

Bulk material box and unitary storing and shipping container comprising such a box

The present invention relates to a storing and shipping box for bulk solid material and to a unitary storing and shipping container assembly including such box.

Corrugated bulk boxes with supporting pallets have been employed heretofore for the storage and shipping of solid material. The boxes of such prior container assemblies (US—A—3 036 752) mostly were of rectangular shape and included four vertical walls, two bottom long side flaps and two bottom short end flaps, the flaps being separated from each other by cuts. In an effort to improve the structural strength of the assembly, octagonal boxes were designed (US—A—4 013 168) which have eight rectangular, vertical, integral face sections around the outer periphery thereof and a plurality of downwardly depending flaps again separated from each other by cuts and inwardly folded within the outer periphery to form, together with a rectangular flat paperboard sheet, the base of the box. Particularly, every other one of the flaps were positioned on top of the flat sheet whereas the remaining ones of the flaps were lying underneath the flat sheet. Nevertheless such boxes and assemblies exhibited serious inherent structural and other limitations including: limited capacity, box collapse during transit, and box collapse as a result of high humidity conditions and the like. As a result, stronger and better designed box and container assemblies of box and pallet are clearly required.

Accordingly an object of the present invention is to provide a box and container assembly resulting in improved performance capabilities required for the various operations of use including filling, inplant handling, storage and shipment between plant locations, particularly by a corrugated construction maximizing bending and compressive strength of the panels of the box and the stacking (storage) capabilities of the box and container assembly; the provision of a unitary corrugated box and pallet container assembly to provide maximum supporting capabilities; by the incorporation of the flanged tube concept in the box construction; by selection of the most advantageous ratio of panel-to-perimeter dimension of the box; and by the provision of multiple corrugated wall profiles to improve resistance to crushing from the exterior.

These and other objects were realized by the provision of the box and container assembly of the present invention as claimed in claims 1 and 6.

In accordance with the present invention, a storing and shipping box for bulk solid material comprising a removable top, a body member and a base member, said box formed of heavy corrugated material, having eight rectangular, vertical, integral face sections positioned around the outer periphery thereof and a plurality of downwardly-depending flaps inwardly folded within said outer periphery to form a portion of the base of said box, is characterized by said flaps being interconnected by fold lines and, when infolded, providing opposing pairs of infolded flaps, a first pair of said infolded flaps having panels defining a rectangular configuration and a second pair of said infolded flaps having panels defining a trapezoidal configuration, said base member having a score line and opposite tabs which interlock with each of the panels of said first opposed pair; the outer edges of said tabs being spaced from each other by a distance which is equal to or smaller than the spacing of the outer edges of said infolded rectangular panels but which is larger than the spacing of the inner edges of said infolded rectangular panels, and the length of said tabs being equal to or smaller than the length of said infolded rectangular panels; said score line extending across said base member intermediate said tabs; said infolded flaps and base member providing the base of said box.

The container assembly of the present invention comprises such a bulk material box joined at its base in assembly with a supporting pallet, thereby forming a unitary assembly from the structural strength standpoint and achieving all of the objects set forth hereinabove.

In the box of the present invention the flaps are integral, i.e. there are no cuts or spaces separating the flaps from each other. It turned out that this type of arrangement provides for more stability and strength than the prior flap structure comprising flaps separated from each other. In addition, the particular geometric configuration in which the flaps define panels of rectangular and trapezoidal shapes, results in greater flexibility of the flaps. The bulk box of the present invention is formed of three body members: a top, a body member and a base member, each of which is specifically formed and shaped so as to provide cooperating engagement in the formation of the box. The three body members are each composed of sheets of heavy corrugated material. The corrugated material may be selected from a wide variety of commercially available corrugated materials having spaced, parallel liner boards of heavy paper, plastic material (such as polyethylene) or the like enclosing an internal corrugated medium positioned in an array, such as sinusoidal, and formed of paper, plastic material or composites or combinations of such paper and plastic materials and the like. The internal medium array is bonded (by gluing, thermal fusion or the like) to the interior walls of the liner boards in the manner normally employed for the formation of corrugated board material.

The three body members may be, as desired, formed of single or multiple sheets of such heavy corrugated material. It has been found preferable to form the body and base member of the box of at least double-ply material, whereas single-ply material has been found sufficient for use as the top member of the box.

Each of the three body member are formed by die cutting or the like to the shapes desired.

In the drawings:

Fig. 1 is an exploded perspective view of an embodiment of the container assembly of the invention showing the top body and base members of the box and the supporting pallet;

Fig. 2 is a perspective view of the container assembly of the embodiment of Fig. 1;

Fig. 2A is a partial horizontal sectional view of the joint of the ends of the box body member in the embodiment of Fig. 1;

Fig. 3 is a plan view of the open box body member employed in the embodiment of Fig. 1;

Fig. 4 is a plan view of the base member of the embodiment of Fig. 1;

Fig. 5 is a plan view of the open top member of the box embodiment of Fig. 1;

Fig. 6 is an exploded perspective view of the top member, body member, base member and a pallet of another embodiment, showing the manner of insertion and interlocking of the base member with the box body member; and

Fig. 7 is a perspective view, similar to that of Fig. 2, showing the presence of an internal, closed liner bag in the box.

