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(54) **WATER SHEDDING DESIGNS FOR RECEPTACLE BOTTOMS**

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(57) **ABSTRACT**

A design for water shedding receptacle bottoms is presented in this invention. For ease in understanding, the specific case of a water shedding mug is presented and described in detail. The mug is designed such that water will run off the bottom of the mug when it is inverted in a dishwasher. The design is comprised of a convex bottom with equally spaced feet around the periphery of the bottom of the mug. The convex bottom and feet combine to form flow channels through which water will flow via normal gravitational forces when the mug is inverted in a dishwasher.

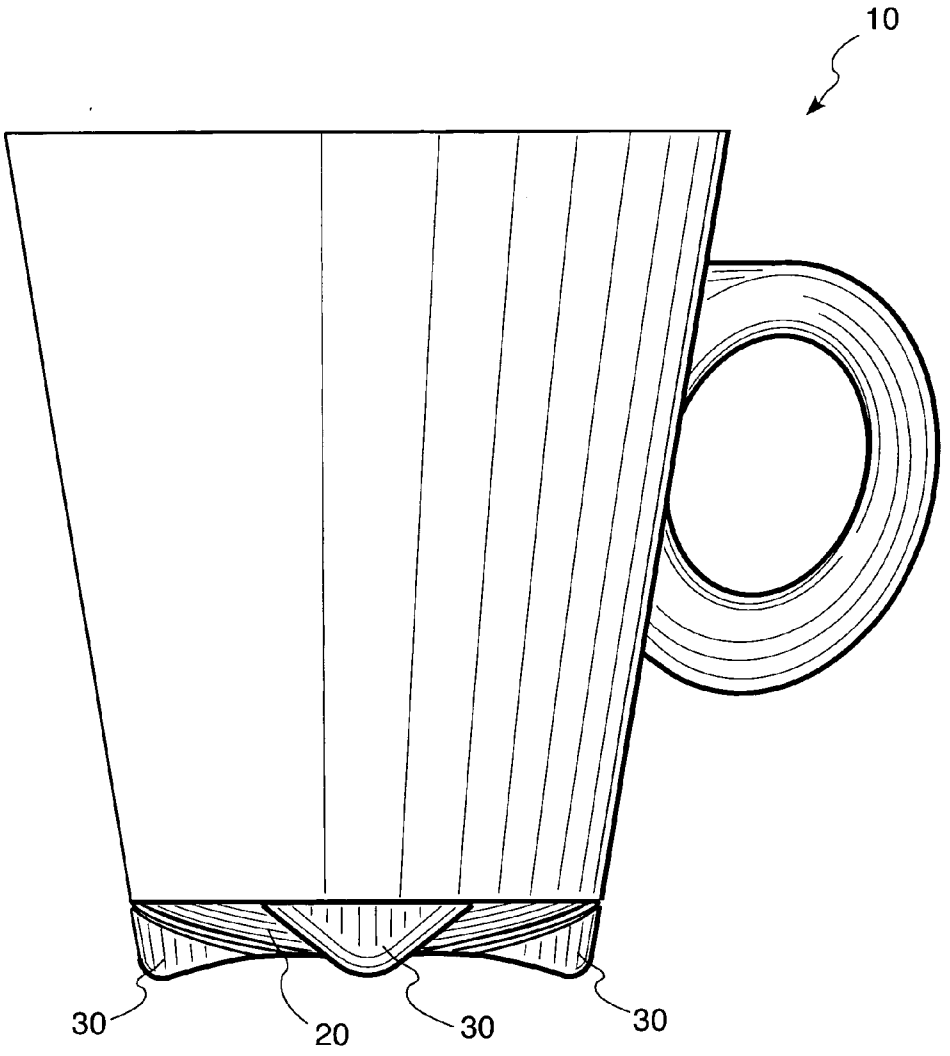


FIG. 1

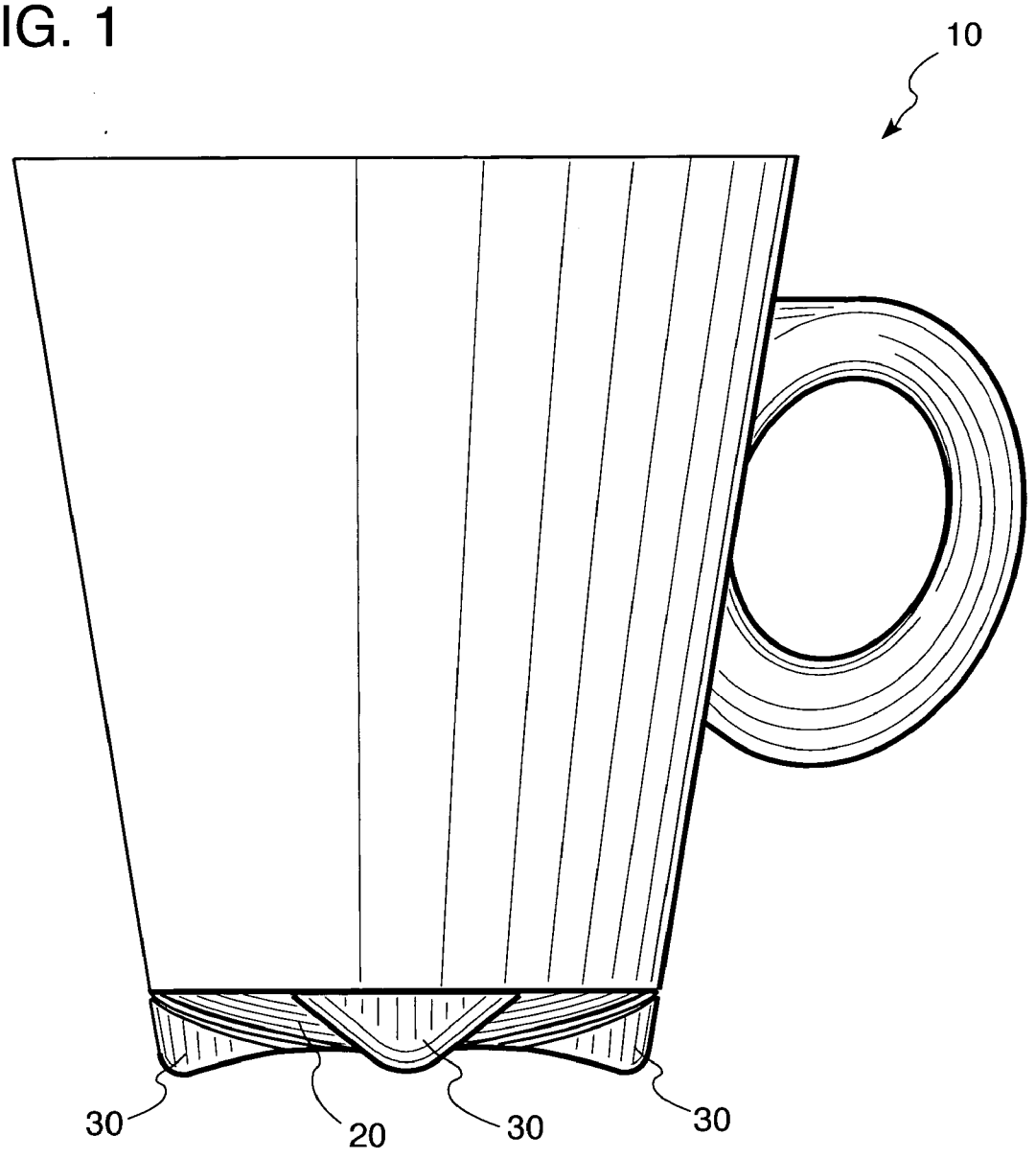


FIG. 2

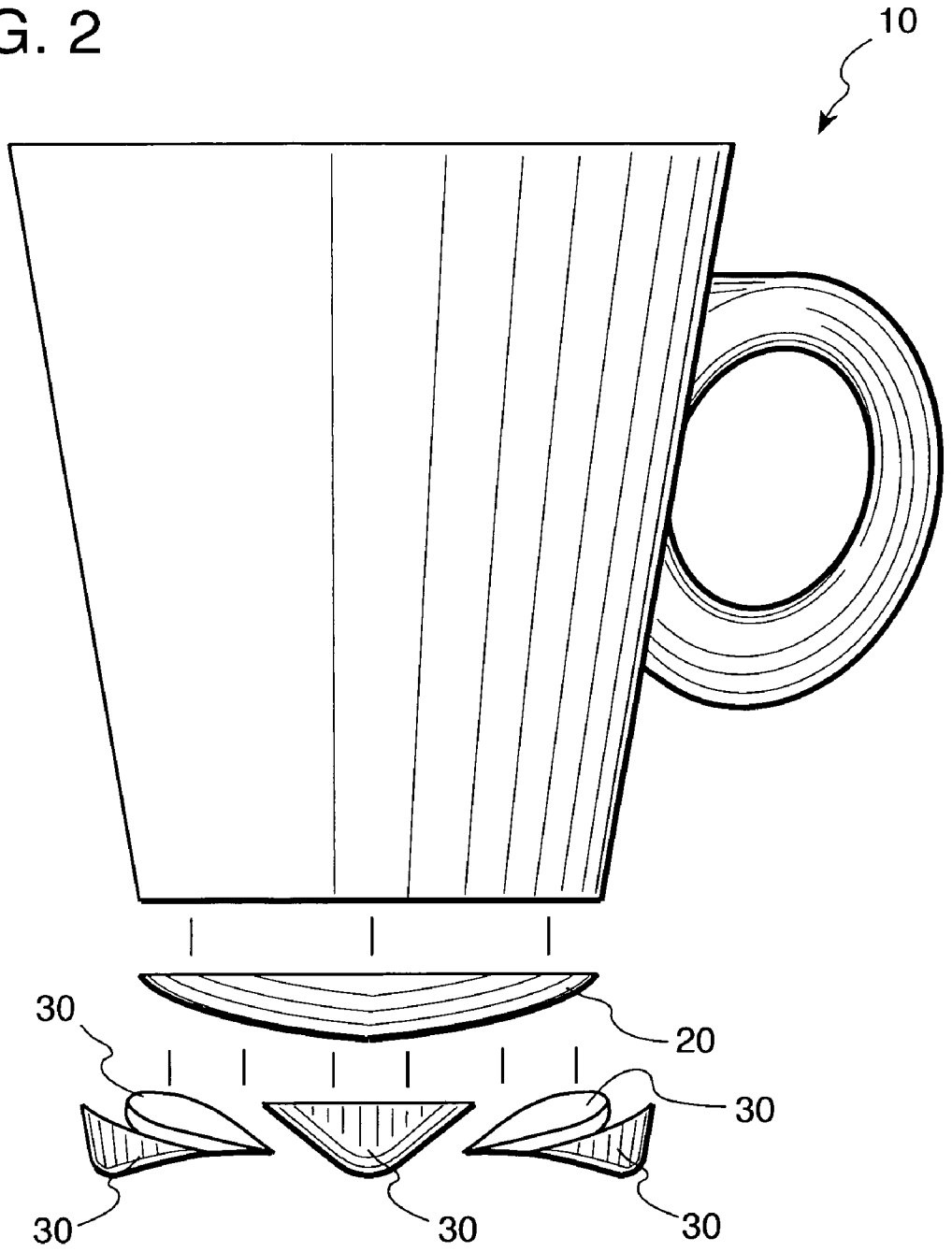


FIG. 3

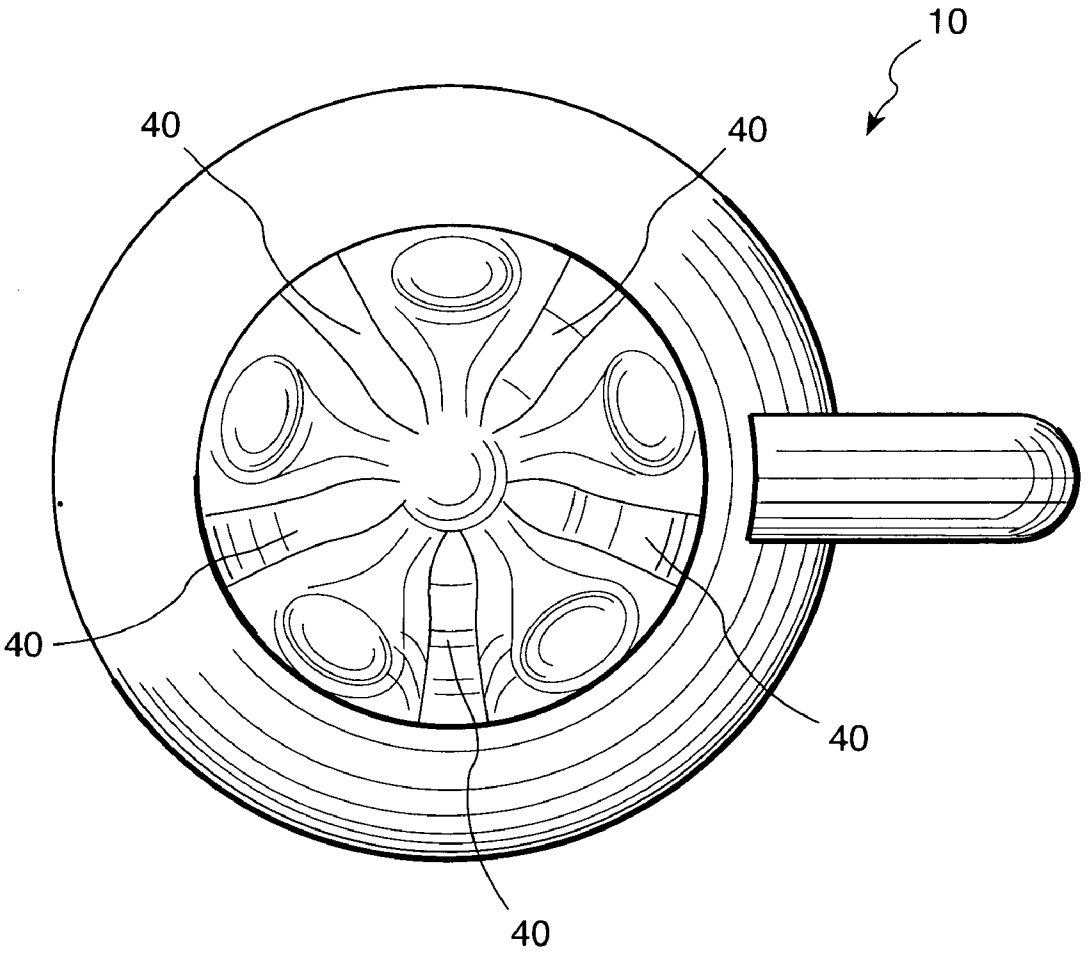
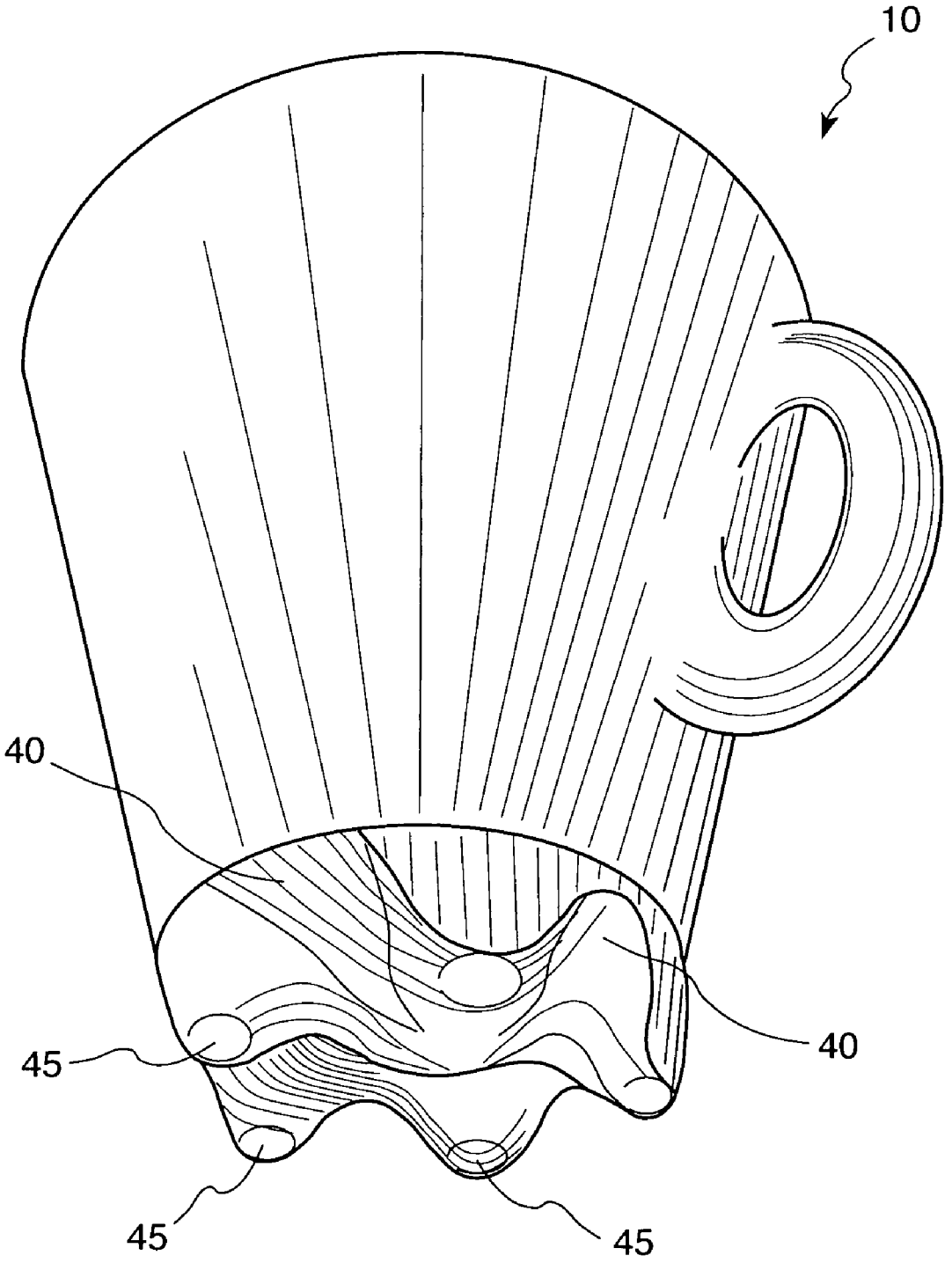


