

Oct. 29, 1968

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3,407,961

PLASTIC POULTRY CRATE AND THE LIKE

Filed April 13, 1966

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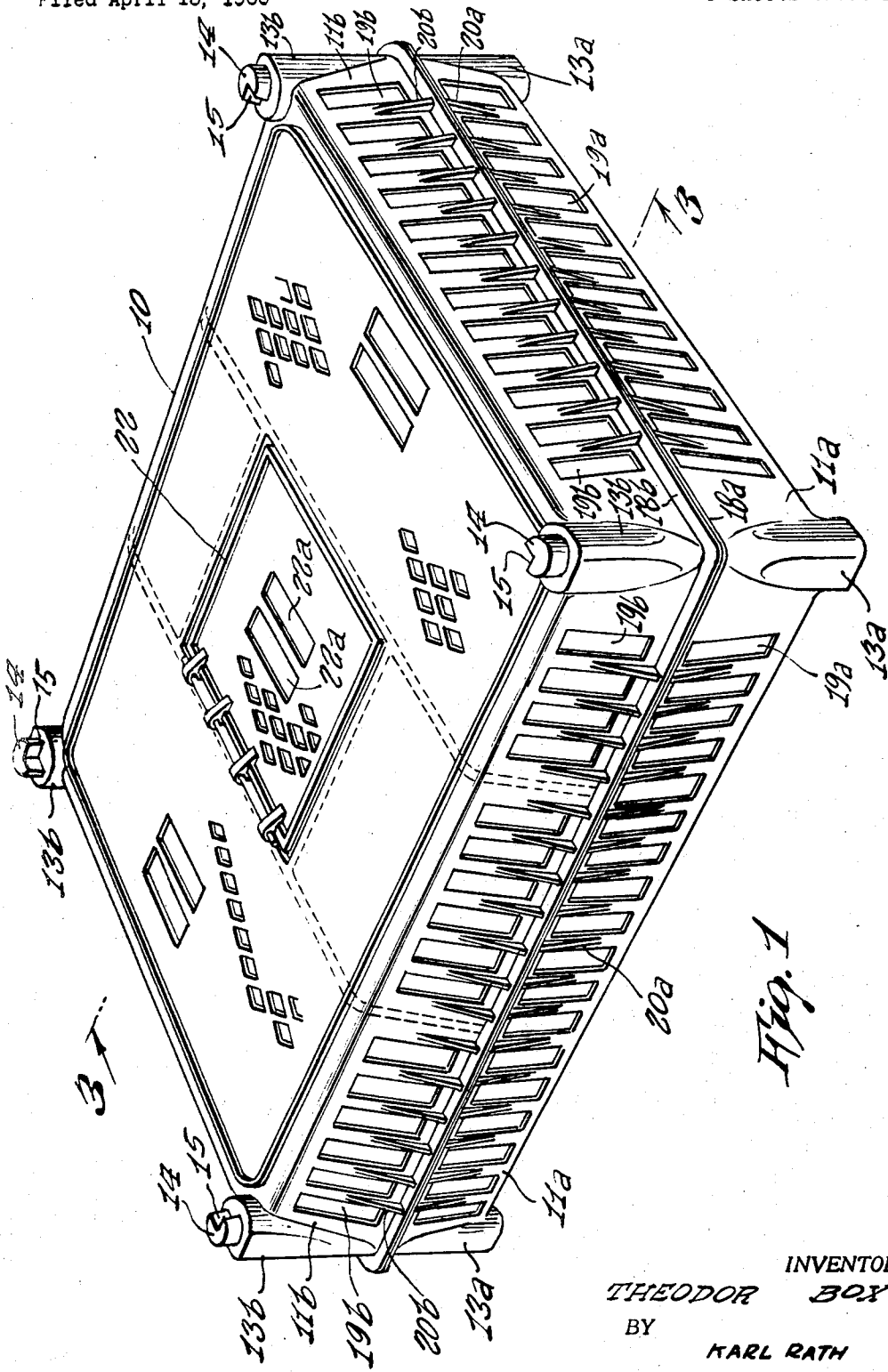


