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(54) STORAGE SYSTEM FOR FLUID BUILDING MATERIAL

(57) Container (1) for containing a volume of liquid of at least 200 litres, the container (1) comprising
- a supporting pallet (2),
- a box structure (7) arranged on top of an upper support surface of the supporting pallet (2), the box structure (7) comprising side walls (8, 9, 10, 11) extending substantially vertically from the upper support surface of the supporting pallet (2),
- a flexible bladder (4) for containing said volume of liquid, the flexible bladder (4) being arranged inside of the box structure (7), the flexible bladder (4) comprising at least an inner lining arranged for enclosing and being in contact with said volume of liquid and an outer lining arranged for being in contact with an inward facing surface (13) of the box structure (7), and
- an outlet fitting (5) provided in the flexible bladder (4) for connecting the volume of liquid with a spray machine,
wherein the outlet fitting (5) has an opening with an inner cross sectional area of at least 30 cm^2, such as at least 35 cm^2. Furthermore is disclosed a system comprising a spray machine and such container filled with spray putty as well the use of such system.

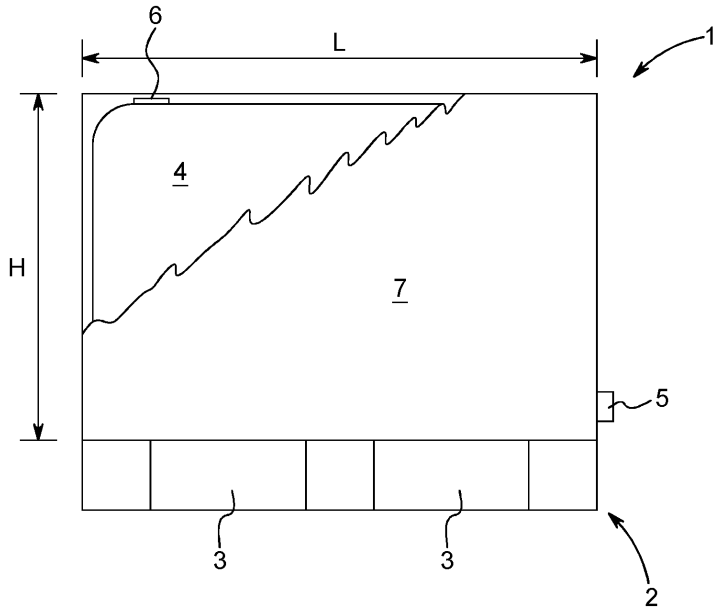

FIG. 1

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Description

[0001] The present disclosure relates to a container for storage and transport of liquid building material such as spray putty, adhesive and paint, suitable for being sprayed on a building surface directly from the storage container by means of the spray machine. The present disclosure further relates to a system comprising such container with spray putty and a spray machine and the use of such system for providing spray putty to building surfaces directly from the storage container by means of the spray machine.

Background

[0002] The building industry is constantly looking to reduce physical wear of the manual workforce and increase productivity, in particular by reducing the number of work hours spent on specific assignments and in reducing the amount of manual heavy lifting. One example of manual work that requires a lot of time is the application of for example putty, adhesive and paint to walls. In the last 5-10 years these type of assignments have increasingly been provided by spraying the liquid building material onto the walls and other surfaces by means of spray machines, and this is possible even with high viscous building material like putty. The spray machine typically has a container and the liquid building material must be supplied to this container. The putty is usually supplied in ready-mixed form in sacks of 10-20 kg putty, typically 15 kg sacks, so that the sacks can be handled by a single person, which includes lifting, opening with a sharp instrument and emptying the putty into the container of the spray machine. Alternatively, the putty is provided in form of a powder in sacks of similar weight, where the putty powder must be supplied to a mixing container and mixed with water in order to provide the spray putty, which can then be supplied to the container of the spray machine. Less viscous liquids, such as adhesive and paint are often supplied in buckets of 15 litre, which are handed manually to be emptied into the container of the spray machine. Thus, a spray job usually requires two persons: One person to operate the spray gun when applying the liquid onto the wall or ceiling and one person to supply the liquid to the spray machine, which involves manual heavy lifting and the process produces a considerable amount of waste in the form of packaging material. Furthermore, residuals of the liquid material in the waste packaging material can amount to 5 to 10% of the full volume of the liquid material, depending on the type of liquid material, in particular depending on the viscous properties thereof.

Summary

[0003] There is a need to reduce the amount of manual work involved in using liquid building material, in particular heavy manual lifting, as well as to reduce the amount of waste packaging material and preferably also the amount of residual waste liquid material to be disposed of with the waste packaging material.

[0004] Thus, the objective problem to be solved by the present disclosure is to provide a device for storage and transport of at least 200 liters of liquid material that is suitable for containing liquid material of a higher viscosity, in particular spray putty, adhesive or paint, and allowing the liquid material to be removed from the container by suction, so that the required amount of manual work and in particular heavy lifting may be avoided.

