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Description

The invention relates to a multi-layered flexible inliner having at least one filling/retrieving port for insertion into supporting external containers for storing and for transporting in particular hazardous liquid or free-flowing filling goods.

The supporting external containers can be, for example, pallet containers, composite IBCs, flexible IBCs, stiff paperboard/cardboard boxes, bunghole drums, lidded drums, canisters or the like, and serve exclusively for supporting the thin-walled inliner. The liquid filling goods herein do not come into contact with the supporting external container but come into contact only with the interior of the inliner. In order for used and in most cases valuable external containers to be re-used, only a replacement of the used and comparatively cost-effective inliner, or film bag, respectively, is necessary.

Thin-walled inliners of this type are often used in large-volume pallet containers, in particular in cuboid-shaped composite IBCs (hereunder referred to as "IBC" for short), so as to protect the valuable rigid plastics-material internal container in relation to contamination by filling goods, and so as to enable said valuable rigid plastics-material internal container to be re-used. Composite IBCs are composed of a rigid internal container from thermoplastic plastics material, a tubular grid frame which is from horizontal and vertical tubular rods that are welded to one another and as a supporting jacket tightly encloses the plastics-material internal container, and a rectangular base pallet on which the plastics-material container bears and to which the tubular grid frame is fixedly connected.

The rectangular rigid plastics-material container most typically has two longer lateral walls, one shorter rear wall, one shorter front wall, an upper base having a closable filling port, and a container base, wherein a lower retrieving region having a concave molding which in the shape of a protective housing is directed inward in the direction into the plastics-material internal container and which has a retrieving port for the protected, recessed fastening of a closable retrieving fitting is provided on the base in the center of the front wall.

Thin-walled inliners which are inserted into a rigid plastics-material internal container are provided with corresponding filling and retrieving ports which are typically from the same film material as the inliner per se and are connected, or fastened, at the top to the filling port, and at the bottom to the retrieving port having a retrieving fitting of the rigid plastics-material internal container of the IBC.

Set of issues:

When selecting the packaging, for example a pallet container having an inserted multi-layered inliner, for different liquid filling goods, the barrier properties of the inliner that are required for the respective filling good have to be chosen. There are known multi-layered film inliners having barrier layers in the case of which comparatively stiff ports from a thin-walled plastics material (PE, PA) which are prefabricated by the injection-molding method are welded on, said ports however not containing any barrier layers and thus not providing any barrier effect. Sensitive liquid filling goods can therefore be influenced and damaged by diffused oxygen, for example.

However, flexible hose ports from the same film material of the inliner, having a barrier layer, can also be welded about the filling and/or retrieving opening of the inliner. The issue in the case of multi-layered inliners having an asymmetrical film construction then however lies in that in the case of welded film ports (filling port and/or retrieving port) the filling goods will always come into contact with the inner cutting edge of the film opening when welding the film port flange to the inliner from the outside, or will come into contact with the outer cutting edge of the film port flange when welding the film port flange to the inliner from the inside. The adhesive-type bonding agent layers which are incorporated between the barrier layers can be compromised and dissolved in particular in the case of solvent-containing filling goods such that a disadvantageous release of the film layers associated with a loss of the barrier properties can take place in particular in large containers which are equipped with multi-layered inliners and transported over a comparatively long temporal period. The mechanical properties can deteriorate when the film composite is dissolved. Moreover, the filling goods can ingress behind the actual barrier layer and thus circumvent the latter.

Prior art:

The use of a cuboid inliner from a thin plastics-material film in a rigid plastics-material internal container of a usual pallet container is known from publication EP 2 090 528 A1. The focus herein is in particular the secure fixing of the lower inliner retrieving port in the rigid retrieving port of the plastics-material internal container with the aid of the screw-fitted retrieving fitting. The inliner retrieving port welded to the inliner film wall here is however composed from an annular sleeve having a welded flange rim which is from another plastics material than the inliner film and which is prefabricated by the injection-

molding method. Publication DE 43 16 865 A1 discloses an inliner made of plastics-material film having a filling/retrieving port likewise consisting of plastics-material film.

Object:

The present invention is based on the object of proposing the design embodiment of a multi-layered inliner having a welded film port in which the disadvantages mentioned are avoided and the full barrier properties are permanently maintained.