Fig. 1

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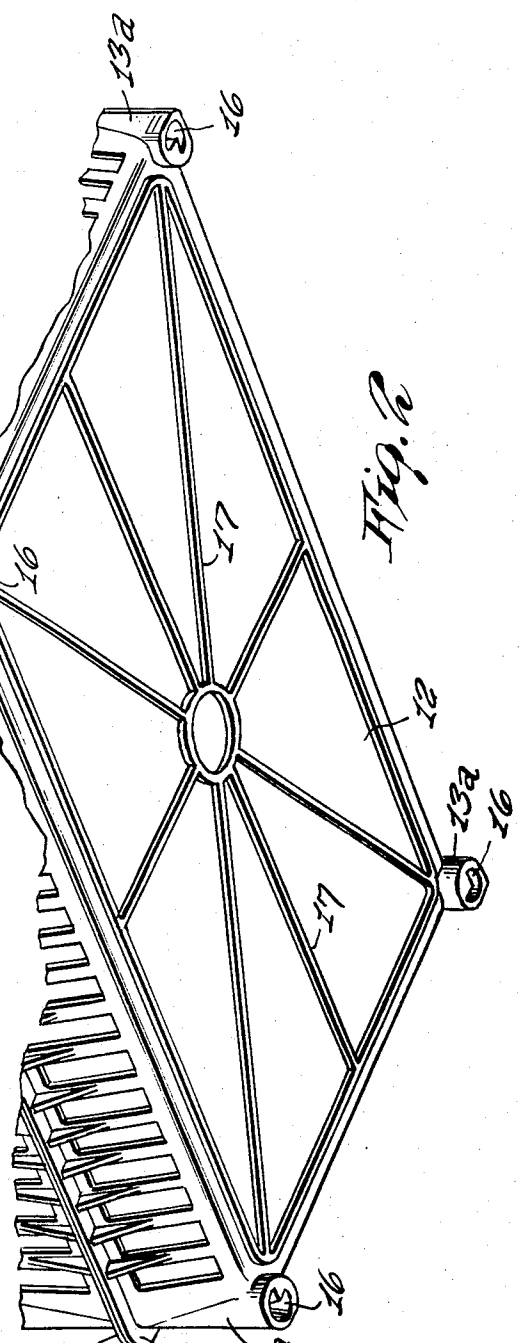
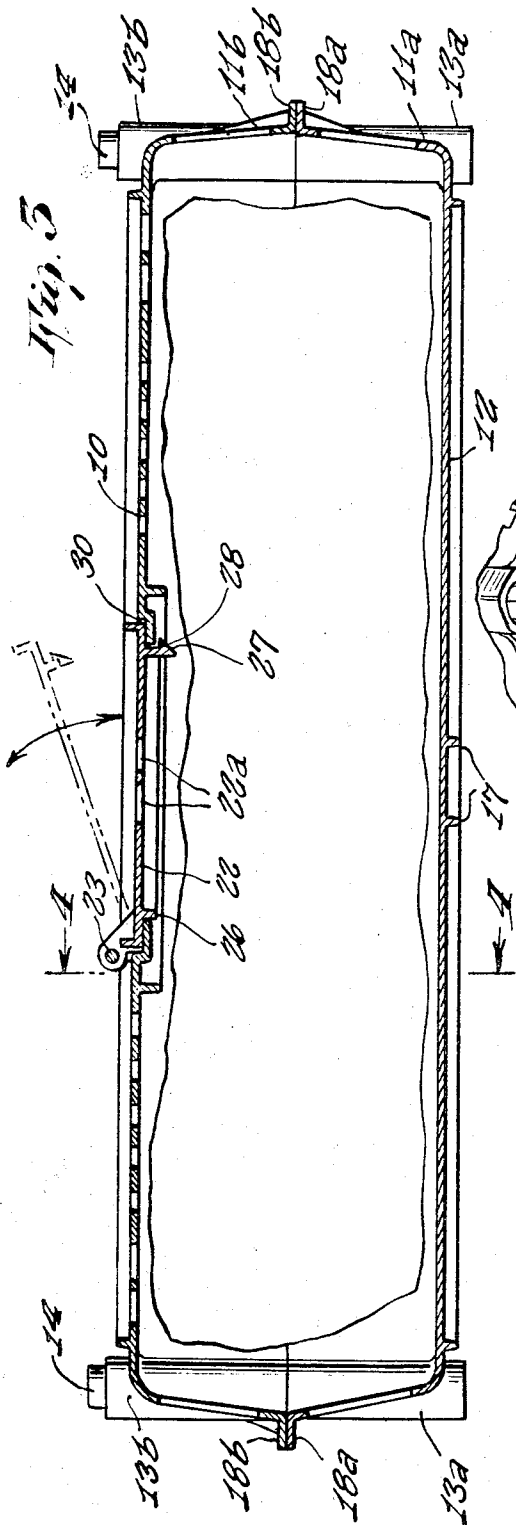
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