Referring specifically to the embodiment of the figures of the drawings, a box is provided having a top member 10, a body member 12 and a base member 14 assembled into a completed box 16 (as shown without top in Fig. 2) and positioned on and secured to a base supporting pallet 18. The open top member 20, open body member 22 and base member 14 are respectively shown in Figs. 5, 3, and 4 of the drawings. Each of these members is cut (as in the case of corrugated paperboard by die cutting) to the shapes there shown in the drawings with score lines formed as shown by the dotted lines in Figs. 5, 3 and 4, respectively.

In the case of the top member, the cut, scored, open board 20 is bent along the four score lines 24 to form the top member major skirts, panels, frame or flange 26 and the tabs 28 are inwardly bent to the lock position for insertion of their ends in open slots 30, thereby locking the underlying skirts 26.

The open box body member 22 is folded along dotted score lines 32 to form the octagonal (eight rectangular, vertical, integral face sections) configuration shown in Figs. 1 and 2 of the drawings. An overlapping joint area 34 is formed and is best shown in Fig. 2A of the drawings. These overlapping joints are preferably of multiple layers of corrugated board material secured as by staples, glue and the like in the event of the use of the preferred paperboard embodiment, or by heat sealing or the like in the case of the employment of thermoplastic corrugated material. In the embodiment of Fig. 2A, two external overlapping sections 36 of double corrugated material enclose the two ends 38 of the double corrugated material of the box body member. It is, of course, to be understood that the downwardly-depending integral flaps 40 may be formed of the same corrugated board as box member 12 or may be formed of a separate corrugated board joined on the inner or outer lower side of open body member 22, so as to downwardly depend therefrom.

The octagonal box body member has four pairs of opposed rectangular face sections. The largest pair forms the length dimension of the box; the intermediate pair forms the width dimension; and the two smallest pairs form the four corner sections of the box.

The downwardly-depending integral flaps 40 of the open body member 22 are diagonally and reverse scored as at regions 42 to provide, when infolded into the box body member 12, an internal frame 44 comprising opposing pairs of infolded flaps. A first pair of the flaps has panels 40a defining a rectangular configuration, and a second pair of the infolded flaps has panels 40b defining a trapezoidal configuration. Furthermore frame 44 has corner locking infolds 46 also internally infolded and lending rigidity to the box body member 12. This configuration also presents an enveloping interlocking means of retaining base member 14 when inserted in the base thereof. Upon such insertion and interlocking, as shown in Fig. 6 of the drawings, an external skirt 48 is simultaneously provided by the overhanging of base member 14 on two opposing sides of the assembled box and the provision of corner flanges 50 formed by the overhanging of corners 52 at the perimeter of the box body member 12. The insertion and interlocking of base member 14 is permitted by the central scoring at 51 of the base member to provide an ability of opposed tabs 53 (see Fig. 4) of the base member 14 to enter under the infolded panel or frame 44 of body member 12 and lock therein upon straightening of the folded base member 14. Outer edges 53a of tabs 53 are spaced from each other by a distance a which is equal to or smaller than spacing b of the outer edges of infolded rectangular panels 40a but larger than spacing c of the inner edges of panels 40a.

The supporting pallets 18 are constructed of wood, plastic materials or the like and are assembled as shown in Figs. 1, 2, 6, and 7 as having 4, 5 or 6 internal stringer elements 52 supporting oppositely positioned transverse stringer elements 54 (4, 5, or 6, as desired). The assembled box 16 is secured to the supporting pallet 18 as by stapling, gluing or nailing. In the case of stapling or nailing, external skirt 48 and corner flange 50 provide preferred locations at the exterior of the box for such staples or nails. Gluing, where desired, may take place over any or all of the areas of the base member and infolded box skirts in contact with stringers of the pallet.

In the preferred pallet employed in the container assembly of the invention, the stringers positioned near opposite ends of the pallet are grouped for columnar support of the box and the box body member corner flanges are positioned on the pallet to provide matching registry with said grouped stringers at the pallet corners.

It is also preferred that the folding scores of the box member be of a special type differing from the normal score profiles of the prior art. Such preferred folding scores are fabricated by the manufacturers of the corrugated board which is shipped by them in a lay-flat form. The folding scores at opposite ends of the lay-flat cut and joined member have, in the preferred type, a double male profile and reversed scores on opposite faces formed by semi-continuous passage of corrugated board material through a pair of roller dies having male projections on each roll. The resultant corrugated product provides a generally "U"-shaped profile at opposite ends or edges of the lay-flat product. Such score-formed edges provide the obtainment of a corner clearance enabling the product to attain a lay-flat position in spite of the inclusion of other body member structures between the outer sections.

