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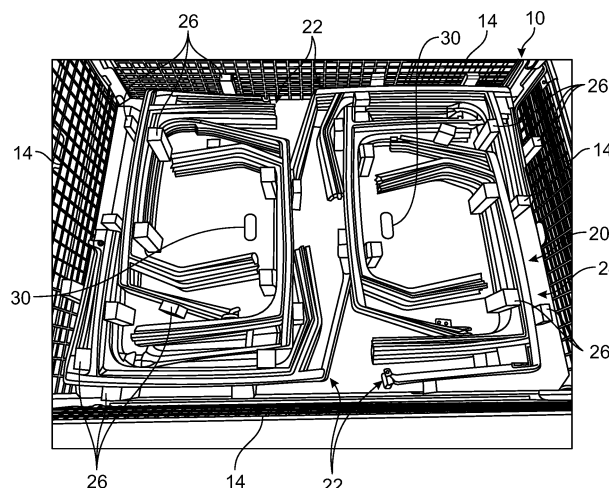
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(54) **TRAY FOR STORAGE OF PARTS, CRATE FOR TRANSPORT OF PARTS AND RELATED USE**

(57) A tray (20) for storing parts (22) with the aim of transporting them, this tray comprising:  
- a plane wall (24) comprising an upper face (24a) and a lower face, the upper face (24a) being capable of supporting the parts (22) to be transported, and  
- positioning studs (26) attached to the wall (24) and projecting from said upper surface (24a) so as to block the parts (22) to be transported,

wherein the studs (26) are independent of one another and attached independently to the upper face (24a) of the wall (24), each of these studs (26) comprising a first portion (32a) made of rigid foam attached to the upper face (24a) and a second portion (32b) made of flexible foam capable of coming into contact with the parts (22) to be transported.



**Fig. 2**

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## Description

### Technical field of the invention

[0001] The invention relates in particular to a tray for storage of parts with the aim of transporting them, as well as a crate for transporting these parts.

### Technical background

[0002] It is known to transport parts in a transport crate. Conventionally, the crate has a generally parallelepiped shape and comprises a base and four side walls extending respectively along four sides of the base. Parts are arranged in the crate with the aim of transporting them. For example, these may be parts destined for an assembly plant, such as vehicle parts destined for a vehicle assembly plant.

[0003] The parts can be relatively fragile, so they need to be blocked as securely as possible in the crate to prevent them from shifting during transport and colliding with each other. For example, the parts may have smooth surfaces that must not be scratched, or flexible portions that must not be deformed or crushed. This is particularly true of sealing parts for vehicles, especially automobiles.

[0004] Depending on the size of the parts, they may need to be stacked in the crate. To achieve this, storage trays can be superimposed one on top of the other in the crate, and each tray can support a stack of several parts. In this configuration, the risk of displacement and impact of the parts is increased, which further reinforces the need to lock in the parts stacked on each tray. The present invention offers a simple, effective and economical solution to this need for prior art.

### Summary of the invention

[0005] To this end, the invention proposes a tray for storing parts with the aim of transporting them, this tray comprising:

- a plane wall comprising an upper face and a lower face, the upper face being capable of supporting the parts to be transported, and
- positioning studs attached to the wall and projecting from said upper surface so as to block the parts to be transported,

characterised in that the studs are independent of one another and attached independently to the upper surface of the wall, at least some of the studs comprising a first rigid foam portion attached to the upper surface and a second portion made of flexible foam capable of coming into contact with the parts to be transported.

[0006] The studs are used to block, i.e. to stall or to lock in, the parts to limit their movement during transportation. The studs are attached to the wall and rest on the parts to be transported. The studs therefore comprise two por-

tions, each with a specific function. The first portion of each stud is made of rigid foam and enables the stud to be attached to the wall. It is therefore understood that each stud is attached to the wall by this first rigid portion. The second portion of each stud is made of flexible foam and is designed to come into contact with the parts for blocking purposes.

[0007] In this application, the terms "rigid" and "flexible" refer to the hardness of the foam. It is understood that a rigid foam has a higher hardness than flexible foam. This means that the hardness of the first portion of each stud is greater than the hardness of the second portion of the stud.

[0008] For example, if the hardness measured is type Shore 00, then the hardness of the flexible foam is less than 20 and the hardness of the rigid foam is greater than 20.

[0009] The tray according to the invention may comprise one or more of the following characteristics, taken separately from each other or in combination with each other:

- the first portion is XPE-based;
- the first portion has a density greater than  $110\text{Kg/m}^3$ , and preferably greater than or equal to  $120\text{kg/m}^3$ ;
- the first portion has a Shore 00 hardness greater than 20, and preferably greater than 30;
- the first portion has an elongation at break greater than 110%, and for example between 110 and 140%;
- the second portion is of the shape memory type;
- the second portion is based on EPDM foam;
- the second portion has a density less than or equal to  $110\text{kg/m}^3$ , and for example between 80 and  $110\text{kg/m}^3$ ;
- the second portion has a Shore 00 hardness of less than 20, and preferably less than 13;
- the second portion has an elongation at break greater than 150%, and for example between 150 and 300%;
- at least some of the studs are covered with a textile film or a textile layer;
- the film or layer comprises a polyester, a polyamide or a combination of the two;
- the film or layer has a density of between 50 et  $200\text{g/m}^2$  and preferably of the order of  $100\text{g/m}^2$ ;
- the film or layer covers two opposite sides of the stud, or even a top and/or a base of the stud;

