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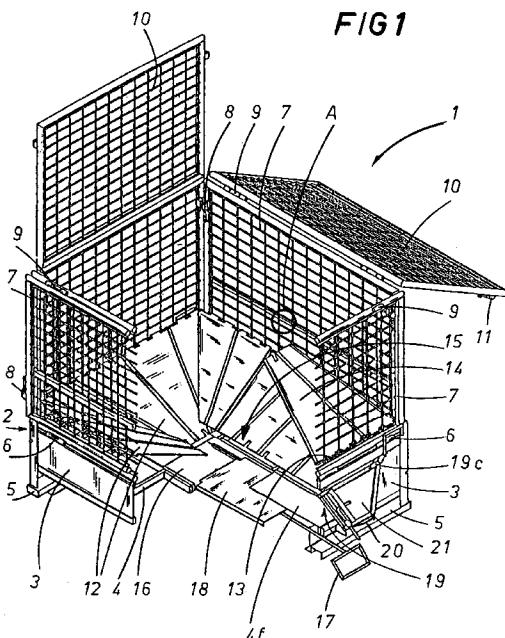
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(54) **A dispensing bin for small items in bulk.**

(57) A bin (1) suitable for transporting and dispensing small loose items, typically screw caps, comprises a rectangular base (2) surmounted by rectangular side panels (7, 10) extending upward to create the enclosure, which are arranged in two sets connected to the base and to each other by hinges (6, 9) in such a way as to allow rotation about horizontal axes between a vertical position, and a collapsed configuration in which all the panels lie flat one on top of another occupying the uppermost part of the base (2); with the bin erected and in use, the adjacent upright members of the panels (7, 10) are secured rigidly one to another at each corner by bolts or catches (8, 11), which are released to collapse the structure. The base (2) affords two dispensing outlets (16, 19), bottom and side, which can be opened selectively according to requirements by positioning two relative gates (18, 21).



The present invention relates to a dispensing bin for small items handled in bulk, and in particular to a container capable of holding large quantities of small objects en masse, for example screw caps, and of distributing such objects in a simple and functional manner to a user machine.

Whilst reference is made at various points in the specification, strictly by way of example, to the items typically carried by a bin according to the invention, which are described as "screw caps" or "caps", such definitions imply no limitation on the general scope of the invention.

Conventionally, screw caps are supplied in large quantities by manufacturers to users, packaged and transported generally in large cardboard boxes of which the dimensions may differ significantly from one supplier to another. Utilizing a first type of box with relatively limited dimensions, capable of being handled manually, the contents are supplied to a user machine by emptying the boxes into metal bins of larger capacity associated directly with the production line. In the case of a second type of cardboard box frequently utilized by suppliers, which is of considerably larger dimensions, the contents are supplied from the box itself, either taken up from the open top or extracted from an opening made in the lower part of the box.

In addition to the inconvenience of the cardboard box, and the laborious nature of the methods by which the contents are removed from its interior, one has the further significant drawback that such containers cannot be recovered economically after use and are almost invariably destroyed, the cost of which is by no means negligible.

It is also the practice to pack small items of the type in question in metal, wooden or plastic bins, effectively of palletizing format, which again can be emptied either by taking up the contents from above or by extraction from an opening provided in the lower part of the structure.

One notable drawback betrayed by this type of bin, stemming from its dimensions, is that of the high transport costs incurred in returning empty bins to suppliers for refilling, disposal obviously being out of the question in this instance.

Accordingly, the object of the present invention is to overcome the aforementioned drawbacks, through the provision of a dispensing bin for small loose items which not only can be reused indefinitely but is neither bulky when empty nor unduly expensive to return to suppliers and/or to store.

The stated object is realized in a dispensing bin for small items in bulk, as characterized by the appended claims.

The invention will now be described in detail, by way of example, with the aid of the accompanying drawings, in which:

- fig 1 is a schematic illustration showing the dis-

pensing bin according to the present invention, in perspective, with certain parts cut away better to reveal others;

- figs 2 and 3 show the two possible dispensing configurations of a bin as in fig 1, which is seen in a side elevation with certain parts cut away better to reveal others;
- fig 4 shows the detail 'A' of fig 1, enlarged and in perspective;
- figs 5 and 6 are enlargements, respectively in elevation and in perspective, showing alternative embodiments of first and second locking means which form a part of the bin of fig 1,
- figs 7, 8, 9, 10 & 11 are schematic illustrations, all in perspective, of the steps by which the bin according to the invention is collapsed.

Referring to the accompanying drawings, 1 denotes a dispensing bin, in its entirety, inside of which to place small loose items (not illustrated); in the interests of convenience, the single term "bin" is adopted throughout the specification. Such a bin 1 is preferably all-metal in construction, comprising a base 2 composed of four vertical side panels 3 associated one with another in like manner to the four lateral faces of a rectangular parallelepiped; the bottom horizontal edges of the four panels are joined to the corresponding edges of a rectangular horizontal bottom panel 4, which might be of solid embodiment, consisting in sheet metal, or virtual as in the example illustrated, and formed of metal section members connected to create a rectangular lattice. Two mutually opposed panels 3 of the base consist in corresponding rectangular cuts of sheet metal strengthened by stiffening ribs (one only of which is illustrated), whereas the remaining two panels 3 (one only of which is discernible) consist in a framework of metal section members appearing rectangular in overall shape. The base 2 rests on two supporting structures 5 associated with two opposite sides, in such a way that a bin 1 set down on the floor will stand with the base 2 raised by a distance sufficient to allow insertion of the forks of a lift truck (not illustrated).