The preferred assembly thereby presents a firmly secured unitary construction capable of supporting a load along both horizontal and vertical axes. With the top member in place, assemblies of this type can be easily vertically stacked for storage.

It is a preferred embodiment of the present invention to employ an internal thermoplastic material liner bag 56 (as shown in Fig. 7) which, after being filled with bulk granular solid material, may be secured for closure by tying as shown at 58 in Fig. 7 of the drawings.

A number of unitary storing and shipping container assemblies of the invention have been constructed and tested. To determine and compare the compressive strength of octagonal corrugated paperboard containers designed for the shipment of bulk solid materials after exposure to both standard laboratory and high humidity conditions, a number of such containers were tested.

Twenty-five octagonal multi-ply, corrugated fiberboard containers embodying the invention were tested to compare their compressive strength.

Thirteen containers were exposed to a controlled atmosphere maintained at 50% RH. (Relative Humidity), 23°C (73°F) for 72 hours and twelve to a controlled atmosphere maintained at 90% RH, 32°C (90°F) for 72 hours before testing. Twenty-four containers were tested empty but one container—conditioned at 50% RH, 23°C (73°F) for 72 hours—was loaded with 544 kg (1200 pounds) of plastic pellets before testing.

All twenty-five containers were tested on a wooden pallet with a second pallet of like construction superimposed to simulate actual stacking conditions.

The average maximum load sustained by containers exposed to like conditions was as follows:

	50% RH., 23°C				90% RH., 32°C			
	Load		Deflection		Load		Deflection	
	(kg)	(lbs.)	(mm)	(inches)	(kg)	(lbs.)	(mm)	(inches)
Tested empty	8,722	19,229	45.7	1.80	5,136	11,323	37.3	1.47
Loaded container	9,866	21,750	57.2	2.25	—	—	—	—

In addition, moisture content and caliper measurements were determined for the twenty-four containers after testing. Edgewise compressive strength (short column) tests were made on specimens from an untested container.

	Moisture Content	
	% of oven dry weight	
	50% RH., 23°C	90% RH., 32°C
	6.2 (Avg. of 12)	(13 (Avg. of 12)
	Edgewise compressive Test	
	(kg/mm width)	(lbs./inch width)
	4.32	242 (Avg. of 12)

The material tested consisted of 25 corrugated fiberboard bulk boxes bearing the 600# test certificate of International Paper Company, New Stanton (Pittsburgh), Pennsylvania. They were octagonal in shape, measured 1.19 m x 1.07 m x 0.97 m (47" x 42" x 38") high and were constructed from A—C double wall with an A—C double wall laminated liner with an 203 mm (8") flange at the bottom. A die-cut and scored double wall bottom and a single box top completed the container.

Thirteen containers were exposed to a controlled atmosphere maintained at 50% RH, 23°C (73°F) in a partially open position to allow free access of air.

After 72 hours, twelve containers were set up and mounted on a wooden pallet with another wooden pallet superimposed to simulate stacking conditions. They were then individually subjected to a top-to-bottom compression test in accordance with American Society for Testing and Materials Test Method D-642 until maximum loads were attained. The remaining container was loaded to capacity (nominally 680 kg (1500 pounds)) with 544 kg (1200 pounds) of plastic pellets before being mounted on a wooden pallet and compression tested as described above.

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Twelve additional containers were exposed to a controlled atmosphere maintained at 90% RH, 32°C (90°F) for 72 hours. During this conditioning period four of the containers were partially opened. The remaining eight were set up with bottoms in place but without tops. After conditioning, all containers were completely assembled, enclosed in a polyethylene bag to prevent loss of moisture and individually subjected to top-to-bottom compression tests with pallets in place as described previously. All were tested empty. The tests were performed on a 13,608 kg (30,000 pound) capacity Tinius Olsen compression machine with loads and deflection automatically recorded.

Immediately after the compression tests, samples were cut from the side walls of the test containers and used to determine moisture content in accordance with ASTM Test Method D-644. In addition, twelve samples were taken from an untested container and used to determine the edgewise compressive strength (short column) in accordance with ASTM Test Method D-2808.

