Nov. 7, 1944. M. DURST 2,362,250

COMBINED SINK AND BASIN STOPPER

Filed Jan. 6, 1943

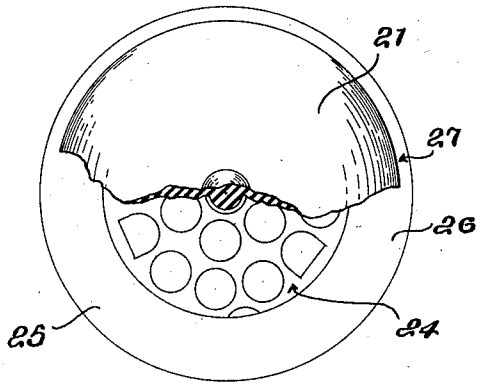


Fig. 3.

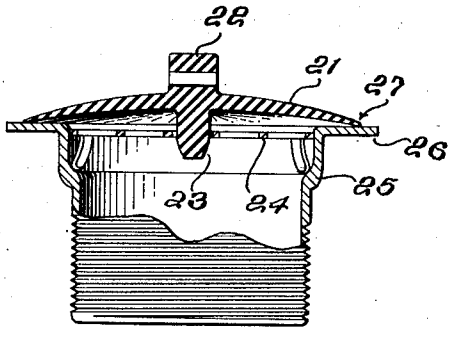


Fig. 4.

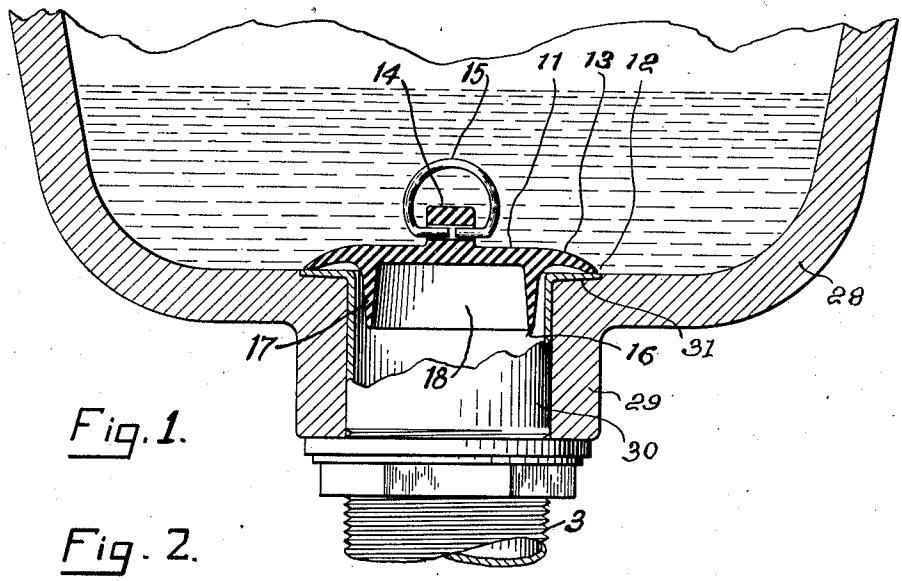
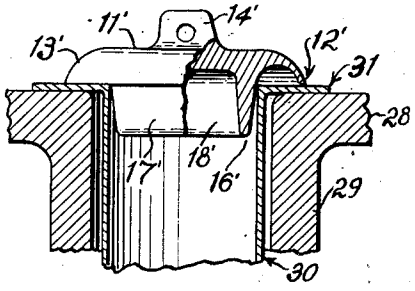


Fig. 1.

Fig. 2.



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COMBINED SINK AND BASIN STOPPER

Max Durst, Philadelphia, Pa.

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1 Claim. (Cl. 4—293)

The invention relates to sink and basin stoppers, and has for an object to effect improvements therein to the end that plug stoppers may be provided that will fit a wide range of drain openings without requiring a corresponding range or variation in stock sizes of the stoppers. It is also an object to present a stopper device which will function more efficiently than the ordinary sink and other drain stoppers.

It is an especially important object of the invention to present a plug type stopper which will include means for increasing the efficiency of the closure when the plug is inserted in a drain opening, and reduce liability of leakage past the plug when knocked by objects or articles moved about in the sink or basin, and also to eliminate liability of leakage due to hasty placement of the stopper.

It is also an aim of the invention to present a plug which is adapted to be used at openings of various diameters, and will have an auxiliary lip portion which will function in a new way independently.

It is another important aim of the invention to present a sink stopper which will overcome objections to prior disc type sink stoppers, in that it cannot be easily displaced from proper position over the drain opening after once being put into place. A further object is to present a plug element of novel construction adapted to accommodate itself readily to a wide range of sizes of openings with ease of insertion, and minimum distortion or wear of the plug.

Additional objects, advantages and features of invention reside in the construction arrangement and combination of parts involved in the embodiment of the invention, as will be more readily understood from the following description and accompanying drawing, wherein

Figure 1 is a sectional view, showing the stopper engaged in a drain opening too large for the central stopper portion to fit tightly therein, by friction;

Figure 2 is a similar view showing a modified shape of the stopper;

Figure 3 is a top view partly broken away of a modified form of stopper;

Figure 4 is a sectional view thereof upon a drain outlet fitting of conventional form.

There is illustrated in Figure 1, a stopper 10 which includes a dome-like body portion 11, which, by itself, resembles in shape the conventional suction cup, including the dome portion 11 substantially flat at the central part and only the outer flange or apron part 13 curved downwardly and tapered to form the lip portion 12 by which a seal may be effected. The flat portion 11 of the dome has a transversely pierced lifting lug 14 formed integrally and centrally upon the upper side thereof, in which a usual split ring 15 is engaged in a conventional way.

