

Sept. 22, 1964

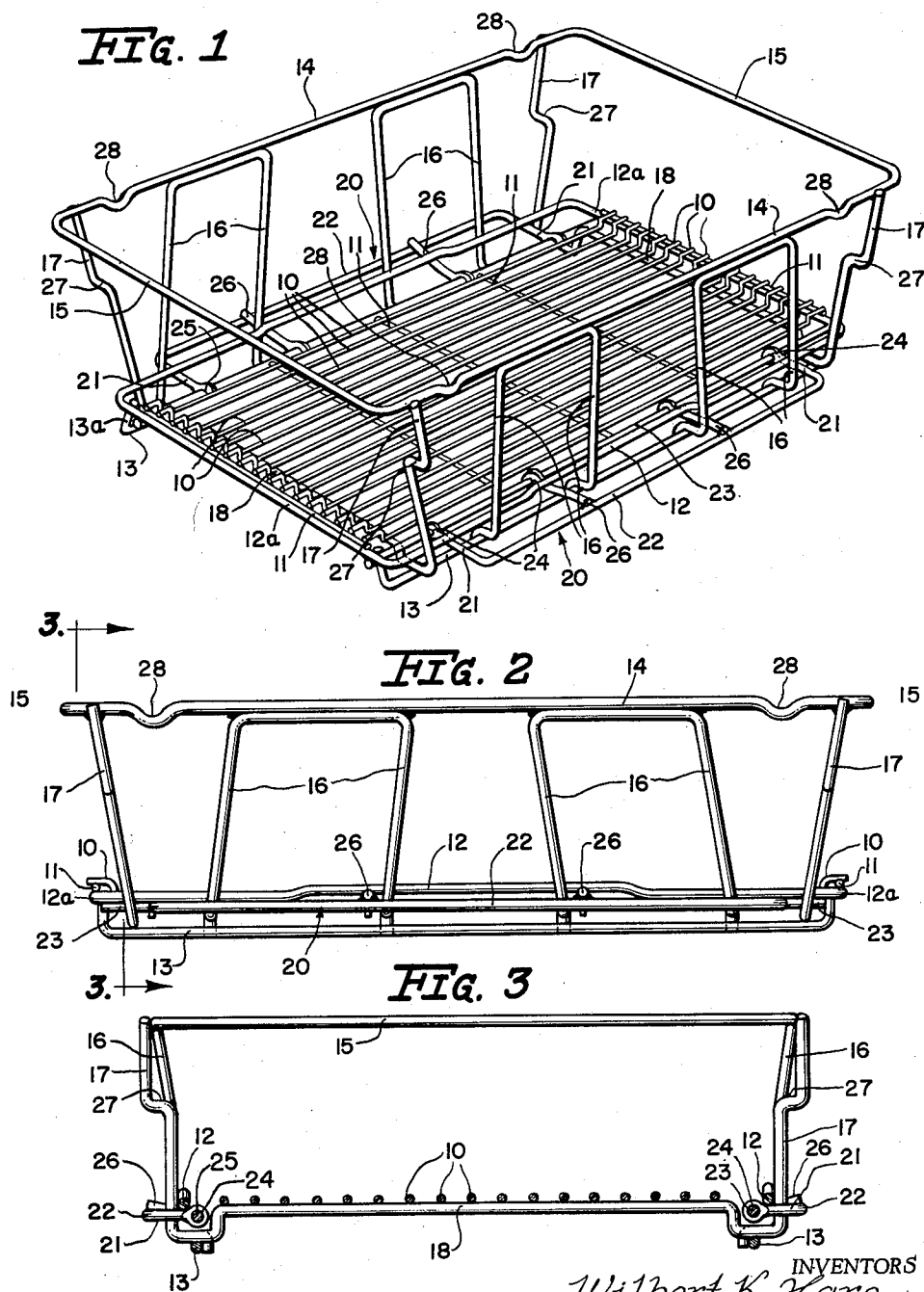
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3,149,748

