A packaging device has a container provided with a shock-absorbing unit that includes a bottom pad, and a plurality of side pads extending upward from opposite sides of the bottom pad. Each of the bottom and side pads includes a plate member that has a corrugated base plate region and a peripheral flange surrounding the corrugated base plate region. The corrugated base plate region projects from an inner surface of the container to absorb shock when the peripheral flange abuts against the inner surface. Partition pads are provided to span opposite side pads when an object to be packaged is small.
FIG. 6
SHOCK-ABSORBING PACKAGING DEVICE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention
[0002] The invention relates to a packaging device, more particularly to a shock-absorbing packaging device.
[0003] 2. Description of the Related Art
[0004] For protection purposes, most objects are packaged within containers when they are transported. When there are voids present between the object and an inner side of the container, or when it is necessary to cushion the object inside the container, stuffing materials are used to fill the voids or to cushion the object.
[0005] Commonly used stuffing materials include foams that are formed as blocks or plates having sizes and shapes capable of complementing with the voids around an object within a container. Usually, the sizes and shapes of the blocks or plates are customized. Therefore, once the object is changed in size, the blocks or plates will become unsuitable, and a new set of blocks or plates must be fabricated, thereby increasing manufacturing costs and inventory problems.
[0006] Another stuffing material is a blistered packing material that can be stuffed into voids between an object and an inner side of a container. While the blistered packing material may be manufactured at a low cost and may be used for different sizes and shapes of objects, wrapping an object with the blistered packing material is laborious and time-consuming and requires use of an adhesive tape to fasten the blistered packing material. When the object is to be unwrapped, it is necessary to cut off the adhesive tape and even the blistered packing material by using a knife or scissors. Generally, the blistered packing material cannot be reused after cut.

SUMMARY OF THE INVENTION

[0007] Therefore, an object of the present invention is to provide a packaging device with a shock-absorbing unit that accommodates different sizes of containers and different sizes of objects to be packaged.
[0008] Another object of the present invention is to provide a packaging device with a shock-absorbing unit that facilitates packaging of an object.
[0009] According to one aspect of this invention, a packaging device comprises a container and a shock-absorbing unit disposed within the container in abutment with an inner surface of the container. The shock-absorbing unit includes a bottom pad having opposite sides, and a plurality of side pads extending upward at the opposite sides of the bottom plate. Each of the side pads has a plurality of parallel grooves that are aligned respectively with the grooves of the other opposite one of the side pads in horizontal directions and that define a plurality of ribs therebetween. The shock-absorbing unit further includes a partition unit to be placed inside the container and including at least one partition pad for spanning two opposite ones of the side pads that are opposite to each other. The partition pad has two opposite ends insertable selectively and respectively into two of the grooves in the opposite ones of the side pads.
[0010] According to another aspect of the present invention, a packaging device comprises a container and a shock-absorbing unit disposed within the container and abutting against an inner surface of the container. The shock-absorbing unit includes: a bottom pad having opposite sides; and a plurality of side pads extending upward at the opposite sides of the bottom pad. Each of the bottom and side pads includes a plate member which has a corrugated base plate region and a peripheral flange surrounding the corrugated base plate region. The corrugated base plate region projects from an inner surface of the container when the peripheral flange abuts against the inner surface. The corrugated base plate region is deformable to absorb shock.

[0011] According to still another aspect of the present invention, there is provided a foldable pad for protecting an object placed inside a container. The foldable pad comprises four plate members that are connected foldably to each other. One of the plate members has front, rear, left and right sides. Three of the plate members are connected respectively to the front and rear sides and the left or right side and are foldable upward from said one of the plate members. Each of the plate members has a corrugated base plate region and a peripheral flange surrounding the corrugated base plate region. The peripheral flange is adapted to abut against an inner surface of the container, and the corrugated base plate region is adapted to project from the inner surface of the container and to cushion the object. The corrugated base plate region is deformable to absorb shock and has a plurality of ribs that define grooves therebetween.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment with reference to the accompanying drawings, of which:
[0013] FIG. 1 is an exploded perspective view of a shock-absorbing unit of a packaging device embodying the present invention;
[0014] FIG. 2 is a plan view showing two foldable pads of the shock-absorbing unit;
[0015] FIG. 3 is a sectional side view showing that plate members of a top panel are assembled with the foldable pads;
[0016] FIG. 4 is a plan view showing that an object and the shock-absorbing unit are placed in a box;
[0017] FIG. 5 is a perspective view of the shock-absorbing unit;
[0018] FIG. 6 is a sectional view of a plate member of a partition pad;
[0019] FIG. 7 is a perspective view showing one partition pad placed inside the shock-absorbing unit;
[0020] FIG. 8 is a perspective view showing three partition pads provided inside the shock-absorbing unit;
[0021] FIG. 9 is a sectional view showing two partition pads provided within the shock-absorbing unit;
[0022] FIG. 10 is a perspective view showing two partition pads provided inside the shock-absorbing unit;
[0023] FIG. 11 is the same view as FIG. 10 but showing an additional top panel provided on top of a foldable pad; and
[0024] FIG. 12 is a perspective view showing four partition pads provided inside the shock-absorbing unit.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0025] Referring to FIGS. 1 to 4, a packaging device embodying the present invention includes a container in the
form of a box 5, and a shock-absorbing unit to be placed inside the box 5 in abutment with an inner surface of the box 5. The shock-absorbing unit includes a bottom pad 1, side pads, a partition unit 3, and a top pad 4.

