The present invention discloses a packaging device for panel, and includes a corner guard for covering and protecting a corner of the panel. The packaging device further includes buffering arrangement which is disposed within the corner guard for supporting the panel. The packaging device effectively embodies as a corner protecting device which can effectively provide buffering result to the panel, while with the minimum packaging material used. With a great deal of packaging material saved, the overall cost is effectively reduced.
PACKAGING DEVICE FOR PANEL

[0001] The present invention relates to a technical field of packaging, and more particularly to a packaging device for panel.

DESCRIPTION OF PRIOR ART

[0002] Liquid crystal television, liquid crystal display has become more and more popular, and not doubts it has been widely welcome by the customers. The liquid crystal display panel used in these electronic devices has also marching toward a trend of slim, light and compact. As a result, protection over those slim, light and compact panels has also become a very important issue to the manufacturers who pay much attention on this field. Currently, the protection over those panels is done by a pair of buffering pads with the panel sandwiched therebetween, or alternatively, the buffering pads enclose the panel from left and right. Even this kind of packaging readily position the panel within a packaging carton during storage and transportation, nevertheless, as the buffering pads cover almost every inch of the panel, it utilizes a great deal of material, while not every inch of the packaging material is utilized to its most. Accordingly, the way of packaging which prior art uses inevitably increase the cost.

SUMMARY OF THE INVENTION

[0003] The present invention is to provide a packaging device for liquid crystal display panel and effectively and reasonably utilizes the material so as to reduce the overall usage of the material and effectively reduce the cost.

[0004] In order to resolve the problem encountered by the prior art, the present invention provides a technical solution by introducing a packaging device for panel to address, and characterized in that the packaging device includes a corner guard attached to a corner of the panel. Wherein the corner guard is configured by folding a packing sheet, and the packing sheet includes a first central portion having a pair of longitudinal sides. A pair of second side portions each is interconnected with the corresponding longitudinal sides of the first central portion, wherein each of the second side portions can be folded along the longitudinal sides to as to parallel to each other and is perpendicular to the central portion, each of the second side portions having a bottom which is perpendicular to the longitudinal side. A pair of third end portions each is interconnected to the bottoms of the second side portions, each or the third end portions is folded centered on the bottom of the second side portions and overlapped with each other, the folded third end portions being perpendicular to both the first central portion and the second side portions.

[0005] Wherein the buffering arrangement further includes a third buffering bar disposed on the second side portion and creates a gap with the opposing side portion for receiving the corner of the panel and providing a solid support to a frontal or bottom surface of the panel.

[0006] Wherein the panel is arranged with a projection on its frontal or back surface, and a buffering pad is attached onto the projection.

[0007] Wherein the projection and the third buffering bar are located at the same surface of the panel, and the overall height of the projection and the buffering pad is smaller than or equal to the height of the third buffering bar and the thickness of the second side portion of the corner guard.

[0008] Wherein the first, second and third buffering bars are made from same buffering material.

[0009] Wherein the buffering material is ethyl vinyl acetate (EVA) or expandable polyethylene (EPE).

[0010] Wherein the packing sheet is a cardboard.

[0011] In order to resolve the problem encountered by the prior art, the present invention provides a technical solution by introducing a packaging device characterized in that the packaging device includes a corner guard for covering a corner of a panel. And a buffering arrangement disposed within the corner guard for supporting the panel.

[0012] Wherein the buffering arrangement further includes a buffering bar disposed on the second side portion and a buffering arrangement disposed within the corner guard for supporting the panel.

[0013] Wherein the first central zone has a rectangular shape, the second side portion has a triangular shape.

[0014] Wherein the buffering arrangement further includes a buffering bar disposed on the second side portion and a buffering arrangement disposed within the corner guard for supporting the panel.

[0015] Wherein the projection and the third buffering bar are located at the same surface of the panel, and the overall height of the projection and the buffering pad is smaller than or equal to the height of the third buffering bar and the thickness of the second side portion of the corner guard.

[0016] Wherein the panel is arranged with a projection on its frontal or back surface, and a buffering pad is attached onto the projection.

[0017] Wherein the projection and the third buffering bar are located at the same surface of the panel, and the overall height of the projection and the buffering pad is smaller than or equal to the height of the third buffering bar and the thickness of the second side portion of the corner guard.

[0018] Wherein the first, second and third buffering bars are made from same buffering material.

[0019] Wherein the buffering material is ethyl vinyl acetate (EVA) or expandable polyethylene (EPE).

[0020] Wherein the packing sheet is a cardboard.

[0021] The present invention can be concluded with the following advantages, as compared to the existing prior art, the packaging device effectively embodies as a corner protecting device which can effectively provide buffering result to the panel, while with the minimum packaging material.
used. With a great deal of packaging material saved, the overall cost is effectively reduced.

