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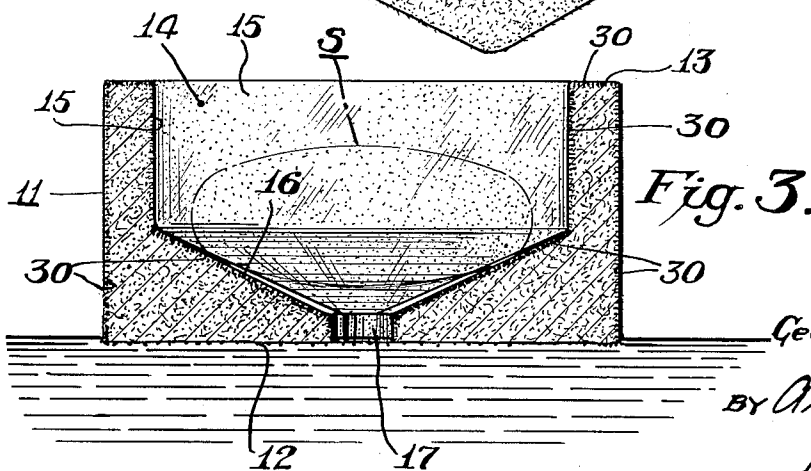
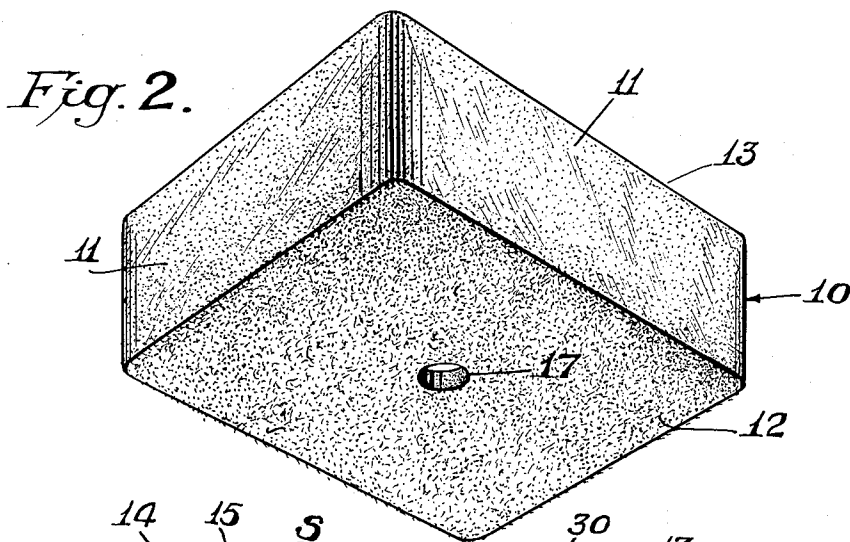
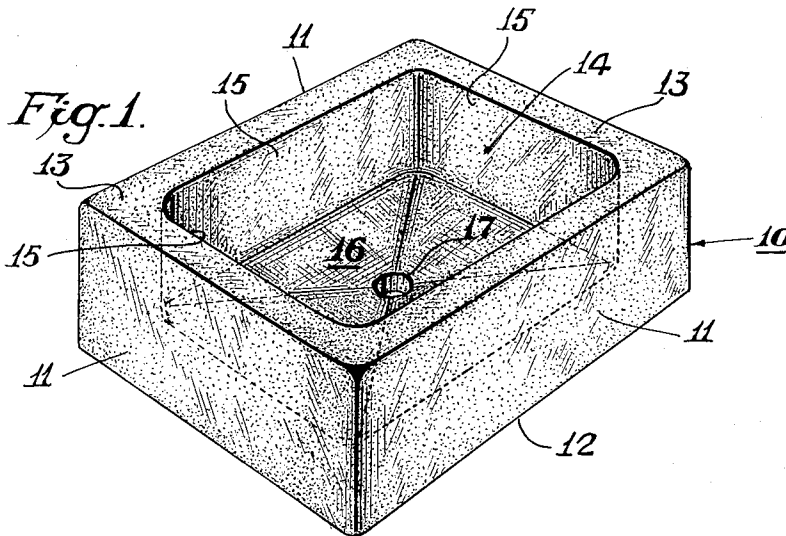
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2,722,719

