Aug. 12, 1952 A. V. RUDD 2,606,683

STACKABLE RECEPTACLE

Filed May 8, 1947 2 SHEETS—SHEET 1

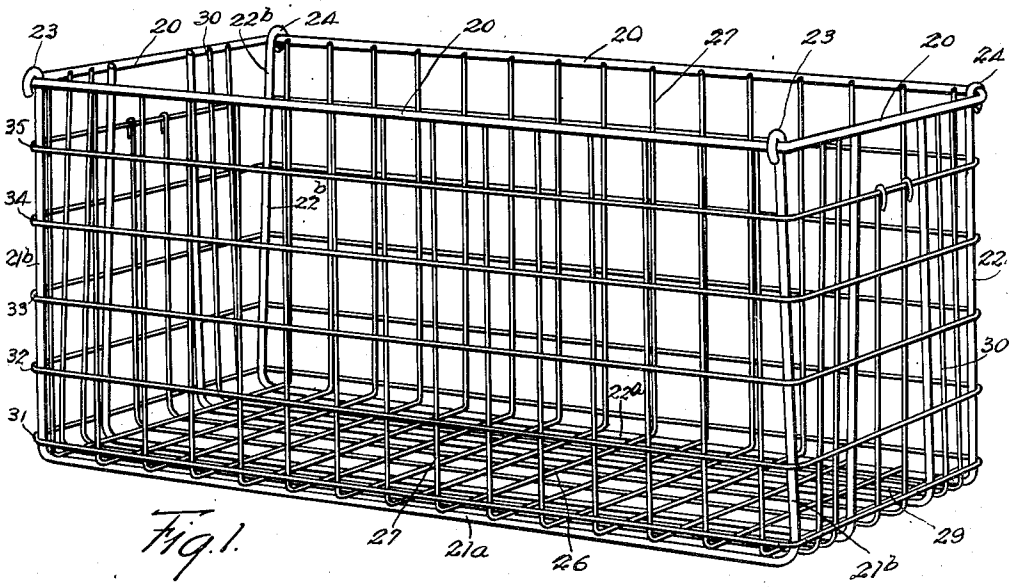

Fig. 1.

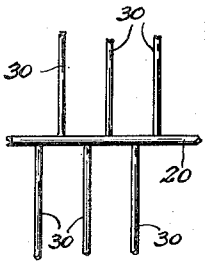

Fig. 2a.

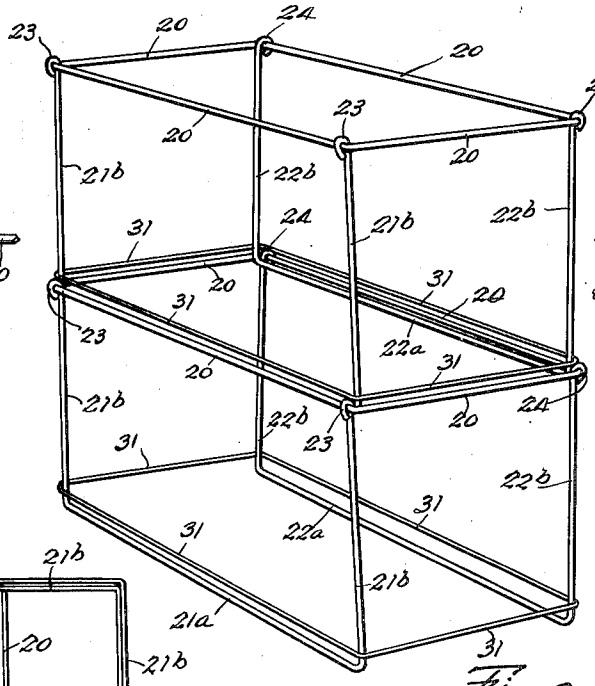

Fig. 2.

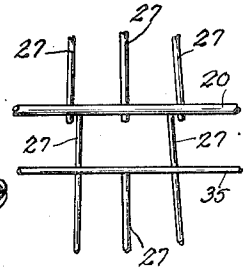

Fig. 2b.