Conditioned @ 50% RH., 23°C

15	Container Number	Max. load		Def. at Max. load		Moisture content	Corrugated board caliper	
		(kg)	(lbs)	(mm)	(inch)		(mm)	(inch)
20	1	8,165	18,000	39.1	1.54	6	19.61	0.772
	2	9,185	20,250	46.2	1.82	7	19.56	0.770
	3	8,448	18,625	45.7	1.80	6	19.74	0.777
	4	9,299	20,500	47.8	1.88	6	19.66	0.774
	5	9,185	20,250	47.2	1.86	6	19.63	0.773
25	6	8,845	19,500	49.8	1.96	6	19.69	0.775
	7	9,015	19,875	55.9	2.20	6	19.66	0.774
	8	9,072	20,000	48.8	1.92	5	19.71	0.776
	9	7,938	17,500	40.9	1.61	7	19.66	0.774
30	10	8,618	19,000	42.7	1.68	6	19.58	0.771
	11	8,391	18,500	40.4	1.59	6	19.66	0.774
	12	8,505	18,750	43.7	1.72	7	19.66	0.774
	Average	8,722	19,229	45.7	1.80	6.2	19.66	0.774
35	Std. Dev.	442	975	4.8	0.19	0.58	0.05	0.002

(Container conditioned and tested as above but filled with 544 kg (1,200 lbs) of plastic pellets)

40	Container Number	Max. load		Deflection at max. load	
		(kg)	(lbs)	(mm)	(inch)
	13	9,866	21,750	57.2	2.25

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Conditioned (a. 90% RH., 32°C

5	Container Number	Max. load		Def. at max. load		Moisture ⁽¹⁾ content	Corrugated board caliper ⁽²⁾	
		(kg)	(lbs)	(mm)	(inch)		(mm)	(inch)
10	14	6,690	14,750	48.8	1.92	10	19.69	0.775
	15	7,087	15,625	44.2	1.74	10	19.74	0.777
	16	6,747	14,875	43.7	1.72	10	19.63	0.773
	17	6,690	14,750	49.8	1.96	11	19.74	0.777
	18	4,933	10,875	34.0	1.34	15	19.28	0.759
15	19	4,819	10,625	36.3	1.43	14	19.35	0.762
	20	4,706	10,375	34.0	1.34	13	19.51	0.768
	21	5,103	11,250	35.6	1.40	13	19.41	0.764
	22	3,345	7,375	28.4	1.12	17	19.33	0.761
	23	3,629	8,000	25.4	1.00	16	19.41	0.764
20	24	3,856	8,500	32.5	1.28	16	19.53	0.769
	25	4,026	8,875	35.6	1.40	13	19.30	0.760
	Average	5,136	11,323	37.3	1.47	13	19.48	0.767
	Std. Dev.	1,345	2,966	7.6	0.30	2.5	0.18	0.007

25 ⁽¹⁾ The first four containers were conditioned, partially opened. The remainder were conditioned, set up without tops.

⁽²⁾ After reconditioning at 50% RH, 23°C

Edgewise Compressive Test (short column)

30 Sample size 31.75 mm (1.25 inches) high (flute direction by 50.80 mm (2.00 inches) wide.

35	Sample No.	Max. load	
		(kg)	(lbs.)
40	1	193	425
	2	236	520
	3	191	420
	4	229	505
45	5	218	480
	6	220	485
	7	163	360
	8	236	520
50	9	222	490
	10	247	545
	11	254	560
	12	218	480

Average max. load: 219 kg (483 lbs.)

Average maximum load/unit width: 4.32 kg/mm (242 lbs.inch)

S.D.: 26 (57)

55 It has been concluded from overall analysis, including consideration of the above test data, that the box and container assembly of the present invention possesses compressive performance superior to that of the prior art, regardless of the specific humidity conditions of use.

60 After testing which yielded the data set forth above, some changes were made as to dimensions and ply construction of the box and the supporting pallet to obtain a most preferred embodiment, i.e., that shown in Figs. 1 through 7 of the drawings. In that embodiment, the four corner panels of the octagonal box were chosen to have widths of 254 mm (10 inches), two opposed sides of the four side faces of the box were chosen to have a width of 0.699 m (27.5 inches), and the other two opposed side faces were chosen to have a width of 0.813 m (32 inches), and the height of the box was chosen at 0.965 m (38 inches) with a depending flange of an additional 203 mm (8 inches) to provide a total unfolded height of 1.168 m (46 inches). Such a box was secured to a supporting pallet having five 65 pallet had over-all dimensions of 1.22 m (48 inches) by 1.09 m (43 inches) by 127 mm (5 inches) in

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height. The interior of the box was lined with a high density polyethylene liner bag capable of "top tying" and containing 680 kg (1500 pounds) of granular high density polyethylene material (beads). This container assembly was found to possess exceptionally high strength against impact and compressive loading and to enable considerable bending without rupture in response to applied forces.

5 even under conditions of high humidity.

It is, of course, to be understood that the bulk solid material contained in the box of the present invention may be in forms other than beads or pellets (such as powders or the like).

