April 25, 1961 G. M. CROSS 2,981,417

MEANS FOR STOWAGE OF VESSELS

Filed Oct. 17, 1958

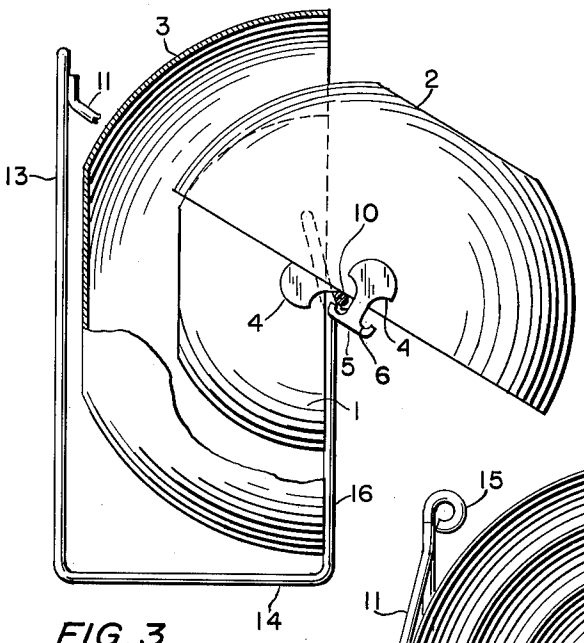


FIG. 3

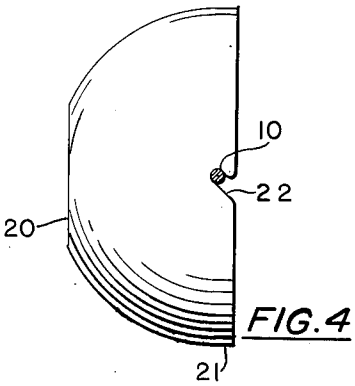


FIG. 4

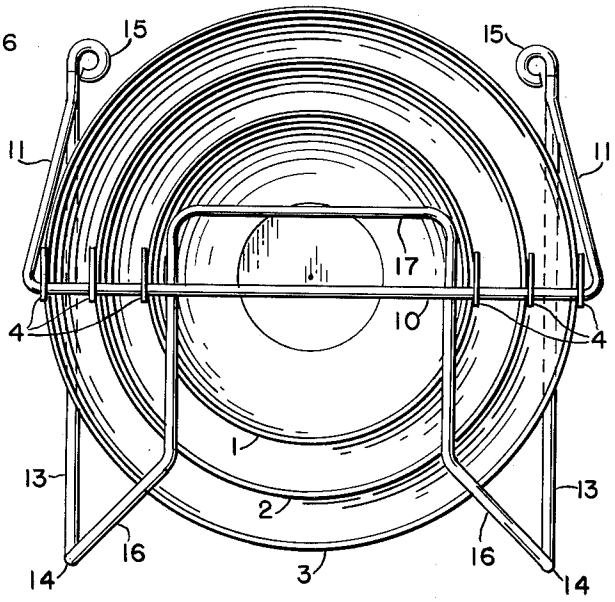


FIG. 2

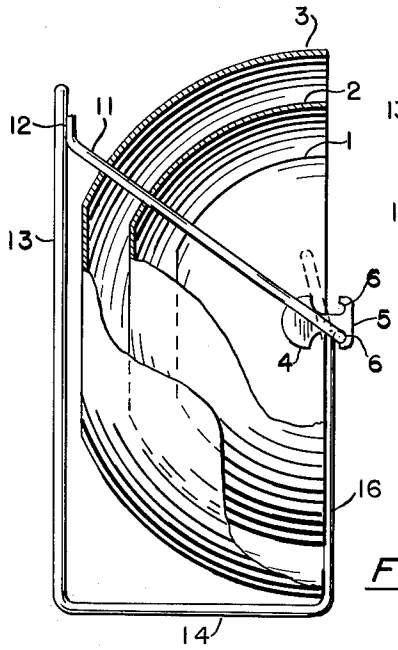


FIG. 1

INVENTOR

United States Patent Office 2,981,417
Patented Apr. 25, 1961

2,981,417

MEANS FOR STOWAGE OF VESSELS

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Filed Oct. 17, 1958, Ser. No. 767,922

