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(71) Applicant: **Svensk Kärnbränslehantering AB**
**101 24 Stockholm (SE)**

(72) Inventors:
- **Laitinen, Heikki**
  **570 91 Kristdala (SE)**
- **Zetterberg, Tobias**
  **197 91 Bro (SE)**

(74) Representative: **Engdahl, Stefan**
**AWAPATENT AB**
**P.O. Box 45086**
**104 30 Stockholm (SE)**

(54) **Pallet for transportation of goods**

(57) A pallet (100), arranged for transportation of goods, comprising a carrier plate (110), arranged to carry the goods, and further comprising a base frame (120), upon which the carrier plate is arranged. The pallet further comprises at least one dampening element (130) arranged between the carrier plate and the base frame, wherein the at least one dampening element is arranged to dampen vibrations of the goods. The pallet further comprises a surface plate (140) arranged on the carrier plate, wherein the surface plate comprises a resilient material for providing a resilience for the goods carried on the carrier plate in a direction parallel to the normal of the carrier plate. Furthermore, the surface plate provides a friction for the goods carried on the carrier plate in a direction in a plane of the carrier plate.

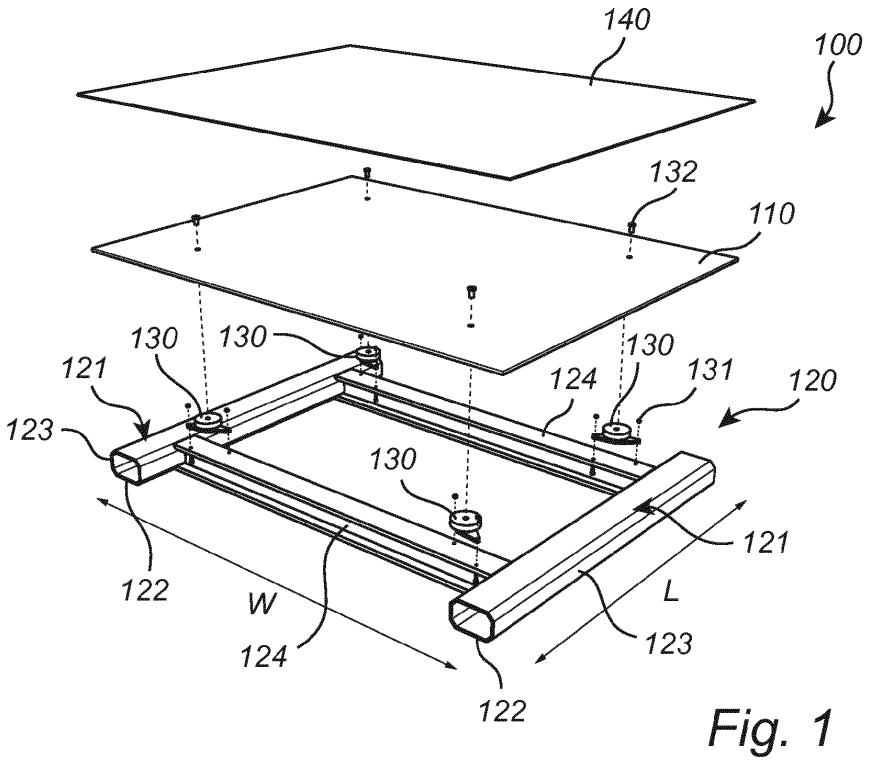


Fig. 1

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## Description

### FIELD OF THE INVENTION

**[0001]** The present invention relates to a pallet and, in particular, to a pallet suitable for transportation of goods which are heavy and/or sensitive to shocks and/or vibrations.

### BACKGROUND OF THE INVENTION

**[0002]** As a result of the ever-increasing production of products in today's society, as well as an increased domestic and international trade, the demands on goods transportation has rapidly increased in terms of quantity and quality.

**[0003]** Pallets are commonly used for the purpose of transportation of goods, objects and/or loads. The pallets may be used in any kind of storage facility e.g. warehouses, stocks, or the like, and may be arranged both for a reliable holding of the goods as well as providing an improved transportation within, into and/or out of the facility, e.g. by means of forklift trucks or any other kind of transportation vehicle or system.

**[0004]** One of the most frequently occurring pallet constructions are made of wood, wherein the wood pallets are typically constructed from wood boards which are assembled by fastening elements such as nails or staples. Alternatively, pallets having this structure have also been made from plastics material. However, these rather crude pallet constructions are not able to provide a satisfactory support for an arrangement and/or transportation of goods which are heavy and/or susceptible to shocks, impacts and/or vibrations.