[0005] It is well-known in the art to use larger flexible bladders, i.e. with e.g. 200 to 400 liters of volume capacity, provided in a box, a so-called bag-in-box, for containing and transporting larger amounts of liquid, such as ketchup, mayonnaise and other condiments, sauces and other liquid food products. However, the use of such flexible bladders has shown to be problematic for liquids of higher viscosity, which require suction to be applied to the outlet in order to empty the liquid out of the bladder as the act of gravity on the liquid contents is not sufficient for driving the flow of the liquid out through the outlet. The application of significant suction to the outlet of the known larger flexible bladders has been tried by the present inventors, which resulted in blockage of the outlet by material of the flexible bladder before more than a fraction of the liquid contents of the flexible bladder had been empties out through the outlet.

[0006] The inventors have decided to seek to meet the objective problem by providing modifications to the known bag-in box with a larger flexible bladder so that it is suitable for containing liquid material of a higher viscosity and allowing the liquid material to be removed from the bladder by suction with a reduced risk of the bladder material blocking the outlet of the flexible bladder during the emptying process.

[0007] This objective has been met by the present disclosure, which relates to a container for containing a volume of liquid of at least 200 litres, such as at least 400 litres, preferably in the range of 300 to 1000 litres, such as in the range of 400 to 800 litres, the container comprising a supporting pallet, a box structure arranged on top of an upper support surface of the supporting pallet, the box structure comprising side walls extending substantially vertically from the upper support surface of the supporting pallet, a flexible bladder for containing said volume of liquid, the bladder being arranged inside of the box structure, the flexible bladder preferably comprising at least an inner lining arranged for enclosing and being in contact with said volume of liquid and an outer lining arranged for being in contact with an inner surface of the box structure, and an outlet fitting provided in the flexible bladder for connecting the volume of liquid with a spray machine, wherein the outlet fitting has an opening with an inner cross sectional area of at least 30 cm^2, such as at least 35 cm^2. The inner cross sectional area may preferably be selected within the range of 30 to 75 cm^2, such as within the range of 35 to 70 cm^2.

[0008] The inventors' tests have shown that the suction level to be applied to the outlet fitting of the flexible bladder in order to obtain a satisfactory flow of the liquid material to the spray machine depends on the viscous properties of the liquid so that the higher the viscosity, the larger the suction level at the outlet fitting should be. However, the risk of the bladder material blocking the outlet of the flexible bladder during the emptying process also increases with the suction level. The inventors have found that by selecting an outlet fitting of a very large inner cross sectional area of at least 30 cm^2, such as at least 35 cm^2, a satisfactory flow of the liquid material can be obtained at a medium level of suction, which decreases the risk of the bladder material blocking the outlet of the flexible bladder during the emptying process significantly, which makes the container according to the disclosure practically usable for liquid within a much wider range of viscous properties. In comparison, the largest outlet of the known flexible bladders of this range of volume known to the inventors is a 2-inch outlet fitting, which has an inner opening of about 16 cm^2.

[0009] The term viscosity is used herein as well as high viscosity. Viscosity is a measure of a fluid's resistance to deformation at a given rate. However, the liquids the present invention is aimed to be used for are generally non-Newtonian, so the viscosity of the liquid very much depends on the shear stress applied. Spray putty e.g. is a high-viscous, non-Newtonian fluid with a non-zero yield stress, meaning that the fluid will not start to flow unless a shear stress higher than the yield stress is applied. Such fluid may fulfil the requirements for a Bingham fluid, a Bingham plastic or a Herschel-Bulkley fluid. Adhesive and paint are normally pseudoplastic fluids, i.e. shear-thinning fluids, and for this reason, simple, specific values for the viscosity of the liquids cannot be provided. However, the present container is particularly advantageous to use with high-viscous liquids, such as spray putty, spray adhesive and paint, of a viscosity higher than 800 cP (centiPoise), such as higher than 1,000 cP, e.g. in the range of 800 to 1,600 cP, such as in the range of 1,000 to 1,400 cP, at low shear rates around 60 s^{-1} and a temperature of 20 °C and atmospheric pressure.

[0010] The container may preferably comprise a separate an inlet fitting provided in the flexible bladder for entering the volume of liquid into the flexible bladder. Since the problems solved by providing an outlet fitting with a large inner opening does not apply to the inlet fitting, as smaller opening area of the inner opening of the inlet fitting may be selected, such as 10 to 20 cm^2, but an inlet fitting corresponding to the outlet fitting may alternatively be selected, such as for reducing the number of different components of the container.

[0011] The outlet fitting may in particular have a substantially circular cross sectional inner opening with a diameter of at least 65 mm, such as at least 70 mm.

[0012] It has also been found to be advantageous in order to meet the above-stated objective of the present invention to provide one or more fasteners between parts of the outer lining of the bladder and an inward facing surface of at least some of the side walls of the box structure, fastening the outer lining of the bladder to the inward facing surface of the side walls of the box structure, the fasteners allowing for the outer lining to be pulled apart from the inward facing surface without rupturing the outer lining. Thus, during the process of emptying the flexible bladder through the outlet fitting, the fasteners will provide a resistance towards the bladder material moving towards the outlet fitting and thus blocking the outlet of the flexible bladder, while at the same time, the fasteners do not prevent the flexible bladder to be pulled apart from the inner surface of the box walls for emptying of the bladder, e.g. by use of a wringer, which itself is known in the art with respect to emptying of larger, flexible bladders.