The top horizontal edges of the four side panels 3 afford hinge means, denoted 6, by way of which the respective bottom edges of four further rectangular panels 7 are associated pivotably with the base 2; each such panel 7 exhibits a horizontal dimension substantially identical to that of the base panel 3 below, and consists preferably in a cut of metallic mesh carried in a rectangular frame fashioned from metal section members. The side edges of the hinged panels 7 can be secured rigidly to and separated from one another by way of locking means consisting for example in bolts 8.

The top horizontal edges of the hinged panels 7 in their turn afford hinge means 9 by way of which to connect the bottom horizontal edges of four further pivotable rectangular panels 10, each exhibiting a

horizontal dimension substantially the same as that of the panel 7 beneath and similar in all respects; the side edges of these panels 10 likewise can be secured rigidly to and separated from one another by way of locking means consisting, for example, in bolts 11 similar to the bolts 8 first mentioned.

Alternatively, the second locking means 11 might consist (see fig 5) in a rigid link 31 of upturned 'L' profile of which the vertical member 31v is accommodated, axially slidable and rotatable about its own axis X, in a tubular socket 32 afforded by a top corner 10a of each further panel 10, and the horizontal member 31o affords two locking pins 33a and 33b of similar embodiment projecting downwards and, with the rigid link 31 in a lowered position, insertable in two relative tubular sockets 34a and 34b afforded by the corresponding top corners 10a of adjacent panels 10; with this arrangement, the panels 10 can be elevated and secured one to the next in sequence, and released simply by lifting and rotating the vertical member 31v of each link 31 to separate the two associated panels 10.

12 denotes one of three panels, each exhibiting the shape substantially of a right trapezium, of which the longer parallel sides are associated with the top edges of three adjoining base panels 3 and the shorter parallel sides are disposed adjacent to the virtual bottom panel 4 and convergent on a central outlet 16. The top edge of the fourth base panel 3 affords hinge means 13 allowing the connection of a fourth trapezoidal panel 14, of which the longer parallel side is associated with the hinge means 13 and the shorter parallel side is rotatable about the top edge of the relative base panel 3 between a position substantially of contact with the bottom panel 4 (see fig 2) and a position fully above the base 2, shown in fig 3. In the lowered position, the hinged panel 14 combines with the three fixed trapezoidal bottom panels 12 to create a hopper 15 substantially of frustopyramidal shape disposed with the vertex over the central outlet 16.

The outlet 16, of rectangular shape, can be opened or shut at will by manual operation of a handle 17 connected to a rectangular panel, or gate 18; more exactly, the gate is positioned above the bottom panel 4 and capable of sliding movement in either direction along a path parallel with two of its own sides, supported in guide means 4g afforded by the aforementioned lattice members, into and away from a position of alignment with the outlet 16.

Similarly, the vertical base panel 3 with which the hinged trapezoidal panel 14 is associated affords a rectangular outlet 19 that can be opened or closed at will by means of a trapezoidally shaped panel or gate 21, associated with the panel 3 by way of a relative hinge 19c and rotatable about a horizontal axis away from or into a position of alignment with the outlet 19; using the side outlet, the bottom of the hopper is formed by the sliding gate 18 and by a fixed horizontal

panel 4f constituting a part of the virtual bottom panel 4.

In a preferred embodiment of the bin 1 (see fig 6) 5 featuring maximum collapsibility, the first hinged panels 7 might be provided with restraint means 25, which also constitute an alternative solution to the first locking means 8, fitted to one vertical frame member in such a manner as to unite this and the adjacent frame member, permanently, as a pair.

More exactly, such means 25 serve to restrain 10 two of the four panels 7 (in this instance, the two aforementioned vertical base panels 3 composed of metal section members are not connected to the two corresponding panels 7 above) and consist in a pair 15 of supports 26 rigidly associated with one of the vertical members of each restrained panel 7; the projecting end of each support 26 takes the form of a shackle 27 designed to create a circular seat rotatably accommodating the vertical member of the adjoining panel 20 7, i.e. that pivotably associated with the top edge of the vertical base panel 3.

With this type of arrangement, the four panels 7 25 immediately above the base 2 can be folded down in pairs (as described more fully in due course).

The three trapezoidal bottom panels 12 might 30 also be anchored pivotably by way of their longer sides to corresponding horizontal hinges, in the manner already intimated for the fourth panel 14, and made rotatable thus between a lowered position in which the hopper is assembled ready for use, and a raised position, flush against the respective mesh panels; in this instance, the bin will incorporate further locking means 28 by which to secure the shorter 35 parallel side of each trapezoidal panel 12 and 14 to the relative mesh panel 7 when folded up into the raised position. As illustrated in fig 4, such locking means 28 might be embodied as a plurality of rigid hoops 29, one to each panel 12 and 14, permanently 40 associated with the respective mesh panel 7 (in effect, with the inwardly directed face of the mesh); the hoop 29 is positioned in such a way as to intercept the shorter parallel side 12a or 14a of the trapezoidally shaped panel 12 or 14 when rotated upwards, and accordingly, each of the shorter sides affords a pair of 45 slots 30 in which the hoop 29 can locate, such that the one panel 12 or 14 is locked to the other panel 7 by mechanical interference. An additional measure of security can be afforded by providing a notch 30s between the slots 30, formed in one of a plurality of vertical stiffening ribs afforded by each panel 12 and 14, and thus allowing a positive horizontal engagement 50 between the hoop 29 and the notch 30s.

