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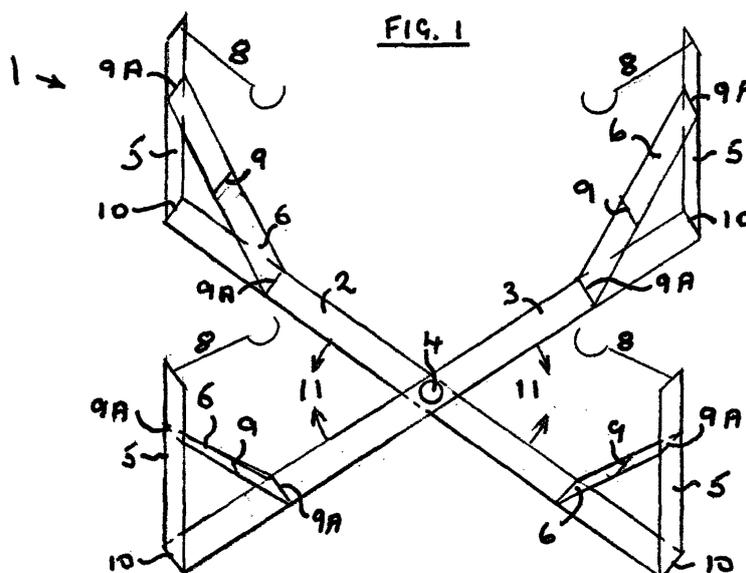
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(56) Documents Cited:  
GB 2466291 A  
EP 0373506 A1  
DE 029919937 U1  
FR 002913668 A1  
JPH10218140  
GB 2432821 A  
WO 1999/049941 A1  
DE 102004032768 A1  
US 4953815 A

(58) Field of Search:  
INT CL B65B  
Other: WPI, EPODOC

(54) Title of the Invention: **Bag opening apparatus**  
Abstract Title: **Bag Opening Apparatus**

(57) A collapsible, self-standing support frame 1 for holding open a flexible bag, e.g. a bulk or dumpy bag, comprises means such as hooks, pegs or lugs 8 adapted to engage with handles or loops on the bag. The bag can be removed, preferably from above, whilst the frame 1 is erect. The frame 1 may be formed of lightweight members 2, 3, 5, which may be separate, with tubular and/or angled sections, and stiffening members 6 e.g. diagonal bracing. These members 2, 3, 5, 6 may be connected via hinges, pivots or fulcrums 4, 9, 10, and comprise means, such as a sleeve (figure 4, 24), to lock the structure when deployed. A pallet may be placed on the base 2, 3 of the frame 1, the bag can then be removed by using a fork-lift to engage with the pallet. The frame 1 is preferably capable of holding the bag open both it is when resting on the base 2,3 or when resting on a pallet. The folded members preferably lie parallel and adjacent to each other to form a compact bundle that is portable by one or two persons.