NESTING AND STACKING RECEPTACLES

Filed May 7, 1963

3 Sheets-Sheet 1



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FIG. 4

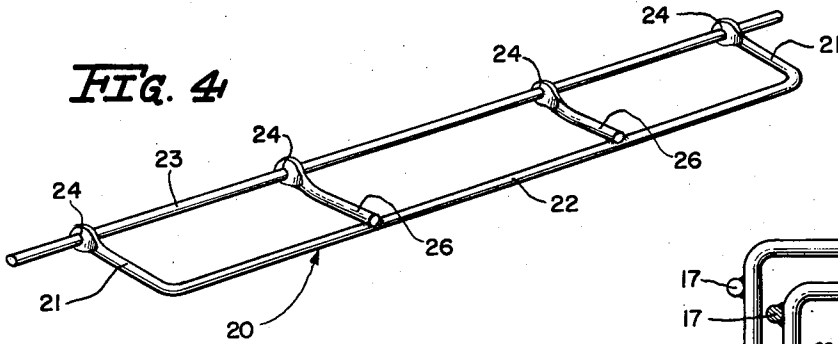


FIG. 8

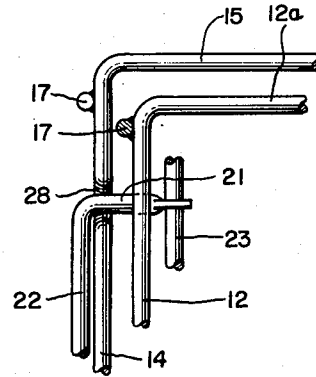


FIG. 7

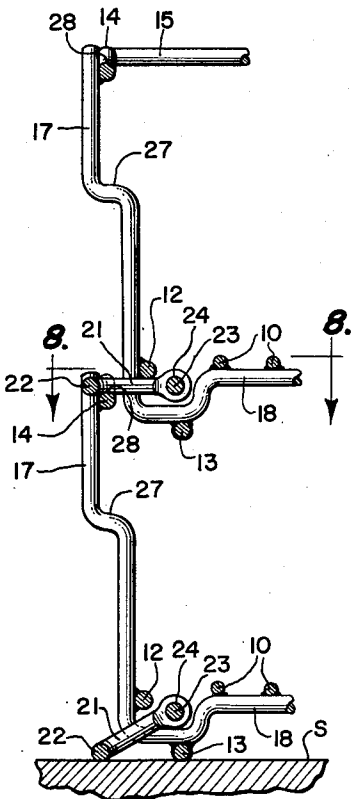


FIG. 6

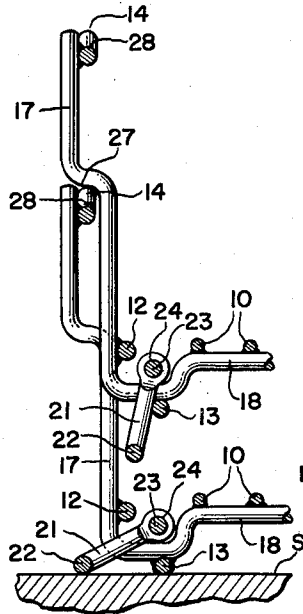
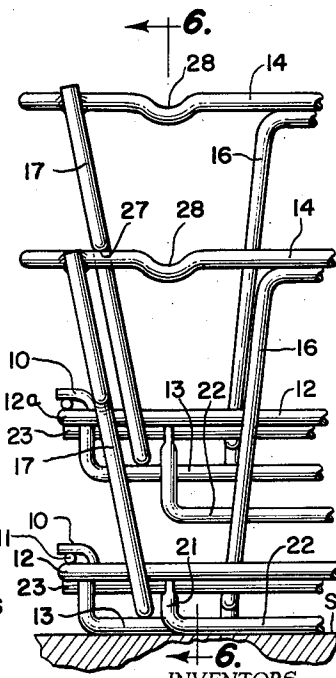


