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2,986,300

NESTABLE SHOCK DAMPING CONTAINER

Filed Oct. 12, 1959

2 Sheets-Sheet 1

Fig. 1

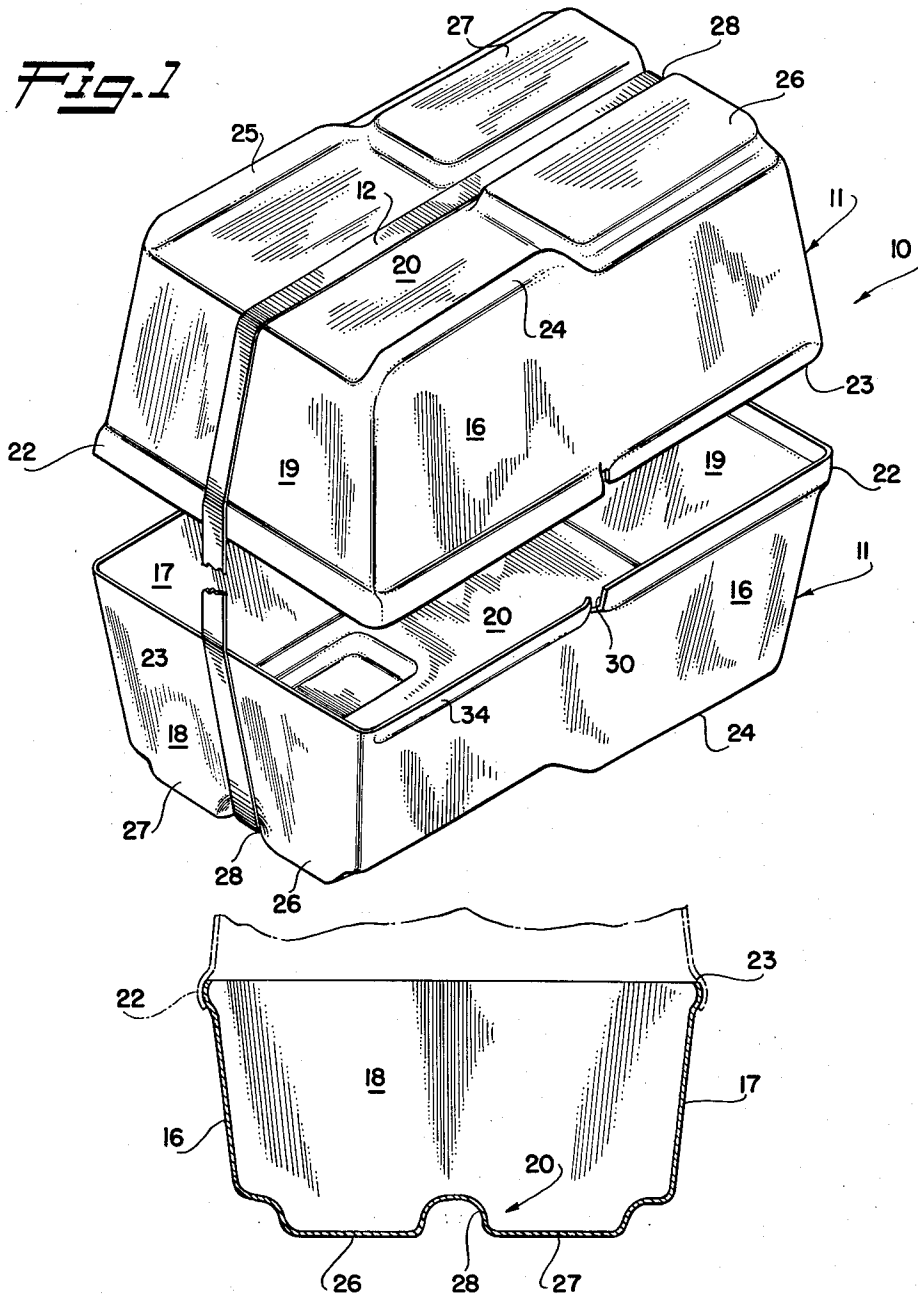


Fig. 2

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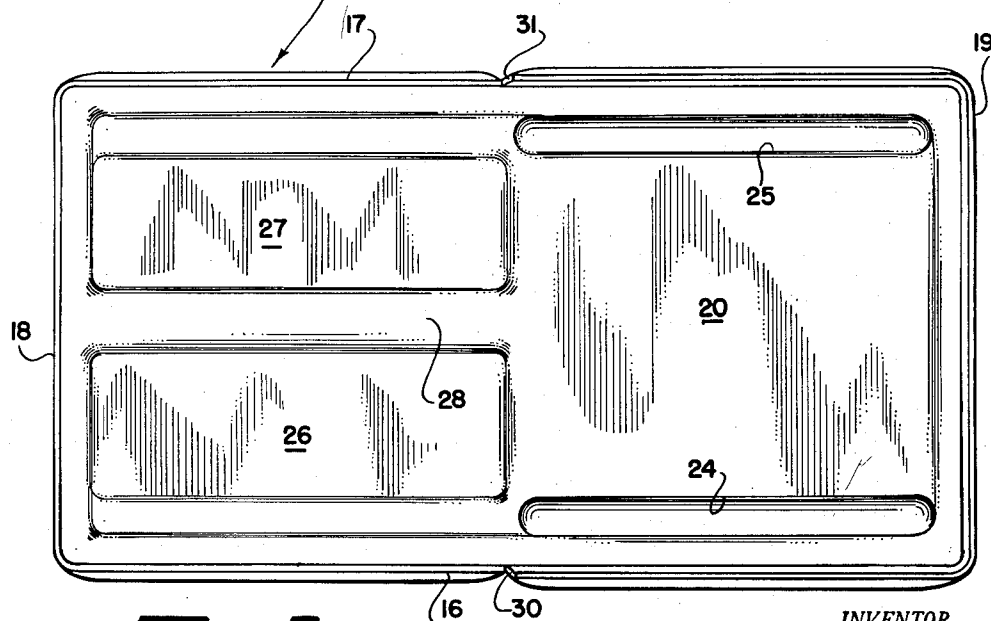
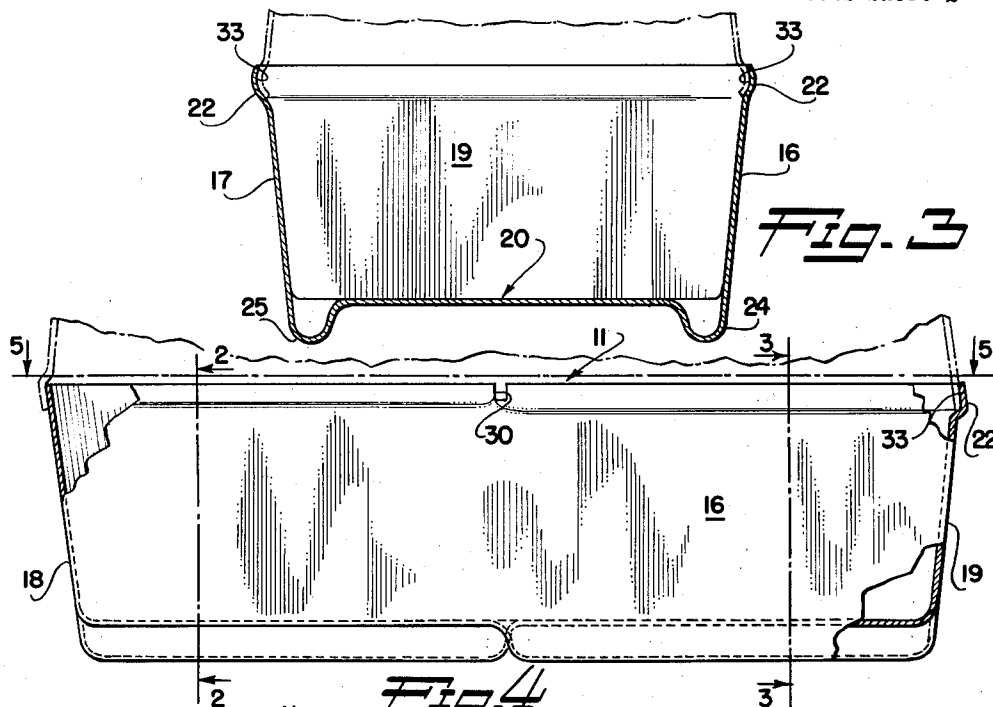