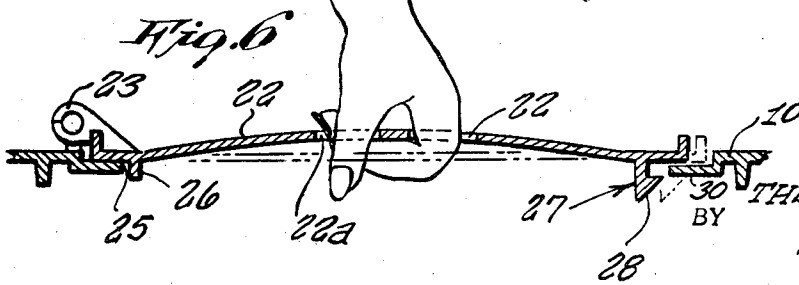
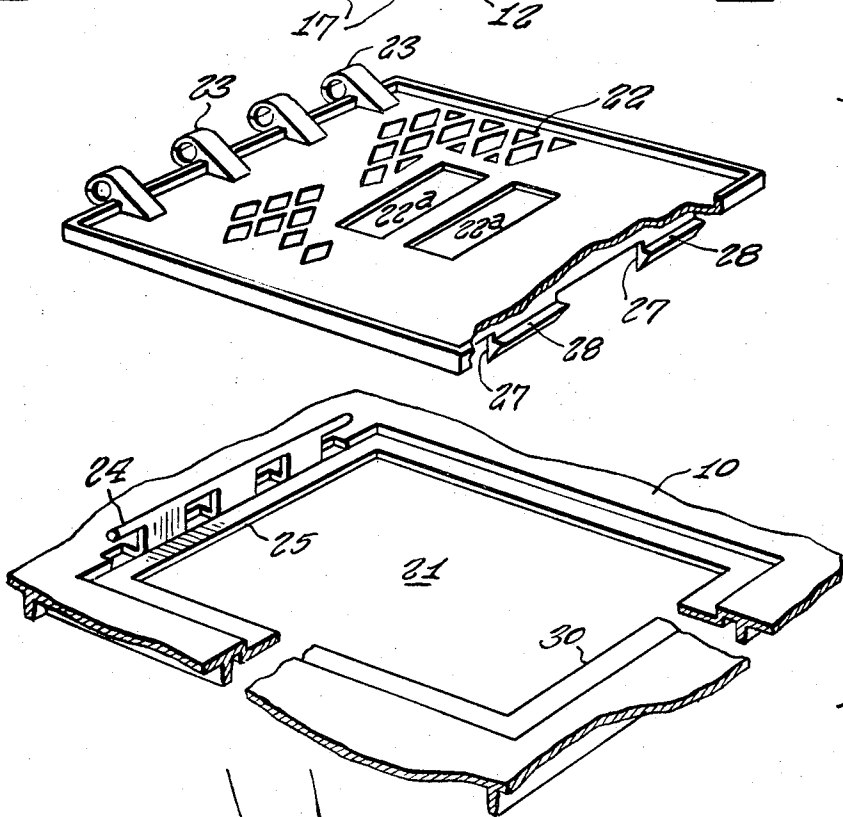
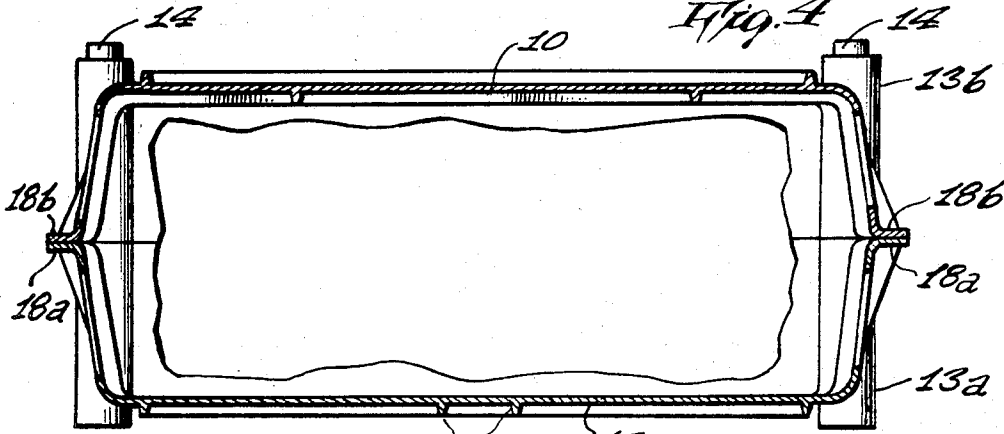
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5 Sheets-Sheet 3