FIG. 5



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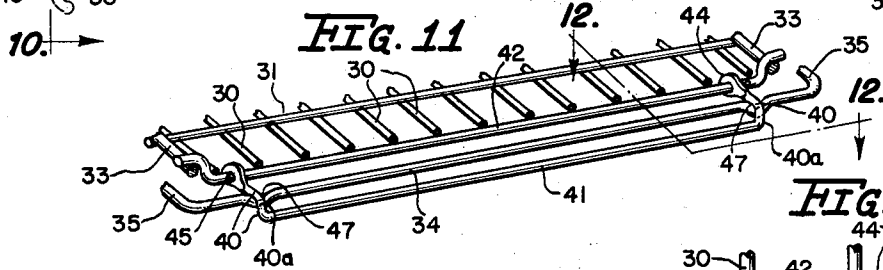
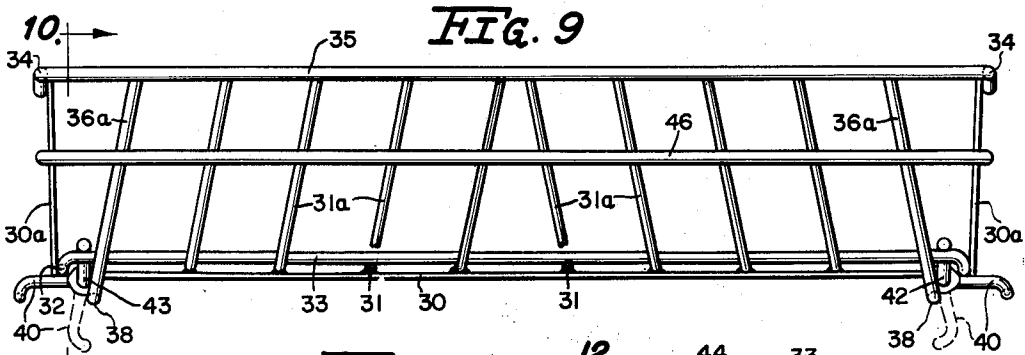


FIG. 12

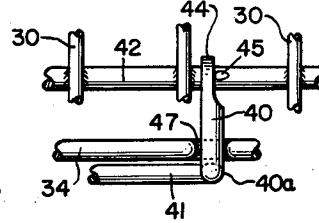


FIG. 10

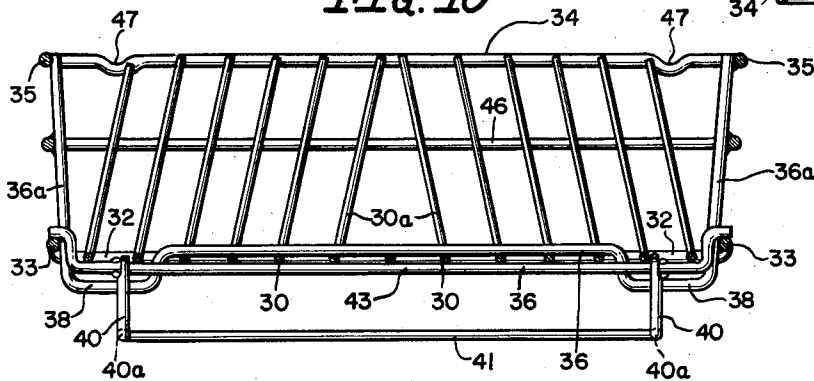
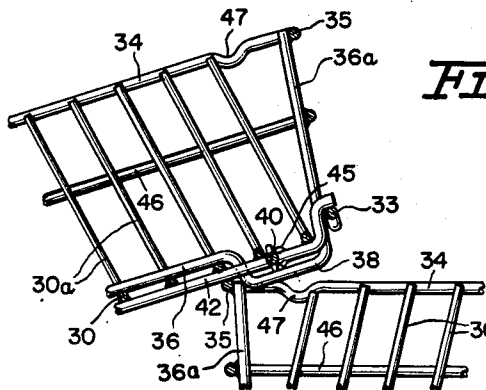


FIG. 13



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NESTING AND STACKING RECEPTACLES

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5 Claims. (Cl. 220-97)

This invention relates to receptacles and in particular receptacles which may be stacked one upon the other, when loaded, and which may be nested one within the other for storage in relatively compact relation and thereby utilize less space for such storage.

