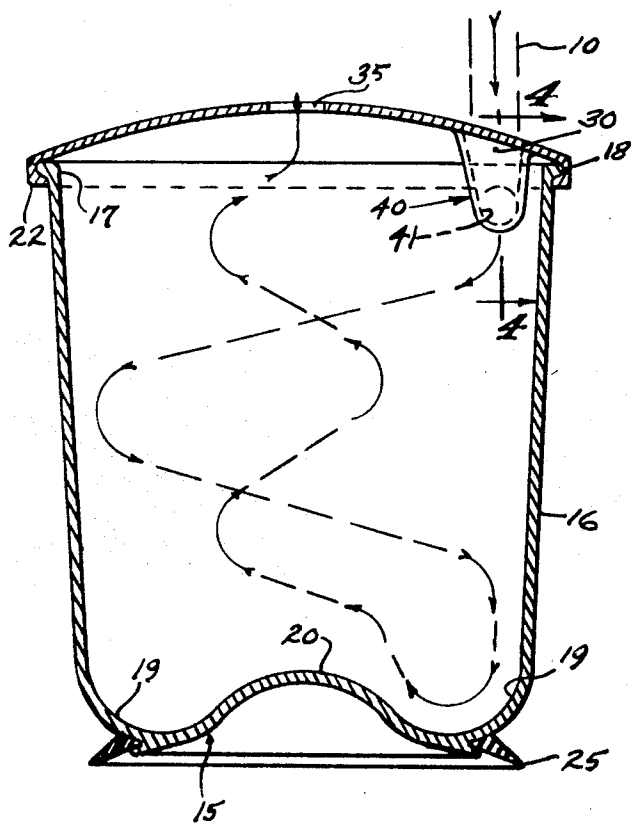


FIG. 1.