METHOD OF FORMING FLOATING SOAP-DISH

Filed Jan. 9, 1952

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

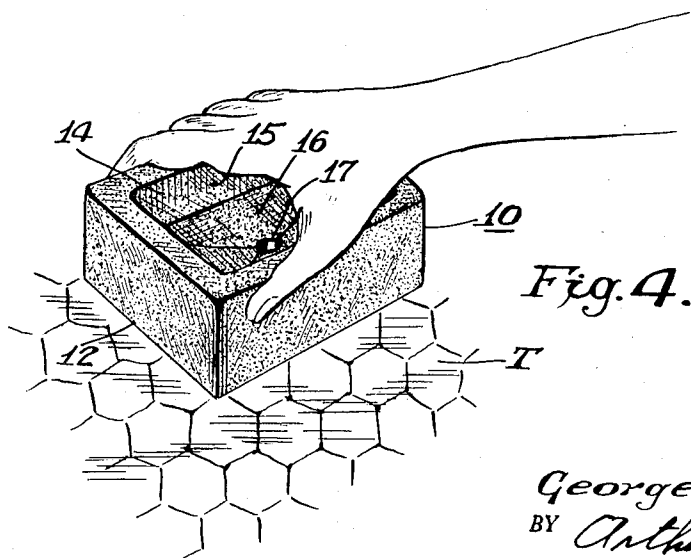
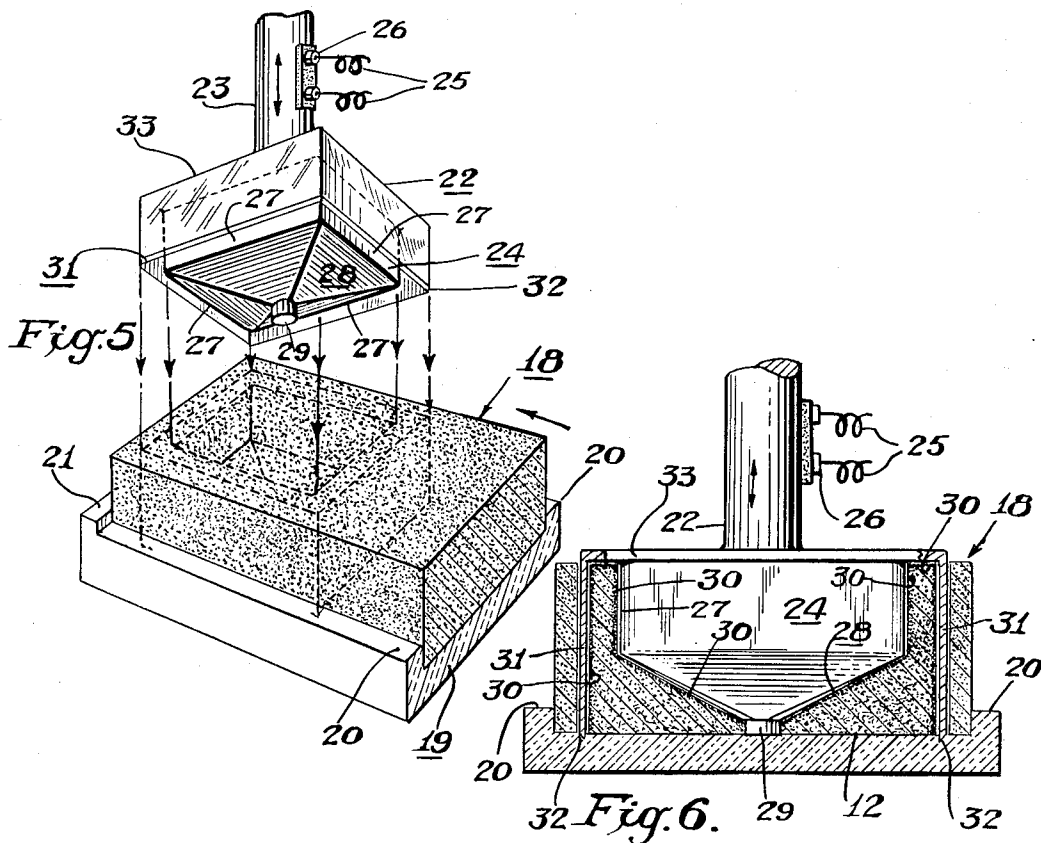


Fig. 4.

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METHOD OF FORMING FLOATING SOAP-DISH

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3 Claims. (Cl. 18—55)

The present invention relates generally to holders or containers for bar soap or the like and it relates more particularly to a floating soap-holder for use in the bath.

An object of the present invention is to provide a new and improved method of forming a holder or dish or container for bar soap or the like. Another object of the present invention is to provide a novel method of forming a floating soap-holder or the like, capable of supporting its contents above water level in a bath or sink or wash-tub or the like, while permitting drainage therefrom of water introduced by inadvertent submersion or splashing, etc.

