

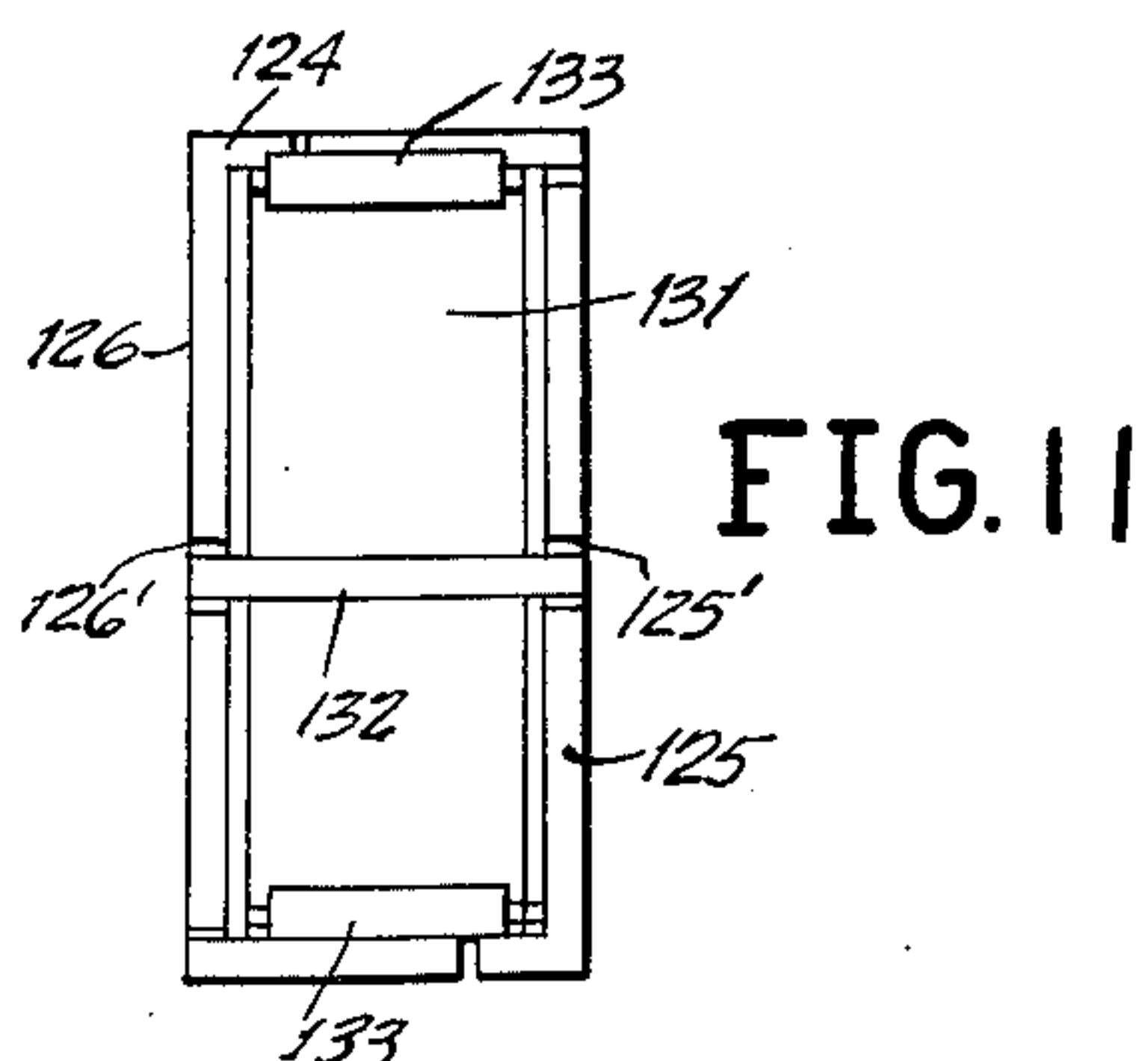
