(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 875 394 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
08.09.2021 Bulletin 2021/36

(51) Int Cl.:
B65D 71/00 *(2006.01)*

(21) Application number: **21157889.3**

(22) Date of filing: **18.02.2021**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **03.03.2020 DK PA202070141**

(71) Applicant: **VKR Holding A/S**
2970 Hørsholm (DK)

(72) Inventors:
- **KAPER, Günther**
  2970 Hørsholm (DK)
- **ANDERSEN, Erik**
  2970 Hørsholm (DK)

(74) Representative: **AWA Denmark A/S**
Strandgade 56
1401 Copenhagen K (DK)

(54) A CARGO CARRIER ELEMENT, A METHOD OF STACKING A NUMBER OF PACKAGES, AND A STACK OF PACKAGES

(57) A cargo carrier element (1) comprising an angular profile strip (2) with a horizontal part (3) and vertical part (4), the angular profile strip having a length in a longitudinal direction (5), the horizontal part (3) and the vertical part (4) together defining a concave side (6) and convex side (7) of the angular profile strip (2), at least two protrusions (8) provided on the horizontal part (3) at the convex side (7) thereof, the protrusions (8) extending to respective ends (9) at a distance from a surface of the horizontal part (3). The angular profile strip (2) comprises fibreboard material, the protrusions (8) comprise a second fibrous material based on plant fibres, and a slat (10) comprising plywood or a wooden board is fixed to the ends (9) of the protrusions (8) to extend in parallel to the horizontal part (3).

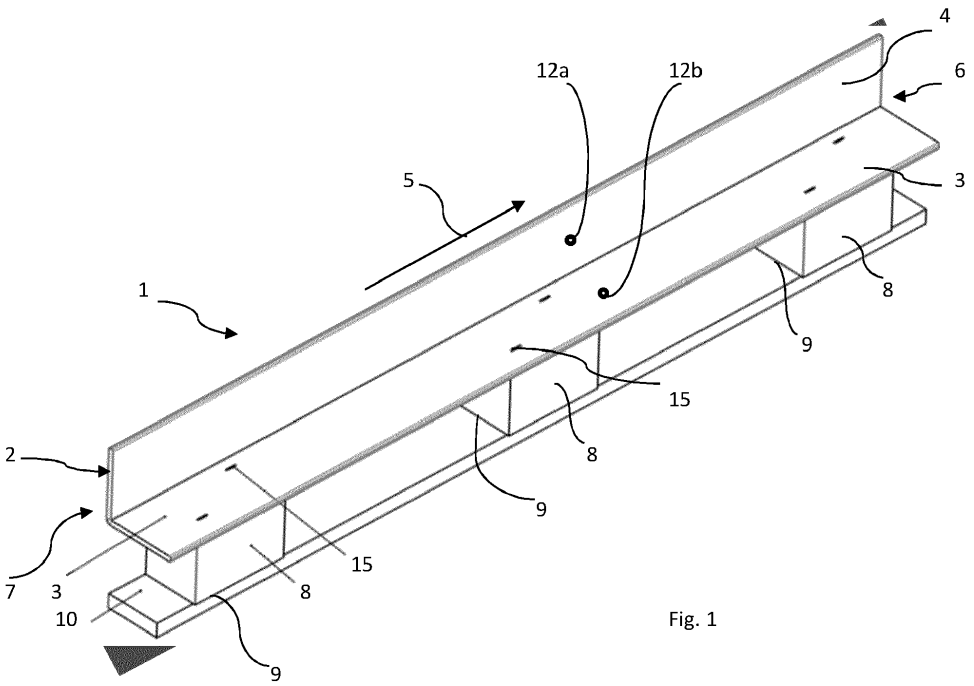

Fig. 1

EP 3 875 394 A1

Description

[0001] The present invention relates to a cargo carrier element comprising an angular profile strip with a horizontal part and vertical part, the angular profile strip having a length in a longitudinal direction, the horizontal part and the vertical part together defining a concave side and convex side of the angular profile strip, at least two protrusions provided on the horizontal part at the convex side thereof, the protrusions extending to respective ends at a distance from a surface of the horizontal part.