Achievement:

This object is achieved by the special features of patent claim 1. The features in the dependent claims describe further advantageous design embodiment potentials of the inliner according to the invention. The proposed technical teaching conveys in a simple manner how the weak points in a multi-layered inliner can be remedied and the full barrier properties are fully maintained even in the case of long transportation and storage periods of the liquids containers, and diffusion-related damage to sensitive filling goods is avoided. In terms of construction, this is achieved in that the filling/retrieving port is welded to the inliner wall in such a manner that existing film cutting edges are covered in relation to contact with the filling goods, and no film cutting edge, neither the film cutting edge on the welded flange rim of the welded filling/retrieving port, nor the film cutting edge on the internal-side delimitation of a retrieving opening in the inliner wall, comes into contact with the filled liquid filling goods.

In one design embodiment of the invention it is provided that the welded filling/retrieving port is of the same multi-layered film construction as the inliner wall. It is ensured on account thereof that the welded filling/retrieving ports have the same barrier qualities as the inliner film.

In order for a high strength of the welding of the filling/retrieving port to the inliner wall having an asymmetrical layered construction to be achieved, the same external film layers are expediently welded to one another.

To this end, the welded flange rim of the filling/retrieving port is in particular aligned in a radially inward manner, wherein a through opening which has the same diameter as the retrieving opening in the inliner wall is configured within the welded flange rim. This is achieved in a simple manner in that the filling/retrieving port by way of the inwardly aligned flange rim is first welded to the closed inliner wall at the envisaged position, and,

after the welding of the flange rim, a retrieving opening by means of an annular cutter or a circular punching tool is cut, or punched, respectively, into the inliner wall so as to be centric in relation to the welded filling/retrieving port, wherein the internal delimitation of the flange rim of the filling/retrieving port having the same diameter as the retrieving opening in the inliner wall is simultaneously punched or trimmed, respectively, so as to have a clean film cutting edge.

In one further design embodiment of the invention it is provided that the welded filling/retrieving port is turned inside out and pulled through the retrieving opening in the inliner wall in such a manner that the welded flange rim of the filling/retrieving port is disposed on the internal side of the inliner wall and the pulled-through filling/retrieving port is disposed on the external side of the inliner. In terms of production technology it is particularly important herein that the annular welding of the welded flange rim of the filling/retrieving port to the inliner wall has taken place still prior to the complete and final welding of the blanks of the multi-layered inliner film for the inliner body. To the extent that a tubular film is used as a vertically encircling lateral wall part for the inliner body, said tubular film is turned inside out prior to the welding of the welded flange rim in the shape of an annular disk, and the internal side is turned outside and after the welding of the welded flange rim is again reversed such that the internal side is disposed on the inside again. Thereafter, the filling/retrieving port which is still protruding inward is likewise turned inside out such that said filling/retrieving port protrudes toward the outside and is disposed on the external side of the inliner.

In an especially preferred design embodiment of the invention the inliner for insertion into usual 1000 l pallet containers has a cuboid design in which three blanks of a multi-layered inliner film are welded to one another, wherein the said three blanks are composed of an upper horizontal cover part having a centric flexible filling port, a lower horizontal base part, and a vertically encircling lateral wall part having a flexible retrieving port on the base. Large-volume pallet containers of this type, in particular composite IBCs, are available worldwide and used in millions for storing and for transporting hazardous liquid or free-flowing filling goods, and by means of the multi-layered inliner according to the invention can be used and rendered useful as a cost-effective multi-application or multi-use packaging means in particular for high-value sensitive liquid filling goods.

In one particular design embodiment of the invention it is provided that the upper centric flexible filling port of the inliner is fixedly welded into an upper centric filling port of a rigid plastics-material internal container, and the flexible retrieving port of the inliner that is disposed on the base is fixedly welded into a retrieving port disposed on the base of a rigid

plastics-material internal container of a pallet container. According to one embodiment herein, the upper centric flexible filling port and/or the flexible retrieving port disposed on the base of the inliner are/is fixedly welded so as to be axial on the end side of the upper centric filling port, or fixedly welded so as to be axial on the end side of the retrieving port disposed on the base of the rigid plastics-material internal container of the pallet container.

According to one other embodiment, the upper centric flexible filling port and/or the flexible retrieving port disposed on the base of the inliner are/is fixedly welded so as to be radial in the external mouth region of the upper centric filling port, or fixedly welded so as to be radial in the external mouth region of the retrieving port disposed on the base of the rigid plastics-material internal container of the pallet container. Both welding variants, radial and axial, can of course be combined in an arbitrary manner.