The operation of the dispensing bin 1 according 55 to the invention will now be described.

The bin 1 being fully assembled and erected, with the shorter parallel side of the trapezoidal bottom panel 14 adjacent to the bottom panel 4 and all the hinged panels 7 and 10 made appropriately secure by

means of the corresponding bolts or links 8 and 11 so that the structure is rendered stable, a bag S of plastic or paper material filled with the small items to be dispensed can be positioned internally of the enclosure, as in fig 2; in this instance, the opening SI from which the bag discharges its contents is positioned centrally, at the bottom.

The bin 1 as shown in fig 2 is easily transported, for example by means of a lift truck of which the forks can be slipped under the base 2, and several bins 1 can be stacked for shipping and storage.

The items can be drawn off from the bottom of the bin 1 simply by opening up the hopper, drawing back the gate 18 to expose the outlet 16 in the bottom panel 4.

Should it happen, on the other hand, that the user prefers to dispense the items from the side of the bin 1 (as in fig 3), the panel 14 is rotated upward (during initial preparation) around the relative hinge 13 to the position illustrated, the sliding gate 18 remains in the position of alignment with the central outlet 16, and the side outlet 19 is exposed by rotating the relative gate 21 upwards; finally, an opening SV is made in the corresponding side or corner of the bag S.

Once the bin 1 has been emptied, the bag is removed (see fig 7), the top bolts or links 11 are released to free the uppermost side panels 10 (denoted 10a, 10b, 10c and 10d in figs 7 and 8 for convenience), and each panel 10 can be rotated outwards and down into a position flush with the corresponding side panel 7 beneath (see fig 8). At this point, having folded the four hopper panels 12 and 14 up against the corresponding side panels 7, the first bolts 8 are drawn back so as to release these same panels 7 (similarly denoted 7a, 7b, 7c and 7d in figs 7 to 10 for convenience), whereupon each vertical pair of panels 7 and 10 can be folded down in turn from the top edge of the relative base panel 3, pivoting about the relative hinge 6, to assume a horizontal position spanning the top of the base 2. To ensure that the four pairs of panels 7 and 10 can collapse correctly into a neat horizontal pack, the hinges 6 to which the bottom side panels 7 are anchored will need naturally to be positioned at varying heights, the calculation of which being obvious to a person skilled in the art. In the example of fig 9, on the other hand, which shows a bin with the lower side panels 7 arranged in two permanently joined pairs each united by the restraint means 25, the second stage of the collapsing sequence (the top panels 10 already being lowered) is accomplished thus: having released panel 7b from 7c and panel 7d from 7a, the operator tilts a first pair of panels 7a and 10a marginally outwards (arrow F in fig 9) and rotates the permanently associated adjoining pair 7b and 10b sideways into a position of flush contact with the former 7a (arrow F1 in fig 9); the resulting pack of four panels can now be folded down together as one into the base 2 (arrow F2 in fig 9). This same procedure

is repeated for the remaining pairs of panels 7c-10c and 7d-10d (see fig 10) to arrive at the configuration of minimum proportions shown in fig 11.

5 Fully collapsed, as described above, the vertical dimension of the bin 1 can be reduced substantially to that of the base 2 and the compacted structure can be shipped to and/or stored at the refilling premises both with ease and with modest demands on available space.

10 15 It will be clear from the foregoing that the stated object is comprehensively realized in a dispensing bin 1 according to the invention, which not only can be reused ad infinitum, but is also of compact proportions when empty, and therefore inexpensive to return to a supplier and/or to store. By virtue of the type of construction adopted, furthermore, fully erected bins can also be stacked one on top of another.

20 **Claims**

25 1) A dispensing bin for small items in bulk, of the type comprising a base (2) appearing substantially rectangular in plan, and associated with the side edges of the base, respective upwardly extending side panels (7) of substantially rectangular shape by which the items are contained within the bin, characterized in that it comprises:

30 - first hinge means (6) by which the side panels (7) are connected pivotably to the base (2) and capable thus of rotation about the axis of the respective first hinge means (6) between a vertical position and a position substantially flush with the top of the base (2), also first locking means (8) by which adjacent side panels (7) can be secured rigidly to and detached from one another;

35 40 - a plurality of further panels (10) equal in number to the side panels (7) and appearing substantially rectangular in shape, each connected pivotably by way of second hinge means (9) to a respective side panel (7) along an edge remote from that associated with the base (2) and rotatable thus about the axis of the relative second hinge means (9) between a position substantially of extension, in which the connected panels (7, 10) occupy a common plane, and a folded position in which the further panel (10) is disposed substantially flush against the side panel (7), also second locking means (11) by which adjacent further panels (10) can be secured rigidly to and detached from one another;

45 50 55 - two outlets (16, 19) located respectively in the bottom and in the side of the base (2), from which to dispense the items contained within the bin (1), also gate means (18, 21) associated respectively with the two outlets (16, 19)

and allowing either outlet to be opened and shut selectively.