A receptacle incorporating the features of this invention includes stacking members which are supported for swinging movement between a first or stacking position in which said members project outwardly in opposite directions from the confines of said receptacle for engagement with upper surfaces of a subjacent like receptacle to establish a stacked relationship of such receptacles and a second or nesting position in which said members are in downwardly and inwardly swung position to accommodate entry of the lower portion of a receptacle into nested relation with a subjacent like receptacle while said stacking members are in said latter position.

It is also an object of this invention to provide stacking members which normally occupy an inoperative position favorable to nesting of like receptacles while sensitive to the application of upward force incident to downward engagement of a stacking member with an underlying abutment surface to move said stacking members into operative position.

A further object of the present invention resides in the provision of a receptacle of the character indicated which incorporates a simple and rugged construction and yet accords an article which is relatively light in weight and economical to manufacture.

Other objects and advantages will be apparent from the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a top perspective view of a receptacle embodying the features of this invention as the same appears when the stacking members are in inoperative position.

FIG. 2 is a side elevational view thereof.

FIG. 3 is an end elevational view thereof.

FIG. 4 is a detail perspective view of a stacking member as it appears in a detached state.

FIG. 5 is an enlarged fragmentary view illustrating a pair of receptacles as they appear when in nested relationship.

FIG. 6 is a vertical section taken along line 6-6 of FIG. 5.

FIG. 7 is an enlarged fragmentary view illustrating a pair of receptacles as they appear in stacked relationship.

FIG. 8 is a horizontal section taken along line 8-8 of FIG. 7.

FIG. 9 is a side elevational view of a modified type of receptacle embodying the present invention.

FIG. 10 is a vertical section taken along line 10-10 of FIG. 9.

FIG. 11 is a fragmentary top perspective view of the stacking member of a receptacle appearing in FIGS. 9 and 10 with said member in stacking position relative to a subjacent receptacle.

FIG. 12 is an enlarged fragmentary section taken along line 12-12 of FIG. 11.

FIG. 13 is a fragmentary view showing an upper receptacle of the type appearing in FIGS. 9 and 10 in the process of being moved into stacking position relative to a subjacent receptacle.

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A receptacle representing an exemplary embodiment of the present invention, as shown in FIGS. 1 to 8 of the drawings, includes a series of rods 10 and 11 secured in criss-cross relation to define an upwardly facing load supporting area. A wire rod sub-frame of rectangular outline includes a pair of spaced parallel arms 12 joined by a pair of end arms 12a to which the endmost wires 11 are fixed with the end arms 12a of the sub-frame in underlying alignment with said endmost wires 11 and said arms 12 in parallel relation to the rods 10 of the load supporting area. A pair of wire rod runners 13 are rigidly joined to the sub-frame along lines in downwardly and inwardly spaced parallel relation to the arms 12 of the sub-frame via legs 13a forming upwardly projecting end portions of the runners 13 which are welded or otherwise suitably secured to the end arms 12a of the sub-frame.

The upper rim of the receptacle, as shown, is also formed of the wire rod stock to provide a pair of side arms 14 joined along spaced parallel lines at a distance apart greater than the distance separating the arms 12 of the sub-frame by a pair of end arms 15 which are at a greater distance apart than the arms 12a of the sub-frame. Upright connecting members 16 of wire rod stock join the arms 12 of the sub-frame with the side arms 14 of the upper rim so as to dispose the arms 14 in uniformly upwardly diverging planes containing lines along which the arms 12 extend while the arms 15 are disposed in uniformly upwardly diverging planes containing lines along which the arms 12a extend. The arms 14 are also joined to the arms 12 of the sub-frame by upwardly and outwardly inclined corner members 17 which form upward extensions of wire reinforcing rods 18 with which the wires 10 of the load containing area have downward engagement along lines in inwardly spaced parallel relation to the endmost rod 11 of said load containing area. The upper rim of the receptacle as so defined by the arms 14 and 15 and as thus positioned with reference to the arms 12 and 12a via the upright connecting members 16 and the corner members 17 provides an open top receptacle into which the lower portion of a like receptacle may be lowered so as to permit nesting of said receptacles.

