Sept. 16, 1947. F. J. ALEXANDER 2,427,487

CUP AND SAUCER AND THE LIKE

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Fig. 1.

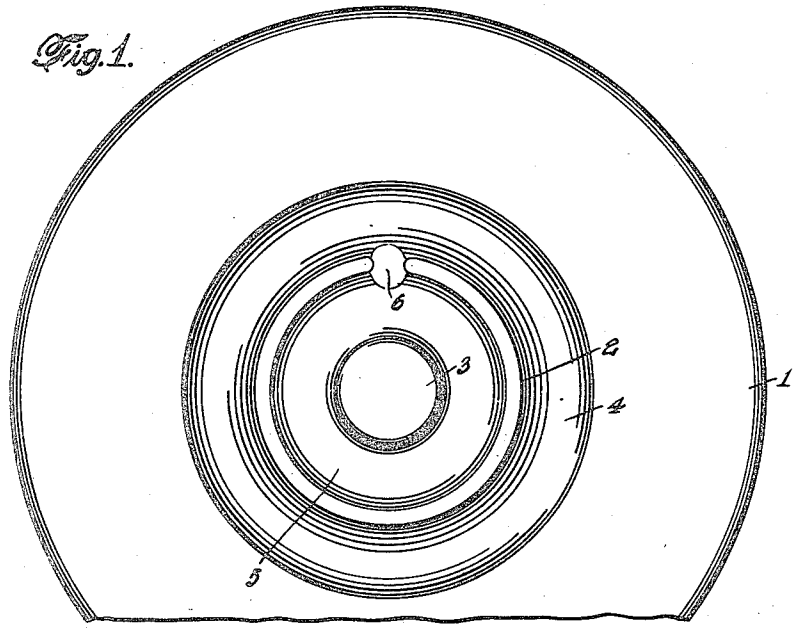


Fig. 2.

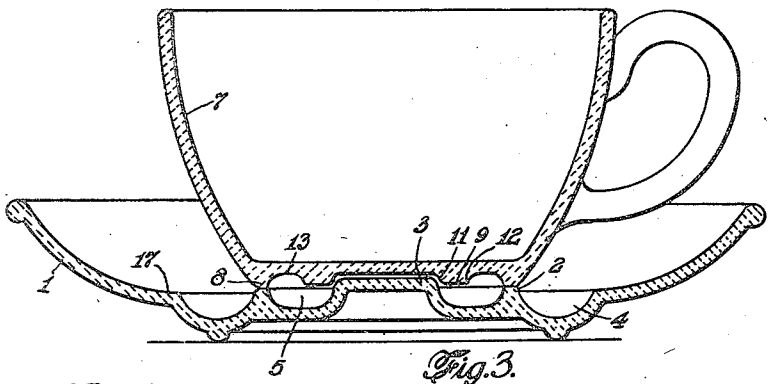


Fig. 3.

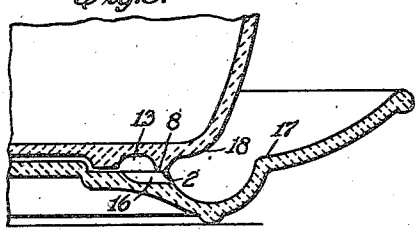
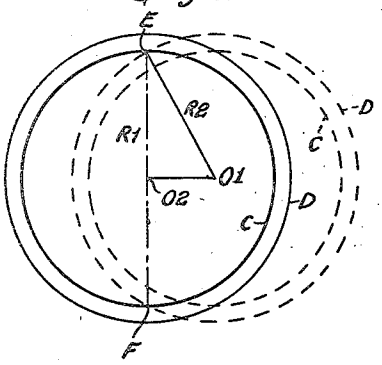


Fig. 4.



INVENTOR.
FELIX JOSEPH ALEXANDER
BY
Louis Prevost Whitaker
ATTORNEY.

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CUP AND SAUCER AND THE LIKE

Felix Joseph Alexander, Scarsdale, N. Y.

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10 Claims. (Cl. 65—13)

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The present invention relates to drinking vessels such as cups and glasses and to saucers, coasters, etc., for supporting such vessels.