**2)** A dispensing bin as in claim 1, further comprising four bottom panels (12, 14) substantially of right trapezoidal shape, consisting in three panels (12) disposed with the longer parallel side at a height above that of the opposite shorter parallel side and connected substantially in a rigid manner to the top edge of a respective side of the base (2), and a fourth panel (14) disposed with the longer parallel side pivotably connected to the top edge of a further side of the base (2) and rotatable thus between a lowered position, similar to that occupied by the three remaining bottom panels (12), in which the four panels combine to create a hopper opening vertically onto the bottom outlet (16), and a raised position flush against a respective side panel (7) in which the panels combine to create a hopper opening laterally onto the side outlet (19), wherein the length of the longer parallel sides of the panels (12, 14) is substantially identical to that of the edges of the base (2) with which they are connected.

**3)** A dispensing bin as in claim 2, wherein the outlet (19) afforded by the side of the base (2) lies adjacent to the fourth bottom panel (14).

**4)** A dispensing bin as in claim 1, further comprising means (25) of restraint afforded by at least two of the side panels (7), associated with one vertical member of the relative panel and coinciding with the first locking means (8), by which two adjacent side panels (7) are joined together as a pair in a permanent association and in such a way that one can be rotated, whenever the further rectangular panels (10) are folded flush against the relative side panels (7), from an open position, in which the two joined panels (7) are disposed mutually at right angles, to a position in which the same two panels (7) are substantially in flush contact one with another, thereby allowing four interconnected panels (7, 10) to be collapsed into a pack, wherein the means (25) of restraint consist in a pair of supports (26), associated rigidly and transversely with the vertical member of the relative panel (7), of which the projecting ends afford respective shackles (27) serving to create a circular seat rotatably accommodating the corresponding vertical member of the adjacent side panel (7).

**5)** A dispensing bin as in claim 2, wherein all four trapezoidally shaped bottom panels (12, 14) are connected pivotably by way of the longer parallel side to a relative side panel (7) and rotatable thus between the position in which the four panels combine to create a hopper, and a position in which each panel (12, 14) is disposed flush against the relative side panel (7) and secured thereto by relative locking means (28) interacting with the shorter parallel side (12a, 14a).

**6)** A dispensing bin as in claim 5, wherein the locking means (28) relative to each bottom panel (12, 14) consist in a rigid hoop (29) associated permanently with the respective side panel (7) and positioned to

intercept the panel (12, 14), when rotated into the corresponding position, by engaging a pair of open slots (30) provided in the edge of the shorter parallel side (12a, 14a) and positioned to admit a portion of the hoop (29), in such a way that the panel (12, 14) is locked by mechanical interference between the hoop and the slots.

**7)** A dispensing bin as in claim 1, wherein the second locking means (11) relative to each of the further rectangular panels (10) consist in a rigid link (31) of upturned 'L' profile of which the vertical member (31v) is accommodated, free to slide axially and rotatable about its own axis (X), in a tubular socket (32) afforded by one top corner (10a) of the further panel (10), and the horizontal member (31o), affords two downwardly projecting pins (33a, 33b) insertable in respective tubular sockets (34a, 34b) afforded by the corresponding top corner (10a) of the adjacent panel (10) when the rigid link (31) is in a lowered position.

