Dec. 21, 1954 C. A. STRAND 2,697,231

LIGHTWEIGHT BATHTUB CONSTRUCTION

Filed June 25, 1953 2 Sheets-Sheet 1

FIG. 1

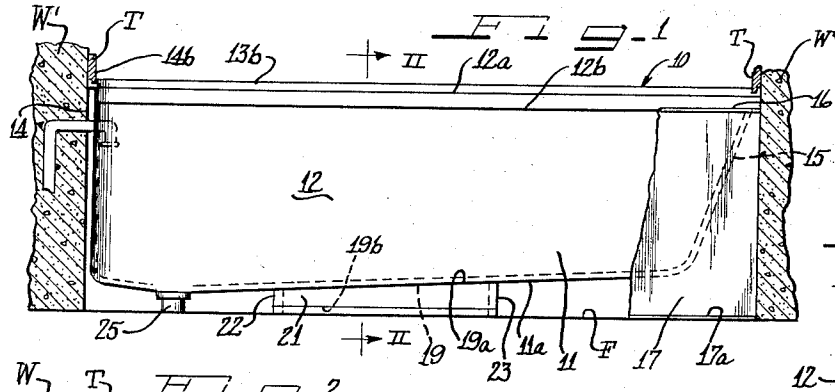


FIG. 3

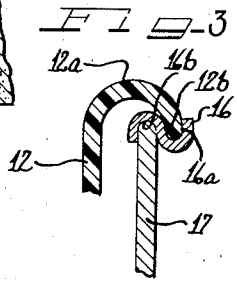


FIG. 2

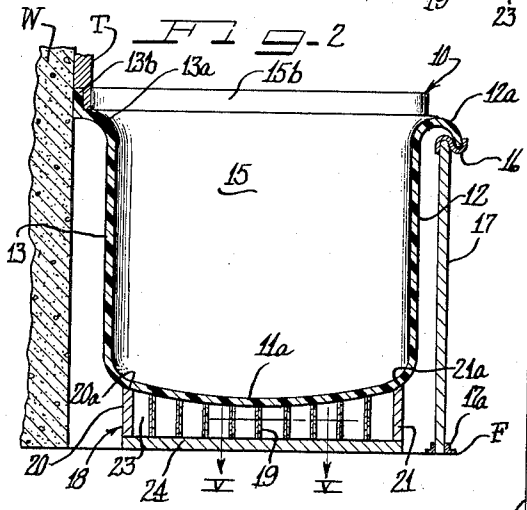


FIG. 6

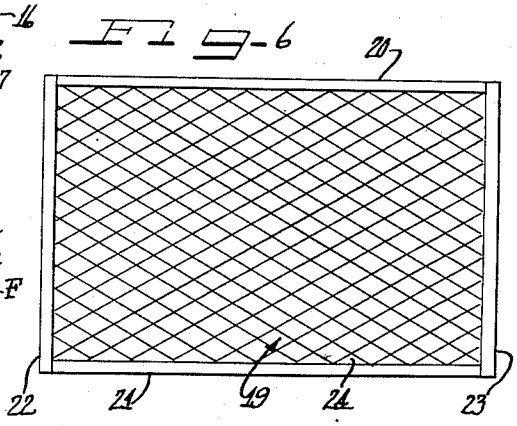


FIG. 5

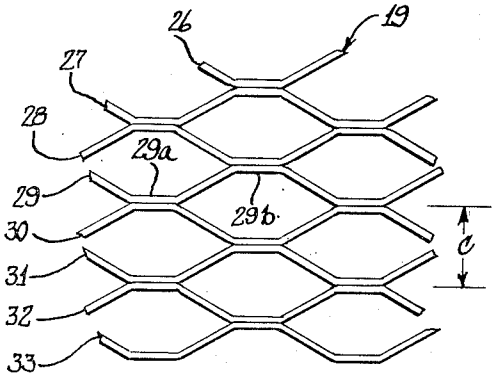
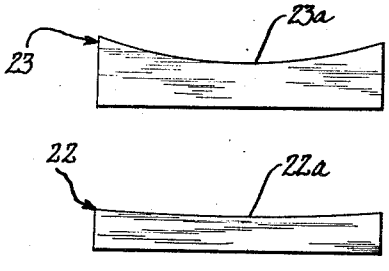


FIG. 4



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LIGHTWEIGHT BATHTUB CONSTRUCTION