**[0005]** In DE 20 2008 005 847 U1, a pallet is disclosed comprising a base plate and a carrier plate which is arranged on top of the base plate. The base plate and the carrier plate are connected by first rubber elements which are arranged to dampen shear loads, and second rubber elements which are arranged to dampen vertical vibrations.

**[0006]** However, the disclosed pallet does not provide a satisfactory support for an arrangement and/or transportation of heavy and/or shock, impact and/or vibration sensitive goods, and especially not for transportations of extremely heavy and/or sensitive goods.

### SUMMARY OF THE INVENTION

**[0007]** It is an object of the present invention to provide a pallet which achieves an improved support of heavy and/or shock, impact and/or vibration sensitive goods during arrangement and/or transportation of goods on the pallet.

**[0008]** This and other objects are achieved by providing a pallet having the features in the independent claim. Preferred embodiments are defined in the dependent claims.

**[0009]** Hence, according to the present invention, there is provided a pallet, arranged for transportation of goods. The pallet comprises a carrier plate, arranged to carry the goods, and further comprises a base frame, upon which the carrier plate is arranged. The pallet further comprises at least one dampening element arranged between the carrier plate and the base frame, wherein the at least one dampening element is arranged to dampen vibrations of the goods. The pallet further comprises a surface plate arranged on the carrier plate, wherein the surface plate comprises a resilient material for providing a resilience for the goods carried on the carrier plate in a direction parallel to the normal of the carrier plate. Furthermore, the surface plate provides a friction for the goods carried on the carrier plate in a direction in a plane of the carrier plate.

**[0010]** The present invention is advantageous in that the surface plate of the pallet provides an improved support of the goods during arrangement and/or transportation of the goods on the pallet compared to pallets in the prior art. The resilient material of the surface plate implies a soft and gentle arrangement (placement) of the goods on the pallet, as well as a soft and lenient transportation of the goods on the pallet, such that the pallet of the present invention thereby avoids an occurrence of damage on the goods. Several pallets in the prior art are prone to such damage, and in particular pallets wherein goods are arranged and/or transported on a hard surface. In contrast, the surface plate of the pallet of the present invention avoids or mitigates damages and/or fractures on the goods.

**[0011]** Furthermore, the resilient material of the surface plate is advantageous in that it, due to its spring-like properties, provides a shock, impact and/or vibration absorption for the goods, such that the arrangement and/or transportation of the goods on the pallet becomes even further improved.

**[0012]** The present invention is further advantageous in that the resilient material of the surface plate provides a surface with a relatively high friction, which implies a safe arrangement and/or transportation of the goods on the pallet in case of a tilting of the pallet and/or an erratic transportation (e.g. fast/sudden accelerations or decelerations) of the pallet. The surface plate thereby provides the further advantage that the goods may not need to be secured to the pallet, which simplifies the arrangement of the goods on the pallet.

**[0013]** Furthermore, by the arrangement of the surface plate on the carrier plate of the pallet, the present invention is advantageous in that the surface plate material may easily be adapted to the goods to be transported, e.g. (extremely) heavy and/or (extremely) sensitive goods. In contrast, this is not easily achievable by arrangements in the prior art, as dampening elements in these arrangements are often not readily accessible, nor exchangeable.

**[0014]** The pallet of the present invention provides a dampening of the goods by the at least one dampening

element, and the resilience and friction of the pallet is provided by the surface plate upon which the goods are arranged and/or transported. This separation of mechanical properties between the dampening element and the surface plate of the pallet provides the further advantage that the pallet may be adapted to the characteristics of the goods to be transported, e.g. goods being (extremely) heavy, less heavy, (extremely) sensitive, less sensitive, etc.

**[0015]** The pallet of the present invention is arranged for a transportation of goods. By "goods", it is here meant freight, articles, products, items, etc., wherein the goods may further be heavy and/or shock, impact and/or vibration sensitive goods. More specifically, the goods may comprise bentonite with the purpose of serving as a buffer material for protecting capsules in which used nuclear fuel is stored.

**[0016]** The pallet comprises a carrier plate, arranged to carry the goods, and further comprises a base frame, upon which the carrier plate is arranged. By "carrier plate", it is here meant a flat plate, slab, sheet, or the like, and the carrier plate is arranged on (fastened to, attached to) the base frame. By "base frame", it is here meant a frame, framework, construction, support, or the like.

