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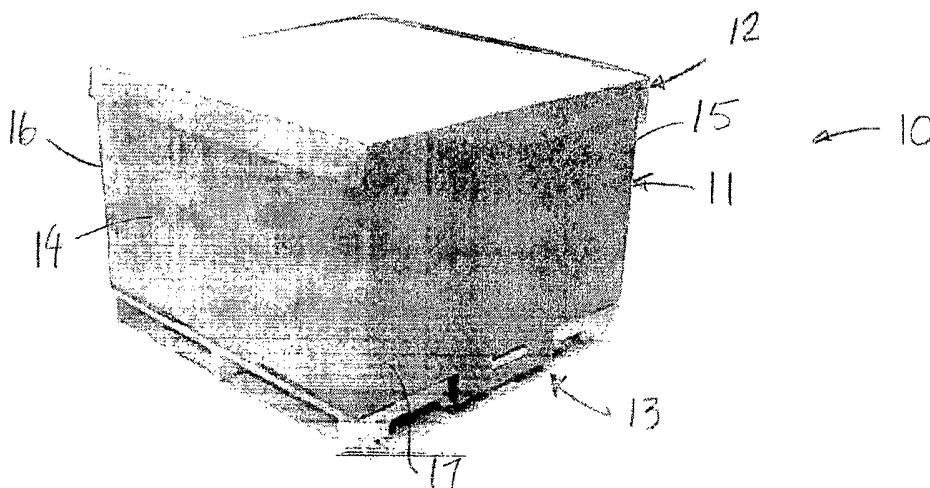
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(54) Title: BULK SHIPPING BOX ASSEMBLY WITH DETACHABLE PALLET



(57) Abstract: A shipping box (11), shipping box and pallet assembly (10), and a blank (B1, B2, B3) for making the shipping box. The box has integral attaching tabs (38) projecting downwardly therefrom, with at least one slot (31, 32) therein for receiving an extended end (41) of at least one slat (40) on a pallet (13), to releasably attach the box to the pallet. A reinforcing insert (70) is placed in the box against opposite walls. The insert has a center panel (77) of the same width and height as the box wall against which it is placed, and double thickness end panels (78) at opposite sides of the center panel, extending perpendicular to the center panel and lying against adjacent box walls.

BULK SHIPPING BOX ASSEMBLY WITH DETACHABLE PALLET

This application claims the benefit of prior U.S. Provisional Patent Application Serial Number 60/490,198, filed July 25, 2003.

Technical Field:

5 This invention relates to shipping containers for shipping products in bulk, and more particularly to a shipping box and detachable pallet for shipping relatively heavy and bulky items, such as automotive parts and the like.

Background Art:

10 Heavy duty boxes formed from one or more plies of corrugated cardboard are commonly used for shipping products in bulk. These boxes are frequently fastened to a pallet by staples or straps prior to filling the box with product. The end user must either have the container shipped to it in its set-up condition and already fastened on the pallet, or the end user must have the necessary stapling or strapping equipment available to set up the container
15 in-house. In the former case, shipping the set-up container and pallet is expensive, and in the latter case, the assembly and set up requires added capital cost for equipment, is labor intensive, and presents safety issues for the end user and its employees. Also, because of the large size of a typical bulk box, it is difficult to reach into the box to apply staples. Moreover, the staples must penetrate both the box and the pallet, and strapping normally crushes the box.
20 Both methods require hand tools to apply and remove the fasteners, and cause damage to both the box and the pallet, making re-use impractical.

 Further, the boxes, with attached pallets, are commonly stacked on top of one another up to three pallets high. The side walls must have sufficient stacking strength to withstand the compressive load imposed on them. Conventional boxes of the type with which the present
25 invention is concerned typically have a capacity of 500 pounds, i.e., they can safely be stacked three high when loaded with 500 pounds of product. However, some bulk products have greater weight than this, and although conventional boxes have a built-in safety factor, greater stacking strength is desirable.

 Accordingly, there is need for a bulk shipping box and pallet assembly that can be
30 manufactured and shipped to an end user in a knocked-down or flattened condition and then easily set up by the end user and fastened to a pallet, and easily detached from the pallet when

desired, without requiring the use of hand tools or other equipment, and without causing damage to either the box or the pallet, whereby they are suitable for reuse. Further, there is need for a bulk shipping box having improved stacking strength.

5 Disclosure of the Invention:

The present invention comprises a bulk shipping box and blank for making the same, wherein the box has integral means for releasably attaching the box to a pallet without requiring the use of separate fasteners, and a shipping box and pallet assembly that can be manufactured and shipped to an end user in a knocked-down or flattened condition and then
10 easily set up by the end user and fastened to a pallet, and detached from the pallet and knocked down to a flattened condition when desired, without requiring the use of hand tools or other equipment and without causing damage to either the box or the pallet. The box of the invention also incorporates a reinforcing insert that improves stacking strength.

As manufactured and shipped to the end user, the bulk shipping assembly of the
15 invention comprises a box in a flattened tubular condition, a pallet, and a cover. The box includes integral slotted tabs that are engageable with the slats of the pallet to hold the box to the pallet without requiring the use of staples, strapping or other fasteners. The box can be quickly and easily erected by hand from the flattened condition to an open expanded condition, and then attached to the pallet by bending the slotted tabs and positioning the ends
20 of a slat or slats of the pallet into the slots of the tabs to attach the box to the pallet. When it is desired to detach the box from the pallet and return it to its flattened condition, the tabs are flexed to disengage the pallet slats from the tab slots, and the box is unfolded to its flattened tubular condition. The box and pallet may then be reused, if desired.

More specifically, the box of the invention preferably is made from a single unitary
25 blank of corrugated cardboard and has opposite side walls, opposite end walls, and bottom flaps that are foldable into closing relationship over the bottom of the box. Two opposed bottom flaps have die cuts in them defining attaching tabs that lie in the plane of the respective flap when the box is in its flattened condition, and that project downwardly from the bottom edge of the associated box side wall when the box is erected. The tabs include a
30 first, outer panel that is a continuation of the associated side wall, and a second, inner panel that folds between the first panel and the pallet, forming a double thickness or double layer construction that is very strong and has sufficient rigidity to stay in locking engagement with

the pallet slat during handling, and yet can be flexed and released from the pallet when desired. The tabs have one or more slots in at least the second, inner panel for receiving an extended end of at least one pallet slat when the box is erected and attached to the pallet.

5 In a first embodiment, a single slot is formed in each of the first and second panels of the attaching tabs, and when the second panel is folded inwardly of the first panel, the slots in the two panels are aligned for receiving the extended end of a pallet slat that forms part of the top deck of the pallet. This embodiment is designed for use with a pallet having only a few slats forming the top deck, with one of the slats lying on the centerline of the pallet, and the extended ends of that slat being engaged in the slots in both panels of the attaching tab.

10 In a second embodiment, two side-by-side slots are formed in each of the first and second panels for receiving the extended ends of two slats that form part of the top deck of the pallet. This embodiment is designed for use with pallets having a larger number of slats than in the first embodiment, wherein the two central slats lie on opposite sides of the pallet centerline, and extended ends of these two slats are engaged in the slots in both panels of the
15 attaching tab.

In a third embodiment, there are no slots in the first or outer panel, and the extended ends of the pallet slat engage in a slot in only the second or inner panel of the attaching tab. The inner panel can have only one slot, as in the first embodiment, or two slots as in the second embodiment. In this regard, it should be understood that a number of slots other than
20 one or two could be employed in each of the embodiments, if desired or necessary for a particular application.

According to another aspect of the invention, a reinforcing insert is placed in the box in each of at least two opposite ends or sides to increase the stacking capacity of the box. The reinforcing insert is made from a flat piece of corrugated cardboard having creases or scores
25 at its opposite ends defining panels that are folded over and laminated together to form a double thickness flap at each of the opposite ends of the insert. A central portion of the insert between the flaps is approximately the same width as the side or end of the box, and when the insert is placed in the box the central portion lies against an inner surface of the side or end wall, and the two flaps lie against adjacent walls. The dimensions of the insert are such that it
30 has a tight fit in the box and extends the full height and width of the wall against which it is placed. However, when it is desired to return the box to its flattened condition, the inserts can

be removed. With the inserts, the stacking strength of the box is increased from about 500 pounds to about 850 pounds. Although the insert is shown and described herein as being used in a box having attaching tabs for securing the box to a pallet, it should be understood that the insert could be used with other types of boxes.

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Brief Description of Drawings:

The foregoing, as well as other objects and advantages of the invention, will become apparent from the following detailed description when taken in conjunction with the accompanying drawings, wherein like reference characters designate like parts throughout the several views, and wherein:

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FIG. 1 is a top perspective view of a first embodiment of a box and pallet assembly according to the invention in fully set up condition.

FIG. 2 is an exploded top perspective view of a box, pallet and cover assembly of the invention, as manufactured and shipped to an end user.

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FIG. 3 is a fragmentary, enlarged perspective view of the box of the invention, shown in an inverted upside down orientation and partially expanded to an open position.

FIG. 4 is a bottom perspective view of the box of figure 3, with the box fully opened up from the flattened condition shown in figure 2 to an expanded condition.

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FIG. 5 is a fragmentary bottom perspective view of the box of figure 4, showing the two opposed major bottom flaps being folded inwardly over the bottom of the box.

FIG. 6 is a fragmentary bottom perspective view of the box of figure 5, showing one of the two opposed minor bottom flaps folded inwardly over the previously folded major bottom flaps, leaving the panels that form the attaching tab in an upstanding position.

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FIG. 7 is a fragmentary bottom perspective view of the box of figure 6, showing both minor flaps folded inwardly, and the second, inner panel of one of the attaching tabs being folded inwardly.

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FIG. 8 is a fragmentary bottom perspective view of the box of figure 7, showing the second, inner panel of one of the attaching tabs being seated in its operative position, with the bottom free edge of the inner panel engaged in the space defined between the side edges of the major bottom flaps and the adjacent box side wall.

FIG. 9 is an enlarged fragmentary perspective view of the box of figure 8, showing one of the attaching tabs in its fully seated operative position.

FIG. 10 is a bottom perspective view of a box according to the invention, shown with the bottom flaps all folded inwardly and both attaching tabs in their operative seated position.

FIG. 11 is a fragmentary bottom perspective view of a first type of pallet being positioned on the bottom of the inverted box of figure 10.

5 FIG. 12 is an enlarged fragmentary bottom perspective view of the pallet and box of figure 11, showing a first extended end of one of the pallet top deck slats aligned with the slots in the attaching tab, and depicting how the pallet holds the minor flaps in their inwardly folded position.

10 FIG. 13 is a bottom perspective view of the pallet and box of figure 12, showing the first extended end of the pallet slat fully engaged with a first one of the attaching tabs, and with the other end of the pallet in an elevated position preparatory to engaging the second extended end of the pallet slat with the second attaching tab.

15 FIG. 14 is an enlarged, fragmentary bottom perspective view of the box and pallet of figure 13, showing how the second attaching tab is flexed outwardly to enable the adjacent end of the pallet to be moved down into operative position lying flat against the bottom of the box, whereby the second extended end of the pallet slat can be inserted into the slots of the second attaching tab.

FIG. 15 is a bottom perspective view of a fully assembled box and pallet assembly according to the first embodiment of the invention.

20 FIG. 16 is a top perspective view of the pallet and box assembly of figure 15, shown in an upright position.

FIG. 17 is a plan view of a blank for making the box of figures 1-16.

FIG. 18 is a plan view of a blank for making a box according to a second embodiment of the invention.

25 FIG. 19 is a bottom perspective view of a fully assembled box and pallet assembly according to the second embodiment of the invention.

FIG. 20 is a top perspective view of the box and pallet assembly of figure 19, shown in an upright position.

30 FIG. 21 is an enlarged fragmentary bottom perspective view of the box of figures 18-20, showing the box in an expanded, upside down position prior to the bottom flaps being folded inwardly.