[0002] The invention further relates to a set of cargo carrier elements; a method of stacking a number of packages for transport and/or storage; and a stack of packages.

[0003] WO 02/38471 A2 discloses a cargo carrier element of the above art. This known cargo carrier element is e.g. made of polypropylene and the protrusions are pressed hollow projections.

[0004] GB 999 546 A discloses another cargo carrier element comprising a single, plane wooden lath carrying on one side a number of rounds in the form of rough timber elements attached to the lath by nails.

[0005] GB 930 263 discloses skids or supports for load carrying pallets, packages, cases or the like. The individual skid is made of a cut sheet of cardboard, corrugated board or similar light weight material, that is folded into a tubular body of rectangular cross section. Further, the skid comprises reinforcing member in the form of vertically extending, cylindrical tubular members of tightly wound and glued paper, or in the form of blocks of cardboard or like material. By the folding, side parts of the sheet are inserted vertically into slits in the reinforcing members thereby providing a vertical centre wall preventing insertion of the prongs of a fork lifter through the skid. Holes provide for insertion of strapping for securing the skid to a package. Apart from the glue for the tightly wound paper member, glue or the like for assembling the skid is not mentioned.

[0006] GB 1 492 804 discloses a method of constructing a box pallet, comprising forming two skids to include a base member, a deck member presenting a load-carrying surface, and support members holding the deck member and the base member in spaced relationship. The base member and the deck member of each said skid may be formed of any suitable material of sufficient strength for its intended load-bearing capacity, such as timber, plastics or stiff card, and the means separating the deck member from the base member may comprise blocks of wood, fibreboard or plastics material. The load-carrying deck member is of shape and dimensions corresponding to the base member, and accordingly these two members appear to be identical.

[0007] For storage and transport of goods such as cardboard packages, it is known to provide a stack of packages on a pallet such as a standard pallet, e.g. a EUR-pallet to be able to lift and carry the stack of packages by e.g. a fork lifter. The EUR-pallets have the benefit that having a standardized size they may surely be lifted by means of a fork lifter with a fork that is correspondingly dimensioned.

[0008] However, since EUR-pallets are used again and again, which is some circumstances is beneficial from a material resource point of view, the EUR-pallets need to be stored and sometimes transported empty because the end user of the packages stacked on a given pallet may not have a further use for the pallet.

[0009] Accordingly, in some circumstances a reuse pallet may not be the most economical or environment-friendly solution for storage and transport of stacks of packages.

[0010] Another problem in relation to standard pallets is, that the packages stacked thereupon may have larger base dimensions than the pallet whereby the packages extend horizontally beyond the pallet and hide the same from the eyesight of the driver of a fork lifter, making it difficult to catch and the stack of packages correctly and safely.

[0011] E.g. the two first of the above prior art documents tend to solve at least some of the problems relating to standard pallets.

[0012] However, either of the solutions proposed by the prior art documents pose their own disadvantages. E.g. is the element disclosed in WO 02/38471 A2 made of plastics material which inherently involves environmental problems and the pressed hollow projections require a firm base for carrying a stack of packages resting on a couple of said elements, and the construction of the element disclosed in GB 999 546 A provides little stability by the single plane lath and the rounds likewise require a firm base for carrying a stack of packages resting on a couple of the elements disclosed in GB 999 546 A.

[0013] It is an object to provide a cargo carrier element that avoids at least some of the disadvantages of the prior art.

