



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.03.2009 Bulletin 2009/12

(51) Int Cl.:
B65D 19/12 (2006.01) B65D 77/06 (2006.01)

(21) Application number: **08075958.2**

(22) Date of filing: **13.10.2006**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**
Designated Extension States:
AL BA HR MK RS

(30) Priority: **25.10.2005 AU 2005905889**
25.10.2005 AU 2005905888
04.10.2006 AU 2006905469

(62) Document number(s) of the earlier application(s) in
accordance with Art. 76 EPC:
06790378.1 / 1 945 523

(71) Applicant: **MACKENZIE, Noel Gordon**
Herston QLD 4006 (AU)

(72) Inventor: **MACKENZIE, Noel Gordon**
Herston QLD 4006 (AU)

(74) Representative: **Miller, James Lionel Woolverton**
et al
Kilburn & Strode,
20 Red Lion Street
London WC1R 4PJ (GB)

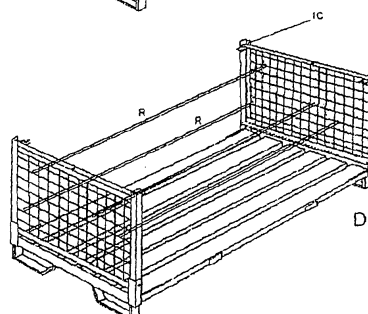
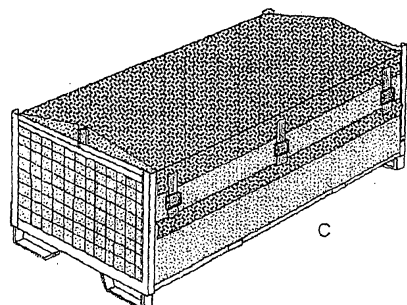
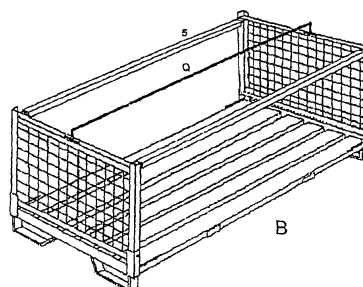
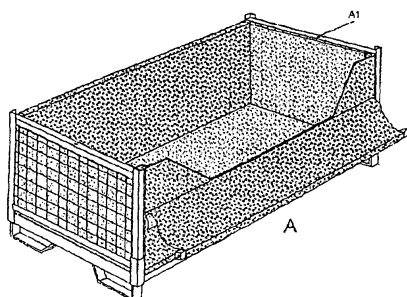
Remarks:

This application was filed on 19-12-2008 as a
divisional application to the application mentioned
under INID code 62.

(54) **Pallet with collapsible frame and bag**

(57) A pallet with hinged end walls (1), joined by detachable cross bars (5), may have a similar pallet stacked thereon. When the walls are collapsed, a superimposed identical pallet will have its U-shaped feet (4) (if made of metal) or the body of the pallet base (7) (if the latter is

made of timber) nested inside corners defined by corner stub angle posts (2). When the walls are erected, the stacked pallet nests within corners provided by the end wall framing. A bag (having an optional roof supported by ridge rod Q) may be supported by the walls of the pallet and stiffened by battens within sleeves in the bag.



Dwg. 3

Description

1. Field of the Invention.

[0001] This invention relates generally to collapsible pallets, frames and other devices designed to provide purpose made fitted bags with the structural integrity and the handling and transport efficiency necessary to perform as general purpose containers for the carriage and storage of a wide range of agricultural produce, goods, liquids and other merchandise.

Description of Related Art

[0002] Bags are generally recognised as man's most popular and ancient form of container and in recent years bags have enjoyed renewed usage in the form of Intermediate Bulk Containers popularly known as IBCs and also Flexible Intermediate Bulk Containers more popularly known as FIBCs.

[0003] IBCs are frequently mounted on a pallet base and some have bellows style ribbing inside a vertical frame or other supporting mechanisms.

[0004] However most IBCs are rigid and made of non-flexible material such as metal or plastic and are designed for storing liquids and viscous products.

[0005] FIBCs are a similar pallet size but are most frequently used without a pallet base and are typically lifted and handled by forklifts which engage lifting loops on the tops of the bags.

[0006] FIBCs are mostly used for the storage and transport of what are called dry and flowable products such as pellets, powders and granules, another popular use is for the transport of hard agricultural produce such as potatoes.

[0007] Typical illustrations of this type of bag usage can be seen in US Patent Numbers 6,974,783; 6,935,500, 5,884,794 and 6,932,266.

[0008] As can be seen from inspecting the above and numerous others listed under the same and similar categories all of these inventions are narrowly and specifically designed to handle what is generally called bulk product as described above as dry and flowable product in an unsupported bag format.

[0009] It will also be seen that none of these products are designed to use the bag as a multipurpose, high utility, general purpose, transport, storage and handling system.

[0010] Other types of hard collapsible containers made from materials such as metal, mesh or ply have disadvantages including high cost, excessive weight, lack of ventilation, hard surfaces that are prone to damage fragile contents, lack of effective rain protection, security or privacy closure, become excessively hot in sunlight, are prone to water damage and are difficult to clean or restore.

Objects of the Invention

[0011] It is an object of the present invention to provide a comprehensive size range of collapsible bag container products to service the widest possible range of agricultural produce, goods and merchandise.

[0012] Another object of the present invention is to provide a range of collapsible bag containers that will function as a returnable packaging system in lieu of existing "hard" containers including metal, mesh, ply or timber products.

[0013] A further object of the present invention is to provide a collapsible container that will function as a returnable packaging system.

15 [0014] Another object of the present invention is to provide a collapsible bag container assembly that can be fitted to existing or purpose made timber pallets.

[0015] Another object of the present invention is to provide a collapsible bag container that makes the most cost efficient use of metal, timber and fabrics to produce a more cost effective container than conventional collapsible containers traditionally manufactured from sheet metal, mesh or ply materials.

20 [0016] Another object of the present invention is to provide a collapsible bag container that when manufactured from metal will provide four way access for the tynes of forklifts and other lifting devices in both collapsed and erected formats.

25 [0017] Another object of the present invention is to provide a collapsible bag container that achieves the optimum levels of safety in handling and transport operations.

30 [0018] A further object of the present invention is to provide a collapsible bag container that securely and safely interlocks when self stacked in the collapsed or erected format.