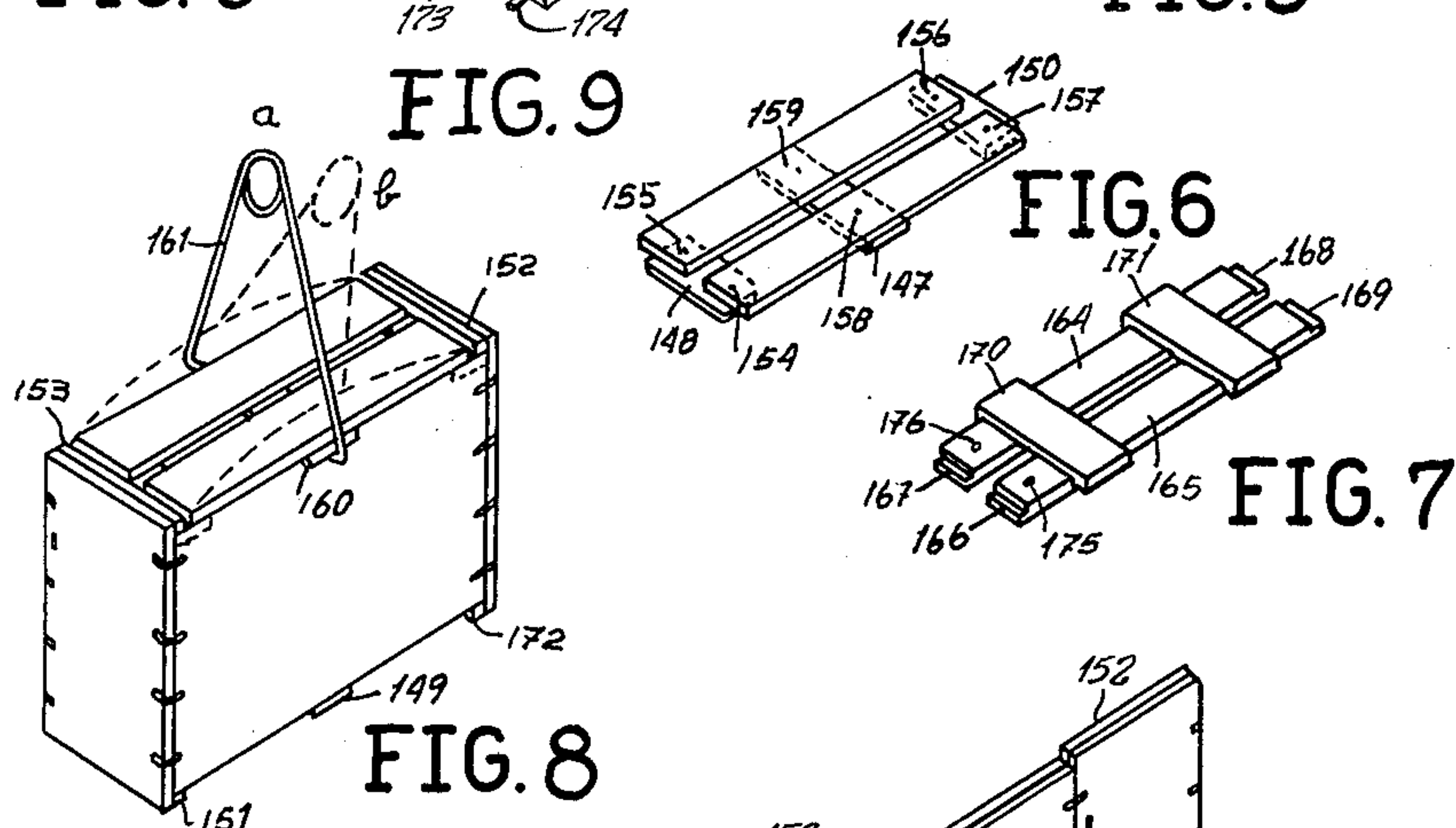