**BRIEF DESCRIPTION OF DRAWINGS**

[0022] FIG. 1 is an illustrational and structural view of a packaging device made in accordance with the present invention;

[0023] FIG. 2 is a depiction of how the packaging device shown in FIG. 1 is used along with a liquid crystal display panel;

[0024] FIG. 3 is an unfolded view of the packaging device shown in FIG. 1 before it is folded;

[0025] FIG. 4 illustrates the corresponding positions of the buffering bars arranged over the corner guard of FIGS. 3; and

[0026] FIG. 5 is a partial enlarged view showing encircled portion of A in FIG. 2.

**DETAILED DESCRIPTION OF PREFERRED EMBODIMENT**

[0027] Detailed description will be given with embodiment along with accompanied drawings.

[0028] FIG. 1 is an illustrational and structural view of a packaging device made in accordance with the present invention. As shown in FIG. 1, the packaging device for panel includes a corner guard 10, a first buffering bar 21, a second buffering bar 22, and a third buffering bar 23. In the current embodiment, the corner guard 10 is configured with a folded packaging material. The substantial folding sequence will be detailedly disclosed herebelow. Preferably, the packaging material is a paper board. It can be selected from a cardboard or corrugated board. In current embodiment, the corner guard 10 has triangular shape, while in other embodiment or requirement, the corner guard 10 can be embodied to as square or diamond shape configuration, or other shape. The first buffering bar 21, the second buffering bar 22, and the third buffering bar 23 are attached inside of the corner guard 10. Substantially, the first buffering bar 21, the second buffering bar 22, and the third buffering bar 23 are firstly glued to the paper board, and then the paper board is folded to create the corner guard 10. Alternatively, the paper board is firstly folded into the corner guard 10, and then the first buffering bar 21, the second buffering bar 22, and the third buffering bar 23 are attached thereto. The first buffering bar 21, the second buffering bar 22, and the third buffering bar 23 are preferably made from the material which can be ethyl vinyl acetate (EVA) or expandable polyethylene (EPE) or other suitable material.

[0029] The packaging device can be used to support and protect the panel. Furthermore, the packaging device can be used on protecting and supporting any panels from electronics, such as a liquid crystal display panel, a glass substrate, and a glass substrate for solar energy, and other displaying panels.

[0030] FIG. 2 is a depiction of how the packaging device shown in FIG. 1 is used along with a liquid crystal display panel. As shown in FIG. 2, the panel 20 to be packed can be a glass substrate, a liquid crystal display panel, a glass substrate, and a glass substrate for solar energy, and other displaying panels. The packaging device 30, 31, 32 and 33 are identical to the corner guard 10 shown in FIG. 1. Each of the packaging device 30, 31, 32 and 33 is attached to a corresponding corner of the panel 20 and the panel 20 is further supported and protected by the first buffering bar 21, the second buffering bar 22, and the third buffering bar 23. By this arrangement, the panel 20 is properly and reasonably supported and protected.

[0031] FIG. 3 is an unfolded view of the packaging device shown in FIG. 1 before it is folded. As shown in FIGS. 1 and 3, the corner guard 10 includes a first central portion 11, a pair of second side portions 12, 13 and a pair of third end portions 14, 15.

[0032] The first central portion 11 includes a pair of first longitudinal sides 111, 112 with the second side portions 12, 13 interconnected thereto respectively. The second side portions 12 includes a bottom 121 which is perpendicular to the first longitudinal side 111, and the other second side portion 13 has a bottom 131 which is perpendicular to the longitudinal side 112. The second side portions 12, 13 can be folded up as centered on the central portion 11 and arranged in parallel to each other.

[0033] The third end portion 14 are each interconnected to the bottom 121 of the side portion 12, and the other end portion 15 is interconnected to the bottom 131 of the side portion 13. The third end portions 14, 15 can be folded up with respect to the second side portion 12, 13, and then overlapped and glued together.

[0034] In the current embodiment, the first central portion 11 and the third end portion 14, 15 are rectangular shaped, while the second side portions 12, 13 have the triangular shape. Of course, they should be limited to such shapes as those shapes can be readily modified according to the field requirements.

[0035] FIG. 4 illustrates the corresponding positions of the buffering bars arranged over the corner guard of FIG. 3. As shown, there are the first buffering bar 21, the second buffering bar 22, and the third buffering bar 23, and each of the first buffering bar 21, the second buffering bar 22, and the third buffering bar 23 is attached or glued to corresponding portions of the corner guard 10. Substantially, the first buffering bar 21 is attached to the first central portion 11; the second buffering bar 22 is attached to the second side portion 12 and creates a gap with respect to the second side portion 12 such that the corner of the panel 20 can be inserted into that gap. The third buffering bar 23 is served to support the front face of the panel 20.

[0036] Referring to FIG. 5 which is a partial enlarged view showing encircled portion of A in FIG. 2. As shown in FIG. 5, the panel 20 to be packed is provided with projection 201 on its frontal or back surface, and a buffering pad 202 is attached onto the projection 201. The buffering pad 202 can be glued onto the top of the projection 201 or with other suitable measurements. By this arrangement, the panel 20 can be prevented from damaging resulted from transversal movement of the projection 201 from adjacent panel 20.