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Fig-7

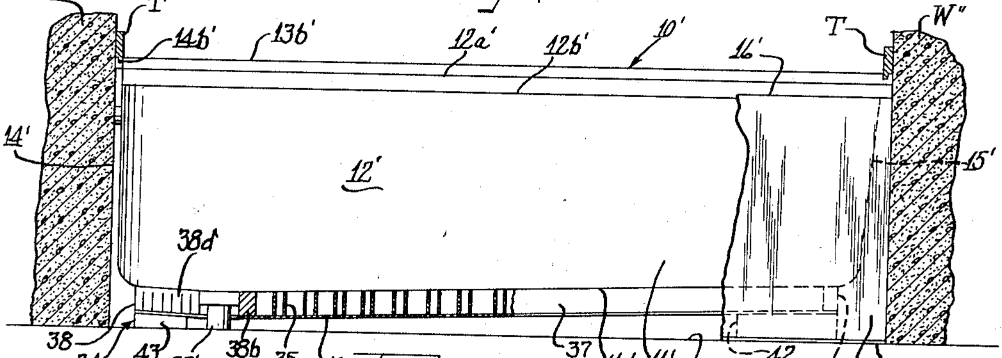


Fig-8

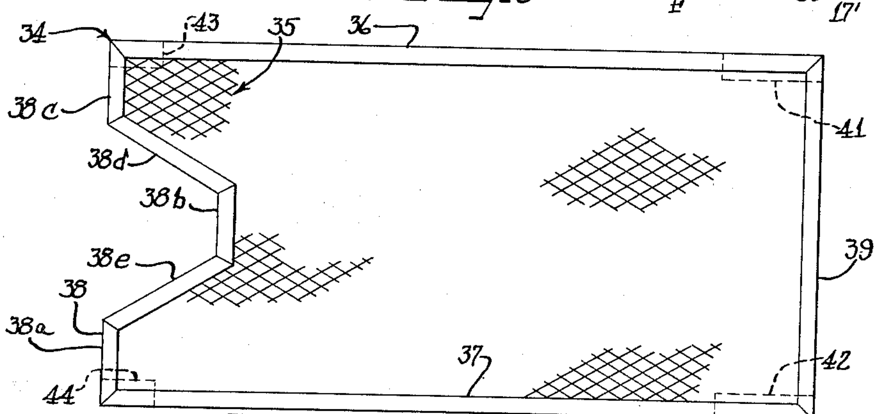


Fig-9

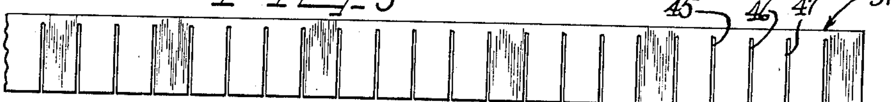
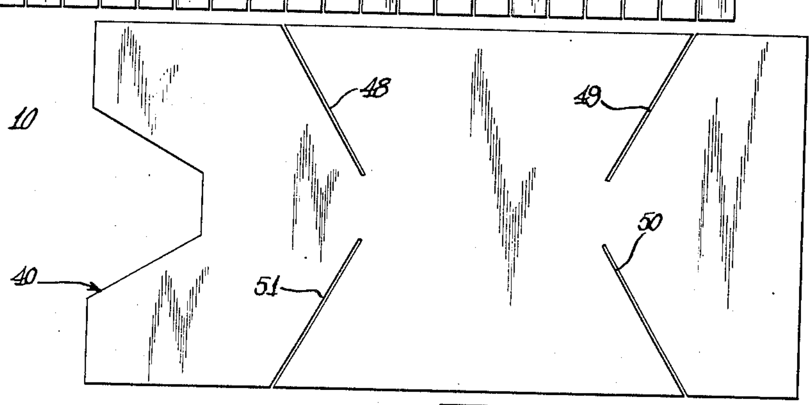


Fig-10



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2,697,231

LIGHTWEIGHT BATHTUB CONSTRUCTION

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Application June 25, 1953, Serial No. 364,045

11 Claims. (Cl. 4—173)

This invention relates to an improved light-weight bathtub construction, and more particularly, to an improved structure for supporting the light-weight bathtub or the like receptacle, and to an improved method of preparing such structure.

As is well known, the ordinary bathtub is a very heavy cast iron receptacle, which is expensive to produce and also to install. In addition, such cast iron bathtubs are extremely difficult to handle during shipment and installation because of their very great weight. This excessive weight also prevents or substantially limits the use of such bathtubs in living quarters wherein weight of fixtures is a distinct disadvantage, for example, in light-weight cabins, temporary houses, certain forms of pre-fabricated dwelling, and particularly in automobile trailer houses.

The substitution of other materials for the enamel-coated cast iron bathtub has, however, provided a problem which heretofore has gone unsolved, notwithstanding the very great need for bathtubs as units of substantially lighter weight. The enamel coating, which is employed for decorative purposes as well as for the purpose of simplifying the cleaning of the bathtub, is characterized by extreme brittleness typical of ceramic materials; and such enamel coating must be supported by an extremely strong and inflexible structure or shell in order to prevent fracture thereof during ordinary wear and tear, and particularly in response to sharp impact. The use of cast iron in the formation of such a shell has, therefor, been considered a necessity heretofore.

