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(54) Benevnelse **INLINER FOR PALLET CONTAINER AND PALLET CONTAINER**

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# Pallet container having an inner liner

The invention relates to an inner liner according to the preamble of claim 1 and to a pallet container according to claim 8 which is provided with such an inner liner.

Such pallet containers are in principle known from the state of the art, for example as so-called Intermediate Bulk Containers (IBCs).

From EP 2 090 528 A1 it is known to arrange a thin-wall flexible and substantially tubular film of an inner liner within the inner container of the pallet container, wherein the inner liner is formed as a film being hermetically sealed, where appropriate being additionally sterilized by way of a germicidal radiation, substantially being tubular, and wherein the film is arranged within the inner container of the pallet container.

When placing the film for receiving the goods to be transported in the inner liner into the inner container of the pallet container, it turns out to be difficult to install, in a simple manner, the inner liner that is hermetically sealed without affecting the airtightness.

It is the object of the invention to provide for an inner liner for a pallet container or a pallet container having an inner liner, wherein the inner liner is to be mounted in a simple fashion and without affecting the airtightness of the volume that is enclosed by the film of the inner liner.

Said object is attained in accordance with the invention by way of an inner liner according to claim 1, wherein the inner liner comprises a thin-wall flexible film, an adapter for linking the film to an opening in the container wall of the inner container of the pallet container, and an armature for removing the goods to be transported, wherein the film, the adapter and the armature form a prefabricated assembly, and wherein the area that is enclosed by the film, the adapter and the armature is hermetically sealed off from the environment.

The adapter according to the invention links the film to the armature and additionally offers the possibility to install the assembly consisting of the film, the adapter and the armature as a prefabricated airtight structural unit into the opening of the container wall of the inner container of the pallet container and to dismount said assembly if required.

Said object is in addition substantially attained for the pallet container, according to claim 8, by way of an inner liner according to one of the claims 1 to 7 in that the adapter of the inner liner is fastened to an opening of the container wall of the inherently stable inner container.

Preferably, it is envisaged for the inner liner that the adapter is embodied as a substantially rotationally symmetric molded part, in particular a molded plastic part.

Preferably, it is envisaged for the inner liner regarding the adapter that the adapter is embodied as a substantially pot-shaped piece, wherein the pot-shaped piece comprises a bottom and a side wall. Here, the substantially pot-shaped piece can be arranged and fixed in a simple fashion within the opening of the container wall, in particular substantially in a form-fitting manner.

Preferably, it is envisaged for the design of the adapter as a substantially pot-shaped piece that the side wall is embodied so as to be tapered, such that the adapter is received in the center within the opening in the container wall of the pallet container.

Preferably, it is envisaged regarding the design of the inner liner as a substantially pot-shaped piece that the pot-shaped piece has an edge area that is flanged. The edge area that is flanged serves as a bearing surface or cover or seal housing for a sealing ring of a seal.

Preferably, it is envisaged regarding the edge area that is turned over, of the adapter of the inner liner, that the edge area is formed to be U-shaped or L-shaped, and that a seal is arranged in the edge area. Here, the seal may be received, as a sealing ring, in the section that is formed to be U-shaped or L-shaped, of the adapter.

Alternatively to an adapter being embodied as a substantially pot-shaped piece, it may be envisaged that the adapter is embodied as a substantially flat annular disk. The annular disk may have a welded edge at the side of the edge.

For the pallet container, comprising the adapter of the inner liner that is fastened to an opening of the container wall of the dimensionally stable inner container, it is preferably envisaged that the adapter of the inner liner is fastened to the inner container with the aid of a screw cap, wherein a thread of the screw cap engages with a mating thread that is envisaged at the opening of the container wall, and wherein the screw cap overlaps the adapter. Such screw caps are easy to obtain for being standard parts and allow for detaching the inner liner after it has been used by simply removing the screw cap.

Alternatively or further to fixing the adapter of the inner liner, in principle removably, to the opening of the container wall of the substantially dimensionally stable inner container of the pallet container, it may be envisaged that the adapter of the inner liner is fixed to the opening of the container wall with the aid of a material connection, in particular with the aid of a welded connection.

Further advantages and features of the invention arise from the dependent claims as well as from the description of a preferred exemplary embodiment.

In the following, the invention is described and explained in more detail with reference to the annexed drawings using a preferred exemplary embodiment.