Used containers for the transportation of liquids such as, pallet containers, bunghole drums, and canisters are expertly reconditioned for re-use in qualified reconditioning facilities, this including in particular cleaning, testing, quality control, as well as the insertion of new inliners. When the flexible thin-walled filling and retrieving ports of the inliner in a pallet container are fixedly welded into the stable filling and retrieving ports of the rigid plastics-material internal container, said fixing of the inliner in the rigid plastics-material internal container is the easiest to handle for the customers and users, thus the parties filling and emptying the liquid filling goods, because no twisting of the flexible filling and retrieving ports of the inliner, associated with the formation of creases and leakages, as has often arisen to date in the usual fastening of inliner ports by way of simple turning inside-out and clamping onto the rigid container port, can result when screw-fitting and unscrewing screw caps, bunghole ports, retrieving fittings, or stirring tools.

The invention will be explained in more detail hereunder by means of an exemplary embodiment which is schematically illustrated in the drawings in which:

figure 1 shows an IBC having an inserted inliner according to the invention, in a front view;

figure 2 shows the inserted inliner according to the invention, in a perspective view;

figure 3 shows a schematic illustration of a welding and punching device;

figure 4 shows a schematic illustration of a welded inliner port;

figure 5 shows a perspective partial sectional view about the region of an upper filling opening of an IBC plastics-material internal container; and

figure 6 shows a perspective partial sectional view about the region of a lower retrieving opening of the IBC plastics-material internal container.

In figure 1 a pallet container (IBC) having a filling goods volume of approx. 1000 l for storing and for transporting in particular hazardous liquid or free-flowing filling goods as a preferred exemplary embodiment is identified by the reference sign 10. The pallet container 10 for an application or use, respectively, with hazardous filling goods meets particular test criteria and is provided with a corresponding regulatory permit. The main elements of the pallet container 10 are composed of a thin-walled rigid internal container 12 which is produced from a thermoplastic plastics-material by the blow-molding method, a tubular grid frame 14 which as a supporting jacket tightly encloses the plastics-material internal container 12 and a base pallet 16 on which the plastics-material internal container 12 bears and to which the tubular grid frame 14 is fixedly connected. The external tubular grid frame 14 is composed of horizontal and vertical tubular rods 18, 20 which are welded to one another.

An identification plate 22 from thin steel sheet for identifying the respective liquid filling goods is fastened to the front side of the tubular grid frame 14. A retrieving fitting 24 for retrieving the liquid filling goods is connected on the front of the base of the plastics-material internal container 12. In order for the rigid plastics-material internal container 12 to be protected against contamination by the filling goods filled into said container and for multiple re-use of the valuable internal container to be enabled, a thin-walled inliner 28 according to the invention from a flexible multi-layered composite film is to be inserted in each case into the rigid plastics-material internal container 12 prior to the pallet container 10 being freshly re-filled, said inliner 28 at the top being connected to the filling port 74 and at the bottom being connected to the retrieving port 76 of the rigid plastics-material internal container 12.

Said flexible inliner 28 according to the present invention, which in this case is likewise cuboid, is schematically illustrated per se (without the enclosing plastics-material internal container 12) in figure 2. In contrast to the rigid plastics-material internal container 12 which when handled always remains dimensionally stable in any case, the inliner 28 per se, by virtue of the thin-walled property thereof, is not dimensionally stable but rather flexible, resilient, and adaptable. The wall thickness of the multi-layered inliner composite film is approx. 100 µm to 300 µm, preferably approx. 150 µm. Given a specific area weight

of approx. 100 to 150 g/m^2, this results in a material weight of approx. 0.7 to 1.3 kg for a 1000 l inliner bag. The inserted inliners are produced from a multi-layered plastics-material composite film having an asymmetrical layered construction. The wafer-thin composite layers herein can be composed of various materials such as, for example HDPE / LDPE / EVOH / PET / PA / PP, or SiOx having layers from a bonding agent disposed therebetween, and/or be provided with a glass-fiber or woven-fabric reinforcement. Depending on the specific application, the composite film is equipped with barrier layers in relation to the diffusion of hydrocarbon, oxygen, aromatic substances, or water vapor, and optionally with antiseptic anti-bacterial coating, or a metal foil which contain vapor depositions of silver or aluminum.

