

Transport container system and transport container

The invention relates to a transport container system with the features of the preamble of claim 1 as well as a transport container, especially for a
5 transport container system, with the features of the preamble of claim 16. Finally, the invention also relates to a lid for a transport container with the features of the preamble of claim 28.

Transport container systems of the kind under discussion are variously
10 known in practice. For example, they serve for organizing the transporting of pharmaceutical goods in the goods distribution channels of the pharmaceutical industry. In technical jargon, such a transport container system is called a "Returnable Domestic Shipper" (RDS; RDS box).

15 From the prior art on which the invention is based (EP 2 700 891 A2) there is known a transport container system of the kind under discussion, having first of all an outer container made from a rigid, resistant material, consisting of a tub-shaped bottom part comprising a bottom and a casing and a
20 lid closing the bottom part at the open side. The outer container and its lid may consist for example of thermoplastic or duroplastic synthetic material, but also of metal or composite materials. The lid can be placeable loosely on the bottom part, but it may also be articulated on one side by corresponding hinge elements and optionally be locked in some way at the opposite side. Specifically, the aforementioned prior art shall be ex-
25 plained in detail.

In the known transport container system, a tub-shaped inner container having an inner bottom and an inner shell inserted into the bottom part of the outer container is located in the outer container. The inner container

forms a receiving space open at the top for goods to be transported. This inner container, called there the "liner", may itself consist of a rigid, resistant material, i.e., the same materials as the outer container. Preferably, it consists of a heat insulating material.

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The inner container in the known transport container system is constructed to be smaller in dimensions than the bottom part of the outer container, so that a spacing is present at the casing and also at the bottom between inner container and outer container. In this spacing, vacuum insulation panels of suitable dimension are arranged both at the bottom and also at the walls of the casing between the inner container and the outer container. At the upper edge, the inner container has an encircling collar reaching outward beyond the inner shell, by which the spacing between the inner container and the outer container is covered, so that no foreign objects can get in here from above.

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The walls of the inner shell diverge from each other upward from the inner bottom of the inner container in slightly conical fashion.

20 In the receiving space of the inner container there is arranged a plate-shaped latent heat storage element on the inner bottom, whose outer dimensions correspond exactly to the inner dimensions of the inner bottom in the receiving space, i.e., its clear length and its clear width. At the edge there remains a minimal gap, so that the latent heat storage element, having corresponding grip openings at the margin, can be grasped by hand and lifted out from the receiving space. Plate-shaped latent heat storage elements are likewise arranged all around the inner walls of the inner shell. These rest at the bottom edge on the latent heat storage element arranged on the inner bottom. At the back side, the latent heat storage elements associated with the inner walls of the inner shell are provided

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ed with projections of various height, so that their effective outer surfaces diverge from each other in slightly conical fashion, but the inner surfaces run exactly parallel to each other. In this way, it is possible to place another latent heat storage element from above on the latent heat storage elements arranged at the edges, as a kind of lid whose outer dimensions – length and width – correspond to the outer dimensions of the latent heat storage element located below on the inner bottom.

In the known transport container system, the two latent heat storage elements at top and bottom arranged on or in the receiving space are identical in outer dimensions. However, they differ in outer dimensions from the latent heat storage elements arranged at the edges. Given a rectangular shape of the inner container, the sideways arranged latent heat storage elements are also different from one another in pairs.

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The above described and known transport container system is relatively costly. In particular, one must use two different sizes of latent heat storage elements, each time in pairs. Such a transport container system is relatively costly and cumbersome for goods traffic in the pharmaceutical product sector, for example, which is oriented to the greatest possible efficiency.

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The teaching of the invention is based on the problem of simplifying and making more cost-effective the above explained transport container system.

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The above indicated problem is solved in the transport container system with the features of the preamble of claim 1 in that the inner container comprises an inwardly protruding projection at the upper edge of the in-

ner shell at least on each of two oppositely situated sides, the clear distance between the oppositely arranged projections is slightly smaller than the corresponding inner dimension – length or width – of the inner bottom in the receiving space, so that the projections form a support for a latent heat storage element, i.e., a latent heat storage element with a corresponding outer dimension can be laid down on these projections.

