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(54) **TRANSPORT CONTAINER WITH A PIVOTABLE SEPARATION DEVICE**

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(57) **ABSTRACT**

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The invention relates to a transport container (1) which is used to transport or store unit loads. Said transport container comprises a base unit (2) and vertical walls (3) and the inner chamber of the transport container can be subdivided into at least two chambers (4) by means of at least one separating device (5). According to the invention, the at least one separating device (5) is connected to at least one inner surface of the transport container by means of a joint-like connection (6, 16, 26) in order to produce a transport container which can be used in a flexible manner, i.e. for the transportation of various unit loads which vary slightly in their shape, size and material properties. Said separating device (5) can be pivoted about the joint-like connection (6, 16, 26) in such a manner that the distribution of the container volume can vary in the chambers (4).

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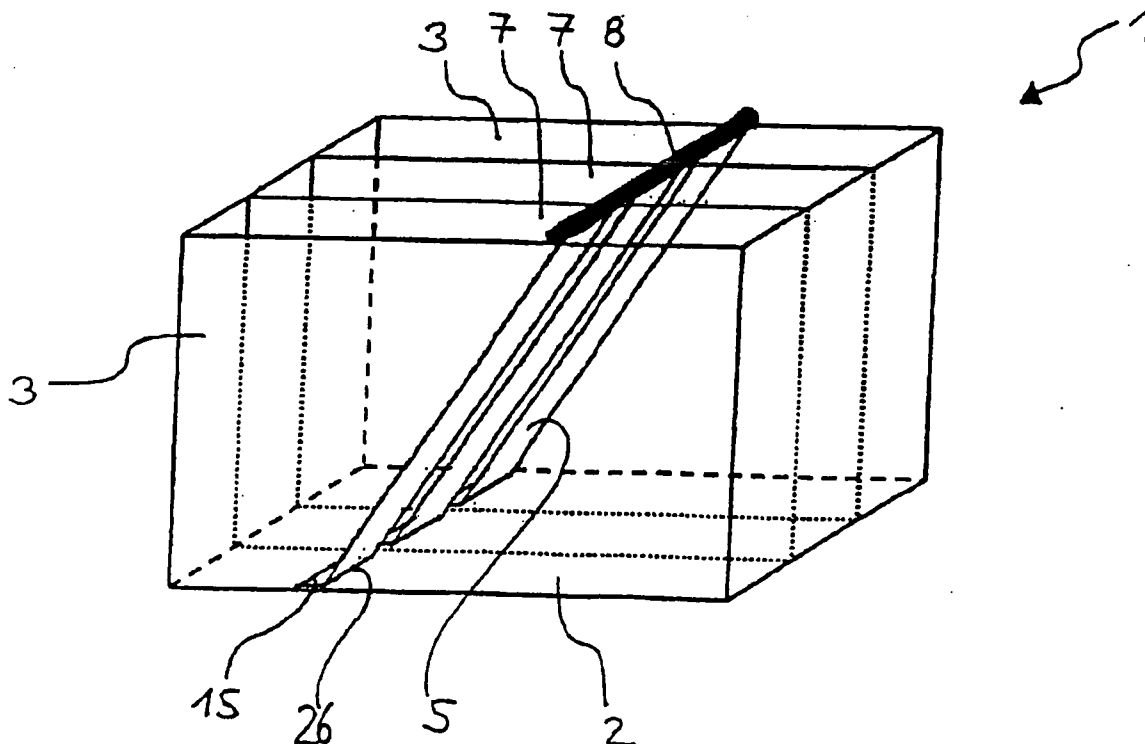


