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(54) Flexible intermediate bulk container with fork lift guide

(57) A flexible intermediate bulk container has walls (4) of flexible sheet, with at least a second end (3) enclosed with a sheet. The ends (2,3) may have filling and discharge spouts. The walls of flexible sheet may have a plurality of loops (6) external to the container and adjacent to the first end. The second end has two parallel guides formed from flexible sheet (7,8) and external to the flexible intermediate bulk container. Preferably, each guide has therein a removable fork guide (9,10) formed from a solid material. The guides and removable fork guides are cooperatively disposed in a spaced apart relationship to accommodate the respective forks of a fork lift.

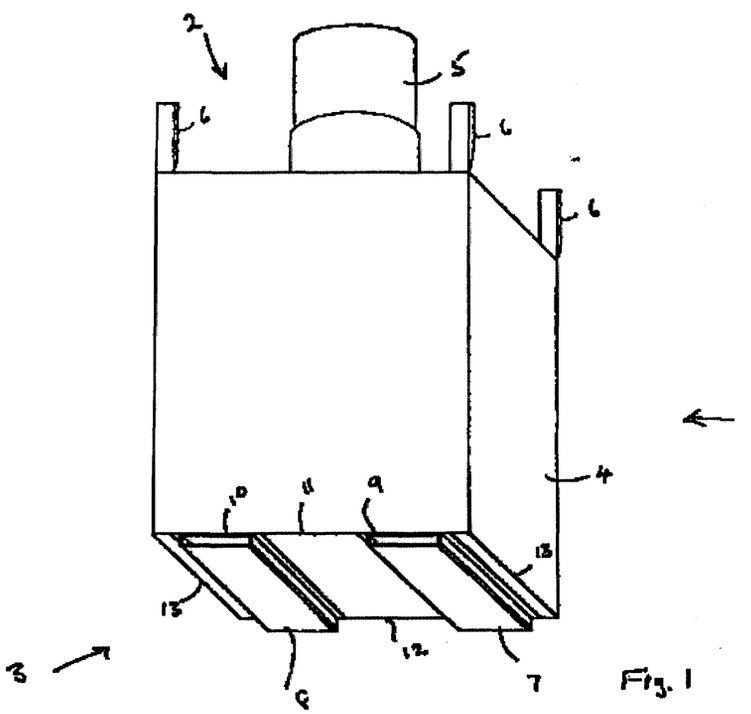

Fig. 1

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Description

[0001] The present invention is directed to containers known as flexible intermediate bulk containers, which are used in the shipping of semi-bulk quantities of, for instance, powdered materials e.g. fine powdered food and chemical products. In particular, the present invention relates to flexible intermediate bulk containers that have fork lift guides for use in movement of the containers from one location to another.

[0002] Flexible intermediate bulk containers, also known as FIBCs, are increasingly used in the packaging and shipping of semi-bulk quantities of fine powdery food, chemical products and other powdered materials. Examples of the products that are shipped in such containers include melamine, silicon and flour. Flexible intermediate bulk containers have a flexible side wall, normally in the form of a tube, and end walls. The end walls typically have spouts thereon, the spout on one end being for filling the container and the spout on the other end being for discharge of the contents from the container.

[0003] Flexible intermediate bulk containers are usually filled using a gravity fill process in which the material is fed through the filling spout into the container, until such time as the container has been filled.

[0004] Techniques for filling FIBCs, especially to reduce entrapped air, are known e.g. as disclosed in Canadian Patent Application No. 2 242 121, published January 25, 1999.

[0005] FIBCs are typically provided with external loops on one end, usually the filling end, for use in movement of the filled FIBC. For instance, a crane may be used to transport the FIBC using such straps, and to locate the FIBC for discharge of its contents. In some instances, the FIBC is elevated using the straps, to enable discharge of the contents.

[0006] Use of a crane, or similar lifting devices, is restricted to areas in which the crane has sufficient room to operate. Some buildings are not equipped with cranes or lifting devices and, in many instances, such buildings could not be so equipped due to the presence of low ceilings or other obstructions. Particular difficulties may be experienced in transportation of FIBCs in railway cars and so-called tractor trailer units, which have limited ceiling space for lifting of the FIBCs. Consequently, the FIBCs are usually placed on a wooden pallet so that the FIBC can be lifted into and out of the railway car or trailer. However, pallets add weight and cost to transportation of the FIBC and do not allow for discharge of the contents from the discharge spout in the bottom of the FIBC.