The cuboid flexible inliner 28 in the front lower retrieving region has an inwardly directed wall concavity 34 which corresponds to the concave molding 26 in the shape of a protective housing of the rigid plastics-material internal container 12, having two lateral wall parts 36, one upper wall part 38, and one rearward wall part 40 having a flexible retrieving port 32 which is molded to the latter and which is configured for bearing in a completely exact fit on the internal surface of the concave molding 26 which in the shape of a protective housing protrudes into the interior of the rigid plastics-material internal container 12. For the sake of improved clarity, this wall concavity 34 of the inliner 28 here is illustrated so as to be very box-shaped. The walls and wall transitions can of course also be configured so as to be heavily radiused, flattened and/or mutually transitioning, but in any case are to be adapted to the respective concave molding 26 in the shape of a protective housing of the rigid plastics-material internal container 12.

In terms of production technology, the body of the flexible inliner 28 is assembled by welding three blanks of a multi-layered composite film having an asymmetrical layered construction. Said three blanks are composed of an upper cover part 46 having the centric flexible filling port 30, a lower horizontal base part 48 having a recess that corresponds to the shape of the base of the wall concavity 34, and a vertically encircling lateral wall blank 52 having sub-portions in terms of faces for the two lateral wall parts 36, as well as the upper wall part 38 and the rearward wall part 40 of the wall concavity 34 of the inliner 28, as is illustrated in figure 2. In the case of a completely produced inliner, the three blanks are welded together by way of two weld seams 42, 44 which are horizontally encircling on the external edge of the upper cover part 46 and on the external edge of the lower base part 48, and for closing the lateral wall blank 52 by way of the weld seam 50 which in the center of the front wall and through the center of the wall concavity 34 runs vertically from the top to the bottom. The particular welding of the flexible filling port 30 and retrieving port 32 will be described hereunder.

The state prior to the welding of a filling/retrieving port 54 is schematically illustrated by means of a double-layered inliner film ("TwinLiner") in figure 3. The two layers of the inliner film are composed of dissimilar materials and thus represent a simple asymmetrical film construction. In an asymmetrical film construction of an inliner film it is important that the same film material, or the same film layer, respectively, of the individual blanks and tubular filling and retrieving ports are at all times welded to one another. In the case of all parts to be welded, the internal side of the parts which comes into contact with the filling goods is expediently first turned outward. To this end, the blanks, or tubular films, respectively, of the vertical inliner wall as well as the tubular filling/retrieving port are turned inside out and turned "to the wrong side", so to speak. After the inliner ports have been welded, all parts are turned back, or reversed, respectively, to their normal positioning.

It is important in this instance that the welded flange rim 58 of the filling/retrieving port 54 prior to welding is aligned in a radially inward manner. The welded flange rim 58 which is aligned in a radially inward manner, by means of a pressing tool in the form of a cylindrical counter bearing 62 (this counter bearing can also be referred to as a welding tube), is pressed against the internal side of the inliner wall and welded by means of an annular welding device 60. As the tubular filling/retrieving port 54 is folded radially inward onto the cylindrical counter bearing 62, thin creases are inevitably formed in the film of the welded flange rim 58, said creases in the subsequent welding of the welded flange rim 58 by way of the annular welding device 60 however being completely ironed out so as to be flat and smooth in relation to the inliner wall. A rib-type reinforcement of the welded area in association with an increased strength of the welded connection is derived on account of the additional film material of the thin creases.

A through opening which is within the welded flange rim 58, 66 and has a clean film cutting edge 68 is configured directly after the welding by means of an annular punching blade 64 which is pushed against the cylindrical counter bearing 62, said through opening having the exact same diameter as the retrieving opening 72 in the inliner wall 56 that is punched, or cut, simultaneously so as to have a clean film cutting edge 70.

After the welding of the tubular filling/retrieving port 54, the latter is again "turned inside-out" and pulled through the retrieving opening 72, which has just been cut in the inliner wall 56, to the outside onto the external side of the inliner body, as can be seen in figure 4. Here, the external side is illustrated at the top, and the internal side of the inliner body is illustrated at the bottom, as an exemplary embodiment for an upper filling port of an

IBC. In order for the inliner according to the invention to be implemented it is in any case important that the annular welding of the welded flange rim 58 of the filling and retrieving port 30, 32, 54 to the inliner wall 56 in terms of production technology has taken place prior to the complete and final welding of the blanks of a multi-layered inliner film for the closed inliner body.

The filling region of the rigid plastics-material internal container 12, having the filling port 74 molded thereon and the filling port 30 of the flexible inliner 28 welded thereto, can be seen in a partial sectional illustration in figure 5. The flexible filling port 30 by way of the welded flange ring 66 is welded to the upper side of the inliner 28, on the one hand, and by way of an annular weld seam 78 by radial welding is welded in a rotationally secure manner to the top in the internal side of the rigid filling port 74 just below the end side of the rigid filling port 74, said welding being in each case gas-tight and liquid-tight.