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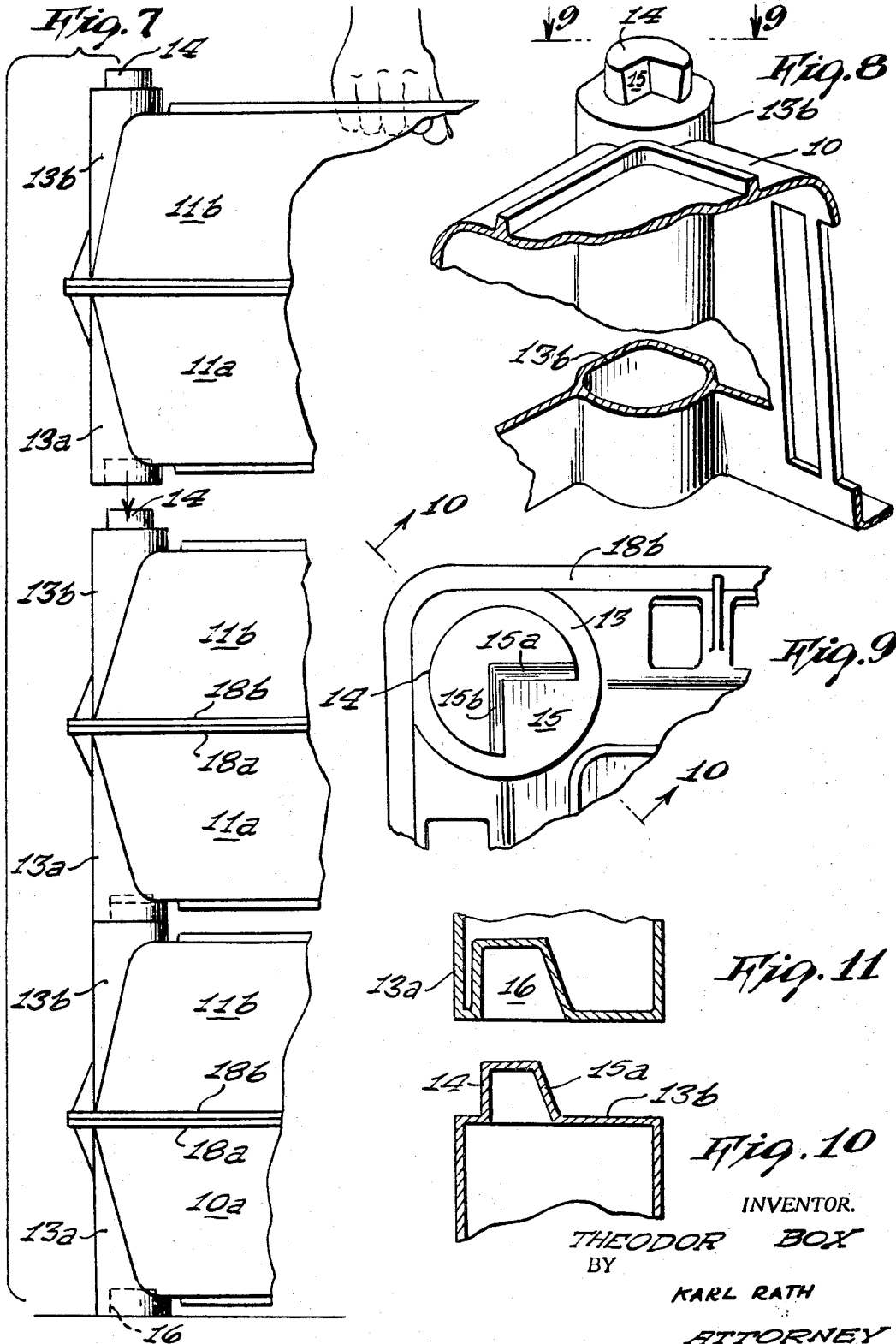
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PLASTIC POULTRY CRATE AND THE LIKE