**[0017]** The pallet comprises at least one dampening element arranged between the carrier plate and the base frame, wherein the at least one dampening element is arranged to dampen vibrations of the goods. By "dampening element", it is here meant virtually any element, member, unit, and/or device arranged to dampen vibrations (oscillations) of the goods.

**[0018]** The pallet comprises a surface plate arranged on the carrier plate, wherein the surface plate comprises a resilient material. By "surface plate", it is here meant a flat plate, slab, sheet, cover, coating, layer, or the like, and by "resilient material", it is here meant virtually any material which comprises resilient (springing, elastic) properties.

**[0019]** The resilient material of the surface plate provides a resilience for the goods carried on the carrier plate in a direction parallel to the normal of the carrier plate, i.e. parallel to the normal force of the carrier plate on the goods arranged on the pallet and parallel to the gravity force on the goods, when the pallet is evenly arranged or transported.

**[0020]** The surface plate provides a friction for the goods carried on the carrier plate in a direction in a plane of the carrier plate. In other words, the friction of the surface plate ensures that the goods carried on the carrier plate do not slide, glide and/or slip in case of a tilting of the pallet and/or an erratic (bumpy, jerky) transportation of the pallet.

**[0021]** According to an embodiment of the present invention, the surface plate may be impermeable. In other words, the surface plate, arranged on the carrier plate of the pallet, provides a protective sealing of the carrier plate. The present embodiment is advantageous in that the surface plate protects the carrier plate from any kind of fluid, e.g. water, which fluid could result in a damage (e.g. rusting) of the carrier plate. Hence, the present embodiment improves e.g. the corrosion resistance of the pallet.

**[0022]** According to an embodiment of the present invention, the surface plate may be arranged to cover the surface of the carrier plate. As the surface plate is arranged to cover the (entire) surface of the carrier plate, it is ensured that goods arranged on the pallet always come in contact with the resilient surface plate, and not in direct contact with the carrier plate. The present embodiment is advantageous in that the surface plate of the pallet to an even further extent ensures a soft and lenient arrangement and/or transportation of goods on the pallet. The present embodiment is further advantageous in that the (impermeable) surface plate which covers the (entire) surface of the carrier plate even further improves the protection of the carrier plate.

**[0023]** According to an embodiment of the present invention, the surface plate may be fastened to the carrier plate by means of an adhesive. By "adhesive", it is here meant virtually any material arranged to adhere or bond the surface plate and the carrier plate together. The present embodiment is advantageous in that the adhesive provides an easy fastening of the surface plate to the carrier plate of the pallet. The present embodiment is further advantageous in that any mechanical attachment means for fastening the surface plate to the carrier plate may be refrained from, which leads to an even easier arrangement of the surface plate on the carrier plate.

**[0024]** According to an embodiment of the present invention, the surface plate may be removably arranged on the carrier plate. The present embodiment is advantageous in that a first surface plate of a pallet may be replaced by a second surface plate which is even more adapted to the properties of the goods which are to be arranged and/or transported on the pallet. For example, a first surface plate having properties adapted for a first kind of goods (e.g. goods with a specific weight, shape, demand on friction, shock, impact and/or vibration sensitivity etc.) may be replaced by a second surface plate adapted for a second kind of goods having different properties and/or demands than the first kind of goods.

**[0025]** According to an embodiment of the present invention, the resilient material may comprise an elastomer selected from the group consisting of natural rubber, synthetic rubber, neoprene, and any mixtures thereof. The present embodiment is advantageous in that the proposed elastomers of the surface plate have elastic properties which are particularly suitable for the purpose of a soft and lenient arrangement and/or transportation of heavy and/or shock, impact and/or vibration sensitive goods on the pallet. The present embodiment is further advantageous in that the proposed elastomers are readily available and/or relatively inexpensive, which is of benefit for an easier and/or cost-advantageous manufacture of the pallet.

**[0026]** According to an embodiment of the present in-

vention, the at least one dampening element may be removably arranged between the carrier plate and the base frame. The present embodiment is advantageous in that first dampening elements of a pallet may be replaced by second dampening elements which are even more adapted to the properties of the goods which are to be arranged and/or transported on the pallet, thereby even further improving the arrangement and/or transport of the goods on the pallet. For example, first dampening elements having properties adapted for a first kind of goods (e.g. goods with a specific weight and/or having specific demands on impact absorption and/or dampening, etc.) may be replaced by second dampening elements adapted for a second kind of goods having different properties and/or demands than the first kind of goods.