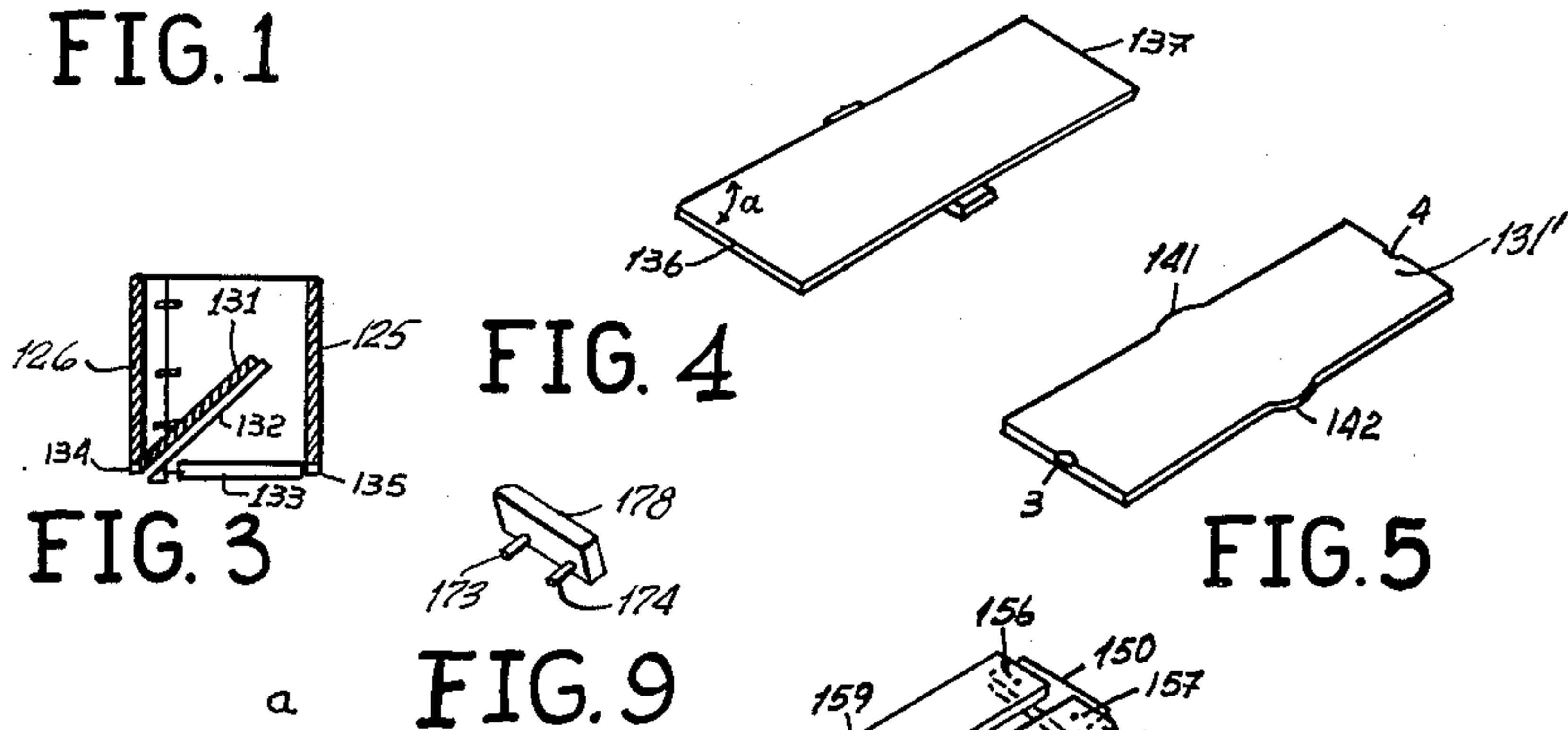