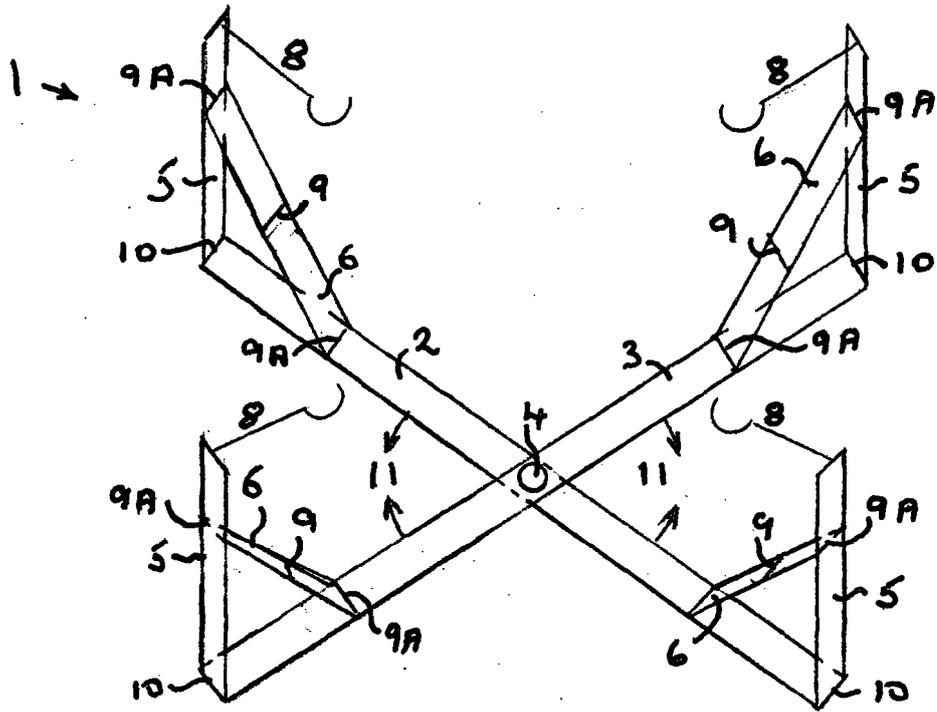


FIG. 1

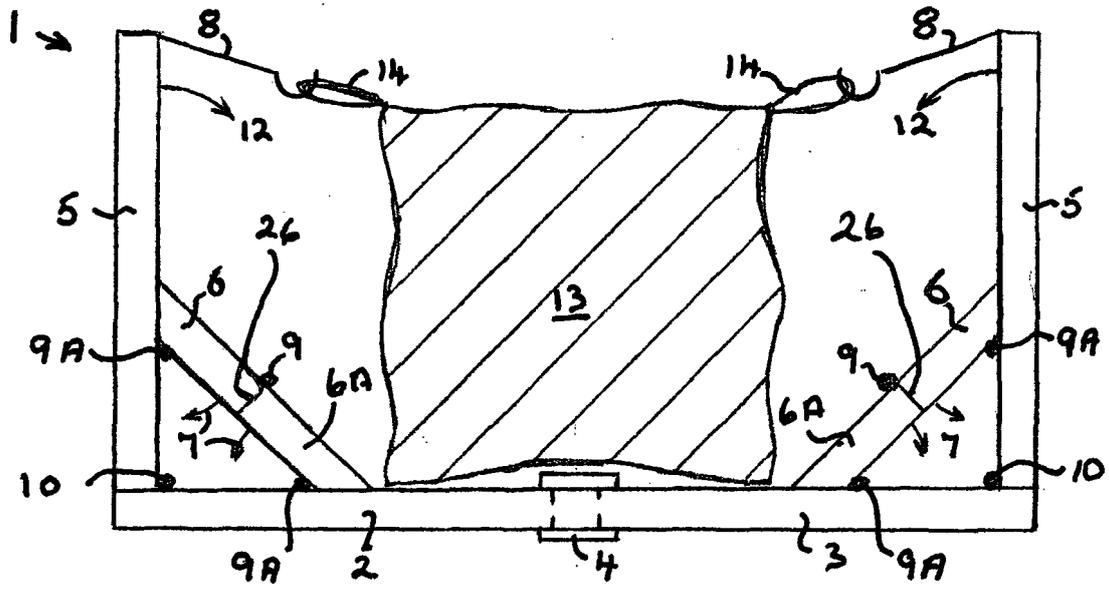


FIG. 2

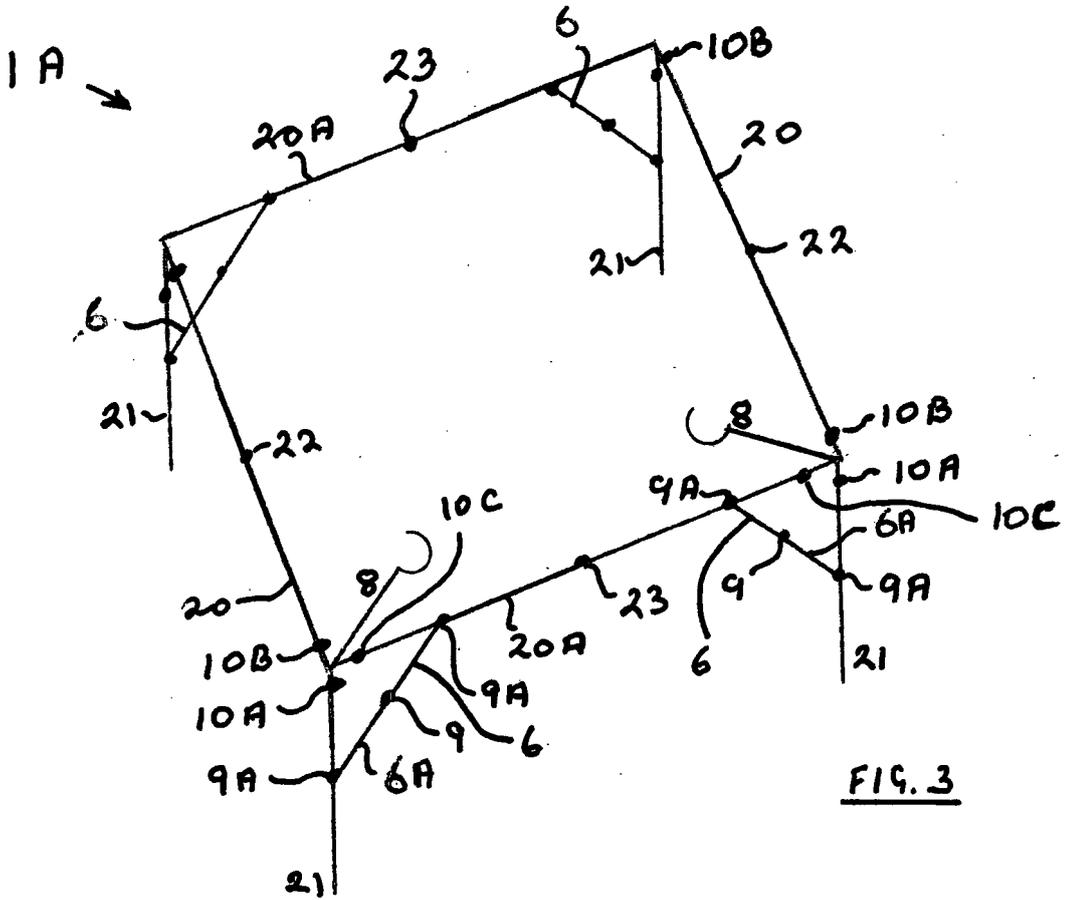


FIG. 3

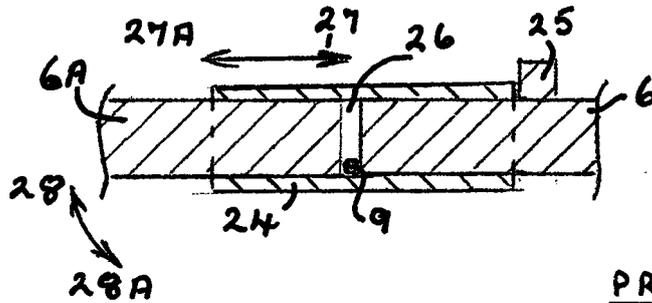


FIG. 4

PRIOR ART

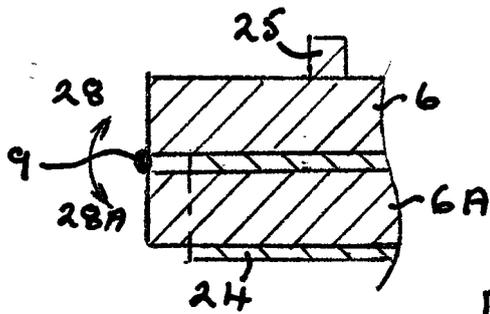


FIG. 5

PRIOR ART

## BAG OPENING APPARATUS

This specification relates to apparatus for holding open bags so that they may be filled. It is particularly appropriate to the One Tonne Canvas Bags commonly used on building sites (which are often referred to as 'Dumpy Bags') but is relevant to many other types of open topped bag.

Dumpy canvas bags are essentially cubic in form with an open top and four handling loops at the upper, open corners. They are commonly used to bring sand or gravel, etc., in nominal 1 Te loads, to building sites and may also be used to remove debris from the site, e.g. soil, broken bricks, pieces of concrete, etc. The handling loops enable the bags to be craned on and off lorries, though, sometimes, they are handled on pallets by fork lift apparatus. When filling an empty bag, it is necessary to hold the bag open. Usually, this will require two people, each holding two of the loops, while a third will fill the bag. Often the bag is filled with a mechanical device and the swinging bucket, moving so close to the 'bag holders' is a breach of Health & Safety regulations but is frequently it is done as a practical expedient, despite being potentially dangerous. If a bag holder is hit by the bucket and injured, legal proceedings are likely follow.