[0013] According to one embodiment, the fastener(s) is/are provided by an adhesive connection, such as by application of lengths of double-sided adhesive tape to the inward facing surfaces of the walls of the box structure and possibly also to the bottom wall of the box structure. According to another embodiment of the present disclosure, the fasteners are provided by hook-and-loop fasteners. In an alternative embodiment, snap fasteners may be provided as fasteners in the present function.

[0014] In a particular embodiment, the outlet fitting extends through a front side wall of the box structure, and one or more fasteners may be provided between parts of the outer lining of the bladder and inward facing surfaces of each of the two side walls of the box structure adjoining the front side wall. It appears that the provision of fasteners at these side walls to the right and left of the front side wall of the box structure has the largest positive effect in preventing the material of the flexible bladder to be sucked into the outlet opening and outlet fitting and thus blocking the outlet.

[0015] In a particularly preferred embodiment, the fasteners are provided as strips extending in a slanted direction a shorter distance from a bottom wall of the box structure at a position near the front side wall to a longer distance from the bottom wall of the box structure at a position further away from the front side wall. Said longer distance is preferably at least 1½ times said shorter distance, such as at least 2 times.

[0016] The bottom wall of the box structure may be a separate structure or be constituted by the upper support surface of the supporting pallet.

[0017] Alternatively or additionally, one or more fasteners may be provided between parts of the outer lining of the bladder and an inward facing surface of the front side wall of the box structure.

[0018] Also, one or more fasteners may be provided between parts of the outer lining of the bladder and an upward facing surface of a bottom wall of the box structure.

[0019] It is particularly preferred that the one or more fasteners allow for the outer lining to be pulled apart from the inward facing surface of the side walls of the box

structure and optionally the upward facing surface of the bottom wall of the box structure gradually, so that the outer lining of the bladder nearer a side wall of the box structure opposite the front side wall of the box structure may be pulled apart from the inward facing surface of the side walls of the box structure and optionally the upward facing surface of the bottom wall of the box structure, to which it is fastened by means of the fasteners, while the outer lining of the bladder nearer the front side wall of the box structure still remains fastened to the inward facing surface of the side walls of the box structure and optionally the upward facing surface of the bottom wall of the box structure by means of the fasteners. Hereby it is achieved that the flexible bladder during the emptying of it may be released from the fastening to the inner side of the walls and possible bottom of the box structure at the end furthest away from the outlet fitting and be subjected to an emptying device, such as a wringer, while the remaining flexible bladder nearer the outlet fitting remains constrained by the fasteners so as to avoid the material of the flexible bladder to be sucked into and blocking the outlet fitting.

[0020] The inner lining of the bladder is preferably heat welded to the outer lining of the bladder in a pattern to prevent the inner lining from being displaced with respect to the corresponding outer lining prior to liquid being entered into the flexible bladder.

[0021] The box structure is preferably provided in corrugated fibreboard.

[0022] The upper supporting surface of the supporting pallet extends preferably 120 × 180 cm, such as the dimensions of a EUR pallet.

[0023] The outlet fitting comprises preferably a Storz connector, and it may comprise an internal removable plug, such as threaded plug to prevent leakage during transport and storage of the container.

[0024] The outlet fitting may be provided with an external removable cap, such as a threaded cap, which are removed upon connection to a spray machine.

[0025] The outlet fitting may also comprise a valve, such a bib cock valve, in order to prevent leakage from the outlet fitting during transport and storage of the container.

[0026] In one specific embodiment, the flexible bladder comprises a volume of spray putty, the volume of spray putty being at least 300 litres, such as at least 400 litres, preferably in the range of 300 to 1000 litres, such as in the range of 400 to 800 litres.

[0027] The spray putty preferably is of a plastic viscosity within the range of 800 to 1,600 cP, preferably in the range of 1,000 to 1,400 cP, provided that the shear stress on the spray putty exceeds the yield stress thereof, where cP is short for centiPoise. The viscosity of the spray putty can only be measured when the shear stress on the spray putty exceeds the yield stress on the shear putty, since it will act as a rigid body at shear stresses below the yield stress. Also, the plastic viscosity may vary at different shear stresses, i.e., the spray putty may behave as a non-Newtonian fluid at shear stresses above the yield stress, such as a shear-thickening or a shear thinning fluid.

[0028] In a second specific embodiment, the flexible bladder comprises a volume of spray adhesive, such for fastening of wallpaper, fabric or felt, the volume of spray adhesive being at least 300 litres, such as at least 400 litres, preferably in the range of 300 to 1000 litres, such as in the range of 400 to 800 litres. The spray adhesive is preferably of a viscosity within the range of 800 to 1,600 cP, preferably in the range of 1,000 to 1,400 cP. The viscosity may vary at different shear stresses, since the spray adhesive may behave as a non-Newtonian fluid, such as a shear-thickening or a shear thinning fluid.

[0029] The viscosities above are measured at a temperature of 20 °C and at atmospheric pressure.