[0026] The bottom pad 1 includes two plate members 11 each of which has a plurality of parallel grooves 111 that define a plurality of ribs 112 therebetween.

[0027] The side pads include two pairs of opposite side pads that extend upright at opposite sides of the bottom pad 1. In particular, the side pads include front and rear side pads 2A, 2B, and left and right side pads 2C, 2D. Each of the front and rear side pads 2A, 2B includes two plate members 21, 22. Each of the plate members 21, 22 has parallel grooves 211, 221 that are aligned respectively with the grooves 211, 221 of the other one of the plate members 21, 22 in a horizontal direction and that define a plurality of ribs 212, 222 therebetween. Each of the left and right side pads 2C, 2D has a plate member 23, 24 including parallel grooves 231, 241. The grooves 231 of the plate member 23 of the left side pad 2C are aligned respectively with the grooves 241 of the plate member 24 of the right side pad 2D in a horizontal direction. The grooves 231, 241 define ribs 232, 242 therebetween. In addition, the grooves 211, 221 of the plate members 21, 22 are aligned with the grooves 111 of the plate members 11 of the bottom pad 1.

[0028] Referring to FIG. 5 in combination with FIGS. 1, 2 and 4, each plate member 11, 21, 22, 23, 24 is a tray-like plate member that includes a corrugated base plate region 26 provided with the grooves 111, 211, 221, 231, 241 and the ribs 112, 212, 222, 232, 242, and a peripheral flange 27 that surrounds the corrugated base plate region 26 and that extends obliquely and flares outwardly from the corrugated base plate region 26. The plate members 11, 21, 22, 23, 24 are preferably made of plastic and are arranged such that the corrugated plate region 26 projects from an inner surface of the box 5 when the peripheral flanges 27 abut against the inner surface of the box 5. The corrugated base plate regions 26 are deformable to absorb shock. The peripheral flanges 27 of the plate member 21, 22, 23, 24 are provided with protrusion-and-recess engagement surfaces for interengaging the plate members 21, 22, 23, 24 at four corners of the box 5. Preferably, the protrusion-and-recess engagement surfaces include recesses 231, 223 formed in the peripheral flanges 27 of the plate member 21, 22, and protrusions 233, 243 formed in the peripheral flanges 27 of the plate members 23, 24.

[0029] The partition unit 3 includes a plurality of partition pads, specifically, first partition pads 31 for spanning the front and rear side pads 2A, 2B, and second partition pads 32 for spanning the left and right side pads 2C, 2D. Each first partition pad 31 has two opposite ends insertable selectively and respectively into two grooves 211, 221 of the plate members 21, 22. Each second partition pad 32 has two opposite ends insertable selectively and respectively into two grooves 231, 241 of the plate members 23, 24. The first and second partition pads 31, 32 are substantially vertical and each has a height smaller than that of the plate members 21, 22, 23, 24. Preferably, the first and second partition pads 31, 32 have a height substantially equal to half a height of the plate members 21, 22, 23, 24. In use, the first partition pads 31 are placed transversely of the second partition pads 32.

[0030] Referring to FIG. 6 in combination with FIGS. 1 and 2, each of the first and second partition pads 31, 32 includes a plate member made of plastic and having a corrugated plate region 331 and a marginal flange 332 that is insertable into the grooves 111, 211, 221, 231, 241. The corrugated partition plate region 331 has a plurality of ribs 334 and grooves 335 that extend in a direction transverse to the directions along which the grooves 211, 221, 231, 241, and the ribs 212, 222, 232, 242 of the plate members 21, 22, 23, 24 extend. However, it is contemplated that the partition pads 31, 32 may be provided with grooves and ribs having any other suitable shapes.

[0031] The top pad 4 has two plate members 41 each of which is also a tray-like plate member that has a peripheral flange 27 surrounding a corrugated base plate region 26 formed with grooves 411 and ribs 412.