10 Claims

1. A storing and shipping box for bulk solid material comprising: a removable top (10), a body member (12), and a base member (14); said box (16) formed of heavy corrugated material, having eight rectangular, vertical, integral face sections positioned around the outer periphery thereof and a plurality of downwardly-depending flaps (40) inwardly folded within said outer periphery to form a portion of the base of said box, characterized by said flaps (40) being interconnected by fold lines (42) and, when infolded, providing opposing pairs of infolded flaps, a first pair of said infolded flaps having panels (40a) defining a rectangular configuration and a second pair of said infolded flaps having panels (40b) defining a trapezoidal configuration, said base member (14) having a score line (51) and opposite tabs (53) which interlock with each of the panels (40a) of said first opposed pair; the outer edges (53a) of said tabs (53) being spaced from each other by a distance (a) which is equal to or smaller than the spacing (b) of the outer edges of said infolded rectangular panels (40a) but which is larger than the spacing (c) of the inner edges of said infolded rectangular panels (40a), and the length of said tabs (53) being equal to or smaller than the length of said infolded rectangular panels (40a); said score line (51) extending across said base member intermediate said tabs; said infolded flaps and base member providing the base of said box (16).

2. The storing and shipping box in accordance with claim 1, wherein said corrugated material is paper.

3. The storing and shipping box in accordance with claim 1, wherein said heavy corrugated material comprises a multiplicity of plies of single corrugated material.

4. The storing and shipping box in accordance with claim 1, wherein a liner bag (56) of plastic material is positioned within said box (16).

5. The storing and shipping box in accordance with claim 4, wherein said liner bag (56) is formed of high density polyethylene resin film.

6. A unitary storing and shipping container assembly for bulk solid material comprising: a box (16) having a removable top (10), a body member (12), and a base member (14), and a rigid pallet (18) secured to and supporting said box at its base; said box formed of heavy corrugated material, having eight rectangular, vertical, integral face sections positioned around the outer periphery thereof and a plurality of downwardly-depending flaps (40) inwardly folded within said outer periphery to form a portion of the base of said box, characterized by said flaps (40) being interconnected by fold lines (42) and, when infolded, providing opposing pairs of infolded flaps, a first pair of said infolded flaps having panels (40a) defining a rectangular configuration and a second pair of said infolded flaps having panels (40b) defining a trapezoidal configuration, said base member (14) having a score line (51) and opposite tabs (53) which interlock with each of the panels (40a) of said first opposed pair; the outer edges (53a) of said tabs (53) being spaced from each other by a distance (a) which is equal to or smaller than the spacing (b) of the outer edges of said infolded rectangular panels (40a) but which is larger than the spacing (c) of the inner edges of said infolded rectangular panels (40a), and the length of said tabs (53) being equal to or smaller than the length of said infolded rectangular panels (40a); said score line (51) extending across said base member intermediate said tabs; said infolded flaps and base member providing the base of said box.

7. The unitary storing and shipping container in accordance with claim 6, wherein said corrugated material is paper.

8. The unitary storing and shipping container in accordance with claim 6, wherein said heavy corrugated board comprises a multiplicity of plies of single corrugated material.

9. The unitary storing and shipping container in accordance with claim 6, wherein a liner bag (56) of plastic material is positioned within said box (16).

10. The unitary storing and shipping container in accordance with claim 9, wherein said liner bag (56) is formed of high density polyethylene resin film.

11. The unitary storing and shipping container in accordance with Claim 6, wherein transverse stringer elements (54) of said pallet (18) positioned near opposite ends of said pallet are grouped for columnar support of said box (16) and the box body member (12) corner flanges (50) are positioned on said pallet to provide matching registry with said grouped stringer elements at said pallet corners.

12. A storing and shipping box or container assembly according to claim 1 or 6, wherein said score line (51) is a central score line.

13. A storing and shipping box according to claim 12, wherein said base member (14) further



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height. The interior of the box was lined with a high density polyethylene liner bag capable of "top-tying" and containing 680 kg (1500 pounds) of granular high density polyethylene material (beads). This container assembly was found to possess exceptionally high strength against impact and compressive loading and to enable considerable bending without rupture in response to applied forces.

It is, of course, to be understood that the bulk solid material contained in the box of the present invention may be in forms other than beads or pellets (such as powders or the like).

10 Claims

1. A storing and shipping box for bulk solid material comprising: a removable top (10), a body member (12), and a base member (14); said box (16) formed of heavy corrugated material, having eight rectangular, vertical, integral face sections positioned around the outer periphery thereof and a plurality of downwardly-depending flaps (40) inwardly folded within said outer periphery to form a portion of the base of said box, characterized by said flaps (40) being interconnected by fold lines (42) and, when infolded, providing opposing pairs of infolded flaps, a first pair of said infolded flaps having panels (40a) defining a rectangular configuration and a second pair of said infolded flaps having panels (40b) defining a trapezoidal configuration, said base member (14) having a score line (51) and opposite tabs (53) which interlock with each of the panels (40a) of said first opposed pair; the outer edges (53a) of said tabs (53) being spaced from each other by a distance (a) which is equal to or smaller than the spacing (b) of the outer edges of said infolded rectangular panels (40a) but which is larger than the spacing (c) of the inner edges of said infolded rectangular panels (40a), and the length of said tabs (53) being equal to or smaller than the length of said infolded rectangular panels (40a); said score line (51) extending across said base member intermediate said tabs; said infolded flaps and base member providing the base of said box (16).