Finally, the retrieving region of the plastics-material internal container 12, having the rigid retrieving port 76 molded thereon and the retrieving port 32 of the flexible inliner 28 welded thereto at the end side can be seen in a partial sectional illustration in figure 6. For improved clarity, a quadrangle has been cut out of the wall of the rigid plastics-material internal container here, wherein the section line runs through the retrieving port 76, through the protective housing 26 molded therein, and a small piece of the front wall of the plastics-material internal container 12, such that in the cut-out quadrangle the inliner 28 bearing therein by way of a curved wall concavity 34, identified by a multiplicity of vertical lines, can be seen. Furthermore, the obscured left rear part of the wall concavity 34 is indicated by dashed lines. It can be clearly seen in the quadrangular cut-out that the flexible retrieving port 42 on the inside, or the rear side, respectively, by way of a narrow welded flange rim 66 is welded to the rearward wall part 40 of the wall concavity 34 of the inliner 28, and on the external side by way of an end weld seam 80 by way of axial welding is welded to the end face of the rigid retrieving port 76, said welding being in each case in a gas-tight and liquid-tight manner. The inliner 28 by way of the shape-adapted wall concavity 34 bears on the full face, like a second skin, on the internal surface of the concave molding 26 of the rigid internal container 12. A substantial advantage of such a second-skin inliner lies in that the film back does not need such a high tear strength in relation to thrashing when being filled, or when the liquid filling goods slosh back and forth in movements during transportation, as to date, since no movement of any kind of the inliner film material takes place because the latter bears in a fixed and permanent manner on the internal side of the plastics-material internal container 12, as if adhesively bonded thereto, so to speak. On account thereof, more cost-effective film materials than to date, which are sensitive to tearing and have high barrier properties, can now also be used.

The upper flexible filling port 30 as well as the lower flexible retrieving port 32 of the flexible inliner 28 are expediently produced from the same film material having the same barrier properties as the film material of the flexible inliner 28. However, in the case of the inliner 28 according to the invention, the filling/retrieving ports 30, 32, 54 are equipped with the same barrier properties as the inliner 28 per se, and disadvantageous diffusion procedures which penetrate the plastics material are precluded. In the case of an asymmetrical film construction of the internal film it is important that the same film material, or the same external film layer, respectively, are in each case welded to one another in the annular welding of the welded flange rim of the filling/retrieving port to the inliner wall.

Instead of being inserted into the pallet container which has been described in detail and has its peculiarities, the inliner according to the invention, in a correspondingly adapted shape, can of course also be inserted into any other liquids container such as, for example bunghole drums or canisters from steel or plastics material.

Conclusion:

The specific production, or constructive design embodiment, respectively, of an inliner according to the invention advantageously results in a film construction in which no open cutting edges of the multi-layered film point towards the filling goods, and wherein the correct surface is always directed inward. On account thereof, the barrier effect of the multi-layered film when in direct contact with the liquid filling goods is in particular fully preserved even over comparatively long transportation and storage periods, and any disadvantageous influence on or damage to the high-value filling goods by diffusion procedures from the inside to the outside (aromatic substances) or from the outside to the inside (oxygen) through the composite film is avoided on account thereof.

List of reference signs

	10	Pallet container	**62**	Cylindrical counter bearing
	12	Plastics-material internal container	**64**	Annular punching blade
5	**14**	Tubular grid frame	**66**	Welded flange ring (28)
	16	Base pallet	**68**	Film cutting edge, flange ring
	18	Horizontal tubular rods (12)	**70**	
		Film cutting edge, inliner wall		
	20	Vertical tubular rods (12)	**72**	Retrieving opening, inliner wall
10	**22**	Identification plate	74	Upper filling port rigid (12)
	24	Retrieving fitting	**76**	Lower retrieving port rigid (12)
	26	Concave molding (12)	**78**	Radial welding, inward
15				
	28	Inliner (film bag)	**80**	Axial welding, end side
	30	Filling port (28), flexible		
20	**32**	Retrieving port (28), flexible		
	34	Inliner concavity (28)		
	36	Lateral wall parts (34, 28)		
25				
	38	Upper wall part (34, 28)		
	40	Rearward wall part (34, 28)		
	42	Upper horizontal weld seam		
30	**44**	Lower horizontal weld seam		
	46	Upper horizontal cover part (28)		
	48	Lower horizontal base part (28)		
	50	Front vertical weld seam (52)		
	52	Lateral wall blank (28)		
35	**54**	Inliner port		
	56	Inliner wall		
	58	Inliner flange, radially inward		
	60	Welding device, annular		