- at least some of the studs, or not all of the studs are identical;
- the studs each have a generally parallelepiped shape;
- each of the first and second portions has a parallelepiped shape.
- the second portion of each stud occupies a volume of the stud which is less than the volume of the stud occupied by the first portion of this stud;

- the studs are all the same height;
- the number of studs is greater than ten;
- the studs are attached to the wall by gluing and/or by attaching screws which pass through the wall and are screwed into the studs;
- the upper face of the wall comprises drawings representing the shape and position of the parts to be transported and blocked between the studs;
- said wall is made of polypropylene (PP);
- said wall has a density of between 1000g/m<sup>2</sup> and 2000g/m<sup>2</sup>, and for example between 1200g/m<sup>2</sup> and 1800g/m<sup>2</sup>; the density is for example of the order of 1500g/m<sup>2</sup>;
- said wall has a thickness of between 2 and 10 mm, and preferably between 3 and 7 mm; the thickness is, for example, 5 mm;
- said wall is a hollow or alveolar panel, for example that marketed under the brand name Triplex®;
- the film or layer is, for example, a textile marketed under the brand name Evolon®.

**[0010]** The invention also relates to a crate for storing parts with the aim of transporting them, comprising a container in which several trays as described above are superimposed, these trays having walls of the same dimensions. The crate according to the invention may comprise one or more of the following characteristics, taken in isolation from each other or in combination with each other:

- each tray, called the upper tray, which is superimposed on a tray, called the lower tray, rests on the tops of the studs attached to the lower tray;
- parts to be transported are located on each of the trays and blocked by the studs on these trays;
- several layers of parts are stacked on each of the trays;
- at least some parts or layers are separated from each other, at least in part, by protective sheets or textiles;
- the parts or layers on each of the trays are stacked to a height that is less than a height of the studs on that tray;
- the difference in height is between 0.5cm and 5cm;
- the crate does not comprise any parts to be transported and comprises a stack of trays for an empty return, the stack of trays comprising several pairs of trays stacked and housed in the crate, each pair of trays comprising two trays which have their upper faces facing each other and which have their studs spaced apart from each other.

**[0011]** The present invention also relates to the use of a tray as described above or a crate as described above for transporting sealing parts for vehicles, in particular motor vehicles.

#### Brief description of the figures

**[0012]** Further characteristics and advantages will be apparent from the following description of non-limiting embodiments of the invention with reference to the accompanying drawings in which:

Figure 1 is a schematic perspective view of a transport crate, in this case empty,  
 Figure 2 is a schematic perspective view of a transport crate comprising at least one storage tray on which parts to be transported are stacked,  
 Figure 3 is a schematic front view of a storage tray according to one embodiment of the invention,  
 Figure 4 is a schematic perspective view of a positioning stud,  
 Figure 5 is a schematic perspective view of another positioning stud, and  
 Figure 6 is a schematic perspective view of a stack of parts on a storage tray.

#### Detailed description of the invention

**[0013]** Figure 1 shows a crate 10 for transporting parts. This crate 10 has, for example, a generally parallelepiped shape as in the example shown, and comprises or forms a container with a base 12, or a base wall, and four side walls 14 extending respectively along the four sides of the base 12.

**[0014]** In general, the base 12 is horizontal and is associated with one or more feet 16 or legs. The side walls 14 are generally vertical and therefore perpendicular to the base 12. They are also perpendicular to each other and parallel to each other in the example shown.

**[0015]** The base 12 is preferably rigid and is made, for example, of metal, wood or both.

**[0016]** The side walls 14 can be made of metal and are, for example, screened as in the example shown.

**[0017]** Alternatively, the crate 10 could be made of plastic.

**[0018]** The crate 10 can also be of the type that cannot be dismantled or, on the contrary, can be dismantled and, in particular, folded.

**[0019]** The crate 10 comprises or forms a container in which a number of trays 20 are designed to be placed one on top of the other, as shown in Figure 2. The number of trays 20 that can be stacked in a crate 10 is not limitative.

**[0020]** Figure 2 shows an upper tray superimposed on a lower tray, which can itself be superimposed on another tray.

**[0021]** The trays 20 preferably have the same dimensions, in particular in width and length, these dimensions corresponding substantially to those of the base 12 so

that the lowest tray can rest on the base 12.

**[0022]** Each tray 20 supports several parts 22 and is configured to block them as well as possible to limit any movement of the parts 22 during transport.

**[0023]** Figure 3 shows an example of a tray 20.

**[0024]** Each tray 20 essentially comprises two portions, namely a plane wall 24 and positioning studs 26.

**[0025]** The plane wall 24 comprises an upper face 24a and a lower face, the upper face 24a being able to support the parts 22 to be transported.

**[0026]** It can be seen that the upper surface 24a may comprise marks 28 delimiting the parts 22 to be transported. In the present case, the parts 22 are sealing parts for vehicles, in particular cars. The parts have relatively complex shapes, with rectilinear and elongated sections.

**[0027]** In the example shown, it can be seen that the upper surface 24a comprise four marks 28 so that four stacks of parts 22 can be produced.