35 [0019] Yet another object of the present invention is to provide a collapsible bag container where the bag element may be rapidly installed and or removed.

40 [0020] Another object of the present invention is to provide a collapsible bag container where the bag element remains securely fixed when the container is inverted for discharge purposes.

45 [0021] Another object of the present invention is to provide a collapsible bag container that offers a range of fabrics for the bag element that may include plain, ventilated, mesh or insulated fabrics.

[0022] A further object of the present invention is to provide a collapsible bag container that provides an optional self draining fabric attachable tonneau cover/closure that will provide rain protection and afford load/content privacy and security.

50 [0023] Yet another object of the present invention is to provide a collapsible bag container and optional self draining attachable tonneau cover that may be manufactured from a range of fabrics including insulated fabrics.

55 [0024] Another object of the present invention is to provide a collapsible bag container that may be readily con-

verted to provide mobility options.

[0025] A further object of the present invention is to provide a collapsible bag container that is readily fitted with other lifting points designed to provide a wider range of container applications and options.

[0026] Yet another object of the present invention is to provide a collapsible bag container with access options that for loading or unloading purposes allow a person to easily step inside the container.

[0027] A further object of the present invention is to provide a collapsible bag container that provides softer floor and wall options for the protection of easily damaged agricultural produce and other fragile goods and merchandise.

[0028] Another object of the present invention is to provide a collapsible bag container whose sizes and dimensions are compatible with the internal dimensions of standard shipping containers.

Summary of the Invention

[0029] According to the present invention a collapsible bag container comprises a rectangular base, two end walls hinged to the shorter sides of the base and two removable bars extending between opposite upper corners of the end walls to form a fixed rectangular frame with the upper edges of the end walls so that when the bars are removed the end walls fold down onto the base.

[0030] Preferably the bars are adapted to drop into mating slots at the corners of the end walls.

Preferably the container has a bag inside it which is supported by the end walls and the bars.

Preferably the base is a metal frame and the end walls are pin hinged to stub posts at the corners.

Alternatively the base is a pallet and the end walls are hinged to the pallet.

Preferably the end walls are higher than half the length of the base and are hinged to allow one wall to fold directly onto the base and the other to fold on top of the other wall. Alternatively the end walls are lower than half the length of the base and are hinged to both fold down directly onto the base.

Preferably the bag has sleeves to receive the bars.

Preferably the bottom of the bag is secured to the base.

Preferably the bag has two or more sleeves to receive reinforcing battens.

Preferably the bag wall has a cutaway hatch allowing entry into the container said hatch being resealed by a covering flap.

Preferably the bag folds down flat on the base when the supporting rods are removed and the ends fold down on top of the bag.

Preferably the removed bars are stowed in the base.

Preferably the base has feet which facilitate vertical stacking of two or more collapsed containers.

Brief Description of the Drawings

[0031] Dwg 1 shows a variety of plan, elevation, sectional and detailed component views of the preferred embodiment in metal pallet base format.

[0032] Dwg 2 shows a variety of plan, elevation, sectional and component views of the preferred embodiment in metal pallet base format are shown where an isometric view of a bag and cover component are included. Other views illustrate the bag attached in the collapsed and erected format. Other views show the relationship of stacked units in the erected and collapsed format.

[0033] Dwg 3 show isometric views of the preferred embodiment in a metal pallet base format with bag and cover / closure attached and the relationship of other support members attached where for purposes of clarity the bag component are not shown.

[0034] Dwg 4 shows a variety of plan, elevation, sectional views of the preferred embodiment in a timber pallet base format with other views of the stacking relationship in the erected and collapsed format.

[0035] Dwg 5 shows a variety of plan, elevation, sectional and detailed component views of the preferred embodiment in timber pallet base format and the relationship of hinge and attachment systems

Detailed Description of the Drawings.

[0036] Dwg 1 details the various components where 1 illustrates the fold down side/end frames, 1A illustrates metal tabs that support the drop bars 5, 1B illustrates the hole that engages pins 5A of drop bars 5, 1C indicates the captive repository corner that capture and supports U-shape feet 4 when stacked above, 1D illustrates the mesh infill of fold down side/end frames 1, 1E are hooks to engage bag eyelets 10E and support a bag in the drop front format, 2 are the angle stub posts that support the hinge down frames 1, and provide the hinge point 6, 2A are nesting cleats designed to support upper stacked pallets when one fold down end frame overlaps another as illustrated in View H, 3 is the angle section that forms the ends of the pallet base, 3A illustrates the void storage space created between the ends of pallet deck sections 7 and the vertical flange of end angle sections 3, 4 are strap metal feet with a generally vertical outer leg designed to engage repository space 1C when one pallet is stacked upon another, 5 are the square tube drop bars designed to fit into bag sleeves 10C and engage upon support tabs 1A, 5A are the internal pins designed to engage tab holes 1B, 6 are hinge pin/bolts connecting stub posts and hinge down side frames 1, 7 are pallet deck members fixed at the ends to end angle sections 3, 7A illustrates the space between deck members 7 that may be used for the stowage of other loose members such as drop bars 5, bag battens (not illustrated) or ridge support member Q, 8 are tyne bearer wear and impact pads, 9 are bag fixing pins fixed to end angles 3 and designed to engage bag sleeves 10A, 10 illustrates one

form of a drop front bag incorporating sleeves 10A designed to engage bag pins 9, 10B designed to engage stiffening battens (not shown) 10C designed to engage drop bars 5, 10D illustrates one form of drop front bag where the fold down apron is used to close and open cut away area behind, 10E is an eyelet designed to hang on bag hook 1E and support the corner of the bag when in drop front format.

[0037] In DWG 3, A shows an isometric view an erect pallet frame assembly with a drop front bag attached in the open format, A1 shows a hole in the middle top of fold down end frames 1, B shows an isometric view of an erect pallet frame assembly illustrating the relationship of drop bars 5 and ridge support member Q, C shows an isometric view of an erect pallet frame and bag assembly with an optional cover in place with the centre supported by ridge member Q and secured with belts NC fixed to buckles F1, D shows an isometric view of an erect frame assembly with space dividers R attached to mesh ends 1D, and the relationship of drop bar support tabs 1C in each corner attached to fold down end frames 1.