**[0027]** According to an embodiment of the present invention, the base frame may comprise at least two bars arranged in parallel, wherein each of the bars is hollow to define a fork tunnel arranged to receive a corresponding fork of a transportation means. Hence, the hollow bars act as female members for receiving the corresponding forks of a transportation means such as a fork truck, fork lift, or equivalent, wherein the hollow bars (fork tunnels) are arranged to tightly enclose the corresponding forks. The present embodiment is advantageous in that the bars of the pallet provides an easy insertion of a fork arrangement into the pallet, transportation of the pallet by the transportation means, and/or removal of the fork arrangement from the pallet. The present embodiment is further advantageous in that the hollow bars, arranged to tightly enclose the corresponding forks, provides an extremely stable, robust and secure transportation of the pallet by a transportation means, and the pallet of the present embodiment is thereby highly advantageous for goods which are (extremely) heavy and/or (extremely) shock, impact and/or vibration sensitive.

**[0028]** According to an embodiment of the present invention, the bars may be arranged on opposite sides of the base frame to define the width of the base frame. In other words, the hollow bars which define fork tunnels of the pallet, constitute the outmost portions of the width of the base frame. The present embodiment is advantageous in that this arrangement of the bars provide a large width of the pallet in relation to the width between the hollow bars (fork tunnels), which results in a even more stable, robust and secure transportation of the pallet.

**[0029]** According to an embodiment of the present invention, the bars may have a rectangular cross-section. The present embodiment is advantageous in that this design of the (hollow) bars may thereby be even more adapted to tightly enclose the corresponding (rectangular) forks of a transportation means for transportation of the pallet.

**[0030]** According to an embodiment of the present invention, the undersides of the bars are flat and arranged to constitute a rest surface or a first rolling surface of the pallet. By "rest surface", it is here meant a support surface or the like, i.e. a surface on which the pallet is put at rest on an underlying surface, e.g. a floor, a surface on a transportation means, or a shelf. By "rolling surface", it is here meant a surface on which one or more rolling means are arranged to roll upon, e.g. to transport the pallet on a transportation system, conveyor belt, or the like. The present embodiment is advantageous in that the flat undersides of the bars provide a even more stable and robust construction for the pallet when at rest and/or that the flat undersides of the bars provide flat rolling surfaces on which rolling means may transport (convey) the pallet in a convenient and smooth manner.

**[0031]** According to an embodiment of the present invention, the outermost sides of the bars are flat and arranged to constitute a second rolling surface of the pallet. The present embodiment is advantageous in that the outermost sides of the bars, i.e. the vertical sides of the bars, provide flat rolling surfaces on which rolling means may transport (convey) the pallet in a convenient and smooth manner. The present embodiment is further advantageous in that the flat, outermost sides of the bars provide rolling surfaces upon which rolling means of a transportation system may transport the pallet evenly, smoothly and/or with a very high precision.

**[0032]** According to an embodiment of the present invention, the carrier plate and the base frame may comprise metal. The present embodiment is advantageous in that a carrier and base plate of metal provides a pallet which is strong, rigid, and highly suitable for an arrangement and/or transportation of goods which are (extremely) heavy and/or susceptible to shocks, impacts and/or vibrations.

**[0033]** According to an embodiment of the present invention, the thickness of the carrier plate is 10-14 mm, such as 12 mm. The present embodiment is advantageous in that the carrier plate is thereby sufficiently thick for providing a strong and robust pallet for the arrangement and/or transportation of goods which are (extremely) heavy, yet sufficiently thin for providing a relatively light pallet.

**[0034]** According to an embodiment of the present invention, the pallet is square with a width and length of 1700-1800 mm, such as 1750 mm, and wherein the height of the pallet is 160-180 mm, such as 170 mm. The square pallet of the present embodiment is advantageous in that it facilitates any rotation of the pallet during manufacture and/or transportation of the pallet. The present embodiment is further advantageous in that the pallet is even more suitable for the arrangement and/or transportation of goods which have a circular underside (e.g. buffer rings), as the square pallet thereby yields a relatively small area which remains unused. The present embodiment is further advantageous in that the relatively low pallet may be efficiently placed/stored and/or piled in a storage facility.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0035]** These and other aspects of the present invention will now be described in more detail, with reference to the appended drawings showing embodiment(s) of the invention.

Fig. 1 is an exploded view of a pallet according to an embodiment of the present invention; and
Fig. 2 is a pallet according to an embodiment of the present invention.