Currently, there are a number of nuclear facilities being decommissioned, where radioactive materials have to be handled. Frequently, this can involve filling dumpy bags with debris in environments where radioactive materials are present; these can be high, intermediate or low levels of radioactivity. Good nuclear practice decrees that people should not be exposed unnecessarily to radioactivity, even though they are provided with appropriate protective clothing, and it could be argued that bag holders are being unnecessarily exposed as, in theory, one person could fill the bag by him- / herself.

It is known to erect structures, e.g. from scaffolding members, onto which dumpy bags can be hooked for filling. This is acceptable if a large number of bags are to be filled at the same point but such structures are usually too heavy for people to carry from one point to another and often too big to move within nuclear facilities being decommissioned. Scaffolding structures can be dismantled and re-erected but only by qualified Scaffolders, who are not always available, i.e. delaying operations (extra cost).

Thus, there is an urgent need for a relatively light, easily portable and transportable means to hold open dumpy bags and the like so that they can be conveniently filled wherever and whenever required.

According to the invention, there is provided apparatus for holding open a bag(s) on a site(s) comprising:-

- i) a foldable or collapsible or dis-assemblable frame having two modes of operation, viz:-
  - 5 a) a first storage and / or transportable mode in which the frame is folded, collapsed or dis-assembled so that the component parts form a compact portable bundle; and
  - b) a second deployed mode in which the frame is unfolded, un-collapsed or assembled the frame being adapted to stand rigidly and stably on an
  - 10 essentially level surface; and
- ii) means on the frame to engage with the handles / loops / means to hold open the bag while it is being filled;

characterised in that the frame is retrieved from a storage location and taken to a first point of use, deployed (i.e. erected / assembled) at the first point of use, a bag is located in the

15 frame and engaged via its handles / loops / means to hold it open with the means provided on the frame, the bag is filled / partly filled and removed from the frame with its contents and the frame is either re-used in its first point of use or folded / collapsed / dis-assembled and taken either to another point of use and used again there or to a storage location.

20 According to a first variation of the apparatus of the invention, the bag is a canvas, one tonne bag (dumpy bag).

According to a second variation of the apparatus of the invention, the frame is formed of lightweight members.

25

According to a third variation of the apparatus of the invention, the lightweight members have tubular sections.

According to a fourth variation of the apparatus of the invention, the lightweight members

30 are made of angled sections.

According to a fifth variation of the apparatus of the invention, the frame is provided with stiffening members.

35 According to a sixth variation of the apparatus of the invention, the stiffening members include diagonal bracing.

According to a seventh variation of the apparatus of the invention, the means of folding / collapsing the frame includes a hinge and / or a pivot and / or a fulcrum.

5 According to an eighth variation of the apparatus of the invention, the hinge / pivot / fulcrum includes means of locking the structure against rotation when in the deployed mode.

According to a ninth variation of the apparatus of the invention, the means of locking a hinge / pivot / fulcrum against rotation includes a sleeve, slidable over the hinging area.

10 According to a tenth variation of the apparatus of the invention, the deployment of the frame includes assembling a plurality of separate members and subsequently dis-assembling them after use.

15 According to an eleventh variation of the apparatus of the invention, the means on the frame to engage with the handles / loops / means to hold the bag open include hooks, pegs and / or lugs.

20 According to a twelfth variation of the apparatus of the invention, the filed / partly filed bag is removed from the frame by lifting from above.

According to a thirteenth variation of the apparatus of the invention, a pallet is placed on the base of the frame and the bag placed thereon so that, the filed / partly filed, bag is removable from the frame using a fork lift means engaging with the pallet.

25 According to a fourteenth variation of the apparatus of the invention, the means on the frame to engage with the handles / loops / means to hold the bag open are adapted to accommodate the bag both when it is in a low position located directly on the frame or in a higher position when located on a pallet resting on the frame.

30 According to a fifteenth variation of the apparatus of the invention, the means of assembling and dis-assembling the component parts includes members movably connected to each other.

35 According to a sixteenth variation of the apparatus of the invention, the means of assembling and dis-assembling the component parts includes separable members fittable to each other.

