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(73) Proprietor: Lee, Chung Kyun
Gangseo-ku, Seoul 157-010 (KR)

(74) Representative: Marlow, Nicholas Simon
Reddie & Grose
16, Theobalds Road
London WC1X 8PL (GB)

(56) References cited:
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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a bag with a shock absorbing unit. In particular, the shock absorbing unit is provided in either a soft cased bag or a hard cased bag in any appropriate manner which allows it to be detached/attached from/to the bag. Otherwise, the shock absorbing unit is sewed to the bag, and the shock absorbing material of the shock absorbing unit is arranged at the upper and lower panels of the bag as well as in the side walls of the bag. Therefore, the shock absorbing unit can absorb any external impact from all directions so that the bag can safely carry its contents. Besides, the configuration of the shock absorbing unit according to the present invention allows the contents to be easily put in and taken out of the bag.

BACKGROUND OF THE INVENTION

[0002] With the wide use of electronic equipment which is sensitive to impacts such as notebook computers, the need has arisen for a bag for safely and conveniently carrying such equipment. In general, the inner material of such a bag is of material such as elastic textile, panel or semi-hard foam attached on both sides of the bag by sewing or any other manner.

[0003] The receiving area of such a hard cased protective bag is conventionally finished off with a shock absorbing plastic such as semi-hard foam. Furthermore, the shape of the shock absorbing plastic is designed to accommodate the shape and size of predetermined contents. The bag described above can be made sufficiently strong to support and carry relatively heavy articles.

[0004] As well as hard cased bags, soft cased bags are also widely used for the purpose of carrying equipment which may be damaged by external shocks. The receiving area of a soft cased bag is usually finished off with a textile covered elastic panel. The soft cased bag has wire on its rim forming the rectangular bag shape. This wire supports the contents of the bag. The advantages of such a bag are that it is light and looks delicate.

[0005] US-A-5 217 131 discloses a shipping container comprising a plurality of pneumatic cylindrical walls. The cylinders are in communication with each other and are inflated by means of a valve member and pump. This container suffers from the disadvantage that it loses shock absorbing effect when any one of the pneumatic cylinders is broken.

SUMMARY OF THE INVENTION

[0006] However the hard cased bag described above has the disadvantages that it is not convenient to take objects out therefrom and it can provide only one receiving area. In addition, as the bag is designed so as to be suitable for receiving objects only of a predetermined size and shape, other smaller objects can be shaken about resulting in the failure to protect the contents from external impacts. On the other hand, in the case of a soft cased bag there is also the risk that the contents may be subjected to external impacts when the bag is carried. Therefore, the users of the bags described above have had to endure inconvenience when taking articles out of such bags and damage to the contents from external impacts.

[0007] Therefore, the object of the present invention is to overcome the above problems. In order to achieve the object, the present invention provides a bag with a shock absorbing unit for protecting the contents from external impacts, the shock absorbing unit comprising upper and lower panels air-cushioned by a plurality of air cells thereon for absorbing impacts to the top and bottom of the bag, each of the air cells being inflated with air and sealed; a side shock absorbing member filled with air and sealed for absorbing impacts to the side of the bag; a band connected to the side shock absorbing member and made of extensible elastic material; and a connecting member for covering the upper panel when the bag is closed, wherein the lower panel, the side shock absorbing member, the band and the connecting member are all connected making one piece and attached to an inner side wall of the bag, and the upper panel is attached to an upper portion of the inner side wall.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a perspective open view showing a bag with a shock absorbing unit according to the first embodiment of the present invention.
FIG. 2 is a development view of the shock absorbing unit according to the first embodiment of the present invention.
FIG. 3 shows a cross section view of a I-1 line and a partially enlarged view of a shock absorbing unit in FIG. 2.
FIG. 4 is a development view of the shock absorbing unit having a second configuration still according to the first embodiment of the present invention.
FIG. 5 is a development view of the shock absorbing unit having a third configuration still according to the first embodiment of the present invention.
FIG. 6 is a perspective open view showing a bag with a shock absorbing unit according to the second embodiment of the present invention.
FIG. 7 is a front cross section view of a side shock absorbing member which can be attached to the bag according to the second embodiment of the present invention.
FIG. 8 is a perspective open view of a bag with a shock absorbing unit according to the third embod-
FIG. 9 is a perspective view of an air-filled bar shaped member.