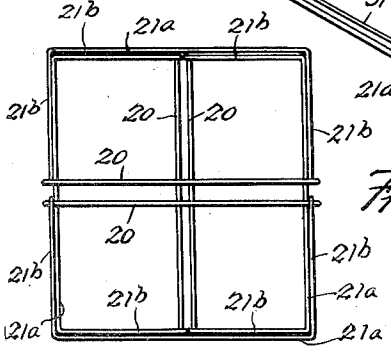

Fig. 2c.

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Filed May 8, 1947 2 SHEETS—SHEET 2

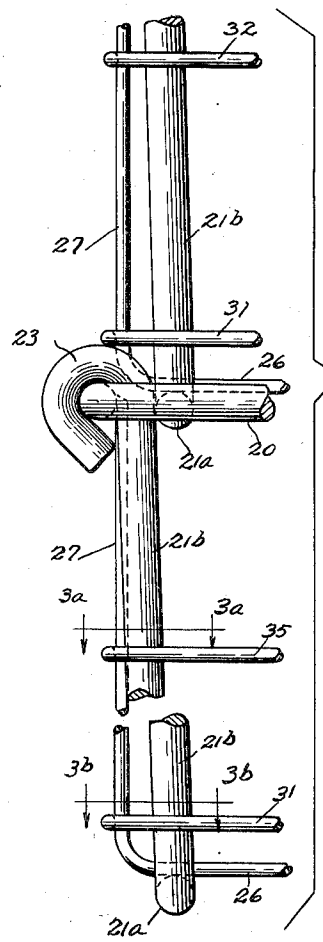

Fig. 3.

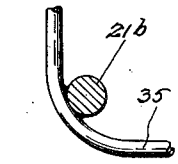

Fig. 3a.

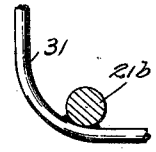

Fig. 3b.

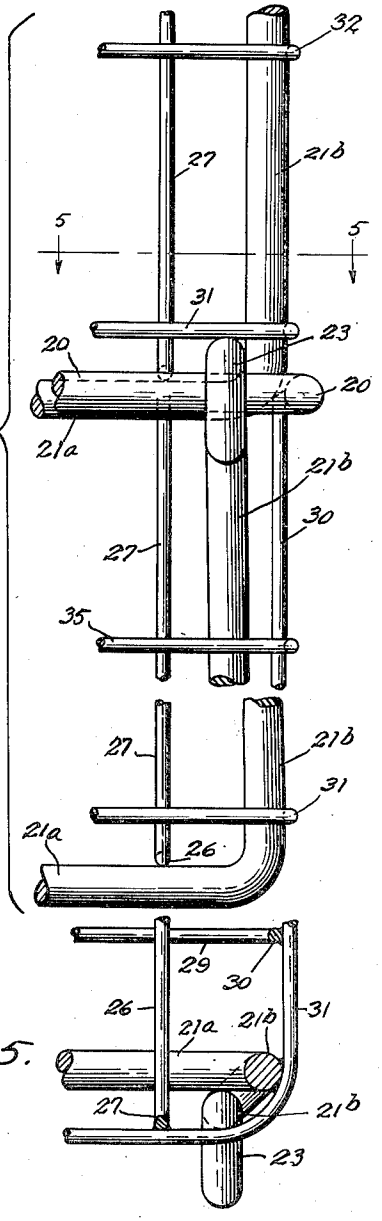

Fig. 4.

Fig. 5.

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Patented Aug. 12, 1952

2,606,683

UNITED STATES PATENT OFFICE

2,606,683

STACKABLE RECEPTACLE

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Application May 8, 1947, Serial No. 746,792

3 Claims. (Cl. 220—19)

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This invention relates to improvements in receptacles now commonly employed in the transportation of various articles, and has particular relation to the provision of means whereby such receptacles may be stacked one on top of the other without the continuing possibility that the normal impacts received during, or movements arising from, transportation shall so shift the upper members of a stacked assembly that they tend to be displaced and their bottom portions bear upon the articles in the next lower receptacle.

