STRENGTHENING INSERT FOR A BOX

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Appl. No.: 13/448,349
Filed: Apr. 16, 2012

Related U.S. Application Data
Provisional application No. 61/476,243, filed on Apr. 15, 2011.

Publication Classification
Int. Cl. B65D 5/44 (2006.01)
U.S. Cl. 229/199; 220/694

ABSTRACT
The invention concerns a strengthening mechanism for use within a corrugated structure. More specifically, the invention provides a corrugated insert that is inserted into a corrugated box. Such insert improves the compression strength of the corrugated box. This is particularly important when such corrugated box has one or more boxes stacked thereon.
STRENGTHENING INSERT FOR A BOX

CROSS-REFERENCE


FIELD OF THE INVENTION

[0002] The invention concerns a strengthening mechanism for use within a corrugated structure. More specifically, the invention provides a removable, corrugated insert that is inserted into a corrugated box. Such corrugated insert operates to improve the compression strength of the corrugated box. This is particularly important when such corrugated box has one or more boxes stacked thereon.

BACKGROUND

[0003] Record storage in the United States is a multi-billion dollar per year business. The need for all manner of businesses and industries to protect and store their written records has been well documented. Typically such printed/written records are collected and sent to one or more of the several thousand record storage centers in the United States.

[0004] In one example, such records are stored within corrugated boxes fashioned for such purpose. Corrugated boxes are most often used because they are readily manufactured and are inexpensive, often costing less than one dollar to produce.

[0005] Record storage centers are often large to very large warehouses suitable for storage of the boxes by stacking them one upon another. Each box when filled can weigh between thirty and fifty pounds. With such weights, boxes upon which other weighted boxes must be able to bear the weight of other boxes positioned thereon.

[0006] Often, such boxes fail due to their inability to withstand the weights of the boxes stacked upon them. When such failure occurs, a solution is required. The typical solution has been to re-box a failed box (i.e., remove the failed box and move its contents to a new box). Re-boxing costs a client money which can be many times more expensive than the cost of the original box or even its transport from a client’s office to the record storage center. Multiplied over several hundred thousand boxes, and potentially millions of boxes, costs for such re-boxing can become massive.

[0007] What is needed therefore is a low-cost, highly effective way to pre-strengthen a non-failed box or otherwise strengthen a box prior to its failure. Such strengthening should enable a box to be used, in the instance in which a box has already been used, to continue to be used without it being re-boxed. The strengthening mechanism should be such that by its use it immediately improves the compression strength of the box in which it is placed.

SUMMARY

[0008] Accordingly, the invention provides a strengthening insert for placement within a container like a box. The strengthening insert comprises multiple parts including a first surface having a first connecting edge. A second surface is connected to the first surface along the first connecting edge; the second surface has a second connecting edge. The strengthening insert also comprises a third surface connected to the second surface along the second connecting edge; the third surface having a third connecting edge. Lastly, the strengthening insert comprises a fourth surface connected to the third surface along the third connecting edge. The fourth surface has a fourth connecting edge; the fourth surface is connected to the first surface along the fourth connecting edge.

[0009] In practice, the strengthening insert is positioned within an inner surface of a box whereby each upright wall of the box is strengthened and supported by one surface of the strengthening insert.

[0010] An alternative embodiment herein provides a strengthening insert for a corrugated box having four walls and a bottom. The strengthening insert herein comprised three parts. The first part of the strengthening insert is a first surface having a first connecting edge. A second surface is connected to the first surface along the first connecting edge; the second surface has a second connecting edge. Lastly, a third surface is connected to the second surface along the second connecting edge.

[0011] The tri-partitioned insert is placeable within a corrugated box whereby the first surface is positioned about one wall of the corrugated box. The second surface is positioned about the bottom of the corrugated box, and the third surface is positioned about another wall of the corrugated box.

[0012] Another embodiment herein is the combination of a strengthened corrugated box comprising a partially enclosed box having four connected vertical walls and an enclosed bottom. The enclosed bottom of the box is connected to all four connected box vertical walls. Each vertical box wall has an outer surface and an inner surface positioned oppositely to the outer surface. Each vertical wall has a top edge, a bottom edge that is parallel to and extends oppositely to the top edge, and a distance extending between the top edge and the bottom edge of each vertical wall. For this combination, a removable insert is positioned within the corrugated box. This combination of strengthened insert and box may include either the four-sided insert or the tri-partitioned insert.

FIGURES

[0013] While the specification concludes with claims particularly pointing out and distinctly claiming the invention, it is believed that the embodiments set forth herein will be better understood from the following description in conjunction with the accompanying figures, in which like reference numerals identify like elements and in which:

[0014] FIG. 1 is a perspective view of a strengthening insert herein held above the opening of a box in which is inserted;

[0015] FIG. 2 provides a perspective view of the strengthening insert and box of FIG. 1 in which the strengthening insert is positioned within the box;

[0016] FIG. 3 provides a perspective view of an alternative embodiment of the strengthening insert herein; and

[0017] FIG. 4 provides a perspective view of the strengthening insert of FIG. 3 positioned within a box.