DETAILED DESCRIPTION OF THE INVENTION

[0009] Hereinafter, each embodiment of the present invention will be explained in detail with reference to the accompanying drawings, in which the same numbers indicate corresponding units.

The First Embodiment

[0010] FIG. 1 is a perspective open view showing a bag with a shock absorber according to the first embodiment of the present invention. The bag 10 shown in the figure is a soft cased bag in which two pieces constituting the bag are joined together. However, the bag 10 can also be a hard cased bag. The shock absorbing unit 1 includes upper and lower panels 2, 3, a side shock absorbing member 4, a band 11 and a connecting member 12. The lower panel 3, the side shock absorbing member 4, the band 11 and the connecting member 12 are serially connected. They can be attached to an inner wall of the bag 10 by sewing a bonding portion 13 thereto (see FIG. 2) or can be attached to the back surface of the bonding portion 13 with Velcro (not shown) in an easily detachable manner. On the other hand, the upper panel 2 is sewed to the upper portion of the inner wall. When opening the bag 10, the shock absorbing unit 1 can be opened to release the contents. At the same time, each of the units can also be separated from each other. On the other hand, when closing the bag, the lower panel 3 is folded to form a right angle to the side shock absorbing member 4. At the same time, the side shock absorbing member 4 itself is folded to form a right angle at four points thereon. Then, the Velcro bonding portions 22 of the side shock absorbing member 4 are piled and bonded to surround the lower panel 3. As the upper panel 2 and the connecting member 12 are piled thereon, they can adhere to each other by the Velcro bonding portion 21 included in the connecting member 12.

FIG. 2 is a development view of the shock absorbing unit according to the first embodiment of the present invention, in which the lower panel having a plurality of air cells, the side shock absorbing member, the band and the connecting member arc laid out. In the figure, the lower panel 3, a side surface of the side shock absorbing member 4, the band 11 and the connecting member 12 are serially connected by sewing. The side shock absorbing member 4 should be long enough to surround four side rims of the lower panel 3. Taking into consideration the

[0011] The side shock absorbing member 4 can be formed in a bar type or can include a plurality of the prominent air cells 5 in their operation and effect, except in their configuration. The prominent air cells 5, shown in FIG. 1 to FIG. 4, are semispherical or square shaped and a lower panel having a plurality of semispherical prominent air cells instead of the square prominent air cells shown in FIG. 1 to FIG. 4. The plurality of the convex air cells 5 are the same as the above prominent air cells 5 in their operation and effect, except in their configuration.
The Second Embodiment

[0013] FIG. 6 is a perspective open view of a bag with a shock absorbing unit, which shows the second embodiment of the present invention. The bag 10 is a conventional bag having soft side surfaces, which includes a receiving space having the upper and the lower panels 2, 3 and is constituted with two outer angled bodies, however it can be any bag having hard surfaces. The upper and lower panels 2, 3, each of which is attached to a bottom surface and an inner panel in the bag 10 respectively, includes a plurality of air cells 5 which are filled with air and sealed. A plurality of the air cells 5 can be formed in either a square shape or a semispherical shape and arranged in a lattice pattern by compression molding. On the other hand, the four side shock absorbing members 4, attached to the inner wall and four corners of the bag 10 also include a plurality of the prominent air cells 6, filled with air and sealed. The side shock absorbing members 4 are preferably attached, in such a way that they may be detached, to the inner surface of the bag 10 with Velcro bonding portions 23 (see FIG. 8) mounted on the rear surface of the side shock absorbing members 4. Therefore, the prominent air cells 5, 6 partially surround the contents of the bag 10.