Inasmuch as receptacles of this character are many times employed in the transportation of various comestibles, particularly meats, vegetables, etc., some of which are peculiarly subject to damage if weight is imposed thereupon, the necessity for insuring permanent stackability in receptacles of this character is a vital consideration in their use. The use of adjustable stacking members which are moved from the outside of a receptacle over the upper edge thereof and into position within the interior upper receptacle boundary to support the bottom of another receptacle on the top of the lower receptacle is well known and is illustrated, for instance, in Faulkner Patent No. 2,252,964. However, the provision of such adjustable stacking irons is a matter of marked expense, and they are very frequently bent or broken in use. They also involve the presence of adjustable members which may move about and interfere with the normal use of the receptacle and be detrimental in other ways not necessary here to detail. The Faulkner patent also discusses the shortcomings of tapered receptacles.

The receptacle hereinafter described and claimed is so built that one of the same can be stacked upon another (in fact, four and five-high stacks are frequently used), with the assurance that the engaging portions of vertically adjacent receptacles so cooperate as to insure that the bottom of the upper receptacle shall be wholly supported above the contents of the lower receptacle in such manner that the two receptacles are locked against horizontal displacement. Moreover, this stackability is accomplished in receptacles which are of maximum volume for the upper or open area thereof without the necessity of providing adjustable stacking irons or similar adjacents, i. e., the receptacles are of the non-tapering variety.

The invention will be better understood as the description thereof is given in connection with the accompanying drawings, in which:

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Fig. 1 is a elevational perspective view of a receptacle embodying the invention;

Fig. 2 is a perspective view illustrating two of these receptacles stacked one upon the other, but with most of the wire structure thereof omitted to facilitate an understanding of the manner in which certain of the portions of these receptacles cooperate to promote the claimed stackability;

Figs. 2*a* and 2*b* are fragmentary elevational end and side views respectively illustrating the manner of cooperation of the end and side vertically extending wires of two stacked receptacles in a hereafter discussed desirable alternate form thereof.

Fig. 2*c* is a side elevational view (with certain portions omitted as in Fig. 2) illustrating the manner of nesting four of the stackable receptacles shown in Figs. 1 and 2.

Figs. 3, 3*a*, 3*b*, 4, 5 are enlarged fragmentary views illustrating the manner in which the abutting upper and lower corner and/or frame portions of receptacles cooperate when one receptacle is stacked upon another.

A receptacle embodying the herein described and claimed invention comprises an upper heavy-gauge frame wire **20** to which are attached by over-turned eye portions two heavy-gauge side frame and end corner wires **21** and **22**. The upper frame **20** is formed substantially integral to include the two sides and two ends of the receptacle and thus comprehend a closed rectangular horizontally extending frame on which the remainder of the receptacle is supported. The side frame members comprise lower longitudinally extending portions **21***a* and **22***a* and riser or columnar end portions **21***b*—**21***b* and **22***b*—**22***b* extending upwardly, the latter terminating at their upper or free ends in eye portions **23**—**23** and **24**—**24**, respectively. The latter are bent over the longitudinally extending side portions of the upper frame member **20** at carefully selected points, thereby to form supporting and horizontally-effective locking members when one of the herein-described receptacles is stacked on another. U-shaped wire members having crosswise extending bottom members **26** and upwardly extending vertical side members **27** are disposed transversely of the receptacle, the upper ends of the latter being secured (as, for instance, by welding) to the side portions of frame **20**. Similarly U-shaped longitudinally disposed members include bottom lengthwise portions **29** and upwardly extending vertical end portions **30**, the upper ends of the latter being secured to the end portions of frame

20. Finally, horizontally-extending frame closed rectangular wire members 31, 32, 33, 34, and 35 are welded (or otherwise secured) to the outside of corner vertical portions 21*b*—21*b* and 22*b*—22*b* of the side frame heavy-gauge members, as well as to the upwardly extending members 27 and 30.