Formed integrally upon the under side of the flat part of the dome, there is an annular concentric depending wall 16 nearly vertical, but tapered from its junction with the dome downwardly to a moderate thickness at its extremity. The wall 16 extends downwardly from the flat dome portion nearly twice the vertical dimension of the downwardly curved portion 13 and lip 12 of the stopper, and the recess 18 provided within the plug wall is coextensive vertically with the wall 16. While the device may be made in several sizes as to diameter of the plug element 16, it will be appreciated that by reason of the manner in which the device functions (as will be described), there will not be required as wide a range of sizes as heretofore required in conventional basin and other rubber plugs.

My stopper device is distinguished from prior stoppers in the possibility of movement of the plug in the outlet opening while the lip is in proper functional engagement with the top surface of the sink or drain fitting, and is especially valuable for ordinary household use where hasty manipulation of stoppers is the rule, the ordinary stopper sometimes being forced too far into the drain opening, while at other times it may be positioned normally or may be left with the plug too loose in the opening. Faulty placement of the stopper is automatically remedied by my invention since the central part 17 is merely an approximate centering means, and the flange 13 and lip 12 function together as both a stop to prevent insertion of the part 17 too far, and as a seal.

In Figures 3 and 4 there is illustrated a modified stopper 20, in which there is a more flattened cup 21, nearly disc-shaped, and being less flattened at its central part. This has a lug 22 formed on its top side similar to the lug 14 before described and transversely apertured to receive a ring or other means to anchor it as may be desired.

On the under side of the cup at its center there is formed an integral solid plug 23, projected downwardly, and being of quite small diameter, so that it may enter the central aperture in the conventional sink drain strainer 24, which is shown set in the familiar drain fitting 25 customarily secured in the drain opening of a sink. This fitting has the usual planiform flange 26,

upon which the lip 27 of the cup 21 rests to effect a closure of the port through the fitting 25. The plug 23 is long enough to project below the plane of the lip 27 of the apron and through the strainer 24 a distance, and so holds the stopper in place centered over the drain outlet or port of the sink, with the lip of the stopper properly concentric with the port, so as to most effectively engage the flange 26 or adjacent surfaces of a sink bottom, according to the size of the outlet. This device operates as a suction disc or as a compression seal, or both, as will be readily understood, the lip portion being extremely attenuated, so as to be easily drawn or pressed to a continuous contact with the flange 26 or the sink bottom.

It will be apparent that the plug 23 does not function as a stopper to close the drain passage, but like the part 17 is a centering means for the cup part 21 to insure seating thereof concentrically outward of the drain port.

My stopper is adapted to be formed of rigid or semi-rigid materials, such as hard vulcanized rubber, or various plastics of the more or less rigid or semi-rigid kinds. It is principally a centering means for the lip 12, to insure that the latter extends outwardly of the drain opening in all directions.

In the use and functioning of the hard body stopper when set in place, the part 17 may engage in the standard size drain opening while the lip rests upon the top surface of the drain fitting flange 31. Or, the part 17 may not engage frictionally in the drain opening at all while the lip rests on the flange. In either case a body of air will be trapped within the annular space or chamber formed under the apron 13 around the plug portion 17, and this will serve to aid in effecting a good stoppage of liquid flow, by the results of surface tension of water and other liquids, as well as the damming action of the air should the plug fit snugly in the drain opening. The latter functioning of the device will also occur in the use of the semi-rigid construction, but in the latter a greater measure of adjustment of the plug relatively to the lip may be utilized to insure a tight fit of the plug in the opening to the drain while the lip of the apron rests properly on the flange 31.

The term "rigid" as here used may include an elastic material of limited capability of strain, but having a moderate adaptability to variation from standard size and finish in plumbing fixtures and fittings such as might be produced by the use of Celluloid, or rubber such as used in hair combs. In the semi-rigid forms, a material somewhat flexible yet less pliable than soft rubber may be employed.

In Figure 1, a basin or sink is conventionally represented at 28, provided with a drain opening through a depending boss 29, and in this opening there is inserted from above a conventional drain fitting or nipple 30, which extends below the boss a distance for connection to piping as required. The nipple is formed with a top planiform flange 31 at its upper end arranged to rest upon the upper surface of the bottom of the sink or basin.

The top surfaces of flanges 31 may vary slightly from a true plane, and also porcelain surfaces of sinks and basins vary from a true plane on circles around drain outlets. These variations will be wide and gradual and only a thousandth of an inch or thereabouts or more or less from the true plane, and the thinness of the edge portion of the apron together with the elasticity of the material of the article, will permit the extreme edge of the lip to accommodate itself to such variations without material deformation of the article, under the pressure of water or other liquid standing in the sink or basin. If there should be a depression in a surface engaged by the lip which exceeds the capability of the latter to fit thereto, the leakage will ordinarily be so slight that in the ordinary uses of sinks and basins it will not be appreciable or objectionable.

I claim:

A device of the character described consisting of a body of material of a hardness and elasticity corresponding to that of rubber hair combs and comprising a cup-like annular upper part, and a coaxial integral depending centering part adapted to fit loosely in a drain opening, said cup-like part terminating peripherally in a thin lip the edge of which is in a plane substantially at right angles to the axis of the cup and centering part, said centering part extending below the lip a distance for the purposes described, and having nearly vertical sides, said cup-like part and lip being proportioned to support the device with the centering part clear of the sides of the drain opening, and without material deformation under pressures of liquid normal in the uses described.

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