

(19)



(11)

EP 4 825 753 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
21.10.2026 Bulletin 2026/43

(51) International Patent Classification (IPC):
B65D 88/16 ^(2006.01) **B65B 67/12** ^(2006.01)
B66C 1/22 ^(2006.01)

(21) Application number: **26172838.0**

(52) Cooperative Patent Classification (CPC):
B65D 88/1681; B65B 67/1227; B65B 67/1233;
B66C 1/226

(22) Date of filing: **16.04.2026**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH LA MA MD TN

(71) Applicant: **Logac AB**
164 40 Stockholm (SE)

(72) Inventor: **KLINGENSTIERNA, Jonas**
386 33 Färjestaden (SE)

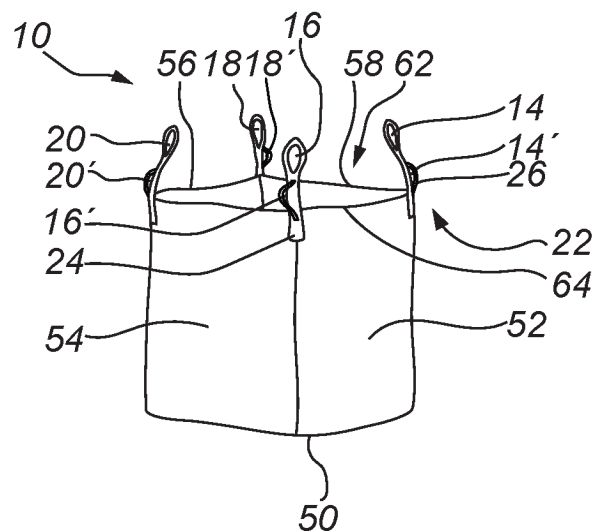
(74) Representative: **Öberg & Sjöberg AB**
Hamnallén 84
234 40 Lomma (SE)

(30) Priority: **17.04.2025 SE 2550373**

(54) FLEXIBLE INTERMEDIATE BULK CONTAINER AND SUPPORT

(57) A Flexible Intermediate Bulk Container (FIBC), wherein the FIBC has an expanded shape, and an upper rim that has four corners, or cross-corners, in the expanded shape,
- four strap arrangements, individually arranged at, and extending from, the corners, wherein each strap ar-

rangment forms a first loop and a second loop, the first loop is configured to carry the FIBC when filled and lifted, and the second loop is configured to be connected to a support, and support the FIBC in the expanded shape, when connected to the support.

**Fig. 1A**

Description

Technical field

[0001] The proposed technology relates generally to the field of Flexible Intermediate Bulk Containers (FIBC).

Background

[0002] Flexible Intermediate Bulk Containers (FIBC), also referred to as jumbo, bulk bag, big bag, super sack or tonne bag, are containers used for packaging and transporting flowable material, such as sand, fertilizer, gravel and more.

[0003] FIBC are usually made from thin woven strands of oriented polypropylene or polyethylene plastic. This provides for a container able to be filled with material having a weight of, normally, 1 metric ton, or 1000 kg, while the weight of the container is around 2-3 kg. FIBC normally measure around 110 cm in diameter or width and varies in height from 100 cm up to 200 cm.

[0004] A FIBC can comprise a bottom, and a side wall. The side wall may be formed by four side panels connected, or joined, to the bottom. In addition, a FIBC may comprise four cross-corner lifting loops, or hooks, enabling a filled FIBC to be lifted and loaded to a vehicle for transport.

[0005] FIBC may be filled manually or assisted by a machine such as a wheel or front loader. Manual filling is performed by a person, equipped with a spade or a shovel, removing material from a pile of material and depositing the material into the FIBC. Manual filling is time consuming.

[0006] Filling of FIBC assisted by machine is usually performed at a filling station. The filling station comprises means for mounting the FIBC by the lifting loops, or hooks, hanging under a funnel or a hopper. The hopper is activated, or the bottom of the funnel is opened, to allow for material from the hopper or funnel to flow into the FIBC. A problem with this solution is that FIBC are filled one-by-one. In addition, the material must be transported from the pile to the filling station, and dumped, or tipped, into the funnel.

[0007] A solution to this problem is disclosed in US 5 004 022, in the form of a filling implement for a wheel loader wherein the bucket in the bottom comprises a funnel and an opening as well as means for attaching the lifting loops of a FIBC directly under the opening. After filling the bucket with material, the bucket is raised and the material in the bucket flows through the funnel and out the opening and deposits in the FIBC. A problem with this solution is that only one FIBC may be filled at a time as well as the high investment costs for acquiring the filling implement. A further problem is that the filling implement is tailored around the design of the FIBC and in particular the lifting loops of the FIBC. FIBC with other kinds of lifting loops require modifica-

tions to the filling implement for use with the above filling implement.

[0008] Accordingly, there is a need for an improved FIBC that allows the FIBC to be filled without the need for a costly filling implement. There is also a need to improve the filling of FIBC that simplifies both filling and handling of FIBC after the FIBC has been filled.

Object

[0009] The proposed technology aims at obviating the aforementioned disadvantages and failings of previously known devices, methods and systems for filling a plurality of FIBCs.

Summary

[0010] The object is attained by means of a Flexible Intermediate Bulk Container (FIBC) and a support for the FIBC, having the features defined in the independent claims. Preferred embodiments of the proposed technology are further defined in the dependent claims.

[0011] According to a first aspect of the proposed technology, a Flexible Intermediate Bulk Container (FIBC) is provided, wherein the FIBC has an expanded shape, and an upper rim that has, or forms, four corners, or cross-corners, in the expanded shape,

- four strap arrangements, individually arranged at, and extending from, the corners of the FIBC,

wherein each strap arrangement forms a first loop and a second loop, the first loop is a lifting loop configured to carry the FIBC when filled and lifted, and the second loop is a supporting loop configured to be connected to a support, and support the FIBC in the expanded shape, when connected to the support.

[0012] According to a second aspect of the proposed technology, a system is provided, that comprises

- the Flexible Intermediate Bulk Container (FIBC) of the first aspect, and
- a support structure that supports the FIBC in the expanded shape, wherein the FIBC is positioned in an upright position, relative to a horizontal surface with the FIBC resting on the horizontal surface, and

wherein the support structure has a plurality of loop holders attached to the support structure, arranged to fix, or lock, the second loops of the strap arrangements, to the support structure, wherein the loop holders individually biases the second loops of each strap arrangement apart from one another, or each other, to arrange the FIBC in the expanded shape.

[0013] Having each strap arrangement form the first

loop and the second loop, wherein the first loop is configured to carry the FIBC when filled and lifted, and the second loop is configured to be connected to a support, and support the FIBC in the expanded shape, when connected to the support, allows for different designs of the first loops and second loops. The first loops are configured to carry the weight of the filled FIBC, or be lifting loops, whereas the second loops are configured to temporarily mount, or fix, the FIBC to a support during filling of the FIBC. The requirement for strength of the second loops may be substantially lower than the requirements for strength of the first loops.

[0014] It is understood that a load path is the path, or route, that an applied force follows through a structure from the applied force to an object the structure is connected to, or attached to. It is further understood that the load path is the path the applied load follows through the respective loops to the FIBC. It is understood that a lifting load is a tensile force, or tensile load, applied to the first loop when the FIBC is lifted. It is further understood that a supporting load is a tensile force, or tensile load, applied to the second loop, when the FIBC is supported, such as supported by the support.

[0015] It is also understood that a loop is flexible such that when a tensile force, or tensile load, is applied to a loop the loop experiences tension and extends away from the FIBC.

[0016] The first loop may be configured to, or arranged to, transmit a lifting load to the FIBC along a first load path, and the second loop may be configured to, or arranged to, transmit a supporting load to the FIBC along a second load path, wherein the first load path is different from the second load path, such that loads applied to the first loop are not transmitted along, or via, the second load path.

[0017] It is specified above that the second load path is different from the first load path. The second load path may be separate, or distinct, from the first load path. The first load path may be distinct from and independent of the second load path.

[0018] The first load path and the second load path may be different, such that a load applied to the first loop is not transmitted along the second load path. The first loop may define the first load path. The first load path may extend between, or transmit load between, a point where the lifting load is applied to, or engages, the first loop and the FIBC. The second loop may define the second load path. The second load path may be extend between, or transmit load between, a point where the supporting load is applied to, or engages, the second loop and the FIBC.

[0019] It follows that different load paths mean that the first loop and the second loop may be designed to support different load scenarios, or support different load-bearing capacities. Each of the first loop and the second loop may thus be formed by different material or have different mechanical structures as will be

further discussed below.

[0020] The first loop may have a higher, or greater, load-bearing capacity than the second loop. Worded differently, the first loops may be configured to support greater force transmission via the first load path than the second loop via the second load path. The second loop may have a lower, or lesser, load-bearing capacity than the first loop. Worded differently, the second loops may be configured to support lesser force transmission via the second load path than the first loop via the first load path. The second loop may have a load-bearing capacity selected such that upon application of a lifting load to the second loop, failure of the second loop occurs before the lifting load needed to lift the FIBC is transmitted to the FIBC. This prevents lifting a filled FIBC using the second loops. This further protects against improper use of the second loops as lifting loops.

[0021] In one alternative, the first loop has, or is configured to have, a load-bearing capacity that is a factor 10 greater than the load-bearing capacity of the second loop. In a further alternative, the first loop has, or configured to have, a load-bearing capacity that is a factor 5-15 times greater than the load-bearing capacity of the second loop. For example, when the load-bearing capacity of the first loop is 250 kg, the load-bearing capacity of the second loop is about 15-50 kg. The second loop may thereby have a lower load-bearing capacity than the first loop such that, upon application of a lifting load to the second loop, failure occurs before the lifting load is transmitted to the FIBC.

[0022] The Flexible Intermediate Bulk Container (FIBC) may comprise a bottom, or bottom panel, and a wall. The bottom and the wall may be connected to form a holding space, or a bag. It is understood that the holding space may be filled with and hold material, such as flowable material. The FIBC and the holding space of the FIBC is configured to hold material. It is understood that the filled FIBC may be self-supporting after being filled. This means that the FIBC does not collapse when filled and not connected to the support structure. The holding space may be configured to, or may be able to contain flowable material, of at least 0.8 cubic meters, more preferably at least 1 cubic meter. The FIBC may be filled with material having a weight of, normally, 1 metric ton, or 1000 kg, while the weight of the container is around 2-3 kg. FIBC normally measures around 110 cm in diameter, or width, and varies in height from 100 cm up to 200 cm. Depending on the material used for the FIBC, more than 1000kg, such as up to 1600 kg may be contained or held in the FIBC. The holding space may hold up to 1 cubic meter of material, or may define a volume of up to 1 cubic meter.

[0023] It is understood that the wall of the FIBC may be circumferential, or annular. The wall may form an opening. The wall may form an upper rim at the opening. Worded differently, the wall may form the rim that defines the opening to the holding space. It is under-

stood that the opening may provide access to the holding space of the FIBC.