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5 Sheets-Sheet 4



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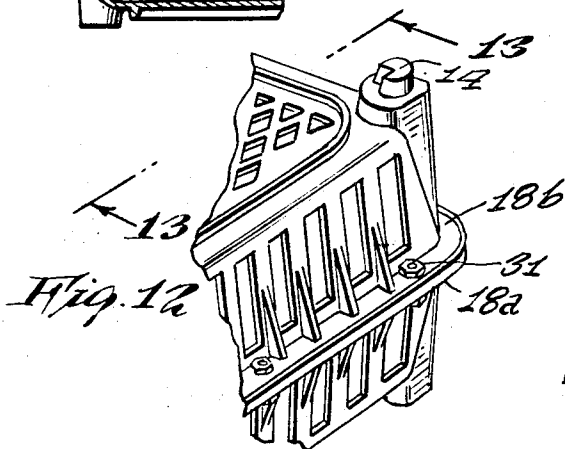
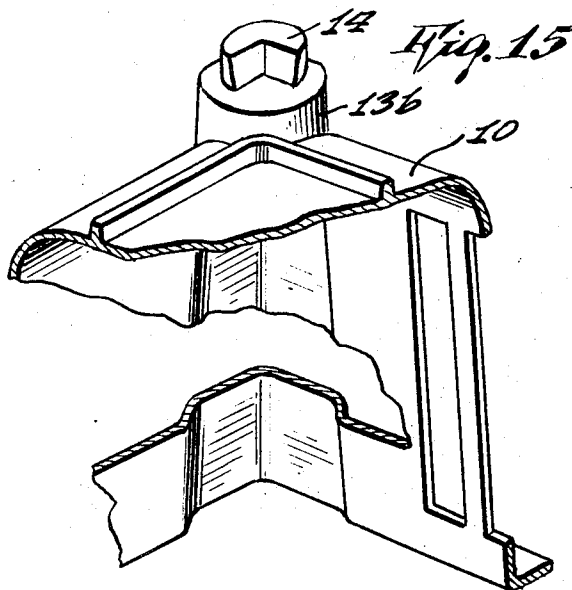
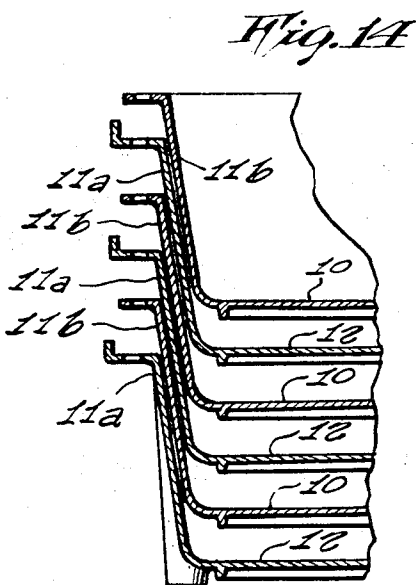
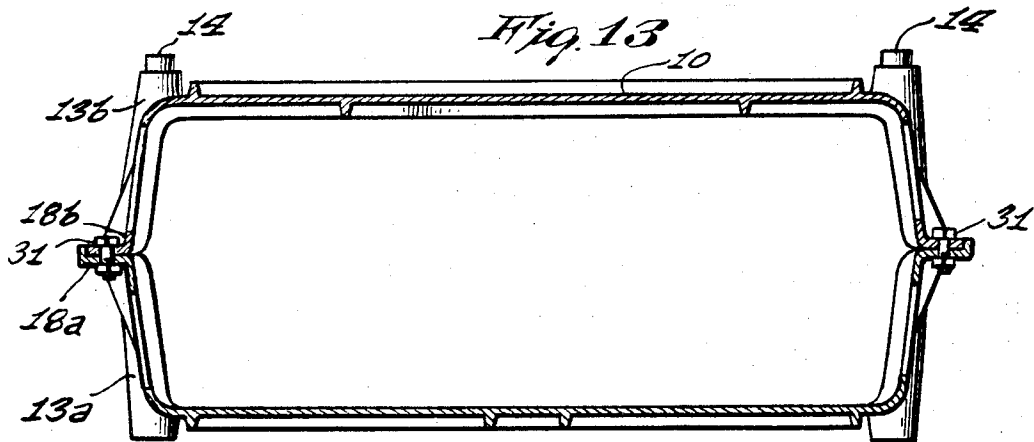
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PLASTIC POULTRY GRATE AND THE LIKE

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5 Sheets-Sheet 5



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PLASTIC POULTRY CRATE AND THE LIKE

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9 Claims. (Cl. 220-97)

ABSTRACT OF THE DISCLOSURE

An integrally molded flat rectangular plastic case has supporting posts projecting from the corners of its top and bottom walls, to enable stacking of a number of cases with the posts of one case resting upon the posts of the case below in the stack. In order to facilitate alignment and locking of the cases in aligned position, the posts on one side of the cases are formed with cylindrical extensions having sector-shaped cut-outs with the surfaces of said cut-out slanting inwardly, while the posts on the opposite side of the cases are formed with mating recesses corresponding to and engaging said extensions in the stacked and locked position. A hinged rectangular door mounted in a corresponding aperture in the top wall of the case has a depending flange adjoining its hinged edge and a depending locking nose at its opposite edge, said flange and nose engaging the adjoining edges of the aperture, to afford locking and unlocking of the door with a snap action by flexing the same in the inward and outward directions, respectively.

The present invention relates to shipping crates or cases preferably, though not limitatively, for use in the transport of poultry and other live animals, and more particularly to a case of this type constructed of a high-impact plastic material by means of a unitary molding operation.

Among the major objects of the invention is the provision of a case of this type which is light in weight yet of sufficient mechanical strength and rigidity to withstand rough handling as well as the impact forces (vibration) thereon during shipment or transport; which can be readily assembled together with other similar cases into a stack of substantial height and adequate mechanical stability; and which may be collapsed or dismounted with the component parts nesting within each other for reducing storage and shipping space.

The invention, both as to the foregoing and ancillary objects as well as novel aspects thereof, will be better understood from the following detailed description of a preferred practical embodiment, taken in conjunction with the accompanying drawings forming part of this specification and in which:

FIG. 1 is a perspective view, as viewed from the side and above, of a poultry case or shipping crate constructed in accordance with the principles of the invention;

FIG. 2 is a partial perspective view, as viewed from the side and below, of the case shown by FIG. 1;

FIG. 3 is a sectional view taken on line 3-3 of FIG. 1;

FIG. 4 is a sectional view taken on line 4-4 of FIG. 3;

FIG. 5 is a further partial view more clearly showing the snap door construction embodied in the top wall of the case of FIG. 1;

FIG. 6 is a partial sectional view of FIG. 3, more clearly illustrating the door at the instant of opening;