According to one aspect, there is provided a transport container system with an outer container made from a rigid, resistant material, having a tub-shaped bottom part comprising a bottom and a casing and optionally a lid closing the bottom part at the open side, and with a tub-shaped inner container inserted into the bottom part of the outer container and having an inner bottom and an inner shell. The inner container forms a receiving space open at the top for goods to be transported. The walls of the inner shell run parallel to each other or diverge, starting at the inner bottom, in slightly conical fashion from each other. The inner bottom has inner dimensions in the receiving space, namely, a particular clear length and a particular clear width. A plate-shaped latent heat storage element can be arranged on the inner bottom in the receiving space. The outer dimensions of a latent heat storage element which can be arranged on the inner bottom can at most correspond substantially to the inner dimensions of the inner bottom in the receiving space. The transport container system is characterized in that the inner container comprises an inwardly protruding projection at the upper edge of the inner shell at least on each of two oppositely situated sides, and the clear distance between the oppositely arranged projections is slightly smaller than the corresponding inner dimension – length or width – of the inner bottom in the receiving space, so that the projections form a support for a latent heat storage element, i.e., a latent heat storage element with a corresponding outer dimension can be laid down on these projections.

According to another aspect, there is provided a transport container, preferably as an inner container for a transport container system, wherein the container has an inner bottom and an inner shell and forms an upwardly open receiving space for goods to be transported. The walls of the inner shell run parallel to each other or diverge, starting at the inner bottom, in slightly conical fashion from each other. The inner bottom has inner dimensions in the receiving space, namely, a particular clear length and a particular clear width. The transport container is characterized in that the container comprises an inwardly protruding projection at the upper edge of the inner shell at least on each of two oppositely situated sides and the clear distance between the oppositely arranged projections is slightly smaller than the corresponding inner dimension – length or width – of the inner bottom in the receiving space.

According to yet another aspect, there is provided a lid for a transport container, especially for a transport container system as disclosed in one of the embodiments or a transport container as disclosed in one of the embodiments. The lid is characterized in that the lid has a lid body with a seat for at least one vacuum insulation panel.

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According to the invention, the inner container of the transport container system is designed such that, as in the known transport container system, two latent heat storage elements with identical outer dimensions to each other can be installed at top and bottom on or in the seat frame. However, this is possible without having to arrange yet further latent heat storage elements in the receiving space. The transport container system according to the invention utilizes exactly two latent heat storage elements, one at the bottom of the receiving space and one at the top, open side of the receiving space, which is later closed by a lid. These two latent heat storage elements may have the same outer dimensions. Thus, they can be

the same type of latent heat storage element. Accordingly, this is especially cost-effective.

5 The teaching of the invention also includes the case when each individual latent heat storage element in turn consists of a plurality of partial latent heat storage elements. For example, a latent heat storage element of a particular length and a particular width may be composed of two partial latent heat storage elements of the same length but only half the width. In this case, one could for example work with a total of four partial latent
10 heat storage elements identical to each other, two at the bottom and two at the top.

According to the invention, the projections at the upper edge of the inner shell of the inner container create a support for a second latent heat storage element at the top end of the receiving space, without substantially impairing the accessibility of the receiving space from above, after removing the latent heat storage element there.

The temperature constancy in the receiving space of a transport container system according to the invention is sufficient for classical goods distribution channels such as in the pharmaceutical industry, for example, for which the two latent heat storage elements at the receiving space used as specified in the teaching of the invention are sufficient. No latent heat storage elements are needed at the inner walls of the inner shell, so that the transport container system is very simple and cost-effective.

However, the design according to the invention also does not rule out arranging latent heat storage elements on one or more inner walls of the inner shell. This may be an option, when a very long-lasting temperature constancy in the receiving space proves to be needed and/or when the heat burden is very high due to the goods to be transported.

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Preferred embodiments and modifications of the transport container system according to the invention are the subject matter of the dependent claims referred to the transport container system.

Subject matter of the invention is also a transport container of the kind under discussion in itself, in which the above indicated problem is solved by the features of claim 16. Such a transport container is especially suitable for use for a transport container system of the kind under discussion.

However, it may also be used by itself or in combination with other outer containers or packagings.

5 Preferred embodiments and modifications of the transport container according to the invention are the subject matter of the dependent claims referred to the transport container.

10 Subject matter of the invention is also a lid for a transport container with the features of claim 28. The essential feature of this lid is the seat in the lid body, in which at least one vacuum insulation panel can be accommodated. This increases the thermal insulation which can be provided by such a lid.