[0024] It is specified above that the FIBC may comprise the bottom, or bottom panel, and the wall. The wall of the FIBC may be composed of four side panels joined together. The FIBC may be a four-panel FIBC. Each side panel may face in different direction. Worded differently, each side panel may have an outer surface, that faces in a different direction. The outer surface may be opposite an inner surface, wherein the inner surface forms part of, and faces, the holding space. The side panels may have the same height relative to the bottom panel, or the horizontal surface, the FIBC rests on. The side panels and the bottom may outline, or define, a cuboid when the FIBC is arranged in the expanded shape.

[0025] The FIBC may have an expanded shape. The expanded shape may be an expanded state of the FIBC. The expanded shape may correspond to the shape of the FIBC when the FIBC holds flowable material. In the expanded shape, the FIBC may have, or define, four corners, or cross-corners at the upper rim of the FIBC. The expanded shape may be a shape wherein each of the four corners is biased apart from one another, or each other. The four corners may define a rectangle, such as a square. Worded differently, in the expanded shape, the four corners may define a rectangular opening of the upper rim of the FIBC.

[0026] Each of the four corners may have a strap arrangement. Worded differently, the FIBC may have four strap arrangements, wherein each strap arrangement may be arranged at, or attached to the FIBC, at the corner of the FIBC. This means that each strap arrangement is connected to, or attached to, the FIBC at least at the corner of the FIBC. It is further specified above that the FIBC may comprise a bottom, or bottom panel, and a wall, and that the wall of the FIBC may be composed of four side panels. Each strap arrangement may be connected to, or attached to, the FIBC at, or along, the wall of the FIBC, such as at, or along, a respective side panel of the FIBC. Each strap arrangement may be connected to two adjacent walls, or outer surfaces of the walls, at the corner of the FIBC.

[0027] Each strap arrangement may form, or have, or comprise, the first loop and the second loop. Worded differently, each strap arrangement may have the first loop and the second loop. The first loop and the second loop may be attached to the bag at the corner of the FIBC. Worded differently, the first loop and the second loop may be attached to, or connected to, the upper rim at the corner of the FIBC. It is specified above that in the expanded shape, the FIBC may have, or define, four corners, or cross-corners at the upper rim of the FIBC. The expanded shape may be a shape wherein each of the four corners is biased apart from one another, or each other, by a biasing of the second loop of each strap arrangement. Worded differently, the second loop of each strap arrangement may be biased

apart to define, or arrange, the FIBC in the expanded shape.

[0028] It is further understood that the bottom panel may be configured to, or intended to, rest on the horizontal surface. Worded differently, in the expanded shape, the bottom panel of the FIBC, may rest on, or be supported by, the horizontal surface. Worded differently, in the expanded shape, the bottom panel of the FIBC, may rest on the horizontal surface and the four corners may be biased apart from one another, at a diagonal outward biasing of the four corners. This means that the bottom panel contacts, and rests on the horizontal surface and that the four corners may be biased apart from one another, or each other, by a diagonal outward biasing of the second loops of the four strap arrangements.

[0029] The four strap arrangements, may be individually arranged at, and extending from, the corners of the FIBC. Worded differently, the first loops and the second loops of the strap arrangements may be arranged at, or attached to, and extend from a respective corner of the FIBC.

[0030] It is specified above that each strap arrangement may form, or have, or comprise, the first loop and the second loop. The first loop may be configured to carry the FIBC when filled and lifted. The first loop may be a lifting loop. The four first loops of the strap arrangements may be configured to carry the weight of the filled FIBC when lifted. Each first loop may be configured to carry at least a fourth of the weight of the filled FIBC. For example, when the FIBC is filled and carries a load of 1000 kg, each first loop may be configured to carry at least 250 kg. Worded differently, each first loop may carry a tensile load of at least 2500 N.

[0031] It is specified above that the expanded shape may be a shape wherein each of the four corners is biased apart from one another, or each other. In the expanded shape, the four corners may be biased apart from one another, at a diagonal outward biasing of the first loops of the four strap arrangements. Preferably, in the expanded shape, the four corners may be biased apart from one another, at a diagonal outward biasing of the second loops of the four strap arrangements.

[0032] It is specified above that each strap arrangement may form, or have, or comprise, the first loop and the second loop. The second loop may be configured to be connected to the support structure, and support the FIBC in the expanded shape, when connected to the support structure. Worded differently, the FIBC may be connected to the support structure via the four second loops of the strap arrangements, and each second loop may be configured to, or arranged to, support the FIBC in the expanded shape. The second loop may be a support, or filling, loop, configured to, or arranged to, connect the FIBC to the support structure, and arrange the FIBC in the expanded shape to support filling of the FIBC. It is further understood that the second loop is

not configured to, or arranged to, be lifted when the FIBC is filled. Worded differently, the second loops may have a tensile strength below the tensile strength of the first loops, or the tensile strength required to support or lift the filled FIBC. Worded yet differently, the first loop may have a higher, or greater, load-bearing capacity than the second loop.

[0033] It is specified above that the expanded shape may be a shape wherein each of the four corners is biased apart from one another, or each other. Preferably, in the expanded shape, the four corners may be biased apart from one another, at a diagonal outward biasing of the second loops of the four strap arrangements.

[0034] It is specified above that each strap arrangement may form, or have, or comprise, the first loop and the second loop.

[0035] The first loop may have a proximal end and distal end. The proximal end may be closer to the corner of the FIBC than the distal end. The second loop may have a distal end and a proximal end. The distal end of the second loop may be closer to the corner of the FIBC than the distal end.

[0036] The proximal end of the first loop may be located at the corner of the FIBC. Worded differently, the first loop may be connected to, or fixed to, or attached to, the FIBC at the corner of the FIBC. The proximal end of the second loop may be located at the corner of the FIBC. Worded differently, the second loop may be connected to, or fixed to, or attached to, the FIBC at the corner of the FIBC.

[0037] The second loop may be formed as an inner loop relative to the first loop. Worded differently, when the first loop and the second loop are subjected to tensile loading, a distal portion, or the distal end, of the first loop may be located farther from the corner of the FIBC than a distal portion, or the distal end, of the second loop. This means that the distal end of the first loop may extend farther away from the FIBC than the distal end of the second loop, when a tensile forces act, or pulls, on the respective first loop and second loop. Worded differently, the first loop may extend outwardly from the corner of the FIBC to a greater extent than the second loop when both are subjected to tensile loading, or both are being pulled. This reduces the risk that the second loops are used for lifting a filled FIBC as connecting the second loops to a single lifting eye, or lifting hook, may be impossible. The first loop thereby may define a primary lifting interface, and the second loop may remain closer to the corner of the FIBC.

[0038] The first loop may have, or define, a length and the second loop may have, or define, a length, wherein the length of the first loop may be greater than the length of the second loop. Worded differently, the first loop may have a length when the first loop is engaged and the FIBC is lifted, and the second loop may have a length when connected to the support, wherein the length of the first loop is greater than the length of

the second loop. When the second loop is engaged and connected to the support structure, the support structure via the loop holder may bias the second loop outwardly from the corner of the FIBC. Worded differently, when the second loop is connected to the support structure, the second loop may be pulled, or biased, outwardly and stretched, and have a length, measured from the tip of the second loop to the corner of the FIBCs. In the same manner, when the first loop is lifted, the first loop may be pulled, or biased, outwardly and stretched, and have a length, measured from the tip of the first loop to the corner of the FIBCs, the length of the first loop may be greater than the length of the second loop.

[0039] It is specified above that the second loop may have a length. It is understood that the length of the second loop may be less than the length of the first loop. This has the effect that a single lifting hook may be unable to connect, or engage, the second loops of the loop arrangements for lifting the FIBC via the second loops, when the FIBC is filled. This increases safety since it is not possible to lift the filled FIBC via the second loops.

[0040] The length of the second loop may be less than 50% of the length of the first loop. For example, the length of the second loop may be 10%-50% of the length of the first loop, more preferably, 10% to 30% of the length of the first loop.

[0041] It is specified above that the first loop may have, or define, a length and the second loop may have, or define, a length, wherein the length of the first loop may be greater than the length of the second loop. Worded differently, an opening defined by the first loop may be greater, or larger, than an opening defined by the second loop. The first loop may thus define an opening having a greater enclosed area than that of the second loop.

[0042] It is specified above that the strap arrangement may form, or comprise, or have, the first loop and the second loop. The strap arrangement may comprise a joint strap, or first strap, and the first loop and the second loop may be formed by the joint strap. Worded differently, the strap arrangement may comprise the joint strap, and the joint strap may form the first loop and the second loop. This means that the strap arrangement only comprises one strap, that forms the first loop and the second loop. The joint strap may have a length, or longitudinal length, a width and a thickness. The width may be transverse to the length of the joint strap. Alternatively, the joint strap may define a diameter, transverse to the length of the joint strap. The thickness may be transverse to both the length and the width, or diameter, of the joint strap.

[0043] The joint strap may have a first end and a second end. The first end may be joined to, or attached to, the FIBC at the corner of the FIBC. Worded differently, the first end may be connected to the FIBC at the corner of the FIBC. The second end may be joined to,

or attached to, the FIBC at the same corner of the FIBC. Worded differently, the second end may be connected to the FIBC at the same corner of the FIBC.

[0044] The first load path of the first loop may transfer tensile forces, or pulling forces, to the corner of the FIBC, wherein the joint strap is joined to, or attached to, the FIBC. Alternatively, the first end and the second end may be joined to, or attached to, the FIBC at the rim of the FIBC between the corners of the FIBC. This means that the first end and the second end are not attached to the FIBC at the corner of the FIBC.

[0045] The first end of the joint strap may be joined to, or attached to, or connected to, the second end of the joint strap, at the corner of the FIBC. This means that the first end may be connected to, or joined to, the second end, at the corner of the FIBC. The first end may overlap the second end, at the corner of the FIBC. Worded differently, the joint strap may overlap at the corner of the FIBC. In one example, the first end of the joint strap is fixed to the second end at the corner of the FIBC. The first end of the joint strap may be connected to the second end of the FIBC and form a strap fixation joint. The strap fixation joint may be connected to the FIBC. This means that the joint strap is fixedly connected to the FIBC via the strap fixation joint.

[0046] The joint strap may extend, or protrude, from the corners of the FIBC. The joint strap may be separate from, or be a separate part from, the sides of the FIBC, and the joint strap may be attached, such as sewn, to the sides, or corners of the FIBC. It is understood that the joint strap may have a length, in the range of 0.3 m to 1 m, such as 0.5 m to 0.7 m.

[0047] It is specified above that the first loop is configured to transmit a lifting load to the FIBC along, or via, a first load path, and the second loop is configured to transmit a supporting load to the FIBC along, or via, a second load path, wherein the first load path is different from the second load path. It is also specified above that the strap arrangement may comprise a joint strap, or first strap, and the first loop and the second loop may be formed by the joint, or first, strap.

