

June 30, 1953

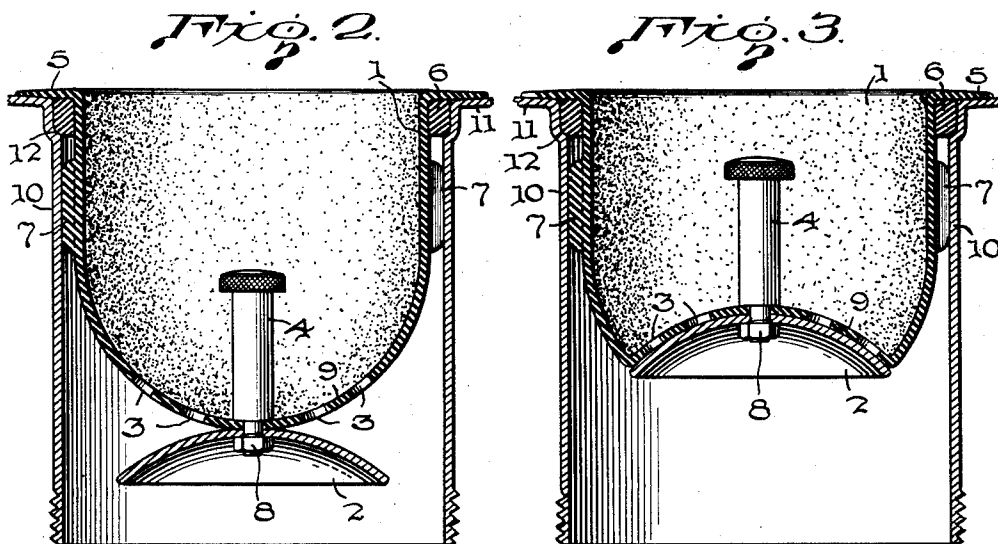
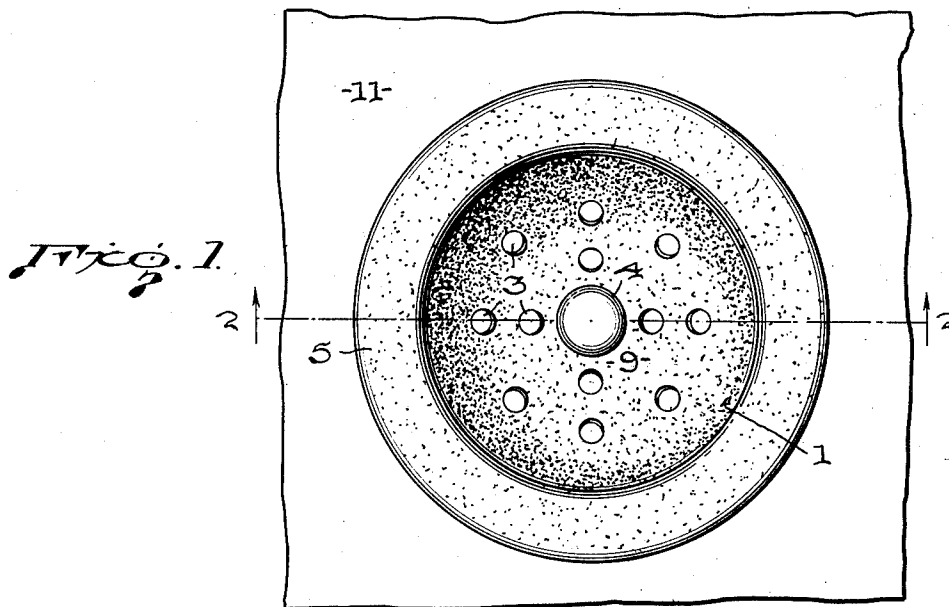
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2,643,394

COMBINATION BASKET STRAINER AND STOPPER

Filed July 21, 1952

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4.

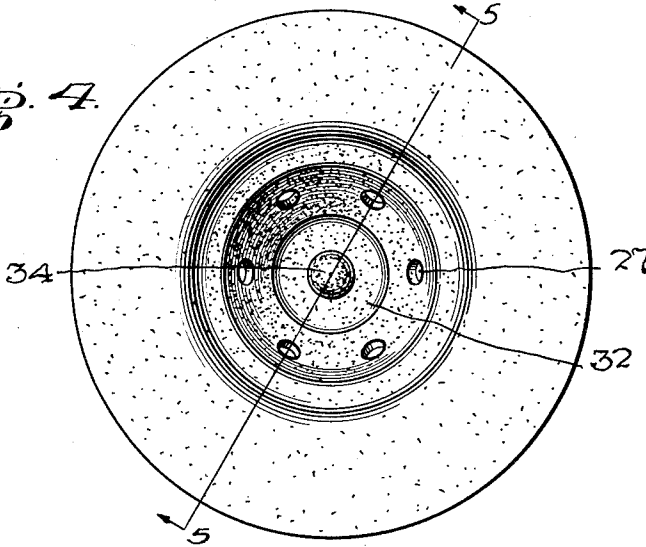


Fig. 5.