As is disclosed and claimed in United States application entitled "Light-Weight Bathtub and Production Thereof" filed concurrently herewith in the names of Valentine DeOlloqui, Carl A. Strand and Carroll H. Van Hartesveldt, and owned by the assignee of the instant invention, a suitable light-weight bathtub has been found which has a suitably flexible or resilient enamel-like coating and integrally formed therewith a glass fiber-polyester laminated body of suitable strength and resiliency. Since this light-weight bathtub has the general shape of all bathtubs which is somewhat irregular in that the bottom tends to slope toward a drain and the extent to which the bottom is dished or bowed varies at different points longitudinally of the bathtub structure, the problem of providing a suitably practical and economical supporting device or means for this light-weight bathtub is somewhat complicated. The problem is further complicated by the fact that the overall resiliency or flexibility of the instant bathtub is such that it is not advisable to employ supports for the bottom of the bathtub which tend to cause sharp concentration of forces at one place or another in the bottom of the tub. As will be appreciated, such means of adequately supporting the bathtub as those which might be provided by forming plaster or concrete beds in which to seat the bathtub must involve an extensive amount of additional work that is more or less inconsistent with the essentially economical features of the instant and light-weight bathtub. Most ideally, a simple but sturdy unit or device which may be prefabricated by the bathtub manufacturer and secured to the bathtub is required for the instant light-weight bathtub; and the instant invention resides in a unique and superior supporting arrangement of this type, and a unique method of producing the same.

It is, therefore, an important object of the instant invention to provide an improved light-weight bathtub

supporting assembly, and an improved method of preparing or prefabricating the same.

It is a further object of the instant invention to provide an improved light-weight bathtub assembly, comprising a suitably formed glass fiber-polyester laminated bathtub shell having the generally dish-shaped bottom thereof sloped downwardly longitudinally toward a drain end, and an attached support device providing beam strength for said bottom consisting essentially of a rigid honeycomb core layer having its top surface contoured to conform to the shell bottom and secured thereto.

It is another object of the instant invention to provide an improved method of constructing a device for supporting from beneath a receptacle made of resilient high shear-resistant material and having a generally dish-shaped bottom sloping downwardly in a given longitudinal direction, that comprises providing a thin layer of flexible honeycomb core material made from strips of hardenable resin-impregnated webbing, shaping the top surface of the layer to conform with the dish-shaped bottom and urging the layer against the bottom, hardening the resin while retaining the layer thus urged against the bottom to rigidify the core and adhere the same to the bottom, and securing protective end, side and bottom wall members to the core.

Other and further objects, features and advantages of the instant invention will become apparent to those skilled in the art from the following detailed description of preferred embodiments thereof, and the attached drawings forming a part of the instant specification.

On the drawings:

Figure 1 is a side elevational view of the instant light-weight bathtub assembly embodying my invention;

Figure 2 is a sectional elevational view taken substantially along the line II—II of Figure 1;

Figure 3 is an enlarged detail view showing fragmentarily the front panel and front top wall cooperation;

Figure 4 is an exploded view showing the different shapes of the laterally extending cross beams of the instant supporting device;

Figure 5 is a fragmentary enlarged plan view taken substantially along the line V—V of Figure 2;

Figure 6 is a top plan view of the supporting rack which is positioned benath the bathtub shell of Figure 1;

Figure 7 is a side elevational view of a preferred embodiment of the instant light-weight bathtub assembly embodying the invention;

Figure 8 is a top plan view of the supporting rack which is positioned beneath the bathtub shell of Figure 7;

Figure 9 is a fragmentary enlarged side elevational view of the rack of Figure 8; and

Figure 10 is a top plan view of the bottom member for the rack of Figure 8.

As shown on the drawings:

As shown in Figures 1 and 2, the instant light-weight bathtub, indicated generally by the reference numeral **10**, comprises a suitably formed glass-fiber-polyester laminated bathtub shell **11** having upwardly extending front **12** and back **13** side walls, and left **14** and right **15** end walls. The back side wall **13** extends upwardly and flares outwardly at **13***a* to engage and be supported by the bathroom wall W. As will be seen, the extreme top of the back wall **13** has an upwardly extending rib **13***b* which interlocks with suitably positioned tile T mounted on the bathroom wall W in the usual manner. The tile T and back wall W are shown essentially diagrammatically only in Figure 2 to avoid undue confusion in the drawings.

The end walls **14** and **15** like the back wall **13** extend upwardly and outwardly to define ridges **14***b* and **15***b*, respectively, which engage the walls W', W'' and coact therewith in substantially the same manner that the back wall **13** engages and is supported by the bathroom wall W.

The remaining wall, the front wall **12**, extends upwardly and near the top thereof at **12***a* is turned outwardly and down, so as to define in cross section at the top **12***a* a curved arch, as is best shown in Figure 3. The arch **12***a* terminates at its outer extremity **12***b* with a substantially downwardly directed rib portion. This end portion **12***b* seats firmly in the front groove **16***a* of an S-shaped elongated metal strip **16** which extends

the full longitudinal direction of the shell **11** and arcuate front wall top **12***a*. The rear groove **16***b* of the S-shaped strip **16** securely seats the rounded top edge of a supporting panel **17** which extends vertically upwardly from the floor F. The panel **17** is rigidly secured to the floor F, for example, by means of a screw and bracket assembly **17***a*, and the panel **17** extends the full longitudinal dimension of the shell **11** and upwardly to substantially the height of the arcuate top **12***a* of the front wall **12**. The panel **17** is made of suitably strong structural wood, plywood, heavy-weight laminate or the like material, which is capable of withstanding very substantial downward pressure and which is sufficiently rigidly secured to the floor F to resist substantial laterally directed forces, so as to afford a certain amount of protection for the front wall **12**. The front wall **12** is made of a suitably strong glass fiber-polyester laminate material so that it is capable of withstanding very substantial downwardly directed forces, and the front wall **12** and panel **17** (by virtue of its supporting engagement with the outer lip **12***b* of the front wall **12**) cooperate to provide very substantial force-resisting support for the top arcuate portion **12***a*.