Several of the heretofore-described receptacle-forming members are so novelly disposed with respect to each other that, although the receptacles are non-tapering (wherefrom a maximum volume of material may be contained therewithin), said receptacles are stackable one upon the other (the upper receptacle being supported on the lower receptacle), and are thereafter secured from displacement due to horizontal movement of one receptacle with respect to another. Moreover, this is accomplished without the bottom of the upper receptacle undesirably pressing against or bearing upon frangible material contained in a substantially completely filled lower receptacle because of the manner in which certain of the afore-described members cooperate with each other at the four vertically abutting corners of two stacked receptacles. As the particular combination and disposition of parts which permits this novel and long desired stackability in receptacles of this character is explained, reference should be had not only to the illustrations of the receptacle as a whole, but even more particularly to the enlarged fragmentary views of the abutting corners, sides and ends illustrated in Figs. 2*a*, 2*b*, 3, 4, 5.

In order to preserve the maximum volume outline of the receptacles, the cross U-shaped members 26—27 and the longitudinally extending U-shaped members 29—30 have the vertical upwardly extending portions thereof bent at substantially right angles to their horizontally extending portions. Such formation of the just-referred-to members insures a non-tapering, maximum-volume receptacle. The problem then arises, however, to secure stackability with such receptacles. This is provided by the novel and unusual disposition of the corner wire column members 21*b*—21*b* and 22*b*—22*b* and end (30) and—when required—of the vertically extending side (27). The bottoms of said corner members are displaced both laterally and longitudinally with respect to the tops thereof, wherefrom said tops (being the eye portions 23—23 and 24—24) are so positioned with respect to the bottoms thereof that the latter are placeable inside of the said top eye members for stacking purposes as herein described. Despite such displacement of the upper ends of said corners to provide a horizontal stacking locking relation between the bottom and top portions of adjacent stacked receptacles, the wire members forming the other boundaries of the receptacles are not disturbed.

Reference to Figs. 3, 3*a*, 3*b*, and 5 shows, possibly more clearly than do any of the other figures, the manner in which the upper end of one of the corner members—for instance, 21*b*—is displaced longitudinally and laterally with respect to the bottom of this same vertical member to provide the aforesaid relation. Note that the bottom-most horizontally extending frame wire 31 is secured near the bottom of the corner member 21*b* (see Figs. 3 and 3*b*), and that the uppermost of such horizontally extending wires (35) is secured to 21*b* near the top of the latter as shown in Fig. 3*a* (the position of the extreme top of 21*b*—where it contacts and is secured to 20—is best shown in Fig. 5). Thus viewing this corner member from the top, the upper end thereof will be seen to have been deliberately displaced with respect to, or canted at a substantial angle away from, its lower end. This particular combination of elements permits the portion of the wire 31 just to the left of where it is connected to the member 21*b* to rest upon the upper side of the bent-over eye portion 23 even though said bent-over eye portion 23 is a part of the same vertical member 21*b*. It will be understood that said wire 31 of an upper receptacle (see Fig. 2) rests on the lower receptacle at four points, i. e., on the upper portions of the four eye portions 23—23 and 24—24. It is because of this novel construction that the receptacle as a whole is of maximum volume and non-tapering, wherefrom a nesting of one within the other may be obtained for return purposes, and a stacking of one on top of the other may be secured despite the non-tapering character thereof.

By predetermining the length, depth and width dimensions as shown in Fig. 2 wherein the overall or outside height or depth is slightly less than the inside width (the outside width is here shown as slightly less than one-half the inside length), four of the illustrated receptacles may be compactly nested for return (see Fig. 2*c*). Thus by turning the up-ended receptacles so that the depth dimensions thereof are parallel to the widths of the horizontally extending receptacles, this novel combination of receptacle structure and dimensions permits the nesting of four receptacles with only slight volume waste.