[0048] It is also specified above that each strap arrangement may be arranged at, or attached to the FIBC, at the corner of the FIBC. The first loop and the second loop may be structurally interconnected. The first loop and the second loop may be structurally interconnected to fixate the relative position of the first loop and the second loop.

[0049] For example, the joint strap may be joined to, or connected to, itself, to form the first loop and the second loop. This means that one strap forms the first loop and the second loop. Worded differently, the joint strap may be joined, or connected, to itself, to form a first connection point of the joint strap, that defines, or separates the joint strap into, the first loop and the second loop. It is understood that the first connection point may be separate from, or distinct from, the attachment of the joint, or first, strap, or the strap arrangement to

the FIBC. The first connection point may form the connection between a first portion, or first element, or first part, of the joint, strap and a second portion, or second element, of the joint strap. The joint strap may overlap itself at the first connection point. It is understood that the first connection point may be a connection region of the joint, or first, strap. The first connection point may be located between the distal end of the first loop and the FIBC, or the corner of the FIBC where the joint strap is connected to the FIBC. The first connection point may form the proximal end of the first loop. Each strap arrangement may thus comprise one or more straps that form the first loop and the second loop, and the one or more straps may be connected at the first connection point, to fixate the relative position of the first loop and the second loop, and the first connection point may be located between the proximal end and the distal end of the first loop. This means that the first connection point is separate from, or located away from the corner of the FIBC.

[0050] The first loop and the second loop may thereby be structurally connected independently of the attachment of the joint, or first, strap to the FIBC, or the attachment of the strap arrangement to the FIBC.

[0051] The first connection point may form part of the second load path. This means that when the second loop is subjected to the supporting load, tension, or tensile force, is applied to the first connection point. Worded differently, applying the supporting load to the second loop thereby applies a tensile load on the first connection point, wherein the tensile load may act to pull the joint, or first, strap apart from itself at the first connection point, or break the connection formed by the first connection point. Thereby, when the second loop is engaged by the supporting load the first connection point may experience tensile force that pulls the first connection point apart, or the one or more straps that is, or are, joined at the first connection point apart.

[0052] The first connection point may be, or form, a load bearing part of the second loop and not the first loop. This means that a lifting load on the first loop is substantially, or completely, transmitted to the FIBC by the first loop and via, or along, the first load path. This also means that the lifting load applied to the first loop is not transmitted via the first connection point. Thereby the first connection point does not need to be dimensioned to support lifting loads.

[0053] The load-bearing capacity of the first connection point and/or the second loop may be lower than the load-bearing capacity of the first loop.

[0054] Each strap arrangement may comprise one or more straps that form the first loop and the second loop, and the one or more straps may be connected at the first connection point, to fixate the relative position of the first loop and the second loop. The one or more straps may thus be connected at the first connection point such that relative movement between the first loop and the second loop is restricted. Thereby relative

movement of the first loop with respect to the second loop under load may be prevented. The first connection point may thus maintain a fixed positional relationship between the first loop and the second loop. This also means that the first loop and the second loop do not form a chain, or link, of loops. Instead, the first loop and the second loop may form a structurally fixed dual-loop system. The first connection point may form part of the second load path and not the first load path.

[0055] A first section of the joint strap may extend from the first connection point and form the first loop. Worded differently, the first section of the joint strap may extend between the first connection point, and form the first loop. A second section of the joint strap may extend between the corner of the FIBC and the first connection point, and a third section of the joint strap may extend between the corner of the FIBC and the first connection point, and the second section and the third section may together form the second loop. Worded differently, the second loop may be formed between the corner of the FIBC and the connection point. This also means that the first loop extends further from the FIBC relative to the second loop, when the joint strap is pulled via the first loop, such as when the FIBC is lifted.

[0056] It is specified above that the joint strap may be joined, or connected, to itself, to form the first connection point of the joint strap, that defines, or separates the joint strap into, the first loop and the second loop. This means the joint strap is permanently connected to itself at the first connection point. Worded differently, the fixed connection at the first connection point is not a releasable connection. Alternatively, the first connection point may be a temporary connection point. It is understood that a temporary connection point may be removed or released, and that when the temporary connection point is removed or released, the first loop and the second loop form a single loop.

[0057] The first connection point may be a single connection point. Alternatively, the first connection point may be an extended connection point, or connection joint. This means that the first connection point extends across at least the full width of the joint strap, or that the first connection point may extend along the joint strap a distance corresponding to, or equal to, the width of the joint strap.

[0058] The first connection point may extend, transverse relative to the longitudinal extension of the joint strap, or in a width direction of the joint strap. Alternatively, the extended connection point may extend along the longitudinal extension direction of the joint strap, or along the joint strap. The first connection point may extend at least 30-100% of the width of the joint strap. Preferably, the joint strap, may have a width, transverse to a longitudinal extension of the joint strap, and the connection point may extend at least half of the width of the joint strap. Alternatively, the connection joint extends across the whole, or full, width of the joint strap.

[0059] The connection between the joint strap, or the connection point, may be formed by constructive stitches. Worded differently, the at least one connection point may form a seam formed by constructive stitches. Alternatively, the connection between the joint strap, or the first connection point, may be formed by an adhesive, or form an adhesive seam. Worded differently, the first connection point may be adhesive connection point. Worded differently, the joint strap may be joined, or connected, to itself in at least the first connection point, by an adhesive.

[0060] It is specified above that the second loop may be configured to be connected to a support, and support the FIBC in the expanded shape, when connected to the support. The second loop may form a loop that supports the FIBC when the FIBC is mounted to, or connected to, the support. It is also specified above that the first connection point may be a temporary connection point. In one alternative, the first connection point may be formed by a clip, or clamp, that clamps, the joint strap at the connection point, and forms the first connection point. When the FIBC has been filled the clip, or clamp, may be removed and reused.

[0061] The first connection point may be a sacrificial connection point. This means that the first connection point is arranged to, or configured to, break after filling of the FIBC. For example, the first connection point may be arranged to, or configured to, break when the filled FIBC is lifted by the first loop. This means that the first connection point is designed to mount the FIBC to the support to allow for filling of the FIBC.

[0062] The first connection point may be load-bearing capacity limiting for the second loop and the second load path. Worded differently, since the first connection point forms a load bearing part of the second loop and not of the first loop, or forms part of the second load path, the first connection point may be designed to be the weakest point of the second load path. This means that the first connection point can be configured to break when experiencing loads above a predetermined load threshold.

[0063] It is specified above that the connection between the joint strap, or the first connection point, may be formed by constructive stitches or by adhesive. The constructive stitches may be chain stitches. It is understood that chain stitches may be used as temporary stitches to for example close of bags filled with material, such as flour. The constructive stitches may be configured to, or arranged to, be removed by pulling at a thread of the stitches. This enables simple removal of the filled FIBC from the support.

[0064] The adhesive may be a melt adhesive, or a thermosetting adhesive. The adhesive may be configured to break when the filled FIBC is lifted by the first loops. The amount, or type of, adhesive may be selected to permit the FIBC to be mounted to the support via the second loops, and to break when the filled FIBC is lifted via the first loops.

[0065] It is specified above that the joint strap may be joined, or connected, to itself, to form the first connection point of the joint strap, that defines, or separates the joint strap into, the first loop and the second loop. It is also specified above that the first loop may have, or define, a length and the second loop may have, or define, a length, wherein the length of the first loop may be greater than the length of the second loop. It is understood that the first connection point may divide the joint strap into the first loop and the second loop and that the length of the first loop, or the size of the opening formed by the first loop, is greater than the length of the second loop, or the size of the opening formed by the second loop.

[0066] The joint strap may be a woven strap. Worded differently, the joint strap may comprise woven strands of oriented polypropylene. The joint strap may be a coated strap or the joint strap may be uncoated. For example the joint strap may be coated to resist UV-radiation.

[0067] It is specified above that the strap arrangement may comprise a joint, or first, strap, and the first loop and the second loop may be formed by the joint strap. Alternatively, the strap arrangement may comprise a joint, or first, strap, and an additional strap, or second strap, wherein the second, strap is connected to the joint strap at the first connection point, and the joint strap and the additional strap, or second strap, jointly forms the second loop. Worded differently, the strap arrangement may comprise the joint strap and an additional, or second, strap. Each strap arrangement may comprise, or have, joint, or first, strap and an additional, or second, strap. This means that the FIBC may have four joint straps and four additional straps.

[0068] The two straps, or the joint strap and the additional strap, that form the first loop and the second loop, may thus be connected at the first connection point, to fixate the relative position of the first loop and the second loop. The first connection point may also form part of the second load path and not the first load path. In also this example the first connection point is a load bearing part of the second loop and not of the first loop.

[0069] It is specified above that the first loop may have, or define, a length and the second loop may have, or define, a length, wherein the length of the first loop may be greater than the length of the second loop. Worded differently, the additional strap may be connected to the joint strap, or first strap, at the first connection point, and the joint strap, or first strap, and the additional strap, or second strap, may jointly form the second loop, wherein the joint strap has a length that is greater than the second loop. For example, the length of the additional strap may be less than 50% of the length of the joint strap. For example, the length of the additional strap may be 10%-50% of the length of the joint strap, more preferably, 10% to 30% of the length of the joint strap.

[0070] The additional strap may be connected to the

FIBC at the corner of the FIBC. The additional strap may extend from the corner of the FIBC and be joined to the joint strap, or first strap, at the first connection point. Worded differently, the joint strap and the additional strap may together form the second loop. The first connection point may form part of the second load path. The second loop may be formed between the corner of the FIBC, wherein the joint strap and the additional strap are connected to the FIBC, and the first connection point. The joint strap may form the first loop, and the joint strap together with the additional strap may form the second loop. The first load path of the first loop may then be formed solely by the joint strap. The second load path of the second loop may then be formed by the additional strap, the first connection point and a portion of, or part of, the joint strap. The additional strap may be joined to, or connected to, the joint strap via the first connection point, and the first connection point may be the same as discussed above in relation to the first connection point wherein the joint strap is joined to, or connected to, itself.

[0071] Alternatively, the additional strap may be joined to the joint strap, or first strap, at the first connection point and at an additional, or second, connection point. Worded differently, the two straps, or the joint strap and the additional strap, that form the first loop and the second loop, may be connected at the first connection point, to fixate the relative position of the first loop and the second loop, and at the additional, or second, connection point. The first connection point and the second connection point may form part of the second load path and not the first load path. In this example the both the first connection point and the second connection point may be load bearing parts of the second loop and not of the first loop.

[0072] The additional strap may then form the second loop between the first connection point and the additional connection point together with a portion of, or part of, the joint strap. The length of the additional strap may then be defined between the first connection point and the additional connection point. The second connection point may form part of the second load path.