**[0028]** The marks 28 can be made by continuous lines or dotted lines drawn on the wall 24, as in the example shown.

**[0029]** The plane wall 24 can also comprise openings 30 to make it easier to grip and handle the tray 20.

**[0030]** For example, the wall 24 comprises two openings 30 substantially in the middle so that an operator can grip the tray 20 by inserting his hands into these openings 30 and folding his fingers over the lower face of the wall 24. The user can therefore manipulate the tray 20 and, for example, remove it from the crate 10 or insert it into the crate 10.

**[0031]** The drawing shows that the openings 30 are at a distance from the marks 28 to prevent the operator from touching the parts when handling the tray 20. The wall 24 is made of polypropylene (PP), for example.

**[0032]** The wall 24 can have a density of between 1000g/m<sup>2</sup> and 2000g/m<sup>2</sup>, and for example between 1200g/m<sup>2</sup> and 1800g/m<sup>2</sup>. The density of the wall 24 is, for example, around 1500g/m<sup>2</sup>.

**[0033]** The wall 24 can have a thickness of between 2 and 10mm, and preferably between 3 and 7mm. The thickness of the wall 24 is, for example, 5mm. The wall 24 can be a hollow or honeycomb panel, for example that marketed under the brand name Triplex®.

**[0034]** The studs 26 are independent of each other and attached independently to the upper face 24a of the wall 24.

**[0035]** Figure 3 shows that the tray 20 can comprise a fairly large number of studs 26. The number of studs 26 per tray 20 is, for example, greater than or equal to 10 or 20.

**[0036]** There are two types of studs 26: the blocking studs 26a and the support studs 26b.

**[0037]** The support studs 26b are designed to support an upper tray.

**[0038]** The blocking studs 26a are positioned in specific areas, next to the marks 28, so that the parts 22 are blocked precisely at the marks 28.

**[0039]** The same part 22 can be blocked by several

studs 26a depending on the shape and dimensions of the part 22. For example, the number of studs 26a per part 22 may be greater than or equal to 2 or 5.

**[0040]** Insofar as the parts 22 are placed on the wall 24 or on another part 22 located on the wall 24, and insofar as the parts 22 are covered by another part 22 or another tray 20, the function of the studs 26a is to block the parts 22 in a plane parallel to the wall 24 of the tray 20. In other words, the number and position of the studs 26a for blocking a part 22 are advantageously chosen to block the movements of this part 22 in any direction in this plane, or at least in several directions in this plane.

**[0041]** The studs 26 may each have a generally parallelepiped shape.

**[0042]** As can be seen more clearly in Figures 4 and 5, the studs 26a comprise a first portion 32a made of rigid foam attached to the upper surface 24a and a second portion 32b made of flexible foam capable of coming into contact with the parts 22 to be transported.

**[0043]** It is understood that the studs 26a are attached to the wall 24 by means of their rigid portions 32a and are resting on the parts by means of their flexible portions 32b.

**[0044]** It is also understood that the studs 26a must be located on the wall 24 so that their flexible portions 32b face the nearest marks 28 in order to rest on the parts 22 placed on these marks 28.

**[0045]** Each of the first and second portions 32a, 32b of each stud 26a may have a parallelepiped shape, as in the example shown in Figure 4.

**[0046]** The second portion 32b of each stud 26a can occupy a volume of the stud 26a which is less than the volume of the stud 26 occupied by the first portion 32a of this stud 26a, as can be seen in figure 4 for example.

**[0047]** For example, the first portion 32a has a Shore 00 hardness greater than 20, and preferably greater than 30.

**[0048]** The first portion 32a, for example, is XPE-based.

**[0049]** The first portion 32a may have a density greater than 110Kg/m<sup>3</sup>, and preferably greater than or equal to 120kg/m<sup>3</sup>.

**[0050]** For example, the first portion 32a has an elongation at break greater than 110%, and for example between 110 and 140%.

**[0051]** The second portion 32b, for example, has a Shore 00 hardness of less than 20, and preferably less than 13.

**[0052]** The second portion 32b is preferably of the shape memory type.

**[0053]** The second portion 32b is made of EPDM foam, for example.

**[0054]** The second portion 32b may have a density less than or equal to 110kg/m<sup>3</sup>, for example between 80 and 110kg/m<sup>3</sup>.

**[0055]** The second portion 32b may have an elongation at break of more than 150%, for example between 150 and 300%.

[0056] In the case of the support studs 26b, they may be made entirely of rigid material.

[0057] Each of the studs 26 can be covered with a textile film or a textile layer 36, as shown in Figure 5. The use of such a film or layer is advantageous for several reasons. The film or layer helps, for example, to preserve the integrity of the second portion 32b over time and prevent it from tearing. The film or layer also serves to facilitate the placement of the stacked parts 22 on the tray, by preventing the second portion 32b from being torn off when the parts 22 come into contact with the stud 26.

[0058] The film or layer 36 may comprise polyester, polyamide or a combination of the two. The film or layer 36 is, for example, a textile marketed under the brand name Evolon®.

[0059] The film or layer 36 can have a density of between 50 and 200 g/m<sup>2</sup> and preferably of the order of 100g/m<sup>2</sup>.

[0060] The film or layer 36 may cover two opposite sides of the stud 26, or even a top and/or a base of the stud 26.

[0061] The film or layer 36 can be attached to the corresponding stud 26, for example by gluing.