In this manner, the top arcuate portion **12***a* is capable of readily withstanding the ordinary wear and tear during use of the instant bathtub assembly **10**, and is particularly capable of withstanding the weight of human beings leaning on or pulling against the arcuate portion **12***a*, while getting in and out of the bathtub **10**. It will be appreciated that the panel **17** may be easily installed at the same time the bathtub **10** is installed and the panel **17** may be prefabricated of the desired weight and strength to carry out its particular function just described. It will also be appreciated that in the use and installation of the ordinary cast iron bathtub a structure generally similar to the instant shell structure **11** is employed with a depending wall member, also made of cast iron, which takes the place of the panel **17**. In such an arrangement the depending wall member furnishes the sole support substantially the entire weight of the cast iron tub, and the top edges of the other walls of the top shell are suitably affixed to the bathroom walls.

The instant top shell **11** is, however, not supported entirely by the panel **17**. In fact, because of its light weight and other advantageous features connected therewith, the overall shell **11** is too resilient in character to be supported by the panel **17** alone. It is also necessary to employ a suitable rack or supporting device **18** which is centrally positioned beneath the top shell **11**.

As will be seen, the rack **18** is an attached support device providing beam strength for the bottom **11***a* of the shell **11** and is constructed of a rigid honeycomb core layer **19** (which will be described in detail hereinafter) having its top surface **19***a* contoured to conform to the shell bottom **11***a* and secured thereto, longitudinally extending side wall members **20** and **21** and laterally extending end wall members **22** and **23** protectively surrounding the core layer **19** and secured to the shell bottom **11***a*, and a bottom wall member **24** cooperatively secured to the end and side wall members **20**, **21**, **22** and **23** and conforming to and secured to the bottom surface **19***b* of the core layer **19**. As will be seen, the wall members **20**, **21**, **22** and **23** are elongated longitudinally and laterally extending support beams protectively surrounding the honeycomb core layer **19** and secured to the shell bottom **11***a*, most preferably by a suitable adhesive.

It will also be seen that the rack **18** is suitably mounted on the floor level and extends upwardly to support the central portion of the shell bottom **11***a*, which is itself a generally dish-shaped bottom that is sloped downwardly in the (longitudinal) direction of the drain **25**, and which becomes decreasingly bowed or dished in shape in the longitudinal direction toward the drain **25** (or the drain end **14** of the shell **11**).

The details of composition and construction of the shell **11** are disclosed at length in previously mentioned co-pending application entitled "Light-Weight Bathtub and Production Thereof," and these details need not be further elaborated upon herein. In general, the instant top shell **11** is a slightly resilient or flexible laminate possessing extremely high shear resistance, having an approximate wall thickness of about 0.08 inch and being composed essentially of polymerized polyester laminating resin having imbedded therein about one-half the weight thereof of glass fibers, with a highly pigmented coating on the inside which is rendered equally resilient by the incorporation therein of a substantial proportion of a flexible polyester.

A particularly important aspect of the instant invention resides in the structural arrangement of the rack **18**, and in the fabrication thereof so as to obtain the desired structural arrangement. The rack **18** is a simple and sturdy unitary device that may be prefabricated by the manufacturer of the light-weight bathtub and permanently secured to the bottom **11** of the bathtub at its point of manufacture thereby avoiding the necessity for the customer or the person installing the bathtub to handle and properly place a separate base or rack element.

Referring now to details of certain of the elements of the rack **18**, it will be seen that the rack **18** constitutes an attached support device for the more or less irregularly contoured bathtub shell bottom **11**, which comprises a plurality of spaced laterally extending support beams, or end walls **22** and **23**, each adapted to rest upon a level surface, such as the bottom wall member **24** (or the floor surface F if the bottom **24** is not employed, or is made to fit within the wall members **20**, **21**, **22** and **23**), and extending upwardly to supportingly contact the shell bottom **11** thereabove, each of the end walls or beams **22** and **23** presenting tops **22***a* and **23***a* suitably curved to conform with the portion of the shell bottom **11** positioned thereabove. As will be seen from Figure 4, the shell bottom **11** becomes decreasingly bowed or less sharely dished in the longitudinal direction toward the drain end **14**, so that the curved top **23***a* of the rearmost beam **23** is quite clearly bowed and the top **22***a* of the forwardmost beam **22** is very slightly bowed. It will also be noted that the rearmost beam **23** extends to a noticeably greater height than the forwardmost beam **22**, so that the downward slope of the shell bottom **11** in the direction of the drain **25** is also provided for by the instant beam arrangement. It will also be appreciated that a suitably compartmented rack might also be constructed using more than two of the laterally extending end walls.