[0073] Each strap arrangement may thus comprise the joint strap and the additional strap that form the first loop and the second loop, wherein the two straps are connected at the first connection point and at the second connection point. The first connection point and the second connection point may fixate the relative position of the first loop and the second loop.

[0074] Alternatively, the joint strap and the additional strap may form separate loops. This means that the joint strap and the additional strap do not form a connection or are not connected in a connection point. The additional strap may have a first end and a second end. The first end and the second end may be connected to, or attached to, the corner of the FIBC. The additional strap may extend from the corner to form the second

loop. The second loop may define an opening. The opening may be configured to secure, or mount, the FIBC to a support. The opening defined by the second loop may be smaller than an opening defined by the first loop. The joint strap, or first strap, may have a length between the corner of the FIBC that is greater than the length between the corner of the FIBC of the additional strap, or second strap. Worded differently, the joint strap, or first strap, may have a length that is greater than the length of the additional strap, or second strap. It is understood that the length of the strap may be the length of the strap in a deconstructed state, or a state, before the strap is attached to the FIBC or a further strap to form the loops.

[0075] It is specified above that the strap arrangement may comprise a joint strap, or first strap, and the first loop and the second loop may be formed by the joint strap, or first strap. The joint strap, or first strap, and the additional strap, or second strap, may be parallel, or may overlap. Worded differently, the additional strap may extend, from the corner of the FIBC, parallel to the joint strap.

[0076] The additional strap may be a woven strap. Worded differently, the additional strap may comprise woven strands of oriented polypropylene. The additional strap may be a coated strap or the additional strap may be uncoated. For example the additional strap may be coated to resist UV-radiation.

[0077] It is specified above that the joint strap may have a length, or longitudinal length, a width and a thickness. The additional strap may have a length, or longitudinal length, a width and a thickness.

[0078] The length of the additional strap may be less than the length of the joint strap. The thickness of the additional strap may be less than the thickness of the joint strap. The width of the additional strap may be less than the thickness of the joint strap. Worded differently, the joint strap, may have a width, transverse to a longitudinal extension of the joint strap, and the additional strap may have a width, transverse to a longitudinal extension of the additional strap, and that is less than the width of the joint strap. This is advantageous in that the second loop formed by the additional strap is not configured to hold the load of the filled FIBC when lifted. This means that the additional strap may be manufactured to, or designed to, resist a tensile load that is less than the tensile load the joint strap is manufactured to, or designed to, resist, when the FIBC is lifted. Worded differently, the additional strap may have a tensile strength less than the tensile strength of the joint strap. In one example, the tensile strength of the additional strap may be less than half the tensile strength of the joint strap.

[0079] It is specified above that the strap arrangement may comprise a joint, or first, strap, and an additional, or second, strap, wherein the additional strap is connected to the joint strap at a first connection point, and the joint strap and the additional strap jointly forms

the second loop. It is specified above that the first connection point may be a sacrificial connection point. The additional, or second, strap, may be a sacrificial strap, configured to, or arranged to, mount the FIBC to the support structure. Worded differently, the additional strap may be arranged to, or configured to, be broken, or cut, to release the FIBC from the support structure.

[0080] The additional strap may have a width that is less than the width of the joint strap. The additional strap may have a thickness that is less than the thickness of the joint strap.

[0081] It is specified above that strap arrangement may comprise a joint, or first, strap, and an additional, or second, strap. It is understood that a strap may be a narrow, usually flat strip, or thong of a flexible material used for securing, holding together, or wrapping.

[0082] It is specified above that each strap arrangement forms a first loop and a second loop, and that the first loop is configured to carry the FIBC when filled and lifted, and the second loop is configured to be connected to a support, or support structure, or, and support the FIBC in the expanded shape, when connected to the support structure. It is also specified above that the FIBC may form part of the system that comprises the FIBC discussed above and the support structure. The support structure may support the FIBC in the expanded shape. Worded differently, the support structure may support and arrange the FIBC in the expanded shape. The expanded shape may be a state of the FIBC, wherein the FIBC is positioned in the upright position, relative to the horizontal surface with the FIBC resting on the horizontal surface. Worded differently, the FIBC may be supported by the support structure in the upright position.

[0083] It is also specified above that the expanded shape may be a shape wherein each of the four corners is biased apart from one another, or each other. The support structure may arrange and support the FIBC in the expanded shape, wherein the four corners of the FIBC are biased apart from one another, or each other.

[0084] The support structure may have a plurality of loop holders attached to the support structure, arranged to fix, or lock, the second loops of the strap arrangements of the FIBC, to the support structure. Worded differently, the plurality of loop holders may attach to a respective second loop of the FIBC and bias the four corners of the FIBC apart from one another, or each other. This means that the support structure may support the FIBC in the expanded shape, and the expanded shape may be a state of the FIBC wherein the FIBC is resting on the horizontal surface with the four corners of the FIBC apart from one another, or each other, to arrange the FIBC with the upper rim of the FIBC pulled or biased to define a rectangle. The support structure may support the FIBC during filling, by the loop holders preventing the FIBCs from collapsing, and in particular the side walls, or rim from collapsing,

and enables the FIBC to be fully filled with reduced material spillage. This enables filling of the FIBC with reduced spillage of material.

[0085] The loop holders may individually bias the second loops of each strap arrangement apart from one another, or each other, to arrange the FIBC in the expanded shape. Worded differently, the support structure may position the FIBC in the expanded shape, with the bottom of the FIBC resting on the horizontal surface. The support structure may be configured to, or arranged to, support one FIBC.

[0086] The loop holders may releasably fix, or lock, the second loops of the FIBC relative to the support structure. Worded differently, the second loops may be released from the loop holder after filling the FIBC. It is understood that a filled FIBC may be self-supporting and allow for the support structure to be removed after filling of the FIBCs. This allows the support structure to be mounted to a truck or trailer bed, during filling.

[0087] It is specified above that the expanded shape may be a state, wherein the FIBC is positioned in the upright position, relative to a horizontal surface with the FIBC resting on the horizontal surface. The support structure may rest on, or be fixedly mounted to, the horizontal surface. The horizontal surface may be the ground, or a truck or trailer bed.

[0088] The loop holders may be configured to bias the corners of the FIBC diagonally outwards in separate directions. Worded differently, the FIBC may be connected to the support structure by four loop holders, and each loop holder may bias the respective second loops in separate directions, relative to the other second loops, to define a rectangle of the FIBC, at the upper rim of the FIBC, at diagonal outward biasing of the second loops by the loop holders. The FIBC is thereby ensured to form and maintain a rectangular opening at the upper rim during filling of the FIBC and the upper rim and the sidewall, of the FIBC is prevented from collapsing during filling. For example, when each second loop is biased apart in an outwardly, X-shaped, direction to arrange the FIBC in the expanded shape, a rectangular opening of the FIBC may be formed at the upper rim. The separate directions may be opposite directions.

[0089] The support structure and the loop holders may be configured to bias the corners of each FIBC diagonally outwards in a horizontal plane. This means that the second loops of two diagonally opposite arranged strap arrangements, or strap arrangement at two opposite corners of the FIBC, may be biased outwardly in parallel and opposite directions. The horizontal plane may be parallel to the horizontal surface. Alternatively, the loop holders may be configured to bias the corners of the FIBC, diagonally outwards in both a horizontal direction and vertical direction. This means that the second loops are not biased apart only in the horizontal plane but biased apart in both a direction parallel to the horizontal plane and in a vertical direc-

tion.

[0090] It is specified above that the support structure may have a plurality of loop holders attached to the support structure, arranged to fix, or lock, the second loops of the strap arrangements, to the support structure. It is understood that the FIBC may have, or define, a first side and an opposite second side. The first side and the second side may be parallel. The plurality of loop holders may comprise first loop holders and second loop holders. The support structure may comprise a first side support positioned, or arranged to be positioned, on, or at, the first side of the FIBC, and the first loop holders may be positioned on the first side support. The support structure may comprise a second side support positioned, or arranged to be positioned, on, or at, the second side of the FIBC, and the second loop holders may be positioned on the second side support. Worded differently, the first side support may be positioned on, or at, the first side of the FIBC and the second side support may be positioned on, or at, the second side of the FIBC.

[0091] The first loop holders may support two second loops of two strap arrangements, and the second loop holder may support two second loops of two strap arrangements. This means that the first side support supports the second loops of the two strap arrangements arranged on the first side of the FIBC. This also means that the second side support supports the second loops of the two strap arrangements arranged on the second side of the FIBC.

[0092] The first side support may define, or form, a first rest surface that faces upward relative to the horizontal plane. The first rest surface may be located at or above, or arranged to be located at or above, the corners of the FIBC at the first side of the FIBC. The first loop holders may be attached to the first side support and may be located below the first rest surface. The first rest surface may be arranged to support, and contact, the second loops of the corners of the FIBC at the first side the FIBC. The second loops may be routed, or extended, or pulled, over the first rest surface and fixated, or secured, to the first loop holders, wherein the first loop holders are arranged below the first rest surface. This results in friction forces between the first rest surface and the second loops and reduces forces acting on the loop holders from the FIBCs with material contained in the FIBCs.

[0093] It is specified above that the support structure may comprise a second side support positioned, or arranged to be positioned, on, or at, the second side of the FIBC. The second side support may comprise a second rest surface that faces upward relative to the horizontal plane. The second rest surface may correspond in features with the first rest surface. It is understood that the first side support and the second side support may be spaced apart with the FIBC positioned between them, or that they are arranged spaced apart for placement of the FIBC between them. The spacing

between the first side support and the second side support, may correspond to the width of the FIBC. Here, the width is understood as the transverse separation between the corners of the FIBC, at the first side of the FIBC and the corners of the FIBC at the second side of the FIBC. For example, the spacing between the first side support and the second side support may be 100-130% of the width of a FIBC.

[0094] The first loop holders may be arranged, or mounted to, the first side support at an opposite side, or outside, of the first side of the FIBC. Worded differently, the first loop holders may be arranged on the first side support, on a side external, or at an opposite side, relative to the FIBC.

[0095] The second loop holders may be arranged, or mounted to, the second side support at an opposite side, or outside, of the second side of the FIBC. Worded differently, the second loop holders may be arranged on the second side support, on a side external, or at an opposite side, relative to the FIBC.

[0096] It is understood that the first rest surface may be continuous. It is understood that the second rest surface may be continuous. This means that the rest surface may have a length equal to the first side support. Alternatively, the rest surface may be discontinuous and comprising a plurality of rest surfaces aligned in the longitudinal direction of the side supports.

[0097] The first side support may be connected to the second side support via one or more transverse side supports. The support structure, and the first side support, the second side support and two transverse side supports may define a rectangle that is parallel to the horizontal surface, or horizontal plane.