[0032] While the plate members 21, 22, 23, 24, 41 are provided with the parallel grooves 111, 211, 221, 231, 241, 411 and parallel ribs 112, 212, 222, 232, 242, 412, the present invention should not be limited thereto. It is contemplated that the grooves and ribs of the plate members 11, 21, 22, 23, 24, 41 may have any other suitable shape as long as the plate members 11, 21, 22, 23, 24, 41 have strength and shock-absorbing characteristics sufficient to cushion an object to be packaged.

[0033] Referring once again to FIGS. 1 and 2, each plate member 11 of the bottom pad 1 is formed foldably as one piece with one of the plate members 21 of the front side pad 2A, one of the plate members 22 of the rear side pad 2B, and the plate member 23, 24 of one of the left and right side pads 2C, 2D, thereby forming a foldable pad 2. Fold lines 26 are formed among the plate members 21, 22, 23, 24 (or 24) of the foldable pad 2. Therefore, there are two foldable pads 2. Each foldable pad 2 has four plate members 11, 21, 22, and 23, or 11, 21, 22, 24. The plate members 21, 22, 23 (24) are foldable upward from the plate member 11 in each foldable pad 2.

[0034] In use, the foldable pads 2 are folded and placed within the box 5 together with an object 6 as shown in FIGS. 1, 4 and 5. The corrugated base plate regions 26 project from an inner surface of the box 5 to cushion or abut against the object 6, whereas the peripheral flanges 27 abut against the inner surface of the box 5. At four corners of the box 5, the peripheral flanges 27 of the plate members 21, 22 abut against and interlock with the respective peripheral flanges 27 of the plate members 23, 24 through interengagement of the protrusions 233, 243 and the recesses 231, 223. The plate members 41 of the top pad 4 are placed on top of the plate members 21, 22, 23, 24, as best shown in FIG. 3.

[0035] Referring once again to FIGS. 1, 2 and 4, if the size of the box 5 is large, the two foldable pads 2 may be placed within the box 5 in a spaced-apart relationship so that the two plate members 11, 21, 22 of each of the bottom pad 1, the front side pad 2A, and the rear side pad 2B are spaced apart from each other by a distance 51. The distance 51 between the foldable pads 2 may be increased or decreased depending on the size or length of the box 5. Thus, the shock-absorbing unit according to the present invention can accommodate to various sizes of the box 5.

[0036] Referring to FIG. 7 in combination with FIGS. 4 and 5, if the width of the object 6 is too small to fit the foldable pads 2, the second partition pad 32 may be placed between the plate members 23, 24 by inserting two ends of the second partition pad 32 into one of the grooves 231 of the plate member 23 and one of the grooves 241 of the plate member 24, respectively. One side of the second partition pad 32 abuts against the object 6, whereas the other side
thereof is spaced apart from the inner surface of the box 5. The two plate members 41 (only one is shown) of the top pad 4 are provided on top of the foldable pads 2, respectively. The peripheral flanges 27 of the plate members 41 will abut against the inner surface of the box 5 when placed in the box 5. As such, the object 6 can be prevented from vibrational movements within the box 5.

[0037] Referring to FIG. 8 in combination with FIGS. 4 and 5, when the height of the object 6 is half a height of the box 5, two second partition pads 32 may be inserted additionally into the box 5 above the first partition pad 31 to press against the top side of the object 6.

[0038] When the length of the object 6 is too small to fit the foldable pads 2, two first partition pads 31 may be placed in the foldable pads 2 to abut against two sides of the object 6 by inserting two opposite ends of each first partition pad 31 into one of the grooves 211 of the corresponding plate member 21 and one of the grooves 221 of the corresponding plate member 22, as shown in FIGS. 9, 10 and 11. If the height of the object 6 is half a height of the box 5, two second partition pads 32 may be inserted additionally into the box 5 above the first partition pads 32 so as to press against the top side of the object 6, as shown in FIG. 12.

[0039] While the present invention has been described in connection with what is considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiment but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.

1 claim:

1. A packaging device, comprising:
   a container; and
   a shock-absorbing unit disposed within said container in abutment with an inner surface of said container, said shock-absorbing unit including:
   a bottom pad having opposite sides;
   a plurality of side pads extending upward from said opposite sides of said bottom plate, each of said side pads having a plurality of parallel grooves that are aligned respectively with said grooves of the other opposite one of said side pads in a horizontal direction and that define a plurality of ribs therebetween; and
   a partition unit to be placed inside said container and including at least one partition pad for spanning two opposite ones of said side pads, said partition pad having two opposite ends insertable selectively and respectively into two of said grooves in said opposite ones of said side pads.

2. The packaging device of claim 1, wherein each of said side pads includes a plate member which has a corrugated base plate region and a peripheral flange surrounding and projecting from said corrugated base plate region, said corrugated base plate region projecting from said inner surface of said container when said peripheral flange abuts against said inner surface, said corrugated base plate region having said grooves and said ribs.