As is shown in Figure 1, the side walls **20** and **21** are also shaped with top faces which conform substantially to the slope of the bottom **11***a*, as well as the curvature thereof at the portion contacted by the top **20***a* or **21***a* of each of the side walls **20** and **21**. As shown in the instant embodiment, the bottom bases of each of the walls **20**, **21**, **22** and **23** are substantially uniplanar, and are suitably affixed to the bottom wall **24** by screws or nails (not shown) or by a suitable adhesive. In this embodiment, the bottom member **24** is substantially flat and is adapted to rest flush upon the floor. The adjustments in the instant rack **18** for the variations in contour and slope of the shell bottom **11***a* are thus made in the wall members **20**, **21**, **22** and **23** and in the core **19** itself.

The core **19** is made of a uniquely superior lightweight high beam strength material, which is suitably protected by the walls **20**, **21**, **22**, **23** and **24**, so that forces other than those directed substantially normal to the top and bottom surfaces of the core **19** will not be exerted against the core during normal use in the instant bathtub **10**. The core **19** has a structure known as the "honeycomb" core structure, because of its resemblance to the structure of the honeycomb formed by bees involving hexagonal cells for repositories for honey and the eggs which produce their young. The instant honeycomb structure is a core layer formed of strips of hardened resin-impregnated webbing. In Figure 6, the honeycomb structure is shown essentially diagrammatically; but in Figure 5 it is shown in more detail. As will be seen, the core **19** comprises a plurality of vertically extending strips **26**, **27**, **28**, **29**, **30**, **31**, **32** and **33** which are alternately affixed to opposite adjacent strips. In other words, the strip **29** is alternately affixed to and spaced from the opposite adjacent strips **28** and **30**. Strip **29** is affixed to the strip **30** at **29***a* (whereat it is spaced from the strip **28**) and it is affixed to the strip **28** at **29***b* (whereat it is spaced from the strip **30**). This arrangement results in the formation of a laminated cellular unit, or a honeycomb structure wherein the cells are hexagonal in shape.

In constructing the instant device for supporting from beneath a receptacle, such as the tub **10**, made of resilient high shear-resistant material and having a generally dish-shaped bottom **11***a* sloping downwardly in a given

longitudinal direction, the first step is that of providing a relatively thin layer of flextble honeycomb core material made from the strips **26**, **27**, **28**, etc. which are suitably impregnated with a hardenable resin or plastic adhesive type of material. The strips are suitably made of a webbing material, which is preferably paper of relatively heavy weight and strength.

The resin or adhesive used may be any one of a number of suitable laminating or adhesive natural or synthetic plastic materials, which include phenol-aldehydes (phenol-formaldehyde), urea-aldehydes (urea-formaldehyde), polyesters (unsaturated dihydric alcohol-dicarboxylic acid condensation products such as ethylene glycol maleate alkyd), modified rosins or rosin modified alkyds, etc. Most preferably, however, phenol-formaldehyde impregnated paper cores are employed.

The top surface **19***a* of the core **19** is shaped to conform with the dish-shaped bottom **11***a*. This may be done, as in the case of Figures 1, 2, 4 and 6 by shaping the individual strips **26**, **27**, **28**, etc. so that the core member in expanded form (as shown in Figure 5) will present a top surface **19***a* having the dished contour of the portion of the bottom **11***a* which the core **19** is to contact. In this respect, it should be pointed out that the invention offers particular advantages because the flexible (expanded) core **19** impregnated with unhardened resin may be urged against the shell bottom **11***a* so as to force the dish-shaped contour desired on the top surface **19***a*. Most preferably, the individual strips **26**, **27**, **28**, etc. are pre-shaped at least approximately to conform to the contour and the necessity for excessive buckling, etc. during forcing the core surface **19***a* into the finally desired shape is thus avoided.

While the core **19** is urged against the shell bottom **11***a* (substantially conforming therewith), the resin therein is cured. This may be done by the use of heat and/or catalysts, although the cold setting (catalyzed) phenol-formaldehyde laminating resins preferably used are permitted to set at substantially room temperatures. The core **19** may be urged against the shell bottom **11***a* by the use of a suitable laminating form (not shown), or by the use of the wall members **20**, **21**, **22**, **23** and/or **24**, which are also to be secured to the shell bottom **11***a*. Most preferably, the box-like frame provided by assembling the wall members **20**, **21**, **22**, **23** and **24** is used as a laminating form, and the uncured resin impregnated core **19** is positioned therein and then urged against the shell bottom **11***a*, while curing of the resin in the core **19** takes place. In this manner, the resin in the core **19** is the principal integrating or adhering force here used, and its adhesive character is principally responsible for securing the entire rack **18** to the shell bottom **11***a*. Of course, additional strengthening elements may be used, either in the assembly of the wall members, or in their attachment to the shell bottom **11***a*. Most preferably, adhesives are the principal attaching means for affixing each and all of the elements of the rack **18** to the bottom of the shell member **11**, for the reason that the shell **11** is not sufficiently thick to support most other ordinary attaching devices. It is an important aspect of the instant invention that the rack member **18** is made of such suitably light material that it may be affixed securely to the shell bottom **11***a* without the use of means other than suitable adhesives.