FIG. 4



WATER SHEDDING DESIGNS FOR RECEPTACLE BOTTOMS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This Non-Provisional Patent Application claims priority from Provisional Patent Application No. 60/633,014 dated Dec. 3, 2004.

FEDERAL RESEARCH STATEMENT

[0002] None

BACKGROUND OF THE INVENTION

[0003] This invention relates to the design of the bottoms of mugs, cups, bowls and other kitchen receptacles that facilitates the runoff of water from the dishwashing process. More specifically, the invention relates to the design of the bottoms of said mugs, cups, bowls and other kitchen receptacles such that water will automatically run off the bottom surface of said vessels when the vessel is inverted during or after the dishwashing process.

[0004] One of the more persistent problems associated with the dishwashing process, whether hand dishwashing or automatic dishwashing, is the presence of standing water in the concave surfaces of most mugs, cups, bowls and other kitchen receptacles, when any of the aforementioned items are inverted and placed on a rack in an automatic dishwasher or are inverted for drying after hand washing. When such items are removed from the dishwashing area and placed in cupboards or other areas of the kitchen before the water has had an opportunity to evaporate, the water may remain in the concave bottom of the items or it may spill out and cause dampness on other items or on surface areas. This can be a significant problem in that such surfaces with standing water can be fertile breeding grounds for germs, insects, mold and diseases attendant with these organisms. The health impacts of having such organisms near or even on surfaces that eventually find their way into the mouths of family members, hospital patients, dining hall patrons, or restaurant customers is obvious. Also, it is an annoyance and makes for extra work in the kitchen, as the handler of such items will generally take the trouble to empty the concave surface into the sink and then wipe it dry with a dishcloth or paper towel (which results in the consumption of additional paper towels).

[0005] The water shedding designs inherent in this invention provide mechanisms whereby virtually all water will automatically run off from the bottom surfaces of mugs, cups, bowls and other kitchen receptacles without any further action on the part of any person in the kitchen. The fact that water runs off automatically eliminates the extra work of disposing of the water and drying the surfaces with a dishcloth or paper towel, and provides a significant reduction in standing water in kitchens, thereby reducing the potential for the proliferation of mold and other infectious microbes in kitchens, cupboards, and other storage areas.

[0006] The invention has further application to receptacles of all sizes that are susceptible to the standing water problem. For example, large industrial drums which are stored outside in either an upright or inverted position tend to accumulate rain water on the upper surface. This accumulated rain water leads to a more rapid onset of rust and deterioration of the drum. In addition, standing water on the drums presents a health hazard as it presents a significant mosquito breeding problem.

[0007] While the present invention is applicable to a wide variety of receptacles ranging from kitchen receptacles (such as mugs, glasses, and bowls) to large industrial drums, for ease in understanding, the invention is described in detail using a basic kitchen mug as an example. The attributes of the invention described in the kitchen mug example are applicable to all other types of receptacles.