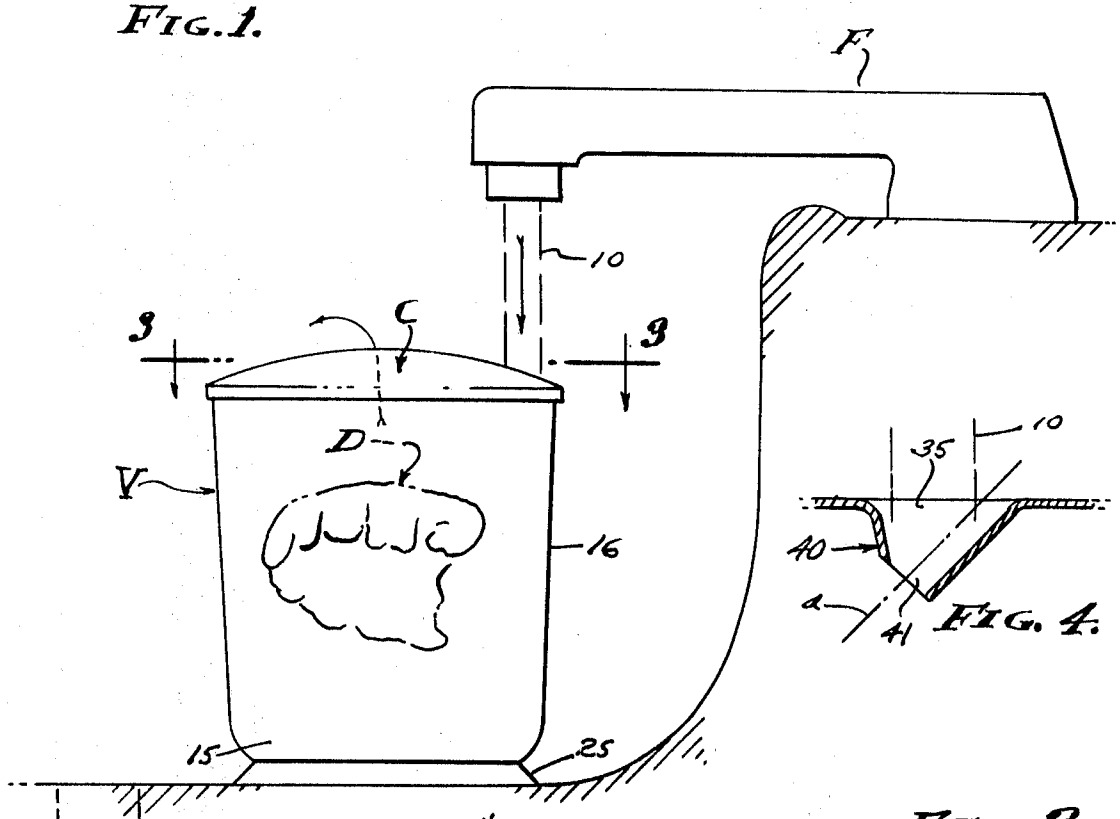


FIG. 4.

FIG. 2.

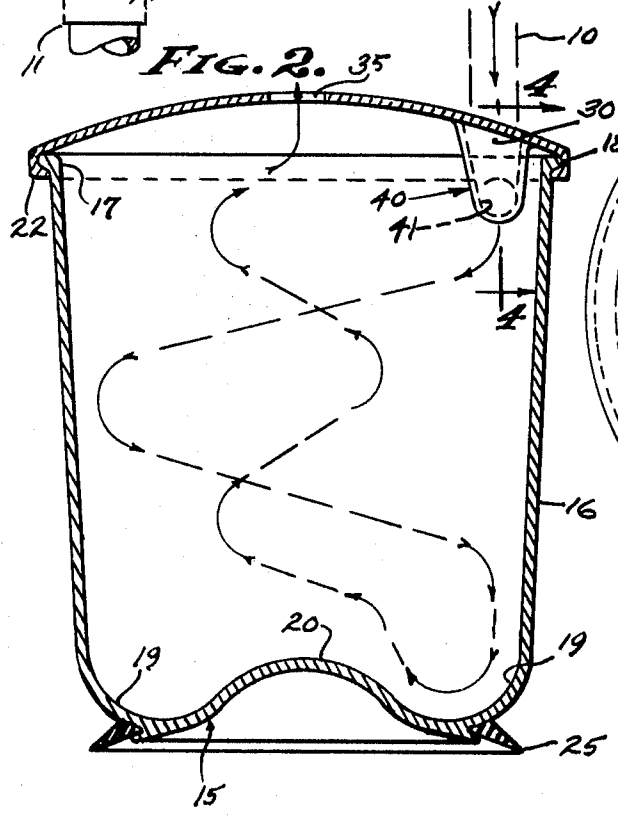
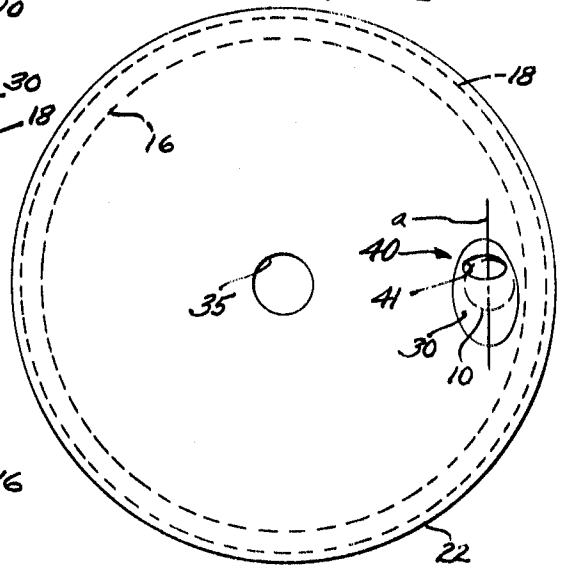


FIG. 3.