Other objects and advantages of the present invention are apparent in the following detailed description, appended claims and accompanying drawings.

During bathing, laundering or washing, it is desirable to have the bar of soap readily accessible adjacent the surface of the water in the bath tub, wash tub or sink. However, the so-called "floating" soaps are not satisfactory because the bar of soap tends to soften and dissolve upon prolonged immersion in the water, resulting not only in excessively rapid rate of consumption of the soap but also in a softened and slippery surface making the soap difficult to grasp and hold.

Accordingly, the present invention contemplates a novel method of forming a soap-holder or the like, which is extremely simple and inexpensive to manufacture, and, at the same time, is highly efficient in supporting the soap above the level of the water while permitting drainage therefrom of water inadvertently introduced thereinto. The present invention further contemplates a novel method of, quickly and easily producing the soap-holders, in volume, from material readily available commercially.

Generally speaking, the novel soap-holder of the present invention is formed of a commercially available multicellular plastic foam-like solid material, having extremely high buoyancy and low water-adsorptivity, produced by the expansion of polystyrene approximately 40 times; methyl chloride being used as the expanding agent. This material, which will be referred to hereinafter as expanded-polystyrene, can, I have found, be controllably collapsed by the application thereto of localized heat, to permit a soap-holding concavity to be formed in a solid block thereof, by means of a suitably-shaped heated die. I have found further that, by providing the heated die with an annular cutter, spaced somewhat apart from the concavity-forming main portion thereof, the soap-holder can be formed from a larger block or strip of the expanded-polystyrene in a single operation. I have also found that, by extending the annular cutter somewhat beyond the concavity-forming main portion of the die and providing the latter with one or more small projections, it is possible to form the soap-dish with a bottom wall which is relatively thin but sufficiently thick to maintain the soap above water level and which has one or more drain openings to permit escape of water from the soap concavity or chamber, so as to keep the soap relatively dry at all times. Moreover, I have found that,

by employing a heated annular cutter in the die, the outer side walls of the soap container or dish can be given a somewhat glazed surface which reduces water adsorptivity and also makes for a harder, better-wearing finish. Additionally, I have found that the unglazed surface of the expanded-polystyrene can be used, somewhat in the manner of an eraser, to remove dirt, soap-scum, grease and the like from tile, porcelain, enamel, metal, glass and other hard surfaces, without scratching, so that, by leaving the outer surface of the bottom wall of the soap dish in its original unglazed condition, the soap dish can serve the additional function of cleaning the tub, sink or basin after use.

For the purpose of illustrating the invention, there are shown, in the accompanying drawings, certain forms thereof, which have been found in practice to give satisfactory results and which are presently preferred. It is to be understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown, and that the several parts, elements and steps can be variously arranged and organized, without departing from the spirit or essential attributes of the invention.

Referring to the accompanying drawings in which like reference characters indicate like parts throughout:

Figure 1 is a perspective view of a soap-dish forming one embodiment of the present invention.

Figure 2 is a perspective view showing the underside of the embodiment of Fig. 1.

Figure 3 is a transverse vertical cross-sectional view showing the embodiment of Figs. 1 and 2 in use as a floating soap-dish.

Figure 4 is a perspective view showing the embodiment of Figs. 1 and 2 being used to clean a tile surface.

Figure 5 is a schematic perspective view showing the forming die and indicating the method of forming an individual soap-dish from a length of expanded-polystyrene.

Figure 6 is a vertical cross-sectional view showing the appearance of the die and the expanded-polystyrene at the end of the forming operation.

In Figs. 1-4, there is shown a soap-dish 10 constituting an illustrative embodiment of the present invention. The soap-dish 10 is of generally rectangular configuration, with plane, vertical sides 11, a plane, horizontal bottom 12 and a peripheral, plane horizontal top 13. Extending downward from the top of the soap-dish 10 is an open-top chamber 14, formed by plane vertical side-walls 15 and an inverted pyramidal floor 16, tapering downward to a central drain-opening 17, which extends vertically downward to the bottom 12.

The soap-dish 10 is formed of expanded-polystyrene, in a manner to be described hereinbelow, which is extremely light, having a weight of not more than two pounds per cubic foot as compared to 62.4 pounds per cubic foot for water, and which, due to the closed-cell structure of the expanded foam-like material and the fact that polystyrene absorbs virtually negligible amounts of water, picks up less than 0.1 pound of water per square foot of area, by way of adsorption in the open cells on the surface of the material.