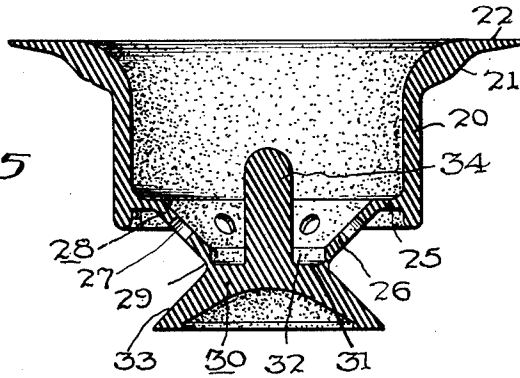
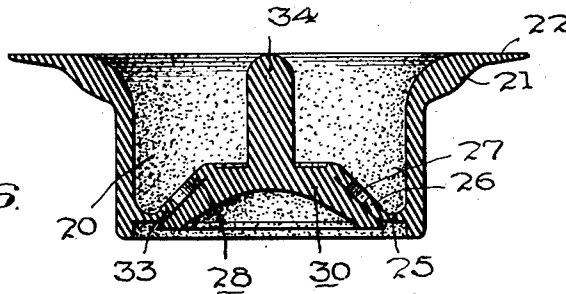


Fig. 6.



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COMBINATION BASKET STRAINER
AND STOPPER

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10 Claims. (Cl. 4—287)

1

This is a continuation-in-part of my prior application entitled "Combination Basket Strainer and Stopper," Serial No. 205,985, filed January 15, 1951, since abandoned.

This invention relates to a combination strainer and stopper adapted for use in the drain outlet of the ordinary sink.

One object of this invention is to provide a combination strainer and stopper which is composed of a minimum number of working parts with due regard for the results desired.

Another object is the provision of a combination strainer and stopper of a flexible nature which may be readily removed from a sink drain outlet for cleaning purposes and will also accommodate itself to drains of slightly varying dimensions.

A further object is the provision of a simple and positive means for opening and closing the strainer.

An important feature of the invention comprises the combination of a deformable resilient strainer with a relatively rigid closure plate which can be positioned to open or close the strainer openings therein.

Another object is the provision of means for preventing the forming of a vacuum between the wall of the strainer and stopper unit and the drain outlet wall.

Other objects and advantages of this invention will be brought out in the following specification and drawings, wherein:

Fig. 1 is a top plan view of the combination strainer and stopper positioned in an ordinary sink drain;

Fig. 2 is a vertical cross-section taken along line 2—2 of Fig. 1 showing the position of the elements when the unit is open for drainage;

Fig. 3 is a similar cross-section showing the same elements as they appear when the unit is closed;

Fig. 4 is a top plan view of a modification of the combination strainer and stopper when the unit is in the open position;

Fig. 5 is a vertical cross-section taken along line 5—5 of Fig. 4 showing the position of the elements when the unit is open for drainage; and

Fig. 6 is a cross-section similar to Fig. 5 showing the same elements as they appear when the unit is closed.

As shown in Figs. 1 to 3 of the drawings this device comprises a unitary cup-like body member 1 of resilient material having a thin sealing flange 5 extending outwardly from the periphery

2

of the open end thereof so as to form a water tight seal with the sink bottom 11. Spacing ribs 7 are located on the outside of the generally vertical walls of the body member, for frictional cooperation with the sink drain wall 10 and so as to maintain spaces within the drain wall and body wall to facilitate removal by preventing the formation of suction pockets. Strainer holes 3 are located in the lower body portion 9 which, as shown in Figs. 2 and 3, is of lesser thickness than the upper portion so as to facilitate flexing of same in the closing operation.

An operating pin or handle 4 is situated within the body member and its reduced lower end extends centrally through a body portion 9 where by means of a nut 8 the dish shaped valve disc 2 is secured to its lower end. It should be noted that valve disc 2 is convex facing the convex outer wall of lower body portion 9 and of a diameter slightly greater than that of the thin area of the lower body portion. This disc is preferably resilient but stiffer than the material of the body.