Figure 1

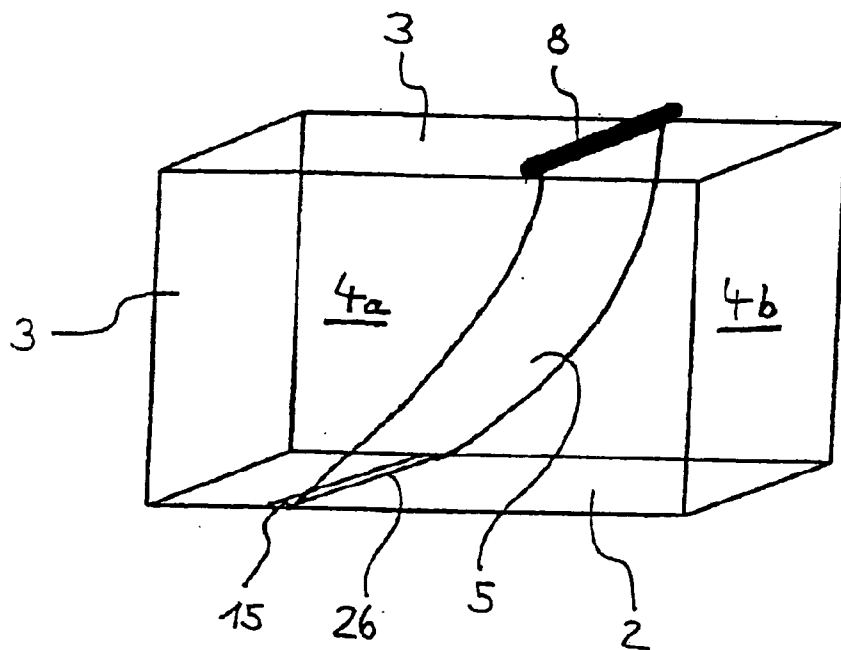


Figure 2

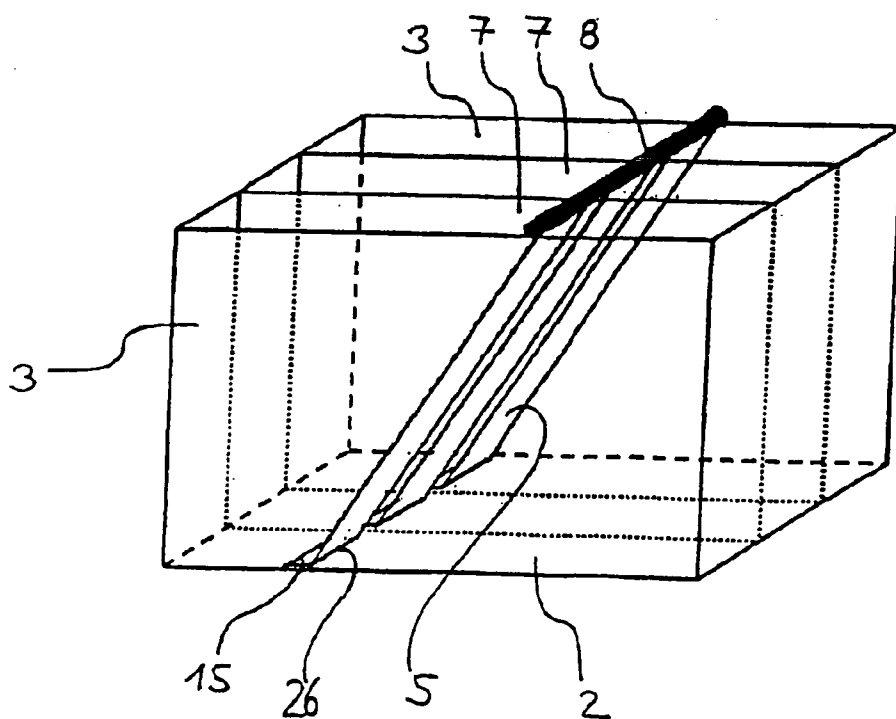


Figure 3

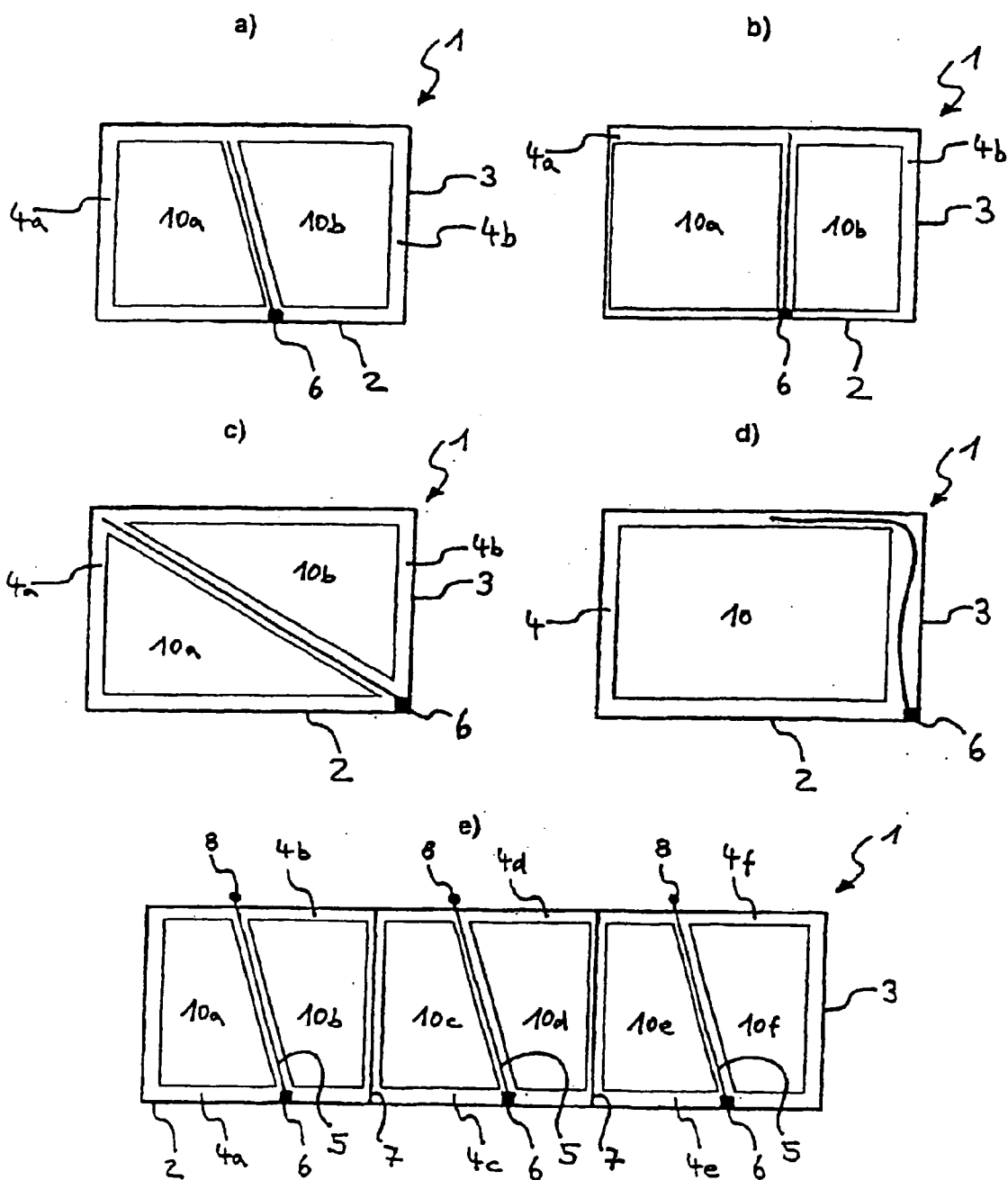


Figure 4

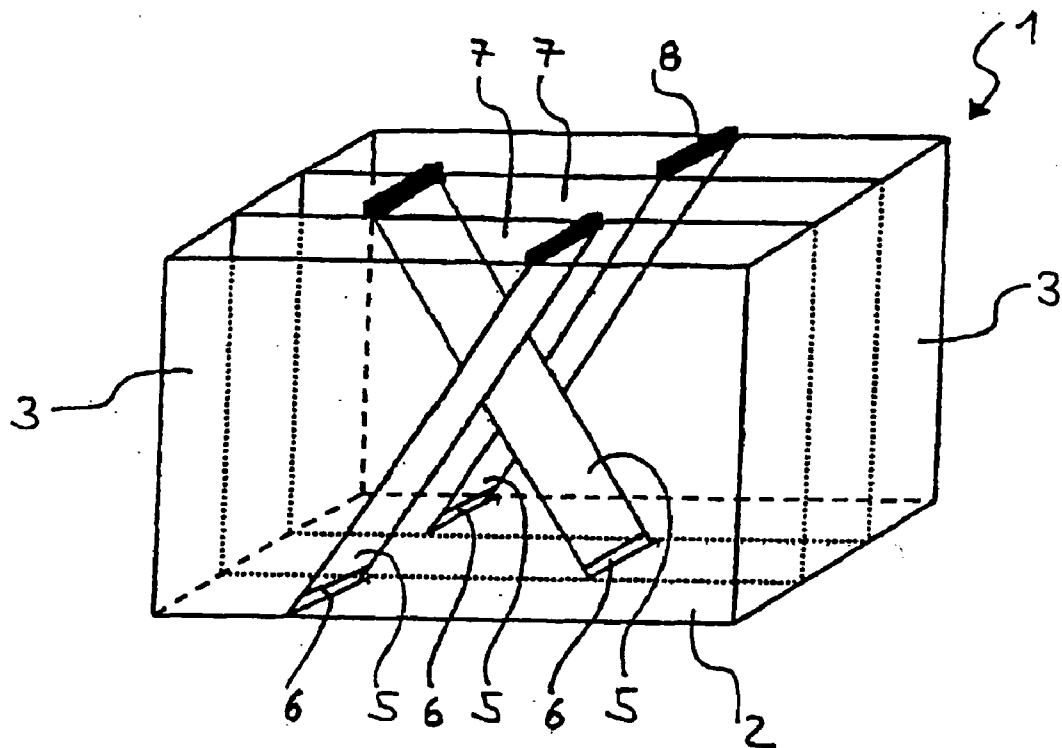
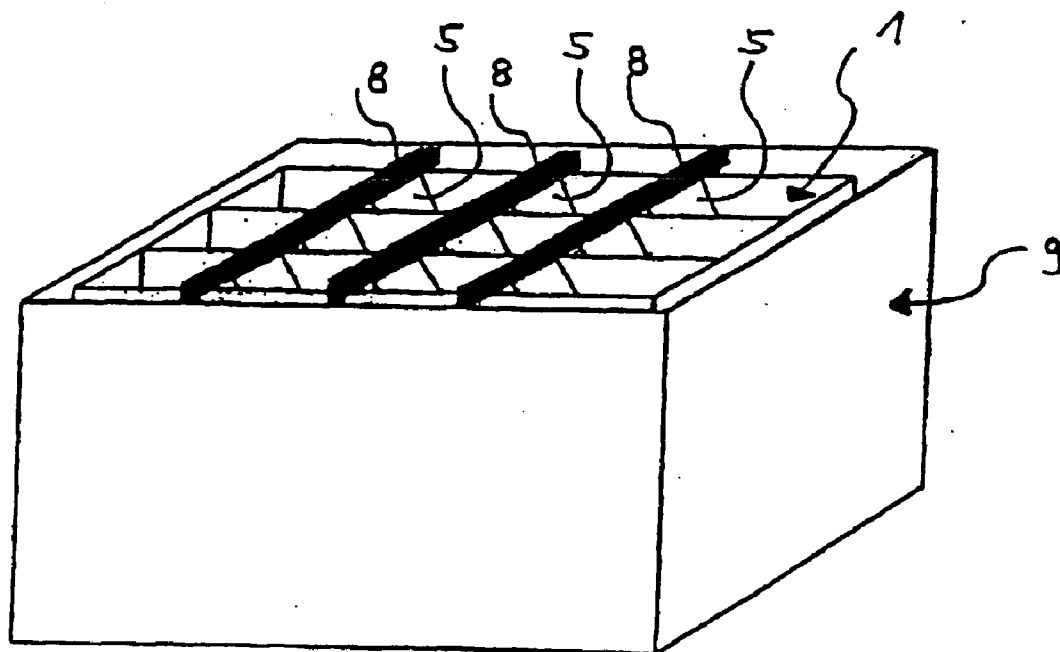


