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(72) Inventors PETER LEONARD MEAD, MICHAEL BROADLEY
and JOHN FRANCIS WOOD



(54) IMPROVEMENTS IN OR RELATING TO CONTAINERS

(71) We, GPG HOLDINGS LIMITED of Cranford, Blackdown, Leamington Spa, Warwickshire, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to containers and is particularly concerned with containers of the type which can be stacked in superimposed layers and interlocked to restrain relative lateral sliding of one layer relative to the adjacent layer above and/or below it.

More especially the invention is concerned with open topped containers having the general outline of a rectangular parallelepiped and comprising a substantially rectangular horizontal bottom and four side walls extending upwardly and substantially perpendicularly from the bottom around the periphery thereof to define a top rim. When several similar containers of this type are stacked in superimposed layers in a manner which is generally known in the art as "brick stacking", a container in one layer overlies at least two containers in the immediately underlying layer and it is conventional practice to provide some means of restraining relative lateral displacement both between the containers in adjacent layers of the stack and between adjacent containers in each layer. To restrain the aforementioned lateral displacement between the containers, each container has its bottom part so formed that it inter-engages or inter-bonds with the top rim of each container which it overlies in the adjacent underlying layer and such an arrangement is generally known in the art as "bonded brick-stacking".

Containers having the facility to form a bonded brick-stack have, as far as we are aware, hitherto been provided with projections on which the container stands

and which extend downwardly from the underside of the container bottom to wholly or partly form what is generally considered as a spaced array of islands. These islands are inset from the side walls of the container in such manner that, when a container is brick stacked, bonding is achieved by some of its bottom projections extending into the open top of each container which it overlies and lateral displacement between the containers is restrained by abutment of the side walls of each underlying container against the projections which extend into the open top of each such underlying container from the container or containers which overlie it. Examples of containers having the facility to form a brick-bond stack are disclosed in British Patent Specifications Nos. 1,137,916 and 1,148,385.

While the provision of the aforementioned downwardly extending bottom projections provides efficient brick bonding, since the islands formed by the projections are inset from the side walls it is found that the vertical loading on a lowermost container of a stack is first transmitted through the side walls and then through the peripheral part of the bottom to the projections which extend downwardly therefrom. As a result the marginal peripheral part of the bottom is subjected to a cantilever effect due to vertical loading on the side walls. In a large stack the cantilevered parts of the bottoms of containers in the lowermost layer of the stack have to take the whole weight of the stack. Such loading can be considerable and as a consequence it has hitherto been necessary to provide a container which is capable of brick-bonding with a bottom of sufficiently strong structure (at least in the peripheral part of the bottom) to carry the vertical loading to which that container is to be subjected. With this in mind it is an object of the present invention to provide a container having the facility to form a bonded brick-stack with other similar containers and which container has an

improved structure for its bottom part by which the aforementioned cantilever effect is alleviated.

5 According to the present invention there is provided an open topped container having the general outline of a rectangular parallelepiped and comprising four substantially vertical side walls which form a substantially rectangular enclosure and
10 provide a bottom rim on which the container can stand, the side walls extending upwardly from the bottom rim to a top rim of the container, said top rim being carried on an upwardly extending top rib formed by a rebate in the side walls which rebate provides a substantially flat
15 shoulder located at the base of the top rib and adjacent to the outer faces of the side walls, said shoulder extending around the periphery of the container; a substantially rectangular horizontal platform for supporting goods in the container, said platform interconnecting opposed side walls
20 at a position between and remote from the top and bottom rims; said bottom rim and top rib being so arranged that two similar containers may be column stacked whereby the top rib of the lower container is closely
25 received within the enclosure formed by the side walls of the upper container adjacent to the bottom rim thereof while the upper container stands with its bottom rim on the shoulder of the lower container; and
30 wherein the side walls of the container are provided with an array of recesses below the platform which recesses open downwardly at the bottom of the container so that the side walls define a discontinuous bottom
35 rim, said recesses being so located that when two similar containers are vertically stacked one on top of the other and with the upper container partially overlying the top of the lower container in brick stacking
40 relationship so that the side walls of the two containers are parallel, the top rib of the lower container can cross with the bottom rim of the upper container where such bottom rim is discontinuous and be received
45 within recesses in the side walls of the upper container to provide bonded brick stacking between the two containers.