Further reference to Figs. 3, 4 and 5 discloses the manner in which the four abutting corners of stacked receptacles are locked against relative horizontal movement, i. e., how the lowermost horizontally extending member 31 is deliberately so combined with the slightly canted columnar members 21*b*—21*b* and 22*b*—22*b* that the lower ends of said members 21*b*—21*b* and 22*b*—22*b* nest within the inner upper ends of said members just sufficiently to permit the wire 31 to rest on the upper over-turned portions 23—23 and 24—24. The combination of the just-referred-to members is, moreover, such that, when two receptacles are stacked, the lowermost points of the upper receptacle, i. e., the longitudinal extending bottoms 21*a* and 22*a* of the side frame members, extend very little below the upper main horizontal frame 20. This provision prevents the imposition of the weighted upper receptacle on the top of any material which may be contained in the lower receptacle, and this irrespective of the fact that said lower receptacle is substantially completely filled.

Moreover, the vertically extending end portions 30—30 may be displaced (slanted) from the perpendicular (see Fig. 2*a*) to insure that, when two of the herein described receptacles are stacked, the lower ends of the various members 30 will not interfere with the upper ends of similar members in the next lower receptacle at the points where the latter are secured to the end portions of 20—20. Half of the end members 30 are slanted in one direction and the other half in the opposite direction (although all may be slanted in the same direction, if desired). Parenthetically, the two centrally located members 30—30 would similarly be slanted in a noninterfering manner if the latter were extended completely upwardly and secured to the inside of the end portions of 20—20. In the particular receptacle illustrated, however, said centrally located members are terminated and bent over hori-

zontally extending frame wire **35**, thereby to eventuate openings which function as handholds. Also, the vertically extending portions **27** of the transversely-extending U-shaped members may be displaced from the vertical (slanted as shown in Fig. 2*b*) to eliminate interference between the bottoms thereof on an upper receptacle and the tops thereof on a lower receptacle when said lower and upper receptacles are in stacked position.

The foregoing slanted disposition of the vertical end and side members may not be necessary when the stacked corner members engage as shown in Figs. 3, 3*a*, 3*b* and 4, but it is described as a desirable alternative.

Accordingly, receptacles embodying the hereindescribed invention may be stacked one upon the other with the assurance that they cannot be displaced longitudinally one from the other under the normal impacts. This ability to withstand such displacement of the bottom of one receptacle from the top of the next lower receptacle in a horizontal direction is another novel result obtained from the disposition of the various members comprising the receptacles in the manner illustrated in said Figs. 3, 4, and 5. Not only are receptacles embodying the present invention stackable as shown in Fig. 2; stacks thereof may also be formed by placing two side-by-side receptacles on top of and extending crosswise with respect to two side-by-side lower receptacles.

It should be immediately appreciated that whereas the corner columnar members which terminate in the over-turned eye portions are canted as hereinbefore specified, such disposition does not result in a tapering receptacle.

The combination of the members forming the receptacle in such manner that the hereinclaimed stackability is secured without reducing the maximum volume content of the receptacles is also illustrated by observing that all of the outer horizontal wires **31**, **32**, **33**, **34** and **35** comprehend substantially the same area as the upper main frame member **20**.

As before intimated, it is possible to nest two upended empty receptacles within a horizontally disposed receptacle and to place another and reversed (upside-down) horizontally disposed receptacle over the tops of the two nested upended receptacles, thus forming a very compact 4-receptacle return shipping or storing unit. When such nesting is effected the indicated predetermined location of the stack-enabling members permits the upended receptacles to be received to the full depth of the horizontally disposed receptacles which are associated therewith. Such combined stackability and nestability of receptacles embodying the present invention accordingly results from the combining of the receptacle forming members in the novel manner hereinbefore described and hereafter claimed; the compactness of just referred-to 4-receptacle unit is enhanced because of the novel dimensions employed, it being understood that the latter feature is claimed as a part of the present invention.