FIG. 22 is a fragmentary bottom perspective view of the box of figure 21, showing the bottom flaps in their inwardly folded position preparatory to attaching the pallet.

FIG. 23 is a plan view of a blank for making a third embodiment of a box according to the invention, wherein the first or outer panel of the attaching tab is devoid of slots for
5 receiving extended ends of the pallet slats.

FIG. 24 is a side view in elevation of a box according to the third embodiment, shown upside down and in flattened condition as shipped to an end user.

FIG. 25 is a top perspective view of a fully assembled pallet and box according to the third embodiment.

10 FIG. 26 is a fragmentary bottom perspective view of the pallet and box assembly of figure 25.

FIG. 27 is an enlarged fragmentary bottom perspective view of the pallet and box of figure 26, with the pallet just being positioned for engagement of the extended ends of the pallet slats in the slots in the inner panel of one of the attaching tabs.

15 FIG. 28 is an enlarged fragmentary top perspective view of the box of figure 25.

FIG. 29 is a further enlarged fragmentary top perspective view of the box of figure 28, showing a reinforcing insert according to the invention placed in one end (or side) of the box.

FIG. 30 is a plan view of a blank for making the insert of figure 29.

20 FIG. 31 is an enlarged fragmentary perspective view of one end of the reinforcing insert of figure 30.

FIG. 32 is a top perspective view of the reinforcing insert of figure 29, prior to the insert being folded for insertion into the box.

FIG. 33 is a greatly enlarged fragmentary top view of one corner of the box and insert of figure 29.

25 FIG. 34 is a fragmentary top perspective view of the insert of figure 31 being inserted into a box.

FIG. 35 is a fragmentary top perspective view of a pair of inserts partially inserted into opposite ends of a box.

30 **Best Modes for Carrying Out the Invention:**

The bulk shipping assembly of the invention is indicated generally at 10, and as seen best in figures 1 and 2, comprises a box 11, cover 12, and pallet 13. This is the assembly that

typically would be manufactured and shipped to an end user in the disassembled, knocked-down flattened condition shown in figure 2.

In a first embodiment of the box of the invention, illustrated in figures 1-17, the box 11 has two opposed side walls 14 and 15, and two opposed end walls 16 and 17. With particular reference to figure 17, which shows a blank B₁ for erecting the first embodiment, the side and end walls are foldably connected to one another along adjacent side edges at fold lines 18, preferably creased. Opposed major bottom flaps 19 and 20 and opposed minor bottom flaps 21 and 22 are foldably attached along fold lines 23, also preferably creased, to bottom edges of respective opposite side and end walls. A glue flap 24 is foldably connected to one side edge of one of the side walls for use by the manufacturer in gluing up the box prior to its shipment to the end user. The bottom flaps are separated from one another by cuts 25 extending in alignment with the respective fold lines 18.

A pair of parallel, spaced apart first cuts 26 are made in each of the minor bottom flaps 21 and 22, perpendicular to the fold lines 23 and extending approximately midway into the respective flap. Second cuts 27 extend between the ends of the cuts 26, spaced from the fold line 23, and a pair of closely spaced score lines 28 extend between the cuts 26 spaced between the fold line 23 and cut 27. The cuts and score lines define first and second rectangular panels 29 and 30. It will be noted that the fold line 23 does not extend across the area between the cuts 26 of each pair, whereby the first panel 29 extends rigidly from the bottom edge of the respective end wall. Second panel 30 is foldably joined to the first panel and has a greater width than first panel 29, whereby when the second panel is folded about the score lines 28 into overlying relationship with first panel 29, the second panel extends at its free edge past the fold line 23. The first panel has a rectangular slot 31 formed therein, with one edge of the slot lying in substantial alignment with the score line 23, and the second panel has a rectangular slot 32 formed substantially in the center thereof. When the second panel is folded alongside the first panel, the slots 31 and 32 are in aligned registry with one another. To facilitate folding of the second panel about the score lines 28, small cut-outs 33 may be made in or between the score lines, and to facilitate grasping of the second panel to fold it about the score lines, a cut-out 34 may be made in the flap adjacent the free edge of the panel.

The outer side edges of the major bottom flaps 19 and 20 are cut away or recessed at 35 for a purpose explained below. If desired, relief cuts 36 may be made in the outer side edges of the minor bottom flaps 21 and 22 to provide clearance space when the box is erected.

Upon receipt by the end user of the assembly shown in figure 2, the flattened box **11** is placed in an upside down orientation, as shown in figure 3, and expanded to the open tubular configuration shown in figure 4. The major bottom flaps **19** and **20** are then folded inwardly and downwardly over the open bottom of the box, as shown in figure 5, followed by folding the minor bottom flaps **21** and **22** inwardly and downwardly over the previously folded major bottom flaps, as shown in figure 6. With further reference to figure 6, it will be noted that due to the rigid connection of the first panel **29** to the associated end wall, when the minor flaps are folded inwardly the panels **29** and **30** remain in an upright position generally coplanar with the end wall. To finish erecting the box, the second panels **30** are then folded inwardly and downwardly about the score lines **28**, as shown in figure 7, and the free edge **36** of the second panel is pressed into the space provided between the associated end wall and adjacent edges of the inwardly folded major bottom flaps, as shown in figures 8 and 9. This space is provided by the cuts **35** in the edges of the major bottom flaps, as described above. The completed erected box is shown in figure 10. The thus-folded panels form an attaching tab **38** for attaching the box to the pallet, as explained hereinafter.

The pallet **13** is then picked up, inverted to an upside down orientation, and placed over the bottom of the box, as shown in figure 11. As seen best in figure 12, the slats **40** that form the top deck of the pallet have extended ends **41**. In the particular pallet shown, there are three slats **40a**, **40b** and **40c** that form the top deck, and the center slat **40b** is aligned with the slots **31** and **32** formed in the first and second panels **29** and **30**, respectively, which comprise inner and outer panels in the erected attaching tab. The pallet is then pushed toward one of the attaching tabs, until the extended end **41** of the slat **40b** is engaged in the slots **31** and **32**, as shown in figure 13. The opposite attaching tab is then flexed outwardly, as shown in figure 14, so that the extended end of the slat **40b** on the other end of the pallet can be inserted into the slots **31** and **32** of that tab, thus completing attachment of the pallet to the box, as shown in figure 15. The assembled box and pallet are then placed in an upright position, as shown in figure 16, for receiving product.

To detach the box from the pallet, the process described above is simply reversed. That is, the box and attached pallet are placed in an upside down position, the attaching tabs are flexed outwardly to disengage the extended slat ends from the slots, the attaching tabs are unfolded, and the flaps are unfolded so that the box can be flattened.

A second embodiment of the invention is indicated generally at **50** in figures 18-22. The box **11'** in this embodiment is made from a single unitary blank **B₂** designed for use with a different pallet **13'**, and is essentially the same as the first embodiment, except that two side-by-side slots **51** and **52** are formed in the first panel **29'**, and two side-by-side slots **53** and **54** are formed in the second panel **30'**, rather than the single slots provided in the first embodiment. Further, the small cut-outs **33** and **34**, provided in the first embodiment, are omitted from this embodiment. The attaching tabs **55** in this embodiment thus have two side-by-side slots for receiving the extended ends **56** of a pair of adjacent slats **57** and **58** in the pallet **13'**. In all other respects this embodiment is the same as the first embodiment, and assembly and disassembly are achieved in the same way.

A third embodiment of the invention is indicated generally at **60** in figures 23-27. The box **11''** in this form of the invention is made from a single unitary blank **B₃**, and is essentially the same as embodiment two described above, except that the slots are omitted from the first, outer panel **29''**, whereby when the pallet is attached to the box, the outer surface of the attaching tab **61** is smooth and unbroken. In all other respects, this embodiment is the same as embodiment two, described above, and assembly and disassembly are achieved in the same way.

Figure 28 depicts the interior of a box **11**, **11'** or **11''**, and shows that the major bottom flaps **19** and **20** each extend half way across the bottom of the box so that the bottom is completely closed. The free edge **66** of the second, inner panel of the attaching tab is seen projecting up through the space defined by the cut-outs **35** in the adjacent side edges of the flaps **19** and **20**. Except for the attaching tab and its associated structure, this inner box construction is generally the same as a conventional bulk box.

Figure 29 depicts a box **11**, **11'** or **11''** having a reinforcing insert **70** placed therein in accordance with another aspect of the present invention. It should be noted that while only one end of the box, and one insert, are shown in this figure, an insert preferably would be placed in each of two opposite sides or ends of the box. See figure 35. Further, although the insert **70** is shown as placed in a box **11**, **11'** or **11''** according to the invention, it could equally as well be used in other types of boxes.

The insert **70** is made from a single flat piece or blank **B₄** of corrugated cardboard having a series of three scores or crease lines **71**, **72** and **73** at each end, defining first, second and third panels **74**, **75** and **76**, respectively, at the ends of the blank, and a center panel **77**.

The distance between the scores or crease lines 73, and thus the width of the center panel 77, is approximately the same as the width of a box wall against which the insert is to be placed. A suitable adhesive is placed on the first and/or second panel, and the second panel 75 is folded onto the first panel 74 and adhesively laminated thereto, forming a double thickness hinged end or panel 78 on each end of the insert, and leaving the third panel 76 free, as depicted in figure 31. In use, the ends 78 are folded inwardly and an insert is pressed into place in each end or side of the box. The fit is snug to prevent displacement of the insert, and as seen best in figure 29, the height of the insert is the same as the height of the box.

Although the preferred embodiments illustrated and described herein pertain to rectangular boxes having four sides, it should be understood that the invention could be applied to other box configurations, such as octagonal.

Although particular embodiments of the invention are illustrated and described in detail herein, it is to be understood that various changes and modifications may be made to the invention without departing from the spirit and intent of the invention as defined by the scope of the appended claims.

WHAT IS CLAIMED IS:

1. A shipping box and pallet assembly, comprising:
a pallet having at least one slat with extended end portions; and
a box having side walls and a bottom adapted to rest on said pallet, and an attaching
tab integral with said box and projecting downwardly from a side wall, said attaching tab
5 having at least one slot therein for receiving the extended end of said at least one slat to hold
the box to the pallet.
2. A shipping box and pallet assembly as claimed in claim 1, wherein:
said box has two opposed side walls and two opposed end walls; and
a flap is foldably joined along a fold line to a bottom edge of each side and end wall,
said flaps forming said box bottom.
3. A shipping box and pallet assembly as claimed in claim 2, wherein:
there are two attaching tabs, located on respective opposite sides of said box.
4. A shipping box and pallet assembly as claimed in claim 3, wherein:
said fold line is interrupted over an area where two opposed flaps are foldably
connected to an associated wall; and
a series of cuts are made in said two opposed flaps, including two spaced apart cuts
5 extending into said flaps from said fold line, and a third cut extending between the ends of
said two cuts remote from said fold line, said interrupted area of said fold line extending
between said two spaced apart cuts, said cuts and interrupted area defining said attaching tabs,
whereby the attaching tabs extend integrally from an associated wall in coplanar relationship
therewith.
5. A shipping box and pallet assembly as claimed in claim 4, wherein:
a fold extends between said two cuts, spaced from said third cut and from said
interrupted area, and with said cuts defines first and second attaching tab panels, said first
attaching tab panel being adjacent said interrupted area and said second attaching tab panel
5 being foldable about said fold to lie against said first attaching tab panel; and
said at least one slot is in said first attaching tab panel.