[0062] In the case of figure 5, for example, the film or layer 36 covers the top of the stud 26, and in particular the top of the two portions 32a, 32b of the stud 26a, and comprises two portions folded over respectively on one face of the portion 32a intended to be in contact with part(s) and an opposite face of the other portion 32b. Alternatively, the film or layer 36 can comprise two portions folded over one of the faces of the stud 26, or even superimposed on it: in this case, the film or layer 36 completely surrounds the stud 26.

[0063] At least some of the studs 26, or all of the studs 26 may have the same height H1. This is particularly the case for studs 26b on which an upper tray 20 is to be placed.

[0064] The studs 26 are attached to the wall 24 by adhesive and/or by attaching screws 38 which pass through the wall 24 and are screwed into the studs 26, advantageously passing through the film or layer 36, which is an additional guarantee for the best hold of the film or layer on the stud. Figure 3 illustrates the case where, for example, the portion 32a of each stud 26a has tapped holes 40 at its base to receive screws 38. These screws 38 pass through orifices in the wall 24 (not shown) and are screwed and tightened into the holes 40.

[0065] As shown in Figure 6, at least some parts 22 or layers of parts may be separated from each other, at least in part, by protective sheets or textiles 42.

[0066] These sheets or textiles 42 may be similar or identical to the aforementioned film or layer 36.

[0067] These sheets or textiles 42 can be joined together in batches when these sheets or textiles are intended to be inserted between parts of the same stack of parts to avoid relative friction between these parts 22, as is the case in Figure 6. In this case, the sheets or textiles 42 may comprise portions 42a which are super-

imposed and attached together. These portions 42a can also be attached to the wall 24, and in particular to its upper face 24a. This can be achieved by gluing and/or sewing, for example.

[0068] The parts 22 or layers of parts 22 on each of the trays 20 are stacked to a height H2 which is preferably less than the maximum height H1 of the studs 26 of this tray 20. The difference in height H1-H2 is preferably between 0.5cm and 5cm to prevent the upper tray coming into contact with parts 22 on the lower tray on which the upper tray is placed.

[0069] The tray 24 and the crate 10 can be reused, which is particularly advantageous and environmentally friendly. Each film or layer 36 may be secured to a stud 26 and is not necessarily replaced when the tray 24 is used again. The same applies to sheets or textiles 42, especially when they are attached to the wall 24.

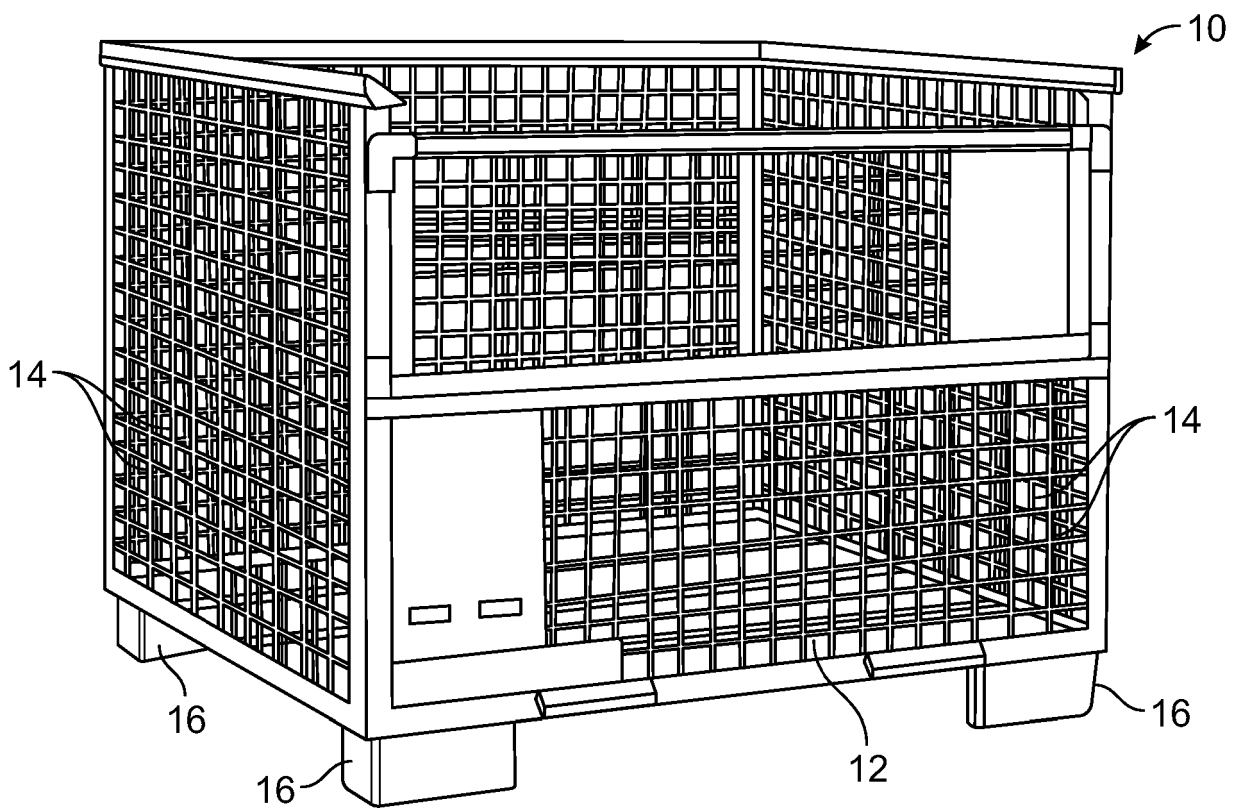
[0070] In a particular embodiment of the invention, at least 120 parts are stored on the trays of a same crate 10.