50 Preferably each of the sidewalls has substantially parallel inner and outer faces at least for their extent above the platform.
55 By the phrase "a substantially rectangular base" as used throughout this specification we include a square base.

60 By the construction in accordance with the invention, the container can stand with the bottom rim of its sidewalls on a horizontal floor and consequently when the side walls are vertically loaded due, for
65 example, to the weight of an overlying container or containers in a stack, the load is transmitted vertically downwardly

directly through the side walls to the floor. In this way the platform is not cantilevered by the vertical loading to which the side walls are subjected. Consequently the platform need only be sufficiently strong to support the intended contents of the container with the result that less material can be used for the platform structure and, if the container is formed in plastics by injection moulding, in the use of a simplified (and thereby less expensive) moulding tool due to less machining being required in that part of the tool for moulding the platform.

In addition to providing the facility for bonded brick-stacking, the container of the present invention has the facility to stack in a vertical column. To provide column stacking of two similar containers, one container is located vertically on the top of the other so that the top rib (which is preferably continuous around the open top of its container) of the lower container is closely received within the substantially rectangular enclosure formed by the lower parts of the sidewalls of the upper container. The top rib of the lower container vertically overlaps the sidewalls of the upper container while the upper container rests with its bottom rim located on the shoulder of the lower container. Consequently the containers are restrained from lateral displacement relative to each other and vertical loading on the column is transmitted directly through the respectively adjacent side walls to the floor on which the column stands.

The recesses in the sidewalls are preferably such that they will at least accommodate the full depth of the top rib of an underlying container at the positions where the top rim of a lower container effectively crosses with the discontinuous bottom rim of an adjacent upper container during bonded brick stacking.

The disposition of the recesses in the array thereof in the sidewalls will depend largely upon the relative proportions in plan of the container and the desired brick bond stacking characteristics required of the container. Generally however the recesses will be symmetrically disposed around the bottom rim so that one half of the bottom rim taken on a centre line parallel to a pair of opposed side walls is the mirror image of the other half of the bottom rim. Recesses can be provided at or adjacent the corners in the bottom rim of the container so that when two containers are stacked in overlying relationship and similarly orientated with one pair of opposed side walls of the upper container in substantially the same vertical planes as the respective one pair of opposed side walls of the lower container and with the other pair of opposed side walls of the upper container

out of vertical alignment with the corresponding other pair of opposed side walls on the lower container, the top rim of the lower container along the said one pair of opposed side walls thereof is located within recesses in the sidewalls of the upper container positioned at or adjacent the corners of such sidewalls below one of the said other pair of opposed side walls in the upper container.

The recesses in the sidewalls of an overlying container are positioned to receive the top rib of an underlying container when such top rib crosses substantially at right angles with the bottom rim of the upper container. Conveniently, in a stacking configuration where two containers in a bottom layer are positioned parallel and adjacent to each other with their side walls in face-to-face abutment, the or at least some of the recesses in the sidewalls may be of such width that they each can receive both the top ribs of the abutting side walls of the two lower containers. In this way a single recess in the sidewalls can closely bridge across the top ribs of two adjacent side walls on separate containers in an underlying layer and thereby restrain the two lower containers from relative lateral movement away from each other. Alternatively at least some of the recesses, or each recess may be adapted to accommodate a single top rib of the container which it overlies and bonds with. Since two containers in a layer of a bonded stack are preferably positioned with their side walls in face-to-face contact it will be apparent that, when each top rib of the side wall is to be located in a separate recess in the sidewalls of an overlying container at least some of the recesses will be disposed in pairs the recesses of which are positioned closely to each other.