DETAILED DESCRIPTION

[0018] The invention herein provides a strengthening insert for placement within a container like a box. The strengthening insert comprises multiple parts including a first surface having a first connecting edge. A second surface is connected to the first surface along the first connecting edge; the second surface has a second connecting edge. The strengthening
insert also comprises a third surface connected to the second surface along the second connecting edge; the third surface having a third connecting edge. Lastly, the strengthening insert comprises a fourth surface connected to the third surface along the third connecting edge. The fourth surface has a fourth connecting edge; the fourth surface is connected to the first surface along the fourth connecting edge.

[0019] In practice, the strengthening insert is positioned within an inner surface of a box whereby each upright wall of the box is strengthened and supported by one surface of the strengthening insert.

[0020] An alternative embodiment herein provides a strengthening insert for a corrugated box having four walls and a bottom. The strengthening insert herein comprised three parts. The first part of the strengthening insert is a first surface having a first connecting edge. A second surface is connected to the first surface along the first connecting edge; the second surface has a second connecting edge. Lastly, a third surface is connected to the second surface along the second connecting edge.

[0021] The tri-partitioned insert is placeable within a corrugated box whereby the first surface is positioned about one wall of the corrugated box. The second surface is positioned about the bottom of the corrugated box, and the third surface is positioned about another wall of the corrugated box.

[0022] Another embodiment herein is the combination of a strengthened corrugated box comprising a partially enclosed box having four connected vertical walls and an enclosed bottom. The enclosed bottom of the box is connected to all four connected box vertical walls. Each vertical wall has an outer surface and an inner surface positioned oppositely to the outer surface. Each vertical wall has a top edge, a bottom edge that is parallel to and extends oppositely to the top edge, and a distance extending between the top edge and the bottom edge of each vertical wall. For this combination, a removable insert is positioned within the corrugated box. This combination of strengthened insert and box may include either the four-sided insert or the tri-partitioned insert.

[0023] FIG. 1 provides a perspective view of insert 5 prior to its insertion into box 14. Insert 5 is designed to fit, preferably, snugly within the four walls of box 14. By the term "snugly" it is meant herein that insert 5 fits proximately adjacent to all of the inner walls 16 of box 14 such that each side 6 of insert 5 substantially touches inner walls 16 of box 14. Importantly, corners 8 of insert 5 align with corners 20 of box 14 when insert 5 sits within box 14. By such alignment insert 5 provides structural reinforcement to box 14 about its walls 18 and about its corners 20.

[0024] As shown, insert 5, which is a four-sided insert herein, is meant to slide within box 14, fit snugly therein and thereby provide additional structural integrity to walls 18 of box 14. To achieve that goal, the length and width of insert 5 are slightly less than the length and width of the inside of box 5. Persons of skill in the art will understand that the objective for insert 5 is to provide a snug fit within box 5 will also allowing insert 5 to be readily removed and placed upon demand by a user.

[0025] Herein, the material of insert 5 preferably matches the material of box 14. For example, when box 14 is preferably made from one or known types of corrugate, insert 5 shall likewise be made from the same or similar material. Persons of skill in the art will understand that the term "corrugate" or "corrugated box" refer to well known boxes, e.g., file boxes, made worldwide from corrugate materials. Insert 5 and box 14 may also be constructed from non-corrugate materials like all manner of plastics including but not limited to polypropylene, poly esters, the family of PETs, wood, steel, iron, aluminum, copper and all other usable materials suitable for insert 5 and box 14 herein.

[0026] FIG. 2 shows the final fit of insert 5 into box 14 as shown in FIG. 1. Preferably, insert 5 sits flush (i.e., snugly) or substantially flush against walls 18 of box 5 in order to lend box 14 added support that translates into additional strength, especially, but not only, compression strength.

[0027] As shown, sides 6 of insert 5 cover at least about one-third to about one-half of the height of inner walls 16. Sides 6 of insert 5 may cover between about one-half to about three-fourths of the inside of box 14. Regardless of the height of insert 5 within box 14, it should be high enough with respect to the height of box 14 to provide the desired structural support. Also, one of skill in the art will recognize that insert 5 may comprise no more than two sides and no more than three sides as alternative embodiments herein, though four side insert 5 as described herein above is preferred.