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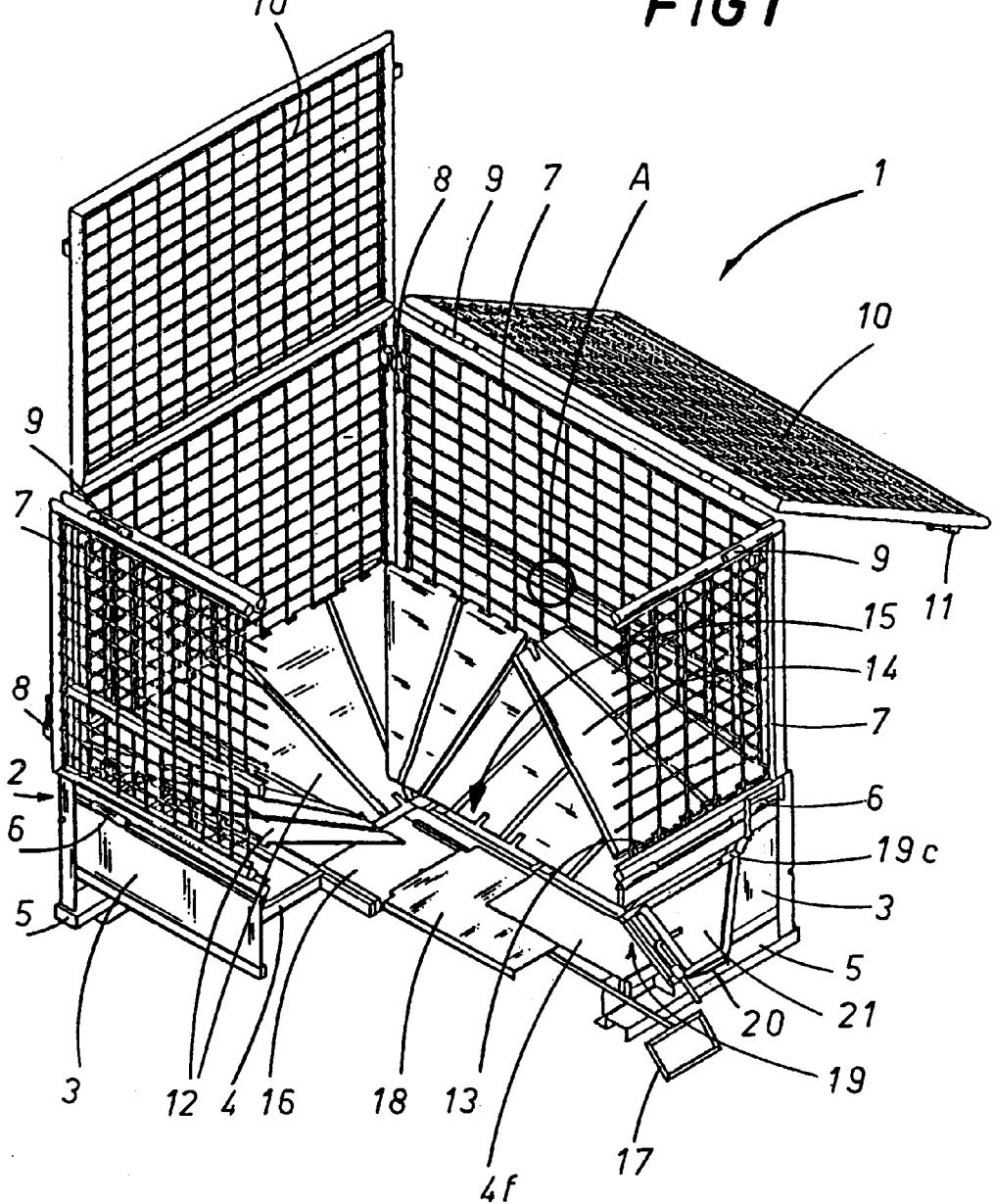
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