Figure 5



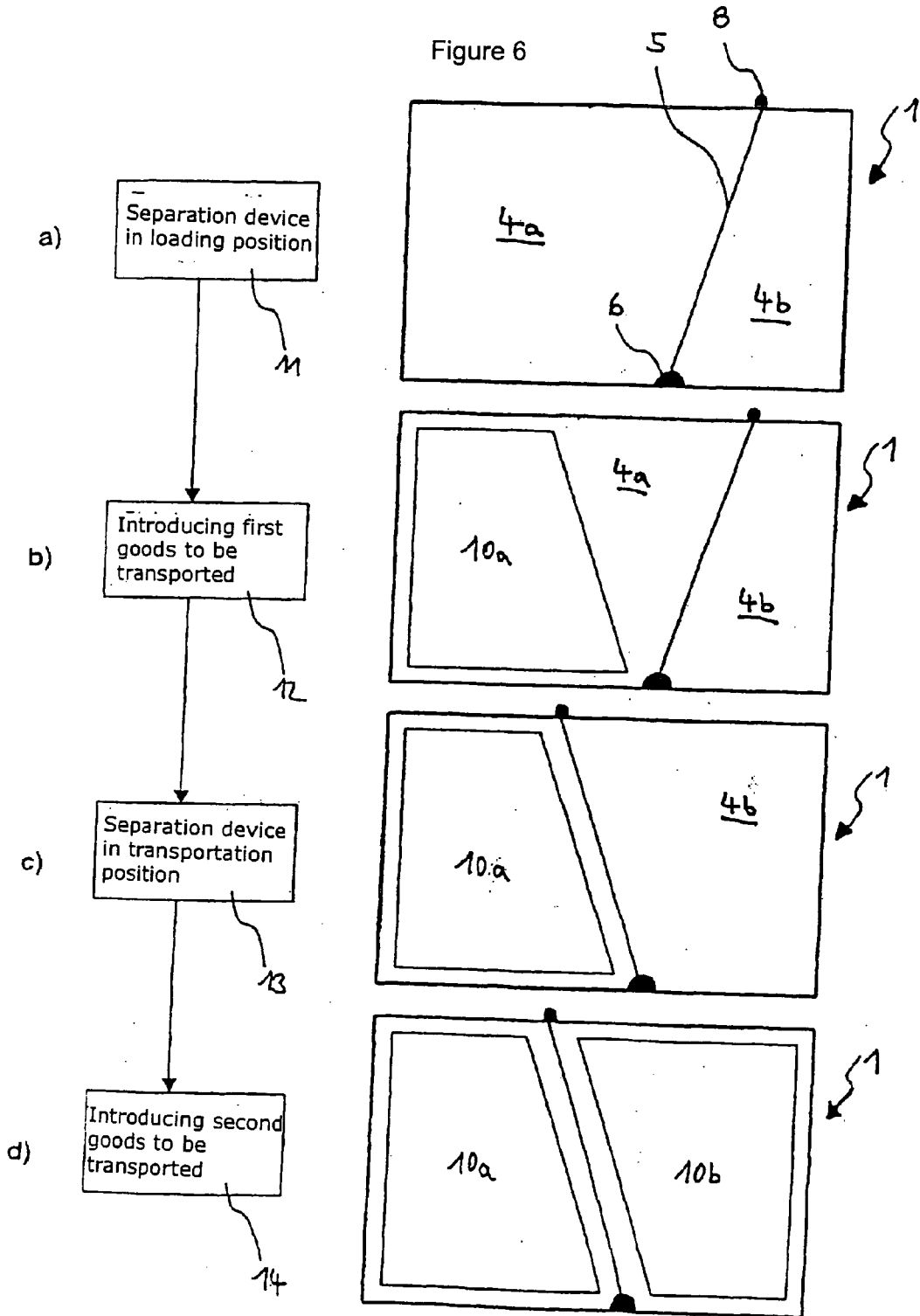


Figure 7

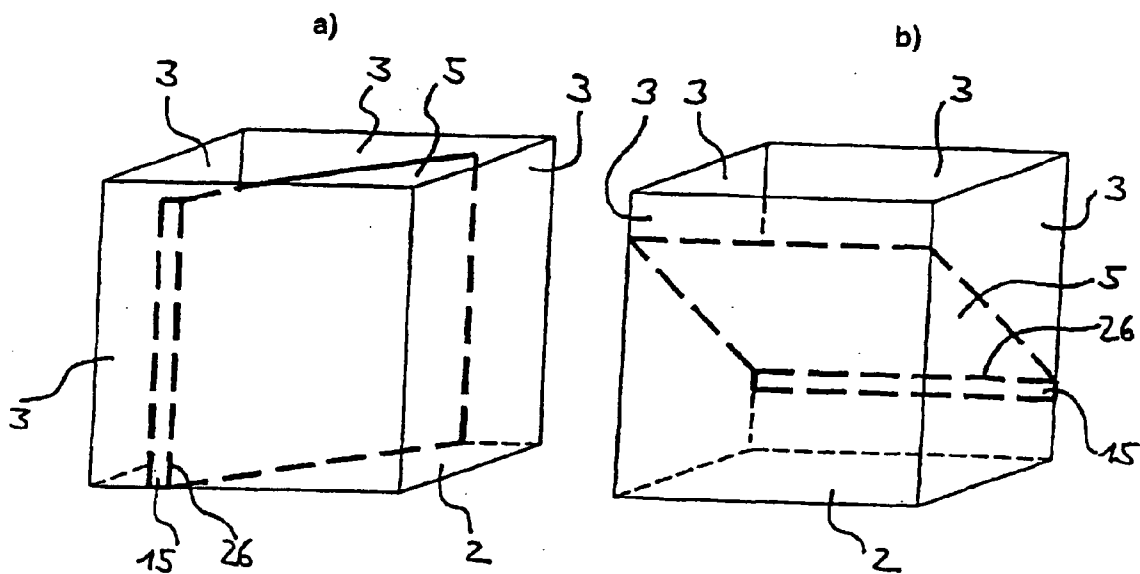


Figure 8

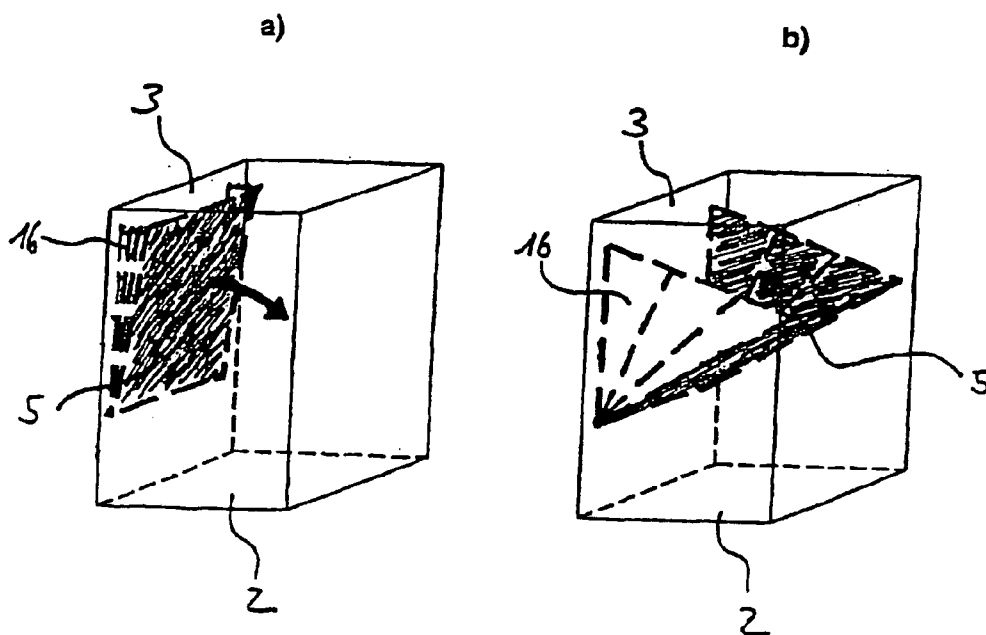


Figure 9

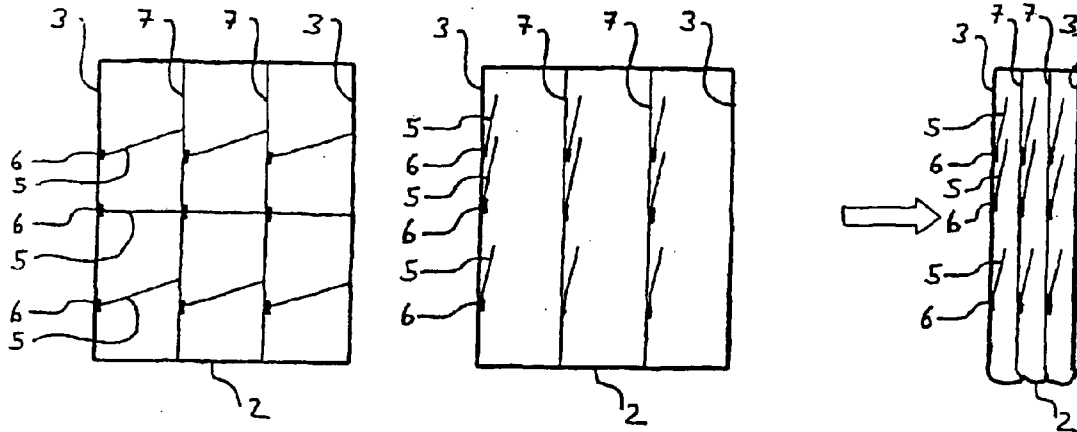
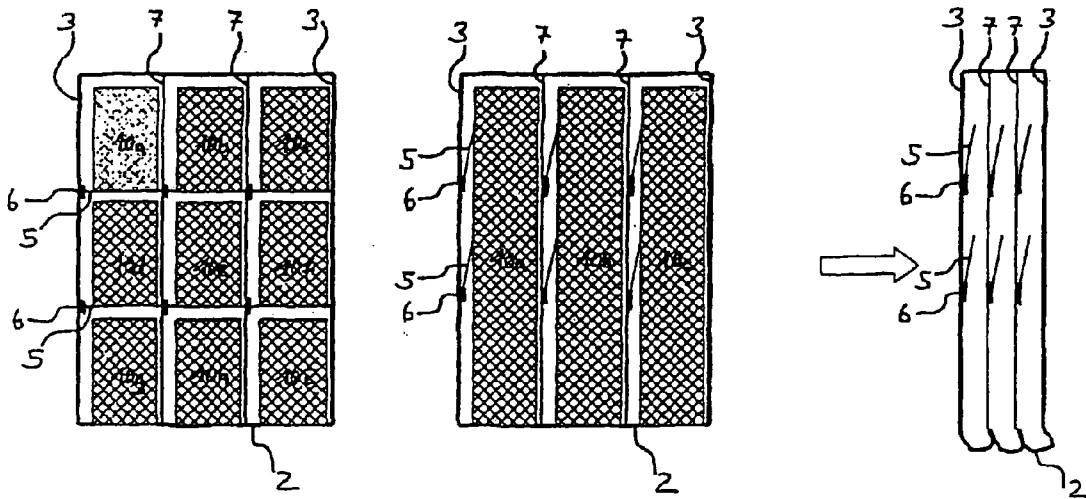


Figure 10



TRANSPORT CONTAINER WITH A PIVOTABLE SEPARATION DEVICE

[0001] This invention concerns a transport container for transporting or storing piece goods comprising a floor unit and vertical walls, wherein the internal space of the transport container can be sub-divided into at least two chambers by at least one separation device. This invention further concerns a method of loading and unloading such a transport container.

[0002] A flourishing traffic of goods takes place between producing and processing works, sales undertakings and consumers. For the great number of various goods, a great number of different transport containers are accordingly also required. Thus in particular when dealing with piece goods there is a great need for transport containers which are matched to the specific demands of the piece goods which are to be transported.

[0003] Conventional transport containers for piece goods are generally of a relatively rigid structure, that is to say they are matched in respect of their geometry and their properties to the transport of a specific kind of piece goods. In other words, such a transport container can only be used to transport those piece goods, for the transport of which the transport container was designed. The transport of a different kind of piece goods which perhaps differs even only slightly from the piece goods, for the transport of which the transport container was actually constructed, is possibly already no longer possible for that reason.

[0004] There is therefore a need for transport containers for transporting piece goods, which are more flexible in terms of use, that is to say those transport containers are also to be suitable for piece goods which differ only slightly from each other in respect of shape, size and material property.

[0005] Piece goods which are to be transported in relatively non-problematical fashion are generally of a substantially parallelepipedic configuration in plan. Parallelepipedic piece goods can be easily introduced with optimum utilisation of space into transport containers of a suitable configuration, in which case a plurality of such articles can be arranged in mutually juxtaposed relationship and/or in mutually superposed relationship without that resulting in relatively large unused intermediate spaces. If in addition separation devices are provided to protect the piece goods which are arranged in mutually juxtaposed and/or mutually superposed relationship, that also affords a stable system, in respect of which slipping or tilting of the piece goods, when suitably arranged, scarcely occurs.