[0037] In the preferred embodiment of the present invention, the projection 201 and the third buffering bar 23 are located at the same surface of the panel 20. In addition, the overall height of the projection 201 and the buffering pad 202 is smaller than or equal to the height of the third buffering bar 23 and the thickness of the second side portion 13 of the corner guard 10. By this arrangement, the panel 20 can be effectively supported and protected. Furthermore, the overall thickness can also be reduced.

[0038] The buffering pad 201, the first buffering bar 21, the second buffering bar 22, and the third buffering bar 23 are
made from same material, such as ethyl vinyl acetate (EVA) or expandable polyethylene (EPE).

In conclusion, the packaging device effectively embodies a corner protecting device which can effectively provide buffering result to the panel, while with the minimum packaging material used. With a great deal of packaging material saved, the overall cost is effectively reduced.

Embodyments of the present invention have been described, but not intending to impose any unduly constraint to the appended claims. Any modification of equivalent structure or equivalent process made according to the disclosure and drawings of the present invention, or any application thereof, directly or indirectly to other related fields of technique, is considered encompassed in the scope of protection defined by the claims of the present invention.

1. A packaging device for panel, characterized in that the packaging device includes:
a corner guard attached to a corner of the panel;
wherewith the corner guard is configured by folding a packing sheet, and the packing sheet including:
a first central portion having a pair of longitudinal sides;
a pair of second side portions each interconnected with the corresponding opposite longitudinal sides of the first central portion, wherein each of the second side portions can be folded along the longitudinal sides to so as to parallel to each other and is perpendicular to the first central portion, each of the second side portions having a bottom which is perpendicular to the longitudinal side;
a pair of third end portions each interconnected to the bottoms of the second side portions, each of the third end portions being folded centered on the bottom of the second side portions and overlapped with each other, the folded third end portions being perpendicular to both the first central portion and the second side portions; wherein the first central zone has a rectangular shape, the second side portion has a triangular shape; and
a buffering arrangement for supporting the panel and arranged within the corner guard, the buffering arrangement including first and second buffering bars with the first buffering bar disposed on the first central portion, and the second buffering bar arranged onto the third end portion for supporting corresponding one of end surfaces of a corner of the panel;
and wherein that the buffering arrangement further includes a third buffering bar disposed adjacent to an edge of the second side portion and creates a gap with the opposing side portion for receiving the corner of the panel and providing a substantial support to a side the panel to be packed.

2. (canceled)
3. (canceled)
4. The packaging device as recited in claim 1, characterized in that the projection and the third buffering bar are located at the same surface of the panel, and the overall height of the projection and the buffering pad is smaller than or equal to the height of the third buffering bar and the thickness of the second side portion of the corner guard.

5. The packaging device as recited in claim 4, characterized that the first, second and third buffering bars are made from same buffering material.
6. The packaging device as recited in claim 5, characterized that the buffering material is ethyl vinyl acetate (EVA) or expandable polyethylene (EPE).

7. The packaging device as recited in claim 1, wherein the packing sheet is a cardboard.
8. (canceled)
9. A packaging device configured with a corner guard and a buffering arrangement disposed within the corner guard for covering and supporting a corner of a panel, characterized in that the corner guard is configured by folding a packing sheet, and the packing sheet including:
a first central portion having a pair of longitudinal sides;
a pair of second side portions each interconnected with the corresponding longitudinal sides of the first central portion, wherein each of the second side portions can be folded along the longitudinal sides to so as to parallel to each other and is perpendicular to the first central portion, each of the second side portions having a bottom which is perpendicular to the longitudinal side; and
a pair of third end portions each interconnected to the bottoms of the second side portions, each of the third end portions being folded centered on the bottom of the second side portions and overlapped with each other, the folded third end portions being perpendicular to both the first central portion and the second side portions; and wherein that the buffering arrangement further includes a third buffering bar disposed on the second side portion and creates a gap with the opposing side portion for receiving the corner of the panel and providing a substantial support to a side the panel to be packed.

10. The packaging device as recited in claim 9, characterized in that the first central zone has a rectangular shape, the second side portion has a triangular shape.

11. The packaging device as recited in claim 9, characterized in that the buffering arrangement includes first and second buffering bars with the first buffering bar disposed on the first central portion, and the second buffering bar arranged onto the third end portion for supporting corresponding one of end surfaces of a corner of the panel.
12. (canceled)
13. (canceled)

14. The packaging device as recited in claim 11, characterized in that the projection and the third buffering bar are located at the same surface of the panel, and the overall height of the projection and the buffering pad is smaller than or equal to the height of the third buffering bar and the thickness of the second side portion of the corner guard.

15. The packaging device as recited in claim 11, characterized that the first, second and third buffering bars are made from same buffering material.

16. The packaging device as recited in claim 15, characterized that the buffering material is ethyl vinyl acetate (EVA) or expandable polyethylene (EPE).

17. The packaging device as recited in claim 9, wherein the packing sheet is a cardboard.

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