15 Preferred embodiments and modifications of the lid according to the invention are the subject matter of the dependent claims referred to the lid.

In the following, the invention shall now be explained more closely with the aid of a drawing representing merely preferred sample embodiments. The drawing shows

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Fig. 1 in perspective view, a transport container system with closed lid, here in the specific embodiment of an RDS box,

25 Fig. 2 the RDS box of Fig. 1 with opened lid and the inner container visible therein,

- Fig. 3 the inner container (transport container) of Fig. 1 by itself in a perspective exploded view in conjunction with two plate-shaped latent heat storage elements,
- 5 Fig. 4 the inner container (transport container) of Fig. 3 in cross section with inserted latent heat storage elements,
- Fig. 5 in a representation corresponding to Fig. 4, the arrangement of vacuum insulation panels on the inner container (transport container), indicating the bottom part of the outer container,
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- Fig. 6 in a representation corresponding to Fig. 4, a modified sample embodiment of an inner container (transport container) according to the invention,
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- Fig. 7 in cross section, a preferred sample embodiment of a lid according to the invention for a transport container of the kind under discussion.
- 20 Fig. 1 first of all shows schematically an example of a transport container system with an outer container 1, consisting of a tub-shaped bottom part 4 comprising a bottom 2 and a casing 3 and a lid 5 closing the bottom part 4 at the open side. In the sample embodiment shown, the lid 5 is two-piece and the two pieces of the lid 5 are pivotably hinged at the side on
- 25 the upper edge of the bottom part 4 of the outer container 1.

Fig. 2 shows the outer container 1 with opened lid 5, i.e., two parts of the lid 5 folded open at the side. In Fig. 2 one is looking into the interior of the

bottom part 4 of the outer container 1 and notices that a tub-shaped inner container 6 is situated in the bottom part 4.

5 The lid 5 for now is not essential to the teaching of the invention, the invention initially primarily relates to the bottom part 4 of the outer container 1 with the inner container 6 arranged therein.

10 The outer container 1 consists of a rigid, resistant material, here, an optionally fiber-reinforced plastic. The outer container 1 should protect the goods to be transported inside the transport container system when the transport container system is being carried on conveyor belts, for example, or being placed into or removed from the cargo space of vehicles. The inner container 6 on the other hand has essentially the function of safely transporting the goods to be transported inside it and providing a thermal
15 insulation for the goods to be transported.

Fig. 3 shows the inner container 6 of the transport container system according to the invention in a perspective exploded view. Such an inner container 6 is generally usable as a transport container, i.e., even without
20 the outer container 1 or with some other outer container or a packaging. This is reflected by the independent claims 16 to 27.

The following discussion of the inner container 6 holds equally for an independent transport container 6, as contained in the claims relating to
25 this.

The inner container 6 is tub-shaped and has an inner bottom 7 and an inner shell 8. In this way, the inner container 6 forms a receiving space 9 open at the top, in which goods to be transported can be transported.

5 Fig. 4 shows a cross section through the inner container 6. It can be seen that the walls of the inner shell 8 here run practically parallel to each other. For manufacturing technology reasons, especially for the stripping of the inner container 6 from a corresponding molding die, it may however also prove expedient for the walls of the inner shell 8 to diverge slightly
10 conically from each other, starting at the inner bottom 7.

One may conclude from Fig.3 in conjunction with Fig. 4 that the inner bottom 7 has definite inner dimensions in the receiving space 9, namely, a particular clear length, measuring from left to right in Fig. 3 and 4, and a
15 particular clear width, measuring from back to front in Fig. 3.

Fig. 3 likewise shows in conjunction with Fig. 4 that a plate-shaped latent heat storage element 10 can be arranged or is arranged in the receiving space 9 on the inner bottom 7 of the inner container 6 (Fig. 4). One notices from Fig. 4 that the outer dimensions of the latent heat storage element 10 arranged on the inner bottom 7 substantially correspond to the inner dimensions of the inner bottom 7 in the receiving space 9. Basically, of course, it is also possible for the outer dimensions of the latent heat storage element 10 arranged on the inner bottom 7 to be significantly
20 smaller than the inner dimensions of the inner bottom 7 in the receiving space 9. In this case, however, one would not make optimal use of the prerequisites dictated by the spatial circumstances in regard to the latent heat storage element 10. Thus, in the normal case the outer dimensions of the latent heat storage element 10 should be chosen to be smaller than
25 the inner dimensions of the inner bottom 7 in the receiving space 9 by as
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little as possible. The latent heat storage element 10 should be well installed there, but also if necessary it can be taken out once more without significant problems. For a relatively slightly elastically deformable material of the inner shell 8 of the inner container 6, the latent heat storage element 10 can also be forced somewhat into the inner container 6 so that it comes to rest against the inner bottom 7 of the inner container 6 (press fit).