[0071] The positions of the studs 26 on the trays 24 are advantageously chosen so that two empty trays from any part can be stacked on top of each other with their upper faces 24a facing each other. In this way, the stacking height of two trays is almost halved (with respect to stacking the trays resting on their studs), and significantly reduces the footprint of the empty trays. The crates are also preferably foldable to reduce their footprint when empty and make them easier to transport with empty trays. Advantageously, the trays used to transport parts in two crates are all stacked as described above and housed inside one of the crates. The other crate can be folded and, for example, placed folded on top of the unfolded crate containing the stack of trays.

## Claims

1. A tray (20) for storing parts (22) with the aim of transporting them, this tray (20) comprising:
  - a plane wall (24) comprising an upper face (24a) and a lower face, the upper face (24a) being capable of supporting the parts (22) to be transported, and
  - positioning studs (26) attached to the wall (24) and projecting from said upper surface (24a) so as to block the parts (22) to be transported, **characterised in that** the studs (26) are independent of one another and attached independently to the upper face (24a) of the wall (24), at least some of the studs (26a) comprising a first portion (32a) made of rigid foam attached to the upper face (24a) and a second portion (32b) made of flexible foam capable of coming into contact with the parts (22) to be transported.
2. The tray (20) according to claim 1, wherein the first portion (32a) is XPE-based.

3. The tray (20) according to claim 1 or 2, wherein the first portion (32a) has:
  - a density greater than 110Kg/m<sup>3</sup>, and preferably greater than or equal to 120kg/m<sup>3</sup>, and/or
  - a Shore 00 hardness greater than 20, and preferably greater than 30, and/or
  - an elongation at break greater than 110%, for example between 110 and 140%.
4. The tray (20) according to one of the preceding claims, wherein the second portion (32b) is of the shape memory type.
5. The tray (20) according to one of the preceding claims, wherein the second portion (32b) is based on EPDM foam.
6. The tray (20) according to one of the preceding claims, wherein the second portion (32b) has:
  - a density less than or equal to 110kg/m<sup>3</sup>, and for example between 80 and 110kg/m<sup>3</sup>, and/or
  - a Shore 00 hardness of less than 20, preferably less than 13, and/or
  - an elongation at break greater than 150%, for example between 150 and 300%.
7. The tray (20) according to one of the preceding claims, wherein at least some of the studs (26) are covered at least in part with a textile film or a textile layer (36).
8. The tray (20) according to claim 7, wherein the film or layer (36) has a density of between 50 and 200 g/m<sup>2</sup> and preferably of the order of 100g/m<sup>2</sup>.
9. The tray (20) according to one of the preceding claims, wherein the studs (26) are attached to the wall (24) by gluing and/or by attaching screws (38) which pass through the wall (24) and are screwed into the studs (26).
10. The tray (20) according to one of the preceding claims, wherein several layers of parts (22) are stacked on each of the trays (20).
11. A crate (10) for transporting parts (22), the crate comprising a container wherein several trays (20) are superimposed in accordance with one of the preceding claims, these trays (20) having walls (24) of the same dimensions.
12. The crate (10) according to the preceding claim, wherein each tray (24), called the upper tray, which is superimposed on a tray, called the lower tray, rests on the tops of the studs (26) attached to this lower tray.
13. The crate (10) according to claim 11 or 12, wherein parts (22) to be transported are located on each of the trays (20) and blocked by the studs (26) of these trays (20).
14. The crate (10) according to claim 13, wherein several layers of parts (22) are stacked on each of the trays (20).
15. The crate (10) according to claim 13 or 14, wherein at least some parts (22) or layers are separated from each other, at least in part, by protective sheets or textiles (42).
16. The crate (10) according to claim 11, wherein it does not comprise parts to be transported and comprises a stack of trays for an empty return, the stack of trays comprising several pairs of trays stacked and housed in the crate, each pair of trays comprising two trays which have their upper faces (24a) facing each other and which have their studs (26) spaced apart from each other.
17. A use of a tray (20) according to one of claims 1 to 10 or of a crate (10) according to one of claims 11 to 16 for transporting sealing parts for vehicles, in particular motor vehicles.