[0014] This is obtained by a cargo carrier element of the art mentioned by way of introduction, wherein the angular profile strip comprises a first fibrous material based on plant fibres, the angular profile strip is primarily made of fibreboard material, preferably solid cardboard material, the protrusions comprise a second fibrous material based on plant fibres, a slat comprising a third fibrous material based on plant fibres is fixed to the ends of the protrusions to extend in parallel to the horizontal part, wherein the slat is primarily made of plywood or a wooden board, especially in the form of a single piece of wood. Thereby is obtained a cargo carrier element that is economic in production using environment friendly materials that are easily recycled or combusted as a CO_2 neutral fuel. Further is obtained a relatively large base surface for the cargo carrier element minimizing the pressure exerted on a base surface on which a stack of packages resting on a couple of cargo carrier elements is placed. Thus it will e.g. be possible to place one such stack of packages upon another stack of packages without crushing the packages of the lower stack.

[0015] In a unique way, as compared to the prior art, the invention provides a cargo carrier element comprising and angular profile strip for abutting a corner of a box, a cardboard package, etc. and a slat for resting on the ground the angular profile strip and the slat being separated by protrusions, i.e. intermediate elements, whereby the angular profile strip and the slat are respectively made of different materials. This choice of different materials provides for the best solution in respect of economy and environmental impact.

[0016] Preferably the angular profile strip is glued to the protrusions avoiding a need of a tear-strength of the material of the angular profile strip to accept nails for fastening.

[0017] In an embodiment the protrusions are primarily made of particle board material, e.g. as wood chip blocks, or pieces of wood.

[0018] In an embodiment at least the horizontal part of the angular profile strip has a thickness of at least 4.5 mm, preferably at least 5.5 mm, and more preferably at least 6.5 mm. The horizontal part and the vertical part are in an embodiment made integrally and have the same thickness.

[0019] In a practical embodiment the slat has a length substantially equal to the length of the angular profile strip.

[0020] The object of the invention is further obtained by a set of cargo carrier elements comprising two separate cargo carrier elements according to the invention.

[0021] Such set of cargo carrier elements provides for a method according to the invention of stacking a number of packages for transport and/or storage, the method comprising:

providing a set of cargo carrier elements according to the invention,

placing a number of preferably box-shaped packages for opposite ends of the respective box-shaped packages to rest on the concave side of the respective cargo carrier elements on the horizontal parts thereof, and

providing an amount of glue between the respective concave sides of the angular profile strips and the respective packages.

[0022] Thus the object is further obtained by a stack of packages comprising a number of packages, each package having a length; a height; and a thickness, the length defining a distance between a first end, and a second end of the respective package and the height defining a distance between a bottom and a top of the respective package, the packages being placed in a mutual side-by-side relationship with their tops up and their bottoms at their respective first and second ends resting on the convex side of the horizontal part of a cargo carrier element of a set of cargo carrier elements according to claim or, the packages preferably being surrounded by bands and/or wrapping material.

[0023] In the following the invention will be explained in further detail by means of an example of an embodiment having reference to the accompanying drawing, in which

Fig. 1 shows a cargo carrier element according to the invention,

Fig. 2 shows a stack of packages resting on a set of cargo carrier elements, and

Fig. 3 shows a stack of differently oriented packages resting on a set of cargo carrier elements.

[0024] Fig. 1 shows a cargo carrier element 1 comprising an angular profile strip 2 with a horizontal part 3 and vertical part 4. The angular profile strip has a length in a longitudinal direction 5 e.g. between 0.5 m and 2 m, especially e.g. between 1 m and 1.4 m. The horizontal part 3 and the vertical part 4 together define a concave side 6 and convex side 7 of the angular profile strip 2. In the present embodiment three protrusions 8 are provided on the horizontal part 3, glued to the convex side 7 thereof. To facilitate the fixing of the angular profile strip 2 to the protrusions 8, stables 15 may by inserted through the horizontal part 3 into the protrusions 8, primarily to fix the protrusions 8 while the glue sets. The protrusions 8 extend to respective ends 9 at a distance from a surface of the horizontal part 3. That distance should be dimensioned to provide space for insertion of the tines of a fork lifter below the horizon part 3, and the distance may e.g. be 7-15 cm, especially e.g. 8-11 cm. According to the present invention the angular profile strip 2 comprises a first fibrous material based on plant fibres, which may primarily be fibreboard, preferably cardboard, material. The material of the angular profile strip 2 should have thickness to provide sufficient strength. E.g. the material may have a thickness of at least 4.5 mm, preferably at least 5.5 mm, and more preferably at least 6.5 mm. The horizontal part and the vertical part are in the embodiment shown made integrally and have the same thickness.