A shoulder stop ring 6 may be inserted just under flange 5 to engage sink drain shoulder 12 as shown in Fig. 2 to afford additional support for the unit.

In use, the unit is placed in a sink drain as shown in Figs. 1 and 2 making sure that the sealing flange 5 smoothly extends over a portion of the sink bottom surrounding the drain. If the sink drain has a counterbored portion such as that shown forming shoulder 12, then a stop ring 6 should be placed under the sealing flange to bear on the shoulder 12 to maintain the unit in the proper position. The spacing ribs 7 will serve to position the remaining portions of the unit properly. These spacing ribs greatly facilitate the insertion and removal of the unit by maintaining an air space between the drain wall 10 and the body wall of the unit, thereby preventing the formation of a suction between these parts.

In operation the water in the sink flows down into the cup portion of the unit and out through strainer holes 3. In order to close the strainer the operating pin 4 is pulled upwardly thereby bringing the valve disc 2 into contact with the under surface of the body portion 9, having the strainer holes therein, and causing this body portion to become inverted as shown in Fig. 3. The pressure from the side walls is sufficient to cause the thin body portion 9 to be held in the inverted position and slightly flex the valve disc which bears tightly against the inverted section sealing the drain holes. However, the application of

a reasonable downward pressure on the operating pin will again cause the unit to return to the open position as shown in Fig. 2.

Another embodiment of this invention is disclosed in Figs. 4, 5 and 6 wherein there is shown a unitary structure possessing the basic elements described in the previous embodiment. This device is most advantageously made from rubber, synthetic rubber or other suitable material which is sufficiently flexible for the intended purpose.

The unit as shown in Fig. 5 comprises a cup-like body 20 having a slightly enlarged annular portion 21 extending outwardly from the upper periphery of the body and blending into a thin sealing flange 22. A flexible annular portion 25 extends inwardly from the lower inner wall of cup-like body 20 and has secured to its inner periphery an invertible inwardly and downwardly slopping portion 26 of greater thickness than said annular portion 25 and having spaced holes 27 therethrough to form a strainer section 28. The downwardly slopping strainer portion 28 terminates at its lower end in a highly flexible circular band 29.

A valve member 30 extends from circular band 29 and has an upper portion 31 coextensive with the opening 32 defined by the circular band 29. Valve member 30 has a downwardly and outwardly slopping surface 33 extending from the periphery of the upper portion 31 of the valve member. This slope is such that upon upward inversion of strainer portion 28 as shown in Fig. 6, the valve surface 33 will be parallel and in face-to-face contact with the underside of strainer 28 to close off strainer holes 27. The extent of the valve surface 33 is sufficient to completely close all the holes in the strainer.

An operating pin 34 is positioned within cup-like body 20 and extends upwardly from the valve member 30 for manual operation in inverting the strainer. The position of this pin with respect to the other elements of the unit is shown in Figs. 4 and 5.

In use, the modification shown in Figs. 4, 5 and 6 is placed in a sink drain in the manner of the previous embodiment as shown in Figs. 1 and 2, annular portion 21 of the body 20 now taking the place of the stop ring 6.

In operation, the water in the sink flows down into the cup portion of the unit and out through the strainer holes 27. In order to close the strainer, the operating pin 34 is pulled upwardly thereby inverting strainer 28 and bringing valve surface 33 into contact with the underside of strainer 28 to close off the holes 27 as shown in Fig. 6. The application of a reasonable downward force on the operating pin will cause the unit to assume the open position as in Fig. 2.

The somewhat thin annular section 25 and the circular band 29 of reduced thickness facilitate the inversion of the strainer by making it readily possible for valve surface 33 to fit smoothly against the under face of the strainer 28. These sections of reduced thickness produce a flexibility resulting in a snap action upon inversion of the strainer to retain the strainer in the inverted position against small downward forces normally encountered by such units when in use.

Having thus described my invention, what I claim as novel and desire to secure by Letters Patent of the United States is:

1. A combination strainer and stopper for use in a sink comprising a cup-like body member adapted to fit down into a sink drain and having a lower flexible invertible body portion with

strainer holes therein, valve means positioned below said lower body portion and spaced from the strainer holes, and operating means positioned to invert the lower body portion to engage the valve means therewith to close said strainer holes.