[0006] When dealing with piece goods which differ from that ideal basic shape to a greater or lesser degree, problems arise in making ideal use of the space available and in regard to the stability of a plurality of piece goods which are arranged in mutually juxtaposed and/or mutually superposed relationship. There is therefore also a great need for transport containers which are suitable in particular for transporting piece goods which are essentially not parallelepipedic. Examples of such non-parallelepipedic piece goods are piece goods whose basic configuration, in at least one plane in which they are considered, is substantially triangular, trapezoidal, rhomboidal or circular or elliptical in shape.

[0007] Therefore the object of the present invention is to provide a transport container which can be used with the

utmost flexibility, that is to say for transporting various piece goods which differ slightly from each other in respect of their shape, size and material property. A particular aspect of the invention is that of developing a transport container which can be used so flexibly that it is also suitable in particular for transporting substantially non-parallelepipedic piece goods, while making optimum use of the space involved, for example for transporting piece goods whose basic configuration in at least one plane in which they are viewed substantially corresponds to a triangle, a trapezium or a parallelogram.

[0008] That object is attained by a transport container of the above-indicated kind which is characterised in that the at least one separation device is connected to at least one inside surface of the transport container by way of a hinge-like connection, wherein said separation device is pivotable about the hinge-like connection in such a way that the division of the container volume into the chambers is variable.

[0009] The transport container according to the invention has the desired flexibility by virtue of the hinge-like connection of the separation device to an inside surface of the transport container. Depending on the respective piece goods to be transported the separation device can be pivoted about the hinge-like connection. The division of the transport container into the chambers can be varied in that way and can thus be matched to the size and shape of the piece goods to be transported. In the extreme case a separation device can even assume such a position that the internal space of the transport container is no longer divided into chambers by that separation device. The pivotability of the separation device by way of the hinge-like connection is advantageous in particular for transporting piece goods which differ relatively greatly from the parallelepipedic shape in terms of their basic configuration such as for example piece goods whose basic configuration in at least one plane in which they are viewed corresponds to a triangle, a trapezium or a parallelogram. The pivotable separation device of the transport container according to the invention makes it possible for two or more such kinds of piece goods to be introduced into the transport container and separated from each other with a separation device without in that case causing relatively large intermediate spaces to be produced, which would unnecessarily increase the total volume of the transport container. The above-mentioned non-parallelepipedic piece goods can be introduced into a transport container according to the invention in such a way as to afford a stable arrangement in which slippage of the piece goods during transport is avoided.

[0010] Here, the term inside surfaces of a transport container according to the invention is used to denote the surfaces of the transport container which face into the internal space of the transport container or directly adjoin same. The inside surfaces include the inwardly facing surfaces of the floor unit and the corresponding surfaces of the vertical walls. Transport containers which, besides the floor unit, have a further substantially horizontal delimitation means such as for example a cover or horizontal subdivision elements can also be connected in accordance with this invention at the inside surface of the cover or the surfaces of the horizontal subdivision elements, with one or more pivotable separation devices as described herein. The inside surfaces also include the surfaces of additional vertical

delimitation means in the internal space of the transport container. Connected to an inside surface signifies that the connection is made by way of the inside surface of the corresponding container component (for example floor unit, vertical wall), wherein the connecting means (for example nail, screw) can also pass completely through that component.

[0011] Preferred transport containers are those in which the separation device is made substantially from flexible material. A separation device of flexible material can better adapt for example to an irregular or curved surface and in addition provides for more careful and gentle treatment for piece goods with sensitive surfaces. Particularly preferred are separation devices of flexible material, which are provided at least in portion-wise manner with reinforcements which are incorporated into or fitted to the separation device, preferably in the form of fibre materials or profile members of for example plastic material or other at least semi-stiff materials. Particularly preferred are separation devices of substantially flexible material, in which such reinforcements are provided in the distal region of the separation device with respect to the hinge-like connection.

[0012] In a further preferred embodiment of the present invention the floor unit is also made from flexible material. In other embodiments at least a part of the vertical walls is made from flexible material. When selecting the materials for the floor unit, vertical walls and separation device it is therefore possible for example selectively to chose flexible material, in which case which part of the transport container is made from flexible material and which part is made from non-flexible material depends on the respective demands of the transport container.

[0013] The advantage of using flexible materials, besides the capability on the part of the flexible material to adapt somewhat to an article being transported, is also that it treats the surfaces and edges of the material being transported carefully and gently. A transport container according to the invention which is made completely from flexible material is particularly preferred as, in the unloaded state, it can be folded or rolled together and can thus be stored or transported in a space-saving fashion.

[0014] The term hinge-like connection is used here to denote a movable connection between the separation device on the one hand and an inside surface of the transport container on the other hand. In an embodiment of the present invention that hinge-like connection is a hinge or articulation which is provided between the separation device and the inside surface of the transport container. A separation device of non-flexible material can then be pivoted by way of the movable articulation or hinge. In other embodiments of the invention the movable connection of the separation device and the inside surface of the transport container is implemented by way of flexible sheets or webs which are provided between the separation device and the inside surface of the container and which are fixedly connected thereto by being sewn thereto, tacked thereon, riveted thereto, welded thereto, glued thereto or in some other fashion. Preferably such flexible sheets or webs are of a substantially triangular to semicircular cut. In a particularly preferred feature there are two of those flexible sheets or webs for each separation device, wherein the sheets or webs are fixed for example on one side to a respective one of two mutually opposite

longitudinal edges of the separation device and are secured on the other side to the inside surface of the transport container.

[0015] In alternative embodiments with a separation device of flexible material, the separation device is glued, tacked or sewn onto the inside surface of the transport container in a fixing region. The separation device can also be nailed, screwed, welded or riveted to the inside surface of the transport container. In all those cases the flexible separation device is movable hinge-like in the region which adjoins the fixing region. In such embodiments, the provision of a separate articulation or hinge is not absolutely necessary.

[0016] Particularly preferred embodiments are those in which the separation device is connected at one end by way of a hinge or articulation and at the other end by way of a web of flexible material, to the inside surface of the transport container. Embodiments are also preferred in which a flexible separation device has at one end a region which is movable hinge-like and which directly adjoins a region which is fixed to the inside surface of the transport container, and at the other end it is connected to the inside surface of the transport container by way of a web of flexible material.

[0017] In a further particularly preferred embodiment the separation device is connected along one of its longitudinal edges to the inside surface of the transport container by way of a hinge or articulation and is additionally connected to the inside surface of the transport container along the two longitudinal edges adjoining that longitudinal edge. Such a separation device preferably has a substantially equal-sided-trapezoidal overall base surface.

[0018] In specific embodiments of the transport container according to the invention the transport container is divided by at least one non-pivotable separation device into at least two primary chambers which in turn can be variably divided by at least one pivotable separation device. Non-pivotable separation devices are additional vertical delimitation means in the internal space of the transport container. Therefore the inwardly facing surfaces of non-pivotable separation devices can also be connected to pivotable separation devices.

[0019] It is particularly preferred if pivotable and non-pivotable separation devices are arranged alternately. The alternate arrangement of pivotable and non-pivotable separation devices is advantageous in particular when the transport container according to the invention is used for the transport or storage of piece goods, the configuration in plan of which in at least one plane in which they are viewed substantially corresponds to a right-angled trapezium or a right-angled triangle.