2. The storing and shipping box in accordance with claim 1, wherein said corrugated material is paper.

3. The storing and shipping box in accordance with claim 1, wherein said heavy corrugated material comprises a multiplicity of plies of single corrugated material.

4. The storing and shipping box in accordance with claim 1, wherein a liner bag (56) of plastic material is positioned within said box (16).

5. The storing and shipping box in accordance with claim 4, wherein said liner bag (56) is formed of high density polyethylene resin film.

6. A unitary storing and shipping container assembly for bulk solid material comprising: a box (16) having a removable top (10), a body member (12), and a base member (14), and a rigid pallet (18) secured to and supporting said box at its base; said box formed of heavy corrugated material, having eight rectangular, vertical, integral face sections positioned around the outer periphery thereof and a plurality of downwardly-depending flaps (40) inwardly folded within said outer periphery to form a portion of the base of said box, characterized by said flaps (40) being interconnected by fold lines (42) and, when infolded, providing opposing pairs of infolded flaps, a first pair of said infolded flaps having panels (40a) defining a rectangular configuration and a second pair of said infolded flaps having panels (40b) defining a trapezoidal configuration, said base member (14) having a score line (51) and opposite tabs (53) which interlock with each of the panels (40a) of said first opposed pair; the outer edges (53a) of said tabs (53) being spaced from each other by a distance (a) which is equal to or smaller than the spacing (b) of the outer edges of said infolded rectangular panels (40a) but which is larger than the spacing (c) of the inner edges of said infolded rectangular panels (40a), and the length of said tabs (53) being equal to or smaller than the length of said infolded rectangular panels (40a); said score line (51) extending across said base member intermediate said tabs; said infolded flaps and base member providing the base of said box.

7. The unitary storing and shipping container in accordance with claim 6, wherein said corrugated material is paper.

8. The unitary storing and shipping container in accordance with claim 6, wherein said heavy corrugated board comprises a multiplicity of plies of single corrugated material.

9. The unitary storing and shipping container in accordance with claim 6, wherein a liner bag (56) of plastic material is positioned within said box (16).

10. The unitary storing and shipping container in accordance with claim 9, wherein said liner bag (56) is formed of high density polyethylene resin film.

11. The unitary storing and shipping container in accordance with Claim 6, wherein transverse stringer elements (54) of said pallet (18) positioned near opposite ends of said pallet are grouped for columnar support of said box (16) and the box body member (12) corner-flanges (50) are positioned on said pallet to provide matching registry with said grouped stringer elements at said pallet corners.

12. A storing and shipping box or container assembly according to claim 1 or 6, wherein said score line (51) is a central score line.

13. A storing and shipping box according to claim 12, wherein said base member (14) further



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includes an external skirt (48) provided by the overhanging of said base member on two opposing sides of said assembly box (16).