Patentkrav

1. Fleksibel inliner (28) i flere lag av plastfolie, der det på en inlinervegg (56) er sveiset på minst én innfyllings-/uttaksstuss (30, 32, 54) med sveiset flenskant (58) som også består av plastfolie, til bruk i stabile ytterbeholdere for å lagre og transportere spesielt farlig flytende eller fluid fyllgods,
der innfyllings-/uttaksstussen (30, 32, 54) er sveiset på inlinerveggen (56) på en slik måte at tilstedeværende folieskjæringskanter (68, 70), altså de som befinner seg på den sveisede flenskanten (58, 66) på den påsveisede innfyllings-/uttaksstussen (30, 32, 54) og de som befinner seg på den indre begrensningen av en uttaksåpning (72) i inlinerveggen (56), er dekket mot kontakt med innfylt flytende fyllgods.

2. Inliner ifølge krav 1,
der den påsveisede innfyllings-/uttaksstussen (30, 32, 54) oppviser den samme folieoppbygningen i flere lag som inlinerveggen (56).

3. Inliner ifølge krav 1 eller 2,
der de samme ytre folielagene er sveiset sammen med hverandre når innfyllings-/uttaksstussen (30, 32, 54) blir sveiset på inlinerveggen (56).

4. Inliner ifølge krav 1, 2 eller 3,
der den sveisede flenskanten (58, 66) på innfyllings-/uttaksstussen (30, 32, 54) før påsveisingen er innrettet radielt innover, der det etter påsveisingen innenfor den sveisede flenskanten (58, 66) er utformet en gjennomgangsåpning som oppviser omtrent samme diameter som uttaksåpningen (72) i inlinerveggen (56).

5. Inliner ifølge krav 1, 2, 3 eller 4,
der den påsveisede innfyllings-/uttaksstussen (30, 32, 54) er vrengt og trukket inn gjennom uttaksåpningen (72) i inlinerveggen (56) på en slik måte at den ferdig påsveisede sveisede flenskanten (66) på innfyllings-/uttaksstussen (30, 32, 54) er anordnet på innsiden av inlinerveggen (56).

6. Inliner ifølge et av de foregående kravene 1 til 5,
der den sveisede flenskanten (58) på innfyllings-/uttaksstussen (30, 32, 54) er innrettet radielt innover og er sveiset på innsiden av inlinerveggen (56) på inlinerfolien i flere lag for inlinerlegemet ved hjelp av ringformede påsveisinger.

7. Inliner ifølge et av de foregående kravene 1 til 6,

der denne er kubeformet for å bli brukt i vanlige 1000 l pallecontainere, der tre tilsnittsdeler av en inlinerfolie i flere lag er sveiset sammen med hverandre, der disse tre tilsnittsdelene består av en øvre horisontal dekseldel (46) med midtre fleksibel innfyllingsstuss (30), en nedre horisontal bunndel (48) og en vertikal omløpende sideveggdel (52) med fleksibel uttaksstuss (32) som er anordnet på bunnen.

8. Inliner ifølge foregående krav 7,
der den øvre, midtre fleksible innfyllingsstussen (30) på inlineren (28) er sveiset fast inn i en øvre, midtre innfyllingsstuss (74) på en stiv indre beholder (12) i plast, og den fleksible uttaksstussen (32) på inlineren (28) som er anordnet på bunnen, er sveiset fast inn i en uttaksstuss (76) som er anordnet på bunnen, av en stiv indre beholder (12) av plast hos en pallecontainer (10).

9. Inliner ifølge et av de foregående kravene 7 eller 8,
der den øvre, midtre fleksible innfyllingsstussen (30) og/eller den fleksible uttaksstussen (32) på inlineren (28) som er anordnet på bunnen, er fastsveiset aksialt på forsiden av den øvre, midtre innfyllingsstussen (74) eller fastsveiset aksialt på forsiden av uttaksstussen (76) som er anordnet på bunnen, på den stive indre beholderen (12) i plast hos pallecontaineren (10).