As has been previously mentioned, the walls **20**, **21**, **22** and **23** also function as supporting members for the shell bottom **11***a* and they are directly in contact therewith, which requires shaping the top surface of each of the end walls **22** and **23** to conform with the dished contour of different narrow laterally extending portions of the shell bottom **11***a* that are longitudinally spaced from each other, and shaping the top surface of each of the side walls **20** and **21** to likewise conform with the sloping and dished contour of a pair of longitudinally extending side portions of the bottom **11***a*, laterally spaced from each other.

It will, however, be noted that the principal beam support for the instant shell bottom **11***a* is provided by the rigid core **19** (after setting of the resin); and the supporting function of the side and end walls **20**, **21**, **22** and **23** is not absolutely necessary to the proper functoining of the instant device. The protective function of the side and end walls, as well as the bottom wall **24**, is comparatively more important. This aspect of the invention will be brought out more clearly in connection

with the most preferred embodiment of the instant invention, which is shown in Figures 7, 8, 9 and 10.

Referring to Figures 7, 8, 9 and 10, it will be seen that Figure 7 is comparable to Figure 1 and the various elements therein which are comparable in structure and function to those shown in Figure 1 are indicated by the primed reference numeral corresponding thereto. The principal difference is that the support device or rack **34** of Figure 7 is substantially different from the rack **18** of Figure 1.

As will be seen from Figure 7, the device **34** is substantially coextensive with the shell bottom **11***a* providing beam strength for substantially the entire shell bottom **11***a*, and is constructed of a rigid honeycomb core layer **35** having its top surface contoured to conform to the shell bottom **11***a* and secured thereto, longitudinally extending side walls **36** and **37** and laterally extending end wall members **38** and **39** protectively surrounding the core **35** and secured to the shell bottom **11***a*, and a bottom wall member **40** cooperatively secured to the end and side wall members **36**, **37**, **38** and **39** and conforming to and secured to the bottom surface of the core layer **35**. It will also be noted that the core member **35** is of substantially uniform thickness or height, and is formed of strips of hardened resin-impregnated webbing of substantially uniform height. Also, the side and end wall members **36**, **37**, **38** and **39** have substantially the height of the core **35**, although each is shaped to conform with the shell bottom contour at the location at which each is secured to the bottom **11***a*. Wedge members **41**, **42**, **43** and **44** are also mounted at opposite ends of the bottom wall member **40** for contacting the floor F to support the bathtub **10'** thereon in suitable alignment. The wedge members **41** and **42** are suitably secured to the higher or back end of the bottom wall **40** beneath the intersections between the end wall **39** and the side walls **36** and **37**, respectively; whereas the wedge members **33** and **34** are positioned at the drain end of the bottom member **40** beneath the intersections of the drain end wall **38** and the side walls **36** and **37**, respectively.

In general, the preparation of the embodiment of Figure 7 involves a method of constructing a device **34** for supporting from beneath a receptacle **10'** made of resilient high shear-resistant material and having a generally dish-shaped bottom **11***a'* sloping downwardly in a given longitudinal direction, which comprises providing a frame (of the walls **36**, **37**, **38** and **39**) substantially coextensive with the shell bottom **11***a'* and made of flexible structural material, providing a thin layer **35** of flexible honeycomb core material of substantially the height of the frame and made from strips of hardenable resin-impregnated webbing, shaping the frame and core therewithin to conform with the contour of the shell bottom **11***a'* by urging the frame and the core into flush contact therewith, shaping a deformable sheet **40** of structural material to conform with the bottom of the frame and the core opposite the side contacting the shell bottom **11***a'* by urging the sheet **40** thereagainst, and hardening the resin to integrate the frame, core and sheet while retained against the shell bottom **11***a'*. Thereafter, suitable wedge members **41**, **42**, **43** and **44** may be applied to the rigid sheet or bottom member **40**.

Actually, the frame consists of a substantially straight laterally extending end wall **39** that is sharpely bowed or curved to conform with the sharp dished contour of the shell bottom **11***a'* in this region, a pair of substantially straight longitudinally extending side walls **36** and **37** which extend from the end wall **39** forwardly substantially the entire length of the tub **10'**; and a somewhat irregularly shaped end wall **38**, which has an offset portion therein to receive the drain **25'**. The end wall **38** comprises substantially laterally disposed sections **38***a*, **38***b* and **38***c* and angularly disposed sections **38***d* and **38***e* which connect the laterally disposed sections. As is shown in Figure 9, wherein a portion of a side wall **37** is shown, these wall members which comprise the instant frame are preferably ¾ by 1¼ inch lumber saw-kerfed as at **45**, **46** and **47**, to provide sufficient flexibility so that each wall member may be made to conform to the compound curvature of the shell bottom **11***a*. Preferably, the wall members are secured together by suitable means such as screws, nails, or adhesive (not shown) so as to form the entire frame just described.