FIG. 7 is a fragmentary elevational view showing a number of cases according to the invention in stacked position;

FIG. 8 is a perspective view of a corner section of the case according to FIG. 1 as viewed from the inside of the case;

FIG. 9 is a partial top view of the corner section of a case according to FIG. 1;

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FIG. 10 is a section taken on line 10-10 of FIG. 9, bisecting an upper corner of the section;

FIG. 11 is a section similar to FIG. 10, bisecting the lower corner of the case coincident with line 10-10 of FIG. 9;

FIG. 12 is a perspective view of a dismountable case construction of the type according to the invention;

FIG. 13 is a section similar to FIG. 3 being taken on line 13-13 of FIG. 12;

FIG. 14 is a partial view showing the component parts of a number of cases according to FIG. 13 in collapsed and nested position; and

FIG. 15, being similar to FIG. 9, more clearly shows the inside construction of a collapsible case according to the invention.

Like reference numerals denote like parts throughout the different views of the drawings.

With the foregoing objects in view, the invention involves generally the provision of a poultry or the like crate of the referred to type comprising essentially an integrally molded flat rectangular case having a top wall, side and end walls, and a bottom wall. In order to facilitate stacking of a number of cases in aligned position, the corners of the cases according to the invention are fitted with supporting and aligning posts of preferably hollow cylindrical or the like cross-section and projecting at right angles and to a predetermined distance from said top and bottom walls, in such a manner as to afford alignment and support of a stack of cases by the end surfaces of the posts of one case engaging the end surfaces of the posts of the adjacent cases of the stack.

In order, furthermore, to facilitate stacking and to lock the stacked cases in properly aligned position, that is, with each case within the stack being horizontal and parallel to the remaining cases, to result in a stack of adequate stability, the corner posts on one side of the cases are fitted with coaxial preferably cylindrical extensions projecting from the end surfaces of the posts and provided with sector-shaped cut-outs, and the corner posts on the other side of the cases are provided in the end surfaces thereof with recesses complementary to said extensions, in such a manner as to afford ready alignment of a plurality of cases in stacked formation by the cylindrical surface portions of the extensions of one case closely engaging the mating cylindrical wall portions of the recesses of an adjacent case of the stack, and to lock the adjacent cases by the side walls of the cut-outs of the extensions of one case engaging the corresponding mating wall portions of the recesses of the next adjacent case of the stack. For the latter purpose, the surfaces of the cut-outs of said extensions and the corresponding or mating surfaces of said recesses are slanting in the inward direction or towards the cases. In other words, the cylindrical surfaces of the extensions and the complementary wall portions of the recesses serve exclusively as aligning means of the cases, while the mating slanting surfaces of the cut-outs and complementary wall portions of the recesses serve as bearing surfaces for the locking of the cases by assuming the load thereon by the remaining cases of the stack.

As a consequence, with each of the cut-outs providing two load-bearing surfaces, any case of the stack rests upon the case below at altogether eight points, whereby to enable a ready force distribution substantially without interfering with the alignment of the cases or impairment of the over all stability of the stack.

According to an improved feature of the invention, the cases are advantageously constructed in two parts, that is, an upper half and a lower half provided with meeting flanges connected by heat welding or any suitable separate fastening means, to form an all-enclosed case or structure. In this case, the resulting tray-like component parts, including the top and bottom walls of the cases,

respectively, may be constructed with side walls flaring outwardly from said walls, whereby to afford ready nesting of the parts in the interest of reducing storage or shipping space and costs, as will become further apparent from the following description in reference to the drawings.

According to a further feature of the invention, there is provided a snap-action door or closure in the top wall of the case, comprising a flexible door panel of plastic material provided with suitable hinge means connecting one side thereof with a side edge of a rectangular aperture in said wall, in such a manner as to provide a hinge axis above said wall and outwardly of the edge of said aperture. The door panel is furthermore provided, on the one hand, with a depending flange or extension engaging the edge of said aperture adjacent to said axis and with suitable catch means disposed at its opposite side, on the other hand, said catch means adapted to cooperate with the adjoining edge of said aperture, whereby to effect closing and opening of the door with a snap action, by virtue of the resiliency of the material, by simple inward pressure or outward pull and corresponding flexing of said panel, respectively.

Referring more particularly to FIGS. 1-4, the poultry case shown comprises essentially a top wall 10, side and end walls consisting of lower and upper halves 11a and 11b, and a bottom wall 12. The top wall 10 and the upper side and end wall parts 11b, on the one hand, and the bottom wall 12 and lower side and end wall parts 11a, on the other hand, constitute a pair of separate tray-like structures with the side and end walls thereof flaring outwardly from the respective top and bottom walls and terminating in outward mounting flanges 18a and 18b, respectively. As a consequence, the lower and upper halves of the case may be molded separately from a suitable high-impact plastic (polyethylene, polypropylene, etc.), to facilitate fabrication of the cases, coordinated lower and upper components being thereafter united by heat welding or sealing or otherwise connecting the flanges 18a and 18b, as shown in the drawing.