In accordance with the present invention two receptacle stacking members, generally indicated by the numeral 20, provide means whereby a pair of like receptacles incorporating the features of this invention may be supported in stacked relation via said stacking members having downward engagement with the upwardly facing support means defined by the arms 14 of a receptacle in underlying relation to said stacking members. Each stacking member is formed of a wire or rod bent to form a pair of arms 21 and an elongated bridge section 22 joining said arms in transversely aligned positions at a distance apart less than the dimension of the sub-frame measured lengthwise of the arms 14. A rod 23 secured to the sub-frame of the receptacle along a line in inwardly spaced parallel relation to one of the arms 12 of said sub-frame extends through bearings defined by perforations 24 formed in flattened end portions of arms 21 of one of said stacking members to provide an axis about which said stacking member is adapted to have free swinging movement between a first position in laterally outlying relation to side of the receptacle opposite thereto as shown in FIGS. 1, 2 and 3 and a second position in downwardly and inwardly rocked relation to said first position, as shown in connection with the upper receptacle appearing in FIGS. 6 and 7. A rod 25 similar to rod 23 and secured to the sub-frame of the receptacle along a line in inwardly spaced parallel relation to the other of said arms 12 of said sub-frame extends through bearings defined by perforations 24 formed in the flattened end zone of arms 21 of the second stacking member to pro-

vide an axis about which the second stacking member is swingable between positions corresponding to the first and second positions of the first stacking member. The bridge section 22 of each stacking member is also secured to a pair of supplementary arms 26 having swinging support on the rod 23. Movement of each stacking member 20 axially of the rod 24 or 25 on which it is supported for swinging movement is limited by interengagement of arms 26 of the stacking member with the upright connecting members 16 straddled by said arms 26. Thus each stacking member 20 occupies a position centrally of the dimension of the receptacle measured lengthwise of the arms 12 and 14. Upward swinging movement of each stacking member is limited by upward engagement of the arms 21 and 26 with first stop means defined by the surface of the arm 12 of the sub-frame in downwardly facing relation to said arms 21 and 26, to establish the first position of said stacking members. Each runner 13 presents a surface defining a second stop means with which the arms 21 and 26 of the stacking member have inward or downward engagement to establish the second or downwardly swung position of the associated stacking member. It will be noted from FIG. 6 that the arms 21 and 26 when thus positioned in engagement with the runner 13 are located outwardly of a vertical plane containing the axis on which said arms 21 and 26 swing between first and second positions whereby an underlying abutment surface S as shown in FIGS. 5, 6 and 7 with which said stacking member has engagement incident to lowering of the associated receptacle toward such surface will always cause the stacking member to rock toward its outwardly swung position. It will also be noted that pending such time as the stacking members are brought into engagement with an underlying supporting surface while undergoing lowering action toward such surface, the forces of gravity act to maintain the stacking members in downwardly rocked positions so as to accommodate entrance of stacking members and the lower portion of the receptacle with which said stacking members are associated to the area within the confines of the upper rim of an underlying like receptacle as shown in FIGS. 6 and 7. The depth to which the upper receptacle is adapted to be nested within an underlying like receptacle is determined by a downwardly facing shoulder 27 defined by an inwardly offset lower portion of the corner members 17, said shoulder having downward engagement with the arms 14 of the subjacent receptacle as shown in FIGS. 6 and 7.