[0098] It is specified above that the support structure may be configured to, or arranged to, support one FIBC. Alternatively, the support structure may be arranged to support a plurality of FIBCs. For example, two or more FIBCs may be configured to be positioned side-by-side in a row. The row of FIBS may have a longitudinal first side and a longitudinal second side. The row of FIBS may have a transverse first side and a transverse second side. The row of FIBC may thus be rectangular shaped. Each FIBC may be oriented with two corners at the first longitudinal side of the row and the other two corners at the second longitudinal side of the row. Worded differently, two FIBC may be positioned side-by-side, placed adjacent each other, forming the row of FIBC, wherein two corners of each row are arranged at the first longitudinal side of the row, and the other two corners of a row is placed and the second longitudinal side of the row. A first FIBC may be positioned next to, or adjacent, or neighboring, a second FIBC may thus have a respective side facing each other. Each FIBC may have four strap arrangements, individually arranged at, and extending from, the corners, and the support structure support each FIBC via the loop holder.

[0099] The support structure and the loop holders

may be configured to individually bias the second loops of neighboring FIBC towards and across, or to overlap, each other. Worded differently, the corner of a first FIBC of the row of FIBC and the corner of a second FIBC of the row of FIBC, wherein the first and second FIBC and the respective corners of the two FIBCs are adjacent and neighboring, may be biased by the loop holders, in respective outwardly directions, wherein the directions overlap, or crosses. This has the effect that the corners of the two FIBC are biased closer to each other with reduced spillage during filling.

[0100] It is understood that the first loop holders and the first rest surface may be arranged such that each second loop of a row of FIBC, at the first side of the row of FIBCs, engages the first rest surface when each second loop is fixed to a first loop holder.

[0101] When the row of FIBC is arranged to the support structure, the first loop holders may be positioned offset along the first side support, relative to the longitudinal two corners of each FIBC arranged to the support structure.

[0102] The relative positioning of the first loop holders contribute to an easier handling. The first rest surface may be convex transverse to the first side of the row of FIBCs. It is understood that an upward facing edge of a thin structure may be defined by narrow rest surface, such as the edge of a steel sheet. The first rest surface may be spaced apart, or arranged to be spaced apart, from the corners of the FIBCs at the first side of the row of FIBCs. For example, it may be spaced apart by more than 50 mm. This is particularly advantageous if the first rest surface is located above or spaced apart from the corners of the FIBCs. The first side support may define, or form, a first side barrier extending from the first rest surface to a level relative to the horizontal plane that is at, or above, the corners of the FIBCs at the first side of the row of FIBCs. It is understood that the first side barrier is intended for, or configured to, guide material that is tipped outside the opening of the FIBCs into the FIBCs. In addition, the first side barrier may support the side wall at the opening from caving, or collapsing outwards when the FIBC has been overfilled. This prevents material spillage during handling and transport of an overfilled FIBC.

[0103] The first side barrier may be inclined in relation to the horizontal plane. The inclination may be an inclination angle, measured between the first side barrier and the horizontal plane. The inclination angle may be in the range of 15-90 degrees. The first side barrier may be adjustably arranged to the first side support, and the inclination angle may be adjustable to adjust for different sized FIBCs.

[0104] The first rest surface and/or the surface of the first side barrier may have a smooth surface to reduce wear on the second loops due to movement between the second loops and the first rest surface and/or first side barrier. Alternatively, the first rest surface and/or first side barrier may have a rough surface, or surface

roughness, to promote friction and prevent movement between the second loops and surfaces during transport.

[0105] The first rest surface may be inclined in relation to the horizontal plane by an inclination angle. The inclination angle in relation to the horizontal plane may be in the range of 30-80 degrees. The inclination angle may preferably be in the range of 40-50 degrees.

[0106] It is understood that the first side support may comprise a first support beam that defines, or forms, the first rest surface. The first support beam may extend, or is arranged to extend, along the first side of the row of FIBCs. It is understood that the first support beam may extend horizontally, in a plane parallel to the horizontal surface. The first support beam may be an elongated beam, having an elongation length larger than the width or diameter of the beam cross section. It is further understood that the first support beam may define a continuous first rest surface. It is further understood that the first support beam may form the first side barrier. The first support beam may have a cross-sectional shape being triangular-, square-, rectangular-, circular-, "T"-, "I"-, or "U"-shaped. The cross-sectional shape may be hollow, comprising an internal hollow space, to reduce weight of the first support beam. The first support beam may be supported at the ends of the first support beam. For example, the first support beam may at a first end be coupled to the truck cab, or trailer, superstructure. The first support beam may additionally be supported in positions between the ends of the first support beam. The first support beam may be made from steel or aluminium. Alternatively, the first support beam may be a composite beam, made from a fiber reinforced composite material.

[0107] The first side support may comprise a first side wall positioned at or juxtaposed to, or arranged to be positioned at or juxtaposed to, the first side of the row of FIBCs.

[0108] The first side wall may define, or form, a planar first side surface facing the FIBCs. For example, the first side wall may be a planar steel sheet. It is understood that the first side wall, or the first side surface, may be arranged to bias, or engage, the side of each FIBC at the first side of the row of FIBCs at an expansion of the FIBC, for example when filling the FIBC. The first side wall may extend vertically and horizontally. It is described above that the first side support may comprise a first support beam that defines the first rest surface. Alternatively, the first side wall may define, or form, the first rest surface. It is further understood that the first side wall, or the first side surface, may form the first side barrier. For example, the first side wall may be manufactured from a sheet of steel, stamped or pressed to form the first rest surface and/or the first side barrier. Alternatively, the first side wall may be a wood, or plastic sheet. For example, the first side wall may be a fibrous board sheet.

[0109] It is understood that the first side wall, may

support the sides of the FIBCs from the hydrostatic forces exerted by the material filled into the FIBCs, and prevent the sides of the FIBCs from expanding outwards. Worded differently, the first side wall may help the FIBC to maintain a shape of the side-panels that corresponds to the shape of the FIBC bottom panel and prevent barreling of the FIBC.

[0110] The support structure may further comprise a base for resting on the horizontal surface, and the first side support may be connected to the base. The second side support may be connected to the base. The base form, or define, a structure configured for being placed on the horizontal plane, such as the bed of a truck or a trailer. The base may be parallel to the horizontal plane. The base may be formed by a uniform structure such as a steel sheet, or may be formed by a plurality of structural elements joined, or connected together. For example, the base may be formed by a plurality of beams joined, or secured, together, wherein two longitudinal beams are joined with two transverse beams between the two longitudinal beams. Thereby a rectangular base may be formed. The first side support may be pivotally connected to the base. The first side support may thus be pivoted, outwardly, in relation to the base, and the FIBCs, around a pivot connection point, arranged between, or connecting, the first side support and the base. Pivoting the support structure outwardly in relation to the filled FIBC reduces the possibility of the filled FIBCs snagging, or getting caught by the structure when hoisted, or lifted, from the support.

[0111] It is understood that the second side support may comprise a second support beam that defines, or forms, the first rest surface. The second support beam may conform, or match, the first support beam. Worded differently, the second support beam may share the features of the first support beam. For example, the second side support may comprise a second side wall, that has the features of the first side wall discussed above.

[0112] It is specified above that the support structure may have a plurality of loop holders attached to the support structure, arranged to fix, or lock, the second loops of the strap arrangements, to the support structure. It is also specified above that the plurality of loop holders may comprise first loop holders and second loop holders.

[0113] The loop holder may form a protrusion and the second loop may be threaded onto the protrusion. The protrusion may protrude transverse to the first side support or the second side support. The protrusion may form a rod, or an axle, that protrudes outwardly from the first side support or the second side support. The second loop may be positioned on the protrusion and the second loop may encircle the protrusion. The protrusion is preferable, straight and may have a square, or circular cross-section. The protrusion may extend, or protrude, outwardly from the first side support or the second side support, in a direction upwards from the

horizontal surface. Alternatively, the protrusion may extend, or protrude, outwardly from the first side support or the second side support, in a direction parallel with the horizontal surface, and away from the FIBC.

[0114] It is specified above that the first loop holders may be arranged on the first side support, on a side external, or at an opposite side, relative to the FIBC. The protrusion may thus be arranged on the first side support, on a side external, or at an opposite side, relative to the FIBC, and the protrusion may extend away from the first side support and the FIBC.

[0115] The loop holders, or the first loop holders and the second loop holders, may have a first state and a second state. In the first state the loop holder may engage the second loop of a respective strap arrangement, to fixate, or lock, the second loop, to the support structure. Worded differently, in the first state the second loop may be threaded onto the protrusion, and fixate, or lock, the second loop to the loop holder and the support. In the second state, the loop holder may disengage the second loop of a respective strap arrangement, to release the second loop from the support structure.

[0116] The loop holder, or the protrusion, may be linearly movable between the first state and the second state. Worded differently, at the transition between the first state and the second state, or at the transition of the loop holder, from the first state to the second state, the loop holder may move linearly. Worded differently, at the transition of the loop holder, from the first state to the second state, the protrusion may move linearly. This allows for simple release of the second loops from the loop holders of the support.

[0117] It is specified above that the protrusion may form the rod, or the axle, that protrudes outwardly from the first side support or the second side support. At the transition of the loop holder from the first state to the second state, the rod, or axle, may move linearly relative to the first side support or the second side support. The loop holder may comprise a guide, that guides the protrusion. The guide may limit movement of the protrusion linearly. Worded differently, the guide may be a linear guide, that enables the protrusion to move linearly at the transition between the first state and the second state. The linear guide may be a bushing, or linear bearing, that contacts and guides the protrusion at the transition between the first state and the second state. The bushing may be a linear bushing. The bushing may receive the protrusion, or rod, or axle, and guide the protrusion. The guide may be attached to the support structure, via the side supports.

[0118] The protrusion may be biased, to assume the first state. Worded differently, the loop holder may be biased to assume the first state. This means that the biasing force must be overcome to arrange the loop holder in the second state for release of the second loop. This is advantageous by simplifying the release of the FIBC from the support after the FIBC has been

filled. The protrusion can be moved from the first state to the second state to release the additional, strap. The operator does not need to pull the second loop, or thread the second loop of the loop holder.

[0119] The protrusion may be biased via a spring. The spring may be a coil spring, or helical spring. The protrusion, or the rod, or axle, may have an annular ridge, or spring seat, and the spring may contact the annular ridge. The spring may further contact the linear guide. Worded differently, the spring may be positioned between the annular ridge and the linear guide. For example, the linear guide may be an annular linear guide with an annular spring seat the spring may contact.

[0120] Alternatively, to the loop holder being biased to assume the first state, the loop holder may be locked in the first state and the second state.

[0121] It is specified above that the loop holder may comprise the protrusion, or rod, or axle and that the loop holder may comprise a guide, that guides the protrusion. In one example, the loop holder may form a tower bolt loop holder, that comprises the slidable protrusion, or bolt, that can slide and at least partly rotate relative to the guide. The guide may define at least two slots, each slot corresponding to the respective first state and the second state of the loop holder. The slots may interact with a lever that protrudes radially from the protrusion. When the lever interacts, and is received by a slot, the protrusion is locked in one of the states.