[0014] Each of the air cells 5, 6 is made by sealing after filling air within a TPU resin of high elasticity with use of a compression molding. Because the air cells 5, 6 act as an air cushion, the impact absorbing effect can be maximized. In addition, it is possible to improve the aesthetic appearance by covering their external surface with a covering cloth 8.

[0015] Therefore, when carrying the bag 10, the convex air cells 5, 6 support and fix the content therein. Moreover, they can protect the contents from external impact in every direction due to their absorbing effect.

[0016] FIG. 7 is a front cross section view of a side shock absorbing member, which can be detachably attached to the bag according to the second embodiment of the present invention. As described above, a plurality of the air cells 6 are formed on a side of the side shock absorbing member 4. On the rear surface of the side shock absorbing member 4, a Velcro bonding unit 23 is provided such that the side shock absorbing member 4 can be attached to the inner wall surface of the bag 10. The width of the side shock absorbing member 4 is adjusted according to the height of the inner wall surface of the bag 10. On the other hand, an appropriate length thereof may be selected within a range of the width of the bag 10. In addition, the attachment locations of the side shock absorbing member 4 are preferably, but not limited to, four corners. The attachment locations can be selected according to the location of objects in the bag 10 to which special care should be paid for the purpose of protecting them from external impact and depending on the configuration of the contents of the bag 10. On the other hand, it can be seen that a plurality of prominent air cells 6 is in the side shock absorbing member 4 in FIG. 7. The prominent air cell 7 in the position in which the side shock absorbing member 4 is folded in a right angle, can be much smaller or omitted such that the side shock absorbing member 4 can be easily folded without pressing other prominent air cells 6.

[0017] Furthermore, the bag 10 with the shock absorbing unit according to the second embodiment of the present invention further includes a partition 9. The partition 9 is preferably made of an absorbing material such as a sponge. The partition 9 has a length corresponding to the vertical length of the bag 10 and has a bonding means such as a Velcro bonding portion on its end. such that the partition 9 can be attached to the inner wall surfaces on both sides across the bottom surface therein. Therefore, the position of the partition 9 can be fixed so as to separate the receiving space depending on the size of the objects in the bag 10. Accordingly, contents of a relatively small size can be safely fixed without being shaken when the bag 10 is carried, and furthermore the contents can be taken out more easily.

The Third Embodiment

[0018] FIG. 8 is a perspective open view of a bag with a shock absorbing unit according to the third embodiment of the present invention. The bag 10 is a bag having a soft side surface which has an internal space for including the upper and lower panels 2, 3 and which is constituted of two pieces of outer angled body, however the bag 10 can be any bag having hard side surfaces. While the upper panel 2 is sewed on its upper surface, the lower panel 3 is attached to the bottom surface of the bag with use of a Velcro bonding portion on its end. The upper and lower panels 2, 3 include a plurality of prominent air cells 5. A plurality of the prominent air cells 5 are made by inserting a thin and long bar shaped member 15, made by compression molding of sealing after filling air in an elastic TPU resin, into tunnel type acceptors 16 disposed in serial rows. On the other hand, the four side shock absorbing members 4, attached to four corners and an inner wall of the bag 10, also have prominent air cells 6 which are a little shorter than the plurality of prominent air cells 5 and formed in the same manner. The side shocking absorbing members 4 include a Velcro bonding portion 23 (not shown in FIG. 8) on their rear surface such that they can be detachably attached to each inner surface of the bag 10. Therefore, the prominent air cells 5, 6 can fully surround the contents of the bag 10. Each of the prominent air cells 5, 6 acts as an air cushion so that the prominent air cells 5, 6 can safely support and fix the contents of the bag 10. In addition, they can protect the contents of the bag 10 by maximizing their absorbing effect of external impacts in all directions. Besides, when at least one of the prominent air cells 5, 6 is damaged thus lessening the shock absorbing effect thereof, it can easily be replaced with a bar shaped member 15 inserted into the acceptor 16. For this reason, the time and cost of
A bag according to claim 1 wherein the shock absorbing member 4 corresponds to the height of the inner side wall of the bag 10, the length thereof can be selected according to the width of the bag 10. In addition, the locations for attachment to the side shock absorbing member 4 are preferably, but not limited to, the four corners of the bag. The attachment locations can be selected corresponding to the location of those contents to which special care should be paid to protect them from external impact upon consideration of the shape of the contents.