6. A shipping box and pallet assembly as claimed in claim 5, wherein:
at least one slot is in each of said first and second attaching tab panels.
7. A shipping box and pallet assembly as claimed in claim 6, wherein:
there are two slots in each of said attaching tab panels.
8. A shipping box and pallet assembly as claimed in claim 5, wherein:
said second attaching tab panel is devoid of slots.
9. A shipping box and pallet assembly as claimed in claim 1, wherein:
at least one reinforcing insert is in said box against at least one box wall to increase
stacking strength of the box.
10. A shipping box and pallet assembly as claimed in claim 9, wherein:
a reinforcing insert is in each of two opposite ends of the box.
11. A shipping box and pallet assembly as claimed in claim 10, wherein:
the reinforcing insert is formed from a single unitary blank of corrugated cardboard,
and comprises a center panel having a width and height approximately the same as the width
and height of the box wall against which the insert is placed, and opposite end panels of
5 double thickness foldably connected to opposite edges of the center panel and extending
perpendicular to the center panel to lie against adjacent walls.
12. A shipping box and pallet assembly as claimed in claim 7, wherein:
at least one reinforcing insert is in said box against at least one box wall to increase
stacking strength of the box.
13. A shipping box and pallet assembly as claimed in claim 12, wherein:
a reinforcing insert is in each of two opposite ends of the box.

14. A shipping box and pallet assembly as claimed in claim 13, wherein:
the reinforcing insert is formed from a single unitary blank of corrugated cardboard,
and comprises a center panel having a width and height approximately the same as the width
and height of the box wall against which the insert is placed, and opposite end panels of
5 double thickness foldably connected to opposite edges of the center panel and extending
perpendicular to the center panel to lie against adjacent walls.

15. A shipping box having means for attachment of the box to a pallet, said box
comprising:
opposite side walls and opposite end walls;
at least one bottom flap foldably joined along a fold line to a bottom edge of at least
5 one of the side and end walls; and
at least one attaching tab integral with at least one of said side and end walls and
projecting downwardly therefrom for releasably attaching the box to a pallet without requiring
the use of separate fasteners.

16. A shipping box as claimed in claim 15, wherein:
a bottom flap is foldably joined along a fold line to each of said side and end walls;
and
an attaching tab is integral with each of two opposed end walls.

17. A shipping box as claimed in claim 16, wherein:
each said attaching tab has at least one slot in it for receiving respective opposite
extended ends of a slat on a pallet on which said box is adapted to be placed.

18. A shipping box as claimed in claim 17, wherein:
said fold line is interrupted over an area where two opposed flaps are foldably
connected to an associated wall; and
a series of cuts are made in said two opposed flaps, including two spaced apart cuts
5 extending into said flaps from said fold line, and a third cut extending between the ends of
said two cuts remote from said fold line, said interrupted area of said fold line extending

between said two spaced apart cuts, said cuts and interrupted area defining said attaching tabs, whereby the attaching tabs extend integrally from an associated wall in coplanar relationship therewith.

19. A shipping box as claimed in claim 18, wherein:

a fold extends between said two cuts, spaced from said third cut and from said interrupted area, and with said cuts defines first and second attaching tab panels, said first attaching tab panel being adjacent said interrupted area and said second attaching tab panel
5 being foldable about said fold to lie against said first attaching tab panel; and
said at least one slot is in said first attaching tab panel.

20. A shipping box as claimed in claim 15, wherein:

a reinforcing insert is in each of two opposite ends of the box, lying against said box walls, said reinforcing insert being formed from a single unitary blank of corrugated cardboard, and comprising a center panel having a width and height approximately the same
5 as the width and height of the box wall against which the insert is placed, and opposite end panels of double thickness foldably connected to opposite edges of the center panel and
extending perpendicular to the center panel to lie against adjacent walls.

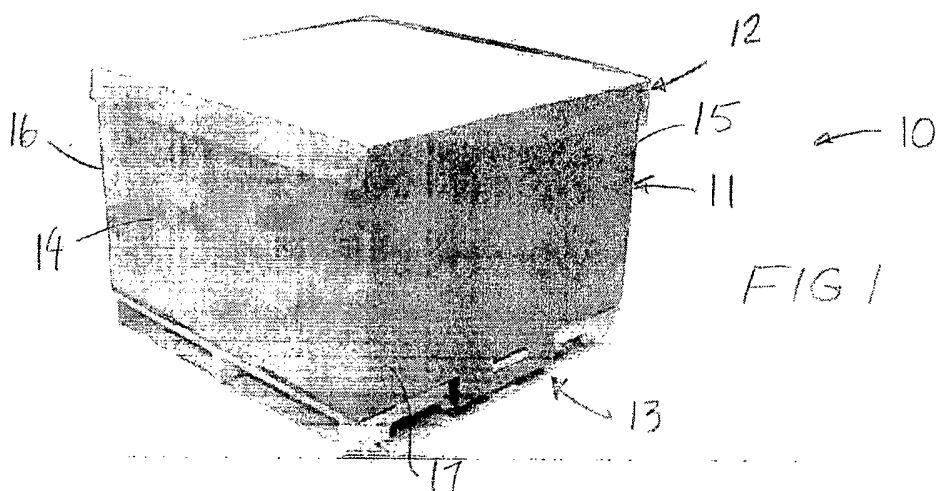
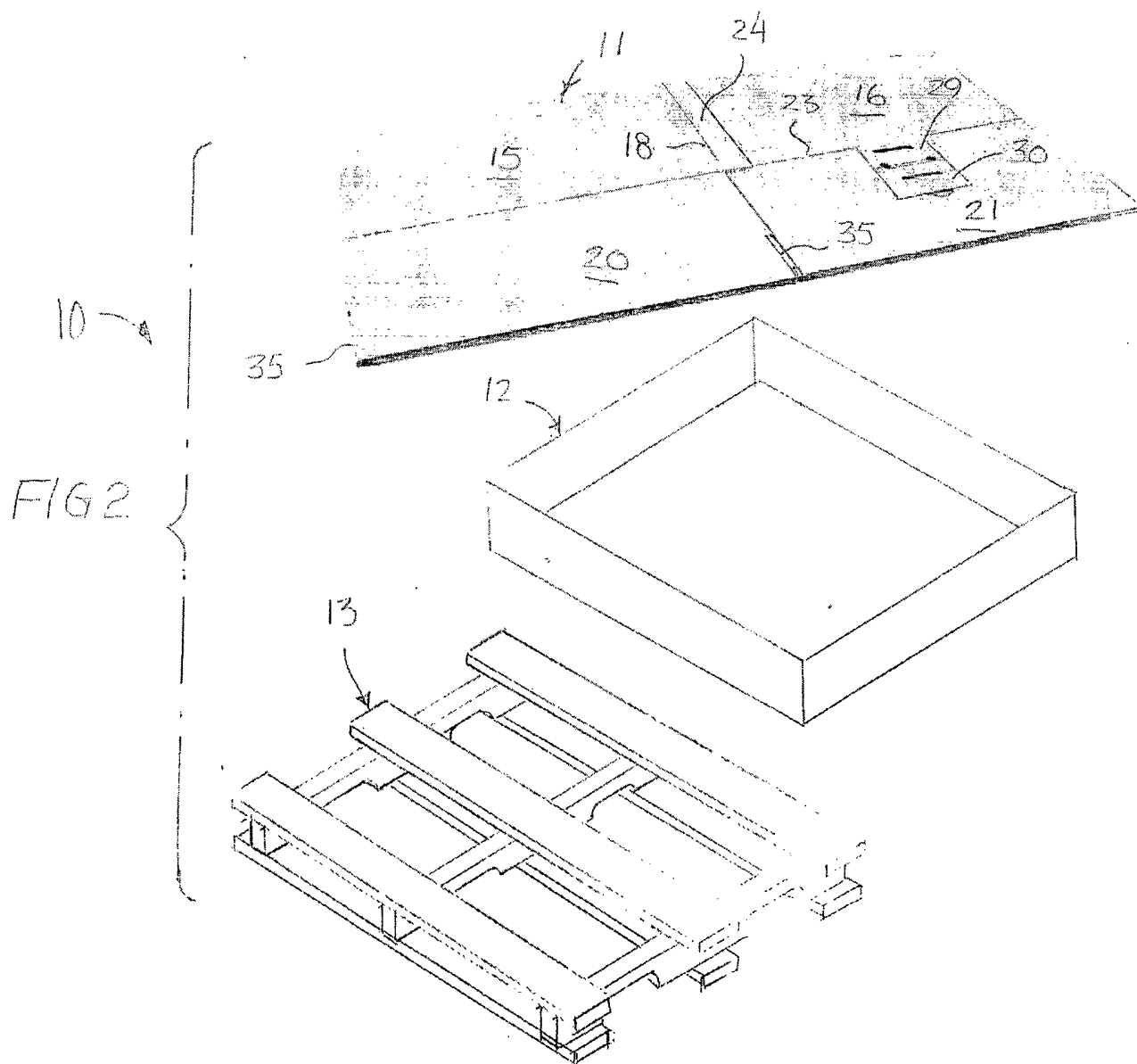
21. A generally rectangular, unitary blank of corrugated cardboard for making a bulk shipping box having means for releasably attaching the box to a pallet, said blank having opposite, parallel long edges and comprising:

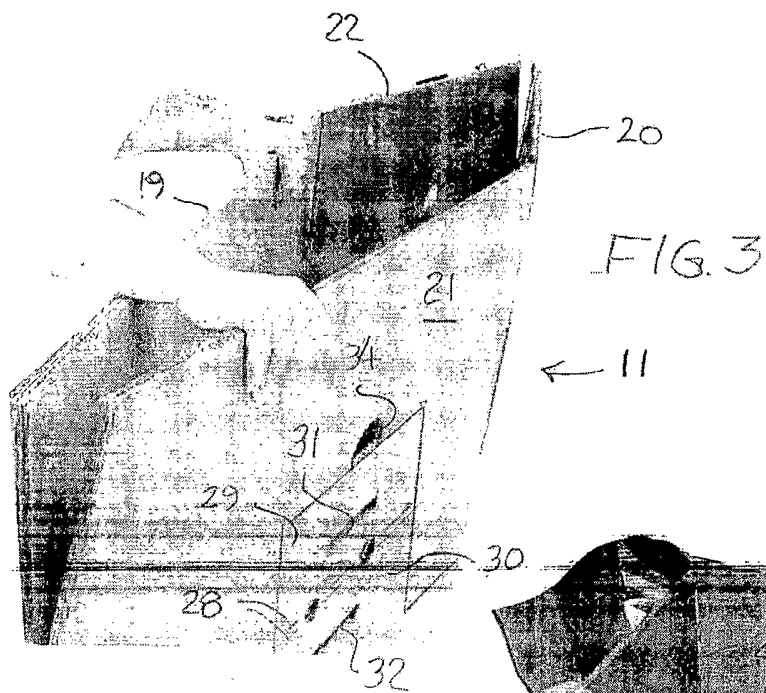
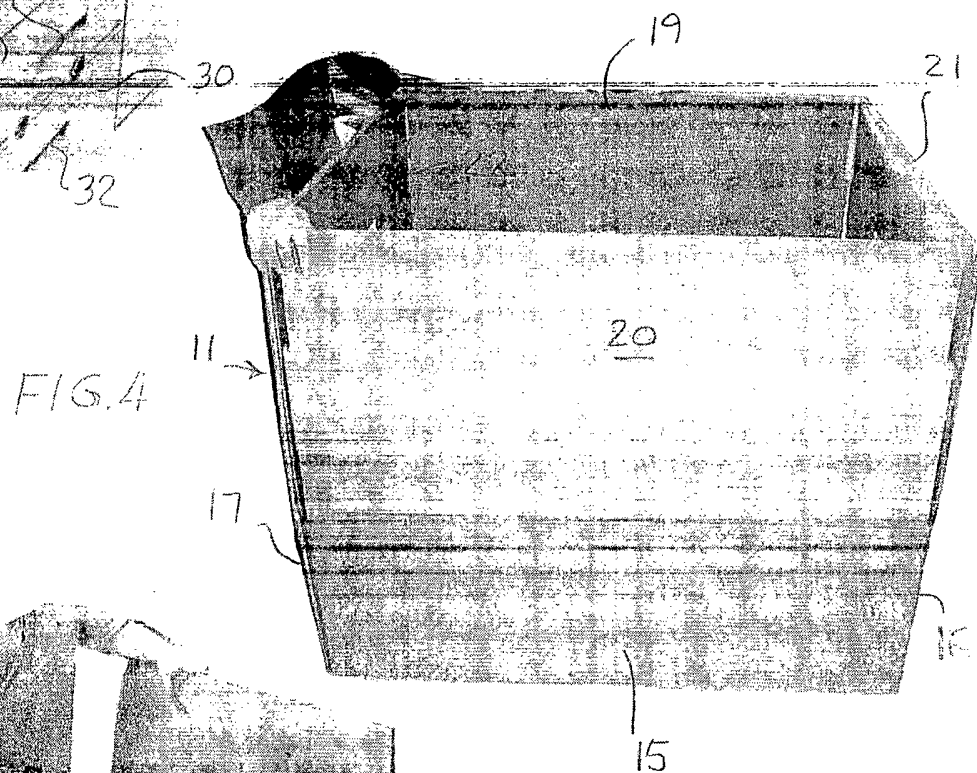
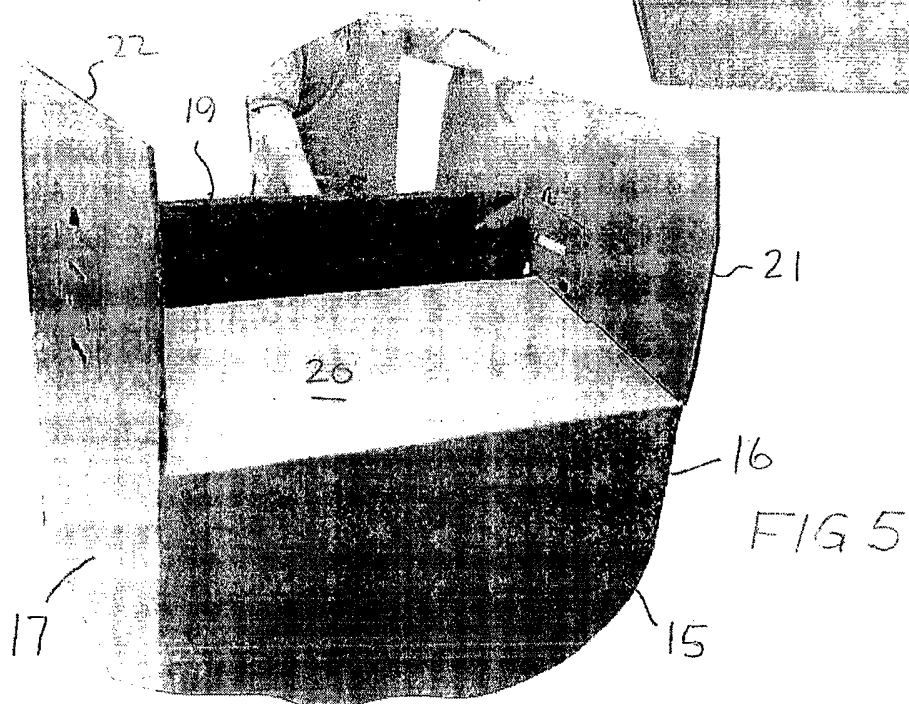
a plurality of wall panels connected together at adjacent edges by first fold lines
5 extending transversely of the blank;

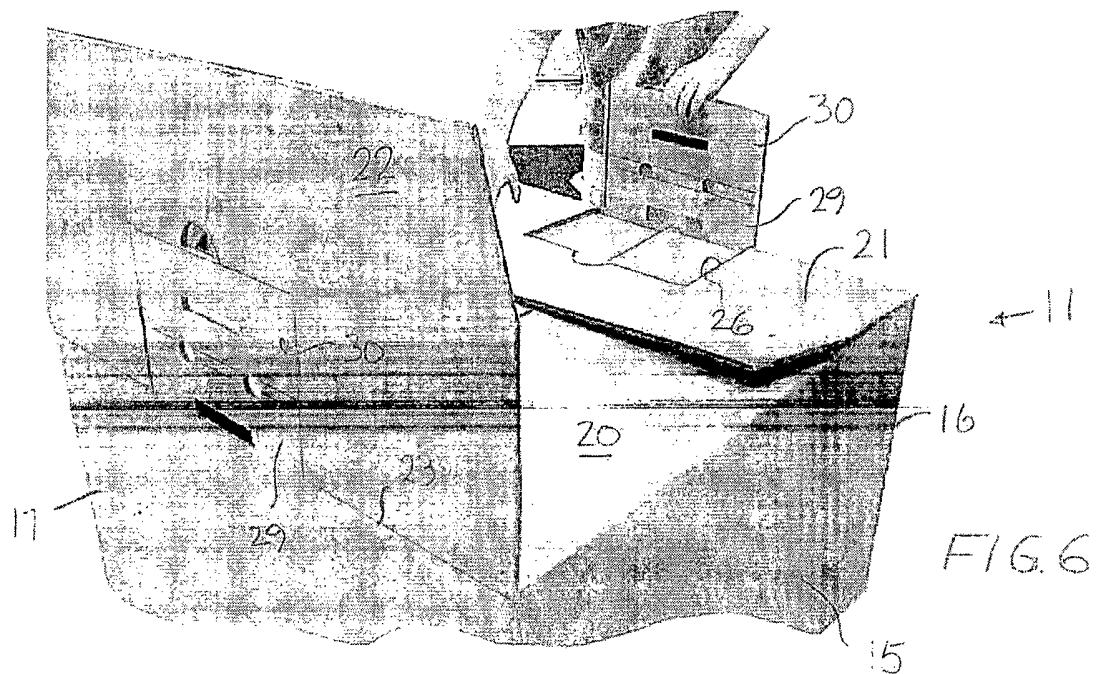
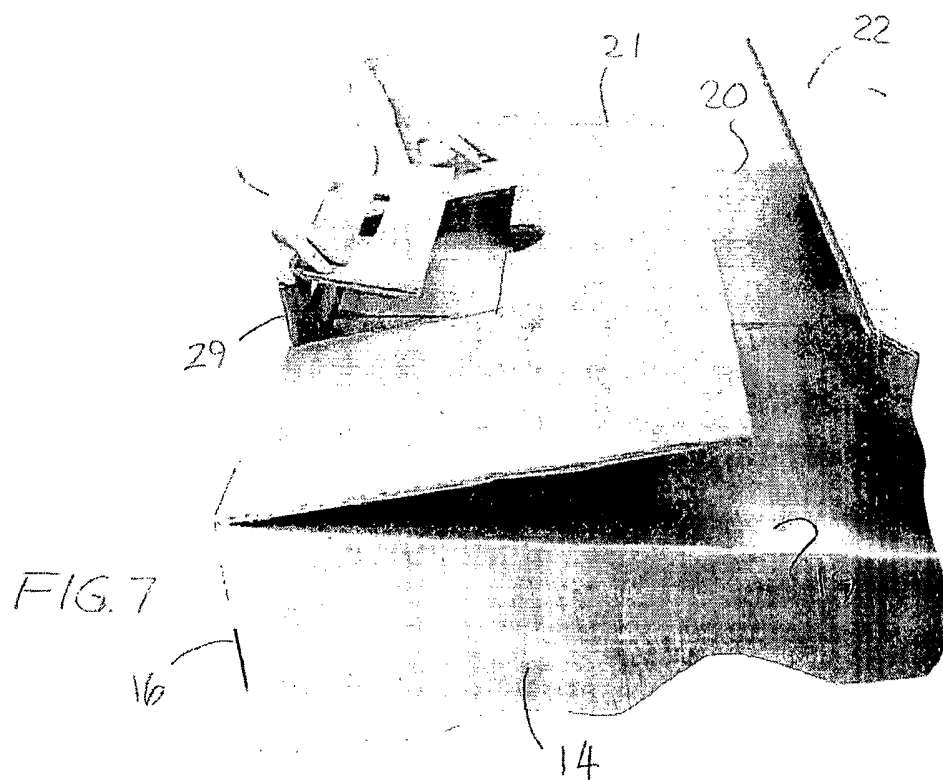
a flap panel foldably connected to an edge of at least some of said wall panels along a second fold line extending perpendicular to said first fold lines, said second fold line being interrupted over an area where two of said flap panels are joined to an associated wall panel, said two flap panels being in opposed relationship to one another in a box erected from said
10 blank, and said interrupted area being less than the width of said flaps; and

a series of cuts in said two flap panels, including two spaced apart cuts extending into said flaps from said second fold line, and a third cut extending between the ends of said two cuts remote from said second fold line, said interrupted area of said second fold line extending

between said two spaced apart cuts, said cuts and interrupted area defining an attaching tab
15 that projects downwardly from a wall panel in a box erected from said blank, and said
attaching tab having means for releasable attachment to a pallet.







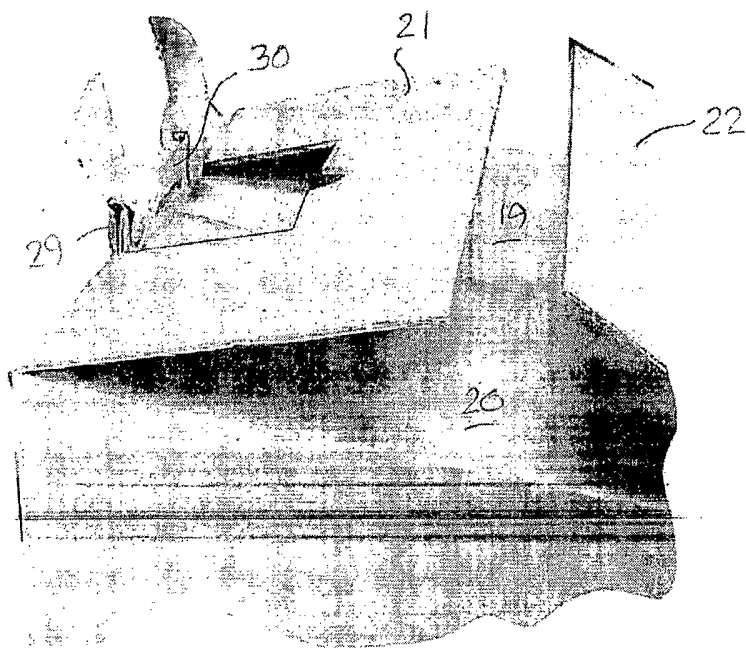
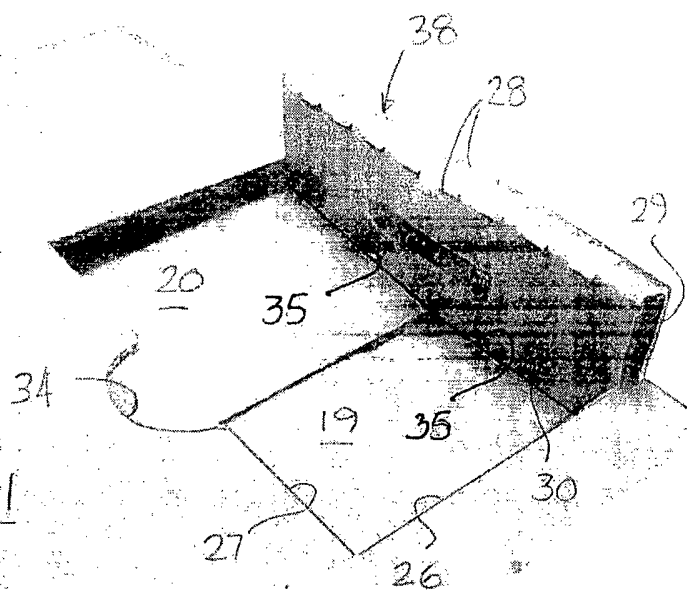
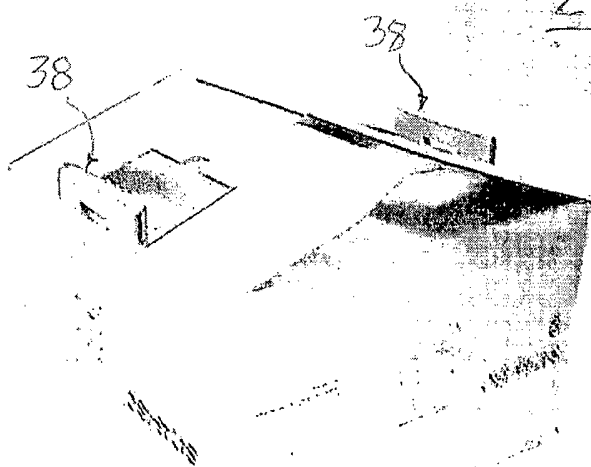