As engagement between the array of recesses in the sidewalls and the top ribs respectively of two stacked layers of containers can provide bonding to alleviate relative lateral movement between the containers in the stack, the under-side of the platform may be planar. However, if required the underside of the platform may be provided with downwardly extending projections which wholly or partly form the islands as aforementioned in conventional containers for bonded brick-stacking. The disposition of these islands is well-known in the art, for example as discussed in Patent Specifications Nos. 1,137,916 and 1,148,385. These islands on the underside of the platform define with the sidewalls an array of intersecting and recessed paths which extend parallel to the side walls and preferably the islands extend from the platform to lie in the plane of the bottom rim (although it is not essential that the

projection of the islands extends this far). When the projecting islands are provided in a container of the present inventions, recesses in the sidewalls will be located in line with and at each end of the aforementioned recessed paths since it is along these recessed paths that the top rim of an underlying container will be located during brick-bond stacking.

Usually the container will be of oblong rectangular shape in plan having the proportion of the length of the shorter side walls to the length of the longer side walls in the ratio a/b , and in such case recesses in the shorter side walls are preferably located substantially one at each end thereof and at approximately every $1/a$ part length of the shorter side walls from the ends thereof, and recesses in the longer side walls are preferably located substantially one at each end thereof and at approximately every $1/b$ part length of the longer side walls from the ends there. For example, in a container having the ratio a/b of $\frac{1}{2}$, recesses in each of the shorter side walls will be located at approximately $\frac{1}{2}$ part length intervals over the length of the shorter side walls whereas recesses in each of the longer side walls will be located at approximately $\frac{1}{2}$ part length intervals over the length of the longer side walls; and in a container having the ratio a/b of $\frac{1}{3}$, a recess in each of the shorter side walls will be located at approximately the mid part length of the shorter side walls whereas recesses in each of the longer side walls will be located at approximately $\frac{1}{3}$ part length intervals over the length of the longer side walls.

The container of the present invention is preferably manufactured in plastics material by injection moulding to provide conventional internal reinforcing ribs as part of the sidewalls and open framework or other platform structure as may be required. In addition the container may have an array of crossing partition walls on the interior thereof to define bottle storage compartments when required for use as a bottle crate.

Several embodiments of the present invention will now be described, by way of example only, with reference to the accompanying illustrative drawings in which:—

Figure 1 is a perspective view showing the side walls, and open top of a container constructed in accordance with the invention;

Figure 2 is a further perspective view of the container shown in Figure 1 and illustrates the platform and side walls of the container;

Figure 3 shows two of the containers illustrated in Figure 1 when stacked in a

vertical column, the two containers being shown in vertical section;

5 Figure 4 diagrammatically illustrates several containers similar to that shown in Figure 1 arranged in a brick-bonded stack, the stack being shown in side elevation and (some of the containers) in part section taken on the line IV—IV of Figure 5;

10 Figure 5 shows an end view of the stack illustrated in Figure 4, some of the containers being illustrated in part section taken on the line V—V of Figure 4;

15 Figure 6 is a perspective view of a container similar to that shown in Figure 1 but which container has modified sidewalls;

Figure 7 is a perspective view of part of the underside of the container shown in Figure 6 and better illustrates the modification to the sidewalls, and

20 Figure 8 is a perspective view of a container similar to that shown in Figure 2 but which container is provided with an array of projections which extend downwardly from the underside of its platform to provide islands for additional bonding in brick-stacking.

25 Referring firstly to Figures 1 to 3, the container is open topped and has an oblong rectangular horizontal platform 1 and four side walls 2 to 5 which extend upwardly and substantially perpendicularly from the platform 1 around its periphery to form a continuous top rim 6. The side walls incorporate internal recesses (shown generally at 2a in Figure 3) which extend upwardly and substantially perpendicularly from the platform to the top part of the container. The innermost and outermost surfaces of the material for each sidewall provide substantially parallel inner and outer faces of the respective sidewalls. At the top of the container the material of the side walls is rebated to form a continuous rib 7 on which is located the top rim 6. The rib 7 is inset from the outer faces of the side walls by a flat shoulder 8 of the rebate.