Therefore, it is intended that the invention should not be limited to the specific embodiment or embodiments disclosed herein, since modifications may be made, and it is contemplated, therefore, that the appended claims shall cover any such modifications as fall within the true spirit and scope of the invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A non-tapering, elongated wire receptacle, comprising any upper continuous frame member, two U-shaped side frame members, U-shaped transversely and longitudinally disposed receptacle forming members having their free ends secured by welding to the upper frame member, said side frame members comprising longitudinally extending bottom portions and substantially vertical end portions, the free ends of the latter being bent outwardly over the sides of the upper rectangular frame member at the corners thereof to form eyes to secure them to and extend them from and inside of the upper frame member and cause the tops of said eyes to project above the upper frame to form supports for a superimposed receptacle, the lower integral ends of the substantially vertical end portions of the side frame members each being inset slightly, transversely of said receptacle, at least to the extent of the thickness of a side frame member, to permit the bottoms of U-shaped side frame members on a superimposed receptacle to nest within the tops thereof on a lower receptacle, additional horizontally extending frames, enclosing said side frames and receptacle forming frames and welded to the outer edges thereof, the lower most of said last-named frames being supported on the eye portions of a lower receptacle when two receptacles are superimposed, and wherein the bottoms of the U-shaped side frame members are nested within the top rectangular frame member of the lower receptacle when superimposed thereon, whereby the superimposed receptacle is locked against horizontal movement.

2. A non-tapering, elongated wire receptacle, comprising an upper continuous frame member, two U-shaped side frame members, U-shaped transversely and longitudinally disposed receptacle forming members having their free ends secured by welding to the upper frame member, said side frame members comprising longitudinally extending bottom portions and substantially vertical end portions, the free ends of the latter being bent outwardly over the sides of the upper rectangular frame member at the corners thereof to form eyes to secure them to and extend them from and inside of the upper frame member and cause the tops of said eyes to project above the upper frame to form supports for a superimposed receptacle, the lower integral ends of the substantially vertical end portions of the side frame members each being inset slightly, transversely of said receptacle, at least to the extent of the thickness of a side frame member, to permit the bottoms of U-shaped side frame members on a superimposed receptacle to nest within the tops thereof on a lower receptacle, additional horizontally extending frames, enclosing said side frames and receptacle forming frames and welded to the outer edges thereof, the lower most of said last-named frames being supported on the eye portions of a lower receptacle when two receptacles are superimposed, and wherein the bottoms of the U-shaped side frame members are nested within the top rectangular frame member of the lower receptacle when superimposed thereon, the sides of the horizontally extending bottoms of the U-shaped side frame members abutting against the inside of the eye portions of said lower receptacle to prevent side motion of the upper superimposed receptacle with respect to the lower receptacle and with the ends of said bottoms abutting against the ends of the upper frame member of the lower receptacle to prevent relative end movement between said superimposed receptacles whereby the superimposed re-

ceptacle is locked against horizontal movement.

3. A non-tapering, elongated wire receptacle, comprising an upper continuous frame member, two U-shaped side frame members, U-shaped transversely and longitudinally disposed receptacle forming members having their free ends secured by welding to the upper frame member, said side frame members comprising longitudinally extending bottom portions and substantially vertical end portions, the free ends of the latter being bent outwardly over the sides of the upper rectangular frame member at the corners thereof to form eyes to secure them to and extend them from and inside of the upper frame member and cause the tops of said eyes to project above the upper frame to form supports for a superimposed receptacle, the lower integral ends of the substantially vertical end portions of the side frame members each being inset slightly, transversely of said recepacle, at least to the extent of the thickness of a side frame member, to permit the bottoms of U-shaped side frame members on a superimposed receptacle to nest within the tops thereof on a lower receptacle, a lower horizontally extending frame enclosing and secured to the outer edges of said side frames and receptacle forming frames, which

lower frame is supported on the eye portions of a lower receptacle when two receptacles are superimposed, the bottoms of the U-shaped side frame members being nested and locked against horizontal movement within the top rectangular frame member of the lower receptacle when superimposed thereon by abutment against the inside of said eyes and the ends of the upper frame of the lower receptacle.

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