Furthermore, the bag 10 with the shock absorbing unit according to the third embodiment of the present invention further includes the partition 9. The partition 9 is preferably made of a shock absorbing material such as a sponge. The partition 9 has a length corresponding to the total inner rim length of the bag 10 and has a bonding means such as the Velcro bonding portion in both ends thereof, so that the partition 9 can be attached to the wall surface of both sides across the inner bottom surface. Therefore, the position of the partition 9 can be fixed to separate the receiving space depending on the size of the contents. In such a manner, any object of a relatively small size can be safely fixed without being shaken when the bag 10 is carried, and furthermore the contents can be more easily taken out.

Claims

1. A bag (10) with a shock absorbing unit (1) for protecting the contents from external impacts, the shock absorbing unit (1) comprising:

   upper and lower panels (2,3) air-cushioned by a plurality of air cells (5) thereon for absorbing impacts to the top and bottom of the bag (10), each of the air cells (5) being inflated with air and sealed;

   a side shock absorbing member (4) filled with air and sealed for absorbing impacts to the side of the bag (10);

   a band (11) connected to the side shock absorbing member (4) and made of extensible elastic material; and

   a connecting member (12) for covering the upper panel (2) when the bag (10) is closed,

   wherein the lower panel (3), the side shock absorbing member (4), the band (11) and the connecting member (12) are all connected making one piece and attached to an inner side wall of the bag (10), and the upper panel (2) is attached to an upper portion of the inner side wall.

2. A bag according to claim 1 wherein the shock absorbing unit (1) is attached either with a hook and loop fastener such as Velcro so as to be easily detachable from the bag (10) or by sewing.

3. A bag according to claim 1 or 2 wherein the upper and lower panels (2,3) and the side shock absorbing member (4) can be externally covered with covering cloth (8), and the side shock absorbing member (4) is either formed in a bar-type or with a plurality of air cells (6) facing towards the contents of the bag (10).

4. A bag according to claim 1, 2 or 3 wherein the air cells (5,6) included in the upper and lower panels (2,3) and the side shock absorbing member (4) are either square or semi-sphere shaped and the plurality of the air cells (5,6) are arranged in a lattice pattern by compression molding.

5. A bag (10) with a shock absorbing unit for protecting the contents from external impacts, the shock absorbing unit comprising:

   upper and lower panels (2,3) having a plurality of air cells (5), each of the air cells (5) being inflated with air and sealed;

   four side shock absorbing members (4) having a plurality of air cells (6), each of the air cells (6) being inflated with air and sealed, and being easily detachable,

   wherein the upper and lower panels (2,3) are respectively sewed to an inner panel and an inner bottom surface of the bag (10), and the side shock absorbing members (4) are attached to all four corners of the bag (10) and an inner wall of the bag (10) upon consideration of the location, the configuration and the size of the parts of the contents to be protected from external impacts.

6. A bag according to claim 5 wherein the plurality of air cells (5,6) included in the upper and lower panels (2,3) and the side shock absorbing members (4) are either square or semi-sphere shaped, and a plurality of the air-cells (5,6) are arranged in a lattice pattern with use of compression molding.

7. A bag according to claim 5 wherein each of the air cells (5,6) is made by inserting a bar shaped member (15) into a tunnel type acceptor (16).