30 The underside of the platform 1 is substantially planar and the sidewalls 2 to 5 extend downwardly around the periphery of the platform to provide what may be regarded as a skirt shown generally at 9. Provided in the skirt part 9 of the sidewalls is an array of recesses 10 and 11 which are symmetrically disposed in the sidewalls. These recesses open downwardly in the skirt 9 so that the bottom of the container has a castellated appearance and a discontinuous bottom rim 12 is thereby formed on the container. The bottom rim 12 vertically underlies the shoulder 8 and coincides in shape thereto in plan. The depth of the skirt 9 below the underside of the platform 1 is slightly greater than the depth of the rib 7 (that is the height of the top rim 6 above shoulder 8), the depth of the recesses 10 and

11 approximate to the depth of the rib 7, and the recesses 11 adjacent to the corners of the container have a width which is less than the width of recesses 10. The disposition of the recesses and their relative widths will become apparent from the description which follows of the stacking characteristics for the container.

To achieve vertical column stacking (see Figure 3) of two of the containers shown in Figures 1 and 2, the upper container is lowered directly onto the lower container with their respective side walls in vertical alignment. The top rib 7 of the lower container is closely received within the rectangular enclosure formed by the skirt part 9 of the sidewalls of the upper container so that the skirt 9 of the upper container vertically overlaps the rib 7 on the lower container and the upper container rests on a lower container by its bottom rim 12 abutting the shoulder 8. If required the outer side face of rib 7 and the inner side face of skirt 9 are provided with complementary tapers.

35 As will be apparent from Figure 3, the engagement of rib 7 of the lower container within the confines of the skirt 9 of the upper container restrains relative lateral movement between the two containers to provide a stable vertical column. A further and considerable advantage derived from the stacked containers shown in Figure 3 is that the vertical loading on the side walls 2 to 5 of the lower container is transmitted directly from the side walls to the floor on which the column stands. Similarly, vertical loading on the side walls of the upper container is transmitted directly through the sidewalls of the upper container to its bottom rim 12 from which it is transmitted through the shoulder 8 to the sidewalls of the lower container. Consequently, the vertical loading to which each container is subjected due to stacking is transmitted directly through the respective side walls of adjacent containers in the column to the floor. The only vertical loading to which each platform 1 of the stacked containers is subjected will result from the intended contents of the container—thereby permitting a lighter platform structure than may otherwise be required.

40 We will now consider the bonded-brick stacking of several similar containers each of which is constructed as above described with reference to Figures 1 and 2. In the stack partly shown in Figures 4 and 5, two layers are provided, the bottom layer comprising six containers (of which four containers 13 to 16 are illustrated) and the upper layer comprising 9 containers (of which five are illustrated at 17 to 21). For convenience of illustration the recesses 2a

have been omitted from the containers shown in Figures 4 and 5.

The particular stacking characteristics of each container will largely depend upon its relative dimensions and the location of the symmetrically disposed recesses 10. In the present example it will be assumed that the ratio of the length of the shorter side walls to the length of the longer side walls of each container is approximately 3:4 and in such case the skirt part 9 of each of the shorter side walls two recesses 10, and the skirt part of each of the longer side walls has three recesses 10. The recesses 10 are located along the shorter sides of the container at approximately $\frac{1}{4}$ part length intervals of the shorter side length whereas the recesses 10 in the longer sides of the container are located at approximately $\frac{1}{4}$ part length intervals of the longer side length.

The six containers in the bottom layer of the bonded stack are positioned in two adjacent rows of three containers per row and are similarly orientated so that the shorter side walls of adjacent containers in each row abut and the adjacent longer side walls of the containers in the two rows also abut. The containers in the upper layer are now positioned in three rows so that each of two adjacent containers in each outer row and all of the containers in the middle row overlies at least two of the containers in the lower layer and all of the containers in the upper layer are similarly orientated to the containers in the lower layer. In the present example the container 20 partly overlies four containers (i.e. 13, 14, 16 and that adjacent to both containers 14 and 16) and each pair of adjacent and parallel ribs 7 of adjacent containers of the four are received in a recess 10 of container 20. Consequently the recesses 10 of container 20 bridge the adjacent short side walls 3 and 5 and also the adjacent long side walls 2 and 4 of the respective pairs of containers of the aforementioned four in the lower layer. The plane of the bottom rim 12 of container 20 is located below the plane of the top rim 6 of the four containers with which it interbonds. The width of each recess 10 is such that it closely receives two parallel ribs 7 of two adjacent side walls located one on each of two adjacent containers (i.e. the width of each recess 10 is slightly greater than twice the thickness of each side wall assuming the latter to be all of the same thickness) and in this way the containers in the bottom layer with which container 20 bonds are restrained from lateral displacement relative to each other and relative to container 20. Since recesses 10 are disposed every quarter part length interval of the longer side of a container and recesses 10 are disposed every one third part length interval of the shorter side of a container it

will be apparent that as the remaining containers in the upper layer are added with their side walls parallel to, and abutting the corresponding sidewalls of, an adjacent container in the layer, the parallel ribs 7 on adjacent side walls of each two adjacent crates will always be located to be received in a recess 10 of the container or containers which overlie them.