10. Inliner ifølge et av de foregående kravene 7 til 9,
der den øvre, midtre fleksible innfyllingsstussen (30, 54) og/eller der den fleksible uttaksstussen (32, 54) som er anordnet på bunnen av inlineren (28), er fastsveiset radielt inne i det ytre munningsområdet på den øvre, midtre innfyllingsstussen (74) eller fastsveiset radial radielt inne i det ytre munningsområdet på uttaksstussen (76) som er anordnet på bunnen, på den stive indre beholderen (12) i plast hos pallecontaineren (10).

Fig. 1

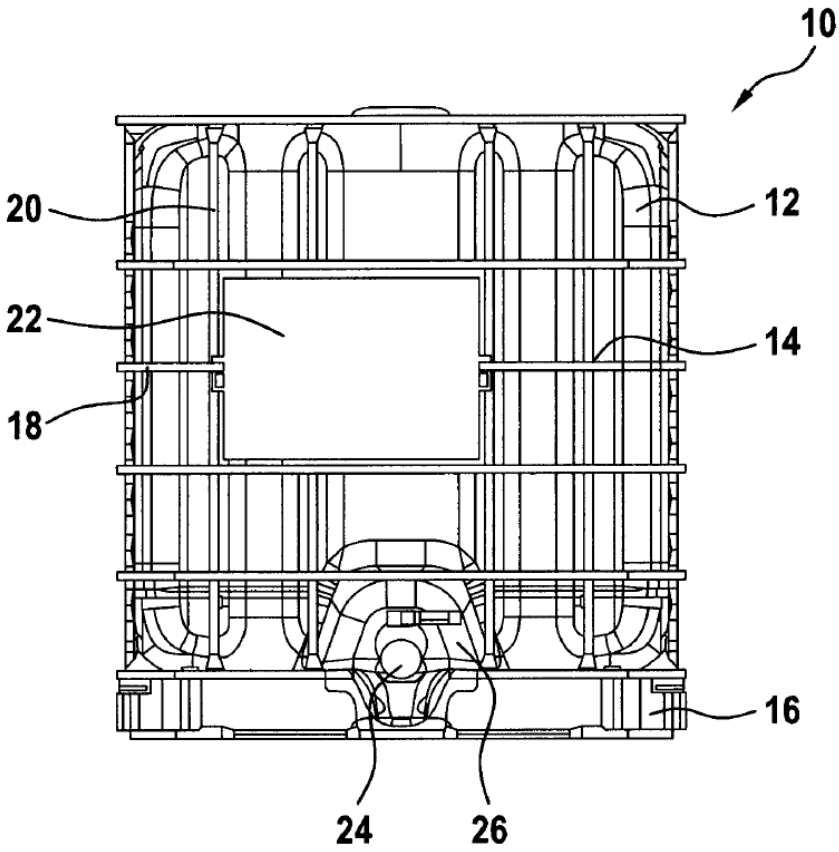

Fig. 2

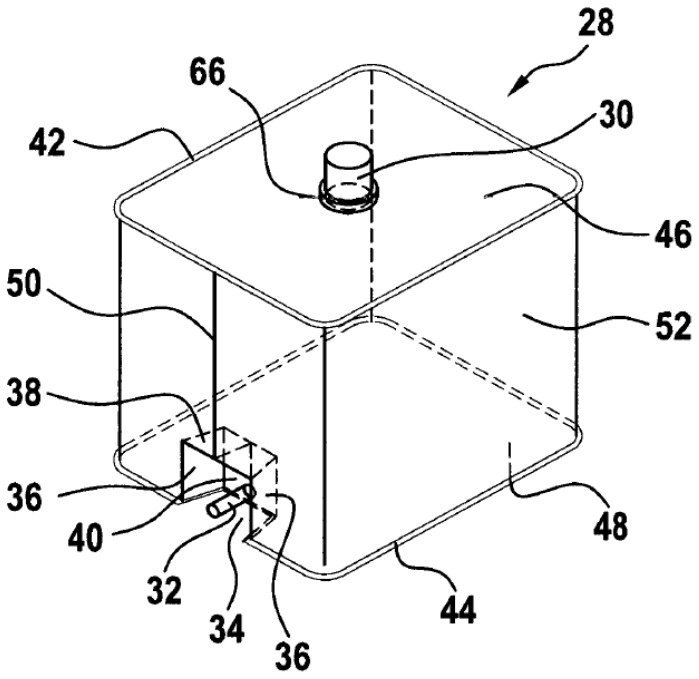

Fig. 3

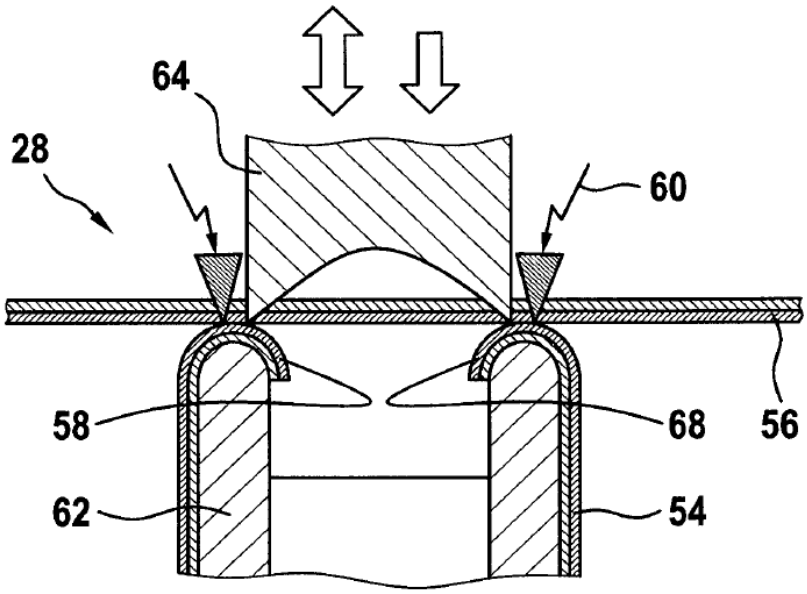

Fig. 4

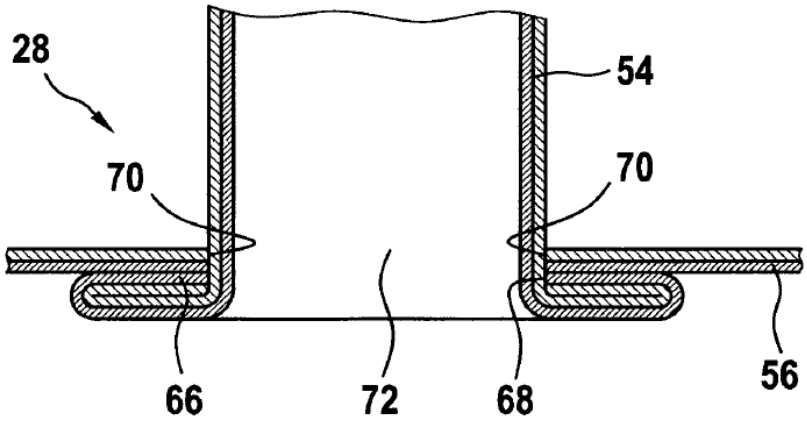

Fig. 5

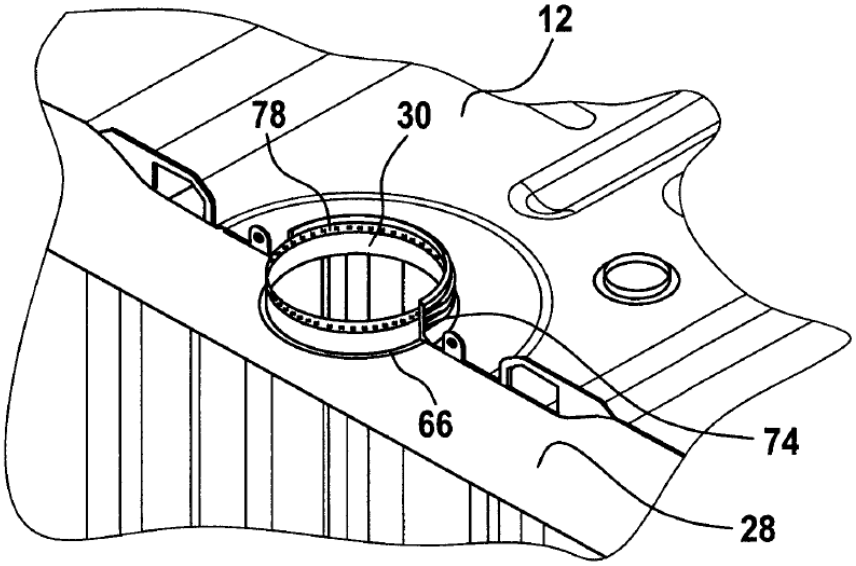

Fig. 6