As a result of this tremendous buoyancy of almost 60 pounds per cubic foot, the soap-dish 10 floats virtually on top of the water, even with a bar of soap S resting in the chamber 14, as shown in Fig. 3. That is, the extent of immersion of the soap-dish and soap is less than one-eighth inch (and, indeed, is less than one-sixteenth inch, in most cases), so that the thickness of the bottom at its thinnest center zone need not exceed one-quarter inch, to maintain the soap well above the water level and to provide effective drainage of water from the chamber 14 downward through the drain-opening 17. In this way, the soap-dish drains itself almost instantly of any water which

may have gotten into the soap chamber 14 due to splashing or due to submersion, momentarily, thereof. Indeed, if the soap-dish is held at the bottom of a filled tub, it will, upon being released, rise to the surface and completely drain itself in a matter of a few seconds.

The downwardly-inclined floor 16 ensures complete drainage from the soap chamber 14 and minimizes softening of the bar of soap, such as results when it is left, for any length of time, in a pool of water. It is, of course, obvious that the configuration of the floor could be changed, so long as there is some downward inclination toward the drain-opening. Similarly, two or more drain-openings could be provided, if desired, with a suitable change in the configuration of the floor.

It is also apparent that the novel soap-dish of the present invention is not limited to the particular rectangular shape shown in the drawings and, instead, could be given any other shape, with or without added features of ornamentation or design. By way of illustration, the soap-dish could be given the external configuration of a duck or fish to arouse the interest of children.

In Fig. 4, there is shown the manner in which the soap-dish can be used to clean a tile-surface T, the foam-like solid bottom 12 removing dirt, scum, etc. from the surface, without scratching, when used in the manner of an eraser or sponge. The dirt or scum adheres to the expanded-polystyrene surface but can be rinsed off readily, so that the cleaning surface can be re-used again and again.

In Figs. 5 and 6, there are shown a novel method of, and apparatus for, forming the soap-dish 10, described above, from a preformed, solid length 18 of expanded-polystyrene. Thus, as shown particularly in Fig. 5, I may provide a base 19, having side guide-rails 20 for the length 18 (which is slightly greater in transverse dimension than the final soap-dish to be formed therefrom) of expanded-polystyrene, and having a stop-shoulder 21.

A vertically-reciprocable die, indicated generally by the reference character 22, is disposed above the base 19 and includes a stem 23 carrying, at its lower end, a main body 24 provided with a concealed electrical heating-element (not shown). Current for the heating-element is provided by wires 25 connected to terminals 26, mounted on the stem 23 and operatively connected to the element.

The die body 24 corresponds in shape to the soap-chamber 14 to be formed thereby. Thus, the body 24 has vertical plane sides 27, and a downwardly-tapered pyramidal bottom 28 provided with a small, central, downwardly-directed tip or projection 29 (designed to make the drain-opening 17).

As mentioned above, I have found that expanded-polystyrene can be controllably collapsed to a small fraction of its original volume, by the application of localized heat, slightly exceeding the softening point of the material. Thus, by maintaining the die body 24 at the desired temperature (about 225–250° F.), it is possible progressively to collapse the expanded-polystyrene as the die body 24 is moved downward into the length 18 to the position shown in Fig. 6. The mass of expanded material corresponding to the volume of the die body 24 is thus collapsed or condensed into a thin, somewhat glazed film or coating 30 lining the side-walls and floor of the final soap chamber 14.

During the last stage of the downward movement of the die, the tip 29, which is also hot, penetrates to the base 19 and forms the drain-opening 17.

There is a slight tendency on the part of the expanded-polystyrene to shrink away from the hot surfaces or the die body 24 and tip 29, so that the soap chamber and drain-opening are somewhat oversize relative thereto. In other words, the die dimensions are made slightly smaller than the dimensions desired in the soap chamber and drain opening.

The die 22 also includes a thin rectangular annular cutter 31 spaced somewhat outward of the main body 24,

with its free edge 32 terminating below the body 24 and generally in the same plane as the free end of the tip 29.

The top wall 33 connecting the main body 24 and annular cutter 31 of the die 22 is of heat-conducting metal or the like, so that the cutter is also hot.

It is apparent that, as the die moves downward from the position shown in Fig. 5 to that shown in Fig. 6, the cutter passes through the length or strip 18 forming the sides 11 of the soap-dish, at the same time the body 24 is forming the soap chamber 14. The heat of the cutter assists the thin edge 32 in slicing through the material by collapsing or condensing the expanded-polystyrene into the thin, glazed film or coating 30 described above, which seals off the outer cells of the material in the sides 11 of the final soap-dish and thereby reduces water adsorption.