5 Claims. (Cl. 211—78)

The present invention provides means for stowing a plurality of progressively sized vessels generally within one another in an assemblage so arranged that any one of the vessels may be removed without disturbing the others. Since all of such vessels are thus contained within a space substantially equal to that occupied by the largest alone, a great economy is effected in the stowage space required over that ordinarily employed in hanging or otherwise distributing the vessels separately; and, on the other hand, the immediate accessibility of any one of the vessels offers an obvious advantage over the inconvenience involved in removing such a vessel individually from a group of vessels kept nested one within the other in the ordinary way. The assemblage is mounted on a simple support or frame which may be laid or stood on a shelf or in a cupboard, or may be mounted on a wall for instant accessibility of the vessels contained therein. The removal of the required vessel from the assemblage is accomplished even more quickly and easily than by taking it off a hook. A further purpose of the invention is to provide the means described, in various forms simple and economical of fabrication and yet of sturdy construction, so that the device is practical for widespread domestic as well as for professional use.

The invention may be embodied in many forms, two of which have been chosen as preferred for illustrative purposes, and will be described in detail. In each form a receiver is shown which is adapted to accept independently and in any order the individual members of a given set of progressively-sized vessels, stably to stow such vessels in respectively pre-established positions in a generally nested arrangement within the receiver, and to permit the individual withdrawal independently and in any order, of the vessels of the set from their positions in the receiver. In every form of the invention means are provided which, in normal use, are adapted to prevent the withdrawal of the given vessel from, or its placement into, its respective position in the receiver from causing the dislodgment, from its respective general position therein, of any other of the vessels which may be contained in the receiver at the time of such withdrawal or placement. In no case is it necessary to touch, adjust or alter in any way the position of any vessel except that which is being removed from or placed into the receiver.

The basic principle of the invention may best be understood by considering each vessel of a series progressive in size, as being the approximate equivalent of a portion, usually half, of a hollow body of revolution, or as being a modified form of such a body. The axis of generation of the generalized half-body of revolution will be referred to as the bowl axis. Modified forms of such bodies are almost infinitely various; they include hollow hemispheres with flattened bottoms and/or cylindrical top extensions, which are the forms most generally taken by commercial sets of mixing-bowls; also, by extension, flat-bottomed cylindrical vessels, cylindrical

vessels whose axis is the axis of half-revolution, even square or polygonal vessels and many others may be considered as similar modifications, although usually such forms are not as useful as the hemispherical forms. Basically, the series of vessels as described is arranged or nested progressively one within the other, their bowl axes roughly coinciding. Means is thus provided whereby any one of the vessels may be rotated independently about an axis generally corresponding to its bowl axis, thus revolving out of its nested position in the assemblage until it may be lifted free from the other vessels. Such rotation would have to be quite exact if the vessels were to differ only slightly in their dimensions, in which case the vessels would also have to approach quite closely the shape of true half-bodies of revolution, such as hemispheres or half-cylinders. In practice, however, there is such a disparity in size between the vessels of a given set that much latitude in shape is permissible before interference between the vessels results, on rotation. Similarly, the axis about which the vessels are rotated for removal may be only very approximately that of the bowl axis; in fact with certain vessels—particularly relatively deep ones—removal is facilitated by rotating the vessel about an axis which progressively shifts its position relative to the vessel. Such rotations, although often differing in fact quite widely from a rotation about the exact bowl axis of the generalized body of which the vessel in question is considered as a modified form, may always be generalized as such a rotation.

In the drawings:

Fig. 1 is a partial section through an assemblage of vessels, the section being taken on a median plane normal to the bowl and rotative axes of the vessels; the support or frame being here embodied in a form utilizing a rod or shaft as a pivot cooperating with hooked lugs fixed to the vessels.

Fig. 2 is a plan or elevation, showing the assemblage of Fig. 1 as seen looking directly into the nest of vessels.

Fig. 3 is a partial section similar to Fig. 1, but showing one of the vessels partially removed from the assemblage.

Fig. 4 is a view of a single vessel, illustrating an alternative embodiment in which the lugs are replaced by diagonal slots.