8. A bag according to claim 7 wherein the bar shaped members (15) are inflated with air and sealed with use of compression molding and the acceptors (16) are continuously disposed in horizontal rows.

9. A bag according to any of claims 5 to 8 further comprising a partition (9) having attachment means at both its ends so as to be attached to the opposing
inner side walls across the inner bottom of the bag (10) in order to limit the receiving space of the bag (10) depending on the size of the contents.

**Patentansprüche**

1. Tasche (10) mit einer Stoßdämpfungseinheit (1) zum Schützen des Inhalts vor Stößen von außen, wobei die Stoßdämpfungseinheit (1) Folgendes umfasst:
   - ein oberes und ein unteres Feld (2, 3), die durch eine Mehrzahl von Luftzellen (5) daran zum Dämpfen von Stößen auf Ober- und Unterseite der Tasche (10) luftgefedert sind, wobei jede der Luftzellen (5) mit Luft gefüllt und dicht geschlossen ist;
   - ein seitliches, mit Luft gefülltes und dicht geschlossenes Stoßdämpfungselement (4) zum Dämpfen von Stößen auf die Seite der Tasche (10);
   - ein mit dem seitlichen Stoßdämpfungselement (4) verbundenes und aus dehnbarem elasti-
     - schen Material hergestelltes Band (11) und ein Verbindungselement (12) zum Bedecken des oberen Feldes (2), wenn die Tasche geschlossen ist.

   wobei das obere und das untere Feld (2, 3) und das seitliche Stoßdämpfungselement (4) äußerlich mit Bezugstoff (8) bedeckt sein können und das seitliche Stoßdämpfungselement (4) entweder mit einem Stabtyp oder mit einer Mehrzahl von Luftzellen (6) ausgeführt ist, die dem Inhalt der Tasche (10) gegenüberliegen.

2. Tasche nach Anspruch 1, bei der die Stoßdämpfungseinheit (1) entweder mit einem Haft- und Flauschband-Verschluss, wie Velcro, angebracht ist, um leicht von der Tasche (10) abgenommen werden zu können, oder durch Annähen.

3. Tasche nach Anspruch 1 oder Anspruch 2, bei der das obere und das untere Feld (2, 3) und das seitliche Stoßdämpfungselement (4) äußerlich mit Bezugstoff (8) bedeckt sein können und das seitliche Stoßdämpfungselement (4) mit einem Stabtyp oder mit einer Mehrzahl von Luftzellen (6) ausgeführt ist, die dem Inhalt der Tasche (10) gegenüberliegen.

4. Tasche nach Anspruch 1, 2 oder 3, bei der die in dem oberen und dem unteren Feld (2, 3) und dem seitlichen Stoßdämpfungselement (4) befindlichen Luftzellen (5, 6) entweder eine quadratische oder eine halbkugelförmig Form haben und die Mehrzahl der Luftzellen (5, 6) durch Formpressen in einem Gittermuster angeordnet sind.

5. Tasche (10) mit einer Stoßdämpfungseinheit (1) zum Schützen des Inhalts vor Stößen von außen, wobei die Stoßdämpfungseinheit Folgendes umfasst:
   - ein oberes und ein unteres Feld (2, 3) mit einer Mehrzahl von Luftzellen (5), wobei jede der Luftzellen (5) mit Luft gefüllt und dicht geschlossen ist; und
   - vier seitliche Stoßdämpfungselemente (4), die eine Mehrzahl von Luftzellen (6) haben, wobei jede der Luftzellen (6) mit Luft gefüllt und dicht geschlossen ist, und leicht abnehmbar sind;

   wobei das obere und das untere Feld (2, 3) an ein Innenelement bzw. eine innere Bodenfläche der Tasche (10) angenäht ist und die seitlichen Stoßdämpfungselemente (4) nach Erwägen der Lage, der Konfiguration und der Größe der vor Stößen von außen zu schützenden Teile des Inhalts an allen vier Ecken der Tasche (10) und an einer Innenna-
   - wand der Tasche (10) angebracht werden.