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VESSEL AND CLOSURE FOR HYDRAULIC AGITATION OF DENTURES AND THE LIKE

This application is a continuation in part of my copending application Ser. No. 811,510 filed Mar. 28, 1969, now abandoned.

Although this vessel and closure can be employed for the hydraulically agitated cleaning of various types of articles, it is dentures which are particularly adapted to be cleaned therein. There are of course various special preparations in which dentures can be soaked, but there is in fact no better method than to wash them regularly in scalding water. Consequently, an assurance of avoiding obnoxious odors and in order to promote good hygiene, persons wearing dentures diligently wash them in hot water, with or without cleansers, and in steaming and/or scalding water if at all possible. However, there is a limit to the degree of heat which a person's hands and fingers can withstand while manipulating the dentures in the hot water, and this presents a serious limitation in the results of such a washing operation. Open-topped vessels and glasses or jars are not the answer, since an unconfined hydraulic wash will flood the dentures out of a vessel, glasses are fragile, and uncontrolled hydraulics cannot be most effective. Therefore, it is na object of this invention to provide a vessel and closure combination that most effectively controls hydraulic flow, to direct its entry into and to direct its discharge from the vessel while creating and confining the turbulent flow of fluid and agitation of the denture and/or articles within the confines of said vessel.

It is also an object of this invention to provide a vessel, closed as above referred to, which has holding means that captures it in working position for receiving a pressurized jet of water, all without capsizing and without requiring a person to hold the vessel in position. With the present invention, the vessel and its closure are aligned with the jet of hot and/or scalding water eminating from a faucet, and left there, preferably within the confines of a washbasin or the like, to receive the jet of water and to redirect the water so as to create the agitating action sought for, and all to the end that the dentures float about and are thoroughly washed from every single angle reaching into every crevice and interstice.

The various objects and features of this invention will be fully understood from the following detailed description of the typical preferred form and application thereof, throughout which description reference is made to the accompanying drawings, in which:

FIG. 1 is a sectional view taken through a typical sink, showing the articles of the present invention in use and in elevation;

FIG. 2 is an enlarged sectional view of the assembled structure of the present invention as it is shown in FIG. 1;

FIG. 3 is a plan view taken as indicated by line 3–3 on FIG. 1; and

FIG. 4 is a fragmentary sectional view taken as indicated by line 4–4 on FIG. 2.

Dentures, partial or full, are characterized by their sets of teeth fixed in a frame adapted to fit with a person's jaw through engagement of the gums, and/or with remaining natural teeth. During the course of a day's use, the fluids of the mouth and accumulations of food particles are caught up in the crevices and interstices of the dentures and become odorous. Therefore, periodical cleaning of such dentures is necessary and among the best methods of cleaning is washing with scalding water. Various preparations can be used before and/or after such a washing, but in any case use of very hot water is most effective and especially when agitation thereof is employed. Consequently, the present invention provides a vessel V and a closure C for hydraulic agitation of dentures D and the like, wherein a jet of very hot water can be usefully employed in the form that it is usually delivered from a water faucet F. As shown, a jet of water **10** is delivered in a substantially vertical and downward direction from the faucet F in a pencillike stream. Such a jet of water **10** is common and almost universally employed in connection with domestic washbasins B in lavatories and the like. Such basins are usually provided with porcelain interiors or the equivalent and with a smooth hard-surfaced bowl. A drain **11** is provided at the bottom for carrying away used water.

In accordance with the invention a vessel V and closure C combination is provided and usefully employed by aligning it with the jet of water **10** and with the dentures D or the like accommodated therein for agitation and cleansing by a washing action that is most effective. The vessel V and closure C are made of moldable material such as a plastic that impedes heat transfer. There are many such plastics which are easily molded and which do not efficiently transfer heat, which are also durable and conducive to cleanliness. It is such material that the vessel V and closure C are made of, preferably a plastic that is bendable for manipulating the two elements V and C into and out of coupled engagement.