The top wall 10 and the side and end walls 11a and 11b may be provided with suitable interspaces or openings, such as in the form of a lattice construction of the top wall 10, as indicated in the drawing, and the provision of openings or apertures 19a and 19b in the side and end walls, to afford adequate air circulation or ventilation of the cases. Moreover, suitable stiffening or reinforcing ribs or like may be provided, as shown at 17 for the bottom wall 12 and at 20a and 20b for the side and end walls 11a and 11b, to improve the mechanical strength or stability of the cases while enabling the utilization of a minimum wall thickness in the interest of both light weight and reduced cost of the cases.

In order to further improve the rigidity of the cases and to enable stacking of a relatively large number of cases, the corners of the upper and lower halves, 10, 11b and 12, 11a, are fitted with preferably hollow cylindrical and vertical supporting and aligning posts 13a and 13b, whereby, with said posts projecting sufficiently from the top wall 10 and bottom walls 12, to facilitate stacking of two or more cases with the posts 13a and 13b of one case registering or being aligned with the posts of the adjoining cases of the stack, in the manner shown by FIG. 7.

In order to effect both alignment as well as interlocking of the adjacent cases of a stack, without jamming or interfering with the proper vertical position or stability of the stack, or to prevent leaning of the stack and, in turn, limiting or the maximum number of cases to be stacked, the aligning posts 13b of the upper half of the case, in the example shown, are fitted with vertical substantially cylindrical extensions 14, extending coaxially from the upper end surfaces of the posts and being provided with sector-shaped cut-outs 15, said cut-outs being preferably located on the inside of the posts, and formed with downwardly slanting bearing surfaces, as more clearly

shown at 15a and 15b in FIGS. 9 and 10. The cut-out angle may be about 90 and symmetrical to the bisecting line of the corners of the case, as shown, or otherwise chosen to suit existing conditions or requirements.

Cooperating with the projections 14 upon the posts 13b of the upper case half 10, 11b are corresponding or complementary recesses 16, FIGS. 2 and 10, within the end surfaces of the posts 13 of the lower case half 12, 11a, whereby to provide altogether eight interengaging or bearing surfaces, two at each corner, between any adjacent cases of a stack. This, in turn, results in the practical equalization of slight deviations between the slanting angles and other dimensions of the projections 14 and recesses 16, as a result of manufacturing tolerance variations, to thereby ensure the proper vertical alignment of the cases upon being assembled into a stack, on the one hand, and to substantially prevent jamming or permanent locking of one case in non-aligned position relative to the adjacent cases of a stack, or leaning of the stack and impairment of its stability, on the other hand.

There is thus provided by the invention a construction for the ready and reliable alignment and efficient interlocking of a plurality of cases of the referred to type in stack formation, mainly as a result of the major (cylindrical) surfaces of the extensions 14 being utilized solely for the mutual alignment of the cases being stacked and of the relatively smaller bearing surfaces 15a and 15b of the cut-outs 15 assuming the load of the case or cases above the stack. The cut-outs 15 and 16 may be designed with adequate mutual play being between the engaging parts or mating surfaces thereof, to enable a uniform distribution of the load thereon without jamming or interfering with the vertical alignment of the cases.

According to a further feature of the invention, the top wall 10 is fitted with a simple and efficient snap door or closure 22, FIGS. 1, 3, 5 and 6, utilizing the inherent elasticity of the plastic material for both locking and unlocking respectively, said door being provided with a pair of hand holes 22a and a plurality of integral hinges 23 located at one end of and being at a distance from the plane of the door, to engage a common pivot pin or hook member 24 integral with and projecting from the edge 25 of the door opening 21 in the top wall 10, to form a hinge joint, in the manner shown in FIG. 5. As more clearly seen from FIGS. 3 and 6, the door 22 is further provided with a dependent flange 26 adjoining the joints 23, 24, said flange engaging the adjacent edge 25, as shown in FIG. 6, of the opening 21 in the closed position of the door, FIG. 3. Disposed at the opposite side of the door 22 or opening 21 is a depending catch 27 having a locking nose 28 and engaging the edge 30 of the opening 21 in the closed position of the door, as shown in full lines in FIG. 3.

In use, the door 22 may be simply opened by grasping it through the holes 22a, FIG. 6, and pulling in the outward direction, whereby to slightly bend or flex the door panel in the outward direction by virtue of the flange 26 and nose 28, engaging the opposite edges 25 and 30 of the aperture 21, acting as abutments, until the nose 28 sliding along the inside of the top wall 10 adjacent to the edge 30 reaches a position clear of said edge, to result in the opening of the door with a snap action, as indicated in dotted lines in FIG. 3. Conversely, closing may be effected simply by downward pressure upon the door panel 22, whereby to flex the same in the opposite or inward direction with the nose 28 sliding along the edge 30 of the opening 21 until clearing said edge, to cause the catch to lock and close the door with snap action.