[0028] FIG. 3 shows a perspective alternative embodiment of insert 25 herein which has three sections; a first surface 30, second surface 35 connected to first surface along line of connection 33, and third surface 40 connected to surface 35 by line of connection 33. Similarly to insert 5 of FIG. 1, insert 25 is shown held above box 14 prior to its placement into box 14. In practice, insert 25 is placed into box 14. Insert 25, unlike insert 5, is held adjacent to two vertical box walls and also to the bottom of box 14. By coverage of the bottom of box 14 with insert 25, and in particular second surface 35 of insert 25, all four vertical walls are reinforced at the bottom corners 42 of box 14. By such reinforcement of corners 42, corners 20 of box 14 are also at least partially reinforced and thereby strengthened.

[0029] First surface 30 and third surface 40 of insert 25 are held adjacent to the inner surface of box 14. That is, first surface 30 and third surface 40 are held flush, or substantially flush, against inner walls 16 of box 14. By such positioning, two inner walls 16 of box 14 are directly reinforced and thereby strengthened.

[0030] Without a strengthening insert 5 being used in a box like a corrugated box of the kind envisioned herein, structural box failure due to compression, most especially, is all but certain over time. Currently, boxes without the strengthening insert herein have a compression strength ranging from about greater than zero pounds to less than about seventy-five pounds. When insert 5 or 25 is added, such strengthening insert provides compression strength ranging from about greater than zero pounds to about less than one-hundred fifty pounds—at last a seventy-five pound compression strength increase. Such compression strength range corresponds to a strengthening insert herein in which the lines of corrugate embedded therein are perpendicular to corners 20.

[0031] When the lines of corrugate within insert 5 or 25 herein are parallel to corners 20 of box 14, such insert 5 or 25 provides a compression strength ranging from about greater than zero pounds to about less than two-hundred fifty pounds.

[0032] The inserts 5 and 25 may be constructed from one piece of corrugated materials in which the lines of corrugate are constructed vertically, such lines of corrugated provide a powerful counter-force when a force, such as a weight, is applied to a corrugated box and thus an insert 5 or 25 positioned therein. Alternatively, the strengthening insert 5 or 25
may be constructed such that the lines of corrugate are constructed horizontally and therefore exist perpendicularly to each wall within box 14.

[0033] The insert 5 or 25 herein may be constructed from corrugated materials, plastic, wood, foam core glass, metal and other suitable materials.

[0034] This written description uses at least one example to disclose the invention, including the best mode, and also to enable any person skilled in the art to make and use the invention. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal language of the claims.

What is claimed is:

1. The strengthening insert of claim 1 comprising,
   i. A first surface having a first connecting edge;
   ii. A second surface connected to said first surface along said first connecting edge, said second surface having a second connecting edge;
   iii. A third surface connected to said second surface along said second connecting edge, said third surface having a third connecting edge; and
   iv. A fourth surface connected to said third surface along said third connecting edge, said fourth surface having a fourth connecting edge, said fourth surface being connected to said first surface along said fourth connecting edge.

2. The strengthening insert of claim 2 wherein said first surface, said second surface, said third surface and said fourth surface are each proximately positioned within an inner surface of a box.

3. A strengthened corrugated box, comprising:
   i. A partially enclosed box having four connected vertical walls and an enclosed bottom, said enclosed bottom being connected to all four said connected walls, each said vertical wall having an outer surface and an inner surface positioned oppositely to said outer surface, each said vertical wall having a top edge, a bottom edge being parallel to and extending oppositely to said top edge, and a distance extending between said top edge and said bottom edge of each vertical wall; and
   ii. A removable insert positioned within said corrugated box, said removable insert comprising at least one side, said removable insert operating to strengthen said corrugated box during compression of said corrugated box.

4. The strengthened corrugated box of claim 3 wherein each said connected vertical wall have the same height.

5. The strengthened corrugated box of claim 3 wherein said removable insert comprises four connected vertical sides.

6. The strengthened corrugated box of claim 5 wherein said removable insert fits along each said inner surface of said corrugated box.

7. The strengthened corrugated box of claim 6 wherein each said connected vertical side of said removable insert is connected to two other said vertical sides of said removable insert.

8. The strengthened corrugated box of claim 3 wherein said removable insert comprises at least three sides.

9. The strengthened corrugated box of claim 8 wherein at least two of said three sides of said removable insert are positioned against two of said connected walls of said box, each said two connected walls facing oppositely to one-another.

10. The strengthened corrugated box of claim 9 wherein said two of said three sides of said removable insert face oppositely to one-another and are connected by a third wall positioned between said two sides of said removable insert.

11. A strengthening insert for a corrugated box having four walls and a bottom, comprising:
   A tri-partitioned insert positionable within said corrugated box, having,
   i. A first surface having a first connecting edge;
   ii. A second surface connected to said first surface along said first connecting edge, said second surface having a second connecting edge; and
   iii. A third surface connected to said second surface along said second connecting edge.

Said tri-partitioned insert being placeable within said corrugated box whereby said first surface is positioned about one wall of said corrugated box, said second surface is positioned about said bottom of said corrugated box, and said third surface is positioned about another wall of said corrugated box.

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