3. The packaging device of claim 2, wherein said partition pad has a plastic plate member that has a corrugated partition plate region, and a marginal flange surrounding and projecting from said corrugated partition plate region.

4. The packaging device of claim 3, wherein said corrugated partition plate region has a plurality of ribs that extend in a direction transverse to directions along which said ribs of said plate members of said side pads extend and that define grooves therebetween.

5. The packaging device of claim 3, wherein said partition unit includes a plurality of said partition pads, said side pads having front, rear, left and right side pads, said partition pads including a first partition pad spanning said front and rear side pads, and a second partition pad spanning said left and right side pads, said first and second partition pads extending one above the other.

6. The packaging device of claim 5, wherein each of said first and second partition pads is vertical and has a height smaller than that of said front, rear, left and right side pads.

7. The packaging device of claim 6, wherein said height of each of said first and second partition pads is half of a height of said plate members of said front, rear, left and right side pads.

8. The packaging device of claim 2, wherein said shock-absorbing unit further includes a top pad, each of said top and bottom pads including a plate member which has a peripheral flange surrounding a corrugated base plate region that is formed with a plurality of substantially parallel grooves and ribs, said corrugated base plate region of said top or bottom pad projecting inwardly from said inner surface of said container when said peripheral flange of said top or bottom pad abuts against said inner surface.

9. A foldable pad for protecting an object placed inside a container, said foldable pad comprising:
   four plate members that are connected foldably to each other;
   one of said plate members having front, rear, left and right sides;
   three of said plate members being connected respectively to said front and rear sides and said left or right side and being foldable upward from said one of said plate members;
   each of said plate members having a corrugated base plate region and a peripheral flange surrounding said corrugated base plate region, said peripheral flange being adapted to abut against an inner surface of the container, said corrugated base plate region being adapted to project from the inner surface of the container and to cushion the object; and
   said corrugated base plate region being deformable to absorb shock and having a plurality of ribs that define grooves therebetween.

10. The foldable pad of claim 9, wherein said ribs of said three of said plate members are substantially vertical when folded upward, said peripheral flange extending obliquely and flaring outwardly from said corrugated base plate region.

11. A packaging device, comprising:
   a container; and
   a shock-absorbing unit disposed within said container and abutting against an inner surface of said container, said shock-absorbing unit including:
   a bottom pad having opposite sides;
   a plurality of side pads extending upward from said opposite sides of said bottom pad, each of said side pads having a plurality of parallel grooves that are aligned respectively with said grooves of the other opposite one of said side pads in a horizontal direction and that define a plurality of ribs therebetween; and
   a marginal flange surrounding and projecting from said inner surface of said container when said peripheral flange abuts against said inner surface, said corrugated base plate region having said grooves and said ribs.

12. The packaging device of claim 11, wherein said marginal flange surrounding and projecting from said inner surface of said container when said peripheral flange abuts against said inner surface, said corrugated base plate region having said grooves and said ribs.

13. The packaging device of claim 12, wherein said marginal flange surrounding and projecting from said inner surface of said container when said peripheral flange abuts against said inner surface, said corrugated base plate region having said grooves and said ribs.
when said peripheral flange abuts against said inner surface, said corrugated base plate region being deformable to absorb shock.

12. The packaging device of claim 11, wherein said side pads includes front, rear, left and right side pads, said bottom pad including a pair of said plate members, each of said front and rear side pads including a pair of said plate members, each of said left and right side pads including one said plate member, one of said plate members of said bottom pad being formed foldably as one piece with one of said plate members of each of said front and rear side pads and said plate member of one of said left and right side pads, each of said corrugated base plate region having a plurality of ribs that define grooves therebetween.

13. The packaging device of claim 12, wherein said plate members of each of said bottom pad, said front side pad, and said rear side pad are spaced apart from each other inside said container by a distance.

14. The packaging device of claim 12, wherein said container has a plurality of corners, said peripheral flanges of said plate members of said side pads having protrusion-and-recess engagement surfaces that are interengaged at said corners.

15. The packaging device of claim 12, wherein said container has a plurality of corners, said peripheral flange of said plate member of each of said left and right side pads abutting against said peripheral flanges of said plate members of said front and rear side pads at said corners.

16. The packaging device of claim 15, wherein each of said peripheral flanges of said side pads flares outwardly from a corresponding one of said corrugated base plate regions.

17. The packaging device of claim 11, further comprising a top pad disposed on top of said side pads, said top pad including a plate member that has a peripheral flange surrounding a corrugated base plate region and abutting against said inner surface of said container, said corrugated base plate region of said top pad projecting from said inner surface and being deformable to absorb shock.

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