Fig. 1 shows a perspective view of an exemplary embodiment of an inner liner in accordance with the invention,

Fig. 2 shows a longitudinal section of the inner liner of Fig. 1, and

Fig. 3 shows a partial section view of an exemplary embodiment of a pallet container in accordance with the invention, in which the inner liner of Figs. 1 and 2 is arranged.

Fig. 1 shows an inner liner for being filled with liquid goods to be transported, wherein the inner liner is envisaged for the purpose that the liquid goods to be transported are received within the inner container of a pallet container, in particular within the inner container of a so-called Intermediate Bulk Container (IBC).

The inner liner comprises a thin-wall flexible film 1 being made from a plastic such as polyethylene, wherein the film 1 is embodied as a tube that is open to one side. The inner liner in addition comprises an adapter 2 for linking the film 1 to an opening in the container wall of the inner container of the IBC, said opening not being depicted in Fig. 1. The inner liner finally comprises an armature 3 for removing the goods to be transported being received in the film 1. Here, the film 1, the adapter 2 as well as the armature 3 embody a prefabricated assembly, wherein the area that is enclosed by the film 1, the adapter 2 and the armature 3 is hermetically sealed off from the environment. The enclosed area in particular has been treated in a germicidal fashion by way of a prior high-level radiation and is sterile.

Fig. 2 shows that the film 1 that is embodied as a tube that is open to one side has a stiffening ring 4 at the open end, with which ring the film 1 is connected to the adapter 2.

The adapter 2 is embodied as a substantially rotationally symmetric molded part, in particular a molded plastic part, which in particular has been produced in an injection-molding process. The adapter 2 is embodied as a substantially pot-shaped piece, wherein the pot-shaped piece comprises a bottom 5 and a side wall 6, and wherein the bottom 5 has a through hole 7, in such a manner that goods to be transported can get from the film 1 to the armature 3. The stiffening ring 4 of the film 1 is fastened to a first side of the bottom 5 of the adapter 2. The armature 3 is fastened to a second side of the bottom 5, such that the adapter 2 establishes the fixed connection of the film 1 and the armature 3.

For the side wall 6 of the adapter 2, it can in particular also be seen from Fig. 1 that the side wall 6 is embodied so as to be slightly conically tapered towards the film 1. From Fig. 2, it can in addition be seen that the adapter 2 being embodied as a pot-shaped piece has an edge area 8 that is flanged, wherein the edge area 8 is substantially formed to be U-shaped, such that a sealing ring of a seal 10 is arranged between the inner leg and the outer leg 9 of the “U”.

The armature 3 comprises a flap valve 11 as well as a connecting piece 12 whose end section is fastened to the second side of the bottom 5 of the adapter 2. The inner area of the inner liner that goes from the tube of the film 1 as well as from the stiffening ring 4 of the film 1 as well as from the through hole 7 of the bottom 5 of the adapter 2 and from the connecting piece 12 up to the flap valve 11 of the armature 3 and that is continuous is embodied so as to be airtight as well as sterile with respect to the environment.

Fig. 3 shows the assembly of the inner liner, which assembly is embodied as a prefabricated, airtight and sterilized structural unit, being mounted to an opening 13 that is embodied as an outlet opening and that appertains to a pallet container. Only part of said pallet container being embodied as an IBC, namely the inner container 14, is illustrated; here, the inner container 14 is embodied as a dimensionally stable plastic part having substantially cuboid dimensions, wherein the plastic part also has a defined

cuboid shape even if it is not filled. A retracted section is centrally arranged at the front container wall 15 of the inner container 14 at the lower edge, at which section an integrally molded shape 16 that is extended to the outside externally has a thread and internally has a smooth surface. The film 1 is guided into the inner area of the inner container 14 through opening 13, in such a manner that the adapter 2 comes to rest against the internal smooth surface of the integrally molded shape 16 with the outer side of the side wall 6. The outer leg 9 of the edge area 8 that is flanged in the shape of a U then is flush with the end of the external thread of the integrally molded shape 16.

The adapter 2 that has been prefixed in the opening 13 in this manner is fastened to the inner container 14 with the aid of a screw cap 17, wherein a thread 18 of the screw cap 17 engages with the thread that is envisaged at the integrally molded shape 16 of the opening 13 of the container wall 15, as a mating thread to thread 18 of the screw cap 17, and wherein the screw cap 17 overlaps the adapter 2. Here, the screw cap 17 has a lid having a bore hole, wherein the armature 3 passes through the bore hole.