For details of a plate-shaped latent heat storage element such as the latent heat storage element 10, in order to avoid needless length, reference is made to the prior art, especially the already cited EP 2 700 891 A2, but also DE 20 2014 004 515 U1, which belongs to the applicant of the present application. Latent heat storage elements of the kind in question are also available for a vast range of target temperatures. The desired target temperature should correspond to the goods to be transported. In the pharmaceutical sector, the desired transport and storage temperature is a few degrees °C. The latent heat storage element or the latent heat storage elements make sure that a stable temperature in the desired range of the target temperature is formed in the receiving space 9, which is thermally insulated by at least the inner container 6.

It further emerges from Fig. 3 and 4 that the inner container 6 has an inwardly protruding projection 11 at the upper edge of the inner shell 8 at each of two oppositely situated sides. The clear spacing between the oppositely arranged projections 11 is slightly smaller than the corresponding inner dimension – length or width – of the inner bottom 7 in the receiving space 9. The projections 11 thus form a support for a latent heat storage element 10 with the corresponding outer dimensions.

In Fig. 3 and Fig. 4 one sees the first latent heat storage element 10, which is arranged on the inner bottom 7 in the receiving space 9, at the bottom, and the second latent heat storage element 12 with identical dimensions as the first latent heat storage element 10, at the top, placed on the projections 11 which are recognizable in Fig. 4 at the left and right.

In Fig. 3 and 4 one sees that the receiving space 9 in the inner container 6 can be effectively temperature controlled by means of the two latent heat storage elements 10, 12, without the need to arrange further latent heat storage elements on the inner shell 8 of the inner container 6. One can make do with the same type of latent heat storage element that is utilized twice in this inner container 6, namely, as the first latent heat storage element 10 on the inner bottom 7 and as the second latent heat storage element 12 at the upper edge of the inner shell 8 of the inner container 6. In this way, a simple design and thus a much more cost-effective solution is found for the area of application according to the invention of the transport container system.

Since the projections 11 are situated laterally at sufficient spacing from each other, and given correspondingly sufficient height of the receiving space 9 in the inner container 6, the first latent heat storage element 10 can be easily removed at the top from the receiving space 9 by placing it on a slant in the receiving space 9 and then pulling it upward and out near the diagonal position through the opening between the two projections 11.

As already indicated above, one may also in theory arrange still further latent heat storage elements in the receiving space 9 of the inner container 6. One could then also install or remove these edge-situated latent heat storage elements in the same way as the latent heat storage element 10.

In Fig. 3 and 4 one sees precisely two projections 11, which are arranged opposite each other at the two narrow sides of the here rectangular inner container 6. Basically, one could provide the projections 11 on the long
5 sides or provide projections on all four sides. However, the arrangement of precisely two projections 11 opposite each other on the narrow sides has the best advantages in terms of handling.

The projections 11, arranged opposite each other, need not occupy the
10 full length of the corresponding side of the inner container 6. They may each extend for only a portion of the length, or in each case several projections 11 may be provided, arranged uniformly or not. The only important point is that a support for the latent heat storage element 10 is
15 11 on the respective side of the inner container 6.

In regard to the material of the inner container 6, it matters whether one can mold the projections 11 on the inner shell 8 at the inside or otherwise attach them, especially by gluing. There are many possibilities for this
20 which are known to the skilled person.

Alternatively, the projections 11 may also be attached releasably on the inner shell 8. For example, one may clamp a projection 11 into the plastic material of the inner shell 8 of the inner container 6 or plug-fit it into a
25 seat which is present there.

If the projections 11 are attached releasably to the inner shell 8, one may first insert the lower latent heat storage element 10 into the receiving

space 9 of the inner container 6 and only then plug-fit the projections 11 at the appropriately designated places, for example.

5 As is represented, it would thus be especially expedient for the introducing of the lower latent heat storage element 10 into the receiving space 9 of the inner container 6 if the projections 11 were not present during this procedure.