Stacking of receptacles embodying the present invention is easily accomplished by grasping the receptacle by its opposite upper rim arms 14 and lowering the stacking members 20 against the end arm 15 of an underlying receptacle to establish sliding engagement of the bridge section 22 of the stacking member with the surface of the end arm 15 opposite thereto. The receptacle undergoing such stacking action can then be rocked forwardly on the end arm 15 of the underlying receptacle to establish downward engagement of the arms 21 of the stacking member 20 with the side arms 14 of the underlying receptacle.

Each arm 14 is provided with a pair of downwardly offset pockets or seats 28 at a distance apart matching the distance between the arms 21 of a stacking member and in such central relation to the dimension of the receptacle measured lengthwise of the arms 12 and 14 as to maintain a first receptacle in vertical alignment with an underlying like receptacle when the stacking members 20 of said first receptacle are received by the seats 28 of the underlying receptacle. While the seats 28 thus provide stops effective to prevent relative shifting of said receptacles along lines extending lengthwise of the arms 14 while said receptacles are thus in stacked relationship, the bridge sections 22 of the stacking members 20 of each stacked receptacle has inward engagement with the surfaces of the arm 14 of the subjacent receptacle opposite said bridge section 22 to limit relative shifting movement

of said receptacles along lines lengthwise of the end arms 15. Thus the stack is very stable.

It will be noted from FIG. 6 that when the receptacles are in nested position, ample space is provided between the load containing areas of the nested receptacles to permit loading of flat type goods between said load containing areas.

In the modified embodiment of the present invention shown in FIGS. 9 to 13 inclusive, the receptacle includes a series of rods 30 and 31 secured in criss-cross relation to define an upwardly facing load supporting area. A wire sub-frame of rectangular outline provides a pair of spaced parallel side arms 32 joined by a pair of end arms 33 to the outwardly facing surface of which end arms 32 upwardly bent extensions 30a of said rods 30 have welded connection. Upwardly bent extensions 31a of rods 31 have welded connection to the outwardly facing surface of the side arms 32 of the sub-frame. The upper rim of the receptacle shown in FIGS. 9 and 10 is likewise formed of wire rod stock to provide side arms 34 joined along spaced parallel lines at a distance apart greater than the distance separating the side arms 32 of the sub-frame by a pair of end arms 35 which are at a greater distance apart than the end arms 33 of the sub-frame. The upper ends of the extensions 30a of rods 30 and the upper ends of extensions 31a of rods 31 have welded connections to the inner faces of the arms 34 and arms 35 respectively to establish the upper rim in upwardly spaced parallel relation to the corresponding arms of the sub-frame, and in such outwardly offset relation to a vertical projection of the sub-frame as to permit the sub-frame of the receptacle to be lowered into a subjacent like receptacle to effect a nested relationship of said receptacles.

A pair of wire rod members 36 secured to the rods 30 of the load supporting area along spaced parallel lines at a distance apart slightly short of the distance between and lengthwise of the side arms 32 of the sub-frame have upwardly bent extensions 36a at opposite ends thereof which are joined to the end arms 33 of the sub-frame and to the end arms 35 of the upper rim of the receptacle. Each member 36 has a downwardly offset portion 38 at the junction with said extensions 36a which provide bottom support below corner regions of the receptacle for downward bearing engagement with an underlying supporting surface.