[0020] Further preferred embodiments of the present invention are characterised in that the at least one non-pivotable separation device extends vertically in substantially parallel relationship with the pivot axes of the pivotable separation device while, in other preferred embodiments, at least one non-pivotable separation device extends vertically in substantially perpendicular relationship to the pivot axes of the pivotable separation device. That provides for further subdivision of a transport container according to the invention, wherein the subdivision takes place not just in one dimension but also in a second

dimension. It is particularly preferred if, in a transport container according to the invention, at least one non-pivotable separation device extends vertically in substantially parallel relationship with the pivot axes of the pivotable separation device and at least one further non-pivotable separation device extends vertically in substantially perpendicular relationship to the pivot axes of the pivotable separation device.

[0021] Preferably at least one non-pivotable separation device is made from flexible material. It is particularly preferred if all non-pivotable separation devices are made from flexible material. The advantages of using flexible material in the production of transport containers according to the invention has already been discussed in detail hereinbefore. Inter alia particular preferred transport containers according to the present invention are characterised in that in the unloaded condition they can be folded together or rolled up.

[0022] In preferred embodiments of the present invention the flexible materials include woven textile and film materials. Particularly preferred materials are films of plastic material or technical textiles such as for example knitted fabrics, warp weave fabrics and biaxial structures. Technical textiles have a very high load-carrying capacity, they are stable and tear-resistant and nonetheless of extremely low weight. It is particularly advantageous to use technical textiles whose textile meshes are so arranged that the meshes can slide in and out of each other. A corresponding technical textile enjoys additional elasticity by virtue of the meshes being able to slide in and out of each other. Particularly preferred materials are those which do not charge up electrostatically and materials which are water-resistant and resistant to various fluids such as for example aqueous solutions, emulsions or oils.

[0023] Further embodiments of the present invention are characterised in that a holding bar is provided at the upper end of the separation device. That holding bar is preferably made from at least semi-stiff material. Movement of the separation device, in particular flexible or elastic separation devices, is facilitated by such a holding bar. In particularly preferred embodiments the holding bar is of such a nature that it prevents the separation device from dropping into the internal space of the transport container. That is achieved for example by the holding bar being embodied somewhat wider than the separation device so that it rests on the vertical walls and/or the non-pivotable separation devices which are arranged in substantially perpendicular relationship to a pivotable separation device.

[0024] In embodiments with more than one pivotable separation device at least two pivotable separation devices are connected together preferably by way of a common holding bar. That provides for coordinating the pivotal movement of the various separation devices. Depending on the respective arrangement of the separation devices and the piece goods to be transported, such co-ordination is not always wanted, and in such embodiments separate mobility of the pivotable separation devices is preferred.

[0025] In a preferred embodiment of the present invention at least one holding bar is of such a configuration that it is movable by machine in the context of an automated method.

[0026] Depending on the respective circumstances involved it may be desired that a transport container accord-

ing to the invention can be introduced into a transport frame provided for same. Accordingly preferred transport containers according to the present invention can be placed in or suspended in a transport frame, in which case the outside dimension of the transport container or a multiple thereof is selected to be so much smaller than the inside dimension of the transport frame that at least one transport container can be introduced into the transport frame. When dealing with a plurality of transport containers which are introduced into such a transport frame, they are arranged in mutually superposed and/or mutually juxtaposed relationship. The combination of transport containers and transport frame is particularly advantageous as different materials enjoying various properties can be selected for the production thereof. An advantageous combination is for example the combination of a transport container of flexible material and a transport frame of stiff material. The flexible material is advantageous for careful and gentle treatment of the piece goods to be transported and the stiffness of the transport frame makes it possible for transport systems according to the invention, comprising transport container and transport frame, to be stacked one upon the other. In the case of some transport frames, the frame only comprises a bar assembly made from a material which has sufficient stability in terms of stackability. Further embodiments are characterised by transport frames which are like an upwardly open box, the walls of which afford additional protection for the material to be transported.

[0027] The transport containers which are placed or suspended in a transport frame can preferably be fixed in the transport frame, in particular fixed with double-sided adhesive tape, profile members and/or hook-and-loop fastener tape. Fixing the transport containers in the transport frame prevents slipping of the transport containers in the transport frame occurring during transport.

[0028] In a method according to the invention of loading and unloading a transport container having a pivotable separation device the separation device for the loading operation is folded into a first loading position, in which case a first chamber opens, into which a first kind of material to be transported can be introduced. After that first kind of material to be transported has been introduced, the separation device is folded into a second loading position. In that case a second chamber opens, into which a second kind of material to be transported is introduced. That second loading position is preferably also the transport position. For the unloading operation firstly the second kind of material being transported is removed from the second chamber, then the separation device is folded into the original first loading position and then the first material is removed from the first chamber. The above-indicated method steps can all be carried out also by machine in an automated loading method.

[0029] The above-indicated transport containers according to the invention are advantageously used for transporting piece goods, the basic configuration of which in at least one plane in which they are viewed is of a geometry which does not involve any mirror-image symmetry, or the basic configuration of which is substantially the same as an isosceles triangle.

[0030] The features set forth in the foregoing description of embodiments of the present invention can all be freely combined together, in which respect the advantages of the

corresponding combinations of features will be apparent to the man skilled in the art from the combination and the underlying object of a specific embodiment. That also applies in regard to the features of further advantageous embodiments of the present invention which are illustrated by way of example with reference to the following Figures in which:

[0031] FIG. 1 shows a perspective view of a transport container according to the invention with a separation device pivotably connected to the inside surface of the floor unit,

[0032] FIG. 2 shows a perspective view of an alternative embodiment of a transport container according to the invention with pivotable and non-pivotable separation devices, the pivotable separation devices being connected together by way of a common holding bar,

[0033] FIGS. 3a-e show lateral views in cross-section through transport containers according to the invention with differing arrangements of the separation device or devices,

[0034] FIG. 4 shows a perspective view of a transport container according to the invention with a plurality of separation devices which are connected hingedly to the floor unit and which have separate holding bars,

[0035] FIG. 5 shows a transport container according to the invention which is placed in a transport frame,

[0036] FIG. 6 shows a method of loading and unloading a transport container according to the invention,

[0037] FIG. 7a shows a perspective view of a transport container according to the invention which has a separation device which is pivotably connected to the inside surface of a vertical wall,

[0038] FIG. 7b shows a perspective view of an alternative embodiment of a transport container according to the invention which has a separation device which is pivotably connected to the inside surface of a vertical wall,

[0039] FIG. 8 shows a perspective view of a transport container according to the invention with a separation device which is hingedly connected by means of flexible webs to a vertical wall, in stages a) and b),

[0040] FIG. 9 shows side views in cross-section through an alternative embodiment of a transport container according to the invention with a different arrangement of the separation devices, and

[0041] FIG. 10 shows side views in cross-section through an alternative embodiment of a transport container according to the invention with a different arrangement of the separation devices.

FIG. 1

[0042] FIG. 1 diagrammatically shows a transport container 1 according to the invention which has a rectangular floor unit 2 and, perpendicularly thereto, vertical walls 3. The internal space of the transport container 1 (and therewith also the container volume) is sub-divided into two chambers 4a and 4b by a separation device 5. The separation device 5 is connected fixedly to the inside surface of the floor unit 2 in the fixing region 15 and is hingedly movably connected thereto in the region 26 adjoining that fixing region 15. A holding bar 8 is provided at the upper end of the

separation device 5. In the embodiment illustrated here the floor unit 2, the vertical walls 3 and the separation device 5 are made from flexible material and the holding bar 8 comprises semi-stiff plastic material.