SUMMARY OF THE INVENTION

[0008] This invention is a design of the bottoms of mugs, cups, bowls and other kitchen receptacles that facilitates the runoff of water from the dishwashing process. A possible second component might be water-shedding caps that can be placed on the inverted bottoms of mugs, cups, bowls and other kitchen receptacles that would ordinarily accumulate standing water in their concave bottoms.

[0009] Standing water inherent in the dishwashing process is at best an annoyance and a cause of extra work in the kitchen, and at worst a potential source of microbes that can accumulate in such standing water in the bottoms of such items. The standing water accumulates because many such items have concave bottoms, which collect water when the items are placed bottom-up in a dishwasher or dish drying rack.

[0010] Using the design of a coffee mug as an example, most mugs are designed such that the bottom of the mug is concave—that is, they curve inward from the bottom. This is not a problem when the mug is upright. However, when the mug is inverted, water will accumulate in the concave surface of the bottom of the mug. Most mugs are inverted and positioned on a rack when they are placed into a dishwasher. This combination of concave bottom design and inverted positioning in a dishwasher results in the accumulation of standing water.

[0011] The same type of standing water problem exists for bowls, pitchers, glasses, cups etc. Note that the problem does not exist for some other kitchen items including plates because these items are rarely placed into a dishwasher in such a position that they can accumulate standing water.

[0012] Many dishwashers have a drying cycle in order to ensure that all surfaces are dry upon completion of the entire dishwashing process. However, many people, in an effort to save energy, do not use this drying cycle. In addition, some mugs accumulate so much standing water that it can not all be dissipated by the drying cycle. The problem occurs when mugs are removed while still containing standing water. If a mug is turned right side up, water spills out onto whatever surface or other items are below, and a film of water remains on the bottom of the mug. If the mug is stored bottom-up, some or all of the water that accumulated in the concave surface will remain there, presenting a perfect opportunity for microbes and mold to form.

[0013] The design of the integral mug is such that the bottom of the mug is a convex shape with at least three "feet" extending from the center of the convex surface to allow the mug to rest stably in the upright position. The feet are so configured such that they allow for no standing water

to accumulate if the mug is tilted up to 45 degrees from the vertical in dishwasher rack. At least three "feet" are required in order to ensure stability. However, the preferred mode is to have at least four feet and the ideal design appears to have five feet.

[0014] The concept of the invention could be extended to a convex shaped cap that is placed snuggly over the bottom of a mug, cup, bowl or other kitchen receptacle. The cap can be constructed of any material that is impervious to water and able to withstand the water temperature and drying temperatures in a dishwasher, including, but not limited to plastic, rubber, and neoprene.

[0015] The concept of the invention can further be extended to other types of receptacles such as industrial drums, garbage cans, and other containers which may be stored outside in either an upright or inverted position. Rain water often accumulates on the exposed upper surfaces of these receptacles thereby leading to a more rapid onset of rust while at the same time presenting a breeding ground for mosquitoes and other organisms. The invention can manifest itself in the manufacture of integral water shedding upper and/or lower surfaces of these drums, cans, and other containers or it can manifest itself as a convex shaped cap (as discussed above) for these receptacles.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] **FIG. 1** shows a side view of the water shedding mug featuring the convex bottom with feet interspersed throughout the bottom of the mug to add stability.

[0017] **FIG. 2** shows an exploded view of the water shedding mug.

[0018] **FIG. 3** shows a bottom view of the water shedding mug including five (5) feet.

[0019] **FIG. 4** shows a perspective view of the water shedding mug.

DETAILED DESCRIPTION OF THE INVENTION

[0020] This invention relates to water shedding designs for the bottoms of receptacles such as mugs, cups, bowls, drinking glasses, etc. In order to aid the understanding of the invention, the specific case of a mug is used to demonstrate the features and uniqueness of the invention.

[0021] Referring to **FIG. 1**, a side view of a mug **10** is shown. With the exception of the bottom of the mug, the mug is just like other mugs found on the market. The uniquely designed bottom of the mug is comprised of a convex bottom **20** which slopes gently from the center of the bottom of the mug to the periphery and at least three feet **30** around the periphery of the mug. The feet **30** gently slope in towards the center of the bottom of the mug. The combination of the feet **30** and convex bottom **20** has the effect of forming a series of flow channels **40** through which water will run off from the bottom of the mug when it is inverted.