Fig. 5

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NESTABLE SHOCK DAMPING CONTAINER

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This invention relates to a container. More particularly, it relates to a container designed for packaging of fragile devices. Even more particularly, it relates to a container designed to absorb impact and which adapts itself to ease of handling.

In the transportation and shipping of any article, there is always a danger that unwanted shocks and crushing may occur from dropping or mishandling. This problem becomes extremely critical when the object being handled is a delicate electronic instrument where any slight shock may cause extreme damage. Many efforts have gone toward perfecting a container which will absorb and cushion impacts without damage to the contents.

Many different materials have been used in various shapes in an attempt to perfect a container which would meet the requirements necessary to package delicate apparatus. One much used configuration is the rectangular prism comprised of several generally flat sides. Rectangular-sided containers, when constructed of yieldable material such as cardboard, provide effective damping when the container is dropped on one of the corners. However, when the container is dropped on a flat side, the impact is transmitted to the contents of the package.

A flat-sided container is effective to absorb corner impact only if the material from which it is constructed is yieldable. However, yieldable materials will not resist steadily applied crushing forces. When materials are used which will resist crushing force, such as metal or wood, the impact-absorbing feature is sacrificed. Impact force, whether on a corner or a side, is transmitted directly to the contents of the container.

Departures from the traditional flat-sided container permitted by metals and synthetic materials in order to achieve a package which would embody the shock-absorbing characteristics resulted in odd shapes which would not stack or package easily and were not crush resistant.

It is thus an important purpose of this invention to provide a container which has good shock-absorbing characteristics. Various raised areas and protuberances are provided about the exterior surface of the package which, when subjected to impact, will yield without appreciable transmission of that impact to the remainder of the package and its contents.

It is another important object of this invention to provide a container which is crush resistant. The shape of the container is designed with strategically located protuberances to provide reinforcement to the structure.

It is another important object of this invention to provide a container which is simple and inexpensive to make. The container is comprised of two parts identical in shape and size so that only a single mold is required. The two parts are interfitted together to form a complete six-sided container. Thus, only one part need be stocked in a supply system.

It is another important object of this invention to provide a container which is simple to use. The two identical parts have interfitting means which permit only the

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correct assembly. Only a single unidirectional movement is required to assemble the two halves.

It is another important object of this invention to provide a container which is easy to store and easy to stack into larger container. The protuberances aforementioned are so shaped that the top of one container interfits and interlocks with the bottom of the next like container above it, providing for a savings in space and a restriction to lateral movement of adjacent packages, lessening the opportunity for shocks and crushing.

It is a further important object of this invention to provide a container comprised of a minimum of parts. Two identical parts or halves are provided which may be fastened together easily and simply to form a single package. A single strap around the package provides the required fastening to hold the two identical halves together.

Further objects and advantages will become apparent from a reading of the specifications and claims which follow, especially when taken in conjunction with the appended drawings.

Fig. 1 is a perspective of the container showing the two identical parts or halves in exploded form.

Fig. 2 is a sectional view of one of the identical parts taken on lines 2—2 of Fig. 4.

Fig. 3 is a sectional view of one of the identical parts taken on lines 3—3 of Fig. 4.

Fig. 4 is a side view of one identical part of a modification of the container within the scope of the present invention.

Fig. 5 shows a plan view of an identical part taken on lines 5—5 of Fig. 4.