[0038] In DWG 2, E shows an end view of an erect pallet and bag assembly, F shows a front view of an erect pallet and bag assembly with support batten in situ and illustrating the relationship of cover buckles F1, G shows an end view of a collapsed pallet frame assembly, H1 shows a front view of a collapsed pallet frame and bag assembly where in a narrower format, one side folds down upon another providing an uneven landing surface for stacking requiring additional nesting cleats 2A, I illustrates on form of bag with a drop front, J shows an end view of erected and stacked pallet frame and bag assemblies illustrating how U-shape strap feet 4 engage inside repository/nesting corner 1C, K shows a front view of erected and stacked pallet frame and bag assemblies illustrating how U-shape strap feet 4 engage inside repository/nesting corner 1C, L shows a front collapsed and stacked view of pallet and bag assemblies where one side folds down upon another providing an uneven landing surface for stacking requiring additional nesting cleats 2A, M shows an end collapsed and stacked view of pallet frame assemblies illustrating how U-shape strap feet 4 engage inside repository/nesting corners 1C, N illustrates on form of cover/closure showing cutout ends NA to accommodate drop bars 5, and cutout NB to accommodate centre ridge support Q, and showing tie down straps NC that are secured by buckles F1, Q shows one form of ridge support that engages in support holes A1 and supports cover/closure N, R shows one form of space divider where hooks at each end engage at random locations on mesh end infills 1D,

In DWG 1, O shows an end view of an erect pallet frame assembly, P shows a front view of a pallet frame assembly.

[0039] Dwgs 4 & 5 show illustrations of how with the deletion of metal pallet deck members and strap feet members the remaining fold down side/end frames can be adapted and fixed to a new or existing timber pallet

to perform the same or similar tasks and functions as the all steel option described above and an illustration of the slotted and sliding hinge arrangement that is required on both steel and timber pallet bases in a format where one fold down side/end frame overlaps the opposite end/side frame.

In these drawings of the timber pallet option of the technology, where appropriate the same numbers are used to identify the same or similar components as the all steel option, where in DWG 5, 1 illustrates the fold down side/end frame with attached 1A metal channel infills in lieu of metal mesh, 2 illustrates the stub angle corner posts fixed to end angle members 3, 2A are nesting cleats fixed to 2 designed to support an above stacked pallet when one side/end frame overlaps the opposite side end frame when in the collapsed position, 2B is the slotted hinge hole in 2 which allows one fold down side/end frame to overlap the opposite side end frame when in the collapsed position, 2C is the locking hole at the top of 2 designed to engage locking pin 2D when in the open and erect position. 2D is the locking pin attached to 1 designed to engage locking slot 2C and used to hold the fold down side/end in an erect and open position, 3 illustrates end angle section which provides a fixing point for bag fixing pins 9, stub posts 2 and slotted fixing cleats 7, 5 is the bag support and drop bar designed to engage the sleeves in the top front and back of the bags, 6 are the fixing hinge pin/bolt connections attaching the fold down side end frames to the fixed base, 7 illustrates a slotted fixing cleat attached to side/end angle member 3, 7B shows a bolt and nut fixing that penetrates 7 and engages clamp plate 7A to provide a mechanical clamping action on the pallet decking, 7A is clamp fixing plate described above, 9 are bag fixing pins designed to engage sleeves 10A in bottom front and back of the bag component.

[0040] In DWG 5, shows an end view of timber pallet and attached fold down side/end frame in the erect position with out a bag attached, B shows a front view of a timber pallet with a pair of fold down side/end frames attached with the drop bar connecting each side without the bag component, C shows collapsed view of same where in a format where one fold down side/end frame overlaps the opposite side when in the collapsed position, D shows a plan view of the lower fixed portions of the side/end frames attached to a timber pallet.

[0041] In DWG 4 F shows a end view of timber pallet and fold down side/end frame assembly in the erect position with a bag attached, G shows a front view of same, H shows an end view of a collapsed frame assembly fixed to a timber pallet, I shows a front view of I with a bag attached, L shows a side view of stacked and interlocked erected timber pallet and fold down side/end frame assemblies with bags attached, M shows a front of L, N shows a front view of collapsed, stacked and interlocked timber pallet and fold down side/end frame assemblies with bags attached.

Other aspects

[0042] A number of other additional independent aspects of the invention are now described:

In another aspect of the invention there is provided a collapsible pallet frame and bag container supported on four U-shape strap metal feet where the outer legs of the U shapes are substantially vertical and positioned to mechanically engage purpose made enclosed corners of the pallet frame assembly such as to permit nestable stacking in both the collapsed and erected formats.

In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above supported on four U-shape strap metal feet where the opening formed by the U-shape strap metal feet and the underside of the pallet deck provide access for the side entry of fork lift tynes.

[0043] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where U-shape strap metal feet or brackets can be positioned on the front and back of the pallet base so as to provide access to the tynes of forklifts such as to restrict accidental sideways movement or slippage between the pallet and the fork lift tynes.

[0044] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where vertical stub angle posts are located in each corner of the pallet base where the angles are disposed to form enclosed internal corners when aligned to the pallet base.

[0045] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the internal corners of the stub angle posts (4.) are used to provide the vertical mechanical engagement of the U-shape strap metal feet of another pallet when stacked above when the lower pallet is in the collapsed format.

[0046] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the internal corners of the stub angle posts are used to provide the vertical mechanical engagement of the corners of another timber pallet when stacked above when the lower pallet is in the collapsed format.

[0047] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the bag container component will have horizontal sleeves at the top front and back where the said sleeves will be designed to accommodate metal support bars also described as drop bars where when erected the said drop bars will attach to the hinge down end frames as described in the last preceding aspect and where the said drop bars will hold the bag open in a square and symmetrical position.

[0048] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the whole assembly will interlock and stack in the both the nested and collapsed

format as described in the last two preceding aspects.

[0049] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where at each end or side, hinge down end frames are attached to the stub angle posts with pin and/or bolt and nut assemblies.

[0050] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the hinge pin connections are positioned on the outer legs of the stub angle posts where the said legs are disposed in parallel with the front and back of the pallet base.

[0051] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the hinge pin connections are vertically positioned below the top of the stub posts so that the opposite leg of the angle above the hinge pin location functions as a mechanical stop to the upward hinging end frame.

[0052] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where spacing washers are used between the stub angle posts and hinge down end frames where the said washers will be used to provide a fixed and working clearance between the hingeable faces.

[0053] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where a nut and bolt assembly combined with tension, spacing washers and locking nuts may be used as the hinge connection in a manner to provide tension and high friction action between the moveable surfaces such to require physical manual effort to lower the hinge down end frames.