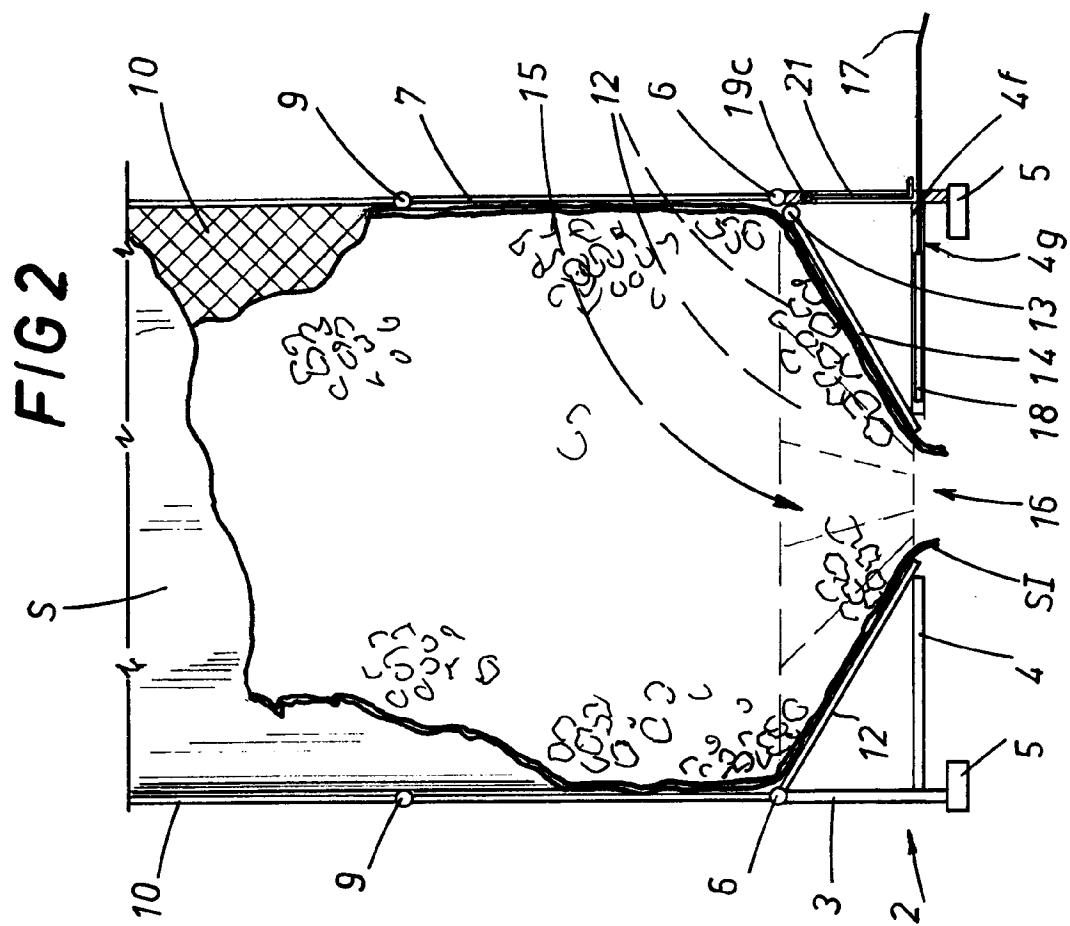
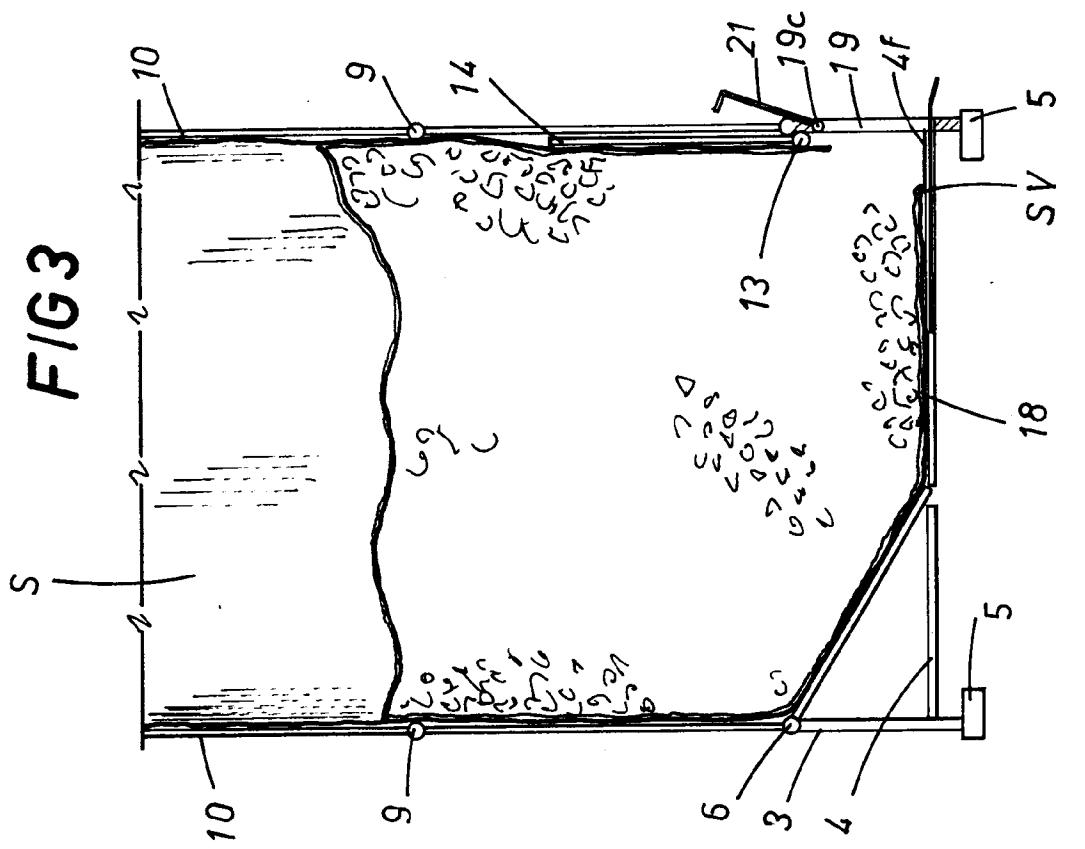
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FIG 1