The container 10 as seen in Fig. 1 is divided in this showing on the horizontal plane into two identical halves or parts 11 having interfitting means 22 and held together face to face by strap 12, making a complete container. Each of said identical parts 11 is comprised of two side walls 16 and 17, end walls 18 and 19, and a bottom 20. It will be understood that the bottom 20 will take the part of the top of the container when the identical part 11 is inverted to mate with another part 11 to form the completed container 10. For simplicity of explanation, it will be referred to simply as a bottom.

The protuberances 24 to 27 on the bottom 20 provide added structural strength. They also provide means which will yield to impact so as to protect the contents of the container. The narrow protuberances 24 and 25 extend along bottom wall 20 adjacent the side walls 16 and 17 from end wall 19 to halfway to end wall 18. The wide protuberances 26 and 27 are displaced inwardly from the side walls the width of the narrow protuberances 24 and 25 and extend from end wall 18 to the halfway point on the bottom 20. The respective relation of the protuberances of their end walls is shown here only as an example.

When two or more containers are stacked one on top of another, the narrow protuberances 24 and 25 will be on either side of the wide protuberances 26 and 27 of the next adjacent container 10, preventing lateral relative movement between the two containers. The narrow protuberances 24 and 25 of one container 10 will abut like members on the adjacent container 10 as will related wide protuberances 26 and 27 to prevent longitudinal or endwise relative movement. Thus, the container 10 is adapted to nest with like containers.

The wide protuberances 26 and 27 are spaced to form a channel 28 which lies parallel to the side walls 16 and 17 to provide a retaining means for endless strap 12. The channel 28 additionally provides rigidity and structural strength. Thus, it also has a dual purpose.

Midway along the side walls 16 and 17 on the peripheral edge 23 are notches 30 and 31. Skirt 22 extends around the peripheral edge 23 of the opening of each of said parts

or halves 11 defined by the side and end walls from notch 30 on edge 23 of side 16, across the end wall 19 and back along the edge 23 of side 17 to the notch 31 on the side wall 17 to form interfitting means between the two identical parts. The skirt 22 is displaced outwardly the width of the walls of the container so that when two identical parts or halves 11 are put in face-to-face relationship, 180 degrees from each other, it will fit over the remainder of the edge 23. Skirt 22 is curved inwardly on its upper edge to form a concave portion 33 on its inner surface from the notches 30, 31 to the end wall 19. The peripheral edge 23 from the notches 30 to 31 on the opposite end of the container is given a convex shape 34 on its outer edge to the depth of the notches 30 and 31, as shown in Figs. 1 and 4. When the container halves 11 are fitted together, the convex portion 34 of the peripheral edge 23 fits inside of the concave portion 33 with the notches 30 and 31 being interlocked. It can be seen that it is not absolutely necessary to use the strap 12, since the concave portion 33 interlocks with the convex portion 34. In such a case, wide protuberances 26 and 27 may be joined to form a single wide protuberance.

For increased simplicity of manufacture, the skirt 22 may be straight with no concave portion 33 and the convex portion 34 eliminated. The parts 11 will fit together with like facility but the holding means will be the strap 12 alone.

As can be seen from Figs. 2 to 4, the side and end walls 16 to 19 diverge outwardly slightly to form a raised portion or ridge about the equatorial plane of separation of the container. This serves to absorb shock and crushing forces so that those forces will not be transmitted to the contents of the container. Any crushing force will be transmitted to the strap 12 since inward movement of this outwardly facing raised portion or ridge around the equatorial plane of separation will cause the side walls 16 and 17 to push the bottom walls 20 outwardly, which will be resisted by strap 12. Thus, it can be seen that the slight outward divergence on the side and end walls serve to absorb crushing and shock forces.

An instrument packaged in the container 10 of the subject invention may be packed in some filler material, such as synthetic foam or rubberized hair which is inserted in container half 11. A like container half 11 is fitted over the top and held together by endless strap 12 in channel 28. When dropped on any one of the protuberances 24, 25, 26 or 27, the protuberance will yield to the force of the impact, transmitting little of the force to the remainder of the container and its contents. The protuberances are of equal height so that when the container is set upon a flat surface, it will lie flat.