Alternatively or further to fastening the adapter 2 to the inner container 14 of the pallet container, it may be envisaged that the adapter 2 of the inner liner is fixed to the opening 13 of the container wall 15 with the aid of a material connection, in particular with the aid of a welded connection.

In the exemplary embodiment that has been described hereinbefore, the inner liner is fastened to the outlet opening 13 of the pallet container. Additionally, it may be envisaged that the inner liner is arranged at an inlet opening of the inner container, substantially in the center at the upper lid surface of the inner container.

In the exemplary embodiment that has been described hereinbefore, it was envisaged that the edge area 8 of the adapter 2 is substantially formed to be U-shaped in order to receive the sealing ring of the seal 10. The edge area 8 of the adapter 2 being substantially formed to have a U-shaped cross-section improves the stability of linking of the armature 3 in the radial direction in the event of a dive shot. In a modification of

the exemplary embodiment, it may be envisaged that the edge area 8 of the adapter 2 is formed to be L-shaped.

In the exemplary embodiment that has been described hereinbefore, it was envisaged that the armature 3 comprises a flap valve 11. Alternatively, the armature may also comprise a ball valve.

In the exemplary embodiment that has been described hereinbefore, it was envisaged that the adapter 2 is embodied as a substantially pot-shaped piece. It shall be understood that the adapter may also be embodied as a flat annular disk, the film or the armature being fastened to the two ring surfaces of said disk, wherein the annular disk is fastened to the opening of the container wall of the dimensionally stable inner container of the pallet container, along the outer edge, for example with the aid of a circumferential welded connection.

**Patentkrav**

1. Innerliner for å motta varer som skal transporteres, spesielt flytende varer som skal transporteres, for å være anordnet i en innercontainer av en pallcontainer, hvor innerliner omfatter:

en tynnveggs, fleksibel film (1) for å motta varene som skal transporteres,

en adapter (2) for å sammenkople filmen (1) til en åpning (13) i containerveggen av innercontaineren (14) av pallcontaineren, og

en armatur (3) for å fjerne varene som skal transporteres,

hvor filmen (1) og adapteren (2) danner en prefabrikkert montering, karakterisert ved at filmen (1), adapteren (2) og armaturen (3) danner en prefabrikkert montering på en slik måte at området som er innkapslet av filmen (1), adapteren (2) og armaturen (3) er hermetisk forseglet av fra omgivelsene.

2. Innerliner ifølge krav 1, hvor adapteren (2) er utført som en hovedsakelig rotasjonssymmetrisk støpt del, særlig en støpt plastdel.

3. Innerliner ifølge krav 1 eller 2, hvor adapteren (2) er utført som et hovedsakelig pottformet stykke, hvor det pottformede stykket omfatter en bunn (5) og en sidevegg (6).

4. Innerliner ifølge krav 3, hvor sideveggen (6) er utført slik at den er konisk.

5. Innerliner ifølge krav 3 eller 4, hvor det pottformede stykket har et kantområde (8) som er flenset.

6. Innerliner ifølge krav 5, hvor kantområdet (8) er formet til å være U-formet eller L-formet, og hvor en forsegling er anordnet i kantområdet (8).

7. Innerliner ifølge krav 1 eller 2, hvor adapteren er utført som en hovedsakelig flat ringformet disk.

8. En pallcontainer som omfatter en dimensjonsstabil innercontainer (14) som er mottatt, innenfor et gitter eller en platemantel, for å stå på en pall, karakterisert av innerliner ifølge et hvilket som helst av kravene 1 til 7, hvor adapteren (2) av innerliner er festet til

en åpning (13) av containerveggen (15) i den dimensjonalt stabile innercontaineren (14).

9. Pallcontaineren ifølge krav 8, hvor adapteren (2) av innerliner er festet til innercontaineren (14) ved hjelp av et skrulokk, hvor en gjeng (18) av skrulokket (17) griper inn i en motgjeng som er imøtesett ved åpningen (13) av containerveggen (15), og hvor skrulokket (17) overlapper adapteren (2).

10. Pallcontainer ifølge krav 8 eller 9, hvor adapteren av innerliner er festet til åpningen av containerveggen ved hjelp av en materialforbindelse, særlig ved hjelp av en sveiset forbindelse.