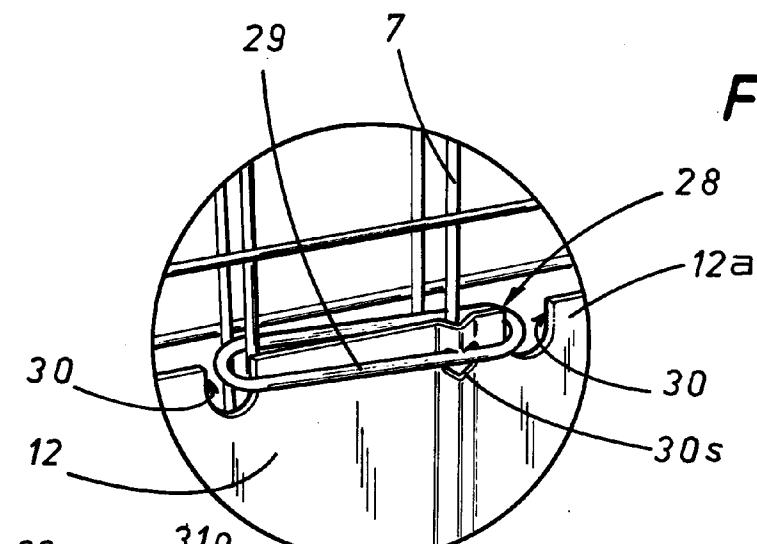


FIG 4

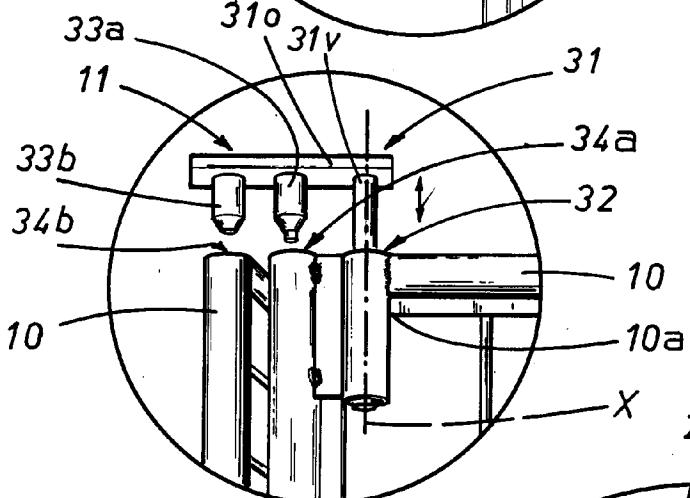


FIG 5

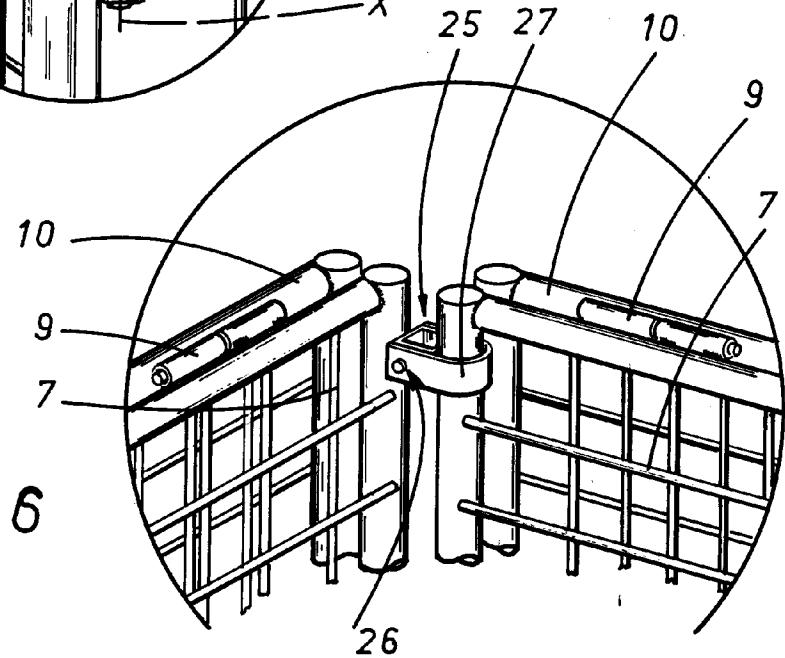
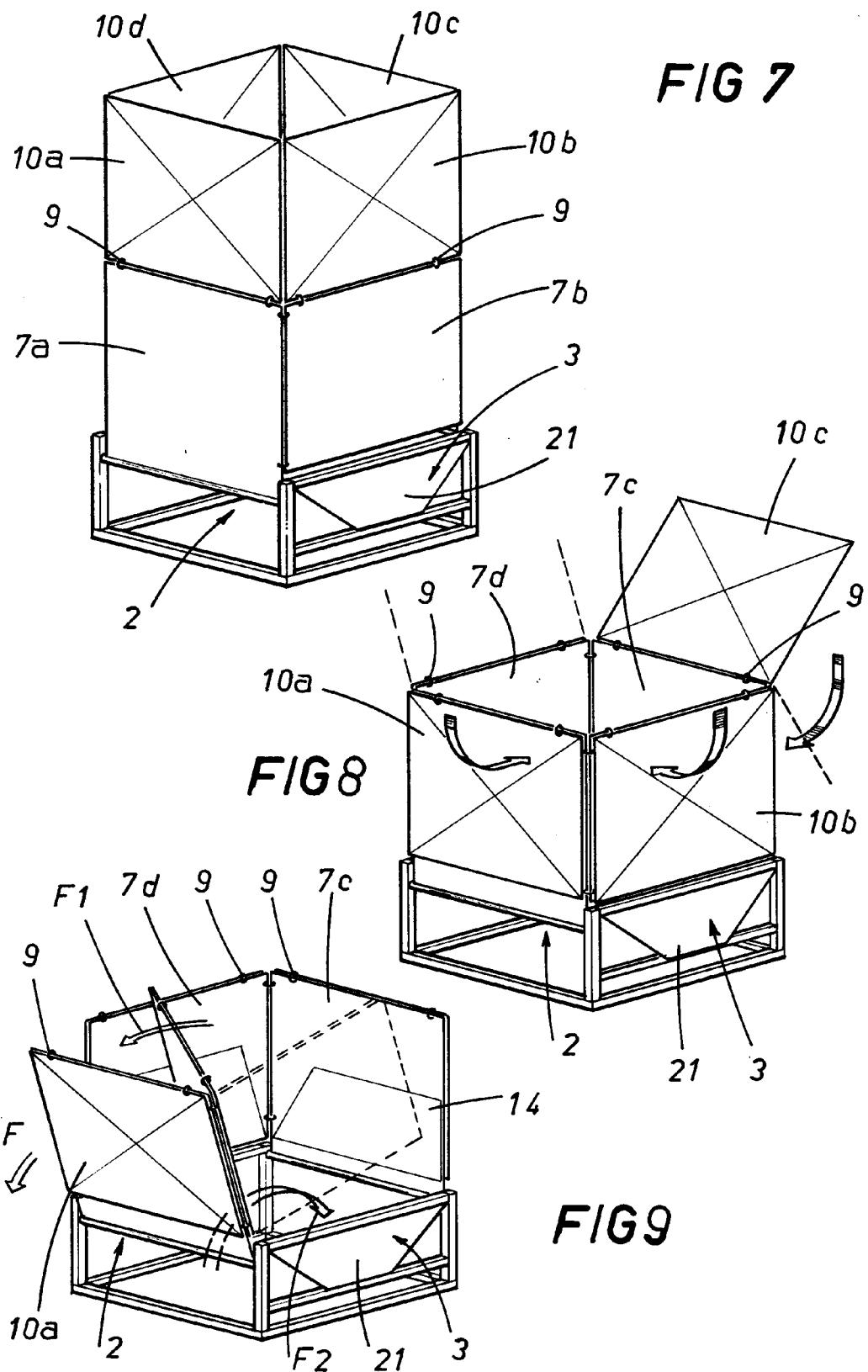
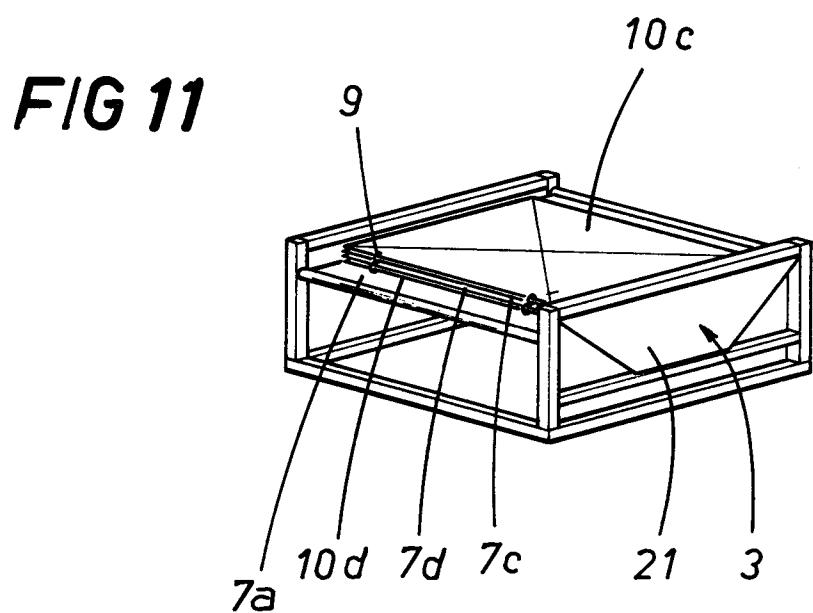
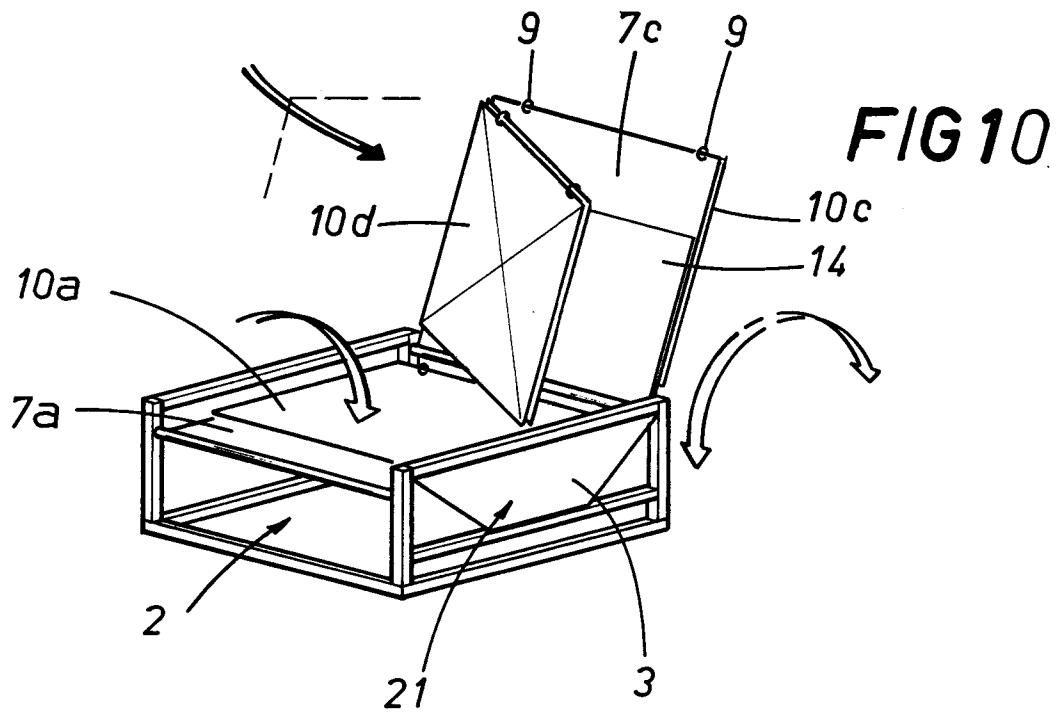


FIG 6







European Patent  
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## EUROPEAN SEARCH REPORT

Application Number

EP 93 83 0102

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	CH-A-513 749 (SCWOB-LÜDIN ET AL.) * column 3, line 43 - line 54; figures 9-16 *	1	B65D88/52 B65D19/12 B65D90/54
A	US-A-4 421 253 (CROLEY) * column 9, line 48 - line 55; figures 1,2,17-19 *	1	
A	US-A-4 106 626 (TRUBIANO) * column 3, line 18 - column 4, line 4 * * column 5, line 57 - column 6, line 14; figures 2,8,9 *	1,2,4	
A	DE-A-3 536 009 (IFF) * column 6, line 33 - line 65; figures 8,9 *	1,2	
A	AU-B-472 004 (BRUGGER METALCRAFT) * page 29, line 3 - line 20; figures 19-24 *	2,5	
	-----		TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65D
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	11 AUGUST 1993	NEVILLE D.J.	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ..... & : member of the same patent family, corresponding document	
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