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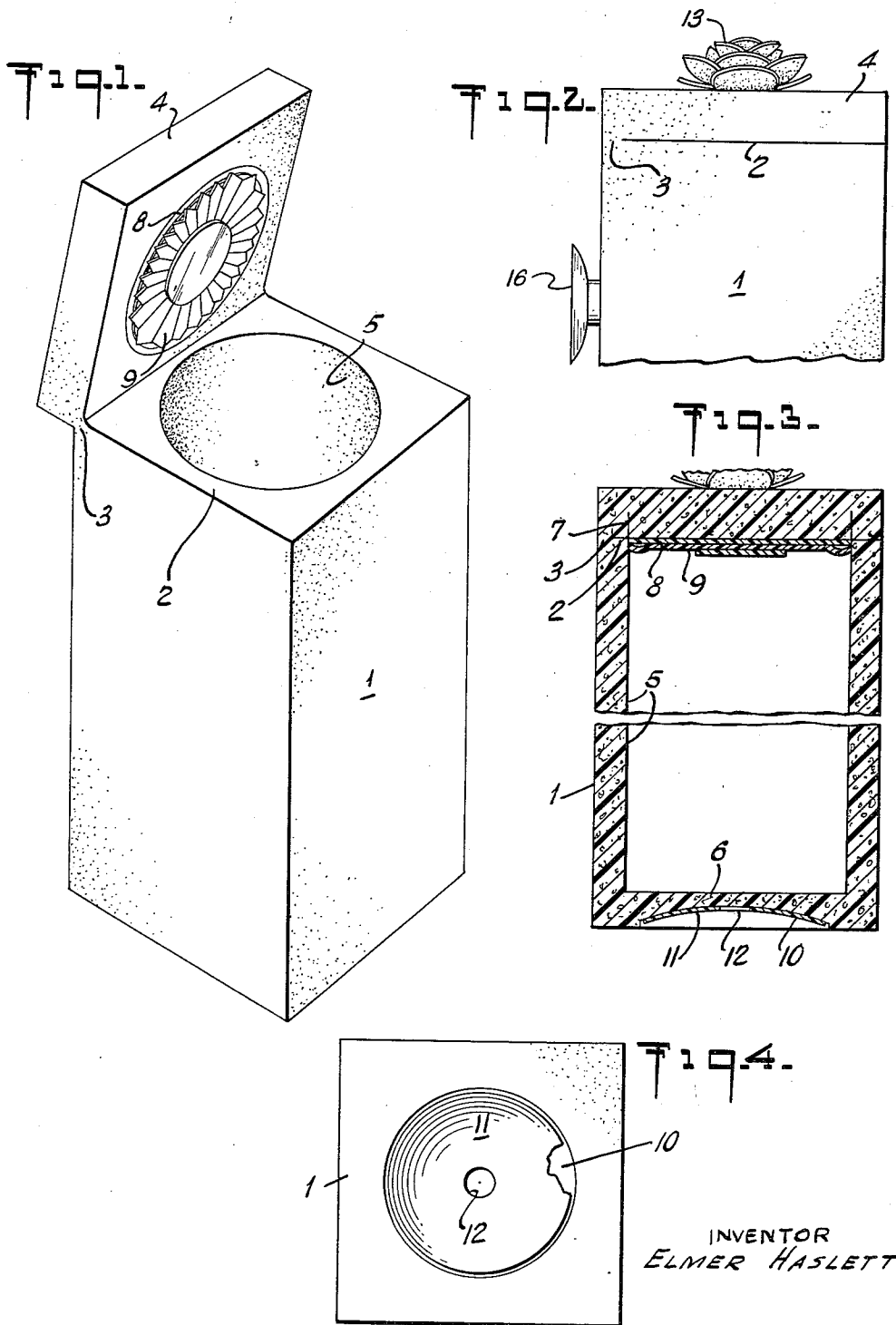
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WASHING APPLIANCE FOR SMALL AND DELICATE ARTICLES