[0025] The angular profile strip 2 may be produced by folding pieces of cardboard having preferably a length corresponding to the intended length of the angular profile strip and a width generally corresponding to the combined width of the horizontal part and the vertical part, and stacking and gluing the folded pieces together. The angular blank thus provided may be wrapped in a cover sheet of e.g. paper to provide a smooth surface. For gluing together the folded pieces of cardboard and the cover paper, e.g. a PVA(C) dispersion glue may be used.

[0026] The width of the horizontal part 3 and the vertical part 4 may e.g. be 7-15 cm, especially 8-12 cm.

[0027] In the present embodiment the protrusions 8 comprise a second fibrous material based on plant fibres, which material e.g. comprises particle board material. Thus the protrusions may primarily be made of particle board material, e.g. as wood chip blocks, and/or pieces of wood. The dimensions of a horizontal cross-section of the protrusions may e.g. be 10-20 cm, especially e.g.

12-15 cm, in the longitudinal direction 5, and 7-15 cm, especially e.g. 7-11 cm in the direction perpendicular thereto.

[0028] In the present embodiment a slat 10 comprising a third fibrous material based on plant fibres is fixed to the ends 9 of the protrusions 8 to extend in parallel to the horizontal part 3. Such slat 10 on one hand adds to the overall strength of the cargo carrier element 1 and for benefits to be explained below, it provides for a smaller pressure against a supporting surface.

[0029] The slat 10 may primarily be made of plywood or a wooden board, especially in the form of a single piece of wood.

[0030] Preferably the slat 10 has a length equal to the length of the angular profile strip 2. It is also possible that the slat 10 is a little longer than the angular profile strip 2 and that the slat 10 is a little shorter than the angular profile strip 2. In the latter case the slat 10 should have a sufficient length to extend beneath and support the outmost of the protrusions 8.

[0031] The slat 10 may have a width approx. equal to the width of the protrusions, or the slat 10 may have a width e.g. 1-3 cm larger than the width of the protrusions, e.g. for the slat to have a width of approx. 10 cm.

[0032] The cargo carrier elements 1 may be used as a set of two cargo carrier elements 1 to provide a stack of packages 11 as shown in Fig. 2 or Fig. 3. The packages 11 may be box-shaped cardboard packages comprising goods such as windows.

[0033] In the stacks respectively shown in Figs. 2 and 3, packages 11 are placed side-by-side whereby a first end 11a and a second end 11b of the respective packages are placed on the horizontal part 3 of respective cargo carrier elements 1, bottoms 11c of the packages 11 facing downwards, and tops 11d of the packages 11 facing up, the bottoms 11c and tops 11d being for the present description defined by the orientation of the packages 11 in the respective stacks. Thus in Fig. 2 the packages 11 are oriented with a longitudinal dimension oriented vertically, while in Fig. 3 the packages 11 are oriented with their longitudinal dimension oriented horizontally.

[0034] In order to avoid that the packages 11 slides relative to the cargo carrier elements 1, dots of glue 12a, 12b, such as hotmelt, may be provided on the vertical and horizontal parts 4, 3 of the angular profile strips 2. Dots of glue 12a on the vertical parts 4 may further add to the strength of the stack as a whole allowing a saving in respect of thickness of the material of the angular profile strips 2.

[0035] Bands 13 are wrapped around the stacks including the angular profile strips 2 to secure the cargo carrier elements 1 to the stack of packages 11, protective corner elements 16 being provided between the bands 13 and the corners of the packages 11 at the tops 11d thereof. These protective corner elements 16 may be similar to the angular profile strips 2, only shorter.