10 In an especially interesting variant represented in Fig. 6, in this case one may still have the projections 11 molded on the inner shell 8 at the inside, for example by being produced in the same foam injection molding process, or be otherwise firmly mounted, especially by gluing. In this variant, one accomplishes this result in that the inner shell 8 is at least two-piece, such that an upper piece 8' of the inner shell 8 comprising the projections
15 can be removed from the rest of the inner shell 8. In Fig. 6 one sees the parting line between the upper piece 8' of the inner shell 8 and the lower tub-shaped remainder of the inner shell 8. The lower tub-shaped remainder of the inner shell 8 could itself also consist of several pieces. The important thing is that one can remove the upper piece 8' of the inner shell
20 8, on which the projections 11 are integrally molded, in order to insert the latent heat storage element 10 situated below on the inner bottom 7. After this, one puts the upper piece 8' of the inner shell 8 back in place and the projections 11 for the upper latent heat storage element 12 are then at once in the right place.

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The sample embodiment represented in Fig. 3 to 5 shows another design in which the projections 11 on the inner container 6 again do not interfere with the inserting of the lower latent heat storage element 10. In the design represented in Fig. 2 to 5, one is independent of the material of the
30 inner shell 8 of the inner container 6. Namely, it is provided here that the

projections 11 are formed on an insert frame 13 which is separate from the inner container 6. The insert frame 13 is joined in some way to the inner container 6 or in any case arranged with respect to it in a particular given position.

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In the represented and preferred sample embodiment, a seat 14 for the insert frame 13 is formed at the upper edge of the inner shell 8 and the insert frame 13 is arranged in the seat 14 on the inner container 6. Here as well, one can insert the insert frame 13 loosely in the seat 14, or with correspondingly elastic material of the inner shell 8 of the inner container 6
10 and/or of the insert frame 13 itself one can realize a kind of press fit.

Fig. 3 shows the insert frame 13 by itself, at the top; Fig. 4 shows the insert frame 13 installed in the seat 14 on the upper edge of the inner shell
15 8 of the inner container 6. The laterally inwardly protruding projections 11 are formed on the insert frame 13, namely, as a single piece with it. On these lies the second latent heat storage element 12 in Fig. 4. In Fig. 4, at the bottom, one sees the first latent heat storage element 10 lying on the inner bottom 7 in the receiving space 9. It has the same outer dimensions
20 as the second latent heat storage element 12. In Fig. 3, one sees suitable grip formations 15 on each of the two latent heat storage elements 10, 12, so that the latent heat storage elements 10, 12 can easily be removed from the inner container 6 or the insert frame 13.

25 Furthermore, one sees in Fig. 3 that the outer surfaces of the latent heat storage elements 10, 12 are configured as smooth as possible. This serves for the possibly desired handling ability of the latent heat storage elements 10, 12 by means of a manipulation robot (such as one with vacuum suction systems).

The inner container 6 should consist of a material with good heat insulating action, such as expanded polystyrene (EPS), expanded polypropylene (EPP), polyurethane (PU) or polyethylene combined with EPS, EPP, PU, to
5 mention only a few examples. In the represented and preferred sample embodiment, it is provided that the inner container 6 is made as an injection molded part of plastic, here thick-wall foamed plastic, and more specifically expanded polypropylene (EPP). There are various methods for the manufacture of components made of thick-wall foamed plastic, such as
10 the combination of foam extrusion and molding process, the thermoplastic foam casting method (TSG), PUR foaming, and other methods known in the prior art.

Basically it is possible, though not shown here, for the inner container 6 to
15 be accurately fitted into the bottom part 4 of the outer container 1. In this case, the thermal insulating effect is provided primarily by the inner container 6 and only to a slight degree by the outer container 1. The efficiency of the latent heat storage elements 10, 12 is however increased significantly if one ensures a better thermal insulating effect.

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The represented and preferred sample embodiment shows, for this purpose in Fig. 3 and 4, that a spacing is present at the casing 3 and preferably also at the bottom 2 between the inner container 6 and the outer container 1. In the region of the spacing between inner container 6 and outer
25 container 1, one can install additional materials for thermal insulation. Fig. 5 shows that in this case at least one vacuum insulation panel 16 is arranged in the spacing between the inner container 6 and the outer container 1.