[0054] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where in the collapsed mode a three way corner is formed between the outer and upper face of the hinge down end frame and the internal corners of the exposed angle stub posts where the said three way corners will be used to mechanically capture the U-shape strap metal feet or corners of another pallet when stacked above.

[0055] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the pallet base deck may be formed from a plurality of lateral metal channels or sections co-joined at each end by metal end angle sections disposed at ninety degrees to the deck sections disposed so that the upper surface of the inner facing horizontal leg of the end angles will form the fixing surface for the deck sections.

[0056] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the outer leg of the end angle sections co-joining the deck sections, will be disposed in an upward vertical position and where there will be a space provided between the vertical ends of the deck sections and the inner face of the leg of the end

angles sections where the space may be used to stow other loose parts of the invention described later.

[0057] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where at the outer ends of the front and back deck sections the space provided to the inner face of the end angle sections described in the last preceding aspect will be closed by joining to the inner face of the stub angle posts.

[0058] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the vertical faces of the end angle sections co-joining the deck sections and the outer ends of the front and back deck sections will be co-joined to the inner faces of the legs of the vertical angle stub posts.

[0059] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the underside of the pallet deck sections may be co-joined by a pair of flat metal strips arranged centrally in parallel and suitably spaced to act as wear and contact pads for interaction with the tynes of forklifts and where each end of the flat metal strips may be extended sufficiently and turned up at ninety degrees and attached to the outer faces of the front and back deck sections so as to act as an impact zone for accidental contact with the tips of forklift tynes.

[0060] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where spaces are provided between the lateral deck members where the said spaces will provide for the stowage of other loose parts of the invention described later.

[0061] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where each of the hinge down end frames may be made from four joined metal angle sections assembled in a rectangular format and where the outer vertical sections will be disposed in parallel with the outer leg of the angle stub posts when erected and where the top horizontal angle section will have one leg of the angle positioned in a horizontal format when in the erected format.

[0062] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the bottom area of the outer leg of the vertical angle member (when erected) of the hinge down end frames will be punched or drilled to accommodate the hinge pin assembly disposed and positioned so that when erected, the opposite leg of the vertical angle member will interact with the inner surface of the corresponding leg of the angle stub posts in a manner that will prevent further rotation and act as a stop mechanism.

[0063] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the vertical members (when erected) of the hinge down end frames will extend

a small distance above the adjoining horizontal angle member where the horizontal member will overlap the inside flange of the vertical member and extend as far as practical into the corner of the adjoining vertical angle member such as to provide an enclosed three way corner where the three way corners will be used to mechanically capture the U-shape strap metal feet or corners of another pallet when stacked above.

[0064] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the hinge down end frames may be infilled or partially infilled with metal mesh, slats or fully sheeted with metal, plastic or any other suitable material.

[0065] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the hinge down end frames may incorporate a releasable gate that corresponds with an orifice in the bag container designed so that when the said gate is released the contents of the bag container may egress through the gate and bag orifice created.

[0066] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the outer ends of the top members (when erected) of the hinge down end frames will have an inward facing horizontal flat male tab attached where the said flat male tab will include a hole and where the tab will be designed to fit inside a horizontally disposed and detachable square metal tube that forms the top (drop) bar and bag container support (described later) and which said drop bars incorporate internal male pins positioned to engage the holes in the said flat male tabs and so when attached will co-join the top front and back areas of the hinge down end frames.

[0067] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where a pair of generally square hollow tubes (described elsewhere as drop bars) with vertical pins located internally near each end will be used to slide through longitudinal sleeves (described later) in the top front and back of the bag container and engage the flat male tabs described in the last preceding aspect and so join the hinge down end frames and hold and suspend the bag container in an open and erect position.

[0068] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the top (when erected) horizontal member of the hinge down end frames will have a suitable hole positioned mid span front to back where the said hole will be designed and positioned to receive a drop-in tonneau cover ridge support bar described later.

[0069] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the exterior face of the hinge down end frames may incorporate fixed horizontally disposed channels or sleeves designed to act as alternative lifting points by engaging the tynes or arms of forklifts or other lifting devices.

[0070] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where to achieve mobility and manual placement the U-shape strap metal feet may be replaced with suitable castors or wheels fixed to the underside of the end angle members used to co-join the pallet deck sections.

[0071] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the top (when erected) horizontal member of the hinge down end frames will have a suitable hook or projection at the front end designed to engage an eyelet in the top front corners of the bag container where the said hooks will hold the bag corner erect and in place when a drop front apron (described later) system is used wherein the drop front option requires a second means of bag attachment to the hinge down end frames.

[0072] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where a narrower format requires one hinge down end frame to fold down on top of another hinge down end frame the hinge point on opposite end stub posts may be positioned at different heights so designed to permit the said overlapping to occur.

[0073] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where a narrower format requires one hinge down end frame to fold down on top of another hinge down end frame the stub posts at each end of the pallet base may incorporate a slotted hinge aperture in lieu of a circular hinge aperture wherein the said slotted aperture will allow one hinge down end frame to fold down on top and overlap the opposing hinge down end frame.

[0074] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the bottom corners of the bag container will be held flat and symmetrical by short horizontal pins fixed at one end to the inner vertical face of the end angle sections co-joining the deck sections of the pallet base where the said pins will be designed to engage corresponding sleeves at the bottom front and back of the bag container (described later).

[0075] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the bag container component will have horizontal sleeves at the bottom front and back where the said sleeves will be designed to fit over horizontal pin connectors as detailed in the last preceding aspect and where the said connecting pins will hold the base of the bag spread open and substantially flat against the top surface of the pallet deck or where the said sleeves may be used to accommodate other slide in full length metal battens which may or may not attach to the pallet base.

[0076] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where in a narrower format one

hinge down end frame is required to fold down on top of another hinge down end frame support tabs may be fixed to the corner stub posts where the said tabs will be positioned to provide a uniformly level resting point for another pallet stacked above when the bottom assembly is in the collapsed mode.

[0077] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where when a tonneau cover (described later) is employed a detachable ridge support member (26) may be used to hold the tonneau cover in a position to allow water to drain to the front and back where the said ridge support member will consist of a metal section that spans from one hinge down end frame to the opposing hinge down end frame where the said ridge support member will have downturns at each end and where the said downturned ends will be designed to engage and gravity attach to centrally located holes in the top members of the hinge down end frames and where when not required the said detachable ridge support member may be stowed in the space provide between the pallet deck sections and where the downturned ends will reside in the space provided between the ends of the deck sections and the vertical leg of the end angle member co-joining the deck sections (14).