5 Revendications

1. Caisse de stockage et de transport pour matière solide en vrac, comprenant: un dessus amovible (10), un élément de corps (12) et un élément de base (14); ledit dessus (10) formé d'une matière ondulée forte, ayant huit sections jointives de faces rectangulaires, verticales, positionnées autour de sa périphérie extérieure et plusieurs pattes descendantes (40) pliées vers l'intérieur de ladite périphérie extérieure pour former une partie de la base de ladite caisse, caractérisée en ce que lesdites pattes (40) sont reliées entre elles par des lignes de pliage (42) et, à l'état déplié, forment des paires opposées de pattes dépliées, une première paire desdites pattes dépliées ayant des panneaux (40a) définissant une configuration rectangulaire et une seconde paire desdites pattes dépliées ayant des panneaux (40b) définissant une configuration trapézoïdale, ledit élément de base (14) ayant une ligne d'entailles (51) et des languettes opposées (53) qui se verrouillent avec chacun des panneaux (40a) de ladite première paire opposée; les bords extérieurs (53a) desdites languettes (53) étant espacés l'un de l'autre d'une distance (a) qui est égale ou inférieure à l'espacement (b) des bords extérieurs desdits panneaux rectangulaires non pliés (40a), mais qui est supérieure à l'espacement (c) des bords intérieurs desdits panneaux rectangulaires non pliés (40a), et la longueur desdites languettes (53) étant égale ou inférieure à la longueur desdits panneaux rectangulaires non pliés (40a); ladite ligne d'entailles (51) s'étendant à travers ledit élément de base entre lesdites languettes; lesdites pattes non pliées et ledit élément de base formant la base de ladite caisse (16).
2. Caisse de stockage et de transport selon la revendication 1, dans laquelle ladite matière ondulée est du papier.
3. Caisse de stockage et de transport selon la revendication 1, dans laquelle ladite matière ondulée forte comprend plusieurs couches d'une matière ondulée unique.
4. Caisse de stockage et de transport selon la revendication 1, dans laquelle un sac (56) de doublure en matière plastique est positionné à l'intérieur de ladite caisse (16).
5. Caisse de stockage et de transport selon la revendication 4, dans laquelle ledit sac (56) de doublure est formée d'une feuille de résine polyéthylène à haute densité.
6. Ensemble à conteneur complet de stockage et de transport pour matière solide en vrac comprenant: une caisse (16) ayant un dessus amovible (10), un élément de corps (12) et un élément de base (14), et une palette rigide (18) fixée à la base de ladite caisse qu'elle supporte; ladite caisse étant formée d'une matière ondulée forte, ayant huit sections de faces jointives, rectangulaires, verticales, positionnées autour de sa périphérie extérieure, et plusieurs pattes descendantes (40) pliées vers l'intérieur de ladite périphérie extérieure pour former une partie de la base de ladite caisse, caractérisée en ce que lesdites pattes (40) sont reliées entre elles par des lignes (42) de pliage et, à l'état déplié, constituent des paires opposées de pattes dépliées, une première paire desdites pattes dépliées ayant des panneaux (40a) définissant une configuration rectangulaire et une seconde paire desdites pattes dépliées ayant des panneaux (40b) définissant une configuration trapézoïdale, ledit élément de base (14) ayant une ligne (51) d'entailles et des languettes opposées (53) qui se verrouillent avec chacun des panneaux (40a) de ladite première paire opposée; les bords extérieurs (53a) desdites languettes (53) étant espacés l'un de l'autre d'une distance (a) qui est égale ou inférieure à l'espacement (b) des bords extérieurs desdits panneaux rectangulaires non pliés (40a), mais qui est supérieure à l'espacement (c) des bords intérieurs desdits panneaux rectangulaires non pliés (40a), et la longueur desdites languettes (53) étant égale ou inférieure à la longueur desdits panneaux rectangulaires non pliés (40a); ladite ligne (51) d'entailles s'étendant à travers ledit élément de base, entre lesdites languettes; lesdites pattes non pliées et ledit élément de base constituant la base de ladite caisse.
7. Conteneur complet de stockage et de transport selon la revendication 6, dans lequel ladite matière ondulée est du papier.
8. Conteneur complet de stockage et de transport selon la revendication 6, dans lequel ledit carton ondulé fort comprend plusieurs couches d'une matière ondulée simple.
9. Conteneur complet de stockage et de transport selon la revendication 6, dans lequel un sac (56) de doublure en matière plastique est positionné à l'intérieur de ladite caisse (16).
10. Conteneur complet de stockage et de transport selon la revendication 9, dans lequel ledit sac de doublure (56) est formé d'une feuille de résine polyéthylène à haute densité.
11. Conteneur complet de stockage et de transport selon la revendication 6, dans lequel des éléments de traverses (54) de ladite palette (18), positionnés à proximité des extrémités opposées de ladite palette, sont groupés pour un support colonnaire de ladite caisse (16) et des brides (50) d'angles de l'élément de corps (12) de la caisse sont positionnées sur ladite palette pour réaliser un alignement complémentaire avec lesdits éléments groupés de traverses auxdits angles de la palette.
12. Caisse ou ensemble à conteneur de stockage et de transport selon la revendication 1 ou 6, dans lequel ou laquelle ladite ligne (51) d'entailles est une ligne centrale d'entailles.
13. Caisse de stockage et de transport selon la revendication 12, dans laquelle ledit élément de



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base (14) comprend en outre une jupe extérieure (48) constituée par le surplomb dudit élément de base sur deux côtés opposés de ladite caisse assemblée (16).