**Fig. 1**

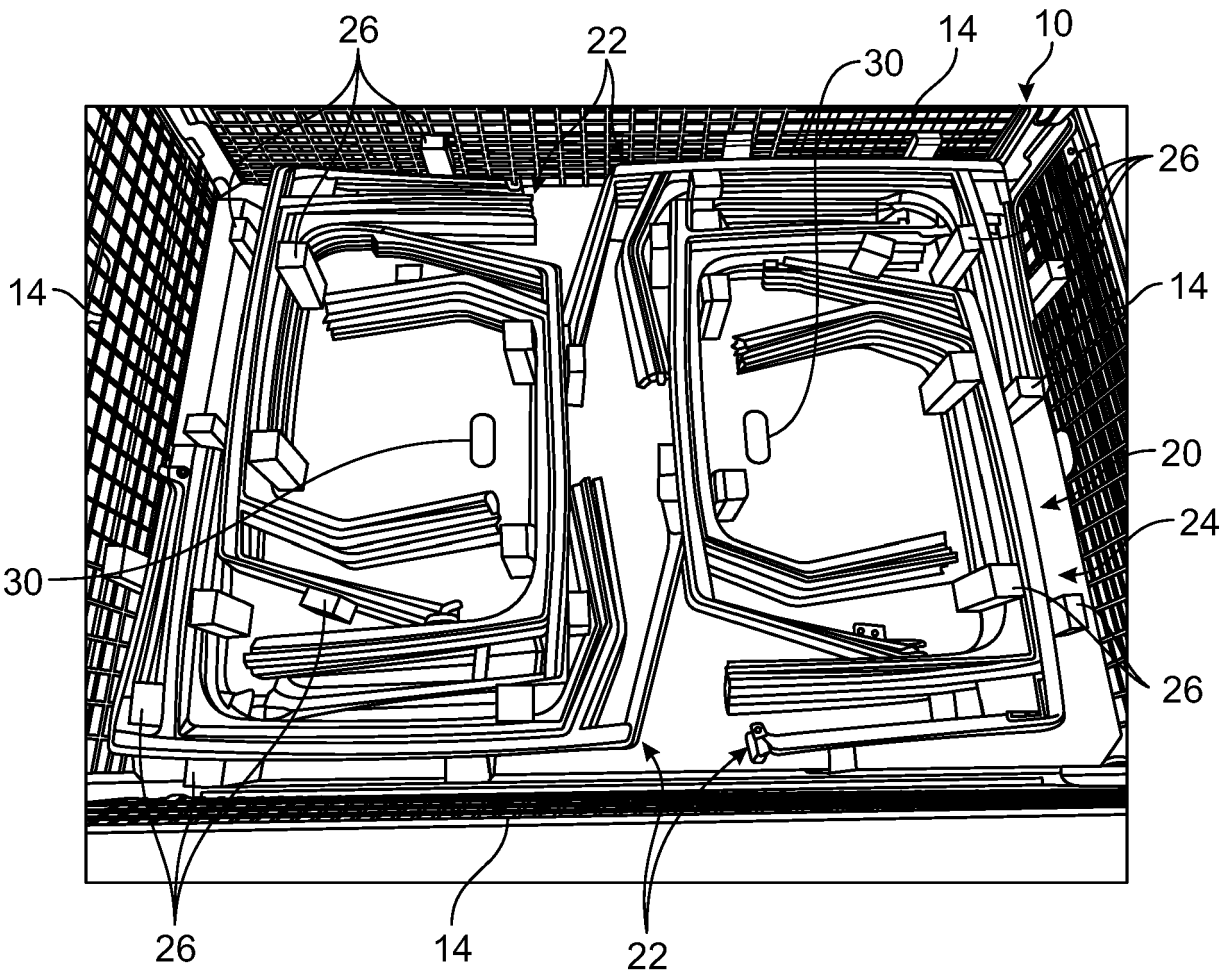