[0078] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above that may also may be used without the bag container as a freight and or storage module wherein the top support members (drop bars) will be used to hold the hinge down end frames open and erect.

[0079] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above that when used as a freight and storage module as in as the last preceding aspect. Spacing bars may be used to sub-divide the internal area of the module where the said spacing bars will consist of a metal section with an extended ninety degree angle cleat at each end designed to form a slot between the end of the spacing bar and the inside of the angle cleat and where the said spacing bar's slotted ends will mechanically engage the wire strands of mesh infilled hinge down end frames which may be infilled or partially infilled with metal mesh, slots or fully sheeted with metal plastics or any other suitable material as in random locations such as to provide various spaces or compartments capable of supporting different products or merchandise.

[0080] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where metal battens in the form of tubes may be used to slide into continuous horizontal sleeves in the bag container where the said battens will provide stiffening and rigidity to the bag container and where said battens may or may not attach (52) to the hinge down end frames or the pallet base.

[0081] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the length, depth and

height of the assembly may change to suit various applications.

[0082] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the bag container component will consist of five sides in the form of an open top box and where the said bag container will be designed to fit closely inside the erected frame.

[0083] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the bag container may be made from any suitable fabric, mesh or webbing.

[0084] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the bag container will have other horizontal sleeves located elsewhere on the bag where the said sleeves will be designed to accommodate slide in full length metal battens where the said battens may or may not attach to the hinge down end frames and where the said battens will provide added stiffness and rigidity to the bag container.

[0085] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the bag container may provide for personal access with a front cutaway area that creates a lower horizontal level of access and where when the said cutaway area and lowered level of access is not required, the said cutaway area will be closed and concealed behind a full width self apron front incorporating the top drop bar sleeve, fixed below the cutaway area and where the said drop bar will attach to the hinge down end frames in the normal way as previously described.

[0086] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the bag container with the various drop bars and battens attached will upon detaching the top drop bars from the hinge down end frames be capable of folding down flat on top of the pallet deck in a manner that will permit the hinge down end frames to fold down on top of the bag and batten assembly in a substantially horizontal format.

[0087] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where to provide added protection to fragile load contents a thin perforated sheet cushion of sponge or other synthetic foam may be interposed underneath the bag container and on top of the pallet deck where the said foam cushion will be restricted and held horizontally by the corner bag holding pins 32. and the vertical leg of the end angle member used to co-join the lateral deck sections.

[0088] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where an exit evacuation shute may be fabricated into the bottom front or side of the bag container where a sleeve at the bottom end of the said shute may incorporate a releasable metal batten that is attachable to the pallet frame assembly.

[0089] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the metal deck sections may be deleted and the remaining end angle, stub posts and hinge down end frame may be attached to a timber pallet base with cleats or brackets wherein the invention with the said timber pallet base will perform all the same or similar tasks and functions as described herein before.

[0090] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above designed to carry a wide range of products and merchandise, that combines open top and drop front access and loadability, in a range of sizes on a metal or timber pallet base, providing for quick and efficient bag removal and installation, with safe interlocking stacking capacity in either erected or collapsed format.

[0091] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above wherein a watertight bag component may be used in conjunction with a discharge spigot attached to the pallet assembly where the said watertight bag will be designed for the carriage of liquids and viscous products.

[0092] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where in the erected format battens used to support the front and back of the bag may mechanically engage behind the vertical angle legs of the hinge down end frames where so disposed the said battens will confine and restrict the tendency of the loaded bag to bulge or belly.

[0093] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the bag component may incorporate overlapping flaps so designed to provide a self closure system in the form of a duffel top.

[0094] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where a formed or fabricated sheet metal top closure may be used in lieu of a fabric tonneau closure (56.).

[0095] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where the front and back sections of the bag assembly may be fully supported by formed or fabricated, hinged or detachable metal panels in lieu of batten supports.

[0096] In another aspect of the invention there is provided a collapsible pallet frame and bag container generally described above where an open top bag format may be closed with an optional tonneau cover where the said tonneau cover will incorporate a skirt perimeter that will overhang the erected bag and where the said skirt will attach to the bag at front and back with a plurality of straps and buckles or straps and loop fastenings with "velcro" closures. The side or end skirts of the said tonneau cover will have three suitable cutaway areas such