It will be seen in Figures 4 and 5 that all the containers are similarly orientated in that their longer side walls extend in parallel planes. However it is to be realised that bonded brick stacking will also be achieved by having some of the containers in either of both layers orientated so that their longer side walls lie in planes which extend perpendicularly to the planes of the longer side walls of the remaining containers (i.e. some containers in each layer may be positioned at right angles in plan relative to the disposition of the remaining containers). Further, the stack shown in Figures 4 and 5 is illustrated in part only, it being realised that the complete stack will generally have the outline of a rectangular parallelepiped.

It will be noted from the stacking configuration shown in Figures 4 and 5 that the recesses 11 in skirt parts 9 have not been utilized. It will be seen that the recesses 11 are located adjacent to the corners formed between the adjacent sides of the respective containers and the purpose of each recess 11 is to receive a separate rib 7 of an underlying container when that container and the overlying container are positioned so that the upper container only partially overlies the lower container but at least one side wall of the upper container lies in the same vertical plane as a side wall of the lower container. For example, in Figure 5 if container 20 is removed and container 17 is displaced leftwardly to lie directly above container 13 whilst maintaining the similar overlapping relationship with containers 13 and 14 as shown in Figure 4, the rib 7 on longer side walls 2 and 4 of container 13 will be received in the recesses 11 in the part of the skirt 9 which underlies the side wall 5 of container 17 while the rib 7 on the longer side walls 2 and 4 of container 14 will be received in recesses 11 in the skirt part 9 of the sidewall 3 of container 17. By this arrangement the skirt part 9 of the side walls 2 and 4 of container 17 will bridge both containers 13 and 14. However it is possible for these latter two containers to move away from each other in a direction parallel to their longer side walls by the ribs 7 on their respective longer side walls sliding in the recesses 11 located in shorter side walls of container 17 within the extent determined by the parts of the skirt 9 formed by the side walls 3 and 5 of container 17 (that is to say the shorter side walls 3 and 5 of containers

13 and 14 respectively can move apart until those shorter side walls abut against the inner face of the skirt of container 17 formed by the shorter side walls 5 and 3 respectively of that container); consequently only partial bonding of containers 13 and 14 is achieved.

From the part stacks shown in Figures 4 and 5 it will be seen that the bottom-rims 12 of the containers in the lower layer stand on the floor. Consequently the whole weight of the containers in the upper layer is transmitted vertically through the respective side walls of the containers in the lower layer to the floor. The platform 1 of each container is therefore only required to support the contents of its container.

In the modification shown in Figures 6 and 7 each of the recesses 10 has effectively been replaced by two smaller width recesses 10a and 10b which are interspaced in the skirt 9 by a skirt portion 10c. The recesses 10a and 10b serve a similar purpose to the single recess 10 which they replace except that in this case the skirt portion 10c is of such width that it is received between two parallel ribs 7 located one on each of two abutting side walls of an adjacent underlying pair of containers while the two parallel ribs are themselves received one in each of the recesses 10a and 10b. For example, if the container shown in Figure 6 is substituted for container 17 in Figures 4 and 5, the two ribs 7 on the adjacent side walls 3 and 5 of containers 13 and 14 respectively will be received in recesses 10a and 10b respectively whilst skirt portion 10c extends downwardly between these two ribs 7, and the rib 7 on the side wall 2 of container 13 will be received in a recess 10a below side wall 5 of container 17.