Brief description of the drawings

[0122] A more complete understanding of the above-mentioned and other features and advantages of the proposed technology will be apparent from the following detailed description of preferred embodiments in conjunction with the appended drawings, wherein:

Fig. 1A	is a perspective view of a FIBC, and Fig. 1B is a top view of the FIBC in Fig. 1A;
Figs. 1C-1F	shows enlarged views of a corner of the FIBC with examples of strap arrangements;
Fig. 2	shows a perspective view of a vehicle in the form of a trailer, comprising the support structure;
Fig. 3	shows a further example of a support structure; and
Figs. 4A-4B	shows a cross-sectional view of the first side support with a examples of loop holders.

Description of the drawings

[0123] Fig. 1A shows a first example of a Flexible Intermediate Bulk Container, or FIBC, as a four panel FIBC 10 formed by a bottom 50, or bottom panel 50, joined with four side panels 52, 54, 56, 58. The four

side panels 52, 54, 56, 58 form the sidewall of the FIBC 10. Opposite the bottom 50, the side panels 52, 54, 56, 58 define a FIBC opening 62 for filling or removal of bulk material from the FIBC 10. An upper rim 64 is defined by the circumferential edge formed at the opening 62 by the side panels 52, 54, 56, 58. Fig. 1A shows that the FIBC has four strap arrangements 22, located at each of the corners of the FIBC 10. Each strap arrangement 22 has, or forms, a first loop 14, 16, 18, 20, or lifting loop, and an additional, or second, loop 14', 16', 18', 20', or support loop, of the FIBC 10.

[0124] The four strap arrangements 22 are evenly spaced apart, or distributed, around the rim 64 of the FIBC 10. Each strap arrangement 22 is attached to the FIBC 10 at least at the corner of the FIBC 10. Each strap arrangement 22, is individually arranged at, and extends from, the corners of the FIBC 10. Each strap arrangement 22 has a joint strap, or first strap 24, that is attached to the FIBC 10 at the corner of the FIBC 10. Each strap arrangement 22 further has an additional strap, or second strap 26. The additional strap, or second strap 26 of Fig. 1A is attached to, or joined to, the joint strap, or first strap 24. The second loops 14', 16', 18', 20' of the strap arrangements 22 are thereby formed by the joint strap or first strap 24, and the additional strap, or second strap 26.

[0125] Fig. 1A further shows that each first loop 14, 16, 18, 20 forms, or has, a lifting eye, configured for lifting the FIBC 10. The first loops 14, 16, 18, 20 are configured to carry the FIBC 10 when filled and lifted. The second loops 14', 16', 18', 20' are configured to be connected to a support, and support the FIBC in an expanded shape, when connected to the support structure 30.

[0126] Fig. 1B shows a top-down view of the FIBC 10 of Fig. 1A, wherein the second loops 14', 16', 18', 20' are outwardly biased, or biased outwardly, in a direction shown by dashed arrows. By being outwardly biased in diagonally outward directions, each corner of the FIBC 10 jointly defines a rectangle, or opening 62, of the FIBC 10, at the upper rim 64. The FIBC 10 of Fig. 1A is shown in the expanded shape. In the expanded shape, the second loops 14', 16', 18', 20' define, four corners, or cross-corners at the upper rim of the FIBC 10.

[0127] Fig. 1C shows an enlarged view of a corner of the FIBC 10 with another example of a strap arrangement 22. The strap arrangement 22 is formed by only a joint strap 24 that extends from the corner of the FIBC 10. The ends of the joint strap 24 are joined to the FIBC 10 at the corners of the FIBC 10. At a first connection point 28, the joint strap 24 is connected to itself, to form the first loop 14 and the second loop 14'.

[0128] Fig. 1D shows an enlarged view of a corner of the FIBC 10 with another example of a strap arrangement 22. The strap arrangement 22 of Fig. 1D differs from the strap arrangement 22 of Fig. 1C in that the first connection point 28 is formed by a clip, or clamp 28. The clamp 28 can be fitted to the joint strap 24, to

divide the joint strap 24 into the first loop and the second loop, and to allow the FIBC 10 to be mounted to the support structure 30. The clamp 28 allows adjustment of the size of the second loop 14', or the opening provided by the second loop, to adjust to the support structure 30.

[0129] Fig. 1E shows an enlarged view of a corner of the FIBC 10 with another example of a strap arrangement 22. The strap arrangement 22 shown comprises a joint strap 24 and an additional strap 26. The joint strap 24 extends from the corner of the FIBC 10 and is connected to the corner of the FIBC 10 via the two ends of the joint strap 24. Joined with, or attached to, the joint strap 24 is the additional strap 26. The additional strap 26 is joined to, or connected to, the joint strap 24 at the first connection point 28 and at a further, or additional, or second connection point 60. The first loop 14 is formed by the joint strap 24, and the second loop 14' is formed by the joint strap 24 and the additional strap 26.

[0130] Fig. 1F shows an enlarged view of a corner of the FIBC 10 with another example of a strap arrangement 22. The strap arrangement 22 shown comprises a joint strap 24 and an additional strap 26. The joint strap 24 and the additional strap 26 are separate straps. The joint strap 24 and the additional strap are individually joined to the corner of the FIBC 10. The joint strap forms 24 the first loop 14 and the additional strap 26 forms the second loop 14'. This means that the first strap and the second strap are not connected at a connection point, as discussed above in relation to Figs. 1C-1E.

[0131] Fig. 2 shows perspective view of a vehicle 100 in the form of a trailer 100, comprising the support structure 30 and two FIBC 10, 12 positioned, or arranged, or mounted to, the support structure 30. The support structure 30 is shown with two FIBC 10, 12, but the support structure can also be used with a single FIBC 10. The trailer 100 comprises a bed 102 defining a horizontal surface, or plane, 102 adapted, or configured, for placing a load onto. Fig. 2 further shows a support 30 or support structure 30 positioned on the bed 102 forming the horizontal plane 102. Positioned on the bed 102 of the trailer is also shown two Flexible Intermediate Bulk Containers (FIBC), a first FIBC 10 and a second FIBC 12. The first 10 and the second 12 FIBC are arranged adjacent, and next to each other, forming a row of FIBCs. The first FIBC and the second FIBC are identical in construction. The FIBCs 10, 12 are configured for being filled with, and to contain, a flowable bulk material to enable transport of the material. Each FIBC 10, 12 shown are of the same type, having the same size, or dimensions, and is adapted to contain the same volume of material. Each FIBC 10, 12 is shown to have a cube or cuboid shape, with a square or rectangular cross-section in a plane parallel the bed 102, or horizontal plane 102.

[0132] Each FIBC 10, 12 comprises four strap arrangements 22, each comprising first loops 14, 16, 18,

20, and second loops 14', 16', 18', 20'. Each strap arrangement 22 is located at a respective corner of each FIBC 10, 12. A first 14, a second 16, a third 18 and a fourth 20 joint loop. The joint loops 14, 16, 18, 20 are shown as being cross-corner lifting loops arranged evenly around the walls of the FIBC. The second loops 14', 16', 18', 20' are shown as being cross-corner support loops arranged evenly around, or at the corners, of the FIBC 10.

[0133] The support 30 is shown comprising a support structure 30 formed by a first 32 and a second side support 34. The first side support 32 is positioned, or arranged, at a first side of the row of FIBCs 10, 12. The second side support 34 is positioned, or arranged at a second side of the row of FIBCs 10, 12. Fig. 1 shows that the row of FIBCs 10, 12 defines two longitudinal sides and two transverse sides. The first and second side of the row of FIBCs are shown as being longitudinal sides. The first side support 32 defines, or forms, a first rest surface 36 that faces upwards in relation to the bed 102, or the horizontal plane 102. The second side support 34 defines, or forms, a second rest surface 38 that faces upwards in relation to the bed 102, or the horizontal plane 102. The first 36 and the second 38 side rest surface are located, or positioned, above the corners of the FIBCs. The first 36 and second 38 side rest surfaces are thus arranged at a height from the bed 102, being larger than the distance between the bed 102, and the corners of the FIBCs. Arranged on the first side support 32 are shown three loop holders 40. The loop holders 40, or first side loop holders 40, couple, or connects, to the second loops 16', 20' of the first and second FIBCs 10, 12 and fixates the second loops 14', 18' to the support structure 30. The second side support 34 comprises corresponding loop holders, or second side loop holders, to couple to, and fixate the second loops 14', 18' to the second side support 34.

[0134] Each second loop 14', 16', 18', 20' is positioned to extend, or run across, and come into contact with the first rest surface 36 or the second rest surface 38 when a FIBC 10, 12 is arranged to, or positioned to, the support structure 30. When each additional loop 14', 16', 18', 20' is biased, or pulled, the corners of each FIBCs will define a rectangle, or square opening of each FIBC 10, 12, and the openings of the two FIBCs 10, 12 will be aligned. Thereby, both FIBCs 10, 12 may be filled from a single working vehicle bucket, with minimal spillage ending up in between the two FIBCs 10, 12.

[0135] Each additional loop 14', 16', 18', 20' is fixed to a loop holder 40, and extends over the rest surfaces 36 or 38 of the support structure 30, and the weight of each FIBC 10, 12, before and after filling, exerts a biasing force on the corners of each FIBC 10, 12 and the opening of each FIBC forms a rectangular, or square shape.

[0136] The first side support 32 comprises a first support beam 42 that defines, or forms, the first rest sur-

face 36. The first support beam 42 extends, or is arranged to extend, along the first side of the row of FIBCs 10, 12. The first support beam 42 is thus a longitudinally extending beam, extending in a direction shared with the longitudinal direction of the row of FIBCs 10, 12.

[0137] The second side support 34 comprises a second support beam 44 that defines, or forms, the second rest surface 38. The second support beam 44 extends, or is arranged to extend, along the second side of the row of FIBCs 10, 12. The first 42 and second 44 support beams extend in parallel.

[0138] Connected, or coupled, to each first 42 and second support 44 beam are shown two vertical support beams 46, 48. The vertical beams 46, 48 are further connected, or coupled, to the bed 102, or the horizontal plane 102. The vertical beams 48 thus support the first 32 and second 34 side support. The vertical beams 48 are fixed to the bed 102, or the horizontal plane 102.

[0139] Fig. 3 shows a support structure 30 comprising a first side support 32 and a second side support 34. The first side support 32 is connected, or joined, to a first base beam 70, and wherein the second side support 34 is connected, or joined, to a second base beam 72. The first 70 and the second 72 base beams form a support structure base configured to be placed on, or positioned, on a truck or trailer bed 102, or horizontal plane 102. The base beams 70, 72 supports and maintains the support structure 30 and FIBCs 10, 12 in place on the horizontal plane 102. During use, the base rests on the horizontal surface 102, or truck or trailer bed 102.