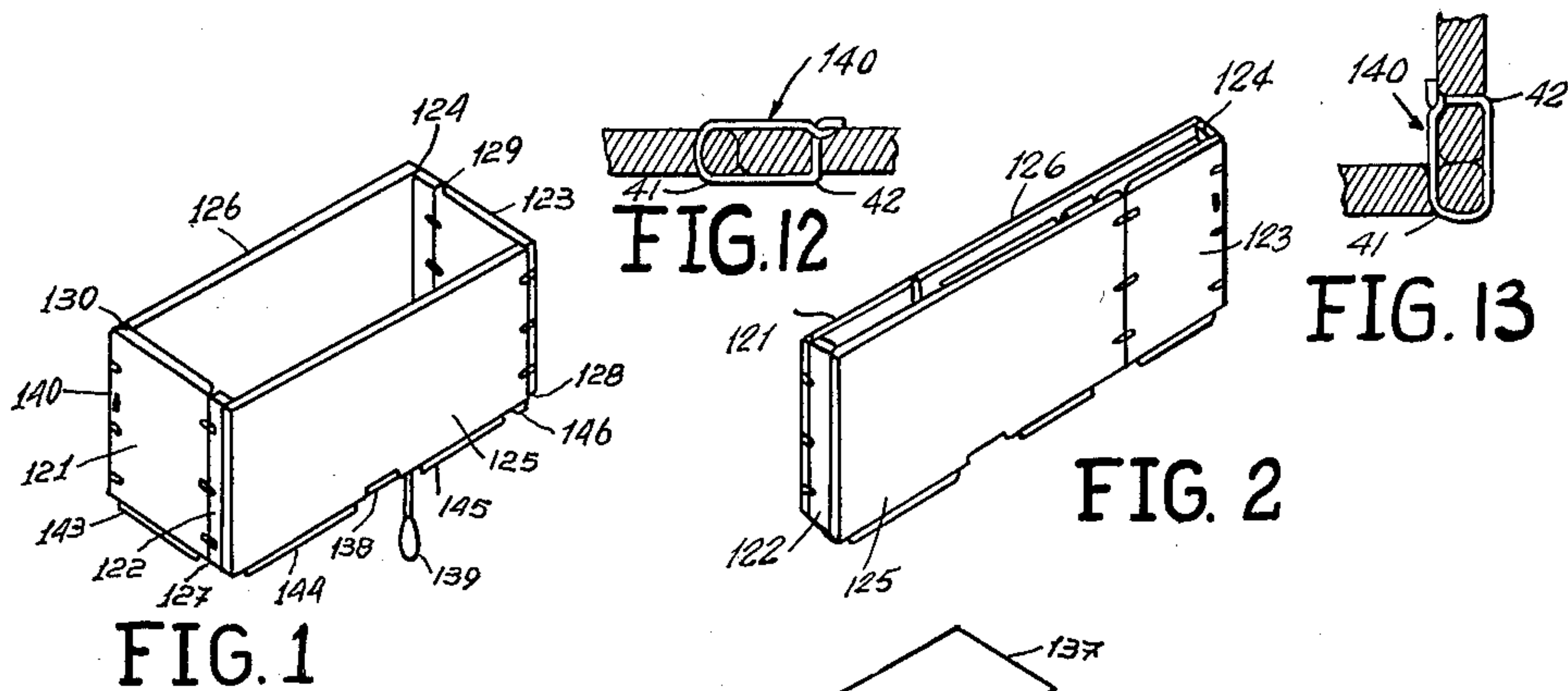
Oct. 9, 1962