The container shown in Figure 8 is similar to that shown in Figure 2 but is modified in two respects therefrom. Firstly, each pair of recesses 11 which are positioned in the skirt 9 of the Figure 2 embodiment adjacent to a common corner formed between two sides of the container have been replaced by a single recess 11a in Figure 9 (the recess 11a is effectively formed by removing the part of the skirt 9 which extends between the pairs of recesses 11 adjacent a common corner in the skirt of the container in Figure 2). Consequently, the recesses 11a in Figure 8 extend around the respective corners of the skirt 9 and serve the same purpose as the individual recesses 11 in Figure 2. The second, and more important, modification is that the container in Figure 8 is provided with projections 23 which extend downwardly from the underside of the platform 1 to define a spaced array of islands 24. The bottom of projections 23 are located in the same plane as the bottom rim 12. The islands 24 are positioned in rows

extending lengthwise and widthwise of the container to form a first array of recessed paths 25 which extend widthwise of the container parallel to the side walls 3 and 5 and a second array of recessed paths 26 which extend lengthwise of the container parallel to the side walls 2 and 4. The projections 23 positioned adjacent to the sides of the container are spaced inwardly therefrom on the platform 1 to form a continuous peripheral track around the islands 24 with the skirt part 9 of the sidewalls. The main purpose of the islands 24 is to provide additional bonding during brick stacking of several containers and consequently the disposition of the projections 23 will be determined by the particular stacking characteristics required of the container (bearing in mind the ratio between adjacent side lengths of the container). The provision and structure of the projections 23 and islands 24 is well-known in the art of stackable containers capable of brick-bonding as, for example, is disclosed in Patent Specifications Nos. 1,137,916 and 1,148,385, for this reason the islands 24 have conveniently been illustrated in block form.

In the example shown in Figure 8 it will be noted that the recesses 10 in the skirt 9 are positioned at each end of, and in line with, the recessed paths 25 and 26 and that such paths have a width which is approximately equal to the width of the recess 10. Consequently, when the containers are stacked in bonding relationship so that two parallel ribs 7 on adjacent side walls of two abutting containers in one layer are received in a recess 10 of an overlying container, those ribs are also located in a recessed path 25 or 26. In this way, the containers in a bonded stack can be restrained from lateral movement relative to each other both by abutment of at least one projection 23 against the inner face of a side wall of a container into the open top of which that projection extends, and by engagement of the ribs 7 in the recesses 10.

Although the projections 23 will stand on a horizontal floor with the bottom rim 12, the vertical loading applied to the top of the container is still taken through its side walls. However the projections 23 will, in the case of a bottom container in a stack, take part of the load effected on the platform by the container contents.

The containers as above described and illustrated are preferably made in plastics material by injection moulding and may be provided with additional constructional features as are well-known in the art, for example the vertical corners of the container may be hollow, the platform may be of open framework structure and

reinforcing ribs may be provided in both the side walls and platform where required. The brick bonding characteristics of the container make it especially suitable for use as a bottle crate in which case the interior of the container will be provided with an array of partitioning walls which extend both lengthwise and widthwise within the container to define separate bottle locating compartments. It will be noted that the outer surfaces of the sidewalls in Figures 1, 2 and 6 are provided with sunken panel parts, those parts are optional. It will further be noted from the drawings that the outer faces of the side walls of the container are substantially flat and this is preferred to permit substantially face-to-face abutment between adjacent containers in a layer when stacked; however, to provide a required degree of frictional contact between adjacent containers the side walls may have located on their outer faces small vertically extending ribs shown generally at 27 in Figures 1 and 2. For the avoidance of doubt the gripper ribs 27 do not constitute reinforcing ribs and extend outwardly of the outer faces of the sidewalls on which they are provided. In a construction in which the outer faces of the side walls are substantially flat and uninterrupted, any reinforcing ribs as may be required in the sidewalls can be located within the interior of the container and conveniently some, if not all, of such internally located reinforcing ribs may be integral both with a side wall and the platform to provide support for a lightweight platform.