Filed May 4, 1962

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 5-

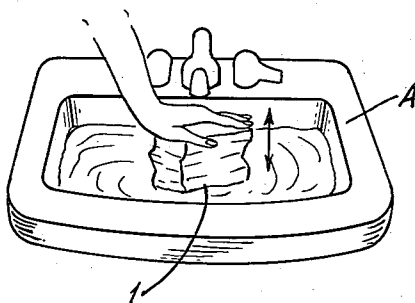
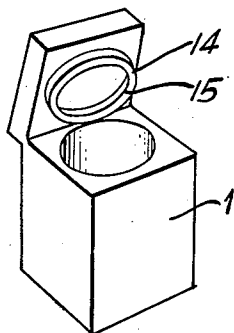


Fig. 6-



Fig. 7-



INVENTOR
ELMER HASLETT

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WASHING APPLIANCE FOR SMALL AND DELICATE ARTICLES

Elmer Haslett, 7007 Groton St., Forest Hills, N.Y.

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13 Claims. (Cl. 68-213)

My invention relates to a device useful for washing very delicate and fragile things, such as sheer hosiery.

As is well known, most hosiery of silk, nylon, rayon, or other composition is generally washed by hand in basins, the sheerness and delicacy of these items being so great that the violent agitation of an ordinary mechanical clothes washer plus the abrasive action of contact with heavier and rougher articles and fabrics often causes tears, snags, and runs. Likewise, there is always the danger or tendency to damage, deterioration, distortion and shrinkage from excessive temperature exposures in washing these delicate things with other fabrics. Separate meshed bags for the protection of these delicate things when washed mechanically with other things are available with some improvement. While these delicate things are thus much safer when washed by hand in the basin, another danger is always present in that a rough edge of a basin stopper ring, a nicked edge of the basin drain, a rough fingernail, hangnail, or even badly chapped skin can cause rims and tears. Also, over half our Nation has hard water. And in washing both by machine and by hand in hard water, one of the biggest problems is that of soap curds. These soap curds (the familiar ring about the bath tub) result generally from coagulation: the chemical reaction of soluble calcium carbonate or magnesium carbonate with soap. The degree of this coagulation depends on several factors, but where heavy curds are present, they coat and adhere to the stockings or other items, destroying the sheen and lustre as well as lodging within the pores a foreign chemical agent for shortening the life of hosiery. The soap curd problem, while quite general, is less where certain detergents are used, or where water is previously softened by zeolites or other chemicals. On the other hand, many skins are allergic to detergents; and so mild soaps are used by preference.

Objects of the invention are to provide means useful for washing and rinsing very delicate, sheer and fragile items, such as ladies' sheer hosiery, with which the danger of snags, runs and other damage to such items during washing and rinsing is substantially eliminated, with which such items are entirely insulated and protected from damage during washing and rinsing, and protected from contact with any sharp, rough, rigid or other surfaces that might tend to tear, snag, distort, or cause runs to occur in such items, which will act as a filter for the cleansing and rinsing solutions to prevent contact of coagulated soap curds with the items being washed and/or rinsed, and which will be relatively simple, compact, effective, practical, convenient, and inexpensive.

Other objects are to provide means for washing and rinsing delicate and fragile items, in the use of which for washing and rinsing such items, the hands of the user may be protected from the washing solution and rinsing water, and which enables the rapid and effective washing and rinsing of such items.

Other objects and advantages will be apparent from the following description of embodiments of the invention and the novel features will be particularly pointed out hereinafter in connection with the appended claims.

In the accompanying drawing:

FIGURE 1 is a perspective of a washer constructed in accordance with this invention, with the top or lid open, and showing the cylinder for receiving articles for washing;

FIGURE 2 is a side elevation of the same, but with the lid closed;

FIGURE 3 is a transverse sectional elevation of the same;

FIGURE 4 is a plan view of the bottom of the same;

FIGURE 5 illustrates the invention being compressed in a washbasin in use;

FIGURE 6 shows the invention being squeezed by side compression after rinsing to wring the material;

FIGURE 7 shows another embodiment of the invention, with a hollow ring affixed to the lid portion to fit within the top of the cylinder and function somewhat like a piston.