[0030] The present disclosure further relates to a system for providing spray putty or spray adhesive to surfaces of a building, the system comprising a container as disclosed herein and a spray machine having a pump unit with an inlet side, which is connected by means of an inlet pipe to the outlet fitting of the container, and an outlet side connected to one or more spray guns, wherein the pump unit is suitable for providing the liquid, such as e.g. spray putty or spray adhesive at the outlet side at a pressure of at least 120 bar, such as at least 150 bar, preferably at least 200 bar, and wherein the pump unit is suitable for providing the liquid at the outlet side without admixing the liquid with additional air.

[0031] Furthermore, the present disclosure relates to the use of a system as disclosed herein for providing a liquid, such as e.g., spray putty or spray adhesive to surfaces of a building, such as walls and ceilings of that building.

Description of the drawings

[0032] The present disclosure will in the following be described in greater detail with reference to the drawings. The drawings are exemplary and are intended to illustrate some of the features of the present method and system and are not to be construed as limiting to the present disclosure.

Fig. 1 illustrates a side view of a container according to the disclosure,
Fig. 2 is a front side view of the container of Fig. 1,
Fig. 3 is a perspective view of the container of Figs. 1 and 2,
Fig. 4 is a perspective view of the inside of the container of Figs. 1 to 3 without the flexible bladder, and
Fig. 5 is a side view of the inward facing surface of a side wall of the container of Fig. 4.

Detailed description of the invention

[0033] An example of a container 1 according to the present disclosure is shown in the drawings, where Figs. 1 to 3 are view from the outside of the container 1. A

support pallet 2, such as a EUR pallet of 120 cm length (L) and 80 cm width (W), is provided for support of the liquid material in the container 1 and for ease of transport and storage of the container 1. The support pallet 2 is provided with openings 3 along all sides for receiving forklift forks for transport of the container 1.

[0034] A box structure 7 is supported on the support pallet 2, comprising a front side wall 11 opposing a back side wall 9, which are connected with a left side wall 8 and a right-side wall 10 as shown in Fig. 4. The four side walls 8, 9, 10, 11 are made from corrugated fibreboard and extending 48 cm upwards (H) from the upper support surface of the support pallet 2, where the bottom wall 12 of the box may be constituted by the upper support surface of the support pallet 2 or by a corrugated fibreboard sheet on top of upper the support surface of the support pallet 2. Other plate material with a suitable strength, such as plywood or fibre-reinforced composite plates may be used for the side walls 8, 9, 10, 11 and possibly bottom wall 12. However, plate material made from paper, such as cardboard and corrugated fibreboard is preferred for the ease of recirculation of the material after use. The box structure 7 is of a substantially rectangular cross section from the supporting pallet 2 and to the top of the box structure 7.

[0035] Inside the box structure 7 is arranged a flexible bladder 4 for containing the liquid material to be contained in the container 1, the flexible bladder 4 being made from two layers of plastic material, an inner lining for enclosing the volume of liquid material and an outer lining for protecting the inner lining and safeguarding the liquid material in case of a leak in the inner lining. The inner lining is preferably made from a flexible food grade plastic material, which protects the liquid material from growth of bacteria, mould and fungus during storage. The flexible bladder 4 is manufactured from a rectangular four-layer sandwich of two layers of the inner lining enclosed between two layers of the outer lining, all four layers being thermal welded together under pressure by a seam along the outer edge of the rectangular shape, creating a closed two-layer flexible bladder 4 with an enclosure of an inner volume of about 450 litres. In Fig. 1 the left side wall 8 of the box structure 7 has been partially removed to provide a view of the flexible bladder 4 provided inside the box structure 7. For illustrative purposes, the vertical side of the flexible bladder 4 is shown separated with a horizontal distance from the back side wall 9 of the box structure 7, but the two are in abutting contact when the flexible bladder 4 is filled with the liquid material. In other embodiments of the present disclosure, the flexible bladder 4 may be manufactured with a single layer of a plastic sheet material enclosing an internal volume.

[0036] The flexible bladder 4 is provided with an outlet fitting 5 of a 70 millimetre inner diameter opening with a 3 inch connector to connect the enclosure of the flexible bladder 4 with a receiver, e.g. a spray machine for spraying paint, adhesive or spray putty onto interior surfaces, such as walls of buildings. The outlet fitting 5 is provided with means, such as an outer thread, to establish a safe connection to the receiver, such as established by means of a Storz connector. Furthermore, the outlet fitting 5 may comprise an internal removable plug, such as threaded plug to prevent leakage through the outlet fitting 5 during storage and transport. Alternatively or additionally, the outlet fitting 5 may be provided with an external removable cap, such as a threaded cap, for protection during transport and storage and for removal before connection to a receiver. The outlet fitting may comprise a valve, such a bib cock valve, to prevent leakage through the outlet fitting 5 during storage and transport. When the flexible bladder 4 is arranged in the box structure 7 of the container 1 as shown in Figs. 1, 2 and 3, the outlet fitting 5 extends through a lower part of the front side wall 11 of the box structure 7.

[0037] The flexible bladder 4 is furthermore provided with an inlet fitting 6, which when the flexible bladder 4 is arranged in the box structure 7 of the container 1 and the flexible bladder 4 is filled with the liquid material, as shown in Figs. 1, 2 and 3 is positioned at the top of the container 1. The inlet fitting 6 may correspond to the outlet fitting 5, or it may be provided with a smaller fitting, such as a 2 inch connector, as the issues with emptying the flexible bladder 4 which are addressed with the inner opening of the outlet fitting 5 does not apply to the inlet fitting 6.