FIG. 8

FIG. 9



← II

FIG 10

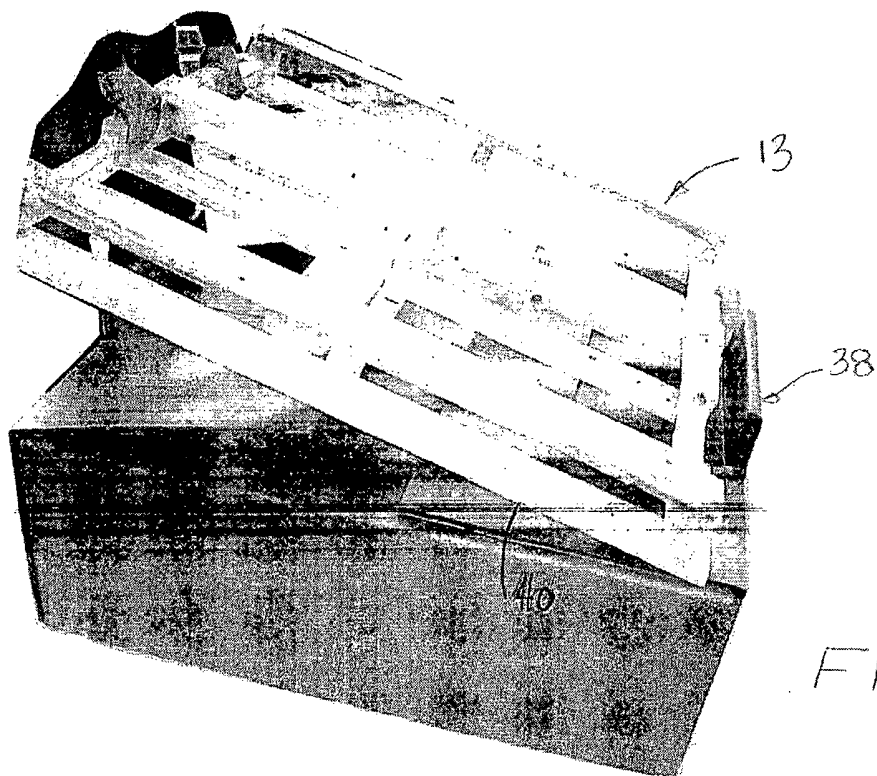
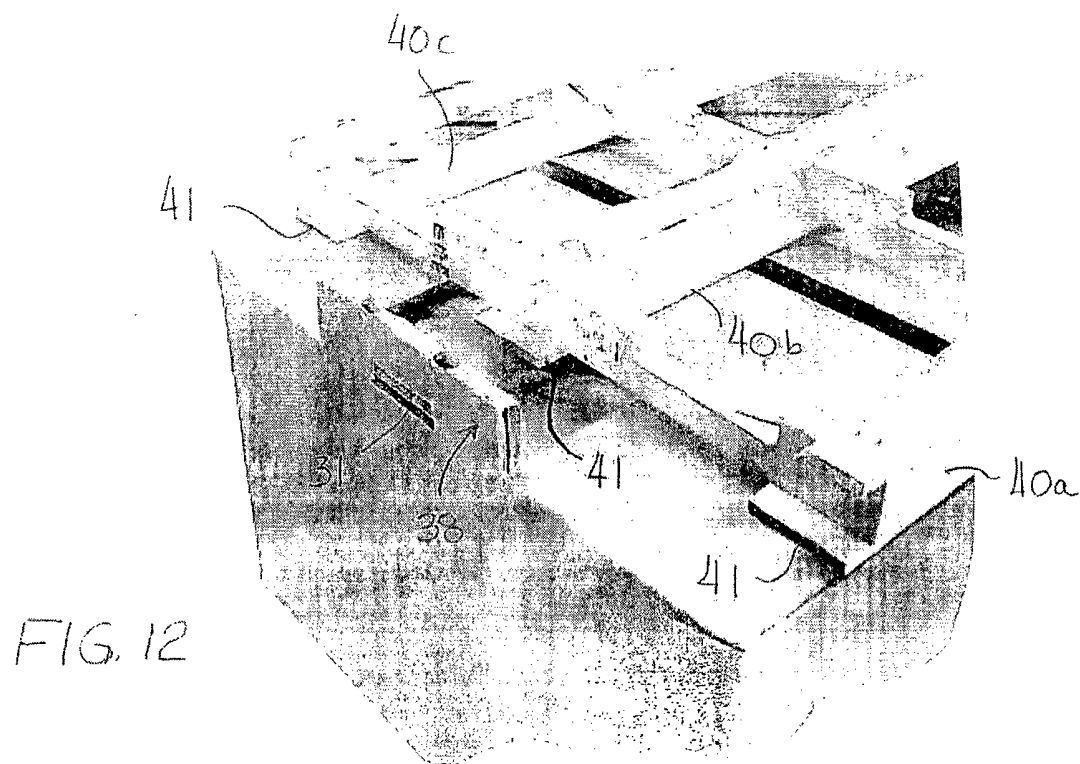