In the embodiment of the invention illustrated in FIGS. 1-6, I use as a container a substantially hollow, completely enclosed, elongated cube or block of unicellular, absorbent, porous, elastic or resilient, or foam material such as foam rubber, cellular polyester resins, polyurethane resins or materials having equivalent properties. The material used must have the properties also of being compressible, flexible, pliable, stretchable with the important inherent characteristic of restoring itself to its original shape after being temporarily distorted by compression, squeezing, or stretching. The unicellular material has many small cells within its interior communicating with one another from surface to surface, and hence is functionally the equivalent of one single, extensive, cellular network. As a result it is absorbent and porous, and liquids can pass through its walls. This is important so that liquids may pass through its walls rather freely. Among these materials, the unicellular and therefore porous and absorbent polyurethanes are highly satisfactory for this purpose.

Referring first to the embodiment shown in FIGS. 1-6, a right or regular parallelepiped shaped container or block 1 of elastic, cellular, porous material has a slit or cut 2 (FIG. 2) that extends parallel to and spaced from one end from one side nearly to but short of the opposite side, that is not entirely across the container or block so as to leave an uncut area 3 that serves as a hinge for the end part 4 above the cut 2. This part 4 functions as a cover which may be swung from the closed position of FIG. 2 to an open position such as shown in FIG. 1. While the cover 4 is in an open position, a cylindrical hole 5 is formed in the block 1 below the cut 2 and terminating somewhat above the bottom end face, so as to leave a continuous and unbroken but porous bottom wall 6.

The cover 4 also has a narrow, annular groove or channel 7 (FIG. 3) formed or cut in its inner face and terminating short of the other, outer end face of the cover. The inner diameter of the channel 7 is that of the diameter of the hole 5. Secured across the portion of the entire inner face of the cover which is encircled by the annular groove or cut 7, is a disc 8 of water impervious, elastic, preferably flexible material, such as of rubber sheet material for example, this disc being confined, such as by cement, flat against the inner face of the cover. The diameter of the disc 8 is equal to or slightly less than the diameter of the channel 7 so that when the cover is closed, the disc 8 may enter and extend substantially across the upper open end of hole 5, as shown in FIG. 3.

Superposed on the exposed face of disc 8 is another disc 9 of sheet material that is inert to water and detergents, and which has a periphery with notches therein for both ornamental and useful purposes. The overall diameter of the disc 9 is preferably slightly greater than the diameter of hole 5 so that the notched margin will be deflected slightly as it enters the upper end of the hole 5 and provide friction to hold the cover in closed position. These discs act as projections that enter the upper end of hole 5 and center the cover properly with respect to hole 5.

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When the top of the container or block so made is depressed in use, as hereinafter explained, the discs 8 and 9 will guide the part of the inner face of the cover that is encircled by the channel 7, and which is in effect a piston recessed in the inner face of the cover, down into the upper end of the hole 5 and thus prevent any lateral displacement of the cover on the body of the block which might damage the hinge portion 3 or open the hole 5.

The exterior bottom face of the container or block 1 has a cavity or recess 10 in its central face area, which does not extend into the hole 5, and this recess 10 may advantageously be defined by an arcuate wall as shown. A disc 11 of water impervious, flexible and preferably elastic sheet material is confined, such as by cement, over its face area against this wall defining recess 10, as shown, so that it acts as a water impervious liner for the recess. This disc 11 has an aperture 12 approximately centrally thereof and of substantial size. An ornamental flower or other ornament 13 may be affixed to the top or outer face of the cover, and a suction cup 16 (FIG. 2) may be affixed to the top or a side wall of the container, such as to the rear side wall thereof, by which the block or container may be detachably confined by suction to a wall or tile of a room when not in use in washing articles, and washed stockings or delicate articles of wear may, for drying, be draped over the block so held to a wall.