6. Tasche nach Anspruch 5, bei der die in dem oberen und dem unteren Feld (2, 3) und den seitlichen Stoßdämpfungselementen (4) befindlichen Luftzel-
   - len (5, 6) entweder eine quadratische oder eine halbkugelförmig Form haben und die Mehrzahl der Luftzellen (5, 6) durch Formpressen in einem Gittermuster angeordnet sind.

7. Tasche nach Anspruch 5, bei der jede der Luftzellen (5, 6) durch Einführen eines stabförmigen Elements (15) in eine tunnenartige Aufnahme (16) hergestellt ist.

8. Tasche nach Anspruch 7, bei der die stabförmigen Elemente (15) durch Formpressen mit Luft gefüllt und dicht geschlossen sind und die Aufnahmen (16) kontinuierlich in horizontalen Reihen angeordnet sind.

9. Tasche nach einem der Ansprüche 5 bis 8, ferner umfassend ein Trennelement (9) mit Anbringungs-
   - mitteln an seinen beiden Enden, um an den einan-
   - der entgegengesetzten inneren Seitenwänden über den inneren Boden der Tasche (10) angeordnet zu sein, um den Aufnahmeraum der Tasche (10) in Ab-
   - hängigkeit von der Größe des Inhalts zu begrenzen.

**Revendications**

1. Sac (10) à unité anti-choc (1) pour protéger le contenu contre les impacts externes, l'unité anti-choc (1) comprénant:
des panneaux supérieur et inférieur (2, 3) amortis pneumatiquement par une pluralité de cellules d'air (5) sur ceux-ci pour absorber les impacts contre le dessus et le dessous du sac (10), chacune des cellules d'air (5) étant gonflée d'air et scellée ; un élément anti-choc latéral (4) rempli d'air et scellé pour absorber les impacts contre le côté du sac (10) ; une bande (11) connectée à l'élément anti-choc latéral (4) et réalisée en une matière élastique extensible ; et un élément de connexion (12) pour couvrir le panneau supérieur (2) quand le sac (10) est fermé, dans lequel le panneau inférieur (3), l'élément anti-choc latéral (4), la bande (11) et l'élément de connexion (12) sont tous connectés composant un tout et fixés à une paroi latérale interne du sac (10), et le panneau supérieur (2) est fixé à une partie supérieure de la paroi latérale interne.

2. Sac selon la revendication 1, dans lequel l'unité anti-choc (1) est fixée soit avec une attache à crochets et boucles tel que du Velcro de manière à pouvoir être facilement détachée du sac (10), soit par couture.

3. Sac selon la revendication 1 ou 2, dans lequel les panneaux supérieur et inférieur (2, 3) et l'élément anti-choc latéral (4) peuvent être couverts extérieurement d'un tissu de revêtement (8), et l'élément anti-choc latéral (4) est formé soit dans un type en barre, soit avec une pluralité de cellules d'air (6) tournées vers le contenu du sac (10).

4. Sac selon la revendication 1, 2 ou 3, dans lequel les cellules d'air (5, 6) incluses dans les panneaux supérieur et inférieur (2, 3) et l'élément anti-choc latéral (4) sont de forme soit carrée, soit hémisphérique, et la pluralité de cellules d'air sont agencées en une configuration en réseau par moulage par compression.

5. Sac (10) à unité anti-choc pour protéger le contenu contre les impacts externes, l'unité anti-choc comprenant :

des panneaux supérieur et inférieur (2, 3) comportant une pluralité de cellules d'air (5), chacune des cellules d'air (5) étant gonflée d'air et scellée ; et quatre éléments anti-choc latéraux (4) ayant une pluralité de cellules d'air (6), chacune des cellules d'air (6) étant gonflée d'air et scellée, et étant facilement détachables,