According to a seventeenth variation of the apparatus of the invention, dis-assembled parts are designed to lie essentially parallel and adjacent to each other to form a compact bundle.

- 5 According to an eighteenth variation of the apparatus of the invention, the compact bundle is portable by one or two persons.

According to a nineteenth variation of the apparatus of the invention, the compact bundle can be passed through restricted apertures.

10

In a preferred application of the apparatus of the invention, a cruciform frame is constructed of two diagonal members pivotally connected at their centres and with upstands at the corners. Hooks are provided at / near the tops of the four upstands. If a dumpy bag is placed in the middle of the frame, the loops at the upper corners may be engaged with the  
15 hooks so that the bag is held upright and open at the top, ready for filling by human or mechanical means.

The frame may have appropriate bracing and stiffening and be provided with lockable, hinged joints to allow the frame to be taken for use from its storage location in its first  
20 storage / transportable mode, deployed in its second mode for use and, after use, folded or dismantled for returning to a storage location. In its collapsed / dismantled form, it should be portable by a single person.

For a clearer understanding of the invention and to show how it may be carried into effect,  
25 reference will now be made, by way of example only, to the accompanying drawings in which:-

Figure 1 is a diagrammatic, perspective view of one design of the apparatus of the invention;

Figure 2 is a diagrammatic, side elevation of the apparatus shown in Fig. 1, showing the  
30 fitting of the bag to the apparatus and the means of folding the apparatus;

Figure 3 is a diagrammatic, perspective view of a second design of the apparatus of the invention;

Figure 4 is a sectional elevation of one means of locking a hinged element of the foldable structure showing it in the locked, erected position (Prior Art); and

35 Figure 5 is a sectional elevation of the means of locking the hinged element of Fig. 4 showing the foldable structure in its unlocked, folded position (Prior Art).

In the following description, the same reference numeral is used for the same component in different Figures and / or for different components fulfilling identical functions.

Referring to Figs. 1 and 2, a bag holding frame 1 consists of two cruciform base members 2, 3 arranged diagonally about a central pivot 4. At the ends of members 2, 3, connected by hinges 10, are upstands 5, each diagonally braced with a member 6. Though the members 2, 3, 5 and 6 are shown as flat strips, this is for ease of drawing and they would actually be angled members, e.g. angle iron, or tubular sections, possibly with square sections. At the tops of each upstand 5 are hooked members 8; these are shown with as a linear portion terminating in a hook so that, when bag 13 is fitted (Fig. 2) and loops 14 are engaged with hooks 8, the bag will hang freely, clear of bracing members 6. The linear part of hook 8 may be a wire rope or a polymer or a springy, i.e. a flexible, material.

As shown (Fig. 2), bag 13 is held taut by loops 14 and assumes its essentially cubic form. When it has been filled, or part-filled, loops 14 are freed from hooks 8 and attached, e.g. via strops (not shown) to a crane or other lifting means (not shown), lifted out of frame 1 and removed. In some applications, a pallet (not shown) is placed on base members 2 and 3 and bag 13 placed on it. This will raise bag 13 so that hooks 8 will either have to be raised too or a second set of hooks (not shown) provided. When frames 1 are designed for use with pallets and removal of filled / partly filled bags 13 by fork lift equipment, the positions of braces 6 will have to be able to accommodate the pallet (not shown) and allow for access of the fork lift equipment.

Diagonal braces 6 are split 26 into two halves 6 and 6A, joined together by hinge 9 (Fig. 2). A locking means, e.g. Figs. 4 and 5, consists of a sleeve 24 which slides 27 up to stop 25 to lock members 6 and 6A together in a linear relationship and render hinge 9 inoperable (Fig. 4). To unlock, sleeve 24 is slid to the left 27A to open gap 26 and member 6A is swung anticlockwise 28A (relative to hinge 9) into the folded position (Fig. 5). To re-lock, member 6A is swung clockwise 28 and sleeve 24 moved to the right 27. (For clarity, locking sleeves 24 are not shown in Figs. 1, 2 or 3.) On the diagonal bracings 6, 6A, stop 25 would always be on the lower leg 6A so that gravity would maintain it in the locked position when deployed.