[0140] The first side support 32, comprises a first support beam 78 that defines, or forms, the first rest surface 36. The first support beam 78 extends, along the first side of the row of FIBCs 10, 12. The first side support 32 defines, or forms, a first side barrier 74 that extends from the first rest surface 36 to a level relative to the horizontal plane that is at, or above, the corners of the FIBCs at the first side of the row of FIBCs. The first side barrier 74 is shown being inclined in relation to the bed 102 or horizontal plane 102. The inclination angle may be in the range of 15-90 degrees. The first side barrier 74 may be adjustably mounted providing for the inclination angle to be varied in the range. This allows to configure the first side barrier 74 for use with different sized FIBCs.

[0141] Fig. 3 shows that the first side support 32 comprises a first support beam 78 that defines, or forms, the first rest surface 36. The first support beam 78 extends, or is arranged to extend, along the first side of the row of FIBCs 10, 12. The first side support 32 comprises a first side wall 66. The first side wall 66 is positioned at or juxtaposed to, or arranged to be positioned at or juxtaposed to, the first side of the row of FIBCs. The first side wall 66 provides a constraint for the movement or shape change of a FIBC 10, 12 during

filling. The first side wall 66 extends from, and connects, the first support beam 78 to the first base beam 70.

[0142] Correspondingly, the second side support 34, comprises a second support beam 80 that defines, or forms, the second rest surface 38. The second support beam 80 extends, along the second side of the row of FIBCs 10, 12. The second side support 34 defines, or forms, a second side barrier 76 that extends from the second rest surface 38 to a level relative to the horizontal plane 102 that is at, or above, the corners of the FIBCs at the second side of the row of FIBCs 10, 12. The second side barrier 76 is shown being inclined in relation to the bed 102 or horizontal plane 102. The inclination angle may be in the same range as the first side barrier, a range of 15-90 degrees. The second side barrier 76 may be adjustably mounted providing for the inclination angle to be varied in the range. This allows to configure the second side barrier 76 for use with different sized FIBC.

[0143] The first 70 and second 72 side wall prevent the FIBCs 10, 12 from moving or bulging out during filling of the FIBCs. The shape of the FIBC 10, 12 is thereby maintained, or substantially maintained, during filling. In addition, the side walls 66, 68 form a vertical support for the support beams 78, 80. Thus the support structure shown in Fig. 4 is free from vertical beams, such as shown in relation to Fig. 1. Fig. 4 shows that the additional loops 14', 16', 18', 20' are fixed, or secured, to loop holders 40. The first side support 32 comprises four loop holders 40. The second side support 34 comprises four loop holders 40. The loop holders 40 are attached, or mounted, to the side walls 66, 68. Alternatively, the loop holders 40 may be attached, or mounted, to the respective first 78 or second 80 support beam.

[0144] Figs. 4A-4B shows a cross-sectional view of the first side support 34 of Fig. 3 with a first rest surface 36. Extending over the first rest surface 36 is the additional loop 14'. The additional loop 14' is attached, or securely fixed, to a loop holder 40. The loop holder forms, or has a rod 108, or an axle 108, that forms a protrusion 108, configured to receive or encircle an additional loop 14', 16', 18', 20'. The rod 108 extends transverse to the first rest surface 36, or the first support beam 42. The rod 108 extends, or protrude, outwardly from the first rest surface 36, or the first support beam 42, in a direction upwards from the horizontal surface 102. The rod 108 is received, or guided by a linear guide 110, in the form of a two part bushing 110, or linear bearing 110, that contacts and guides the rod 108. The rod 108 is movable between a first state and a second state. In the first state the rod 108 protrudes from the rest surface or first support beam 78, and may receive the additional loop 14'. In the second state, the rod 108 moves to release the additional loop 14'.

[0145] The loop holder 40, and the rod 108 is spring

loaded by a spring 112, that biases the rod 108 and the loop holder 40 to assume the first state. The rod 108 has an annular ridge 114, or spring seat 114, and the spring 112 contact the annular ridge 114, to force, or bias, the rod 108 to assume the first state. The spring 112 may further contact the linear bearing 110.

Item list

10 [0146]

10	First FIBC
12	Second, or additional, FIBC
14	First joint loop
15 14'	First additional loop
16	Second joint loop
16'	Second additional loop
18	Third joint loop
18'	Third additional loop
20 20'	Fourth joint loop
22	Fourth additional loop
24	Strap arrangement
26	joint, or first, strap
25 28	additional, or second, strap
30	first connection point
32	Support structure
34	First side support
36	Second side support
30 38	First rest surface
40	Second rest surface
42	Loop holders
44	First support beam
48	Second support beam
35 50	Vertical support beams
52, 54, 56, 58	FIBC bottom, or bottom panel
60	FIBC side panels
62	second connection point
64	FIBC opening
40 66	FIBC rim, upper rim
68	First side wall
70	Second side wall
72	First base beam
74	Second base beam
45 76	First side barrier
78	Second side barrier
80	First support beam
100	Second support beam
102	Vehicle, or trailer
50	Bed of trailer or truck, forms horizontal plane
108	rod, axle, protrusion
110	linear guide, or linear bushing
112	spring, coil spring
55 114	annular ridge

Claims

1. A Flexible Intermediate Bulk Container (FIBC) (10),

wherein the FIBC has an expanded shape, and
an upper rim (64) that has, or forms, four corners, or cross-corners, in the expanded shape,

- four strap arrangements (22), individually arranged at, and extending from, the corners of the FIBC,

wherein each strap arrangement forms a first loop (14, 16, 18, 20) and a second loop (14', 16', 18', 20'), the first loop is a lifting loop configured to carry the FIBC when filled and lifted, and the second loop is a supporting loop configured to be connected to a support, and support the FIBC in the expanded shape, when connected to the support,
wherein the first loop (14, 16, 18, 20) is configured to transmit a lifting load to the FIBC (10) along a first load path, and the second loop (14', 16', 18', 20') is configured to transmit a supporting load to the FIBC (10) along a second load path,
wherein the first load path is different from the second load path, such that loads applied to the first loop (14, 16, 18, 20) are not transmitted along the second load path.

2. The Flexible Intermediate Bulk Container (FIBC) of claim 1, wherein each strap arrangement (22) comprises one or more straps that form the first loop (14, 16, 18, 20) and the second loop (14', 16', 18', 20'), and the one or more straps (24, 26) are connected at a first connection point (26), to fixate the relative position of the first loop (14, 16, 18, 20) and the second loop (14', 16', 18', 20'), wherein the first connection point (26) forms part of the second load path and not part of the first load path.
3. The Flexible Intermediate Bulk Container (FIBC) of claim 2, wherein the first connection point (26) is, or forms, a load bearing part of the second loop (14', 16', 18', 20') and not a load bearing part of the first loop (14, 16, 18, 20).
4. The Flexible Intermediate Bulk Container (FIBC) of claims 1-3, wherein the first loop (14, 16, 18, 20) has a load-bearing capacity that is greater than the second loop (14', 16', 18', 20').
5. The Flexible Intermediate Bulk Container (FIBC) of claims 1-4, wherein the first loop (14, 16, 18, 20) has a load-bearing capacity that is a factor 5 to 15 times greater than the load-bearing capacity of the second loop (14', 16', 18', 20').
6. The Flexible Intermediate Bulk Container (FIBC) of any claim 1-5, wherein an opening defined by the

first loop (14, 16, 18, 20) is greater than an opening defined by the second loop (14', 16', 18', 20').

7. The Flexible Intermediate Bulk Container (FIBC) of claims 1-6, wherein the strap arrangement (22) comprises a joint strap (24) that is joined, or connected, to itself at a first connection point (26), wherein the first connection point defines, or separates the first strap (24) into, the first loop (14, 16, 18, 20) and the second loop (14', 16', 18', 20').
8. The Flexible Intermediate Bulk Container (FIBC) of claims 1-7, wherein the strap arrangement (22) comprises a joint strap (24), and an additional strap (26), wherein the joint strap is connected to the additional strap at a first connection point (28), and the joint strap and the additional strap jointly forms the second loop (14', 16', 18', 20').
9. The Flexible Intermediate Bulk Container (FIBC) of claim 8, wherein the additional strap (26) is connected to the joint strap at the first connection point (28), and at a second connection point (26).
10. The Flexible Intermediate Bulk Container (FIBC) of claim 7, wherein the additional strap is connected to the joint strap at the first connection point (28), and to the FIBC at the corner of the FIBC.
11. The Flexible Intermediate Bulk Container (FIBC) of claim 7, wherein the second strap (28) has a load-bearing capacity that is less than the first strap (24).
12. The Flexible Intermediate Bulk Container (FIBC) of claims 1-11, wherein a distal portion of the first loop (14, 16, 18, 20) is located farther from the corner of the FIBC than a distal portion of the second loop (14', 16', 18', 20'), when the first loop (14, 16, 18, 20) and the second loop (14', 16', 18', 20') are subjected to a tensile load, or a pulling force.
13. A system comprising
 - the Flexible Intermediate Bulk Container (FIBC) (10) of any of claims 1-12, and
 - a support structure (30) that supports the FIBC in the expanded shape, wherein the FIBC is positioned in an upright position, relative to a horizontal surface (102) with the FIBC resting on the horizontal surface, and wherein the support structure has a plurality of loop holders (40) attached to the support structure, arranged to fix, or lock, the second loops (14', 16', 18', 20') of the strap arrangements (22), to the support structure, wherein the loop holders individually biases the second loops of each strap arrangement

apart from one another, or each other, to arrange the FIBC in the expanded shape.

- 14.** The system of claim 13, wherein each loop holder (40) has

5

- a first state wherein the loop holder engages the second loop (14', 16', 18', 20'), of a respective strap arrangement (22), to fixate, or lock, the second loop, to the support structure, and

- a second state wherein the loop holder disengages the second loop, of a respective strap arrangement, to release the second loop from the support structure.

10

15

- 15.** The system of claim 14, wherein, at a transition of the loop holder (40), from the first state to the second state, the loop holder (40) moves linearly.