Next, a flexible paper honeycomb core (of the type of material described in connection with the embodiment

of Figure 1 and described in detail in connection with Figure 5) which is preferably 1¼ inches in height, the same height as the frame, is cut to fit within the frame. The expanded core member **35**, like the core member **19**, preferably has a cell size "*c*" (as indicated in Figure 5) of ½ inch, although cell sizes may be used ranging from as little as ¼ inch to as much as 1 inch, and preferably the core size is about ½ to ¾ inch. The amount of impregnating resin used will depend to an appreciable extent upon the particular type of resin used, but the usual amount of laminating resin or binder should be employed, and in the particular instance, proportions ranging from about 5 to about 30% may be used, with the preferred proportion being between about 12 and about 18 weight per cent of the paper core. Phenol-formaldehyde laminating resins used in amounts of about 12–18 weight per cent have been found to be particularly effective employing the instant cell sizes in a paper core.

A particularly important aspect concerning the superiority of the improved structure of Figure 7, involves the use of a core layer of substantially uniform height, namely, about twice the cell size, and most preferably about 1¼ inch height for a cell size of ½ inch, so as to obtain maximum effective beam strength. It will be appreciated that a core layer that is quite thick will tend to have less effective beam strength unless the cell size is extremely small, because the rather substantial height of each individual impregnated paper strip makes buckling thereof more probable, and it is necessary to position the strips more closely adjacent each other. This results in a substantial increase in weight. A particularly advantageous aspect of the embodiment of Figure 7 resides in the fact that the core layer **35** used therein is of substantially uniform height or thickness throughout so that the most effective combination of core height and cell thickness or size may be used; whereas in the embodiment of Figures 1 and 2, it is necessary to use core thicknesses which vary throughout the body of the core **19**.

The bottom wall member **40** which is provided for the embodiment of Figure 7 is provided with a plurality of sawcuts **48**, **49**, **50** and **51** which extend angularly inward from the sides a substantial distance so as to provide for suitable flexibility and for the necessary complex contouring of the bottom wall member **40** in fitting the same against the bottom of the core **35**. The bottom wall member **40** is preferably made of plywood, consisting of thin plies of wood or cardboard or the like having uncured hardenable adhesive therebetween, so that the bottom member **40** may be hardened or rigidified either previously to or at the same time as the core layer **35** is hardened by the setting of the resin therein. The core member **35**, protectively surrounded by the frame formed by the walls **36**, **37**, **38** and **39**, and the bottom wall member **40** are urged against the shell bottom **11***a*′ so as to conform substantially therewith and the resin adhesive therein is cured or hardened so as to cause the entire rack assembly **34** to adhere to the bottom of the tub **10**′. Usually an additional amount of adhesive is applied to the adhering faces of the walls **36**, **37**, **38** and **39** and to the adhering top surface of the core **35** so as to assure adequate adherence to the bottom of the tub **10**′. Also, the saw-cuts are preferably filled with a suitable "plastic wood" or the like material comprising paste-like composition of filler and phenol-formaldehyde adhesive or the like resin, so that the setting of the entire assembly will involve filling up of all of the saw-cut holes and completely sealing off the entire core assembly.

The wedge members **41**, **42**, **43** and **44** may, of course, be suitably applied to the bottom wall member **40** by means of nails, screws or suitable adhesive (not shown) and these wedge members **41**, **42**, **43** and **44** are so shaped that they effectively act as four legs for the entire bathtub assembly for suitably positioning the assembly **10**′ on the floor F. For maximum strength, the wedge members **41**, **42**, **43** and **44** are screwed to the bottom member **40** so as to be very securely fastened thereto. It will be appreciated, of course, that it would not be possible to affix wedge members to the shell bottom **11***a*′ by such fastening means because of the thinness of the shell **11**′.

The various wall members **36**, **37**, **38** and **39**, and the bottom wall member **40** are, like the wall members **20**, **21**, **22**, **23** and **24** of the embodiment of Figure 1, made of suitable structural material, which may be wood, plywood, impregnated cardboard panels, etc.

Modifications and alterations may be effected without departing from the scope of the instant invention.

I claim as my invention:

1. A light-weight bathtub assembly, comprising a suitably formed glass fiber-polyester laminated bathtub shell having a generally dish-shaped bottom therefor sloped downwardly longitudinally toward a drain end, and an attached support device providing beam strength for the bottom constructed of a rigid honeycomb core layer having its top surface contoured to conform to the shell bottom and secured thereto.

2. A light-weight bathtub assembly, comprising a suitably formed glass fiber-polyester laminated bathtub shell having a generally dish-shaped bottom therefor sloped downwardly longitudinally toward a drain end, and an attached support device providing beam strength for the bottom constructed of a rigid honeycomb core layer having its top surface contoured to conform to the shell bottom and secured thereto, said honeycomb core layer being formed of strips of hardened resin-impregnated webbing.

3. A light-weight bathtub assembly, comprising a suitably formed glass fiber-polyester laminated bathtub shell having a generally dish-shaped bottom therefor sloped downwardly longitudinally toward a drain end, and an attached support device providing beam strength for the bottom constructed of a rigid honeycomb core layer having its top surface contoured to conform to the shell bottom and secured thereto, and elongated longitudinally and laterally extending support beams protectively surrounding said honeycomb core layer and secured to the shell bottom.