The vessel V is an upstanding open-topped vessel having a bottom **15** and sidewalls **16**. The bottom is horizontally disposed while the walls **16** are vertically disposed extending upward from the outer periphery of the bottom. As shown, the bottom is round in which case the walls **16** form a cylinder. The upper end of the vessel is completely open and has an attaching rim **17** which in practice is a radially enlarged bead **18**. Also, in carrying out the invention, the bottom **15** is filleted at **19** where it joins the walls **16**, and said fillet turns radially inward and into a cone-shaped center **20** that projects convexly upward establishing a concaved bottom.

The closure C is a planar element that covers the open upper end of the vessel V and is preferably a domed disc form having a periphery with a depending flange **22** to mate with the bead **18** for attachment. The said bead **18** and flange **22** have overlapped engagement that is forcibly fitted for coupled engagement of the closure C and supporting vessel V. In accordance with the invention, the closure C is apertured at **30** and **35** for the separated reception and discharge of fluid, and nozzle means **40** is associated with the receptive aperture **30** and directs fluid to swirl through the vessel V in a predetermined manner. In practice, a flow pattern is established whereby the entry of high-velocity fluid swirls downwardly in a helical path adjacent the cylindrical wall **16** and is turned at the bottom of the vessel to swirl upwardly in a continuing helical path at the center of the vessel and is then discharged. The flow is continuous and impeded by the presence of articles within the vessel, and all of which creates turbulence and assures effective cleaning, with the apertures **30** and **35** positioned and shown as now described:

Aperture **30** is the fluid-receiving port and it is located in the marginal portion of the closure C immediately adjacent the wall **16** of the vessel. Aperture **35** is the fluid-discharging port and it is located in and occupies the central portion of the closure C. Both apertures **30** and **35** are ports of ample area, the aperture **30** being of somewhat larger area than the diameter of the jet of water **10**. This is, the jet of water **10** enters the aperture **30** with clearance. However, the lower velocity water leaving the vessel V is in a flooded condition and simply swirls upwardly through the aperture **35** to flow laterally in omnidirections.

A feature of the invention is the nozzle means **40** which determines and directs the predetermined flow pattern of the fluid that is forced into the vessel V and is spent therein and then discharged for disposal as waste. The nozzle means **40** is adapted to receive a high-velocity jet of water **10**, to collect it and to redirect it to the useful purpose of agitation within the vessel V. Normally, a jet of water **10** is disposed vertically or substantially so, and its velocity is downward. Therefore, the nozzle means **40** opens upwardly for the reception of the jet water **10** and is an upwardly flared cone that has a funnel shape and a corresponding collective function. However, the axis *a* of the cone-shaped nozzle means **40** is angularly or helically disposed and tangent to a radius point spaced immediately inward from the wall **16** of the vessel V. Although the pitch of the helix can vary, a 45° angle is most practical and is shown. The opening **41** of said nozzle means is restricted as

compared with the mouth **42** of the aperture **30** and functions to direct fluid circumferentially within the confines of the cylindrical wall **16**. Consequently, the jet of water **10** revolves and/or swirls toward the bottom of the vessel where it is turned radially inward by the fillet at **19** and upwardly by the conical center **20**, whereupon the vessel V is filled with swirling water that rises to the top and discharges through the central aperture **40** and without interferring with the incoming jet of water **10**.

Securement means B is provided for the attachment of the vessel V to the smooth surface of a porcelain bowl or the like, and as shown in the drawing, the means B advantageously employs the bottom concaved contour of the vessel V. In the event that the plastic material of the vessel is sufficiently pliable or supple then the perimeter of the bottom **15** is feather edged as indicated at **25**, and so that its suppleness conforms to the contours of the basin. In the event that the vessel material is excessively stiff, then the securement means B is a separate element of sufficiently pliable material, such as an elastomer, attached to the bottom **15** and with the lip **25** projecting radially and downwardly at its perimeter, as shown.