Referring to Figs. 1, 2 and 3, three hemispherical vessels with flattened bottoms are shown; the smallest vessel **1** nested generally within the medium vessel **2**, in turn generally nested within large vessel **3**. On the outer surface of each vessel near its edge are affixed, by welding or other suitable means, two tabs or lugs **4**. Tabs **4** are placed on diametrically opposite sides of each vessel, and protrude above the edge thereof. An imaginary line across each vessel between tabs **4** attached thereto may be considered as representing approximately the location of the bowl axis of the half-body of revolution of which the vessel is conceived as a modification, and thus also as the approximate axis of rotation described above. As drawn in Figs. 1, 2 and 3, the bowl axes of all three vessels roughly coincide, and tabs **4** of all three are thus in line, as shown in Fig. 2. A short distance above the face of the vessels, each of tabs **4** is broadened into a T-shaped cross portion **5**, extending in a plane normal to the bowl axis. Each of the extremities of T-portion **5** are shaped back toward the vessel, forming the hooks or half-loops **6**. The proportions of the above parts are such that the vessels may be supported thereby, from a cross bar **10** which traverses the faces of the vessels, as shown in Fig. 2; ample clearance being allowed for rod **10** to pass between the vessel face and the inward extending ends of T-portion **5**. Bar **10** also fits easily into the hook **6**, as shown in Figs. 1 and 3.

Bar **10**, straight in its central portion over a length

somewhat greater than that of the diameter of the largest vessel, is bent into legs **11**, which extend back outside the body of the largest vessel and are attached at the points **12**, as by welding, to two lateral extremities **13** of a second frame element shown as made of bent wire or rods. Each lateral extremity **13** is formed into a loop **15**, near the attachment point **12**. Loops **15** are adapted to receive screws or other means for supporting the structure, as on a wall. Lateral extremities **13** are shown as extending parallel to each other in a plane substantially parallel to the flattened bottoms of the nested vessels, thus forming a flat structural base below the latter. Extremities **13** are shown as the symmetrical terminations of a structural member made of a single bar or wire whose central portion **17** is disposed parallel to the bowl axes and somewhat within the zone occupied by vessel **1**, thus being adapted to act as a guide locating the latter laterally. Portion **17** is bent at its two ends into portions **16** which cross the bowl axes, and under bar **10**, to which they are attached, as by welding. Portions **16** then extend generally across the faces of the vessels until well outside the zone of the largest vessel, at which point they are bent backwardly at substantially right angles to form portions **14**, which are in turn bent at right angles to terminate in portions **13** and loops **15** as already described. A rigid framework is thus formed by bar **10**, legs **11**, and the rod or wire bent as described into portions **13**, **14**, **15**, **16** and **17**.

Fig. 4 reveals one of many possible variations of the above-described structure. Vessel **20** is shown, as typical of all the vessels of the assemblage. Although not necessarily so constructed, vessel **20** is shown as having a short cylindrical extension **21** beyond the true hemispherical portion, which is flat-bottomed as before. A slot **22** is cut downwardly and at an angle, into each opposite edge of the vessel. Slot **22** is of a size easily accommodating a cooperating pivot member, such as the bar **10** of Figs. 1, 2 and 3, shown in cross-section in Fig. 4. The disposition of slots **22** on the two edges of the vessel is such that a pivotal bar such as bar **10**, when lying in the bottom of the slots, corresponds approximately with the bowl axis of the vessel.

The operation of the device will be apparent from the drawings. In the illustrative embodiment shown in Figs. 1, 2 and 3, the frame or support, constructed as already described from the bar or wire portions numbered **10**, **11**, **13**, **14**, **15**, **16** and **17**, may be utilized in any of three positions, viz: (1) lying on a flat surface, the frame supported by portions **13**; (2) standing on a flat surface, the contact members being the two parallel members **14**; or (3) hanging on a wall or other vertical surface to which it may be attached by screws passing through loops **15**. In all three cases, the vessels, when stowed, will assume the positions shown in Figs. 1 and 2, and will be supported principally by the lugs **4** and hooks **6** passing over or around the transverse bar **10**. Since lugs **4** are placed on diametrically opposite sides of the vessel, hooks **6** will lie somewhat to one side of the center of gravity of the vessels; this is shown most clearly in Fig. 2, where the bar **10**, which passes through hooks **6**, is clearly seen to lie below the centers of the bowls. In all three positions of the supporting frame there will therefore be a turning moment on the vessels (counterclockwise in Fig. 1) tending to maintain them resting in nested position, with their edges in contact with the portions **16** of the framework. When it is desired to remove any of the vessels from the assemblage, that vessel is simply grasped by its upper edge—or by a conventional loose ring attached thereto—and revolved outwardly around the bar **10** as a pivot. Fig. 3 illustrates the median vessel **2** of the three shown in Figs. 1 and 2, so revolved. At some point in its revolution the vessel **2** may be slid out along bar **10**, thus freeing hook **6** from contact therewith; the vessel then may be lifted off the assemblage easily, and without disturbing the other vessels therein. When it is desired to return the vessel, the process is simply reversed; the vessel is placed into its cavity and its edge rested on bar **10**; it is then pushed inwardly, while turning, until arrested by contact with lug **4**; beyond a point where its center of gravity lies above bar **10**, its own weight will cause it to continue turning, and the vessel will drop once more into nested position.