With a conventional cup and saucer the base of the cup rests in any liquid spilled in the saucer so that when the cup is picked up, the liquid adheres to the base of the cup and then drips off, frequently soiling clothing or table linen. Various attempts to solve the problem of preventing this objectionable dripping have proved unsuccessful and appear never to have been adopted commercially. The problem is not solved merely by providing the saucer with a liquid storage space below the base of the cup when sitting in the saucer, as has been proposed in the past, for it has been found that capillary action, surface tension and adherence of the liquid to the surface of the cup prevents the liquid from draining away from the seat of the cup and into said liquid storage space. For example, it has been proposed that the saucer be provided with radial ribs to support the cup above the liquid storage space of the saucer. In practice it has been found that when liquid is spilled on the outside of a cup it runs down by gravity to the seating rim but is prevented by surface tension from dropping off unless and until a drop is formed of sufficient size to enable the force of gravity to overcome the opposing force of adhesion. When a cup is supported in such a saucer, a number of small droplets can form between the supporting ribs and these droplets, when the cup is picked up and tilted as in the act of drinking, run down to the lowest portion of the seating rim and combine to form a large drop which falls off.

It has also been proposed to provide a saucer with a circular seating raised above the level of the liquid storage space, and with the usual register outside the circular seating, for centering the cup on the saucer. In practice, it has been found that spilled liquid from the cup adheres to the space or crevice between the register and the cup seating, and does not all drain into the liquid storage space. Hence when the cup is lifted, liquid adheres to it and drops off. Moreover, with the configurations and arrangements heretofore proposed for a saucer having storage space of annular shape, a shape very suited for cleaning purposes, the cup will tip or rock excessively if placed eccentrically of the saucer so that an even greater quantity of liquid may be spilled.

It is an object of the present invention to provide a truly no-drip cup and saucer. Another object of my invention is to provide such cup and

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saucer that can be easily washed and dried and are of attractive appearance. A further object of this invention is to provide a no-drip cup and saucer in which excessive tipping or rocking of the cup is prevented even when the cup is off-center with respect to the saucer. Other objects and advantages of my invention will be understood from the following description of the embodiment selected to illustrate the invention and shown in the accompanying drawings, in which

Fig. 1 is a top plan view of a saucer embodying my invention.

Fig. 2 is a vertical cross section of the saucer shown in Fig. 1, shown with a cup resting on the saucer.

Fig. 3 is a fragmentary vertical cross section corresponding to a portion of Fig. 2 but showing another embodiment.

Fig. 4 is a diagrammatic view showing the relation between the seating rim or base of the cup and the seating surface of the saucer when the cup is placed eccentrically of the saucer.

In accordance with my invention, the saucer is formed not only to provide a storage space below the level of a seating surface which supports the cup, but also to provide a seating which will minimize the amount of liquid that can adhere to the cup when seated upon it. This latter provision takes the form of a circular seating whose outer edge is immediately adjacent and above the storage space, and is of approximately the same diameter as the seating of the rim of the cup. I provide a register between the seating and the center of the saucer. Thus, the liquid spilled will flow down the cup and down the edge of the seating and is readily drained into the storage space. It is important that this outer edge of the seating be not substantially larger than the seating rim of the cup, as otherwise through the effects of surface tension the uncovered seating surface would attract and hold some of the spilled liquid and cause a large quantity to adhere to the cup.

In a preferred form of my invention, the circular seating takes the form of a circular ridge of approximately the same size as the seating rim of the cup. This form ensures that even when the cup is not in place to shelter the circular seating when liquid is spilled in the saucer, no sufficient quantity of liquid will adhere to the seating to wet the seating rim of the cup to cause drops to fall from the cup when it is placed thereon and then picked up.