In the embodiment of the invention illustrated in FIG. 7 the construction is similar to that shown in FIGS. 1-6, except that instead of having the annular channel 7 and the discs 8 and 9 of FIGS. 1-6, a boss 14 having an outside diameter approximately equal to the diameter of hole 5 is fixed, such as by cement, to the inner face of the cover in a position to be aligned with and enter the upper open end of hole 5 when the cover is closed, and prevent sidewise movement of the cover when the block or container is compressed in use. While this boss 14 may be a cylindrical boss or projection, it is illustrated as an annular ring cemented to the inner face of the cover. In either event a ring 15 of water impervious sheet material is confined, such as by cement, to the center of the boss 14 or within the annular ring, so that water or detergent may not pass upwardly through the center portion of the cover when the block is compressed while partially immersed in a liquid.

In one example of use, nylon stockings or other items to be washed are placed in the hole 5 while the cover 4 is open, and then the cover is closed. A quantity of water and detergent or soap forming a warm sudsy solution about 2 inches deep is placed in the basin of a wash bowl A (FIG. 5) and then the block or container 1, with the items therein, is placed upright in the basin as shown in FIG. 5. Then one compresses the cover, as shown by the hand in FIG. 5, like an accordion and releases it repeatedly. When the block or container is compressed in this manner against the bottom of the container the concave recess 10 (FIG. 3) is collapsed flat against the bottom of the basin, and the sudsy water that was confined in or occupied the concave recess or cup 10 is pumped or forced under pressure through the aperture 12 and the porous bottom wall 6 of the block into the chamber or hole 5 where it contacts and passes through and around the stockings or items contained in the hole 5. During this compression of the block to approximately half of its normal height (FIG. 5) air in the hole 5 is expelled through the porous side walls of the block. This expulsion of air from hole 5 is greatly accentuated by reason of the fact that the water impervious disc 8 (FIGS. 1-6) (or ring 15 of FIG. 7) moves down the hole 5 during the compression of the block and acts as a piston in hole 5 to expel air therefrom.

When the hand or fist releases the container or block, the collapsed block resumes or returns to its original shape and size, due to the inherent resiliency or elasticity of the material of which the block is formed. As the collapsed block returns to its original shape and size, the partial

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vacuum created in hole 5 by its enlargement due to such return to size, causes sudsy water to be drawn through the side and bottom walls of the container into the hole 5 to fill it in place of the previously expelled air. Each additional compression of the device against the bottom of the basin forcibly pumps sudsy water in from the recess 10 in the bottom of the block, and expels other sudsy water from the hole 5 with considerable force through the porous side walls of the block. The pressures on the liquid in the hole 5 creates jets or streams of sudsy water that pass through aperture 12 and penetrate and pass around the fabrics in the hole, which is the most efficient manner of washing fabrics. The aperture 12 concentrates some liquid into a defined stream passing through the bottom wall of the container.

During compression or collapsing of the block or container by downward hand pressure on the cover, the part of the cover encircled by the channel 7 moves down into and somewhat along the hole 5 as a piston to prevent sidewise movement of the cover 4 on the block 1, which prevents loss of textile material from the hole 5, damage to the hinge portion 3 of the cover, and possible entry of soap curds into the hole 5. When not in use, the discs 8 and 9 (boss 14 of FIG. 7) keep the cover closed by friction of the periphery of disc 9 against the side wall of hole 5.

The shape of a right or regular hexahedron or right or regular parallelepiped for the block 1 with a cylindrical hole 5 is advantageous because the larger thickness of the side wall at the upright corners gives more body to the block that assists in increasing the resiliency of the material and provides a more rapid return of the block to its normal shape after compression and release. The thinner portions of the side walls between the corners offer minimum resistance to the free circulation of cleaning solution or rinsing liquid during compressions and releases of the block. The porous walls of the container act as filters to prevent entry of any soap curds into the hole 5 and contact there with the items being washed.

After the items have been washed in this manner in a sudsy water, the block with items therein is removed from such water and the compression and release operation again repeated with plain or rinsing water to rinse the items while still in the hole 5. The items may have excess liquid expressed therefrom by removing the container with items confined therein from the liquid, and then squeezing the container between the hands as shown in FIG. 6. This squeezing may be performed after the washing in a detergent and before rinsing, and also after rinsing so that the items will then only be damp when removed from hole 5 for drying. This facilitates drying.