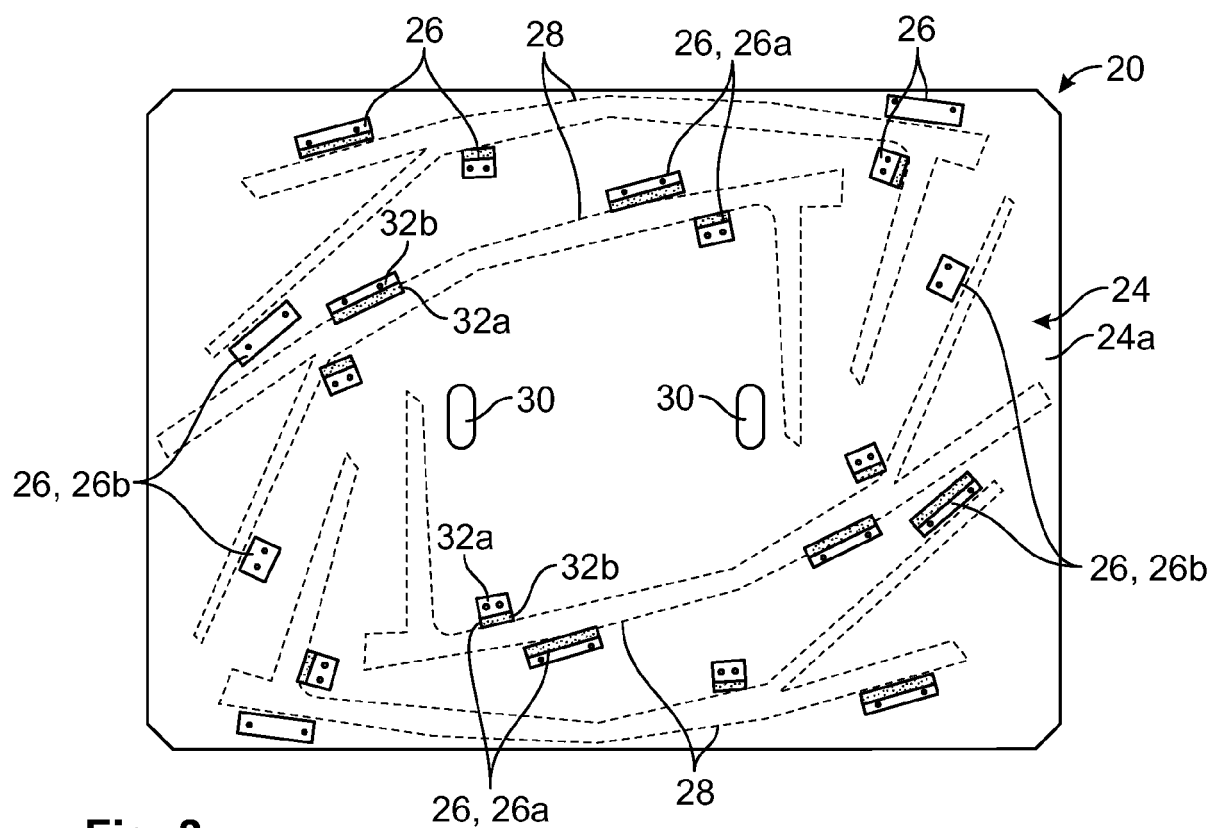
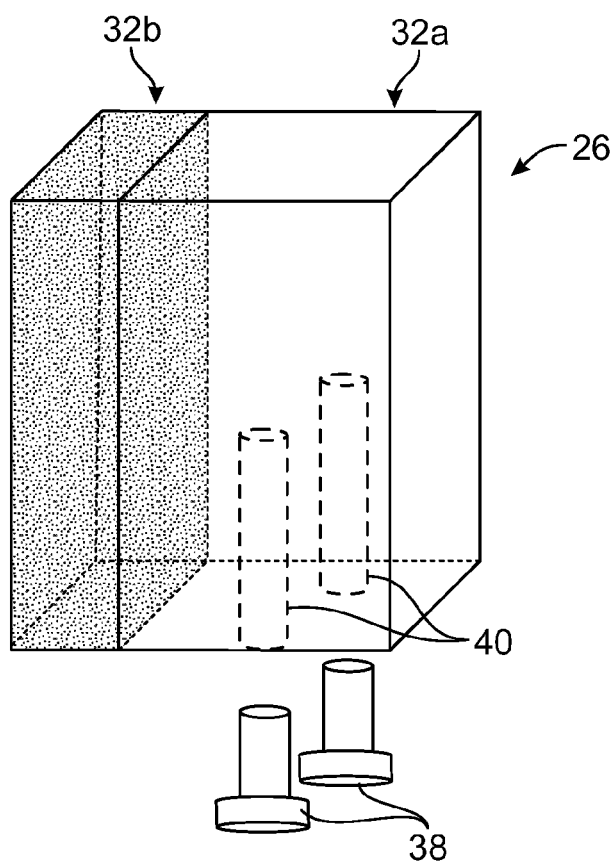