Any material which can be shaped according to that disclosed in the detailed description and drawings can be used to construct a container 10 of the present invention. It can be seen that only one shaping tool such as a mold will be needed to form the two identical parts. When a mold is used, only a single operation is required. Since both parts 11 are identical, only a single package unit need be stocked in the supply system which uses this type of container. The person who assembles the container 10 need not have extensive training in the packaging operation. Time is not wasted identifying the differing package parts since there is only one. There is no necessity for extreme care in assembling the two identical halves since they will fit in only the correct manner. The problem of mismatching parts has been overcome by the present invention.

While various materials have been mentioned in the statement of the problems and have been suggested in the description of the present device, this invention is not intended to be limited to the use of those specific materials. The invention is further not intended to be restricted to any particular arrangement of elements and parts even where specifically shown and described herein, as the same may be modified in various particulars or may be

applied in many varied relations without departing from the spirit and scope of the claimed invention, practical constructions embodying certain details of the invention being illustrated and described but only for the purpose of complying with the requirements of the statutes for the disclosure of operative embodiments but without attempting to disclose all of the various forms and modifications in which the invention might be embodied.

Having revealed the details of my invention, I claim the following combinations and their equivalents which fall within the scope of the following claims as my invention.

What is claimed is:

1. A container comprised of identical top and bottom halves, each half having side walls, end walls and a bottom wall, the exterior of said bottom wall having two relatively narrow elongated protuberances along its edges adjacent said side walls extending half the length of said bottom wall from one of said end walls, a relatively wide protuberance extending half the length of said bottom wall from the other of said end walls, said wide protuberance having a width equal to the width of said bottom wall between said side walls less the width of the narrow protuberances and being centrally located between said side walls on said bottom wall.

2. A container comprised of identical interfitting top and bottom halves, each half being comprised of side walls, end walls and a bottom wall, said side walls terminating in an upper peripheral edge, a skirt extending one-half the distance around said peripheral edge being displaced outwardly the thickness of said walls, said bottom wall having an exterior surface including two relatively narrow protuberances extending along said bottom wall adjacent opposite side walls from one of said end walls to one-half the distance to the other of said end walls and a relatively wide protuberance on said bottom wall extending from said other of said end walls to one-half the distance to said one of said end walls, said wide protuberance having a width substantially equal to the distance between said narrow protuberances and lying halfway between said side walls on said bottom so that when several containers are stacked one on top of another, said wide protuberance will rest between said narrow protuberances.

3. A container comprised of identical halves being divided on a plane parallel to the top and bottom of said container, two halves terminating in a peripheral edge at said parallel plane, each of said edges having a skirt displaced outwardly the width of the wall one-half the distance around the periphery of said edge, each of said halves being comprised of end walls, side walls and a bottom wall, said bottom wall having two elongated narrow protuberances extending along said side walls from one of said ends one-half the distance to the other of said end walls, a wide protuberance extending from said other of said end walls extending halfway to said one of said end walls, said wide protuberance having a width equal to the width of said bottom wall less the width of said elongated narrow protuberances and lying equidistant between said side walls, said wide protuberance having a channel extending its length parallel to said side walls so as to accommodate holding means.

4. An open top container having a bottom wall, side walls and end walls terminating in an edge extending about the side walls and said end walls in a plane parallel to said bottom wall, a skirt extending one-half the distance around the periphery of said edge being displaced outwardly from said side and end walls the width of said walls, said bottom wall having narrow elongated protuberances extending from one of said end walls halfway to the other of said end walls extending along said side walls, a wide protuberance of equal height to said narrow protuberances extending from said other of said end walls to a point halfway to said one end wall having a width equal to the width of said bottom less the width of

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said narrow protuberances and being centrally located on said bottom wall equidistant between said side walls, said wide protuberance having a channel extending its length and being parallel to said side walls.