WHAT WE CLAIM IS:—

1. An open topped container having the general outline of a rectangular parallelepiped and comprising four substantially vertical side walls which form a substantially rectangular enclosure and provide a bottom rim on which the container can stand, the side walls extending upwardly from the bottom rim to a top rim of the container, said top rim being carried on an upwardly extending top rib formed by a rebate in the side walls which rebate provides a substantially flat shoulder located at the base of the top rib and adjacent to the outer faces of the side walls, said shoulder extending around the periphery of the container; a substantially rectangular horizontal platform for supporting goods in the container, said platform interconnecting opposed side walls at a position between and remote from the top and bottom rims; said bottom rim and top rib being so arranged that two similar containers may be column stacked whereby the top rib of the lower container is closely received within the enclosure formed by the side walls of the upper container adjacent to

the bottom rim thereof while the upper container stands with its bottom rim on the shoulder of the lower container; and wherein the side walls of the container are provided with an array of recesses below the platform which recesses open downwardly at the bottom of the container so that the side walls define a discontinuous bottom rim, said recesses being so located that when two similar containers are vertically stacked one on top of the other and with the upper container partially overlying the top of the lower container in brick stacking relationship so that the side walls of the two containers are parallel, the top rib of the lower container can cross with the bottom rim of the upper container where such bottom rim is discontinuous and be received within recesses in the side walls of the upper container to provide bonded brick stacking between the two containers.

2. A container as claimed in claim 1 in which each of the side walls has inner and outer faces which are substantially parallel at least for their extent above the platform.

3. A container as claimed in either claim 1 or claim 2 wherein the top rib is continuous around the open top of the container.

4. A container as claimed in any one of the preceding claims wherein the recesses in the sidewalls are of a depth such that they will accommodate the full depth of the top rib of an underlying similar container.

5. A container as claimed in any one of the preceding claims wherein the array of recesses in the sidewalls provide a castellated appearance around the bottom of the container.

6. A container as claimed in any one of the preceding claims wherein that side of the top rib which extends upwardly from the shoulder, is provided with a chamfer tapering upwardly and inwardly of the container and the inner face of the sidewalls at the bottom of the container below the platform is provided with a complementary chamfered taper to mate in column stacking with the chamfer on the top rib of an underlying similar container.

7. A container as claimed in any one of the preceding claims wherein the recesses in the sidewalls are symmetrically disposed around the bottom rim so that one half of the bottom rim taken on a centre line parallel to a pair of opposed side walls is the mirror image of the other half of the bottom rim.

8. A container as claimed in any one of the preceding claims wherein at least some recesses in the bottom rim of the sidewalls are each of a width to closely receive a single top rib of an underlying similar container.

9. A container as claimed in any one of the preceding claims wherein at least come



reinforcing ribs may be provided in both the side walls and platform where required. The brick bonding characteristics of the container make it especially suitable for use as a bottle crate in which case the interior of the container will be provided with an array of partitioning walls which extend both lengthwise and widthwise within the container to define separate bottle locating compartments. It will be noted that the outer surfaces of the sidewalls in Figures 1, 2 and 6 are provided with sunken panel parts, those parts are optional. It will further be noted from the drawings that the outer faces of the side walls of the container are substantially flat and this is preferred to permit substantially face-to-face abutment between adjacent containers in a layer when stacked; however, to provide a required degree of frictional contact between adjacent containers the side walls may have located on their outer faces small vertically extending ribs shown generally at 27 in Figures 1 and 2. For the avoidance of doubt the gripper ribs 27 do not constitute reinforcing ribs and extend outwardly of the outer faces of the sidewalls on which they are provided. In a construction in which the outer faces of the side walls are substantially flat and uninterrupted, any reinforcing ribs as may be required in the sidewalls can be located within the interior of the container and conveniently some, if not all, of such internally located reinforcing ribs may be integral both with a side wall and the platform to provide support for a lightweight platform.