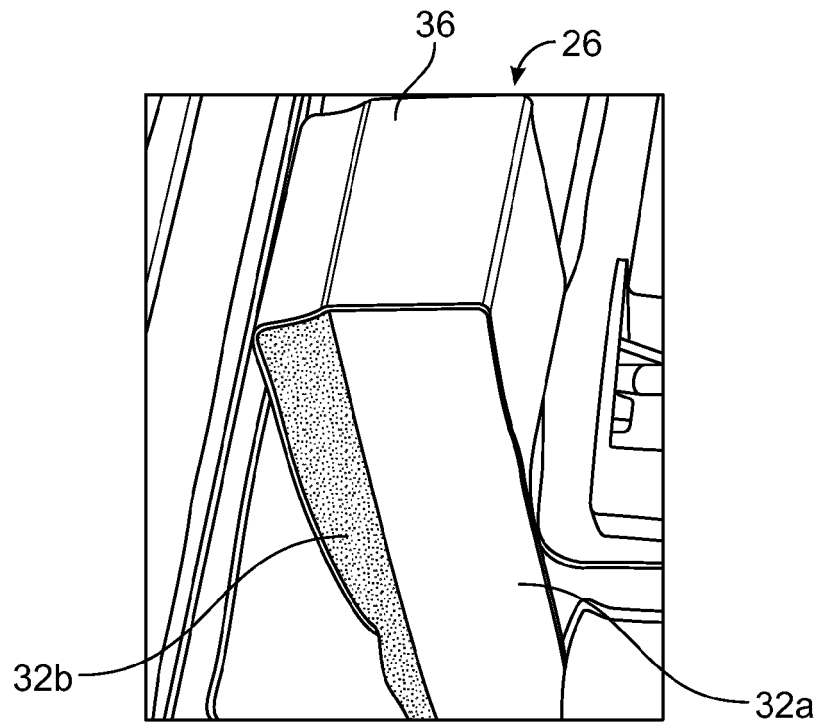
Fig. 2



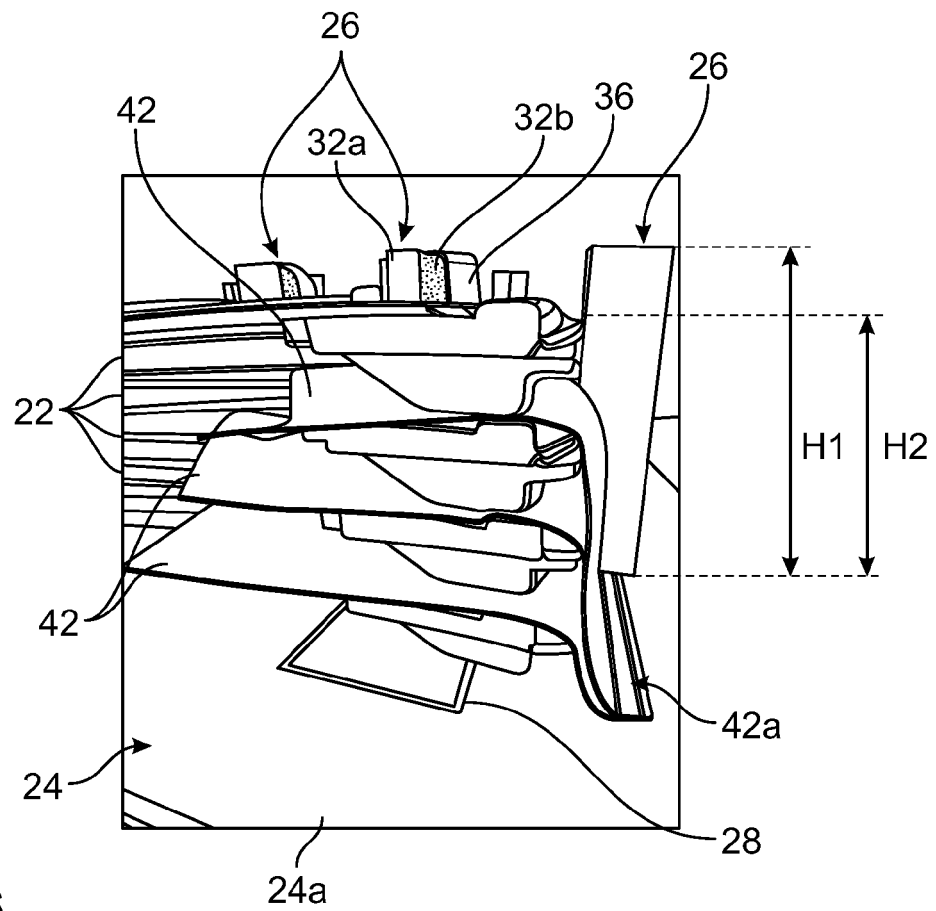
**Fig. 3**



**Fig. 4**



**Fig. 5**



**Fig. 6**



## EUROPEAN SEARCH REPORT

Application Number

EP 24 30 6894

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category                                                                         | Citation of document with indication, where appropriate, of relevant passages                                                                           | Relevant to claim                | CLASSIFICATION OF THE APPLICATION (IPC) |
|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------------|
| X                                                                                | US 2018/265249 A1 (GRUTT ADAM J [US])<br>20 September 2018 (2018-09-20)                                                                                 | 1-6,9,10                         | INV.<br>B65D19/06                       |
| Y                                                                                | * paragraph [0025] - paragraph [0037] *                                                                                                                 | 10-17                            | B65D19/10                               |
| A                                                                                | * figures 1-14 *                                                                                                                                        | 7,8                              | B65D19/18<br>B65D19/44<br>B65D25/10     |
| X                                                                                | DE 20 2005 008496 U1 (SCHMIDT ANDREAS [DE]) 28 July 2005 (2005-07-28)                                                                                   | 1,2,4-6,9                        |                                         |
| A                                                                                | * paragraph [0005] - paragraph [0007] *<br>* claim 3; figures 1-5 *                                                                                     | 7,8                              |                                         |
| Y                                                                                | WO 2020/165662 A1 (UPALE PRAVIN [IN];<br>MATHEW SHYNU [IN])<br>20 August 2020 (2020-08-20)<br>* page 7, line 21 - page 9, line 16 *<br>* figures 1-10 * | 11-17                            |                                         |
| Y                                                                                | DE 44 34 286 C1 (ELRINGKLINGER GMBH [DE])<br>21 March 1996 (1996-03-21)<br>* column 3, line 68 - column 7, line 23;<br>figures 1-4 *                    | 10,14,17                         |                                         |
|                                                                                  |                                                                                                                                                         |                                  | TECHNICAL FIELDS SEARCHED (IPC)         |
|                                                                                  |                                                                                                                                                         |                                  | B65D                                    |
| The present search report has been drawn up for all claims                       |                                                                                                                                                         |                                  |                                         |
| Place of search                                                                  |                                                                                                                                                         | Date of completion of the search | Examiner                                |
| Munich                                                                           |                                                                                                                                                         | 9 April 2025                     | Fitterer, Johann                        |
| CATEGORY OF CITED DOCUMENTS                                                      |                                                                                                                                                         |                                  |                                         |
| X : particularly relevant if taken alone                                         |                                                                                                                                                         |                                  |                                         |
| Y : particularly relevant if combined with another document of the same category |                                                                                                                                                         |                                  |                                         |
| A : technological background                                                     |                                                                                                                                                         |                                  |                                         |
| O : non-written disclosure                                                       |                                                                                                                                                         |                                  |                                         |
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# **ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO.**

EP 24 30 6894

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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09-04-2025

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| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|---------------------|----------------------------|---------------------|
| US 2018265249 A1                          | 20-09-2018          | NONE                       |                     |
| DE 202005008496 U1                        | 28-07-2005          | NONE                       |                     |
| WO 2020165662 A1                          | 20-08-2020          | NONE                       |                     |
| DE 4434286 C1                             | 21-03-1996          | DE 4434286 C1              | 21-03-1996          |
|                                           |                     | ES 1033168 U               | 01-08-1996          |
|                                           |                     | GB 2293367 A               | 27-03-1996          |

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82