FIG. 13

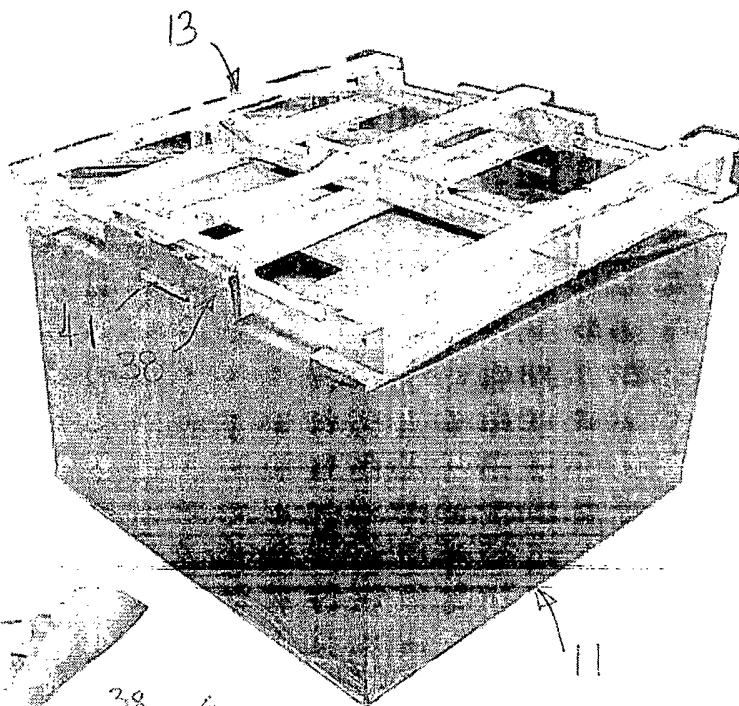


FIG. 14

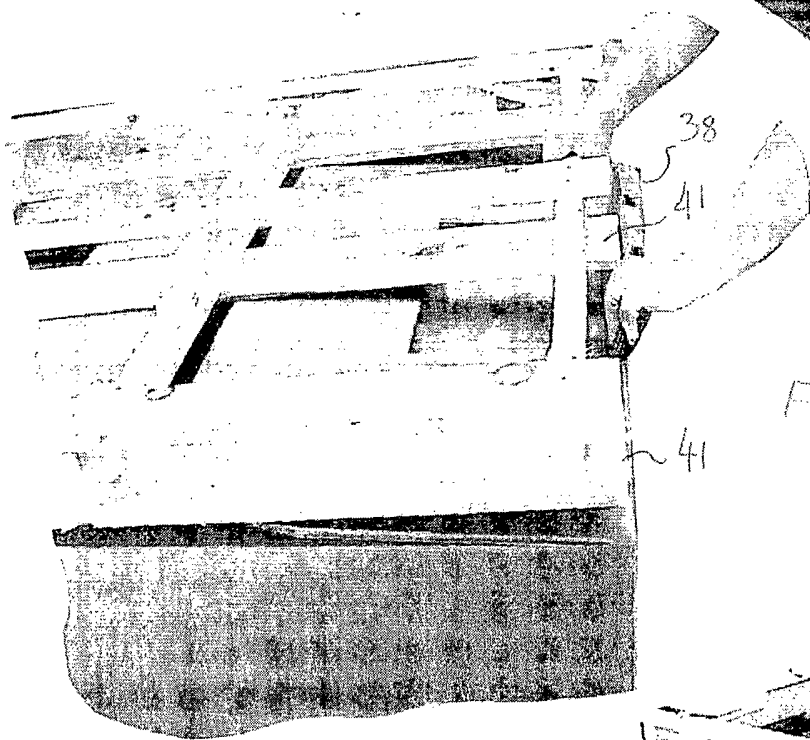
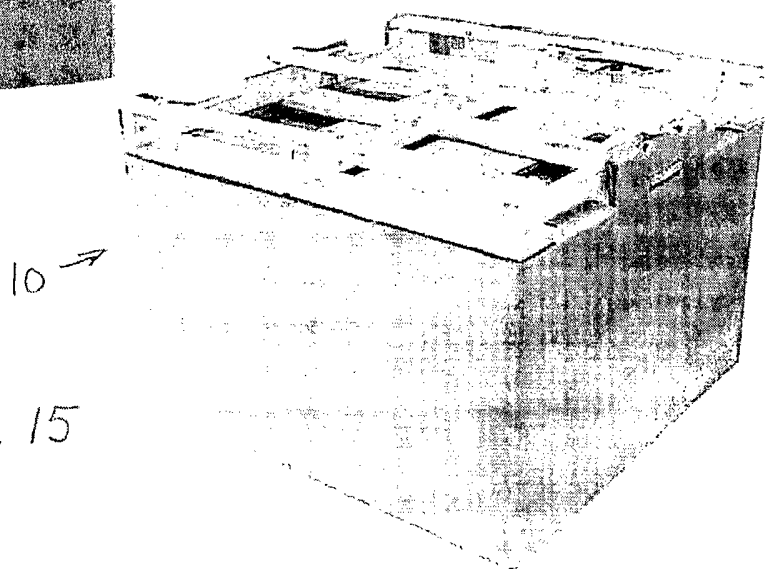
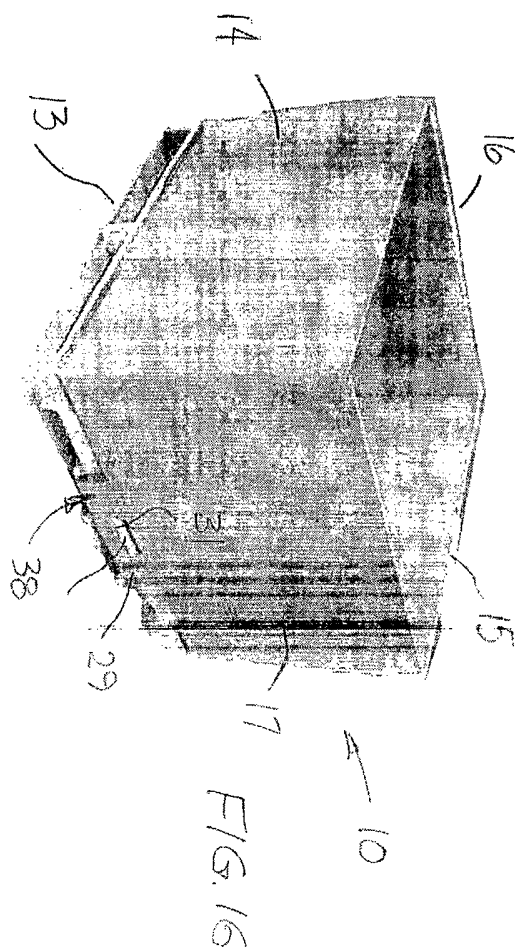
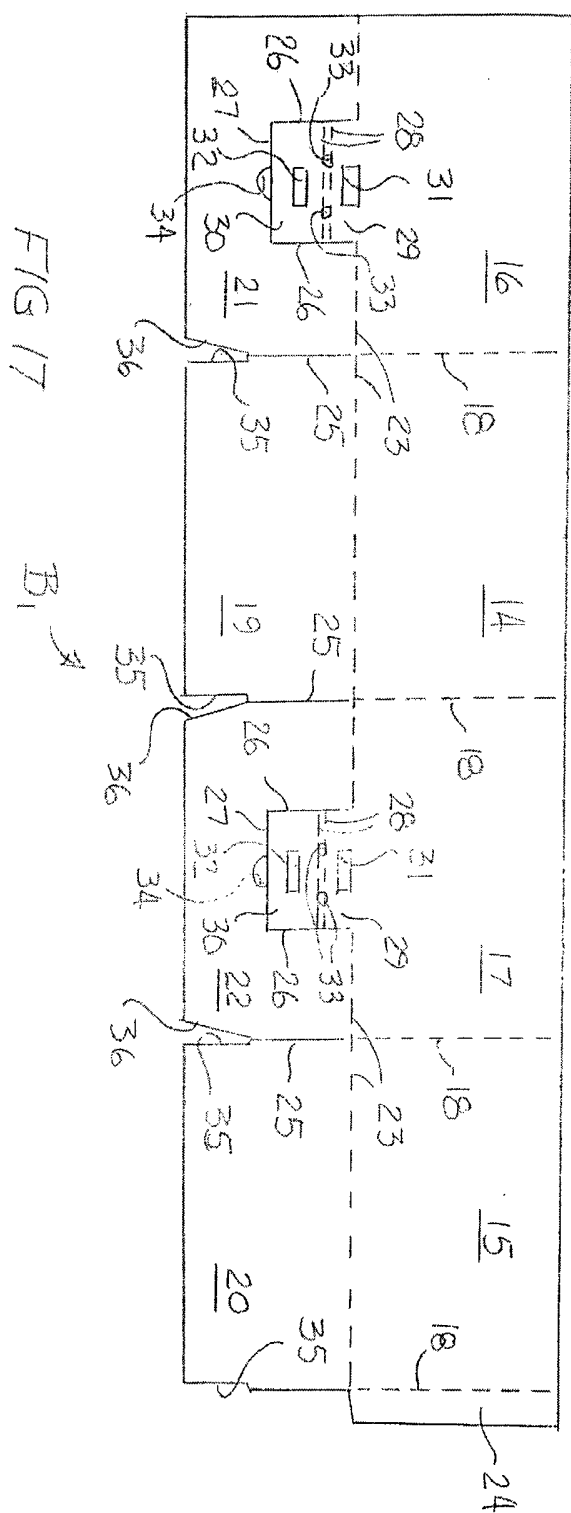
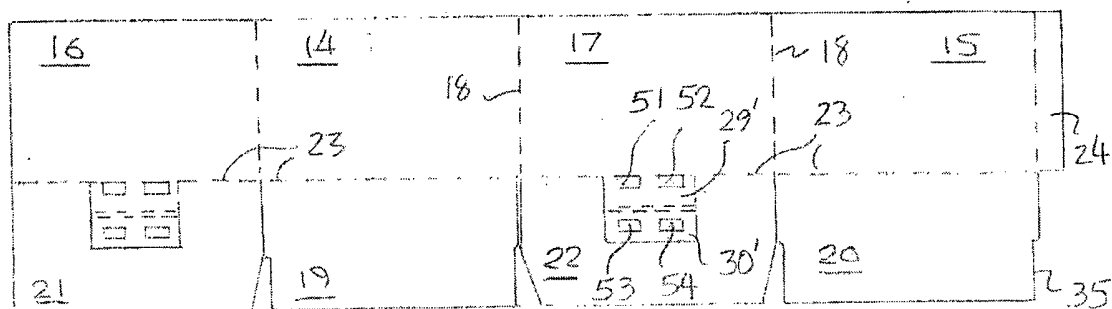