For vacuum insulation panels one should also refer to the prior art from EP 2 700 891 A2 and DE 20 2014 004 515 U1. There, examples are given for the configuration of vacuum insulation panels. Further information on vacuum insulation panels will also be found in WO 2004/104498 A2.

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It is especially effective to arrange corresponding vacuum insulation panels 16 each time on both the bottom 2 and on the casing 3 of the outer container 1 on the inside, so that the entire space between inner container 6 and outer container 1 is filled up with vacuum insulation panels 16.

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Fig. 4 and 5 show another peculiarity of a preferred inner container 6, namely that the inner container 6 has an encircling collar 17 at the upper edge, which reaches outward beyond the inner shell 8, by which the spacing between the inner container 6 and the outer container 1 is covered.

15 Such a collar 17 already exists in theory in the transport container system on which the present invention is based. However, according to further preferred teaching of the invention, the collar 17 here is utilized in particular, namely, in that a seat groove 18 for the edge of at least one vacuum insulation panel 16 is formed on the collar 17 of the bottom side. One notices in Fig. 5 that one can preposition vacuum insulation panels 16 in the
20 seat groove 18 on the inner container 6. In this way, one can better handle the vacuum insulation panels 16 together with the inner container 6 when inserting the inner container 6 into the outer container 1.

25 Fig. 3 and 4 moreover reveal another peculiarity, in that an outward encircling sealing lip 19 is formed on the collar 17, said sealing lip's outer dimensions being chosen such that the inner container 6 inserted in the bottom part 4 of the outer container 1 is press-fitted here. With the sealing lip 19 on the collar 17 of the inner container 6, one accomplishes a clean
30 sealing of the inner container 6 against the outer container 1. This pre-

vents contaminants from getting into the space between inner container 6 and outer container 1, especially smaller solids which might otherwise damage the vacuum insulation panels 16 located there.

5 In theory, one may also prevent contaminants from getting into the space between inner container 6 and outer container 1 in another manner, for example, by gluing the inner container 6 and outer container 1 together at the upper edge or for example by permanently closing the gap with an adhesive strip.

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Fig. 3 and 4 show another peculiarity of a preferred sample embodiment of a transport container system according to the invention, namely, that the inner container 6 has its own inner lid 20. The represented and preferred sample embodiment shows that the inner container 6 has an encircling seat 21 for the inner lid 20 at the upper edge of the inner shell 8, in which the inner lid 20 is or can be accurately fitted. Finally, Fig. 4 shows in cross section that in the represented and preferred sample embodiment a vacuum insulation panel 22 is also arranged on the inner lid 20, and this in a seat 23 provided there. The seat 23 is situated on the inner lid 20 on the underside, facing toward the receiving space 9 in the inner container 6. Alternatively, it could be provided to arrange the seat on the top side of the inner lid and thus to position the vacuum insulation panel on the top side of the inner lid. However, the arrangement on the underside of the inner lid 20 is more favorable for avoiding damage to the vacuum insulation panel 22.

The subject matter of the invention is also a transport container 6 in itself. For this transport container 6, the preceding explanations given for the inner container 6 of the transport container system also apply accordingly.

30 In this case, the inner lid is designated as the lid 20. Such a transport con-

tainer 6 may also be used by itself. Especially preferably, however, such a transport container 6 is used as the inner container for a transport container system according to the invention or in conjunction with other outer containers or another kind of packaging.

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Fig. 7 shows another peculiarity having independent inventive significance, namely, a lid 20 in a preferred sample embodiment, which can possibly be used for a transport container 6 or inner container 6 according to the invention, yet which also constitutes an especially preferred design. In
10 this lid, the already discussed seat 23 for a vacuum insulation panel 22 is provided.

According to preferred teaching, it is provided in the sample embodiment represented in Fig. 7 that the lid body consists of two interconnected half-
15 shells 20', 20'', between which the seat 23 is formed, in which the vacuum insulation panel 22, if present, is arranged.

In theory, the half-shells 20', 20'' of the lid body of the lid 20 may be permanently joined together, when the vacuum insulation panel 22 is present
20 in the seat 23, for example by gluing. However, then the vacuum insulation panel 22 cannot be replaced if it should prove to be defective. According to preferred teaching, therefore, it is provided in the represented sample embodiment that the half-shells 20', 20'' are releasably joined together, especially clamped together by force locking and/or interlocked by
25 form fitting. In the represented sample embodiment, tongue and groove connections are present on the two half-shells 20', 20'', being designed as press-fit seats and/or as latching connections. By plugging the two half-shells 20', 20'' together, they are releasably joined together.