WHAT WE CLAIM IS:—

1. An open topped container having the general outline of a rectangular parallelepiped and comprising four substantially vertical side walls which form a substantially rectangular enclosure and provide a bottom rim on which the container can stand, the side walls extending upwardly from the bottom rim to a top rim of the container, said top rim being carried on an upwardly extending top rib formed by a rebate in the side walls which rebate provides a substantially flat shoulder located at the base of the top rib and adjacent to the outer faces of the side walls, said shoulder extending around the periphery of the container; a substantially rectangular horizontal platform for supporting goods in the container, said platform interconnecting opposed side walls at a position between and remote from the top and bottom rims; said bottom rim and top rib being so arranged that two similar containers may be column stacked whereby the top rib of the lower container is closely received within the enclosure formed by the side walls of the upper container adjacent to

the bottom rim thereof while the upper container stands with its bottom rim on the shoulder of the lower container; and wherein the side walls of the container are provided with an array of recesses below the platform which recesses open downwardly at the bottom of the container so that the side walls define a discontinuous bottom rim, said recesses being so located that when two similar containers are vertically stacked one on top of the other and with the upper container partially overlying the top of the lower container in brick stacking relationship so that the side walls of the two containers are parallel, the top rib of the lower container can cross with the bottom rim of the upper container where such bottom rim is discontinuous and be received within recesses in the side walls of the upper container to provide bonded brick stacking between the two containers.

2. A container as claimed in claim 1 in which each of the side walls has inner and outer faces which are substantially parallel at least for their extent above the platform.

3. A container as claimed in either claim 1 or claim 2 wherein the top rib is continuous around the open top of the container.

4. A container as claimed in any one of the preceding claims wherein the recesses in the sidewalls are of a depth such that they will accommodate the full depth of the top rib of an underlying similar container.

5. A container as claimed in any one of the preceding claims wherein the array of recesses in the sidewalls provide a castellated appearance around the bottom of the container.

6. A container as claimed in any one of the preceding claims wherein that side of the top rib which extends upwardly from the shoulder, is provided with a chamfer tapering upwardly and inwardly of the container and the inner face of the sidewalls at the bottom of the container below the platform is provided with a complementary chamfered taper to mate in column stacking with the chamfer on the top rib of an underlying similar container.

7. A container as claimed in any one of the preceding claims wherein the recesses in the sidewalls are symmetrically disposed around the bottom rim so that one half of the bottom rim taken on a centre line parallel to a pair of opposed side walls is the mirror image of the other half of the bottom rim.

8. A container as claimed in any one of the preceding claims wherein at least some recesses in the bottom rim of the sidewalls are each of a width to closely receive a single top rib of an underlying similar container.

9. A container as claimed in any one of the preceding claims wherein at least come

- recesses in the bottom rim of the sidewalls are each of a width so that they can bridge and closely receive the top ribs of two side walls one from each of two underlying similar containers when such two side walls are parallel and positioned adjacent to each other in substantially face-to-face abutment.
- 5 10. A container as claimed in any one of the preceding claims wherein the area of the underside of the platform within the substantially rectangular enclosure formed by the sidewalls is substantially planar.
- 10 11. A container as claimed in any one of claims 1 to 8 wherein the underside of the platform is provided with downwardly extending projections which form an array of islands, said islands defining between themselves and with the sidewalls an array of intersecting and recessed paths which extend on the underside of the platform parallel to the side walls, and wherein the recesses at the bottom rim of the sidewalls are located in line with, and at each end of, the said recessed paths.
- 15 12. A container as claimed in any one of the preceding claims which is of oblong rectangular shape in plan and has the proportion of the length of the shorter side walls to the length of the longer side walls in the ratio a/b , and wherein recesses in the shorter side walls are located substantially one at each end thereof and at substantially every $1/a$ part length of the shorter side walls from the ends thereof and in the longer side walls are located substantially one at each end thereof and at substantially every $1/b$ part length of the longer side walls from the ends thereof.
- 20 13. A container as claimed in any one of the preceding claims when formed as a single unit in plastics material by injection moulding.
- 25 14. A container as claimed in any one of the preceding claims and in the form of a bottle crate in which the interior of the container is provided with means setting out an array of separate bottle receiving compartments.
- 30 15. A container substantially as herein described with reference to Figures 1 to 5 of the accompanying illustrative drawings.
16. A container substantially as herein described with reference to Figures 6 and 7 of the accompanying illustrative drawings.
17. A container substantially as herein described with reference to Figure 8 of the accompanying illustrative drawings.
- URQUHART-DYKES & LORD,
Columbia House,
69 Aldwych,
London, WC2B 4EJ,
and
11th Floor Tower House,
Merrion Way,
Leeds LS2 8PB.
Chartered Patent Agents.

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