In the form of my invention shown by way of example in Figs. 1 and 2, the saucer designated

in general by the reference numeral 1 is provided with a raised seating surface 2 for supporting a cup placed on the saucer. The seating surface 2 is in the form of a narrow annular ridge for the purpose described below. Inside of the annular seating ridge 2 and spaced therefrom is a register 3 for centering a cup on the saucer, the register being preferably in the form of a raised protuberance or plateau as shown. Outside of the seating ridge 2 and immediately adjacent thereto is provided an annular valley 4 to receive any liquid spilled in the saucer or drained off of the bottom of the cup by the action of the seating surface 2 as explained below. A second annular valley 5 is provided immediately inside the seating ridge 2, being located between the seating ridge and the register 3. The two valleys 4 and 5 are preferably connected by one or more gaps 6 formed in the seating ridge 2 so that liquid can flow from one valley to the other.

The cup 7 is provided with an annular base or seating rim 8 adapted to rest on the seating ridge 2 of the saucer. The seating rim 8 is preferably narrow as shown, for the purpose described above and the outer diameter of the seating rim is approximately the same as the outer diameter of the seating ridge 2. Inside of the seating rim 8 the bottom of the cup is provided with a second annular rim 9, the inner diameter 11 of which is slightly larger than the diameter of the register 3 of the saucer so that when the cup is placed in the saucer, the inner diameter 11 of rim 9 fits down over the register 3 and holds the cup in centered position to maintain the seating rim 8 of the cup in contact with the top of the seating ridge 2 of the saucer. The outer portion 12 of the inner rim 9 is adapted to cooperate with the saucer to prevent the cup from tipping when inadvertently placed on the saucer in an off-center position as will be explained more fully below. The rim 9 thus serves a dual function. It will be seen that the outer rim 8 and the inner rim 9 are shown as being separated from one another by an annular gap or recess 13. Rim 9 is above the plane of rim 8, which is the cup's normal seating when placed on any plane surface, as for example the top of a table or on the embodiment of saucer shown in Fig. 3.

It will be noted that the outer diameter of the base rim 8 of the cup is substantially the same as that of the seating ridge 2 of the saucer. Hence, any liquid running down the outside of the cup will tend to drain down into the valley 4 of the saucer rather than being trapped or held by the effects of surface tension in the region of the contact surfaces of the cup and saucer when the seating is of larger diameter. Moreover, by reason of the inner valley 5 of the saucer and the recess 13 of the cup, the surfaces of the cup and saucer inwardly of the seating ridge 2 are sufficiently separated as to prevent any tendency of the liquid to run in between the cup and saucer by capillary action towards the second ridge 9 of the cup and the register of the saucer. The seating ridge 2 of the saucer should be sufficiently high above the bottom of valley 5 to prevent the liquid bridging the gap between the base of the cup and the surface of any liquid in the valley 5. In practice it has been found that the ridge 2 should be not less than one-eighth inch above the lowest portion of the valley. The gap 6 in the seating ridge 2 not only provides communication between the two valleys 4 and 5, but also reduces adhesion between the cup and saucer. The gap 6 does not prejudice the effect of the seating ridge 2 in draining off liquid from the base of the cup as any large drop formed immediately above the gap would engage and drain off on one or the other side of the gap.

In some instances the inner valley 5 may be omitted as shown in Fig. 3, the recess 13 of the cup being depended upon to prevent liquid running in and under between the cup and saucer by capillary action. In this embodiment one or more notches 16 corresponding to the gap 6 of Fig. 1 are provided to reduce adhesion between the cup and saucer.