[0022] Referring to **FIG. 2**, an exploded view of the water shedding mug **10** is presented. This view clearly shows the convex bottom **20** of the mug. It also clearly shows how the feet **30** are shaped such that they contour to the convex bottom **20**. There are at least three feet associated with the design and they are positioned equidistant around the periphery of the mug. This **FIG. 3** shows five feet which enhances stability of the mug. Furthermore, the feet should generally be positioned such that they are slightly above the highest point of the convex bottom when the mug is inverted in order to enhance stability.

[0023] Referring to **FIG. 3**, a bottom view of the water shedding mug is presented. This view clearly shows the flow channels **40** formed by the convex bottom **20** and the equally spaced feet **30**. The design of the water shedding mug allows any water that would otherwise be trapped in many traditional or standard mugs when inverted in a dishwasher to flow down the flow channels **40** and eventually down the sides of the inverted water shedding mug **10** and eventually off the mug.

[0024] Referring to **FIG. 4**, a perspective view of the water shedding mug **10** is shown. This view presents another view of how the flow channels **40** are formed by the convex bottom **20** and equally spaced feet **30**. This view also shows how the bottoms **45** of the feet can be leveled off in order to enhance the stability of the mug **10**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0025] **FIGS. 1-4** illustrate one preferred embodiment of the water shedding designs for receptacle bottoms of the present invention—more specifically, a mug. It can be appreciated that the various aspects of this invention can be slightly modified and combined in various ways while still achieving the basic benefits encompassed within the scope and spirit of the present invention. The essential components of the invention are: 1) the convex bottom **20** of the receptacle, 2) three or more feet **30** around the periphery of the bottom of the receptacle, and 3) flow channels **40** formed by the convex bottom and the feet. These basic components are embodied in the preferred mode as shown in **FIGS. 1-4**.

[0026] The feet **30** as shown in **FIGS. 1-4** are somewhat rounded in order to preclude sharp edges that may more easily break under the strain of frequent handling. Five feet **30** are shown in the preferred embodiment in order to optimize the delicate balance between stability of the upright mug **10** and sufficient width of the flow channels **40** to effect nearly complete run off of water from the bottom of the receptacle. Placement of more than five feet **30** around the periphery would necessarily mean more but narrower flow channels **40**. However, narrower flow channels would ultimately lead to reduction of runoff flow due to the forces of adhesion and/or cohesion.

[0027] The feet **30** are so designed such that they slope gently towards the center of the inverted mug until they reach the convex surface **20** of the mug. The gently inward sloping feet **30** and the outwardly sloping convex surface combine to form the gently outward sloping flow channels **40**. In an inverted situation, water from, for example, the automatic dishwashing process will gently flow off the convex surface **20** and into the gently outward sloping **40** flow channels and eventually off the periphery of the inverted mug **10**, down the sides of said mug and eventually into a drainage area.

[0028] Further stability is added to the preferred embodiment by leveling off the bottoms **45** of the feet **20** in order that a significant portion of the leveled off feet is in direct

contact with the surface of the object on which the mug is resting. However, the leveling off must be accomplished in such a manner that the tops of the leveled off feet **45** remain slightly higher than the top of the convex surface **20** when the mug is inverted in order to preserve the stability of the mug when it is placed right side up on a surface. The ultimate benefit of the water shedding design is that water which would ordinarily be trapped and collected in the bottom of an inverted mug now flows harmlessly into a drainage area.

The following is claimed:

1. A drinking mug with a convex external bottom and at least three external feet arranged symmetrically around the external periphery of the mug.

2. A drinking mug as in claim 1 whereby the external feet are so configured that the mug rests on the external feet when the mug is right side up.

3. A drinking mug as in claims **1** and **2** whereby the feet are so configured that water runs off the bottom of the external of the mug when the mug is inverted.

4. A drinking glass with a convex external bottom and at least three external feet arranged symmetrically around the external periphery of the mug.

5. A drinking glass as in claim 4 whereby the external feet are so configured that the mug rests on the external feet when the mug is right side up.

6. A drinking glass as in claims **4** and **5** whereby the feet are so configured that water runs off the bottom of the external of the mug when the mug is inverted.

7. A kitchen bowl with a convex external bottom and at least three external feet arranged symmetrically around the external periphery of the mug.

8. A kitchen bowl as in claim 7 whereby the external feet are so configured that the mug rests on the external feet when the mug is right side up.

9. A kitchen bowl as in claims **7** and **8** whereby the feet are so configured that water runs off the bottom of the external of the mug when the mug is inverted.

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