R. E. V. J. MIOCQUE

3,057,504

FOLDABLE CASES AND IMPROVED ELEMENTS FOR FORMING THE SAME

Filed Feb. 27, 1956



INVENTOR.
Robert Edmond Victor Jean Mioque
BY *Benet Moutagne*
Attorney

1

3,057,504

FOLDABLE CASES AND IMPROVED ELEMENTS FOR FORMING THE SAME

Robert Edouard Victor Jean Miocque, Sao Paulo, Brazil

Filed Feb. 27, 1956, Ser. No. 568,085

Claims priority, application Brazil Feb. 28, 1955

2 Claims. (Cl. 217-16)

The present invention relates to foldable cases.

The foldable cases designed in accordance with the present invention are of such structure that they can be used over again many times and can be returned for re-use in folded position. In such folded position, the cases required little volume and, therefore, the expenses for the return shipment are very low.

It is one object of the present invention to provide a foldable case which comprises a front wall and a rear wall, constituting a first pair of oppositely disposed vertical walls, and a second pair of oppositely disposed vertical walls connecting the first pair of walls, a cover wall and a bottom wall, each of the walls of one of the pairs of walls consisting of two parts which are disposed in the same plane in their operative position and disposed at an angle of about 90° in their collapsed or inoperative position, to be used during the return shipment of the cases. One of the two parts of the one pair of walls is rigidly connected to the adjacent wall of the other pair of walls at an angle of about 90° at one of its ends and is hingedly connected with the other of the two parts of the one pair of walls.

It is another object of the present invention to provide a foldable case, wherein strips connect the two parts of the same vertical walls and the other of the two parts of the one pair of walls with the adjacent wall of the other pair of walls.

It is still another object of the present invention to provide a foldable case, wherein shield bars are secured to the bottom end of the end walls and extend inwardly to support the bottom thereon, the bottom wall including a reinforcing bar which is secured thereto. The reinforcing bar has a greater length than the width of the bottom wall to form protruding ends and the side walls have at their corresponding bottoms corresponding openings to receive the protruding ends, in order to lock the bottom wall in its operative position.

It is yet another object of the present invention to provide a foldable case, wherein one side of the bottom wall is cut obliquely to form an angle of less than 90° with the corresponding side of the adjacent wall, in order to provide a play between the bottom wall and the adjacent vertical wall.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawing, in which:

FIGURE 1 is a perspective front view of a foldable case;

FIG. 2 is a perspective front view of the foldable case shown in FIG. 1 in folded position;

FIG. 3 is a cross-section of the case shown in FIG. 1 indicating the bottom wall and its reinforcement wall;

FIG. 4 is a perspective top view of the bottom wall of the case shown in FIG. 1;

FIG. 5 is a perspective top view of another embodiment of the bottom wall, applied to smaller cases;

FIG. 6 is a top perspective view of the cover;

FIG. 7 is a bottom perspective view of the cover, without the engaging means at the edges;

FIG. 8 is a top perspective view of the case with removable bottom and provided with a reinforcing bar;

FIG. 9 is a perspective front view of the tool for opening and closing the case, respectively;

2

FIG. 10 is a perspective front view of the case shown in FIG. 8 in folded position;

FIG. 11 is a bottom plan view of the case shown in FIG. 3, indicating the reinforcing bar ends on each side secured in the openings of the side walls.

FIG. 12 is a section through two adjacent walls showing two parts with holes, secured together by means of a connection member; and

FIG. 13 is a section through the two adjacent walls shown in FIG. 12 with the two parts at a right angle.

Referring now to the drawing, and in particular to FIGS. 1-4, the case comprises two oppositely disposed vertical side walls, each of which consists of two parts, namely a part 121 of greater length and a part 122 of smaller length of one of the vertical side walls, shown on the left side in FIG. 1, and a part 123 of greater length and a part 124 of shorter length of the other of the vertical side walls, shown on the right side in FIG. 1.

The case comprises further a vertical front wall 125 and a vertical back wall 126. One end of the part 122 of one of the vertical walls is rigidly and permanently secured to and forms an angle of about 90° with the front wall 125 and the other end of the part 122 is hingedly connected with the other part 121 of the same vertical side wall. In the same manner, one end of the part 124 of the other of the vertical side walls is rigidly and permanently secured to and forms an angle of about 90° with the back wall 126.