[0038] Fasteners 15, 16, 17, 18, 19, 20 are provided between the outer lining of the flexible bladder 4 and various inwards surfaces 13 of the side walls 8, 10, 11 as well as the top surface of the bottom wall 12 of the box structure 7. The fasteners 15, 16, 17, 18, 19, 20 are in the present example lengths of double-sided adhesive tape, which are fastened to the inwards surfaces 13 and the bottom wall 12 before the flexible bladder 4 is placed in the box structure 7. The function of the fasteners 15, 16, 17, 18, 19, 20 is to prevent the flexible bladder 4 from being sucked into the outlet fitting 5 during emptying the flexible bladder 4 by means of a pump of a spray machine or the like connected to the outlet fitting while allowing the flexible bladder 4 to be released from the fastening to the inwards surfaces 13 and the bottom wall 12 without harming the flexible bladder 4, so that the flexible bladder 4 may be more completely emptied, e.g. by means of a wringer. Furthermore, the fasteners 15, 16, 17, 18, 19, 20 are arranged and designed so that the flexible bladder 4 may be gradually released from the inwards surfaces 13 and the bottom wall 12 so that the flexible bladder 4 may be emptied from the end near the back side wall 12 of the box structure 7 while the end of the flexible bladder 4 near the front side wall 11 of the box structure 7 remains fastened to the inwards surfaces 13 and the bottom wall 12 by means of the fasteners 15-20.

[0039] The slanted fasteners 15, 17 provided on the inwards side 13 of the left side wall 8 and the right side wall 10 of the box structure 7 as shown in Figs. 4 and 5 are specifically designed to retain the flexible bladder 4 to the

inwards surfaces 13 and prevent the flexible bladder 4 form being sucked into the outlet fitting 5 during the last part of the process of emptying the flexible bladder 4, where the flexible bladder 4 may be released from the slanted fasteners 15, 17 at the end away from the front side wall 11 of the box structure 7 while still be fastened to the inwards surfaces 13 of the left 8 and right side wall 10 by the end of the slanted fasteners 15, 17 near the front side wall 11 and thereby near the outlet fitting 5, which is situated low on the front side wall 11 near the bottom wall 12 of the box structure 7. The slanted fasteners 15, 17 are slanted from a higher position H2 towards a lower position H1 near the front side wall 11 in order to accommodate this function as the part of the flexible bladder 4 to be emptied last is the part close to the outlet fitting 5.

[0040] The distance H2 between the higher position and the bottom wall 12 is preferably at least 1½ times the distance H1 between the lower position and the bottom wall 12, such as at least 2 times.

List of reference numerals

[0041]

1	Container
2	Support pallet
3	Openings for receiving forklift forks
4	Flexible bladder
5	Outlet fitting
6	Inlet fitting
7	Box structure
8	Left side wall of box
9	Back side wall of box
10	Right side wall of box
11	Front side wall of box
12	Bottom wall of box
13	Inward facing surface of side wall of box
14	Upward facing surface of bottom wall of the box
15	Slanted fastener on left side wall of box
16	Horizontal fastener on left side wall of box
17	Slanted fastener on right side wall of box
18	Horizontal fastener on right side wall of box
19	Fastener on front side wall of box
20	Fastener on bottom wall of box
H	Height of box
L	Length of box
W	Width of box
H1	Distance from the bottom wall of box near the front side wall to slanted fastener strip
H2	Distance from the bottom wall of box further away from the front side wall to slanted fastener strip

Claims

1. Container (1) for containing a volume of liquid of at least 200 litres, such as at least 400 litres, preferably in the range of 300 to 1000 litres, such as in the range of 400 to 800 litres, the container (1) comprising

- a supporting pallet (2),
- a box structure (7) arranged on top of an upper support surface of the supporting pallet (2), the box structure (7) comprising side walls (8, 9, 10, 11) extending substantially vertically from the upper support surface of the supporting pallet (2),
- a flexible bladder (4) for containing said volume of liquid, the flexible bladder (4) being arranged inside of the box structure (7), the flexible bladder (4) preferably comprising at least an inner lining arranged for enclosing and being in contact with said volume of liquid and an outer lining arranged for being in contact with an inward facing surface (13) of the box structure (7), and
- an outlet fitting (5) provided in the flexible bladder (4) for connecting the volume of liquid with a spray machine,

wherein the outlet fitting (5) has an opening with an inner cross-sectional area of at least 30 cm^2, such as at least 35 cm^2.

2. The container (1) according to claim 1, wherein the outlet fitting (5) has a substantially circular cross sectional inner opening with a diameter of at least 65 mm, such as at least 70 mm.

3. The container (1) according to claim 1 or 2, wherein one or more fasteners (15-20) are provided between parts of the outer lining of the flexible bladder (4) and an inward facing surface (13) of at least some of the side walls (8, 9, 10, 11) of the box structure (7), fastening the outer lining of the flexible bladder (4) to the inward facing surface (13) of the side walls (8, 9, 10, 11) of the box structure (7), the fasteners (15-20) allowing for the outer lining to be pulled apart from the inward facing surface (13) without rupturing the outer lining.