[0007] GB-A- 2255963 discloses a combined flexible container and pad with an elongate tear-away panel for discharge of the contents of the container and a pallet member adapted to deform concomitantly in use with the container.

[0008] US-A- 5785175 discloses a flexible bulk bag with a base for cooperating with a fork lift. The base has a reinforced cavity.

[0009] Improvements in flexible intermediate bulk containers, especially in respect to movement, transportation, and discharge of the container using a fork lift are required.

[0010] A flexible intermediate bulk container with fork lift guides has now been found.

[0011] Accordingly, an aspect of the present invention provides a flexible intermediate bulk container comprising walls of flexible sheet, a first end and a second end, at least said second end being enclosed with a sheet, said second end having two parallel sleeves formed from flexible sheet and cooperatively disposed in a spaced apart relationship to accommodate the respective forks of a fork lift, said sleeves being external to the flexible intermediate bulk container.

[0012] In embodiments of the present invention, the first end has means for filling the container e.g. a filling spout, and/or the second end has a discharge spout therein.

[0013] In a preferred embodiment of the flexible intermediate bulk container, a cover sheet extends over the discharge spout, optionally additionally over said sleeves.

[0014] In another embodiment, the sleeves are of elongated rectangular cross-section.

[0015] In a still further embodiment, the guides extend substantially for the width of the flexible intermediate bulk container.

[0016] Another aspect of the present invention provides a flexible intermediate bulk container comprising walls of flexible sheet, a first end and a second end, at least said second end being enclosed with a sheet, said second end having two parallel sleeves formed from flexible sheet and external to the flexible intermediate bulk container, each of said sleeves having therein a removable fork guide formed from a solid material, said sleeves and removable fork guides being cooperatively disposed in a spaced apart relationship and accommodating the respective forks of a fork lift.

[0017] In a preferred embodiment of the present invention, the solid material of the fork guides is wood, cardboard, plastic or metal.

[0018] In a further embodiment, the removable fork guide is releasably retained in the sleeve.

[0019] A further aspect of the present invention provides a flexible intermediate bulk container comprising walls of flexible sheet, a first end and a second end, at least said second end being enclosed with a sheet, said second end being enclosed in and secured to a removable flexible base assembly, said flexible base assembly accommodating said flexible intermediate bulk container and having therein at least one external sleeve disposed at said second end, said external sleeve being formed from flexible sheet and cooperatively disposed to accommodate the respective forks of a fort lift.

[0020] In embodiments, said flexible base assembly

has two parallel sleeves cooperatively disposed in a spaced apart relationship to accommodate said respective forks of the fork lift, especially in which the sleeves are of elongated rectangular cross-section. Preferably, the sleeves extend substantially for the depth of the flexible intermediate bulk container.

[0021] Another aspect of the present invention provides a flexible base assembly for a flexible intermediate bulk container comprising a base and side walls, means to attach said base assembly to a flexible intermediate bulk container, said base assembly having at least one external sleeve formed from flexible sheet and cooperatively disposed to accommodate the respective forks of a fork lift.

Brief Description of the Drawings

[0022] The present invention is illustrated by to the embodiments shown in the drawings, in which:

Fig. 1 is a schematic representation of a flexible intermediate bulk container of the invention, with fork guides;

Fig. 2 is a schematic representation of a sleeve and fork guide of the flexible intermediate bulk container of Fig. 1; and

Fig. 3 is a schematic representation of an alternate embodiment of the flexible intermediate bulk container with fork guides.

Detailed Description of the Invention

[0023] Fig. 1 shows a flexible intermediate bulk container (FIBC), generally indicated by 1. FIBC 1 has first end 2 and second end 3. First end 2 has filling spout 5 extending upwards from a central location in first end 2. In addition, first end 2 has a plurality of loops 6, of which three are shown in the drawing. FIBC 1 would normally have four such loops.

[0024] First end 2 and second end 3 are joined to the opposed ends of flexible sheet 4, which forms the walls of FIBC 1.

[0025] Second end 3 has sleeves 7 and 8. Sleeves 7 and 8 contain fork guides 9 and 10, respectively, which are more clearly seen in Fig. 2. Sleeves 7 and 8 are parallel and spaced apart by a distance that would correspond with the separation of the forks on a fork lift. Fork guides 9 and 10 within sleeves 7 and 8 would be of a size to accommodate a fork of a fork lift. Sleeves 7 and 8 are in the form of a sheath that accommodates fork guides 9 and 10.