When in operation as hereinabove described, the dentures D are captured within the confines of the vessel V and its attached closure C, the dentures being a greater bulk than that permitted to pass through the aperture **40**. The rolling effect of the downwardly swirling water at the periphery acting in opposition to the upwardly swirling water at the center lifts and tumbles the dentures, and a continuation of this effect ensures a thorough cleaning, especially when jetting high-velocity scalding water into the vessel as directed by the nozzle means **40**. Upon completion of sufficient cleaning, the plastic vessel V is manipulatable, due to the low heat-retaining character of the plastic material, and without danger of scalding one's hands or fingers. It is to be understood that the vessel V and fluid directive closure C therefor is applicable to a wide range of sizes and configurations, namely to conduct cleaning processes and the like as may be required of articles susceptible to processing by agitation in a moving fluid.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any modifications or variations that may appear to those skilled in the art.

Having described my invention, I claim:

1. A vessel and closure combination for the fluidic agitation of articles such as dentures and the like, and including, an upright vessel having a horizontal bottom with a surrounding substantially vertically disposed sidewall upstanding from the perimeter of the bottom and terminating at an open top in a horizontal plane, a removable closure coextensively overlying the open top of the vessel and having a marginal and a central aperture therein, nozzle means aligned with the first-mentioned marginal aperture and disposed angularly on a helical axis tangent to a point spaced inward from the sidewall of the vessel, and means releasably coupling the closure to the vessel, whereby a vertically and downwardly projected jet of fluid is adapted to enter the vessel through said first-mentioned aperture and is directed circumferentially by said nozzle means and adjacent the sidewall to swirl downwardly through the vessel and turned by the bottom to swirl upwardly through the center of the vessel thereby agitating said articles and to discharge from said second-mentioned aperture.

2. The vessel and closure combination as set forth in claim **1** wherein the bottom is round and the sidewalls form a cylinder, and wherein the closure is disc shaped, for inducing a circular swirling action.

3. The vessel and closure combination as set forth in claim **1** wherein the bottom and sidewalls are joined by a generous fillet, or deflecting liquid inwardly.

4. The vessel and closure combinations as set forth in claim **1** wherein the bottom is round and the sidewalls form a cylinder, wherein the closure is disc shaped, and wherein the bottom and sidewalls are joined by a generous fillet for deflecting liquid inwardly and inducing a circular swirling action.

5. The vessel and closure combination as set forth in claim **1** wherein the bottom and sidewalls are joined by a generous fillet for deflecting liquid inwardly, and wherein said fillet curvature continues into a conical convexly shaped center for deflecting liquid upwardly.

6. The vessel and closure combination as set forth in claim **1** wherein the said bottom is round and the sidewalls form a cylinder, wherein the closure is disc shaped, and wherein the bottom and sidewalls are joined by a generous filet and wherein said fillet curvature continues into a conical convexly shaped center for deflecting liquid inwardly and upwardly for inducing a circular swirling action.

7. The vessel and closure combination as set forth in claim **1** wherein the means releasably coupling the closure of the vessel comprises a peripheral bead at the top of the vessel walls, and an overlapping flange at the rim of the closure forcibly engaged over the bead for releasable attachment.

8. The vessel and closure combination as set forth in claim **1** wherein the vessel has securement means comprising a pliable feather-edged bottom perimeter that conforms to the contours of a supporting surface for suction engagement.

9. The vessel and closure combination as set forth in claim **1** wherein the vessel has securement means comprising a pliable feather-edged element encircling the bottom perimeter and that conforms to the contours of a supporting surface for suction engagement.

10. The vessel and closure combination as set forth in claim **1** wherein the said bottom of the vessel is concaved and wherein the vessel has securement means comprising a pliable feather-edged element encircling the bottom perimeter and that conforms to the contours of a supporting surface to establish a chamber adapted to be pressured for suction engagement.