To fold up frame 1 (when bag 13 has been removed), the locking means (24, Figs. 4, 5) around hinges 9 (e.g. at the left hand side of Fig. 2) are released and the diagonal bracing 6 folded 7 about hinges 9 and 9A causing upstand 5 to hinge down about hinge 10 to lie on top of member 2. Similarly, at the right hand side, upstand 5 lies on top of member 3. The same happens at the other two corners (Fig. 1) and the two base members 2 and 3 are twisted about pivot 4 to lie essentially parallel to each other so that the whole folded frame 1 may be picked up as a single bundle and carried to a storage location or to another site for re-deployment. Hooks 8 would be aligned parallel to upstands 5.

Fig. 3 shows another variation 1A of the principle of the invention. Here, the frame components are all tubular members and are shown as single lines for clarity. To avoid confusing detail, not all the members and hinges are numbered. Here a square or rectangular frame 20, 20A has legs 21 at the corners with diagonal bracing 6, 6A and corner hooks 8 (only two shown). Legs 21 locate members 20, 20A at the height of the top of a bag 13 (Fig. 2) but otherwise the principle of the structure is similar to that of frame 1 (Fig. 1).

To fold frame 1A, sleeves 24 (Fig. 4) are released and side members 20 folded downwards in their middles about hinges 22 and 10B and the two halves of frame 1A brought together. Diagonal bracings 6, 6A and legs 21 are folded 9, 9A and 10A inwards under members 20A. Finally, sleeves 24 are released over hinges 23 and folded inwards and downwards 23, 10C to give a compact bundle. If required, hinges 23 may be retained un-folded to give a smaller but longer bundle, which might be more convenient to carry in some instances.

Figs. 1 and 3 show two arrangements of the frame 1, 1A of the invention. Other arrangements, e.g. similar to the tubular structures used in frame tents where connecting members are often joined by sprung linkages, are equally possible. Another arrangement is where some members are separate and fit together, e.g. tubes fitting into sleeves. All these variations fall within the scope of the disclosure. Most of the structures should be reasonably compact and portable by a single person. Their compactness will allow them to be carried through limited size access ports and used in relatively confined spaces, e.g. for the decommissioning of nuclear facilities.

The principle of the disclosure will be immediately apparent to the skilled person who will be able to adapt it to other types of bags and applications all such applications falling within the scope of the disclosure.

**Claims:-**

1. Apparatus for holding open a bag(s) on a site(s) comprising:-
  - i) a foldable or collapsible or dis-assemblable frame having two modes of operation, viz:-
    - a) a first storage and / or transportable mode in which the frame is folded, collapsed or dis-assembled so that the component parts form a compact portable bundle; and
    - b) a second deployed mode in which the frame is unfolded, un-collapsed or assembled the frame being adapted to stand rigidly and stably on an essentially level surface; and
  - ii) means on the frame to engage with the handles / loops / means to hold open the bag while it is being filled;

characterised in that the frame is retrieved from a storage location and taken to a first point of use, deployed (i.e. erected / assembled) at the first point of use, a bag is located in the frame and engaged via its handles / loops / means to hold it open with the means provided on the frame, the bag is filled / partly filled and removed from the frame with its contents and the frame is either re-used in its first point of use or folded / collapsed / dis-assembled and taken either to another point of use and used again there or to a storage location.
2. Apparatus for holding open a bag(s) on a site(s), as claimed in claim 1, wherein the bag is a canvas, one tonne bag (dumpy bag).
3. Apparatus for holding open a bag(s) on a site(s), as claimed in claims 1 or 2, wherein the frame is formed of lightweight members.
4. Apparatus for holding open a bag(s) on a site(s), as claimed in claim 3, wherein the lightweight members have tubular sections.
5. Apparatus for holding open a bag(s) on a site(s), as claimed in claim 3, wherein the lightweight members are made of angled sections.
6. Apparatus for holding open a bag(s) on a site(s), as claimed in claims 4 and 5, wherein the frame is provided with stiffening members.
7. Apparatus for holding open a bag(s) on a site(s), as claimed in claim 6, wherein the stiffening members include diagonal bracing.