4. The container (1) according to claim 3, wherein the outlet fitting (5) extends through a front side wall (11) of the box structure (7), and wherein the fasteners (15-18) are provided between parts of the outer lining of the flexible bladder (4) and inward facing surfaces (13) of each of the two side walls (8, 10) of the box structure (7) adjoining the front side wall (11).

5. The container (1) according to claim 4, wherein fasteners (15, 17) are provided as strips extending in a slanted direction a shorter distance (H1) from a bottom wall (12) of the box structure (7) at a position near the front side wall (11) to a longer distance (H2) from the bottom wall (12) of the box structure (7) at a position further away from the front side wall (11).

6. The container (1) according to claim 4 or 5, wherein one or more fasteners (19) are provided between

parts of the outer lining of the flexible bladder (4) and an inward facing surface (13) of the front side wall (11) of the box structure (7).

7. The container (1) according to any of claims 3 to 6, wherein one or more fasteners (20) are provided between parts of the outer lining of the flexible bladder (4) and an upward facing surface of a bottom wall (12) of the box structure (7).

8. The container (1) according to any of claims 3 to 7, wherein the one or more fasteners (15-20) allow for the outer lining of the flexible bladder (4) to be pulled apart from the inward facing surface (13) of the side walls (8, 9, 10, 11) of the box structure (7) and optionally the upward facing surface of the bottom wall (12) of the box structure (7) gradually, so that the outer lining of the flexible bladder (4) nearer a side wall (9) of the box structure (7) opposite the front side wall (11) of the box structure (7) may be pulled apart from the inward facing surface (13) of the side walls (8, 9, 10, 11) of the box structure (7) and optionally the upward facing surface of the bottom wall (12) of the box structure (7), to which it is fastened by means of the fasteners (15-20), while the outer lining of the flexible bladder (4) nearer the front side wall (11) of the box structure (7) still remains fastened to the inward facing surface (13) of the side walls (8, 9, 10, 11) of the box structure (7) and optionally the upward facing surface of the bottom wall (12) of the box structure (7) by means of the fasteners (15-20).

9. The container (1) according to any of claims 3 to 8, wherein the fastener(s) (15-20) is/are provided by an adhesive connection.

10. The container (1) according to any of the preceding claims, wherein the inner lining of the flexible bladder (4) is heat welded to the outer lining of the flexible bladder (4) in a pattern to prevent the inner lining from being displaced with respect to the corresponding outer lining prior to liquid being entered into the flexible bladder (4).

11. The container (1) according to any of the preceding claims, wherein the box structure (7) is provided in corrugated fibreboard.

12. The container (1) according to any of the preceding claims, wherein the upper supporting surface of the supporting pallet (2) extends 120 × 180 cm, such as a EUR pallet.

13. The container (1) according to any of the preceding claims, wherein the flexible bladder (4) comprises a volume of spray putty, the volume of spray putty being at least 300 litres, such as at least 400 litres, preferably in the range of 300 to 1000 litres, such as in the range of 400 to 800 litres.

14. The container (1) according to claim 13, wherein the spray putty has a plastic viscosity in the range of 800 to 1,600 cP, preferably in the range of 1,000 to 1,400 cP, provided that the shear stress on the spray putty exceeds the yield stress thereof.

15. A system for providing spray putty to surfaces of a building, the system comprising a container (1) according to claim 13 or 14 and a putty spray machine having a pump unit with an inlet side, which is connected by means of an inlet pipe to the outlet fitting (5) of the container (1), and an outlet side connected to one or more spray guns, wherein the pump unit is suitable for providing spray putty at the outlet side at a pressure of at least 120 bar, such as at least 150 bar, preferably at least 200 bar, and wherein the pump unit is suitable for providing spray putty at the outlet side without admixing the spray putty with additional air.

16. Use of a system according to claim 15 for providing spray putty to surfaces of a building, such as walls and ceilings of that building.