The receptacle shown in FIGS. 9 and 10, like those shown in FIGS. 1 to 8, is provided with stacking members having swinging support along opposite borders of the receptacle defined by the side arms 32 of the sub-frame. Each of such stacking members is formed of a wire or rod bent to form a pair of arms 40 joined in transversely aligned spaced apart positions by an elongated bridge section 41. A rod 42 having upward engagement with the rods 30 of the load supporting area of the receptacle and arranged alongside one of the rod members 36 outwardly of the area between said rod members 36 occupies a position inside a downward vertical projection of the side arm 32 of the sub-frame nearest said rod member 36 while a similar rod 43 arranged alongside the other rod member 36 outwardly of the area between said rod members 36 occupies a position inside a downward vertical projection of the other side arm 32 of the sub-frame at the opposite side of the receptacle. Rod 42 provides an axis about which one of said stacking members has swinging movement between a first position in laterally outlying relation to the side arm 32 of the sub-frame nearest said rod 42 as shown in full lines in FIG. 9 and a second position in downwardly and inwardly rocked relation to said first position as shown in dotted lines in FIG. 9. Rod 43 similarly provides an axis about which the other stacking member has swinging movement between first and second positions as shown in FIG. 9. The arms 40 of each stacking member are pivotally mounted on their associated axis rod via perforations formed in flattened

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end portions 44 on said arms. While thus supported on said axis rod, the arms 40 of the stacking member are confined against axial movement on said rod via lugs 45 formed integrally with the axis rod. It will be observed that the arms 40 of each stacking member have engagement with the bottom supports 38 of the rod 36 which define stop means facing the area in which the stacking member has swinging movement between first and second positions to limit movement of the swinging member from said first position toward said second position. Such interengagement between the supports 38 and said arms of the stacking member opposite thereto is established while the stacking member is located outwardly of a plane projected vertically downwardly of the axis rod on which the stacking member is pivotally mounted. Upward swinging movement of the stacking members from said second or downward position is limited by upward engagement of said arms 40 of the stacking member with a stop means defined by the lower surface of the sub-frame side arm 32 facing the area in which said stacking member has swinging movement.

It will be noted that the stacking members of the receptacle shown in FIGS. 9 to 13 inclusive, like the stacking members of the receptacle shown in FIGS. 1 to 8 inclusive, occupy downwardly rocked positions so as to accommodate entrance of said stacking members and the lower portion of the receptacle with which said stacking members are associated to the area within the confines of the upper rim of an underlying like receptacle. The depth to which the receptacle in FIGS. 9 to 13 is adapted to be nested within an underlying like receptacle is determined by a reinforcing border wire 46 in fixed downwardly spaced parallel relation to the upper rim of the receptacle, said wire 46 having downward engagement with the end arms and side arms of the upper rim of the subjacent receptacle.

In stacking of receptacles of the type shown in FIGS. 9 to 13 inclusive, one of the end arms 35 of the lower receptacle provides an upwardly facing surface with which the axis rods 42 and 43 of the upper receptacle have sliding engagement while the opposite side arms 34 of the upper rim of the lower receptacle are capable of retaining the forwardmost bottom supports 38 of the upper receptacle within the confines of said upper rim of the lower receptacle and thereby guiding the upper receptacle along said side arms 34 of the lower receptacle pending full movement of said upper receptacle into vertical alignment with said lower receptacle. During such movement of the upper receptacle from the position shown in FIG. 13 to a position of vertical alignment with the lower receptacle, the arms 40 of the stacking members of said upper receptacle ride on the opposite side arms 34 of the rim of the lower receptacle and said arms 40. Downwardly offset pockets or seats 47 formed in the arms 34 of upper rim of the receptacle, corresponding to the pockets or seats 28 in the arms 14 of the receptacle shown in FIGS. 1 to 8, receive said arms 40 of the stacking members riding on said arms 34 to prevent relative shifting of said upper and lower receptacles along lines extending lengthwise of said arms 34 when the receptacles are in stacked relationship. It will be noted that the arms 40 of the stacking members shown in FIGS. 9 to 13 inclusive are provided with angular bent end portions 40a at the junction between the bridge section 41 and the arms 40 joined by said bridge section. As shown in FIG. 11, these end portions 40a are effective to so engage the portion of the arms 34 in inward relation to said end portion 40a as to resist any forces tending to shift said upper receptacle relative to the lower receptacle along lines lengthwise of the end arms 33 of said receptacle. While the seats 47 in the upper rim of the lower receptacle in cooperation with the arms 40 of the stacking members of the upper receptacle and the offset end portions 40a of the arms 40 of said latter members in conjunction with the surfaces of upper

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rim of the lower receptacle facing said end portions 40a provide stabilizing means to prevent displacement of said receptacle from a stacked relationship, the bottom supports 38 of the upper receptacle are likewise engageable with the inwardly facing surfaces of the end arms 33 and side arms 34 of the upper rim of the lower receptacle to maintain the receptacles against relative shifting movement from a stacked condition.