Thus, the part 121 of one of the side walls is hinged to the back wall 126 at 130, and to the front wall at 127, while the part 123 of the other of the side walls is hinged to the front wall 125 at 128 and to the back wall 126 at 129.

This arrangement permits a folding of the vertical walls along the given hinge lines 127, 128, 129 and 130, to form in the folded position a complete parallelepipedon, as shown in FIG. 2 of the drawing. The folded vertical walls are sufficiently spaced apart to receive therebetween the bottom wall 131 with its reinforcing bar 132, as well as the shield bars 133 forming a shield to the bottom wall (FIG. 3).

It is to be understood, that it is possible to form the front wall 125 and the back wall 126 of two parts each and the side walls of a single integral part, with the same result.

The bottom wall 131 is hinged to the back wall 126 along the longer side thereof by means of connection strips and can fold inwardly and upwardly between the vertical walls, as shown in FIG. 3.

The reinforcing bar 132, secured crosswise to the bottom face of the bottom wall 131, has a length greater than the width of the bottom wall 131 and, thus, protrudes beyond the opposite edges of the bottom wall 131. The vertical front and back walls 125 and 126 have openings or recesses 125' and 126', respectively, at their lower edge and the protruding end portions of the reinforcing bar 132 are received in the openings 125' and 126' in the upright, operative position of the case, thereby locking the bottom wall 131 in its operative position, the latter simultaneously resting on the shield-bars 133 which in turn are connected with the vertical walls.

The turning of the reinforcing bar 132 from its folded position into its operative horizontal position is made possible by the resiliency of the front wall 125, which is capable to curve out slightly during the downward movement of the reinforcing bar 132 due to the pressure of the protruding end portions upon the front wall 125.

In order to provide an improved resilient yielding of the front wall 125, a predetermined amount of play is provided between one of the shorter sides of the bottom

wall 131 and the vertical wall 125 and for this reason the shorter side of the bottom wall 131 may be cut obliquely. In the embodiment shown in the drawing, the left side of the bottom wall is cut obliquely. As shown in FIG. 4, the side 136 of the bottom wall 131 is cut under an angle α of less than 90° , while the opposite side 137 is cut at an angle of 90° .

In order to fold the case, at first the protruding end portions 138 are removed from the openings 125' and 126' of the front wall 125 and the back wall 126, for instance by means of a screw driver 139 (FIG. 1), which is inserted between the edge of the bottom wall 131 and the front wall 125, whereupon the bottom wall 131 can be raised inwardly and upwardly and the vertical walls can be folded, to assume the position indicated in FIG. 2.

The folding and the upright, operative position, may be retained by the use of clamping irons 140 (FIG. 1) which are resilient and permit the change of each pair of adjacent, hingedly connected walls from a position in which the walls are disposed in the same plane to a position in which the walls are disposed at an angle of 90° relative to each other. Such angle irons are disclosed in FIGS. 12 and 13, where the holes 41 and 42 in the respective walls permit the insertion of the angle iron 140 therethrough.

Each of the cases is equipped with the shield-bars 133 which project over the bottom plate 131 by the projections 143, 144, 145 and 146 and form a guiding frame, in order to pile up the cases in superposed positions.

If the cases are small, the reinforcing bars can be eliminated and the bottom wall 131' itself is equipped with projections 141 and 142 (FIG. 5).

Referring now to FIG. 8, a casing is shown in which the bottom wall (not shown) has again a reinforcing bar 149 and the bottom wall rests on the shield bars 151 and 172. As shown in FIGS. 8 and 10, the casing has in addition also top shield bars 152 and 153.

If the cases are used for the transportation of agricultural products, a cover as shown in FIG. 6 is preferably used. The cover comprises in this case longitudinal bars equipped with overpassing cross bars 148 and 150, the length of which is shorter than the distance of the corresponding opposite vertical walls, and with a central reinforcing bar 147 having a length substantially identical with the external width of the case. The longitudinal bars are connected with the cross-bars 148 by nails at the points 154, 155, 156, 157, 158 and 159. By relative movement of the longitudinal bars and the cross-bars 148 assuming an oblique position, the space between the longitudinal bars can be eliminated.