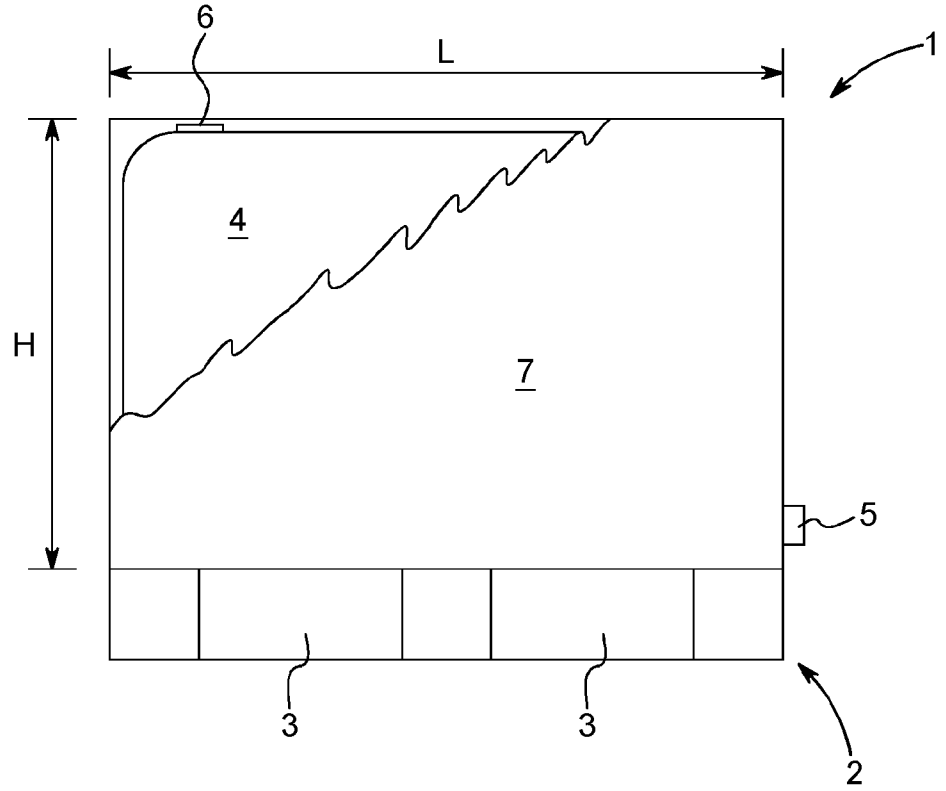

FIG. 1

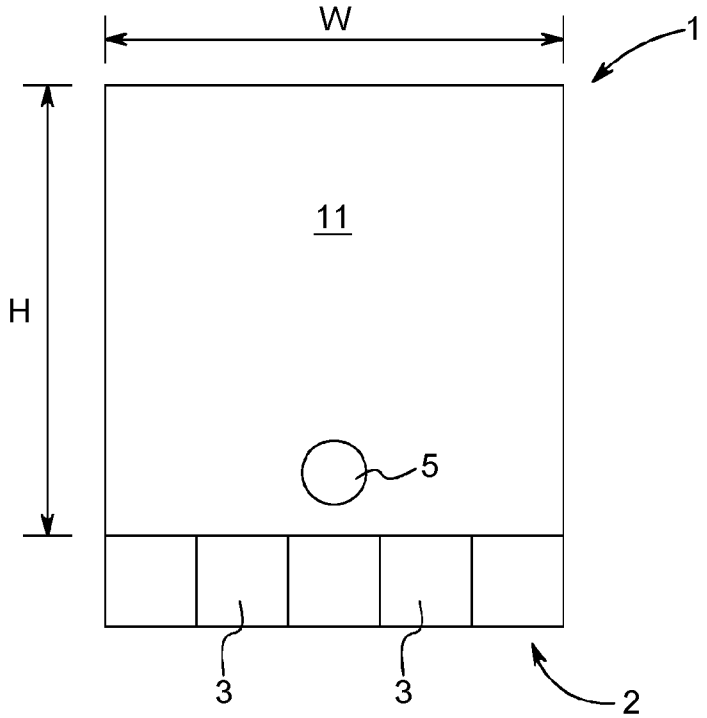

FIG. 2

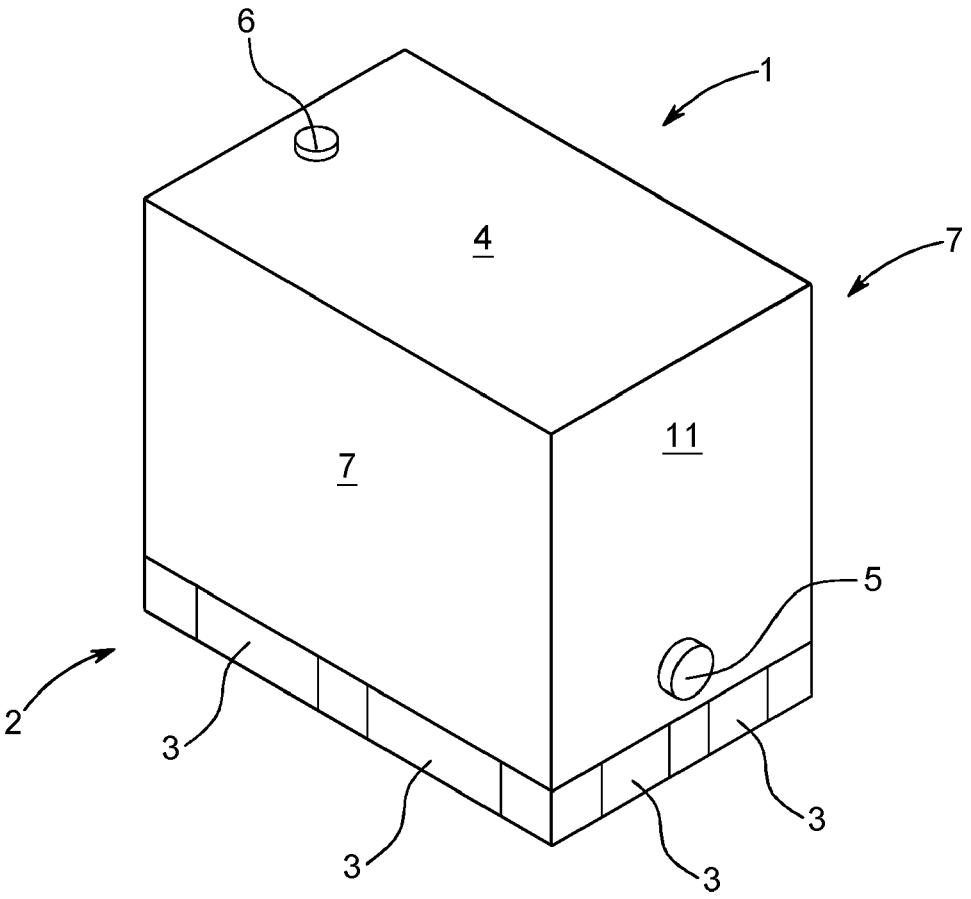

FIG. 3

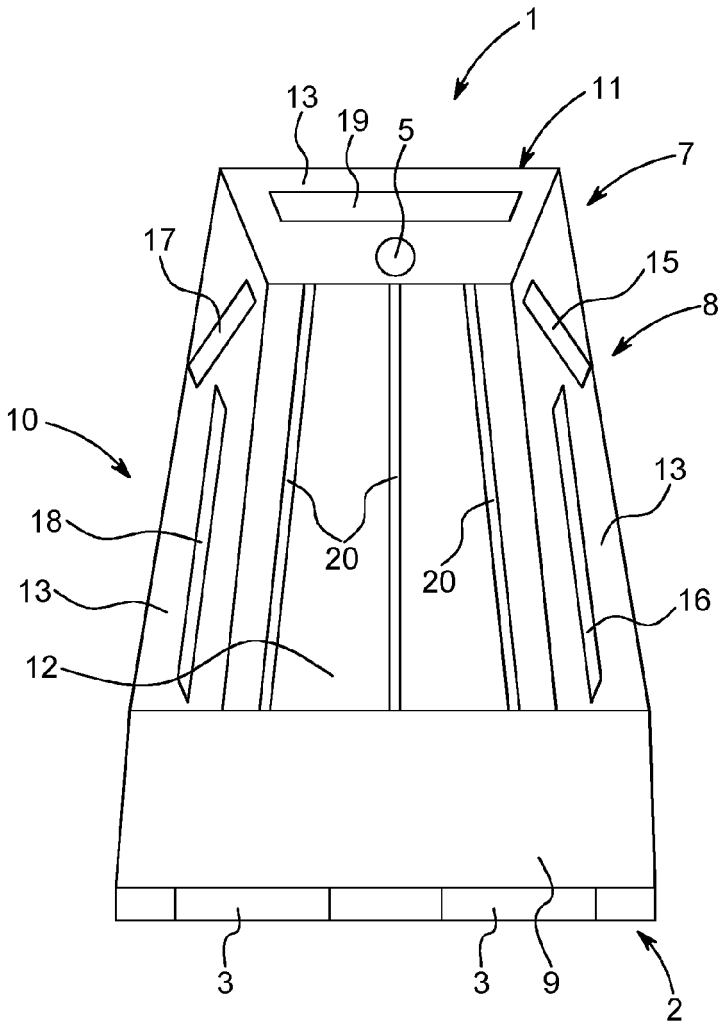

FIG. 4

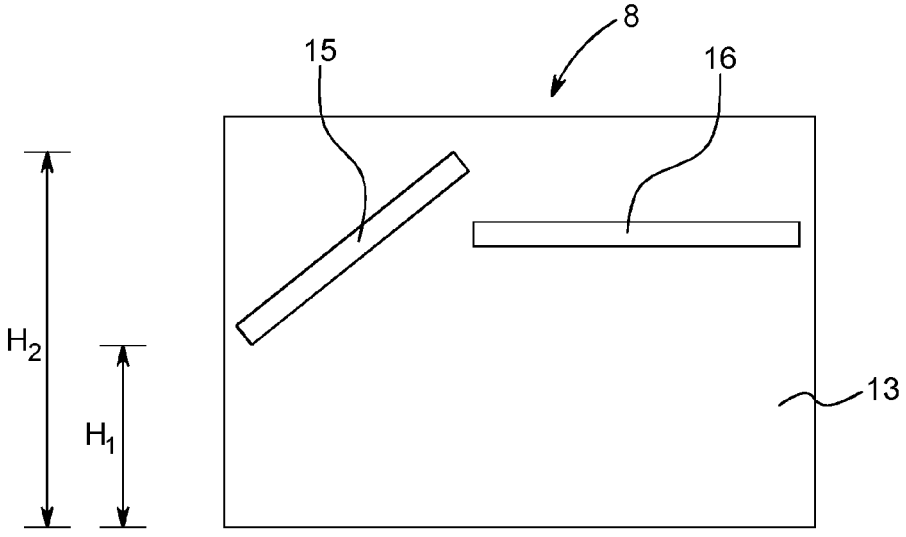

FIG. 5

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EUROPEAN SEARCH REPORT

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The present search report has been drawn up for all claims

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Place of search	Date of completion of the search	Examiner
Munich	17 January 2024	Eberwein, Michael

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