As in the design and construction above with reference to the receptacle illustrated in FIGS. 1 to 8 inclusive, the stacking members of the modified receptacle disclosed in FIGS. 9 to 13 inclusive, are biased by gravity to normally occupy a position favorable to nesting of the receptacles and yet are sensitive to upward forces applied thereto incident to downward engagement with an underlying abutment surface to move said stacking members into a stacking position with the aid of means preventing movement of said stacking members into a dead center downward position relative to its axis of swinging movement. Added advantages in the construction of the receptacle shown in FIGS. 9 to 13 inclusive are obtained by the provision of the bottom supports 38 which facilitate indexing of a receptacle relative to a like subjacent receptacle preparatory to establishing a stacked position. Due to the fact that visual detection of alignment conditions between a first receptacle being stacked and a second receptacle in underlying target relation to said first receptacle is hindered by the load contained in the first receptacle, the bottom supports 38 of the first receptacle in conjunction with the guidance afforded by the upper rim of the second receptacle provides for detecting proper alignment by "feel" rather than by sight.

What is claimed is:

1. An open top receptacle having a load containing area, a pair of stacking members pivotally connected to said receptacle in spaced apart relation along opposite borders of said load containing area, first stop means with which said stacking members have upward engagement to establish a first position wherein said stacking members are in laterally outlying relation to said borders, and second stop means with which said stacking members have downward engagement to establish a second position wherein said stacking members are in downwardly and inwardly extending relation to said first position, each of said stacking members having its center of gravity outside the confines of an area between planes projected vertically downwardly from said pivotal axes of said stacking members while in said second position and said stacking members being biased by gravity to normally occupy said second position, and support means in fixed relation to said receptacle and occupying positions in such upwardly and outwardly offset relation to said borders of the load containing area as to provide seats on which the stacking members of a vertically aligned superposed second like receptacle is adapted to have downward engagement to maintain said receptacles in stacked relationship when said stacking members of said latter receptacle are in said first position, and to provide an open space between said support means into which said second receptacle and said stacking members associated therewith may be lowered into nested relationship with said underlying receptacle when said stacking members of the second receptacle are in said second position.

2. An open top receptacle according to claim 1, wherein said support means are defined by portions of a rim along the upper limits of the receptacle and said rim having extensions along a line bridging the distance between said support means which present abutments with which the stacking members of the second receptacle have downward engagement to effect movement of said latter stacking members from second to first position preparatory to establishing a stacked relationship between said second receptacle and the receptacle subjacent thereto.

3. An open top receptacle according to claim 1, wherein

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said first stop means are defined by a pair of side arms extending along opposite borders of said load containing area of the receptacle.

4. An open top receptacle according to claim 1, wherein a pair of side arms are joined in spaced apart relation along opposite borders of said load containing area of the receptacle and said side arms include downwardly offset sections to provide feet through which the receptacle has downward bearing engagement with an underlying supporting surface.

5. An open top receptacle according to claim 1, wherein said support means are defined by portions of a rim along the upper limits of the receptacle and said stacking members each have angularly bent outer end portions which

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have inward engagement with the surface of said upper rim of the receptacle subjacent thereto to resist relative shifting of said receptacles lengthwise of the distance between said support means while said stacking members are in said first position.

References Cited in the file of this patent

UNITED STATES PATENTS

2,803,369	Fleetwood	Aug. 20, 1957
2,822,951	Tartaglia	Feb. 11, 1958

FOREIGN PATENTS

529,816	Belgium	July 15, 1954
614,315	Canada	Feb. 14, 1961