20

25

30

35

40

45

50

55

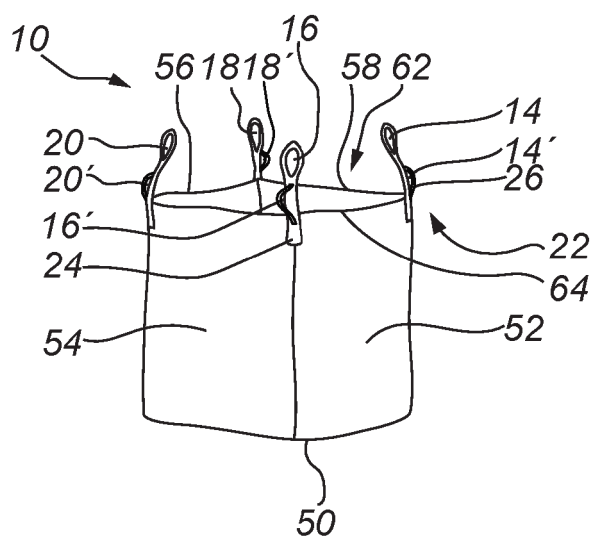


Fig. 1A

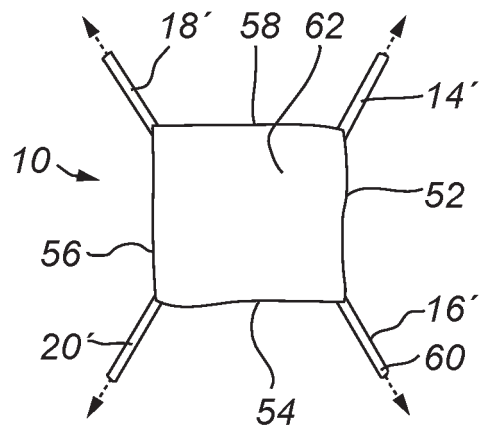


Fig. 1B

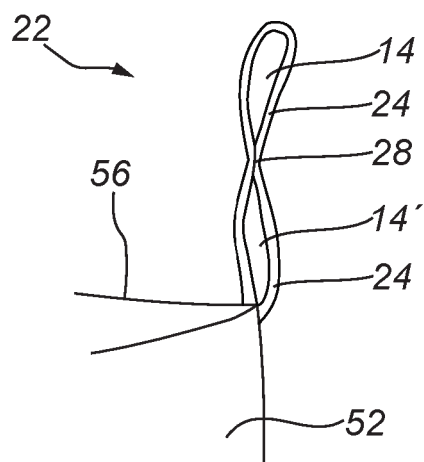


Fig. 1C

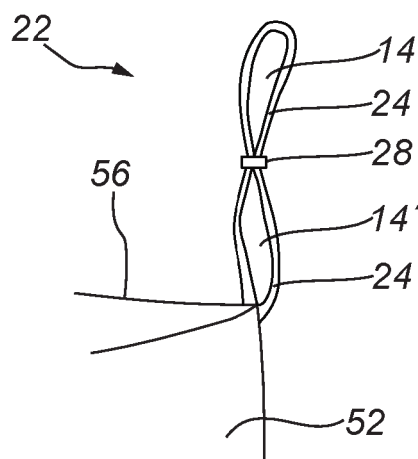


Fig. 1D

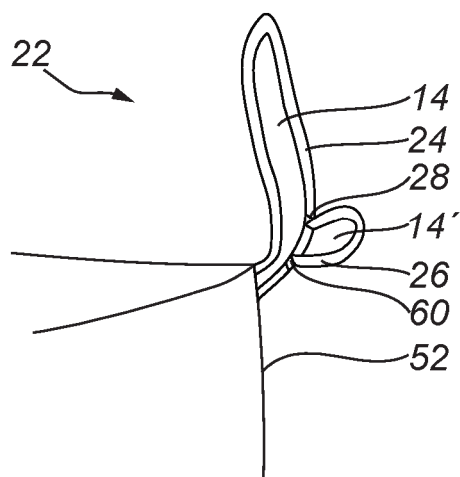


Fig. 1E

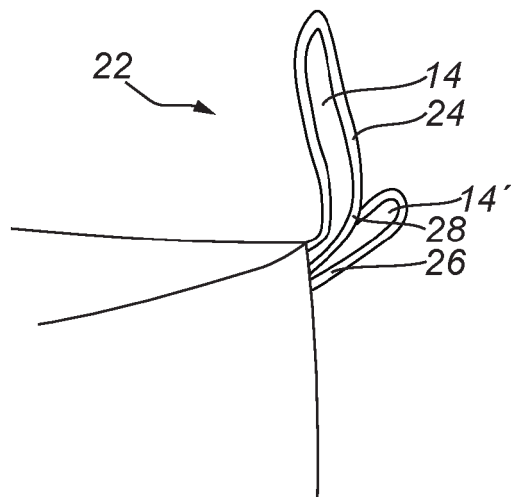


Fig. 1F

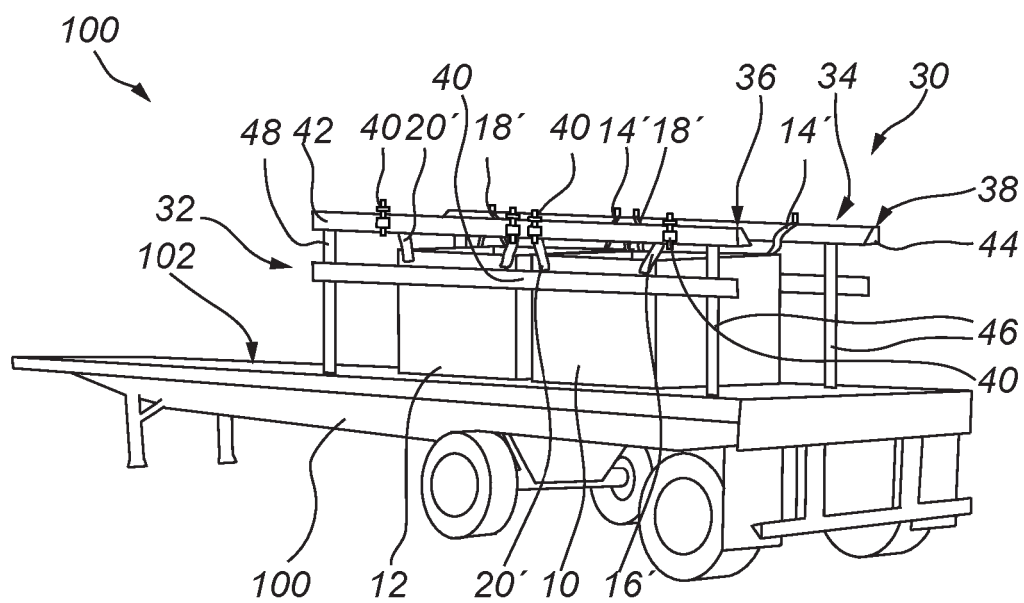


Fig. 2

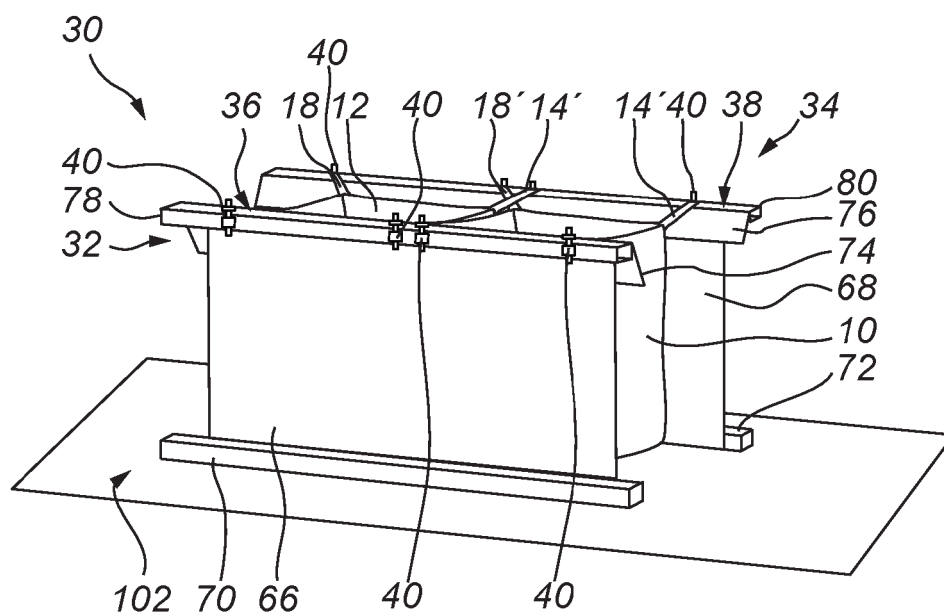


Fig. 3

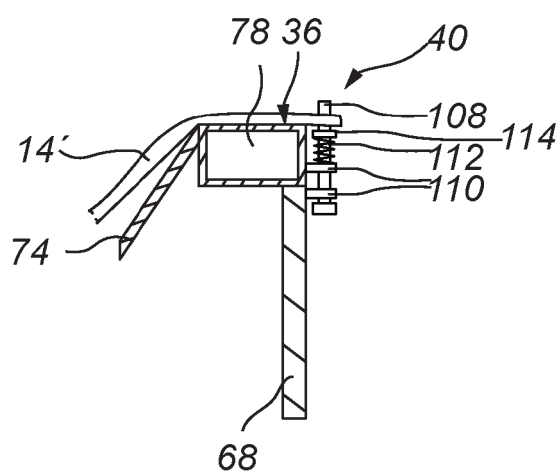


Fig. 4A

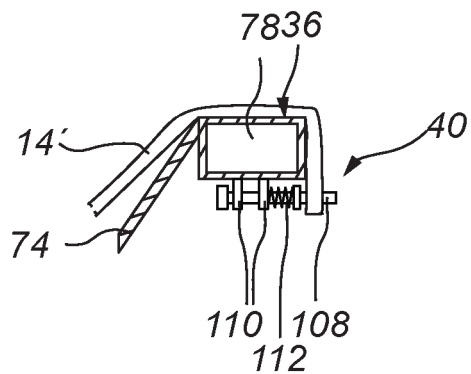


Fig. 4B



EUROPEAN SEARCH REPORT

Application Number

EP 26 17 2838

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	AU 2009 100 871 A4 (AMCOR LTD [AU]) 8 October 2009 (2009-10-08)	1-12	INV. B65D88/16
Y	* page 7, line 23 - page 11, line 8; figures 1-4 *	13-15	B65B67/12 B66C1/22
X	US 2014/177980 A1 (DIAO QIZHONG [US]) 26 June 2014 (2014-06-26)	1-12	
Y	* paragraph [0016] - paragraph [0032]; figures 1-3B *	13-15	
X	DE 83 36 862 U1 (LOLIFT UK LTD [GB]) 15 March 1984 (1984-03-15)	1-12	
Y	* page 9, line 12 - page 12, line 12; figures 1,8,9 *	13-15	
Y	EP 4 410 733 A1 (LOGAC AB [SE]) 7 August 2024 (2024-08-07) * paragraph [0059] - paragraph [0089]; figures 1-9 *	13-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D B66C B65B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		10 July 2026	Lämmel, Gunnar
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone			
Y : particularly relevant if combined with another document of the same category			
A : technological background			
O : non-written disclosure			
P : intermediate document			
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			

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 26 17 2838

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

10-07-2026

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
	AU 2009100871 A4	08-10-2009	NONE	
15	US 2014177980 A1	26-06-2014	NONE	
	DE 8336862 U1	15-03-1984	NONE	
20	EP 4410733 A1	07-08-2024	EP 4410733 A1	07-08-2024
			EP 4446271 A1	16-10-2024
25				
30				
35				
40				
45				
50				
55				

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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 5004022 A [0007]