[0026] The fork guides 9 and 10 are formed from a solid material, examples of which are wood, cardboard, plastic and metal. It is preferred that fork guides 9 and 10 be attached to the respective sleeves 7 and 8, for example using Velcro™ hook and loop fasteners, to assist in retention of fork guides 9 and 10 in sleeves 7 and 8 during use. Thus, fork guides 9 and 10 are releasably retained in sleeves 7 and 8, to permit removal for storage and for transportation of the FIBC 1 when it is empty.

[0027] Sleeves 7 and 8 are shown as extending between front edge 11 of FIBC 1 and back edge 12 thereof. In addition, sleeves 7 and 8 are spaced from side edges 13 of FIBC 1. It is understood that sleeves 7 and 8 would normally be symmetrically disposed on second end 3, with equal spacing from the respective side edges 13, so that when FIBC 1 is lifted on a fork lift, the load on the fork lift is stable and balanced, and will not tend to tip to one side.

[0028] Fig. 2 shows sleeve 8 in more detail. Sleeve 8 is attached to second end 3 by hems 14 and 15. Fork guide 10 is shown as inserted in sleeve 8, thereby providing fork opening 16 for insertion of a fork from a fork lift.

[0029] The discharge spout for FIBC 1, if present, would normally be located on second end 3 between sleeves 7 and 8, but is not shown in Fig. 1.

[0030] In a preferred embodiment of the present invention, in which FIBC 1 has a discharge spout, a cover sheet is attached to second end 3 to cover the discharge spout. The cover sheet could be attached to second end 3, and optionally additionally attached to flexible sheet 4, by any suitable means, including snaps, straps, tie tapes or Velcro™ hook and loop fastenings. In embodiments, the cover sheet covers the area of the discharge spout i.e. the area between the fork guides, but does not extend over the fork guides. In other embodiments, the cover sheet covers the area of the discharge spout and additionally extends over the fork guides. Suitable means of attachment are used, as is appropriate for the particular cover sheet. The cover sheet provides protection to the area of the discharge spout, to reduce or prevent dirt or other contamination of the discharge spout.

[0031] In a further embodiment of the invention, the cover sheet extends over both sleeves 7 and 8 as well as the intervening section of second end 3, and optionally extends onto flexible sheet 4. Suitable means to attach the cover sheet would be provided.

[0032] In use, a filled FIBC with fork guides inserted in the sleeves is readily movable using a fork lift. The forks of the fork lift are inserted in the respective fork guides to permit lifting of the FIBC. It is important that the fork guides extend at least substantially across the FIBC, so that when moved the FIBC is less prone to tipping in a forwards/backwards direction. Transportation of the FIBC on a fork lift involves starting and stopping of the fork lift, which imparts force on the FIBC in the direction of movement of the fork lift. The FIBC of the present invention reduces the consequent tendency for the FIBC to tip forwards or backwards.

[0033] After the contents of the FIBC have been discharged, the FIBC is normally returned for re-filling. With the FIBC of the present invention, it is convenient to remove both fork guides from the respective sleeves so that stacks of fork guides and of folded FIBCs may be transported for re-filling. Such separate stacks of fork

guides and folded empty FIBCs should require less space for transportation. Alternatively, the fork guides may be retained i.e. not transported back with FIBCs, and thus kept at locations where fork lifts are used. This would reduce shipping costs.

[0034] Fig. 3 shows an alternate embodiment of the present invention. FIBC 20 has first end 21 and second end 22. First end 21 has filling spout 23 extending upwards from a central location of first end 21. First end 21 and second end 22 are joined to the opposite ends of flexible sheet 24, which forms the walls of FIBC 20. Securement ties 25 are attached to flexible sheet 24, and represent attachment means for attaching flexible base assembly 26 to FIBC 20. Other securement means may be used, for example as discussed above.

[0035] Flexible base assembly 26 has walls 27 and 28, which are conveniently formed from woven fabric e. g. woven polypropylene. Walls 27 and 28 have eyelets 29 for attachment of flexible base assembly 26 to FIBC 20 using securement ties 25. Bottom panel 30 of flexible base assembly 26 has external sleeves 31 which contain fork guides. Such sleeves and fork guides have been described above with respect to the embodiment shown in Fig.s 1 and 2.