For certain shapes or materials of vessels the variation shown in Fig. 4 becomes suitable. It is evident that the diagonal slots **22**, formed in the edges of each of the vessels of the set, as already described, will enable the vessels to rest in a framework such as that of Figs. 1, 2 and 3 in the same way as the vessels shown therein, when the framework is positioned as illustrated, that is, either resting on frame portions **14** or mounted on a vertical surface by screws through loops **15**. Vessels so slotted can obviously not be used with the framework flat—i.e., resting on portions **13**. The procedure for placing a vessel so slotted into the assemblage is similar to that already described; the vessel is placed into the appropriate opening, turned and lowered until its edge rests on bar **10**; it is then further turned and pushed inward until bar **10** enters slots **22**; turning continues and the vessel finally falls into resting position, of its own weight. A further restriction to the use of vessels slotted as in Fig. 4, is, of course, that they must be placed with slots **22** correctly oriented.

The assemblage is shown illustratively as consisting of three vessels, but it is clear that only the requirements of convenience and bulk limit the number of vessels which may be accommodated. The framework of Figs. 1, 2 and 3 may be increased in size and vessels added outside those shown. Any desired number may thus be added.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. An assemblage of vessels of progressive sizes nested one within the other, each vessel consisting generally of a closed body terminating in an open annular rim lying substantially in a single plane, the planes containing the respective rims of said vessels lying substantially in coincidence or parallelism when said vessels are nested in said assemblage; a plurality of locating elements fixed to said body of each of said vessels and projecting beyond the plane of its annular rim; a frame adapted to assume a stable pre-established position upon a suitable flat supporting surface; said frame including a pivot bar disposed substantially horizontally when said frame assumes said pre-established position upon said supporting surface; said locating elements associated with each of said vessels cooperating with the rim thereof to rest in such a position on said pivot bar that said vessel may be rotated about said bar into or out from said assemblage.

2. The assemblage of vessels, the locating elements and the frame defined in claim 1; each of said locating elements being comprised of a central portion projecting across and substantially normal to the plane of said rim, a transverse portion forming a T with said central portion on that side of the plane of said rim not occupied by said body of said vessel, and two hook portions returning toward the plane of said rim, one from each end of said T.

3. An assemblage of vessels of progressive sizes nested one within the other, each vessel consisting generally of a closed body terminating in an open annular rim lying substantially in a single plane, the planes containing the respective rims of said vessels lying substantially in coincidence or parallelism when said vessels are nested in said assemblage; each of said bodies of said vessels bearing a plurality of slots penetrating thereinto from and through said rim of said vessel; a frame adapted to assume a stable pre-established position upon a suitable flat supporting surface; said frame including a pivot bar

disposed substantially horizontally when said frame assumes said pre-established position upon said supporting surface; each of said slots in said bodies of said vessels being adapted to receive said pivot bar, and two of said slots in each vessel being so arranged that said vessel may be held in a pre-established position on said pivot bar such that said vessel may be rotated about said bar into or out from said assemblage.

4. An assemblage of vessels of progressive sizes nested one within the other, each vessel terminating in an open rim, the rims of said vessels lying in the same general plane when said vessels are nested in said assemblage; together with a support for said assemblage; said support

including a substantially horizontal pivot bar lying generally adjacent to the plane containing said rims of said vessels, and a guiding member intersecting said plane and adapted to engage the rim of one of said vessels at a point within that plane.

5. The assemblage of vessels and the support as set forth in claim 4, said support also comprising mounting elements disposed in a plane, whereby said support may be attached to a wall.

References Cited in the file of this patent

UNITED STATES PATENTS

2,596,312 Von Mertens ---------- May 13, 1952