## DETAILED DESCRIPTION OF THE EMBODIMENTS

**[0036]** In the following description, the present invention is described with reference to a pallet arranged for transportation of goods.

**[0037]** Fig. 1 is an exploded view of a pallet 100. The pallet 100 comprises a carrier plate 110 which is arranged to carry the goods. Here, the carrier plate 110 is shown as a flat plate (slab, sheet) of rectangular shape, but it will be appreciated that the carrier plate 110 may alternatively have any other shape, e.g. a square or round shape. The thickness of the carrier plate 110 may be 10-14 mm, such as 12 mm, for the purpose of carrying (extremely) heavy goods. Compared to a plate with stiffeners, it is preferred that the carrier plate 110 is made somewhat thicker, but without stiffeners, such that costs are reduced in the manufacture of the pallet 100. Furthermore, the carrier plate 110 of the present invention is preferred compared to a plate wherein stiffeners are adjusted in length and welded to the plate, as this runs the risk of damaging the plate due to the influence of heat. The carrier plate 110 may be provided with fastening means (not shown) for fastening the goods to the carrier plate 110.

**[0038]** The pallet 100 further comprises a base frame 120, upon which the carrier plate 110 is arranged. The base frame 120 comprises two hollow bars 121 arranged in parallel and extending along the length L of the base frame 120. The bars 121 are arranged on opposite sides of the base frame 120 to define the width W of the base frame 120. Each of the bars 121 is hollow to define a respective fork tunnel arranged to receive a corresponding fork of a transportation means for a transportation of the pallet 100. The hollow bars 121 have a rectangular cross-section when viewed along the length L of the base frame 120, whereby the flat undersides 122 of the bars 121 are arranged to constitute a rest surface or a first rolling surface (for transportation purposes) of the pallet 100, and the flat outermost (vertical) sides 123 of the bars 121 are arranged to constitute a second rolling surface of the pallet 100. The base frame 120 further comprises two cross bars 124 arranged in parallel and extending along the width W of the base frame 120. Hence, the cross bars 124 extend orthogonally from the bars 121. The cross bars 124 extend from portions of the bars 121 approximately between the center of the bars 121 and the end portions of the bars 121. The base frame 120, comprising (hollow) bars 121 and cross bars 124, thereby provides a strong and robust, yet relatively light, pallet 100 which is particularly suitable for (extremely) heavy and/or shock, impact and/or vibration sensitive goods. To even further simplify and reduce costs in the manufacture of the pallet 100, the bars 121 and/or the cross bars 124 may be produced from standard profiles, e.g. profiles of hot formed rectangular cross section (HFRHS) and/or HEA (DIN 1025-3, Euronorm 53-62). For a pallet 100 arranged to be lifted in an elevator arrangement, FEM-calculations have shown that HFRHS 180x100x10 and HEB-100 are suitable profiles for the base frame 120 of the pallet 100.

**[0039]** The pallet 100 further comprises four dampening elements 130 arranged between the carrier plate 110 and the base frame 120. The dampening elements 130, which are arranged to dampen vibrations of the goods, are shown in Fig. 1 as rubber dampers, but may alternatively be virtually any kind of dampening elements for dampening vibrations/oscillations of the goods during transportation. The dampening elements 130 are fastened by screws 131 on the cross bars 124 of the base frame 120, and are further fastened to the carrier plate 110 by screws 132. It will be appreciated that the dampening elements 130 are removably arranged. The positioning of the dampening elements 130 on the cross bars 124, which is relatively close to the end portions of the respective cross bar 124, was optimized by FEM-calculations for the goods in Table 1. It will be appreciated that the number of dampening elements 130 may vary, although at least four dampening elements 130 are preferred for a satisfactory function of the pallet 110. Each dampening element 130 is designed for a goods weight/load of approximately 2200 kg / 4 dampers=550 kg/damper, and the standard damper RA 800

**[0040]** (DMS 144) may be used for this purpose, which even further reduces the manufacture costs for the pallet 100. Depending on the weight of the goods, the mentioned damper may e.g. be chosen as a hard damper (60 shore) or as a softer damper (40 shore), and the dampening elements 130 may be interchanged by the removable arrangement as described of the dampening elements 130.