[0036] The embodiment of Fig. 3 shows a removable base assembly. The base assembly could be attached to FIBC 20 prior to filling of the latter, or at any time thereafter to enable a fork lift to move the filled flexible intermediate bulk container. After use, the base assembly may be removed e.g. for storage for future use or for return with empty FIBCs when the latter are returned for filling.

[0037] The flexible base assembly may be provided with an opening, especially a closable opening, for discharge of contents of the FIBC, or the flexible base assembly could be removed prior to discharge of contents of the FIBC. Any opening in the flexible base assembly would be cooperatively located with respect to the discharge spout of the FIBC.

[0038] A water-proof lining may be provided within the flexible base assembly.

[0039] To further illustrate the embodiment shown in Fig. 3, the FIBC may have a width of about 40 inches (100 cm) and a height of about 48 inches (120 cm). The fork guides may be 5-8 inches in width (12.5-20 cm). The height of the flexible base assembly may be 2-4 inches (5-10 cm). It will be appreciated that other appropriate dimensions may be used.

[0040] Materials for the construction of FIBCs are known, and include coated woven materials. The sleeves attached to the end of the FIBC could be formed from similar material, un-coated woven material or other materials with sufficient tear and tensile strength. In particular embodiments of the invention, the flexible sheet used to form the FIBC and/or flexible base assembly may be woven or non-woven polypropylene or polyethylene materials.

[0041] The walls of the FIBC may have a variety of constructions, as is known in the art. In particular, the walls could be in the form of a four-sided baffle bag, a U-shaped bag or a circular bag. Other shaped bags could also be used. In embodiments, the FIBC has internal baffles, to facilitate filling and discharge of contents from the FIBC. In other embodiments, the FIBC does not have such baffles.

[0042] The present invention has been particularly described herein with reference to a FIBC having a discharge spout in the second (bottom) end. It is to be understood that a discharge spout is not essential. The FIBC could have no discharge spout, with other means being used to empty the FIBC. Alternatively, the FIBC could have a porthole/cover construction of an outlet for discharge of the contents of the FIBC, or other types of discharge outlets.

[0043] The present invention has also been particularly described herein with reference to a FIBC having a filling spout. It is to be understood that a filling spout is not essential and that the FIBC could have other means for the filling of the FIBC. In embodiments, the FIBC could have a duffle construction or a plain top, or other types of construction suitable for filling the FIBC.

[0044] The present invention has been particularly described herein with respect to the FIBC having a first end and a second end. The second end is formed from a sheet, especially a flexible sheet, which may have a discharge spout. The first end may also be formed from a sheet, especially a flexible sheet, but in some constructions defined herein the first end may have other forms e.g. in a duffle construction.

[0045] The present invention has been particularly described with reference to the use of two sleeves to accommodate the forks of a fork lift. Although two sleeves are preferred, it is understood that the two sleeves could be combined to a single sleeve that accommodate both forks of a fork lift.

[0046] The present invention provides FIBCs that may be moved using a fork lift, and contents discharged therefrom, without requiring use of a separate pallet and/or use of a crane or other lifting device.

Claims

1. A flexible intermediate bulk container comprising walls of flexible sheet, a first end and a second end, at least said second end being enclosed with a sheet, said second end having at least one sleeve formed from flexible sheet and cooperatively disposed to accommodate the respective forks of a fork lift, said at least one sleeve being external to the flexible intermediate bulk container.

2. The flexible intermediate bulk container of Claim 1 in which said second end has two parallel sleeves cooperatively disposed in a spaced apart relationship to accommodate said respective forks of the

fork lift.

3. The flexible intermediate bulk container of Claim 1 or Claim 2 in which the second end is a flexible sheet.

4. The flexible intermediate bulk container of any one of Claims 1-3 in which said first end has means for filling the container.

5. The flexible intermediate bulk container of Claim 4 in which the means to fill the container is a filling spout.

6. The flexible intermediate bulk container of any one of Claims 1-5 in which the second end has a discharge spout therein..

7. The flexible intermediate bulk container of Claim 6 in which a cover sheet extends over the discharge spout.

8. The flexible intermediate bulk container of Claim 6 in which the cover sheet extends over said sleeves.

9. The flexible intermediate bulk container of any one of Claims 1-8 in which the sleeves are of elongated rectangular cross-section.