According to an alternative embodiment of the invention, as shown by FIGS. 12-15, the upper and lower halves 10, 11b and 12, 11a of the case are joined by the aid of separate fastening means, such as screws, bolts, or the like 31, FIGS. 12 and 13, connecting the adjoining flanges 18a and 18b. As a consequence, the parts or

halves, as a result of their trapezoidal cross-section, may be stored and/or shipped in nested position, FIG. 14, to reduce shipping weight or storage space. Whenever desired, the component lower and upper parts 10, 11b and 12, 11a may be assembled instantly and readily by applying the screws 31 or the like fastening means. In this embodiment, the corner posts 13a and 13b are advantageously of semi-circular or the like cross-section, so as not to interfere with the proper nesting of the parts, as shown by and understood from FIG. 15.

In the foregoing the invention has been described in reference to a specific illustrative device. It will be evident, however, that variations and modifications, as well as the substitution of equivalent parts for those shown for illustration, may be made without departing from the broader scope and spirit of the invention, as set forth in the appended claims. The specification and drawings are accordingly to be regarded in an illustrative rather than a restrictive sense.

I claim:

1. A poultry and the like plastic case comprising in combination:

- (1) a flat and integrally molded rectangular case having a top wall, side and end walls, and a bottom wall,
- (2) integral aligning posts forming the corners of and projecting at right angles and to a predetermined distance from said top and bottom walls, whereby to enable stacking of a plurality of cases in relatively aligned position with the end surfaces of the posts of one case engaging the end surfaces of the posts of the adjoining cases of the stack,
- (3) coaxial cylindrical extensions projecting from the end surfaces of the posts on one side of said case,
- (4) said extensions provided with sector-shaped cut-outs having side walls slanting inwardly in the direction towards the case, and
- (5) recesses complementary to said extensions within the end surfaces of the posts on the opposite side of said case, whereby to afford alignment of a plurality of cases in stacked position by the cylindrical surface portions of said extensions adjoining the corresponding cylindrical wall portions of the recesses of an adjacent case, and to lock the stacked cases by the side walls of the cut-outs of one case engaging the adjoining corresponding side wall portions of the recesses of an adjacent case of the stack.

2. In a plastic case as claimed in claim 1, said side and end walls being constituted by upper and lower parts forming a pair of tray-like component structures with said top and bottom walls, respectively, and the open edges of said structures provided with outwardly extending mounting flanges with the flanges of one structure engaging and being connected to the flange of the other structure.

3. In a plastic case as claimed in claim 1, said side and end walls being constituted by upper and lower parts forming a pair of tray-like component structures with said top and bottom walls, respectively, and the open edges of said structures provided with outwardly extending mounting flanges with the flange of one structure engaging and being welded to the flange of the other structure.

4. In a plastic case as claimed in claim 1, said side and

end walls being constituted by upper and lower parts forming a pair of tray-like component structures with said top and bottom walls, respectively, the open edges of said structures provided with outwardly extending flanges with the flange of one structure engaging the flange of the other structure, and removable fastening means connecting the engaging flanges of said structures.

5. In a plastic case as claimed in claim 1, said side and end walls being constituted by upper and lower parts forming a pair of tray-like component structures with said top and bottom walls, respectively, the partial walls of said structures flaring outwardly from their respective top and bottom walls and provided at their outer edges with outwardly projecting flanges with the flange of one structure engaging the flange of the other structure, and removable fastening means connecting said flanges.

6. In a plastic case as claimed in claim 1, said cut-outs including an angle of about 90° and disposed symmetrically to the bisecting lines of the corners of the case.

7. In a plastic case as claimed in claim 1, including a snap-action door of plastic material disposed in a rectangular aperture of said top wall, cooperating hinge means open one side of said door and said aperture, to provide a hinge axis disposed above said top wall and outwardly of a first edge of said aperture, a depending flange extending from said door towards the case at a point adjacent to and engaging said first edge of said aperture, and catch means having a locking nose disposed at the opposite side of said door and operatively engaging a second edge of said aperture opposite said first edge.

8. In a plastic case having bottom, side and top walls, a door fitting in a rectangular aperture of the top wall of said case, hinge means rotatively connecting a first edge of said door with the adjacent edge of said aperture, said hinge means having an axis located above said top wall and outwardly of said aperture, a depending flange extending from said first edge of said door towards the case, and a depending locking nose extending towards the case from the edge of said door opposite to said first edge, said door having a resiliency to allow of flexing thereof with said flange and said nose engaging the adjoining aperture edges acting as abutments, whereby to lock said nose with and to unlock it, respectively, from the adjoining aperture edge with a snap action.

9. In a plastic case as claimed in claim 8, said door provided with handholes, to facilitate flexing in the outward direction.

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