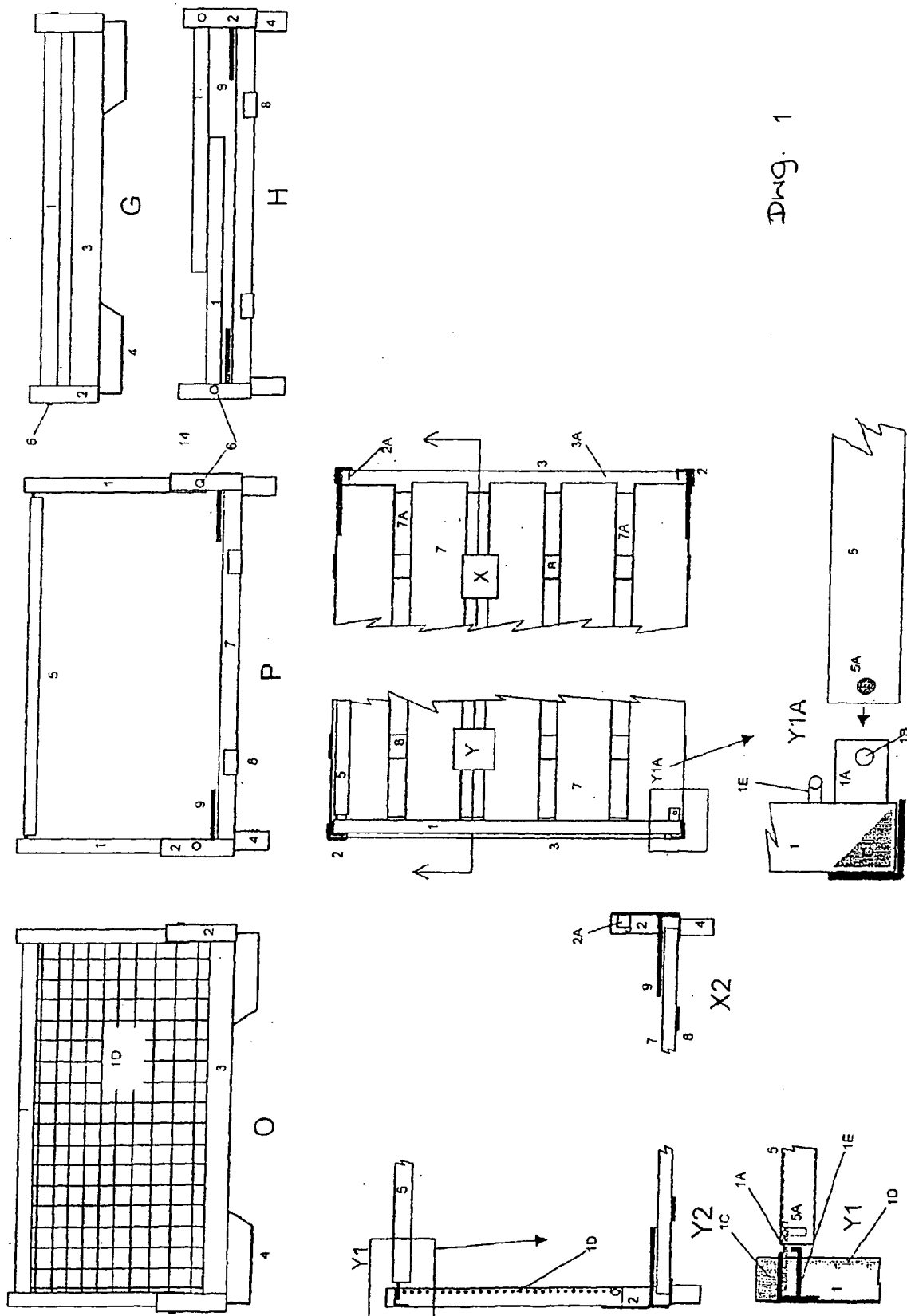
as to allow the ridge support member (34) and front and back drop bars (25) to pass through. When not required the tonneau cover may be stowed in a purpose made bag or cavity attached to or forming part of the hinge down end frames.