10. The flexible intermediate bulk container of any one of Claims 1-8 in which the sleeves extend substantially for the depth of the flexible intermediate bulk container.

11. The flexible intermediate bulk container of any one of Claims 1-10 in which the walls of flexible sheet have a plurality of hoops extended to the container and adjacent to the first end.

12. A flexible intermediate bulk container comprising walls of flexible sheet, a first end and a second end, at least said second end being enclosed with a sheet, said second end having at least one sleeve formed from flexible sheet and external to the flexible intermediate bulk container, each of said sleeves having therein a removable fork guide formed from a solid material, said sleeves and removable fork guides being cooperatively disposed to accommodate the respective forks of a fork lift.

13. The flexible intermediate bulk container of Claim 12 in which said second end has two parallel sleeves cooperatively disposed in a spaced apart relationship to accommodate said respective forks of the fork lift.

14. The flexible intermediate bulk container of Claim 12 or Claim 13 in which the second end is a flexible sheet.

15. The flexible intermediate bulk container of any one of Claims 12-14 in which first end has means for filling the container.

16. The flexible intermediate bulk container of any one of Claims 12-15 in which the means to fill the container is a filling spout.

17. The flexible intermediate bulk container of any one of Claims 12-16 in which the second end has a discharge spout therein.

18. The flexible intermediate bulk container of Claim 17 in which a cover sheet extends over the discharge spout.

19. The flexible intermediate bulk container of Claim 18 in which the cover sheet extends over said sleeves.

20. The flexible intermediate bulk container of any one of Claims 12-19 in which the sleeves are of elongated rectangular cross-section.

21. The flexible intermediate bulk container of any one of Claims 12-20 in which the sleeves extend substantially for the depth of the flexible intermediate bulk container.

22. The flexible intermediate bulk container of any one of Claims 12-20 in which the walls of flexible sheet have a plurality of hoops extended to the container and adjacent to the first end.

23. The flexible intermediate bulk container of any one of Claims 12-22 in which the solid material of the fork guide is wood, cardboard, plastic or metal.

24. The flexible intermediate bulk container of any one of Claims 12-23 in which the removable fork guide is releasably retained in the sleeve.

25. A flexible intermediate bulk container comprising walls of flexible sheet, a first end and a second end, at least said second end being enclosed with a sheet, said second end being enclosed in and secured to a removable flexible base assembly, said flexible base assembly accommodating said flexible intermediate bulk container and having therein at least one external sleeve disposed at said second end, said external sleeve being formed from flexible sheet and cooperatively disposed to accommodate the respective forks of a fort lift.

26. The flexible intermediate bulk container of Claim 25 in which said flexible base assembly has two parallel sleeves cooperatively disposed in a spaced

apart relationship to accommodate said respective forks of the fork lift.

27. The flexible intermediate bulk container of Claim 25 or Claim 26 in which the sleeves are of elongated rectangular cross-section.

28. The flexible intermediate bulk container of any one of Claims 25-27 in which the sleeves extend substantially for the depth of the flexible intermediate bulk container.

29. A flexible base assembly for a flexible intermediate bulk container comprising a base and side walls, means to attach said base assembly to a flexible intermediate bulk container, said base assembly having at least one external sleeve formed from flexible sheet and cooperatively disposed to accommodate the respective forks of a fork lift.

30. The flexible base assembly of Claim 29 in which said flexible base assembly has two parallel sleeves cooperatively disposed in a spaced apart relationship to accommodate said respective forks of the fork lift.

31. The flexible base assembly of Claim 29 or Claim 30 in which the sleeves are of elongated rectangular cross-section.

32. The flexible base assembly of any one of Claims 29-31 in which the sleeves extend substantially for the depth of the flexible intermediate bulk container.