Patentansprüche

1. Speicher- und Versandbox für sperriges festes Material mit einem abnehmbaren Deckel (10), einem Körper (12) und einem Bodenteil (14), wobei die Box (16) aus schwerem Wellmaterial mit acht rechteckigen, vertikalen, integralen Stirnflächenabschnitten, die entlang dem Außenumfang der Box verlaufen, sowie mehreren nach unten abstehenden Laschen (40) gebildet ist, die innerhalb des Außenumfangs unter Bildung eines Teils des Bodens der Box nach innen gefaltet sind, dadurch gekennzeichnet, daß die Laschen (40) durch Falzlinien (42) untereinander verbunden sind und im eingefalteten Zustand einander gegenüberliegende Paare von einwärts gefalteten Laschen bilden, daß ein erstes Paar der einwärts gefalteten Laschen Felder (40a) von rechteckiger Gestalt und ein zweites Paar von einwärts gefalteten Laschen Felder (40b) von trapezförmiger Gestalt bildet, daß das Bodenteil (14) eine Falzlinie (51) und einander gegenüberliegende Nasen (53) aufweist, die mit jedem der Felder (40a) des ersten gegenüberliegenden Paares verschränkt sind, daß die Außenkanten (53a) der Nasen (53) einen gegenseitigen Abstand (a) haben, der gleich oder kleiner als der Abstand (b) der Außenkanten der einwärts gefalteten rechteckigen Felder (40a), aber größer als der Abstand (c) der Innenkanten der einwärts gefalteten rechteckigen Felder (40a) ist, daß die Länge der Nasen (53) gleich oder kleiner als die Länge der einwärts gefalteten rechteckigen Felder (40a) ist, daß die Falzlinie (51) quer über das Bodenteil zwischen den Nasen reicht, und daß die einwärts gefalteten Laschen und das Bodenteil den Boden der Box (16) bilden.
2. Speicher- und Versandbox nach Anspruch 1, dadurch gekennzeichnet, daß das Wellmaterial Papier ist.
3. Speicher- und Versandbox nach Anspruch 1, dadurch gekennzeichnet, daß das schwere Wellmaterial eine Mehrzahl von Lagen von Einzelwellmaterial aufweist.
4. Speicher- und Versandbox nach Anspruch 1, dadurch gekennzeichnet, daß ein Auskleidungsbeutel (56) aus Kunststoff innerhalb der Box (16) angeordnet ist.
5. Speicher- und Versandbox nach Anspruch 4, dadurch gekennzeichnet, daß der Auskleidungsbeutel (56) aus einem Polyäthylenharzfilm hoher Dichte gebildet ist.
6. Speicher- und Versandbehältereinheit für sperriges festes Material mit einer Box (16), die einen abnehmbaren Deckel (10), einen Körper (12) und ein Bodenteil (14) aufweist, und mit einer starren Palette (18), die am Boden der Box an der Box befestigt ist und letztere trägt, wobei die Box aus schwerem Wellmaterial mit acht rechteckigen, vertikalen, integralen Stirnflächenabschnitten, die entlang dem Außenumfang der Box verlaufen, sowie mehreren nach unten abstehenden Laschen (40) gebildet ist, die innerhalb des Außenumfangs unter Bildung eines Teils des Bodens der Box nach innen gefaltet sind, dadurch gekennzeichnet, daß die Laschen (40) durch Falzlinien (42) untereinander verbunden sind und im eingefalteten Zustand einander gegenüberliegende Paare von einwärts gefalteten Laschen bilden, daß ein erstes Paar der einwärts gefalteten Laschen Felder (40a) von rechteckiger Gestalt und ein zweites Paar von einwärts gefalteten Laschen Felder (40b) von trapezförmiger Gestalt bildet, daß das Bodenteil (14) eine Falzlinie (51) und einander gegenüberliegende Nasen (53) aufweist, die mit jedem der Felder (40a) des ersten gegenüberliegenden Paares verschränkt sind, daß die Außenkanten (53a) der Nasen (53) einen gegenseitigen Abstand (a) haben, der gleich oder kleiner als der Abstand (b) der Außenkanten der einwärts gefalteten rechteckigen Felder (40a), aber größer als der Abstand (c) der Innenkanten der einwärts gefalteten rechteckigen Felder (40a) ist, daß die Länge der Nasen (53) gleich oder kleiner als die Länge der einwärts gefalteten rechteckigen Felder (40a) ist, daß die Falzlinie (51) quer über das Bodenteil zwischen den Nasen reicht, und daß die einwärts gefalteten Laschen und das Bodenteil den Boden der Box bilden.
7. Speicher- und Versandbehältereinheit nach Anspruch 6, dadurch gekennzeichnet, daß das Wellmaterial Papier ist.
8. Speicher- und Versandbehältereinheit nach Anspruch 6, dadurch gekennzeichnet, daß die schwere Wellpappe mehrere Lagen von Einzelwellmaterial aufweist.
9. Speicher- und Versandbehältereinheit nach Anspruch 6, dadurch gekennzeichnet, daß ein Auskleidungsbeutel (56) aus Kunststoff innerhalb der Box (16) angeordnet ist.
10. Speicher- und Versandbehältereinheit nach Anspruch 9, dadurch gekennzeichnet, daß der Auskleidungsbeutel (56) aus einem Polyäthylenharzfilm hoher Dichte gebildet ist.
11. Speicher- und Versandbehältereinheit nach Anspruch 6, dadurch gekennzeichnet, daß quer verlaufende Strebenelemente (54) der Palette (18), die nahe gegenüberliegenden Enden der Palette angeordnet sind, zwecks säulenartiger Abstützung der Box (16) gruppiert sind, und daß Eckflansche (50) des Boxenkörpers (12) auf der Palette derart aufliegen, daß sie mit den gruppierten Strebenelementen an den Palettenecken fluchten.
12. Speicher- und Versandbox oder Behältereinheit nach Anspruch 1 oder 6, dadurch gekennzeichnet, daß die Falzlinie (51) eine mittige Falzlinie ist.



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13. Speicher- und Versandbox nach Anspruch 12, dadurch gekennzeichnet, daß das Bodenteil (14) eine externe Fußleiste (48) aufweist, die dadurch gebildet ist, daß das Bodenteil auf zwei gegenüberliegenden Seiten der Box (16) übersteht.

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