4. A light-weight bathtub assembly, comprising a suitably formed glass fiber-polyester laminated bathtub shell having a generally dish-shaped bottom therefor sloped downwardly longitudinally toward a drain end, and an attached support device providing beam strength for the bottom constructed of a rigid honeycomb core layer having its top surface contoured to conform to the shell bottom and secured thereto, longitudinally extending side wall members and laterally extending end wall members protectively surrounding the core and secured to the shell bottom, and a bottom wall member cooperatively secured to the end and side wall members and conforming to and secured to the bottom surface of said core layer.

5. A light-weight bathtub assembly, comprising a suitably formed glass fiber-polyester laminated bathtub shell having a generally dish-shaped bottom therefor sloped downwardly longitudinally toward a drain end, and an attached support device providing beam strength for the bottom constructed of a rigid honeycomb core layer having substantially uniform thickness and having its top surface contoured to conform to the shell bottom and secured thereto, said haneycomb core layer being formed of strips of hardened resin-impregnated webbing, longitudinally extending side wall members and laterally extending end wall members protectively surrounding the core and secured to the shell bottom, and a bottom wall member cooperatively secured to the end and side wall members and conforming to and secured to the bottom surface of said core layer.

6. A light-weight bathtub assembly, comprising a suitably formed glass fiber-polyester laminated bathtub shell having a generally dish-shaped bottom therefor sloped downwardly longitudinally toward a drain end, and an attached support device providing beam strength for the bottom constructed of a rigid honeycomb core layer having substantially uniform thickness and having its top surface contoured to conform to the shell bottom and secured thereto, said honeycomb core layer being formed of strips of hardened resin-impregnated webbing, longitudinally extending side wall members and laterally extending end wall members protectively surrounding the core and secured to the shell bottom, and a bottom wall member cooperatively secured to the end and side wall members and conforming to and secured to the bottom surface of said core layer, and wedge members mounted at opposite ends of said bottom for contacting a floor to support the bathtub assembly thereon in suitable alignment.

7. A light-weight bathtub assembly, comprising a suitably formed glass fiber-polyester laminated bathtub shell having a generally dish-shaped bottom therefor sloped downwardly longitudinally toward a drain end, and an attached support device providing beam strength for the

bottom constructed of a rigid honeycomb core layer having substantially uniform thickness and having its top surface contoured to conform to the shell bottom and secured thereto, said honeycomb core layer being formed of strips of hardened resin-impregnated webbing of substantially uniform height, longitudinally extending side wall members and laterally extending end wall members protectively surrounding the core and secured to the shell bottom, said side and end wall members having substantially the height of the core and being shaped to conform with the shell bottom contour at the location at which each is secured to the bottom, a bottom wall member cooperatively secured to the end and side wall members and conforming to and secured to the bottom surface of said core layer, and wedge members mounted at opposite ends of said bottom for contacting a floor to support the bathtub assembly thereon in suitable alignment.

8. A method of constructing a device for supporting from beneath a receptable made of resilient high shear-resistant material and having a generally dish-shaped bottom sloping downwardly in a given longitudinal direction, that comprises providing a thin layer of flexible honeycomb core material made from strips of hardenable resin-impregnated webbing, shaping the top surface of the layer to conform with the dish-shaped bottom and urging the layer against the bottom, hardening the resin while retaining the layer thus urged against the bottom to rigidify the core and adhere the same to the bottom, and securing protective end, side and bottom wall members to the core.

9. A method of constructing a device for supporting from beneath a receptacle made of resilient high shear-resistant material and having a generally dish-shaped bottom sloping downwardly in a given longitudinal direction, that comprises providing a thin layer of flexible honeycomb core material made from strips of hardenable resin-impregnated webbing, shaping the top surface of the layer to conform with the dish-shaped bottom and urging the layer against the bottom, and hardening the resin while retaining the layer thus urged against the bottom to rigidify the core and adhere the same to the bottom.

10. A method of constructing a device for supporting from beneath a receptacle made of resilient high shear-resistant material and having a genrally dish-shaped bottom sloping downwardly in a given longitudinal direction, that comprises providing a thin layer of flexible honeycomb core material of uniform thickness substantially coextensive with the bottom in size and made from strips of hardenable resin-impregnated webbing, urging the layer against the bottom to conform the same therewith, and hardening the resin while retaining the layer thus urged against the bottom to rigidify the core and adhere the same to the bottom.

11. A method of constructing a device for supporting from beneath a receptacle made of resilient high shear-resistant material and having a generally dish-shaped bottom sloping downwardly in a given longitudinal direction, that comprises providing a frame substantially coextensive with the shell bottom and made of flexible structural material, providing a thin layer of flexible honeycomb core material resin-impregnated webbing, shaping the frame and the core therewithin to conform with the contour of the shell bottom by urging the frame and core into flush contact therewith, shaping a deformable sheet of structural material to conform with the bottom of the frame and the core opposite the side contacting the shell bottom by urging the sheet thereagainst, and hardening the resin to integrate the frame, core and sheet while retained against the shell bottom.

No references cited.