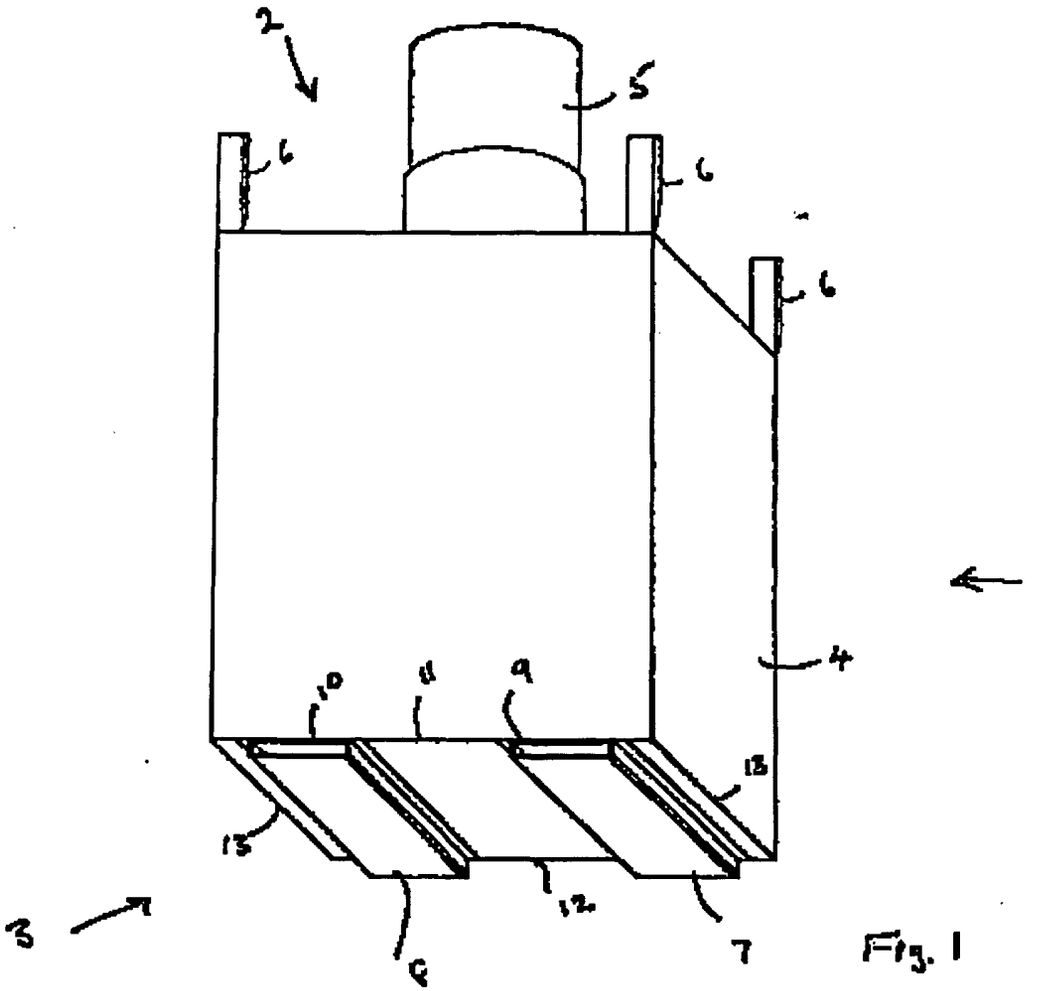

Fig. 1

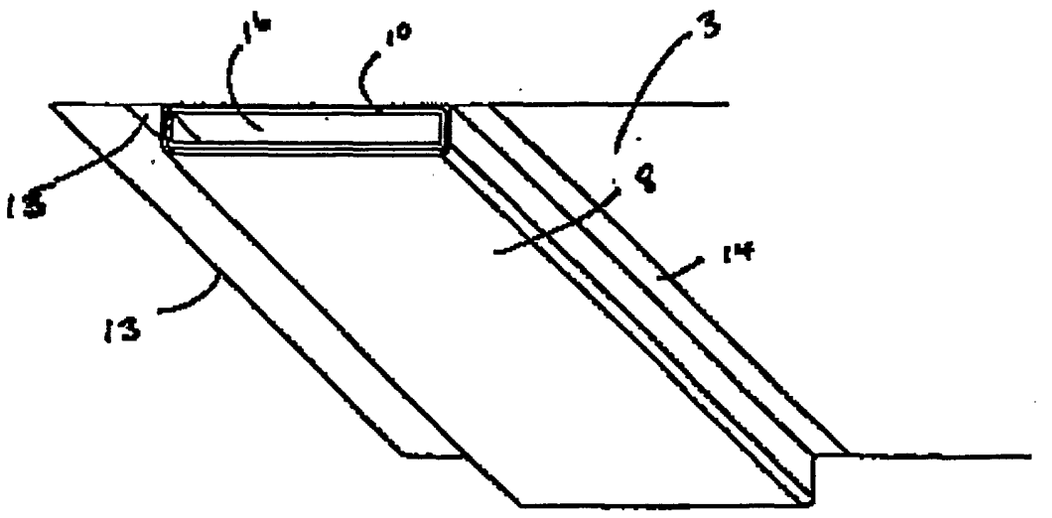

Fig. 2

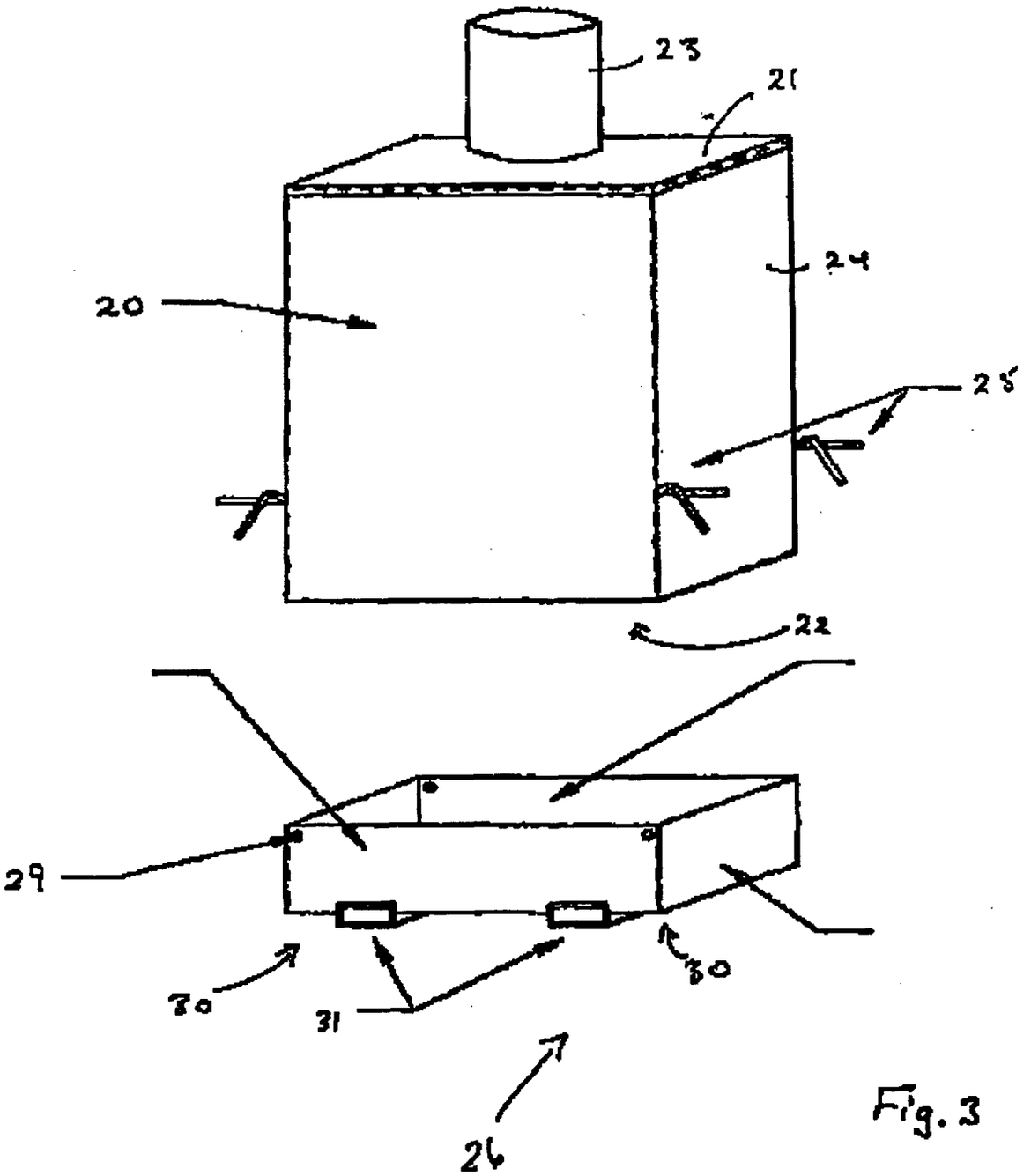

Fig. 3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	29 August 2001	Van Rolleghem, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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