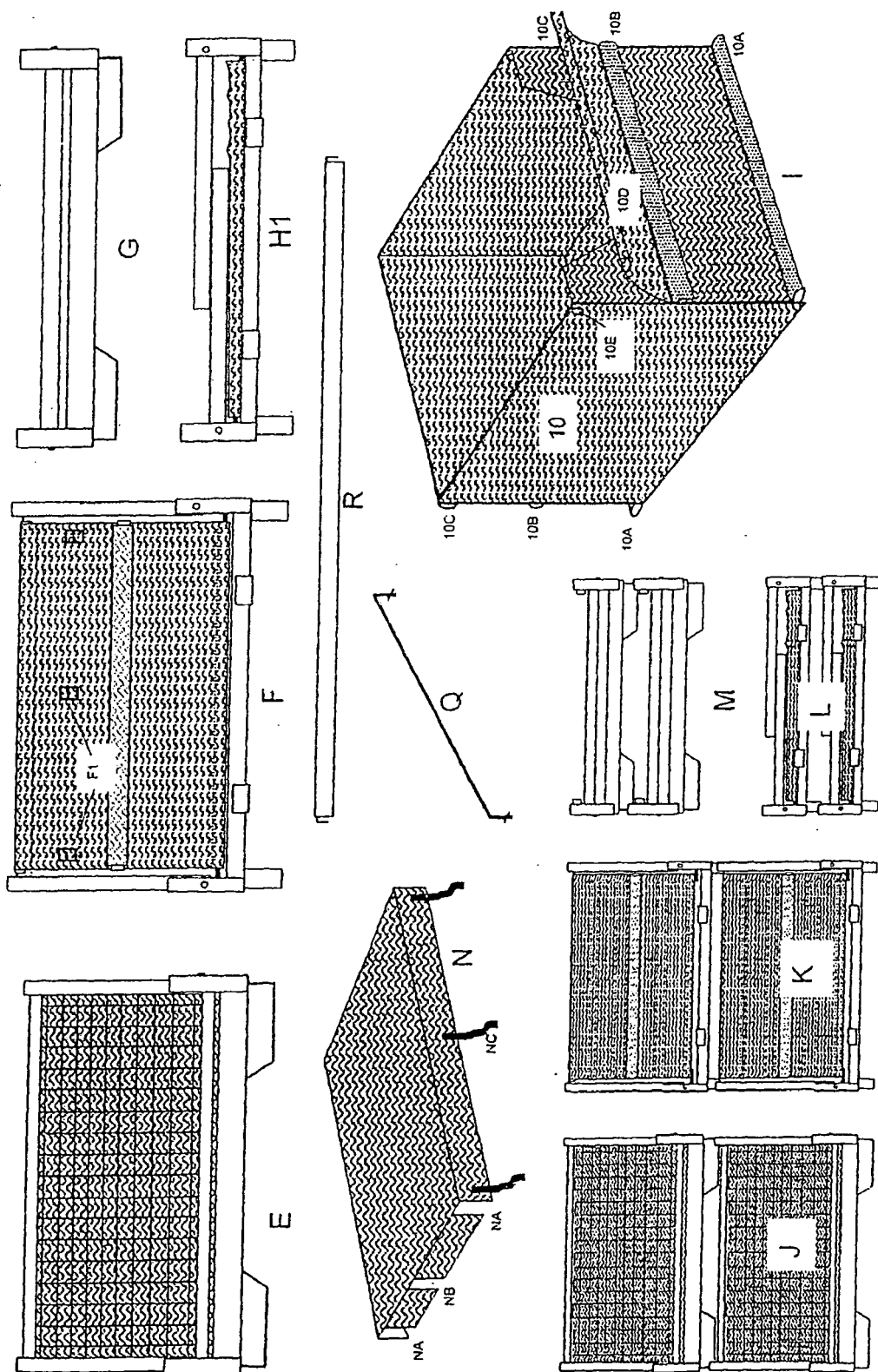
Claims

1. A collapsible bag container comprises a rectangular base, two end walls hinged to the shorter sides of the base and two removable bars extending between opposite upper corners of the end walls to form a fixed rectangular frame with the upper edges of the end walls so that when the bars are removed the end walls fold down onto the base. 10
2. The container of claim 1 wherein the bars are adapted to drop into mating slots at the corners of the end walls. 20
3. The container of claim 1 having a bag inside it which is supported by the end walls and the bars.
4. The container of claim 1 in which the base is a metal frame and the end walls are pin hinged to stub posts at the corners. 25
5. The container of claim 1 in which the base is a pallet and the end walls are hinged to the pallet. 30
6. The container of claim 1 in which the end walls are higher than half the length of the base and are hinged to allow one wall to fold directly onto the base and the other to fold on top of the other wall. 35
7. The container of claim 1 in which the end walls are lower than half the length of the base and are hinged to both fold down directly onto the base. 40
8. The container of claim 3 in which the bag has sleeves to receive the bars.
9. The container of claim 3 in which the bottom of the bag is secured to the base. 45
10. The container of claim 3 in which the bag has two or more sleeves to receive reinforcing battens.
11. The container of claim 3 in which the bag wall has a cutaway hatch allowing entry into the container said hatch being resealed by a covering flap. 50
12. The container of claim 3 in which the bag folds down flat on the base when the supporting rods are removed and the ends fold down on top of the bag. 55
13. The container of claim 1 in which the removed bars

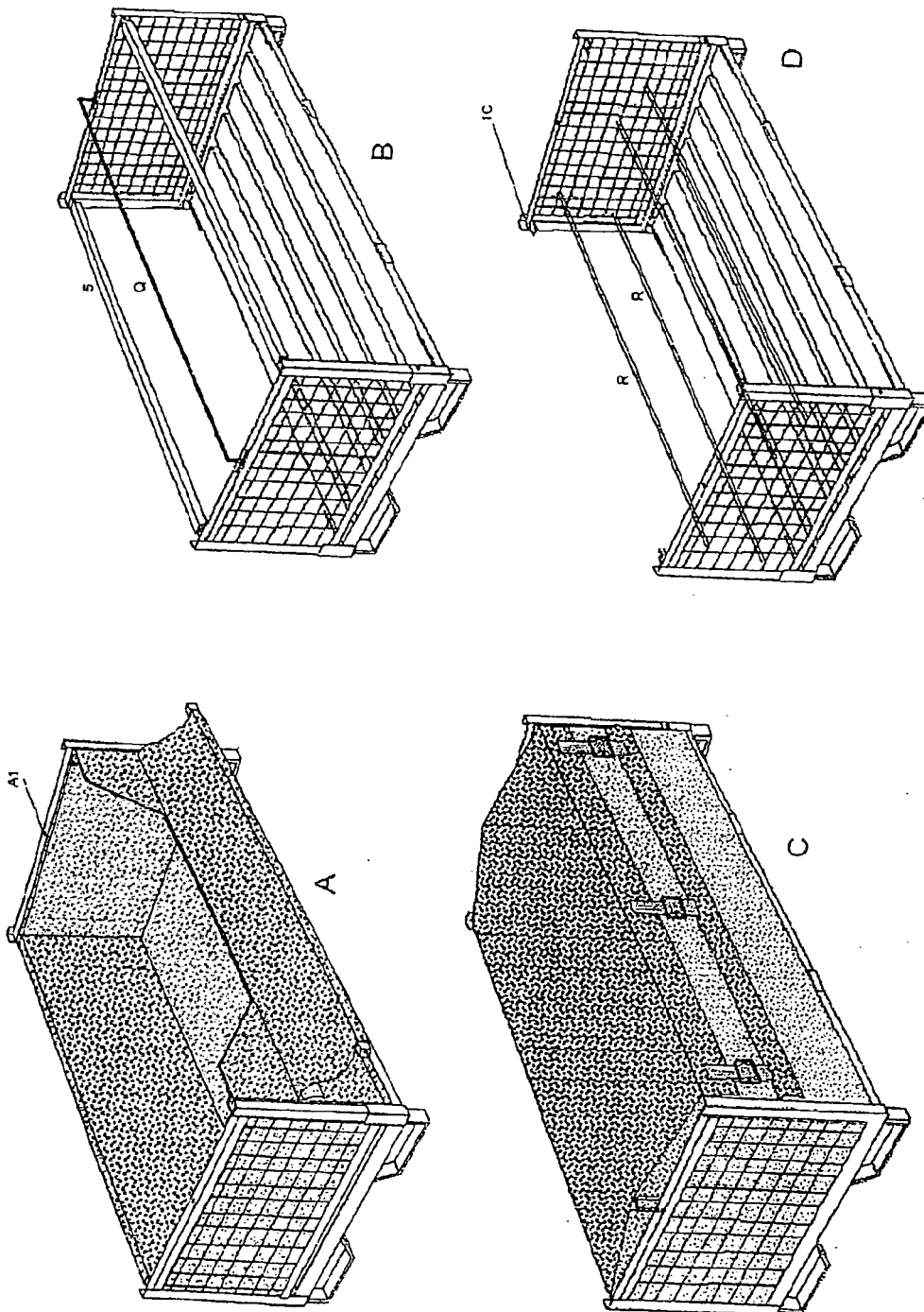
are stowed in the base.

14. The container of claim 1 wherein the base has feet which facilitate vertical stacking of two or more collapsed containers. 5
15. A collapsible pallet frame and bag container supported on four U-shape strap metal feet where the outer legs of the U-shapes are substantially vertical and positioned to mechanically engage purpose-made enclosed corners of the pallet frame assembly such as to permit nestable stacking in both the collapsed and erected formats.