Since the basin of sudsy water or detergent solution need only have a depth much less than the height of the block or container, the washing and rinsing operations can be performed without the hand coming into contact with the detergent or rinsing water. This avoids damage to manicure of the skin and nails of the user. Of course, if one does not object to having the detergent or rinsing water contact the hands, the washing and rinsing liquids may be much deeper, even to a depth greater than the height of the container 1. While use of detergents and sudsy water for the cleaning has been described, other cleaning agents that do not damage the material of the block or container may be employed, so that limited, so called dry cleaning of delicate items is possible with this invention.

The rinsing operation can also be performed by holding the block or container 1, with its cover open, directly under a faucet and allowing clean water to flow into hole 5, with some of it overflowing and some or all of it passing through the porous side wall of the container. Also by placing a rubber band or string around the container and over the cover, while the items to be washed are confined within the hole 5, the container with its cover so held closed may be placed in a mechanical washing ma-

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chine and the items washed alone or with other laundry, without danger of damage to the items. The action of the washing machine in tumbling the container about in the washing chamber will alternately compress and release the container so as to cause flow of the cleaning solution through the container walls and through and around the items in the hole 5.

While the device is especially useful in washing or cleaning delicate textile items such as sheer nylon stockings, it may also be used to clean other delicate items. It will also be understood that various changes in the details, steps and arrangements of parts, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention, as expressed in the appended claims.

I claim:

1. A device useful for safely washing relatively small and delicate articles of wearing apparel which comprises a porous container of unicellular, elastic material having a chamber therein for receiving and holding said articles and closed at one end by a moveable cover, whereby when said closed container with said articles therein is placed in a body of cleaning liquid and such closed container with said articles in said liquid is squeezed and released repeatedly the cleaning liquid will be caused to flow through the porous walls of said container into and out of said chamber to agitate and clean such articles, whereby when said liquid is replaced by rinsing water, the repeated squeezing and release of the container with the articles in said chamber will cause the articles to be further rinsed clean, all without contact of such articles with human hands in washing and rinsing, and whereby subsequent squeezing and release of the container, out of the water, will express excess water from said container and articles, and facilitate drying of the articles, the bottom wall of said container having in its interior area only of its outside face of its bottom wall, a cavity that opens solely outwardly through such outside face, and a layer of flexible, water impervious material secured flat against and covering substantially all of the wall of said cavity, said layer having an aperture of substantial size there-through from face to face in its interior area, whereby when said container is compressed endwise, with its bottom wall against a surface covered by a liquid, the liquid trapped in said cavity will be forced as a stream through said aperture and the bottom wall of the container into said chamber to agitate and contact with said articles therein.

2. A device useful for safely washing relatively small and delicate articles, such as of apparel, which comprises a container of unicellular elastic material having therein a chamber for receiving and holding such articles to be cleaned and closed at one end by a moveable cover, the bottom wall of said container having a cavity opening outwardly through its exposed bottom face substantially solely in the interior of its face area but with a continuous wall of said unicellular material between the bottom surface of said recess and said chamber, said cover having in its inner face a relatively short post of about the size and shape of, and aligned with, the face area of the top of said chamber, which post, when the closed container is compressed endwise, acts like a stud received in said chamber and restraining the cover against sidewise movement on the top of the container which would tend to open the top of the container.

3. The device according to claim 2, and a layer of flexible water impervious sheet material abutting flat against and bonded to the surface of said cavity, but being substantially apertured in its interior area to cause liquid that may be trapped and compressed in said cavity when the container is compressed endwise while its bottom wall is compressed against a liquid covered surface, to pass through said bottom wall into said chamber in

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stream form to better agitate said articles in said chamber and bring them into contact with such liquid.

4. The device according to claim 3, and a water impervious sheet material covering the face area encompassed by the free end of said post, whereby when the container is compressed endwise, liquid from said chamber will be restrained from passing through said cover and contacting a person's hand which is pressing downwardly against said cover in its closed position to compress said container but will accentuate the pressure of the cleaning solution through the material being washed.