2. A combination strainer and stopper for use in a sink comprising a cup-like body adapted to fit down into a sink drain and having a lower flexible invertible body portion, said lower body portion having perforations extending therethrough, a valve disc secured to the underside of the lower body portion and spaced vertically from the strainer holes therein, and an operating pin secured to the lower body portion for inverting same to engage the valve disk therewith to close said strainer holes.

3. A combination strainer and stopper for use in a sink comprising a cup-like body adapted to fit down into a sink drain and having a lower flexible body portion invertible from convex to concave, said lower body portion having perforations extended therethrough, an upwardly convex valve disc secured to the underside of said lower body portion, and an operating pin located within the cup and secured to the lower body portion for inverting the same to engage the valve disk therewith to close said strainer holes.

4. The combination of claim 3 in which the operating pin extends through the cup-like body and unites the valve disc therewith.

5. A combination strainer and stopper for use in a sink comprising a cup-like body adapted to fit down into a sink drain and having a lower flexible body portion of reduced thickness to allow inversion thereof, said lower body portion having perforations extending therethrough, a valve disc of substantially the same diameter and secured to the underside of the lower body portion and spaced vertically from the strainer holes therein, an operating pin located within the cup and secured to the lower body portion for inverting the same to engage the valve disk therewith to close said strainer holes.

6. A combination strainer and stopper for use in a sink comprising a cup-like body having a thin sealing flange extending outwardly from the upper peripheral edge of the open end of said body member, a lower flexible body portion of reduced thickness to allow inversion thereof from convex beneath to concave beneath, said lower body portion having perforations extending therethrough, an upwardly convex valve disc secured to the underside of said body and having an area sufficient to close said perforations when the lower body portion is concave beneath, and an operating pin centrally secured to the lower body portion to invert the same to engage the valve disk therewith to close said strainer holes.

7. A combination strainer and stopper for use in a sink comprising a cup-like body of flexible material having a thin sealing flange extending outwardly from the upper peripheral edge of the open end, vertical ribs on the outside of the generally vertical walls of said body member, a lower portion of the body being reduced in thickness to allow inversion thereof, said lower body portion having perforations extending therethrough for drainage, an upwardly convex semi-flexible valve disc secured to the underside of said body member and of greater diameter than said reduced thickness portion of the body, and an operating pin located within the cup of the body member and centrally secured to the portion of reduced thickness.

5

8. A one-piece combination strainer and stopper of flexible rubber-like material for use in a sink comprising a cup-like member adapted to fit down into a sink drain and having a lower invertible body portion with strainer holes therein, valve means positioned below said lower body portion and spaced from the strainer holes, and operating means positioned to invert the lower body portion to engage the valve means therewith to close said strainer holes.

9. A combination strainer and stopper for use in a sink comprising a cup-like body of flexible rubber-like material adapted to fit down into a sink drain and having an invertible inwardly sloping portion extending downwardly from the lower inner wall of the cup-like body when in the open position and having holes therethrough to form a strainer portion, the downwardly and inwardly sloping strainer portion terminating in a highly flexible circular band of reduced thickness, a valve member extending from said circular band, said valve member having an upper portion coextensive with the opening of the circular band and a downwardly and outwardly sloping valve surface extending from the periphery of the upper portion of the valve member, the slope of the valve surface being such that upon inversion of the strainer portion said valve surface will be substantially parallel and in face-to-face contact with the under side of the strainer portion, the extent of the valve surface being sufficient to cover and close off the holes of the strainer portion, and an operating pin located within the cup-like body and extending upwardly from the valve to invert the strainer.

10. A combination strainer and stopper for use in a sink comprising a cup-like body of flexible rubber-like material having a thin sealing flange extending outwardly from the upper pe-

6

ripheral edge of the open end, a lower flexible bottom body portion comprising an annular section extending inwardly from the lower inner wall portion of the cup-like body, an invertible inwardly sloping portion of greater thickness than said annular section extending downwardly from the inner edge of the annular section when in the open position and having holes therethrough to form a strainer portion, the downwardly and sloping strainer portion terminating in a highly flexible circular band of reduced thickness, a valve member extending from said circular band, said valve member having an upper portion coextensive with the opening of the circular band and a downwardly and outwardly sloping valve surface extending from the periphery of the upper portion of the valve member, the slope of the valve surface being such that upon inversion of the strainer portion said valve surface will be substantially parallel and in face-to-face contact with the under side of the strainer portion, the extent of the valve surface being sufficient to cover and close off the holes of the strainer portion, and an operating pin located within the cup-like body and extending upwardly from the valve to invert the strainer.

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