**[0041]** The pallet 100 further comprises a surface plate 140 arranged on the carrier plate 110. The surface plate 140 comprises a resilient material for providing a resilience for the goods carried on the carrier plate 110 in a direction parallel to the normal of the carrier plate 110. Further, the surface plate 140 provides a friction for the goods carried on the carrier plate 110 in a direction in a plane of the carrier plate 110. Due to its spring-like properties, the surface plate 140 provides a shock, impact and/or vibration absorption for the goods, improving the arrangement and/or transportation of the goods on the pallet 100 compared to pallets in the prior art. Further, the surface plate 140 achieves a relatively high friction due to the yielding of the resilient material due to the

weight of the goods (i.e. the friction of the surface plate 140 increases as the goods sinks into the resilient material). Furthermore, the friction of the surface plate 140 may be even further increased by a friction-enhancing topology such as knobs or the like (not shown) arranged on the surface plate 140. A surface plate 140 with a high friction may render any further security/fastening measurements unnecessary, e.g. fastening arrangements of the carrier plate 110. Hence, any flange, edge or the like of the carrier plate 110 for fastening purposes, which may be obstructive for an operator and/or robot for handling the goods on the pallet 100, may be refrained from. However, it will be appreciated that any security/fastening means of the pallet 100 may nevertheless be provided if an additional fastening of the goods on the pallet 100 is considered necessary. The edges of the carrier plate 110 may further be used for an arrangement of a vapor barrier. The surface plate 140 in Fig. 1 covers the entire surface of the carrier plate 110, and may further be impermeable to protect the carrier plate 110. The surface plate 140 is fastened to the carrier plate 110 by means of an adhesive. The thickness of the surface plate may be 5-10 mm.

**[0042]** Fig. 2 is a pallet 100 according to an embodiment of the present invention. Here, the pallet is square with a width and length of 1750 mm and a height of 170 mm. The pallet 100 is provided for the arrangement and/or transportation of (extremely) heavy and/or shock, impact and/or vibration sensitive goods, and the properties of the pallet 100 as described provides an improved pallet in terms of e.g. dampening, friction and robustness for the goods compared to pallets in the prior art. The pallet 100 is furthermore easily handled by any transportation means, such as trucks, elevator means and/or replenishing and buffer equipment.

**[0043]** In Fig. 2, a buffer ring 200 is arranged on the pallet 100 as an example of arrangement and/or transportation of goods on the pallet 100. Further examples of goods which the pallet 100 is arranged to hold and/or transport are provided in Table 1.

TABLE 1

| | |
|---|---|
| Buffer ring | |
| Diameter: | 1630 mm |
| Inner diameter: | 1070 mm |
| Height: | 806 mm |
| Weight: | ca 2000 kg |
| | |
| Buffer block | |
| Diameter: | 1630 mm |
| Inner diameter: | 500 mm |
| Weight: | ca 2200 kg |

(continued)

| | |
|---|---|
| Replenshing block | |
| Length: | 571 mm |
| Width: | 500 mm |
| Height: | 400 mm |
| Weight: | 230 kg / each |
| | |
| Bentonite pellets | |
| Bulk density: | ca 1600 kg/m$^3$ |

**[0044]** The goods in Table 1 comprise bentonite (bentonite clay), wherein the purpose of the goods is to serve as a buffer material for protecting capsules in which used nuclear fuel is stored. The capsules, which may comprise copper and an insert of cast iron, may be arranged in an ultimate storage site (e.g. in primary rock), and the bentonite goods may be arranged around the capsules to protect the capsules from movements/vibrations in the primary rock. Hence, it is highly important that the transportation of the heavy bentonite goods is conducted cautiously, and that shocks, impacts and/or vibrations of the goods during transportation is avoided, or at least mitigated. The pallet 100 of the present invention is particularly suitable for the arrangement and/or transportation of (extremely) heavy and/or shock, impact and/or vibration sensitive goods, such as the bentonite goods described, and the pallet 100 thereby provides a safe and reliable arrangement/transport of the goods.

**[0045]** The weight of the buffer rings and buffer blocks are 2000 and 2200 kg, respectively, and these cannot be adjusted in weight. The replenishing blocks weigh 230 kg each, and it is suitable that 9 replenishing blocks constitute one transportation unit (230x9=2070 kg), e.g. by arranging the replenishing blocks 3x3 on the pallet 100. A square pallet 100 of 1750x1750 mm is particularly suitable for this symmetric arrangement of 3x3 blocks. Furthermore, the exemplified pallet 100 is particularly suitable for the arrangement of buffer rings/blocks in that a margin of approximately 50 mm is provided around the buffer rings/blocks when arranged on the pallet 100.