5. The device according to claim 2, wherein said chamber is cylindrical in shape and said cover has an annular groove in its inner face having a diameter at least as large as that of the top of said chamber to form said post.

6. The device according to claim 2, and a water impervious layer of flexible sheet material covering the free end of said post whereby when the container is compressed endwise, liquid from said chamber will be restrained from passing through said cover and contacting a person's hand which is pressing downwardly against said cover in its closed position to compress said container.

7. A device useful for safely cleaning relatively small and delicate articles, such as of wearing apparel, which comprises a container of porous, unicellular elastic material having therein a closed chamber to receive and hold articles to be cleaned and a moveable cover for said chamber enabling transfer of such articles into and out of said chamber, said cover having a water impervious area on its inner face of a size, shape and alignment with the top of said chamber to enter the top of said chamber like a post and prevent sidewise movement of said cover on said container when the container is compressed and released repeatedly in a body of cleaning liquid that passes through the walls of said container to agitate and clean any of such articles in said chamber, the bottom wall of said container having therein a cavity opening outwardly through the exposed face of said bottom wall solely in the interior of its face area.

8. A device useful for safely cleaning relatively small and delicate articles, such as of wearing apparel, which comprises a container of porous, unicellular elastic material having therein a closed chamber to receive and hold articles to be cleaned and a moveable cover for said chamber enabling transfer of such articles into and out of said chamber, said cover having a water impervious area on its inner face of a size, shape and alignment with the top of said chamber to enter the top of said chamber like a post and prevent sidewise movement of said cover on said container when the container is compressed and released repeatedly in a body of cleaning liquid that passes through the walls of said container to agitate and clean any of such articles in said chamber, the bottom wall of said container having therein a cavity opening outwardly through the exposed face of said bottom wall solely in the interior of its face area, and a water impervious layer of flexible sheet material lining and confined to the bottom surface of said cavity and having a substantial aperture through it in its interior area, through which aperture the cleaning solution covering a surface against which the container is compressed endwise with its said bottom wall against said liquid covered surface, may pass as a defined stream.

9. A device useful for safely cleaning relatively small and delicate articles such as of wearing apparel, which comprises a closed container of unicellular, elastic material having therein a chamber in which said articles may be held while being cleaned, said container having a wall moveable to open and close said chamber and provide of access thereto, one wall of said container having therein a cavity opening outwardly solely through the exposed outer face of said wall in the interior of its face area, with a continuous unapertured wall of said unicellular material separating the bottom of said cavity from said chamber, whereby cleaning liquid trapped in said cavity when the

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container is compressed against a surface covered by said cleaning liquid, with said cavity abutting such liquid covered surface, will be forced through said continuous separating wall into said chamber to agitate and clean such articles present in said chamber.

10. A device useful for safely cleaning relatively small and delicate articles, such as of wearing apparel, which comprises a closed container of porous, cellular, elastic material having therein a closed chamber in which said articles may be disposed while being cleaned, and also having a slit nearly, but not entirely, across it, in a direction from side to side, near one end leaving an uncut margin along one side of the container that serves as an integral hinge between the cover, which is the portion above the slit, and the balance of the container, said cover having in its inner face an endless slit corresponding in size and shape to the size and shape of said chamber and aligned with it, whereby when said container, with cover closed on it is repeatedly compressed endwise and released while its lower part is immersed in a body of cleaning liquid, the liquid will pass through said chamber and clean the articles therein and the part of said cover within said endless slit on the inner face of the cover will enter and move along the upper end of said

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chamber and hold the cover against lateral displacement on the balance of the container.

11. The device according to claim 10, and the exterior face of the end of the container opposite from the cover having a cavity therein opening outwardly solely through the interior area of that exterior face.

12. The device according to claim 11, and a water impervious liner for the wall of said recess, having a small aperture in the interior area of said liner.

13. The device according to claim 12, and a water impervious liner confined on the inner face of said cover in the portion thereof surrounded by said slit in the inner cover face.

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