FIG. 2

[0043] The embodiment diagrammatically illustrated in FIG. 2 has two non-pivotable separation devices 7 which extend vertically in substantially perpendicular relationship to the pivot axes of the three pivotable separation devices 5. The non-pivotable separation devices 7 divide the container volume into firstly three primary chambers. Those primary chambers can in turn be variably divided by the pivotable separation devices 5. The pivotable separation devices 5 are hingedly connected to the inside surface of the floor unit 2 in the region 26. The separation devices 5 are connected fixedly to the inside surface of the floor unit 2 in the fixing region 15. The upper ends of the separation devices 5 are connected together by way of a common holding bar 8. The floor unit 2, the vertical walls 3 and the non-pivotable separation devices 7 are made from stiff material while the movable separation devices 5 are made from flexible material, wherein bar profile members are incorporated into the flexible material for stabilisation purposes (this is not shown).

FIGS. 3a-e

[0044] FIG. 3a shows a highly diagrammatic view of a transport container 1 according to the invention with a separation device 5 of stiff material, which is connected to the floor unit 2 by way of an articulation 6. The view in this Figure is a side view in cross-section through the transport container 1. This plane in which the transport container 1 is viewed is a rectangular cross-sectional area which is defined by the length of the floor unit 2 and the height of the vertical walls 3. The overall cross-sectional area of the transport container 1 is divided into the cross-sectional areas of the chambers 4a and 4b by the separation device 5. The cross-sectional areas of the chambers 4a and 4b are trapezoidal in the position illustrated here of the separation device 5 and are therefore suitable for accommodating therein the piece goods 10a and 10b which are also of a trapezoidal cross-section, wherein the cross-section of the piece goods is somewhat smaller than that of the chambers 4a and 4b.

[0045] FIG. 3b shows the transport container 1 from FIG. 3a, wherein the separation device 5 is in a different position. The volumes of the chambers 4a and 4b have been altered by the change in the separation device position, in such a way that the transport container is now suitable for transporting piece goods of different shapes, more specifically piece goods of a substantially rectangular cross-section 10a and 10b. FIG. 3b thus shows in combination with FIG. 3a how flexibly a transport container 1 according to the invention can be used, as it is suitable for transporting items of differing configurations.

[0046] The cross-section of a transport container 1 as shown in FIG. 3c is substantially the same cross-sectional area as the transport container shown in FIGS. 3a and 3b, that cross-sectional area being divided by the separation device 5 which is hingedly connected by way of the articulation-like element 6 to the inside surface of the floor unit 2, into two chambers 4a and 4b which each are of a cross-

section in the form of a right triangle. The embodiment illustrated in this Figure can accordingly accommodate therein two items of piece goods, which are also of a cross-section of a right triangle, in which respect the length of the sides of the triangle of the items being transported should be slightly less than that of the sides of the chamber cross-section.

[0047] FIG. 3d shows the transport container 1 from FIG. 3c, with the separation device 5 in another position. The change in the position of the separation device means that the transport container 1 now has substantially only still one large chamber 4 of substantially right-angled cross-section, into which is introduced an item of piece goods 10 which is selected to be of a corresponding size and configuration. FIG. 3d in combination with FIG. 3c thus shows how flexibly a transport container 1 according to the invention can be used as it is suitable for transporting articles of differing configurations.

[0048] The embodiment shown in FIG. 3e is of such a design that it can accommodate therein six items 10a to 10f, the cross-section of which is like a right-angled trapezium. The chambers 4a-4f are separated from each other alternately by pivotable separation devices 5 and non-pivotable separation devices 7. The non-pivotable separation devices 7 extend vertically in the interior of the container in substantially parallel relationship with the pivot axes of the pivotable separation devices 5. The pivotable separation devices 5 are connected to the inside surface of the floor unit 2 by way of hinge-like connections 6. At the upper end the separation devices 5 each have a respective holding bar 8.

FIG. 4

[0049] The embodiment diagrammatically illustrated in FIG. 4 is very substantially comparable to the embodiment shown in FIG. 2. It will be noted here however that, unlike FIG. 2, there is not a common holding bar 8 for the three separation devices 5. In this embodiment the separation devices 5 each have separate holding bars 8. In addition the articulation-like elements 6 by way of which the separation devices 5 are connected to the floor unit 2 and therewith the pivot axes of the separation devices 5 do not lie on a common axis or in a line. In this embodiment the floor unit 2, vertical walls 3 and separation devices 5 are of stiff material.

FIG. 5

[0050] The transport container 1 according to the invention which is diagrammatically shown in FIG. 5 comprises flexible material and is suspended in a transport frame 9 for stabilisation purposes. The transport container 1 has in all nine pivotable separation devices 5 of which each three in a respective row are connected together by way of a common holding bar 8.

FIG. 6

[0051] FIG. 6 diagrammatically shows a method of loading and unloading a transport container according to the invention as is illustrated for example in FIGS. 1, 2 and 3a. In FIG. 6a the separation device 5 is in the first loading position 11. The holding bar 8 prevents the separation device 5 from falling into the internal space of the transport container. FIG. 6b illustrates the introduction 12 of a first

item 10a to be transported into the left-hand chamber 4a of the transport container 1. In this state, the right-hand chamber 4b is of a markedly smaller volume than the left-hand chamber 4a. In order to advantageously alter the volume of the two chambers, the separation device 5 is moved into the second loading position 13, as shown in FIG. 6c. In this case the volume of the left-hand chamber 4a is reduced while the volume of the right-hand chamber 4b is increased. FIG. 6d shows how the item 10b to be transported is introduced into the chamber 4b which has now been increased in size, as at 14. Transport is then preferably also effected in that position.

FIG. 7a

[0052] FIG. 7a) shows a transport container 1 according to the invention which has a separation device 5 which is fixedly connected to the inside surface of a vertical wall 3 in the fixing region 15 and which is movably connected thereto by way of the region 26 which is movable hinge-like. The separation device 5 of this embodiment can be moved in a horizontal plane.

FIG. 7b

[0053] The separation device 5 of the embodiment shown in FIG. 7a) of a transport container 1 according to the invention can be moved in a vertical plane. This separation device 5 is also connected pivotably to a vertical wall 3 adjoining the fixing region 15.

FIG. 8

[0054] FIGS. 8a) and b) diagrammatically show a perspective view of a transport container 1 according to the invention with a separation device 5 which is connected hinge-like to a vertical wall 3 by means of flexible webs 16. The flexible webs 16 comprise a flexible textile material and are sewn both onto the inside surface of the vertical wall 3 and also onto the separation device 5, the separation device 5 being made from flexible textile material in which plastic profile members have been incorporated for reinforcement purposes (not shown). FIG. 8a) shows the position of the separation device 5 which is suitable for loading and unloading the lower chamber. FIG. 8b) shows the position of the separation device 5 which is suitable for loading and unloading the upper chamber and for transport in the laden state.