The above explained design is especially advisable when the two half-shells 20', 20'' of the lid 20 can be made from a foamed plastic, or in the design of the lid 20 per claim 31.

- 5 The represented sample embodiment has the peculiarity that the two half-shells 20', 20'' in the representation shown in Fig. 7 are formed rotationally symmetrical with respect to an axis situated here centrally and running perpendicular to the plane of the drawing. In this way, it is possible to make the two half-shells 20', 20'' identical in configuration, i.e., to
10 produce in practice only one component which is then used twice to make the lid 20.

List of reference numbers

- 1 Outer container
- 2 Bottom
- 5 3 Casing
- 4 Bottom part
- 5 Lid
- 6 Inner container
- 7 Inner bottom
- 10 8 Inner shell
- 8' Upper portion of the inner shell
- 9 Receiving space
- 10 First latent heat storage element
- 11 Projection
- 15 12 Second latent heat storage element
- 13 Insert frame
- 14 Seat for 13
- 15 Grip formations
- 16 Vacuum insulation panel
- 20 17 Collar
- 18 Seat groove
- 19 Sealing lip
- 20 Inner lid
- 20' Half-shell
- 25 20'' Half-shell
- 21 Seat for 20
- 22 Vacuum insulation panel
- 23 Seat for 22

Claims:

1. A transport container system
with an outer container (1) made from a rigid, resistant material, hav-
5 ing a tub-shaped bottom part (4) comprising a bottom (2) and a cas-
ing (3) and optionally a lid (5) closing the bottom part (4) at the open
side,
with a tub-shaped inner container (6) inserted into the bottom part
(4) of the outer container (1) and having an inner bottom (7) and an
10 inner shell (8),
wherein the inner container (6) forms a receiving space (9) open at
the top for goods to be transported,
wherein the walls of the inner shell (8) run parallel to each other or
diverge, starting at the inner bottom (7), in slightly conical fashion
15 from each other,
wherein the inner bottom (7) has inner dimensions in the receiving
space (9), namely, a particular clear length and a particular clear
width,
wherein a plate-shaped latent heat storage element (10) can be ar-
20 ranged on the inner bottom (7) in the receiving space (9) and
wherein the outer dimensions of the plate-shaped latent heat stor-
age element (10) which can be arranged on the inner bottom (7) can
at most correspond substantially to the inner dimensions of the inner
bottom (7) in the receiving space (9),
25 **characterized in that**
the inner container (6) comprises an inwardly protruding projection
(11) at the upper edge of the inner shell (8) at least on each of two
oppositely situated sides, and
the clear distance between the oppositely arranged projections (11)
30 is slightly smaller than the corresponding inner dimension – length
or width – of the inner bottom (7) in the receiving space (9), so that
the projections (11) form a support for the plate-shaped latent heat
storage element (10), i.e., the plate-shaped latent heat storage ele-
ment (10) with a corresponding outer dimension can be laid down on
35 these projections (11), and
a spacing is present at the casing (3) and preferably also at the bot-
tom (2) between the inner container (6) and the outer container (1),
and
the inner container (6) has an encircling collar (17) at the upper
40 edge, which reaches outward beyond the inner shell (8), by which

the spacing between the inner container (6) and the outer container (1) is covered, and
an outer encircling sealing lip (19) is formed on the collar (17), said sealing lip's outer dimensions being chosen such that the inner container (6) inserted in the bottom part (4) of the outer container (1) is
5 press-fitted against the outer container.

2. The transport container system as claimed in claim 1, characterized in that the projections (11) are molded on the inside of the inner
10 shell (8) or otherwise firmly mounted, especially by gluing, or releasably mounted, especially inserted.

3. The transport container system as claimed in claim 2, characterized in that the inner shell (8) is at least two-piece, such that one upper piece (8') of the inner shell (8) comprising the projections can be
15 removed from the rest of the inner shell (8).

4. The transport container system as claimed in claim 1, characterized in that the projections (11) are formed on an insert frame (13)
20 separate from the inner container (6),
wherein, preferably, a seat (14) for the insert frame (13) is formed at the upper edge of the inner shell (8) and the insert frame (13) is arranged in the seat (14) on the inner container (6).