**Figurer**

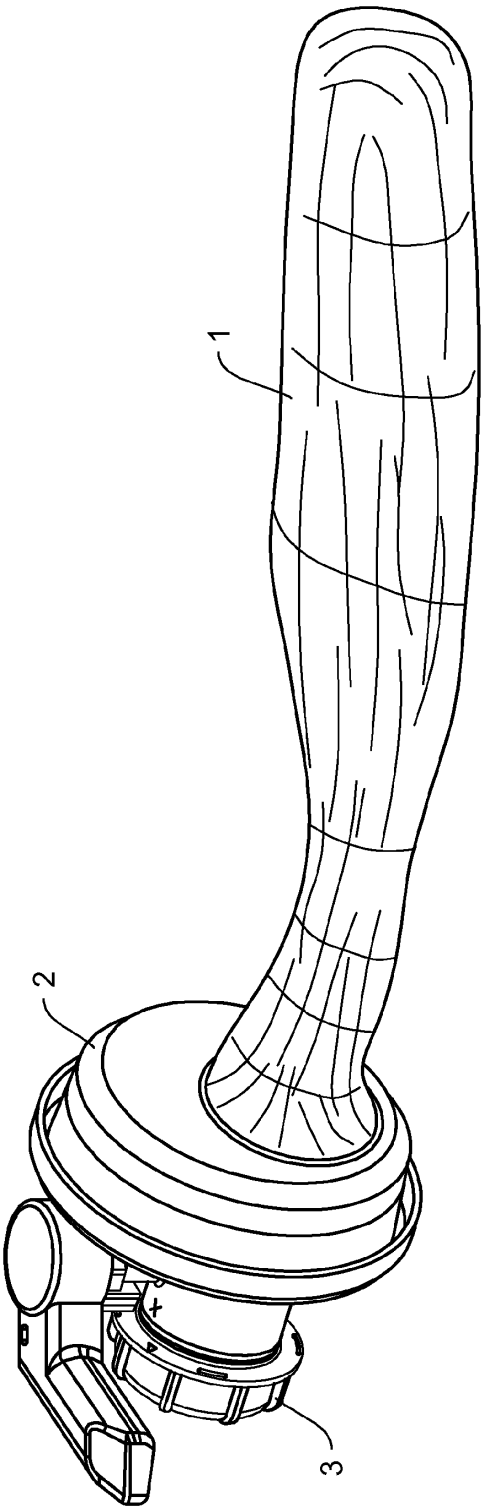


Fig. 1