FIG. 9

[0055] The cross-section shown on the left-hand side of FIG. 9 through an alternative embodiment of a transport container 1 according to the invention has in the illustrated plane in which it is viewed twelve chambers which are formed by the floor unit 2, the vertical walls 3 and the pivotable separation devices 5 and the non-pivotable separation devices 7, wherein the materials used are flexible and are provided at least in part in portion-wise manner with reinforcements. In the third dimension, this embodiment can also have further pivotable and non-pivotable separation devices and a corresponding number of chambers (not shown). In this case the further non-pivotable separation devices extend in part parallel and in part perpendicular to the illustrated non-pivotable separation devices 7. The pivotable separation devices 5 are hingedly connected by way of articulation-like elements 6 to the inside surfaces of the side walls 3 and the surfaces of the non-pivotable separation devices 7. The embodiment illustrated in this view can

accommodate in the illustrated plane for example twelve elements to be stored or transported, in chambers of substantially trapezoidal cross-section. This view however shows the transport container in the unloaded state.

[0056] The middle view in FIG. 9 shows the same embodiment, with the pivotable transport devices 5 being in an upwardly folded position. The upward folding of the separation devices 5 provides that the flexible transport container can be horizontally folded together. That folded-together collapsed state is finally shown in the right-hand view in FIG. 9.

FIG. 10

[0057] The side views in cross-section shown in FIG. 10 through a further embodiment of a transport container 1 according to the invention are comparable to the embodiment of FIG. 9, wherein in this case the pivotable separation devices 5 are oriented in the laden state either substantially horizontally (left-hand view) or substantially vertically (central view).

[0058] Depending on the respective orientation of the pivotable separation devices 5 the transport container 1 in the plane in which it is viewed has either nine small or three large chambers of substantially right-angled cross-section, into which are introduced piece goods 10a-10i of suitable size and configuration. The left-hand and the middle views in FIG. 10 thus graphically show how flexibly a transport container 1 according to the invention can be used as it is suitable for transporting items of differing sizes and configurations.

[0059] The right-hand view in FIG. 10 shows that specific transport container 1 in the unloaded and collapsed state.

[0060] It is to be noted in regard to all the illustrated Figures that the man skilled in the art will readily recognise the diagrammatic character of the drawings so that, when carrying the present invention into effect, he will not feel himself bound for example to precise dimensions, size ratios and layer thicknesses, as are illustrated in the Figures. The corresponding advantageous dimensions, size ratios and layer thicknesses will derive from the respective demands which for the major part are dependent on the nature of the materials being transported and the materials used in manufacture of transport containers according to the invention.

LIST OF REFERENCES

- [0061] 1 transport container
- [0062] 2 floor unit
- [0063] 3 vertical wall
- [0064] 4 chamber
- [0065] 5 pivotable separation device
- [0066] 6 hinge-like connection
- [0067] 7 non-pivotable separation device
- [0068] 8 holding bar
- [0069] 9 transport frame
- [0070] 10 material being transported
- [0071] 11 first loading position

[0072] 12 introducing a first kind of material being transported

[0073] 13 second loading position

[0074] 14 introducing a second kind of material being transported

[0075] 15 fixing region

[0076] 16 hinge-like connection in the form of a flexible sheet

[0077] 26 region movable in a hinge-like fashion

1-18. (canceled)

19. A transport container for transporting or storing piece goods comprising a floor unit and vertical walls, wherein the internal space of the transport container can be sub-divided into at least two chambers by at least one separation device, the at least one separation device is connected to at least one inside surface of the transport container by way of a hinge-like connection, wherein said separation device is pivotable about the hinge-like connection in such a way that the division of the container volume into the chambers is variable, wherein the separation device comprises a flexible woven textile or film material, wherein a holding bar of preferably at least semi-stiff material is provided at the upper end of the separation device.

20. A transport container according to claim 19 wherein at least two pivotable separation devices are connected together by way of a common holding bar.

21. A transport container according to claim 19 wherein the separation device is provided at least portion-wise with reinforcements which are preferably incorporated into or fitted to the separation device in the form of fibre materials or profile members.

22. A transport container according to claim 19 wherein the floor unit and/or at least a part of the vertical walls is made from flexible material.

23. A transport container according to claim 19 wherein a separation device of flexible material is glued, tacked or sewn to the inside surface in a fixing region or is nailed, screwed, riveted or welded to the inside surface, wherein the flexible separation device is movable hinge-like in the region adjoining the fixing region.

24. A transport container according to claim 19 wherein at least one sheet or web of flexible material, preferably at least two sheets or webs of flexible material, is or are provided as the hinge-like connection between the separation device and the inside surface of the transport container.

25. A transport container according to claim 24 wherein the one sheet or the one web or the sheets or the webs are of a substantially triangular or equal-sided trapezoidal cut and is or are connected to an inside surface of the transport container and the separation device respectively preferably by sewing, tacking, riveting, welding, gluing, nailing fast or screwing fast.

26. A transport container according to claim 19 wherein the transport container is divided by at least one non-pivotable separation device into at least two primary chambers which in turn can be variably divided by at least one pivotable separation device.

27. A transport container according to claim 26 wherein the at least one non-pivotable separation device extends vertically in substantially parallel relationship with the pivot axes of the pivotable separation device.

28. A transport container according to claim 23 wherein the at least one or at least one further non-pivotable separation device extends in substantially perpendicular relationship to the pivot axis of the pivotable separation device.

29. A transport container according to claim 20 wherein the flexible material includes films of plastic material or technical textiles.

30. A transport container according to claim 19 wherein the end of the separation device, that is remote from the holding bar, is hinge-like connected to the floor unit or a vertical wall of the transport container.

31. A transport container according to claim 19 wherein the transport container can be placed or suspended in a transport frame, wherein the outside dimension of the transport container or a multiple thereof is selected to be so much smaller than the inside dimension of the transport frame that at least one transport container can be introduced into the transport frame, wherein when a plurality of transport containers are involved they are arranged in mutually superposed and/or mutually juxtaposed relationship.

32. A transport container according to claim 31 the transport container can be fixed in the transport frame, preferably by means of double-sided adhesive tape, profile members and/or hook-and-loop fastener tape.

33. A transport container according to claim 19 wherein in the unloaded state the transport container can be folded together or rolled up.

34. A method of loading and unloading a transport container having a pivotable separation device according to claim 19, wherein the pivotable device is connected to at least one inner floor or side surface of the transport container by way of a hinge-like connection, wherein the separation device comprises a flexible woven textile or film material which is connected hinge-like to the floor unit or a vertical wall of the transport container, wherein provided at the

upper end of the separation device is a holding bar of preferably at least semi-stiff material, wherein

a) for the loading operation the separation device is folded into a first loading position, in which case a first chamber opens upwardly into which a first material to be transported can be introduced, wherein after introduction of the first material to be transported the separation device is folded into a second loading position, in which case a second chamber opens into which a second material to be transported is introduced, the second loading position preferably also being the transport position, and

b) for the unloading operation firstly the second material being transported is removed from the second chamber, then the separation device is folded into the first loading position and then the first material being transported is removed from the first chamber.

35. Use of a transport container according to claim 19 for the transport of piece goods, whose basic configuration in at least one plane in which they are viewed is of a geometry which does not involve any mirror-image symmetry, or whose basic configuration is substantially the same as an isosceles triangle.

36. A transport container according to claim 26 wherein the at least one or at least one further non-pivotable separation device extends in substantially perpendicular relationship to the pivot axis of the pivotable separation device.

37. A transport container according to claim 20 wherein the floor unit and/or at least a part of the vertical walls is made from flexible material.

38. A transport container according to claim 21 wherein the floor unit and/or at least a part of the vertical walls is made from flexible material.

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