5. The transport container system as claimed in one of claims 1 to 4, characterized in that
25 the plate-shaped latent heat storage element (10) is arranged in the receiving space (9) of the inner container (6) on the inner bottom (7) as a first latent heat storage element, and
30 a second latent heat storage element (12) with identical outer dimensions to the first latent heat storage element (10) is arranged on the projections (11).

6. The transport container system as claimed in one of claims 1 to 5, characterized in that
35 the inner container (6) is formed as an injection molded part made of plastic, preferably of a thick-wall foamed plastic, especially expanded polypropylene (EPP).

7. The transport container system as claimed in one of claims 1 to 6, characterized in that the inner container (6) is accurately fitted into the bottom part (4) of the outer container (1).

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8. The transport container system as claimed in claim 1, characterized in that at least one vacuum insulation panel (16) is arranged in the spacing between the inner container (6) and the outer container (1).

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9. The transport container system as claimed in claim 8, characterized in that a seat groove (18) for the edge of at least one vacuum insulation panel (16) is formed on the collar (17) at the bottom side.

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10. The transport container system as claimed in one of claims 1 to 9, characterized in that the inner container (6) has its own inner lid (20).

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11. The transport container system as claimed in claim 10, characterized in that the inner container (6) has an encircling seat (21) for the inner lid (20) at the upper edge of the inner shell (8), in which the inner lid (20) is or can be accurately fitted.

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12. The transport container system as claimed in claim 10 or 11, characterized in that a seat (23) for at least one vacuum insulation panel (22) is present on the inner lid (20).

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13. A transport container, preferably as an inner container for a transport container system, wherein the container (6) has an inner bottom (7) and an inner shell (8) and forms an upwardly open receiving space (9) for goods to be transported,

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wherein the walls of the inner shell (8) run parallel to each other or diverge, starting at the inner bottom (7), in slightly conical fashion from each other, and

wherein the inner bottom (7) has inner dimensions in the receiving space (9), namely, a particular clear length and a particular clear width,

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characterized in that

the container (6) comprises an inwardly protruding projection (11) at the upper edge of the inner shell (8) at least on each of two oppositely situated sides and

- 5 the clear distance between the oppositely arranged projections (11) is slightly smaller than the corresponding inner dimension – length or width – of the inner bottom (7) in the receiving space (9), and the container (6) has an encircling collar (17) at the upper edge, which reaches outward beyond the inner shell (8), and
10 the container (6) has a seat groove (18) for the edge of at least one vacuum insulation panel (16) formed on the collar (17) at the bottom side.

14. The container as claimed in claim 13, characterized in that
15 the projections (11) are molded on the inside of the inner shell (8) or otherwise firmly mounted, especially by gluing, or releasably mounted, especially inserted.

15. The container as claimed in claim 14, characterized in that
20 the inner shell (8) is at least two-piece, such that one upper piece (8') of the inner shell (8) comprising the projections can be removed from the rest of the inner shell (8).

16. The container as claimed in claim 13, characterized in that
25 the projections (11) are formed on an insert frame (13) separate from the container (6), wherein, preferably, a seat (14) for the insert frame (13) is formed at the upper edge of the inner shell (8) and the insert frame (13) is arranged in the seat (14) on the container (6).

- 30 17. The container as claimed in one of claims 13 to 16, characterized in that a first latent heat storage element (10) is arranged in the receiving space (9) of the container (6) on the inner bottom (7) and
35 a second latent heat storage element (12) with identical outer dimensions to the first latent heat storage element (10) is arranged on the projections (11).

18. The container as claimed in one of claims 13 to 17, character-
40 ized in that

the container (6) is formed as an injection molded part made of plastic, preferably of a thick-wall foamed plastic, especially expanded polypropylene (EPP).

- 5 19. The container as claimed in claim 13, characterized in that an outer encircling sealing lip (19) is formed on the collar (17).

20. The container as claimed in one of claims 13 to 19, characterized in that the container (6) has a lid (20).

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21. The container as claimed in claim 20, characterized in that the container (6) has an encircling seat (21) for the lid (20) at the upper edge of the inner shell (8), in which seat the lid (20) is or can be accurately fitted.

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22. The container as claimed in claim 20 or 21, characterized in that a seat (23) for at least one vacuum insulation panel (22) is present on the lid (20).

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