5. A container having a substantially plane bottom of rectangular shape, upstanding side walls and end walls from said bottom of substantially equal height, said walls diverging outwardly slightly and defining an open top having a peripheral edge substantially rectangular in shape, said peripheral edge being relieved by two notches equidistant from each other, said notches having equal depth, one half of said peripheral edge from one of said notches to the other of said notches being displaced outwardly approximately the width of said wall to the depth of said notches to form a skirt, said skirt being curved inwardly at its upper edge to form an inwardly facing concave cross section, the remainder of said peripheral edge being formed with an outwardly facing convex cross section, said bottom of said container having two relatively narrow protuberances extending from substantially said one end wall to halfway to said other end wall lying adjacent said side walls of said container, relatively wide protuberances extending from said other end wall to halfway to said one end wall being of less width than the width of said bottom wall and being displaced inwardly from said side walls the width of said narrow protuberances and having a channel between said wide protuberances extending from said other end wall to parallel to said side walls between said wide protuberances.

6. A container having a substantially plane bottom of rectangular shape, upstanding side walls and end walls from said bottom of substantially equal height, said walls diverging outwardly slightly and defining an open top having a peripheral edge substantially rectangular in shape, said peripheral edge being relieved at two points equidistant from each other around the periphery by notches approximately twice the thickness of the walls of said container in width and four times the thickness in depth, one half of said peripheral edge from one of said notches to the other of said notches being displaced outwardly approximately the width of said wall to a depth approximately equal to the said depth of said notches to form a skirt, said skirt being curved inwardly at its upper edge to form a concave cross section facing inwardly, the remainder of said peripheral edge being formed with an outwardly facing convex cross-sectional shape, said bottom of said container having two relatively narrow protuberances extending from substantially one of said end walls to halfway to the other of said end walls lying adjacent said side walls of said container, relatively wide protuberances extending from said other of said end walls to halfway to said one of said end walls being of less width than the width of said bottom wall and being displaced inwardly from said side walls the width of said narrow protuberances and having a channel between said wide protuberances extending from said other of said end walls parallel to said side walls between said wide protuberances.

7. A container having a substantially plane bottom of rectangular shape, upstanding side walls and end walls from said bottom of substantially equal height diverging outwardly slightly and defining an open top having a peripheral edge substantially rectangular in shape, said peripheral edge being relieved at two points equidistant from each other around the periphery by a notch midway along each of said side walls having a width approximately twice the thickness of the walls of said container and a depth of four times the thickness of said walls, said peripheral edge from one of said notches to the other of said notches including the edge along one of said end walls being displaced outwardly approximately the width of said walls to a depth approximately the depth of said notches to form a skirt, said skirt being curved inwardly at its upper edge to form a concave cross section facing inwardly, the remainder of said peripheral edge being

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formed with an outwardly facing convex cross-sectional shape, said bottom of said container having two relatively narrow protuberances extending from substantially said one of said end walls halfway to the other of said end walls lying adjacent said side walls of said container so that they are on the same end of said container as said concave-shaped skirt and relatively wide protuberances extending from the other of said end walls to halfway to said one of said end walls being of less width than the width of said bottom wall and being displaced inwardly from said side walls the width of said narrow protuberances and having a channel extending from one end to the other of said wide protuberance parallel to said side walls of said container.