Dwg. 2



Dwg. 3

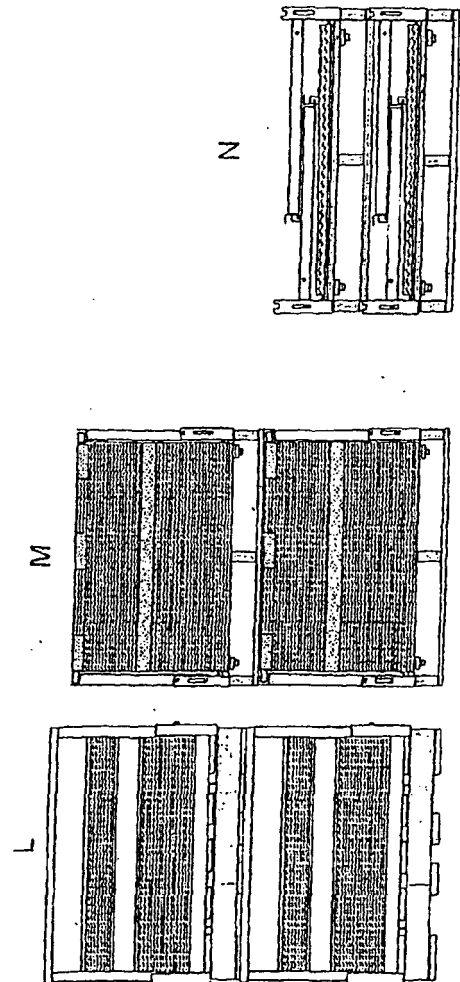
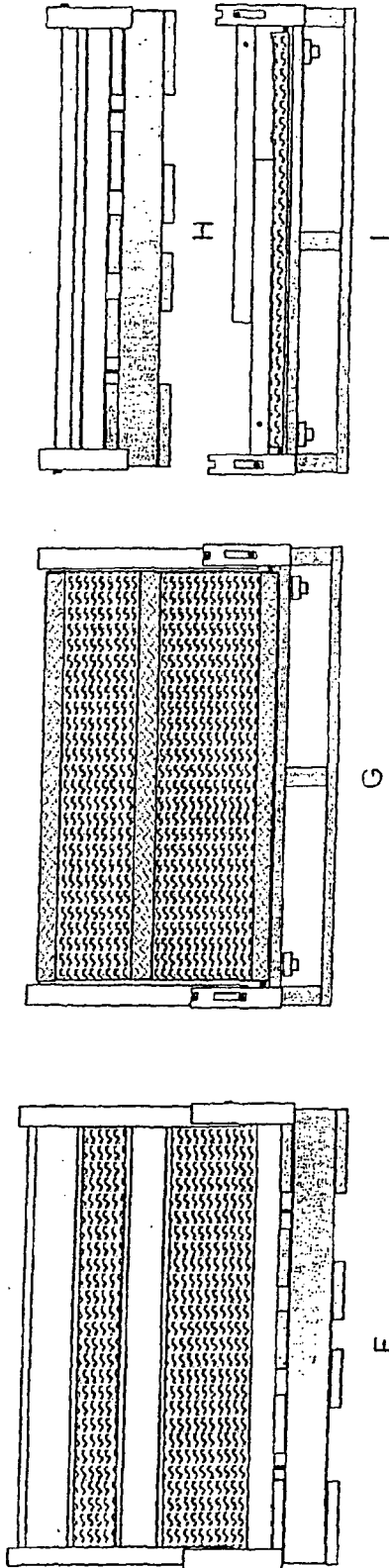


Fig. 4

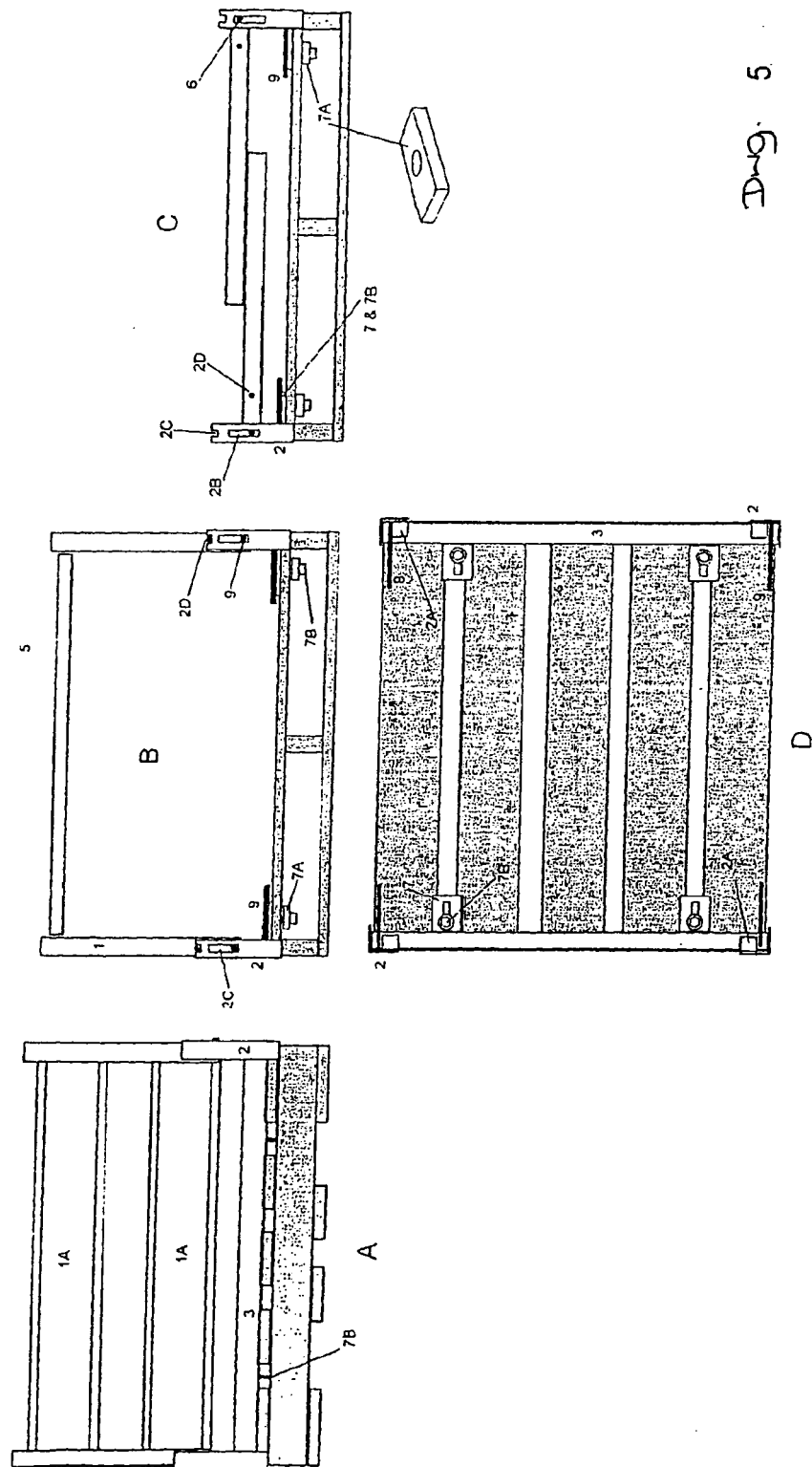


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 6974783 B [0007]
- US 6935500 B [0007]
- US 5884794 B [0007]
- US 6932266 B [0007]