Thus, a soap-dish is formed from the length 18 of expanded-polystyrene by a single stroke of the die 22, a small amount of surplus material is trimmed off by the cutter adjacent the guide-rails 20 and stop-shoulder 21. After stroke of the die, the length 18 is advanced (from right to left in Fig. 5), following removal of the formed soap-dish, to position a new portion of the material beneath the die 22.

As mentioned above, it is preferred to keep the bottom 12 in its original uncoated condition in order to utilize the cleaning action of the expanded-polystyrene and, for this reason, the base 19 is not heated. However, where this cleaning action is not desired, an appropriated heating element (not shown) can be incorporated in the base 19 to form a thin, glazed film or coating on the bottom 12, as well, and thereby to reduce water-adsorption and improve wearing properties by providing a harder and less brittle surface on all external and internal surfaces of the dish.

The heat of the top wall 33 of course forms a thin, glazed film or coating on the peripheral top wall 13 of the soap-dish.

By keeping the annular cutter 32 cool (as for example by making the top wall of heat-insulating material) and relying on mechanical cutting action alone, it is possible to leave the sides 11 of the soap-dish in uncoated condition, so as to provide additional surfaces available for cleaning action, where this is desirable and where the slight increase in water-adsorption is not critical.

It is also possible to form the soap-dish in two separate operations, by first cutting out or molding a solid piece, and then using the heated die (without the peripheral or annular cutter) to form the soap chamber therein. This procedure may be preferred where the soap-dish is to have some irregular or decorative configuration or design, which cannot be produced by a single die-cutting operation.

As used in the appended claims, the term "expanded-polystyrene" defines a multicellular, plastic, foam-like, solid material, produced by the expansion of polystyrene approximately 40 times, having a density of not more than about 2 pounds per cubic foot and a water-adsorptivity of less than about 0.1 pound per square foot of area.

The present invention may be embodied in other specific forms, those described herein being merely illustrative and not restrictive, and, accordingly, reference should be made to the appended claims, rather than to the foregoing description, as indicating the scope of the invention.

I claim as my invention and desire to protect by Letters Patent:

1. A method of forming a form-retaining floating soap-dish or the like from a rigid block of expanded-polystyrene including the steps of applying localized heat, slightly above the softening point of the expanded-polystyrene, to an intermediate portion of the block extending from the top thereof downward to somewhat above the bottom thereof, thereby to effect collapse or condensation of the expanded-polystyrene and to provide an open-top chamber in said block, the condensed polystyrene forming a thin somewhat glazed film or coating for said

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chamber simultaneously cutting the block annularly in spaced relationship to the chamber so as to form the external contour of the final soap-dish and forming a drain-opening extending from the bottom of the soap-dish to the floor of the chamber.

2. A method of producing a form-retaining floating soap-dish or the like from a rigid block of expanded-polystyrene including the steps of, forming an open-top chamber in the soap-dish by applying localized heat, somewhat above the softening point of the expanded-polystyrene, to an intermediate portion of the soap-dish extending from the top thereof to somewhat above the bottom thereof, thereby to effect collapse or condensation of the expanded-polystyrene and to form a thin somewhat glazed film or coating of condensed polystyrene for said chamber, forming the external contour of the soap-dish simultaneously with the chamber by applying localized heat, somewhat above the softening point of the expanded-polystyrene, to an annular zone of the block in spaced relationship to the chamber, thereby to effect collapse or condensation of the expanded polystyrene, of the condensed polystyrene forming a thin somewhat glazed film or coating on the outside of the soap-dish, and forming a drain-opening extending from the bottom of the soap-dish to the floor of the chamber.

3. A method of forming a form-retaining floating soap-dish or the like from a rigid block of expanded-polystyrene including the steps of applying localized heat, slightly above the softening point of the expanded-poly-

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styrene to an intermediate portion of the block extending from the top thereof downward to somewhat above the bottom thereof, thereby to effect collapse or condensation of the expanded-polystyrene and to provide an open-top chamber in said block, the condensed polystyrene forming a thin somewhat glazed film or coating for said chamber, simultaneously applying localized heat, slightly above the softening point of the expanded-polystyrene, to an annular zone of the block in spaced relationship to the chamber, thereby to effect collapse or condensation of the expanded-polystyrene so as to form the external contour of the soap-dish, the condensed polystyrene forming a thin somewhat glazed film or coating on the outside of the soap-dish, and of forming a drain-opening extending from the bottom of the soap-dish to the floor of the chamber.

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