8. Apparatus for holding open a bag(s) on a site(s), as claimed in any preceding claim, wherein the means of folding / collapsing the frame includes a hinge and / or a pivot and / or a fulcrum.
- 5 9. Apparatus for holding open a bag(s) on a site(s), as claimed in claim 8, wherein the hinge / pivot / fulcrum includes means of locking the structure against rotation when in the deployed mode.
- 10 10. Apparatus for holding open a bag(s) on a site(s), as claimed in claim 9, wherein the means of locking a hinge against rotation includes a sleeve, slidable over the hinging area.
11. Apparatus for holding open a bag(s) on a site(s), as claimed in any preceding claim, wherein the deployment of the frame includes assembling a plurality of separate members and subsequently dis-assembling them after use.
- 15 12. Apparatus for holding open a bag(s) on a site(s), as claimed in any preceding claim, wherein the means on the frame to engage with the handles / loops / means to hold the bag open include hooks, pegs and / or lugs.<sup>8</sup>
- 20 13. Apparatus for holding open a bag(s) on a site(s), as claimed in any preceding claim, wherein the filed / partly filed bag is removed from the frame by lifting from above.
14. Apparatus for holding open a bag(s) on a site(s), as claimed in any preceding claim, wherein a pallet is placed on the base of the frame and the bag placed thereon so that, the  
25 filed / partly filed, bag is removable from the frame using a fork lift means engaging with the pallet.
15. Apparatus for holding open a bag(s) on a site(s), as claimed in any preceding claim, wherein the means on the frame to engage with the handles / loops / means to hold the  
30 bag open both are adapted to accommodate the bag both when it is in a low position located directly on the frame or in a higher position when located on a pallet resting on the frame.
16. Apparatus for holding open a bag(s) on a site(s), as claimed in any preceding claim,  
35 wherein the means of assembling the component parts includes members movably connected to each other.

17. Apparatus for holding open a bag(s) on a site(s), as claimed in any preceding claim, wherein dis-assembled parts are designed to lie essentially parallel and adjacent to each other to form a compact bundle.

5 18. Apparatus for holding open a bag(s) on a site(s), as claimed in claim 17, wherein the compact bundle is portable by one or two persons.

19. Apparatus for holding open a bag(s) on a site(s), as claimed in claim 18, wherein the compact bundle can be passed through restricted apertures.

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20. Apparatus for holding open a bag(s) on a site(s), as described in and by the above statement with reference to Figures 1-3 of the accompanying drawings.

15



**Application No:** GB1423075.9

**Examiner:** Dr Katy Nelson

**Claims searched:** 1-20

**Date of search:** 13 April 2015

**Patents Act 1977: Search Report under Section 17**

**Documents considered to be relevant:**

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 3, 5-9, 11-13 & 16-18	US4953815 A (Beymer & Kite) See figures 1-4 and column 3 line 21 - column 4 line 31.
X	1-5, 8, 12-14 & 16-18	FR2913668 A1 (Bricaud & Cirone) See figures 1, 9-11 and WPI abstract accession number 2008-K58089.
X	1-6, & 11-18	DE102004032768 A1 (Kroll) See figures 1-3 and WPI abstract accession number 2006-080151.
X	1, 3-6, 11-13 & 17-19	WO99/49941 A1 (Rosky) See figures 1-2, page 2 line 14 - page 3 line 18 and claims.
X	1-4, 6, 11, 13 & 17-19	GB2466291 A (Bouchier) See figure 1 and page 3 line 15 - page 4 line 17.
X	1-6 & 11-13	GB2432821 A (Roache) See figures 1-2 and page 1 line 27 - page 2 line 9.
X	1-2, 5-6, 12-14 & 16-17	DE29919937 U1 (Becker) See figures 1-8 and WPI abstract accession number 2000-172942.
X	1-2, 8-10, 13 & 16-17	EP0373506 A1 (Sarig) See figures 1-5d and paragraphs [0002], [0006] & [0011-0012].
X	1, 8, 12-13 & 16-17	JPH10218140 A (Daifuku & Showa Boeki) See figures 1-3 and WPI abstract accession number 1998-501017.

**Categories:**

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.



**Field of Search:**

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>X</sup> :

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Worldwide search of patent documents classified in the following areas of the IPC

B65B
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The following online and other databases have been used in the preparation of this search report

WPI, EPODOC
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**International Classification:**

Subclass	Subgroup	Valid From
B65B	0067/12	01/01/2006