8. A container having two identical parts, each part comprised of a substantially plane bottom of rectangular shape, upstanding side walls and end walls from said bottom of substantially equal height, said walls diverging outwardly slightly and defining an open top having a peripheral edge substantially rectangular in shape, said peripheral edge being relieved by two notches equidistant from each other, said notches having equal depth, one-half of said peripheral edge from one of said notches to the other of said notches being displaced outwardly approximately the width of said walls to the depth of said notches to form a skirt, said skirt being curved inwardly at its upper edge to form an inwardly facing concave cross section, the remainder of said peripheral edge being formed with an outwardly facing convex cross section, said bottom of said part having two relatively narrow protuberances extending from substantially said one end wall to halfway to said other end wall lying adjacent said side walls of said part, relatively wide protuberances extending from said other end wall to halfway to said one end wall being of less width than the width of said bottom wall and being displaced inwardly from said side walls the width of said narrow protuberances and having a channel between said wide protuberances extending from said other end wall to parallel to said side walls between said wide protuberances, said narrow and said wide protuberances being of equal height, the peripheral edges of the two identical parts being mated to form a closed six-wall container, the notches of one of said identical parts interlocking with the notches of the other of said identical parts, the concave portion of the peripheral edge of one of said identical parts being mated with the outside of the convex portion of the other part to interlock the two parts together, an endless strap around said container lying in the channels defined by the wide protuberances, the diverging side and end walls of said container providing a shock and crush-absorbing cushion around the equatorial axis and the protuberances on the top and bottom of said container providing crush and shock-absorbing devices for vertical forces.

9. A container having a substantially plane bottom of rectangular shape, side walls and end walls upstanding from said bottom of substantially equal height, said walls diverging outwardly slightly and defining an open top having a peripheral edge substantially rectangular in shape, said peripheral edge being relieved by two notches equidistant from each other around said periphery, said notches having equal depth, one-half of said peripheral edge from one of said notches to the other of said notches being displaced outwardly approximately the width of said wall to the depth of said notches to form a skirt, said skirt being curved inwardly at its upper edge to form an inwardly facing concave cross section, the remainder of said peripheral edge being formed with an outwardly facing convex cross section.

10. A container having two identical parts, each part comprised of a substantially plane bottom of rectangular shape upstanding side walls and end walls from said bottom of substantially equal height, said walls diverging outwardly slightly and defining an open top having a peripheral edge substantially rectangular in shape, said

peripheral edge being relieved by two notches equidistant from each other, said notches having equal depth, one-half of said peripheral edge from one of said notches to the other of said notches being displaced outwardly approximately the width of said walls to the depth of said notches to form a skirt, said skirt being curved inwardly at its upper edge to form an inwardly facing concave cross section, the remainder of said peripheral edge being formed with an outwardly facing convex cross section, the notches of one of said identical parts interlocking with the notches of the other of said identical parts, the concave portions of the peripheral edge of said identical parts being mated with the outside of the convex portions of the other of said parts to interlock two parts together.

11. A container comprised of identical halves being divided on a plane parallel to the top and bottom of said container, two halves terminating in a peripheral edge at said parallel plane, means to retain said identical halves in face-to-face relationship at said peripheral plane, each of said halves being comprised of end walls and side walls and a bottom wall, said bottom wall having two elongated narrow protuberances extending along said sidewalls from one of said end walls one-half the distance to the other of said end walls, relatively wide protuberances extending from said other end wall to halfway to said one end wall being of less width than the width of said bottom wall and being displaced inwardly from said side walls.

12. A container having two identical parts, each part comprised of a substantially plane bottom of rectangular shape, side walls and end walls upstanding from said bottom of substantially equal height, said walls diverging outwardly slightly and defining an open top having a pe-

ripheral edge substantially rectangular in shape, said bottom of each of said parts having two relatively narrow protuberances extending from substantially said one end wall to halfway to said other end wall lying adjacent said side walls of said part, relatively wide protuberances extending from said other end wall to halfway to said one end wall being of less width than the width of said bottom wall and being displaced inwardly from said side walls the width of said narrow protuberances and having a channel between said wide protuberances extending from said other end wall to parallel to said side walls between said wide protuberances, said narrow and said wide protuberances being of equal height, the peripheral edges of the two identical parts being mated to form a closed six wall container, an endless strap around said container lying in the channels defined by the wide protuberances, the diverging side and end walls of said container providing a shock and crush absorbing cushion around the equatorial axis and the protuberances on the top and bottom of said container providing crush and shock-absorbing devices for vertical forces.

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