In order to put the cover wall into place, one of its overpassing portions 150 (FIG. 6) is set below the shield-bar 152 (FIG. 8) and by lifting the center portion of the cover wall the other of its overpassing portions 148 is set below the opposite shield bar 153, so that the cover wall is secured to the casing.

The removal of the cover wall can be brought about by means of a tool 161 which is inserted below the central bar 160 which causes again lifting of the central portion of the cover wall, whereupon the overpassing portions 148 and 150 are released from the corresponding shield-bars. By moving the tool 161 from the position *a* (shown in full lines) to the position *b* (shown in dotted lines) the lifting of the cover wall is achieved speedily.

Another embodiment of the cover wall is shown in FIG. 7, which comprises longitudinal bars 164 and 165, the ends 166, 167, 168 and 169 of which are partially cut away and cross-bars 170 and 171 having ends of greater thickness are secured to the longitudinal bars

170 and 171. It is also possible to make the inner portions of the shield-bars 152 and 153 of a reduced thickness than their portions to substitute for the cut-out portions of the longitudinal bars 164 and 165.

The tool disclosed in FIG. 9 can be used for assembling and disassembling, respectively, the case. The tool comprises two spurs 173 and 174 inserted in a wooden block 178.

The bottom wall shown in FIG. 5 may serve also as a cover wall, provided it is designed in the same manner as the cover wall, the structure of which has been disclosed above.

The structure of the casing lends itself to instantaneous unfolding and folding, respectively, by placement and removal of the bottom and cover walls and folding and unfolding, respectively, of the vertical walls.

While I have disclosed one embodiment of the present invention, it is to be understood, that this embodiment is given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

What I claim is:

1. A foldable case comprising at least two pairs of oppositely disposed vertical walls, a cover wall and a bottom wall, all said walls defining a chamber, the walls of one of said pairs of vertical walls consisting of two parts disposed in the same plane in the operative position of said case and disposed at an angle of about 90° in the collapsed position of said case, one of said parts being rigidly connected at an angle of about 90° at one of its ends to the adjacent wall of the other of said pairs of vertical walls, and being hingedly connected at the other of its ends with the other of said parts, and strips connecting said two parts of the same vertical walls and the other of said parts of vertical walls with the adjacent walls of the other pair of said vertical walls, shield bars secured to the bottom end of the end walls and extending inwardly to support the bottom thereon, said bottom wall including a reinforcing bar secured thereto, said reinforcing bar having a length greater than the width of said bottom wall, so as to form protruding ends, said side walls defining at their bottom corresponding openings to receive said protruding ends, thereby locking said bottom wall in its operative position.

2. The case, as set forth in claim 1, wherein one side of said bottom wall is cut obliquely to form an angle of less than 90° with another adjacent side, in order to provide a play between said bottom wall and the adjacent of said vertical walls.

References Cited in the file of this patent

UNITED STATES PATENTS

203,293	Rapp	May 7, 1878
696,243	Johnston	Mar. 25, 1902
952,827	Martin	Mar. 22, 1910
1,020,534	Branham	Mar. 19, 1912
1,026,379	Bradshaw	May 14, 1912
1,046,297	Hubbard	Dec. 3, 1912
1,431,232	Hubbard	Oct. 10, 1922
1,432,670	Cole	Oct. 17, 1922
1,447,055	Averill	Feb. 27, 1923
2,232,346	Sikes	Feb. 18, 1941
2,413,774	Montgomery	Jan. 7, 1947
2,516,658	Stelly	July 25, 1950

FOREIGN PATENTS

24,045	Great Britain	1912
312,050	Italy	Oct. 18, 1933
279,138	Switzerland	Feb. 16, 1952