Although the cup is intended to be placed centrally on the saucer, it frequently happens that the cup is put down without attention to its position and may hence be placed off center. A serious defect of certain of the proposals of the prior art was that when this occurred, the cup might rock or tip excessively so as to spill its contents. In accordance with the present invention on the other hand, such rocking or tipping is prevented. In the diagram shown in Fig. 4, R1 represents the inside radius of the cup seating rim and R2 represents the outside radius of the annular seating ridge 2 of the saucer and the outside radius of the cup seating rim 8. O1 represents the center of gravity of the cup when the cup is centered, while O2 represents the position of the center of gravity of the cup when the cup has been moved off-center to a position in which the center of gravity is in line with the outermost point of support of the cup. In other words, if the cup is moved any farther than the position represented by O2, its center of gravity will be beyond the line joining the points of support on the seating rim 8 and the cup will overbalance. The dotted circles C and D are drawn with the radii R1 and R2 respectively about the center O1. Solid circles C and D are drawn with radii R1 and R2 respectively about the center O2. The center O2 will by its definition lie on the line connecting the points E and F which are the points of contact between the seating rim of the cup and the seating ridge of the saucer when the cup is in its extreme eccentric position. The distance from O1 to O2 or in other words the distance the cup can be moved off-center with respect to the saucer before tipping can be calculated mathematically by using the formula for a right triangle which states that the square of the hypotenuse is equal to the sum of the squares of the other two sides. Hence, $O1-O2=\sqrt{R2^2-R1^2}$. If it is assumed, for example, that for an average cup R1 might be 1" and R2 $1\frac{1}{16}$", then $O1-O2=\sqrt{(1\frac{1}{16})^2-1^2}$ which equals approximately $\frac{3}{8}$". In other words the cup can be moved off-center approximately $\frac{3}{8}$" before over-balancing on the seating ridge 2.

To prevent tipping or rocking of the cup when moved off-center a greater distance, the saucer is provided with an annular supporting ledge 17. When the cup is moved off-center a distance which would otherwise cause it to tip, the seating rim 8 of the cup will engage the ledge 17 of the saucer and effectively prevent tipping or rocking movement of the cup on the saucer. The height of the ledge 17 should be such that as the cup is slid sideways on the saucer, the rim 8 of the cup will come into smooth engagement with the ledge 17. The distance between the ledge 17 and the seating ridge 2, or in other words, the width of the valley 4, will correspond theoretically to the distance O1—O2 referred to above (see Fig. 4). However, as a practical matter, the valley should be made somewhat narrower

than this theoretical value, since the equilibrium of the cup due to the moulded edges being rounded becomes somewhat unstable, as it approaches the theoretical maximum eccentric position before overbalancing.

In order to provide the saucer with a wider valley 4 and hence with greater storage capacity for spilled liquid, the base of the cup may be provided with auxiliary seating surfaces which help bridge over the gap between the seating ridge 2 and the anti-rocking ledge 17. In the embodiment shown in Fig. 2, the inner rim 9 of the base of the cup provides an auxiliary seating surface for this purpose. If the cup is moved towards the left from the position shown in Fig. 2, the outer diameter 12 of the inner rim 9 comes into engagement with and is supported by the seating ridge 2 before the unstable position of rim 8 on seat 2 is reached. There is therefore no interruption in the support afforded by the outer rim 8 and the inner rim 9 while the cup is moved away from its concentric position. As the cup is moved stll farther towards the left, it will eventually reach the position in which the center of gravity is in line with the point of contact between the inner diameter of the inner rim 9 and the outer diameter of the seating ridge 2. This corresponds to the extreme position represented by the center O2 in Fig. 4, i. e., the position at which the cup would tip. However, it will be seen that the difference between R1, the inside radius of the inner rim 9, and R2 the outside radius of the annular seating ridge 2, is in this instance much greater than was assumed in the example illustrated in Fig. 4 and the valley 4 can be made correspondingly wider. Alternatively, the overlap between the support afforded by the seating ridge 2 and that afforded by the ledge 17 can be made much greater to avoid even approaching closely to an unstable position.

In Fig. 3 there is shown a modification in which a further supporting surface is provided by a shoulder 18 which projects outwardly from the seating rim 8 of the cup. It will be seen that the shoulder 18 will come into engagement with the ledge 17 of the saucer before the cup has reached an unstable position. In this instance the ledge 17 is made slightly higher than the surface 2 as distinguished from being slightly lower as shown in Fig. 2 so that the shoulder 18 will slide smoothly on to ledge 17 as the cup is moved laterally of the saucer.

I wish to make it clear that I may provide a cup and saucer as shown in Figs. 1 and 2 but without the valley 5 in the saucer and that in place of the gap or gaps 6, I may substitute notches similar to 16 in Fig. 3.