FIG. 15







B₂ →

FIG. 18

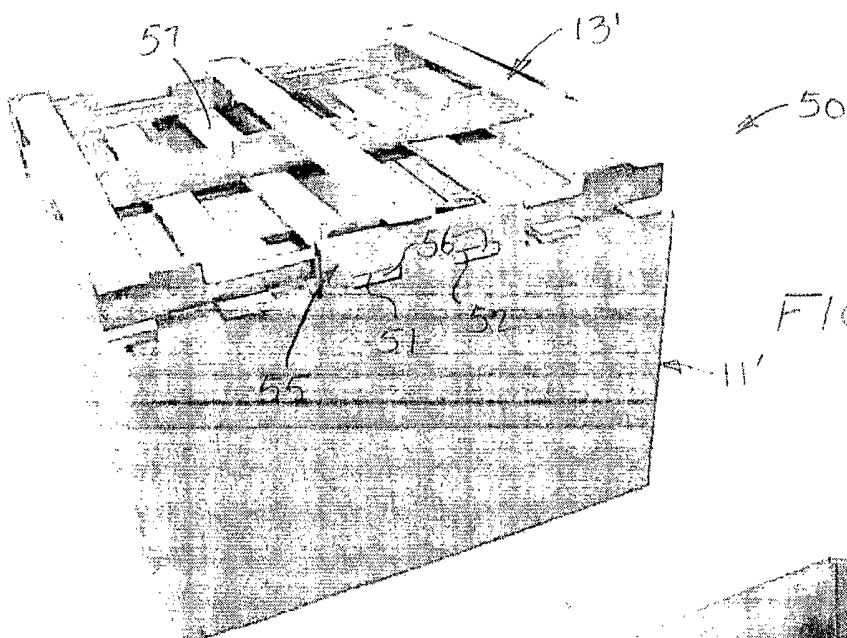


FIG. 19

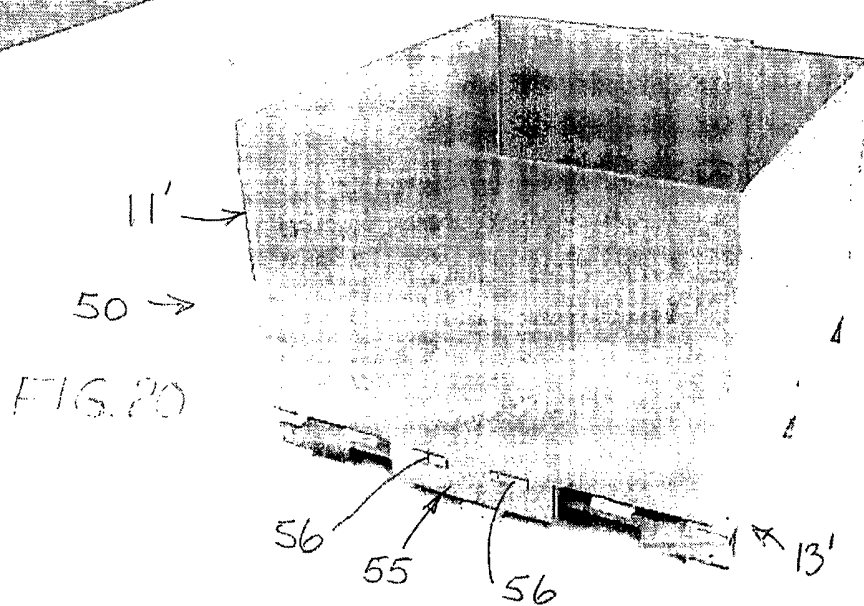


FIG. 20

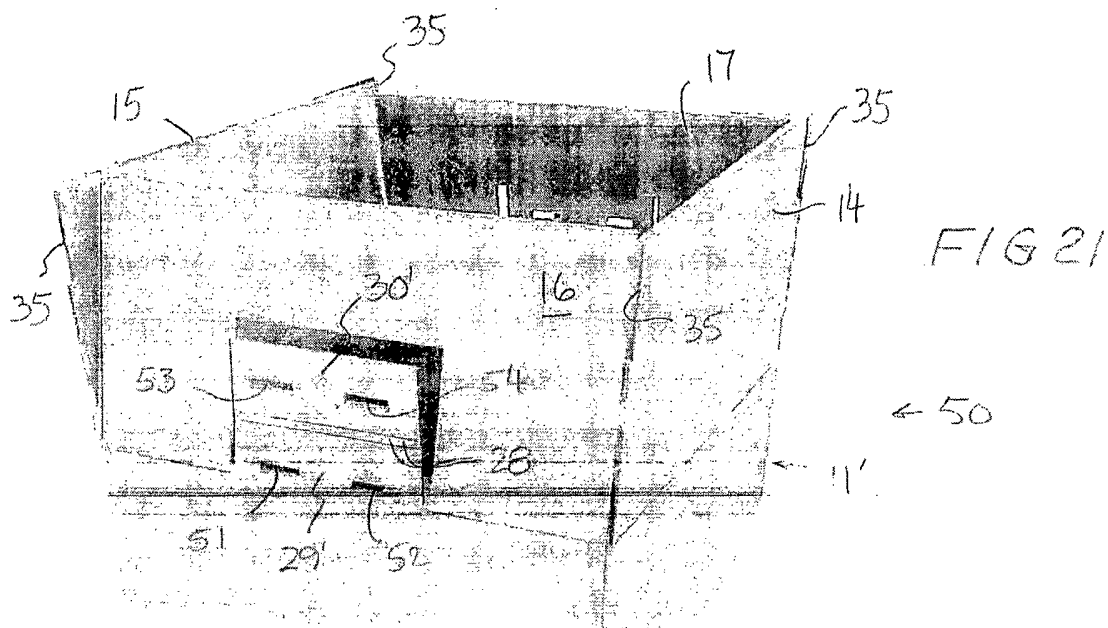
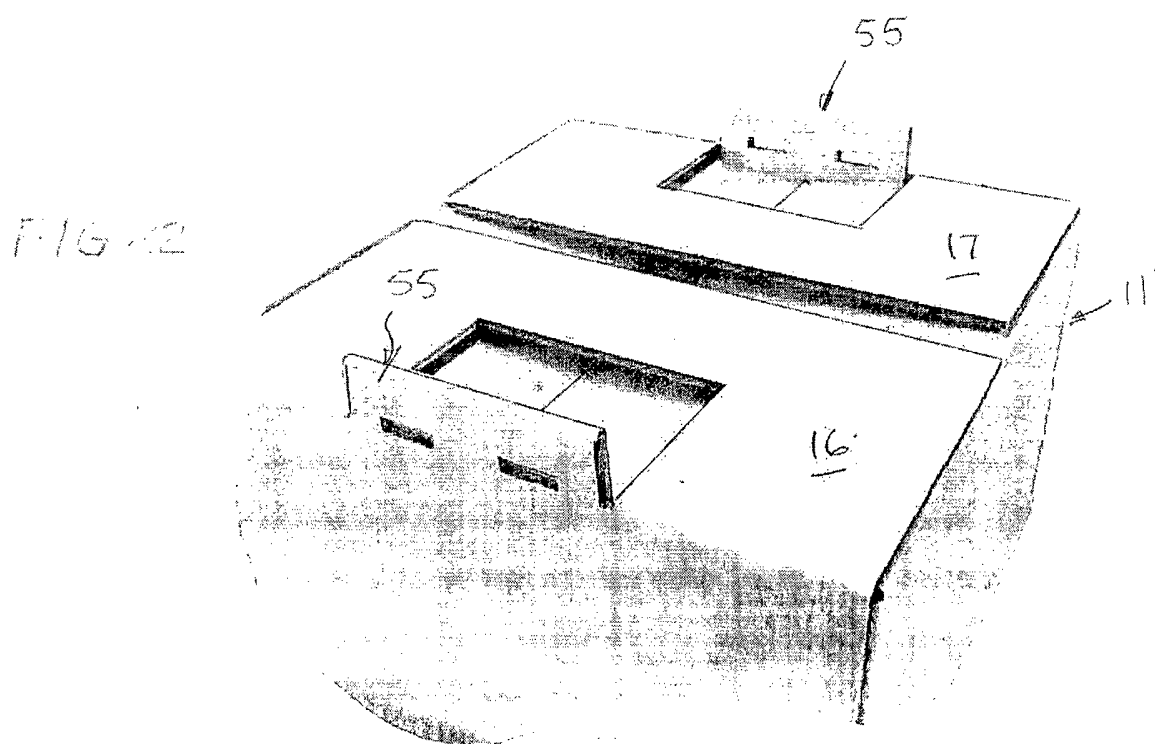
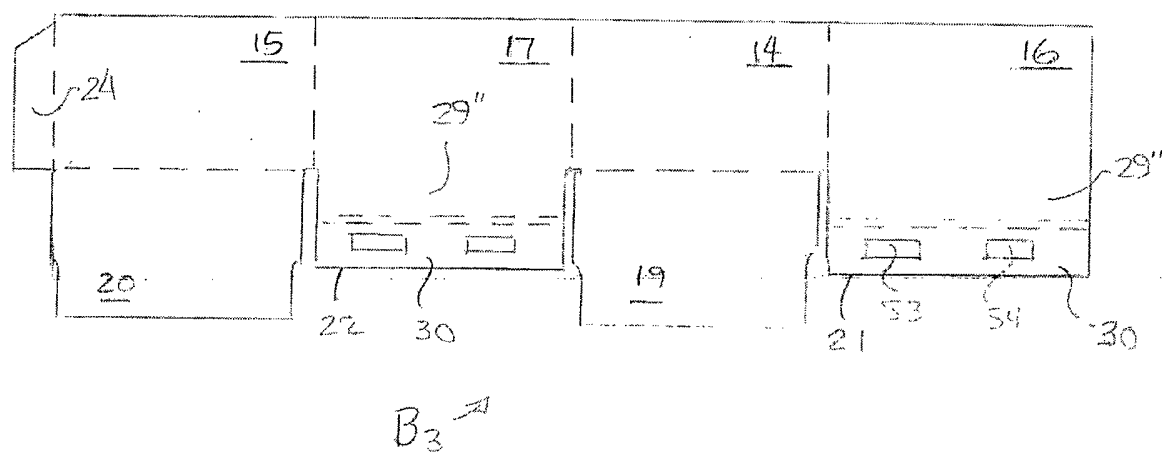
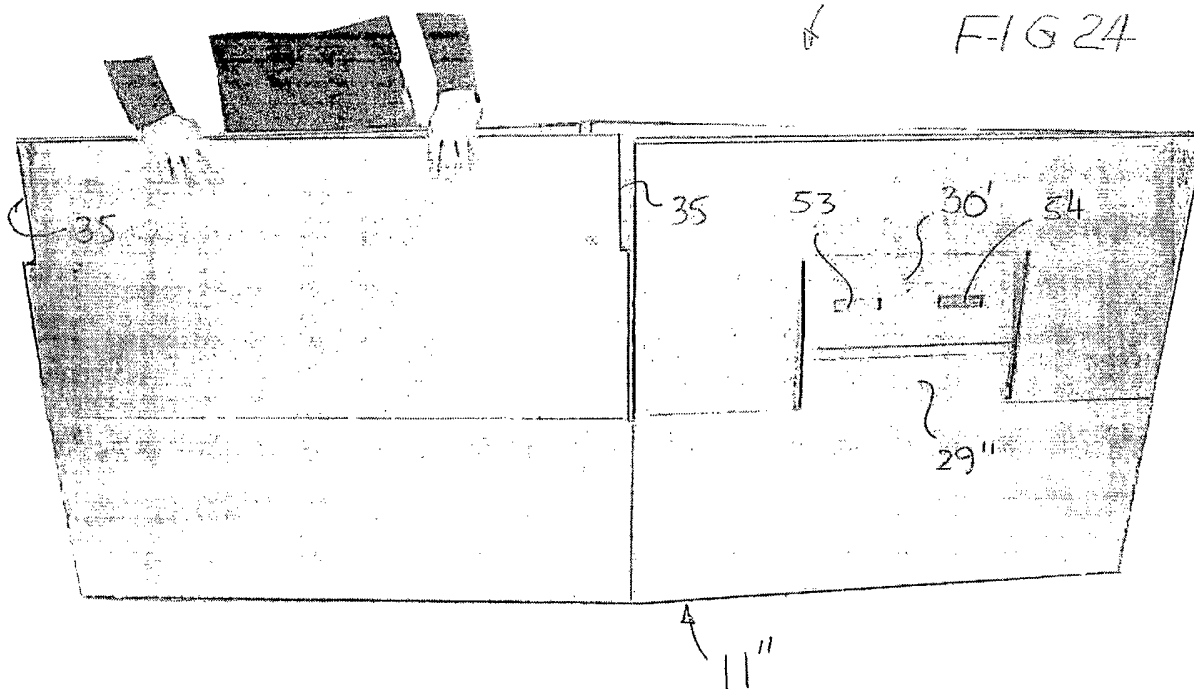


FIG. 23



60

FIG. 24



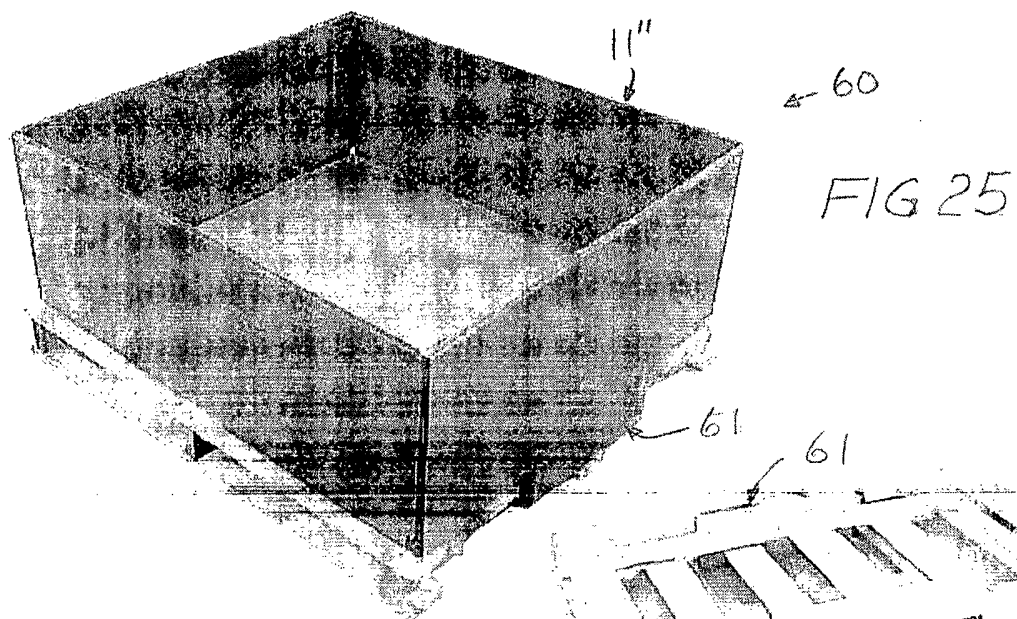
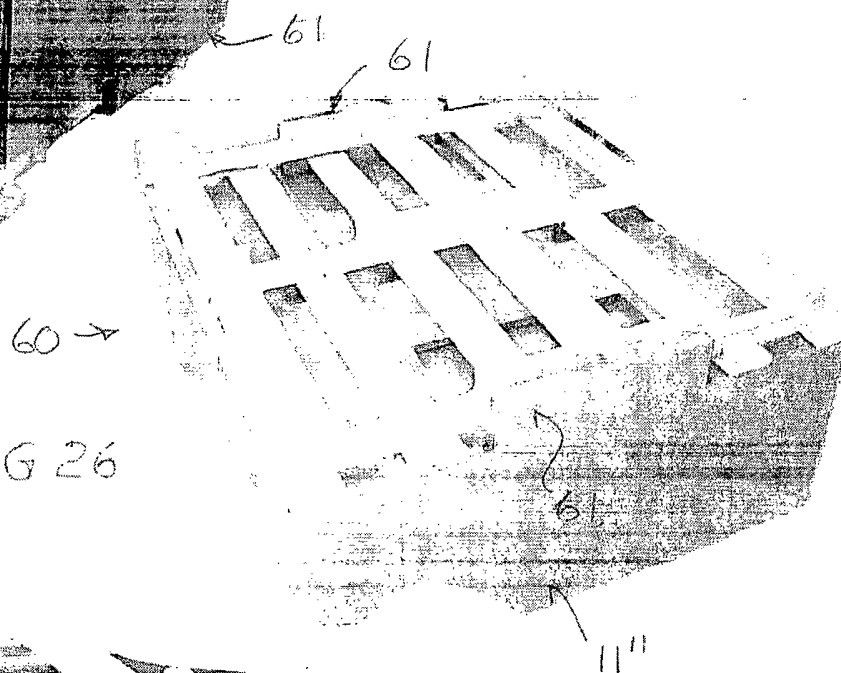
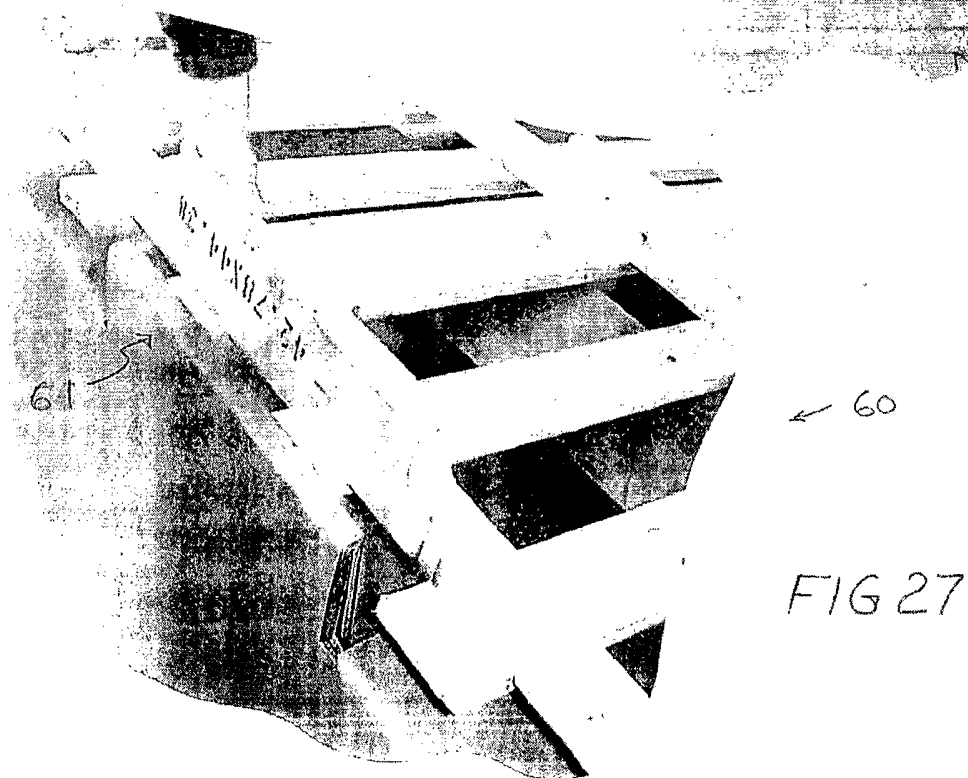