**[0046]** It is suggested that the bentonite pellets are arranged in a container which is placed on or attached to the pallet 100, which leads to an equivalent transportation of the pallet 100 when transporting bentonite pellets as any other goods. This is advantageous as the same pallet 100 construction may be used, and that the container may be provided separately.

**[0047]** Even though the invention has been described with reference to specific exemplifying embodiments thereof, many different alterations, modifications and the like will become apparent to those skilled in the art. After studying this description, the described embodiments are therefore not intended to limit the scope of the invention, which is only defined by the appended claims. For example, the number of dampening elements 130 may be different from that shown in Fig. 1, and may further be

arranged at different positions than those disclosed in the figure. Furthermore, the number and/or arrangement of the bars 121 and the cross bars 124 may be different from that disclosed. For example, there cross bars 124 may be arranged at the end of the bars 121, such that the base plate 120 becomes rectangular (i.e. the length L of the pallet is defined by the cross bars 124). Furthermore, it will be appreciated that the size and/or shape of the pallet 100 may be different from that shown in Figs. 1 and 2.

**Claims**

**1.** A pallet (100), arranged for transportation of goods, comprising:

a carrier plate (110), arranged to carry the goods,
a base frame (120), upon which said carrier plate is arranged,
at least one dampening element (130) arranged between said carrier plate and said base frame, said at least one dampening element being arranged to dampen vibrations of the goods, and
a surface plate (140) arranged on said carrier plate, wherein said surface plate comprises a resilient material for providing a resilience for the goods carried on said carrier plate in a direction parallel to the normal of said carrier plate, and for providing a friction for the goods carried on said carrier plate in a direction in a plane of said carrier plate.

**2.** The pallet as claimed in claim 1, wherein said surface plate is impermeable.

**3.** The pallet as claimed in claim 1 or 2, wherein said surface plate is arranged to cover the surface of said carrier plate.

**4.** The pallet as claimed in any one of the preceding claims, wherein said surface plate is fastened to said carrier plate by means of an adhesive.

**5.** The pallet as claimed in any one of claims 1-3, wherein said surface plate is removably arranged on said carrier plate.

**6.** The pallet as claimed in any one of the preceding claims, wherein said resilient material comprises an elastomer selected from the group consisting of natural rubber, synthetic rubber, neoprene, and any mixtures thereof.

**7.** The pallet as claimed in any one of the preceding claims, wherein said at least one dampening element is removably arranged between said carrier plate and said base frame.

**8.** The pallet as claimed in any one of the preceding claims, wherein said base frame comprises at least two bars (121) arranged in parallel, wherein each of said bars is hollow to define a fork tunnel arranged to receive a corresponding fork of a transportation means.

**9.** The pallet as claimed in claim 8, wherein said bars are arranged on opposite sides of said base frame to define the width of said base frame.

**10.** The pallet as claimed in claim 8 or 9, wherein said bars have a rectangular cross-section.

**11.** The pallet as claimed in claim 10, wherein the undersides (122) of said bars are flat and arranged to constitute a rest surface or a first rolling surface of said pallet.

**12.** The pallet as claimed in claim 10, wherein the outermost sides (123) of said bars are flat and arranged to constitute a second rolling surface of said pallet.

**13.** The pallet as claimed in any one of the preceding claims, wherein said carrier plate and said base frame comprises metal.

**14.** The pallet as claimed in any one of the preceding claims, wherein the thickness of said carrier plate is 10-14 mm, such as 12 mm.

**15.** The pallet as claimed in any one of the preceding claims, wherein the pallet is square with a width and length of 1700-1800 mm, such as 1750 mm, and wherein the height of said pallet is 160-180 mm, such as 170 mm.