It will be seen from the above description of the examples shown in the drawings that my invention not only avoids the objectionable dripping of liquid from the bottom of a cup, but also prevents the cup from tipping or rocking and spilling further liquid in the event of its being placed eccentrically on the saucer. While for the sake of simplicity of language, reference has been made in the foregoing description and the following claims to a cup and saucer, it will be understood that the invention is also applicable to similar articles such as glasses or tumblers and coasters, and the terms "cup" and "saucer" are used with the intention of covering such articles.

What I claim and desire to secure by Letters Patent is:

1. In a saucer of the kind described, the combination of a circular seating ridge for a cup, a central upwardly projecting portion for centering the cup on the saucer, an annular valley between said ridge and said central portion and an annular valley outside said seating ridge and immediately adjacent thereto.

2. In a saucer of the kind described, the combination of an annular seat for a cup in the form of a narrow annular ridge, an upwardly projecting register inside of said ridge for centering the cup on the saucer, an annular valley between said seating ridge and register, a second annular valley immediately outside the seating ridge, said seating ridge being interrupted in at least one place to reduce adhesion between the cup and saucer and to permit flow of liquid between said two valleys.

3. In a saucer of the kind described, the combination of an annular seat for a cup, said seat being in the form of a narrow annular ridge, an upwardly projecting register inside of and spaced from said ridge for centering the cup on the saucer and an annular valley between said ridge and register, said ridge being at least one-eighth inch above the lowest portion of said valley.

4. In a saucer of the kind described, the combination of a raised circular seat for a cup, an upwardly projecting register inside said seat for centering the cup on the saucer, an annular valley outside said seat and immediately adjacent thereto and an annular supporting ledge outside said valley and positioned to cooperate in supporting the cup to restrain its rocking when placed on the saucer eccentrically of said circular seat.

5. In combination with a saucer having a raised circular seat for a cup, an upwardly projecting register inside of and spaced from said seat for centering the cup on the saucer, and an annular valley immediately adjacent said seat, a cup provided with an annular seating rim adapted to engage the top of the circular seat of the saucer and with a second annular rim separated from the seating rim of said cup by an annular groove and adapted to engage said register of the saucer.

6. In combination with a saucer having a circular seating ridge with valleys immediately outside and inside said seating ridge, a cup having a downwardly projecting circular seating rim, said seating rim forming the lowermost portion of the cup and being adapted to sit on the top of said seating ridge, and means for centering the cup on the saucer to maintain said seating rim in contact with the top of said seating ridge comprising interengaging surfaces on said cup and saucer spaced from said seating ridge.

7. In combination with a saucer having a circular seating ridge with valleys immediately outside and inside said seating ridge, a cup having a downwardly projecting circular seating rim of substantially the same diameter as the seating ridge of the saucer, said seating rim forming the lowermost portion of the cup and being adapted to sit on the top of said seating ridge, and interengaging surface spaced from said seating rim and seating ridge for centering the cup on the saucer.

8. In combination with a saucer provided with a circular seating ridge and a protuberance inside of said seating ridge, a cup having a downwardly projecting seating rim, adapted to engage said seating ridge of the saucer, an inner rim and a groove separating said seating rim and inner rim, the inside of said inner rim being

adapted to engage the outside of said protuberance of the saucer to maintain said seating rim and seating ridge in registry with one another.

9. In combination with a saucer having a circular seating ridge and a valley surrounding said ridge, a cup having a downwardly projecting seating rim of substantially the same diameter as the seating ridge of the saucer, said seating rim forming the lowermost portion of the cup and being adapted to sit on the top of said seating ridge when the cup is centered on the saucer, and means for normally maintaining the cup in centered position, said saucer being provided with an annular supporting ledge outside of said valley and adapted to limit the tipping of the cup when the cup is positioned eccentrically of the saucer.

10. In a saucer of the kind described, the combination with an annular seating ridge for supporting a cup in approximately centered position on the saucer, liquid storage spaces immediately on each side of said seating ridge, the outer space being in the form of an annular valley, and a supporting ledge disposed immediately outside said valley and inwardly from the outer periphery of the saucer, said ledge being adapted to engage the cup to restrain it from undue tipping when the cup is sufficiently out of centered position as to overbalance outwardly from off said seating ridge.

FELIX JOSEPH ALEXANDER.

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