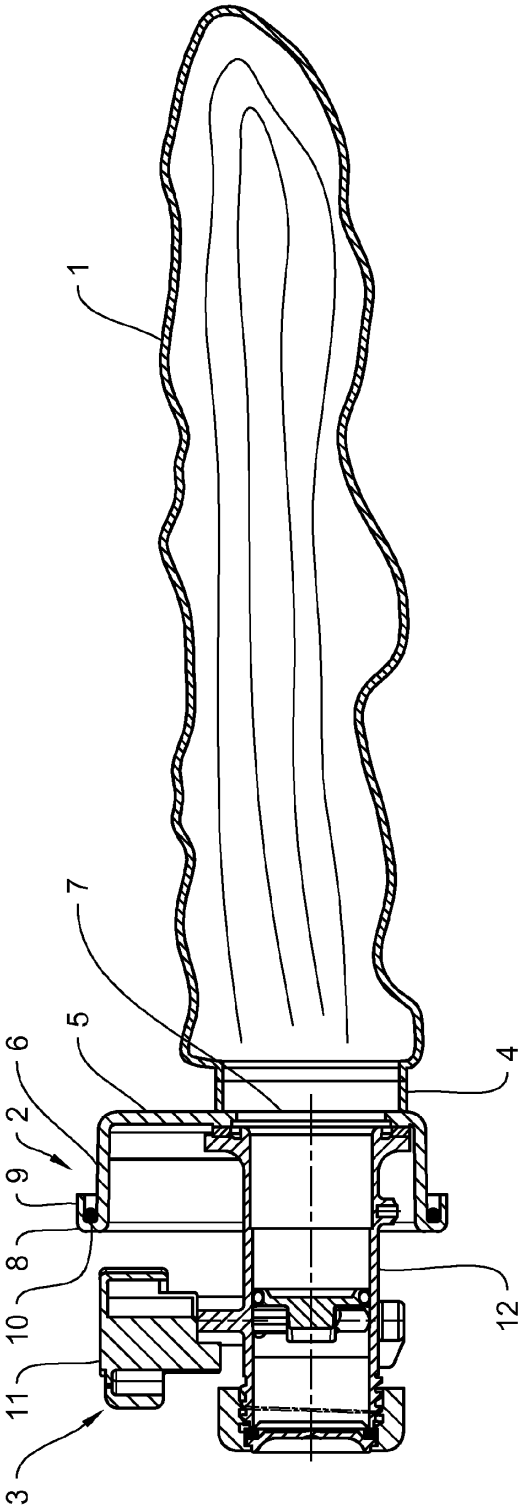


Fig. 2

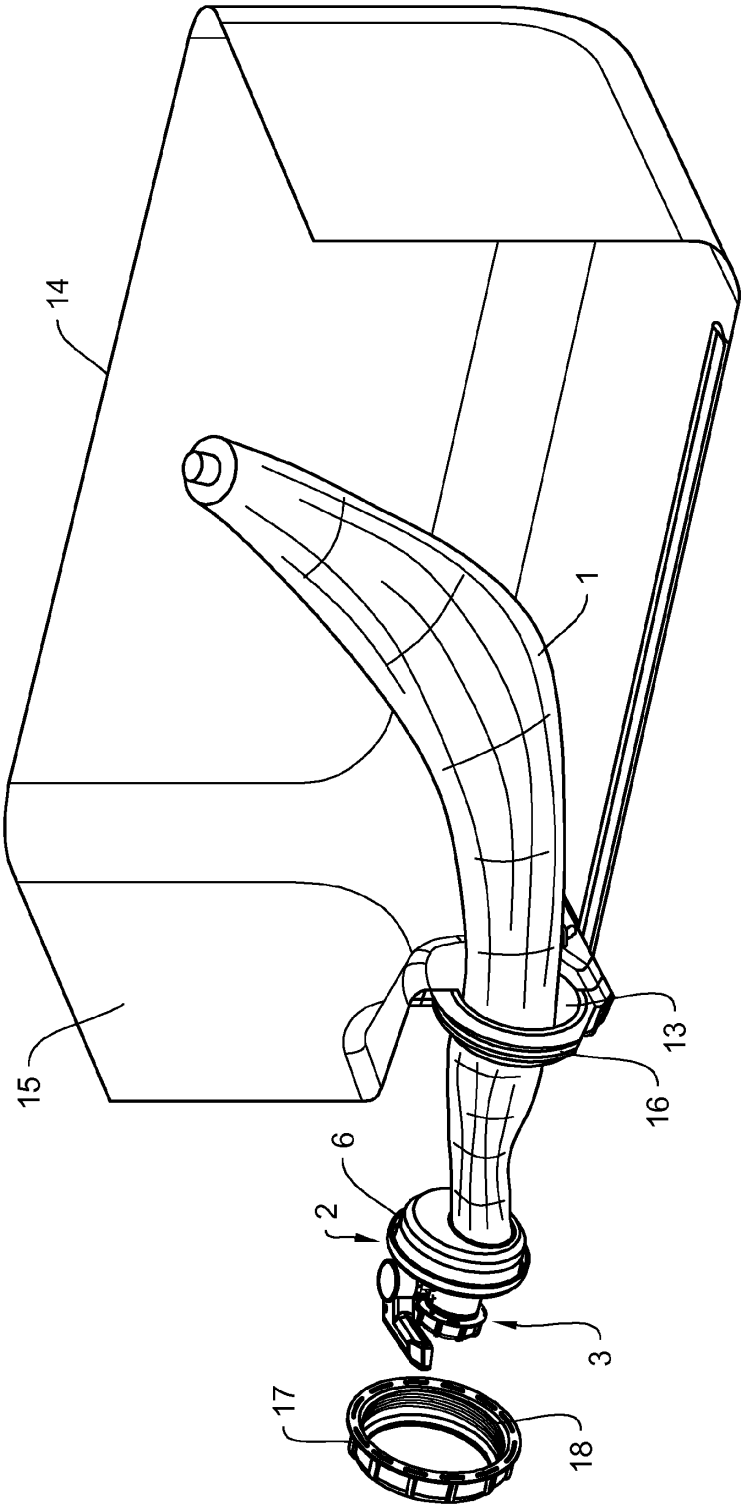


Fig. 3