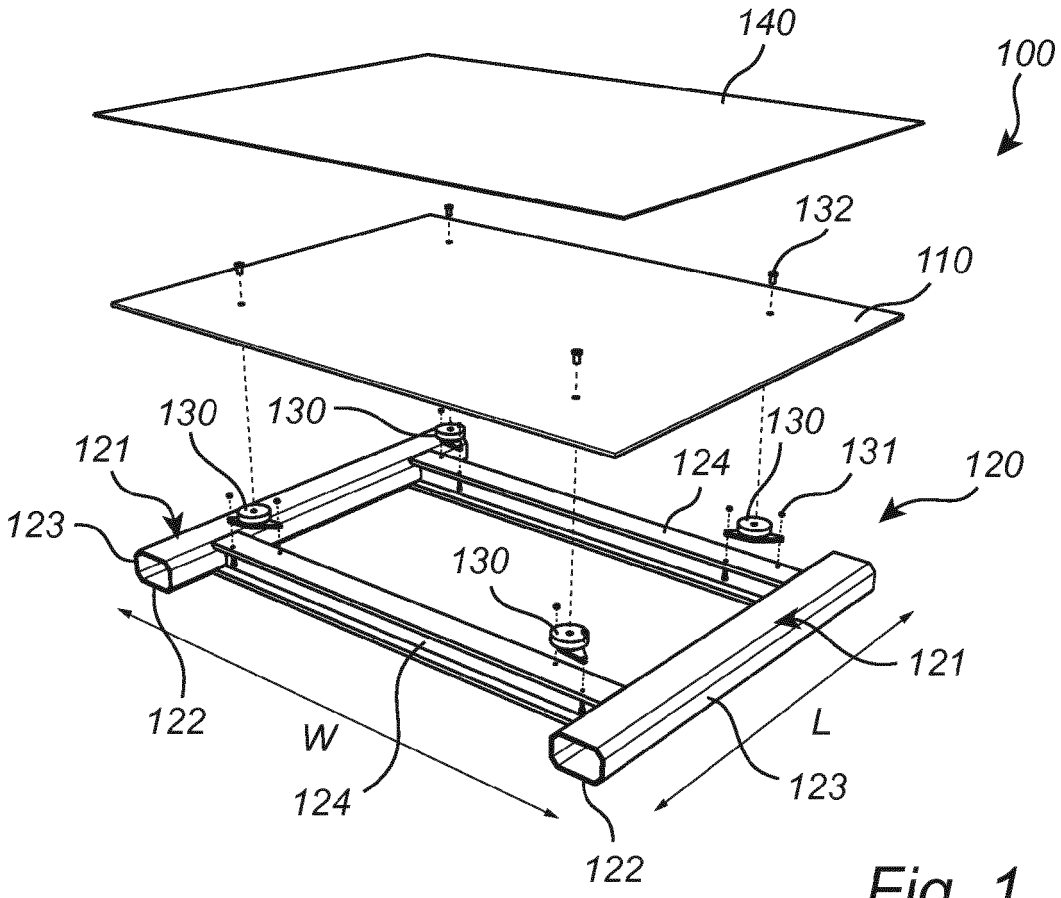
140
100
132
110
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Fig. 1

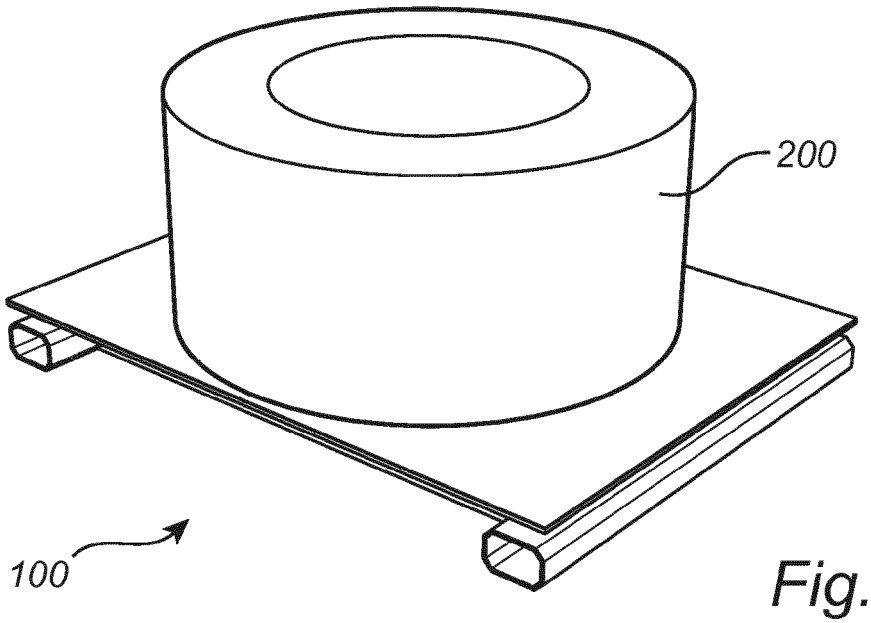
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Fig. 2

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# EUROPEAN SEARCH REPORT

Application Number
EP 12 18 3498

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
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| Munich | 15 January 2013 | Fitterer, Johann |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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D : document cited in the application
L : document cited for other reasons

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## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 18 3498

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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