FIG 26



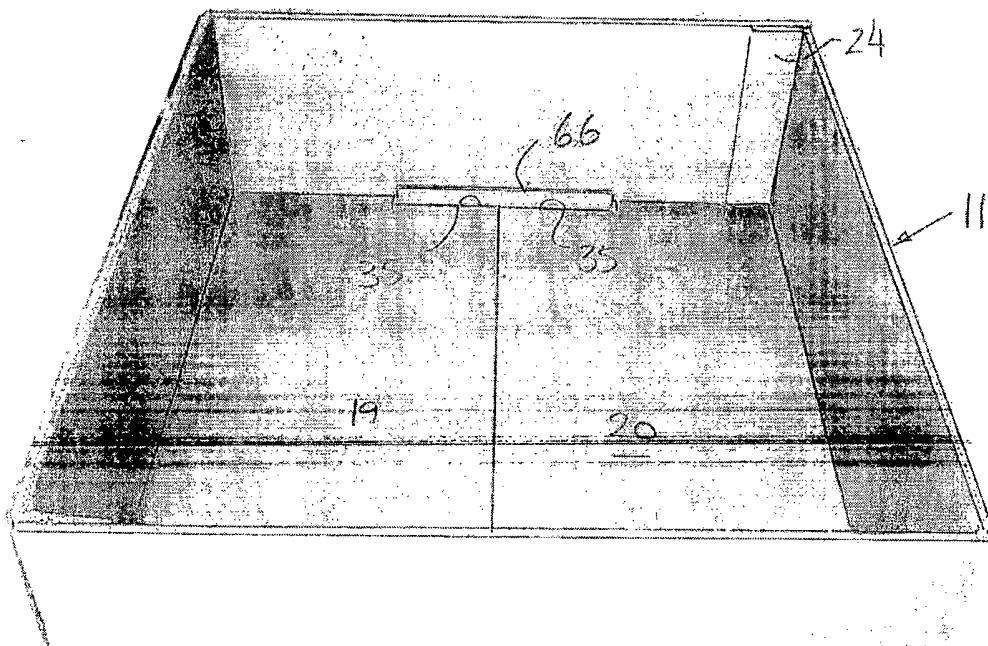
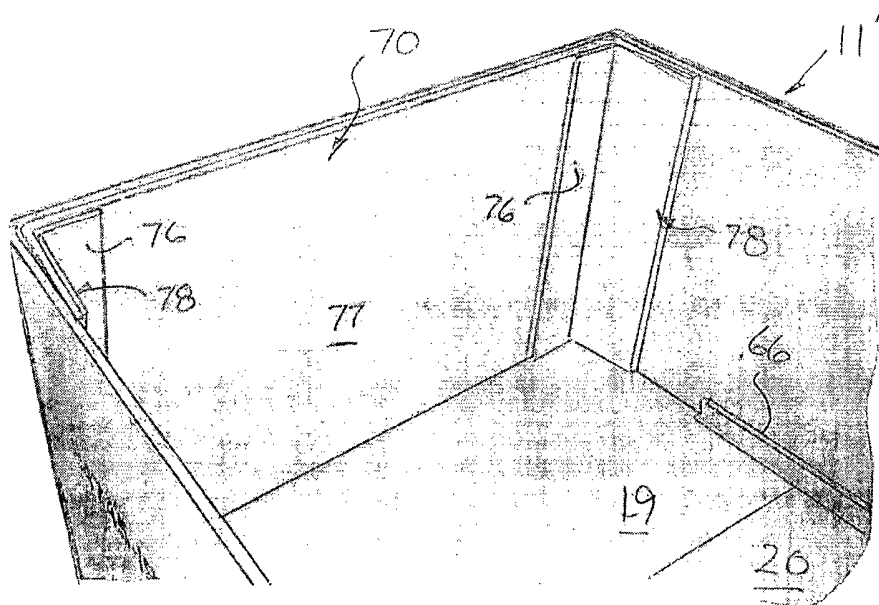


FIG 28



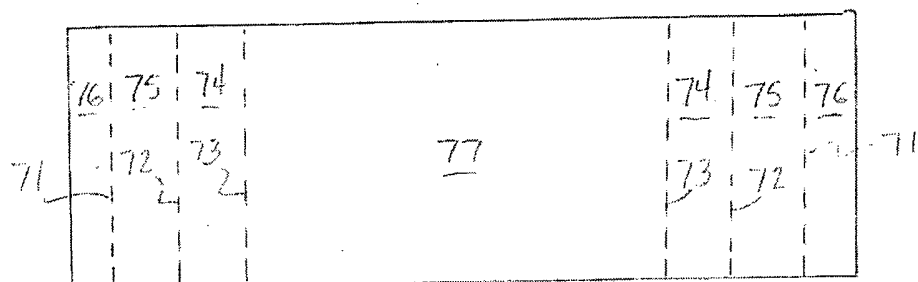


FIG. 30

B4 ↗

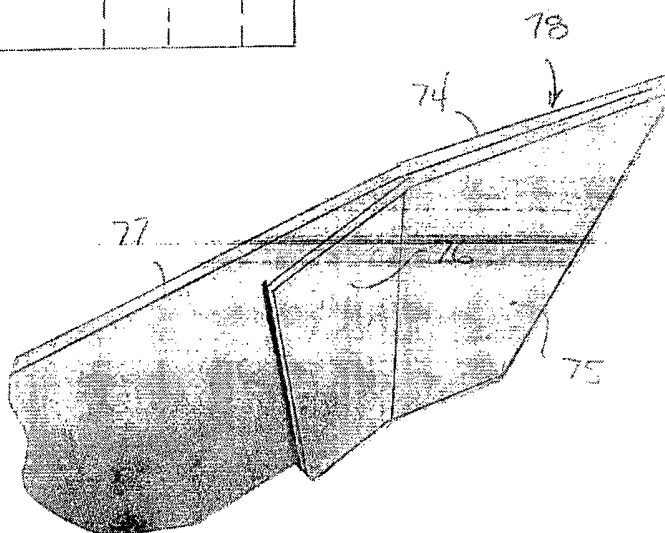


FIG. 31

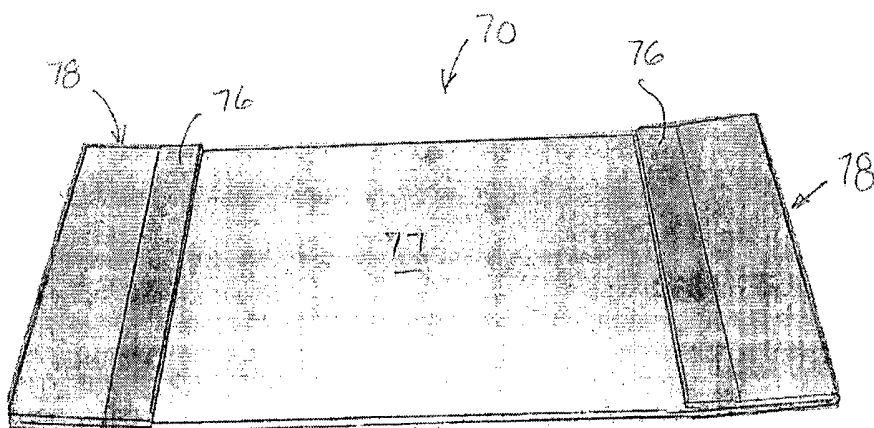


FIG. 32

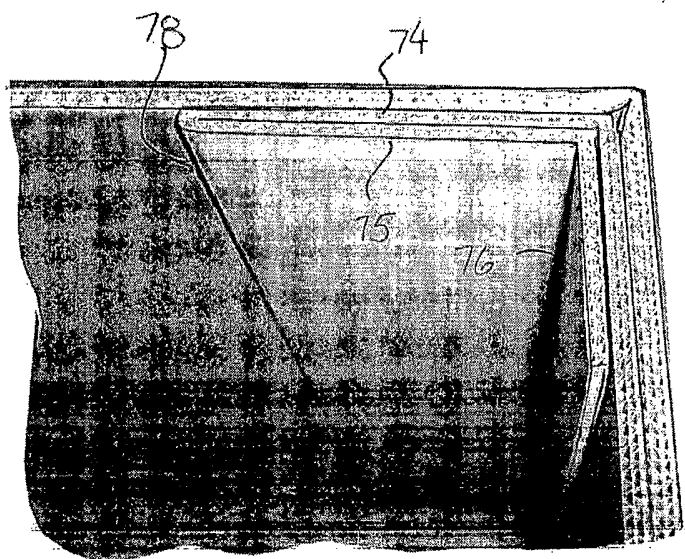


FIG 33

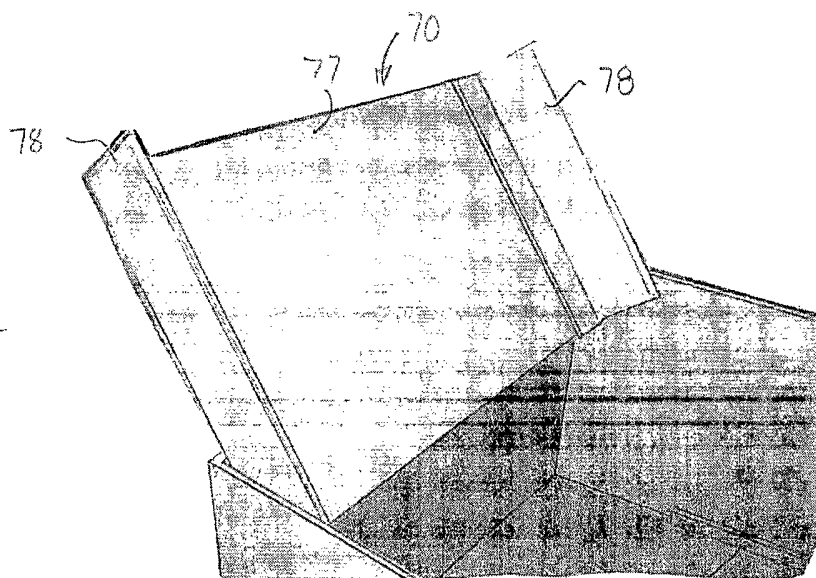


FIG 34

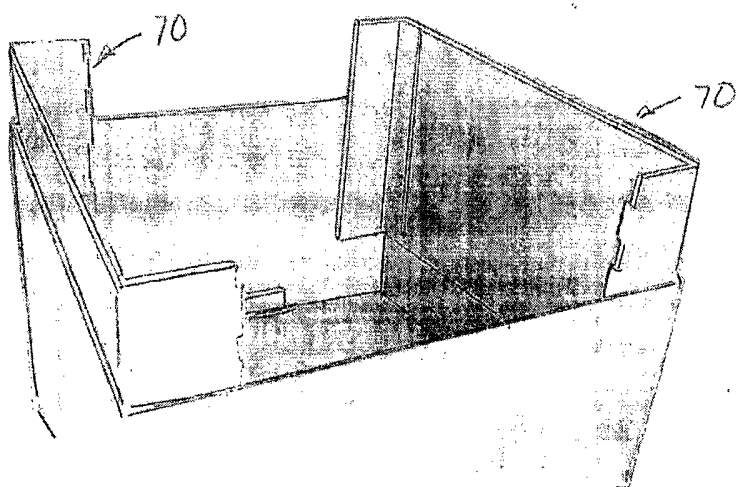


FIG 35