[0036] In an embodiment, two bands 13 are used as shown in Figs. 2 and 3. In other embodiments more bands 13 are used, e.g. a third band is applied parallel to and intermediate of the two bands 13 shown in Figs. 2 and 3, and next to the protrusion 8 at the centre of the cargo carrier elements 1, when a protrusion is positioned at said centre.

[0037] Additionally, the stacks of packages 11 may be wrapped in a wrapping material, e.g. plastic film, as it is known per se.

[0038] As seen from a comparison of Figs. 2 and 3, the provision of two cargo carrier elements 1 according to the invention allows for arranging packages in different orientations providing stacks of different heights and widths as suitable e.g. for storing the stacks. The cargo carrier elements 1 always remain visible below the stack of packages to facilitate insertion of the tines of e.g. a fork lifter to lift and move the stack. Due to the presence of the slats 10 it is possible to stack more stacks on top of each other without the protrusions 8 damage the packages below. The present inventors have successfully stacked up to 6 m high to a total weight of 2800 kg for a stack of packages of windows.

[0039] In the embodiment described herein the cargo carrier elements according to the invention provides an environment friendly solution to stacking of packages, the materials of the cargo carrier elements being possibly recycled and/or recyclable.

Claims

1. A cargo carrier element (1) comprising an angular profile strip (2) with a horizontal part (3) and vertical part (4), the angular profile strip having a length in a longitudinal direction (5), the horizontal part (3) and the vertical part (4) together defining a concave side (6) and convex side (7) of the angular profile strip (2), at least two protrusions (8) provided on the horizontal part (3) at the convex side (7) thereof, the protrusions (8) extending to respective ends (9) at a distance from a surface of the horizontal part (3), **characterized in that** the angular profile strip (2) comprises a first fibrous material based on plant fibres, wherein the angular profile strip (2) comprises fibreboard material, preferably solid cardboard material, wherein the protrusions (8) comprise a second fibrous material based on plant fibres, and wherein a slat (10) comprising a third fibrous material based on plant fibres is fixed to the ends (9) of the protrusions (8) to extend in parallel to the horizontal part (3), wherein the slat (10) comprises plywood or a wooden board, especially in the form of a single piece of wood.

2. A cargo carrier element according to claim 1, wherein the angular profile strip (2) is glued to the protrusions (8).

3. A cargo carrier element according to claim 1 or 2, wherein at least the horizontal part (3) of the angular profile strip has a thickness of at least 4.5 mm, preferably at least 5.5 mm, and more preferably at least 6.5 mm.

4. A cargo carrier element according to any one of claims 1 and 3, wherein the protrusions (8) comprise particle board material or pieces of wood.

5. A cargo carrier element according to any one of claims 1 to 4, wherein the slat (10) has a length equal to the length of the angular profile strip (2).

6. A set of cargo carrier elements comprising two separate cargo carrier elements (1) according to any one of claims 1 to 5.

7. A method of stacking a number of packages for transport and/or storage, the method comprising:

providing a set of cargo carrier elements 1 according to claim 6,
placing a number of preferably box-shaped packages (11) for opposite ends (11a, 11b) of the respective box-shaped packages to rest on the concave side (6) of the respective cargo carrier elements (1) on the horizontal parts (3) thereof, and
providing an amount of glue (12a, 12b) between the respective concave sides (6) of the angular profile strips (2) and the respective packages (11).

8. A stack of packages comprising a number of packages (11), each package having a length; a height; and a thickness, the length defining a distance between a first end (11a), and a second end (11b) of the respective package and the height defining a distance between a bottom (11c) and a top (11d) of the respective package (11), the packages being placed in a mutual side-by-side relationship with their tops (11d) up and their bottoms (11c) at their respective first and second ends (11a, 11b) resting on the convex side (6) of the horizontal part (3) of a cargo carrier element (1) of a set of cargo carrier elements according to claim 6, the packages preferably being surrounded by bands (13) and/or wrapping material (14).

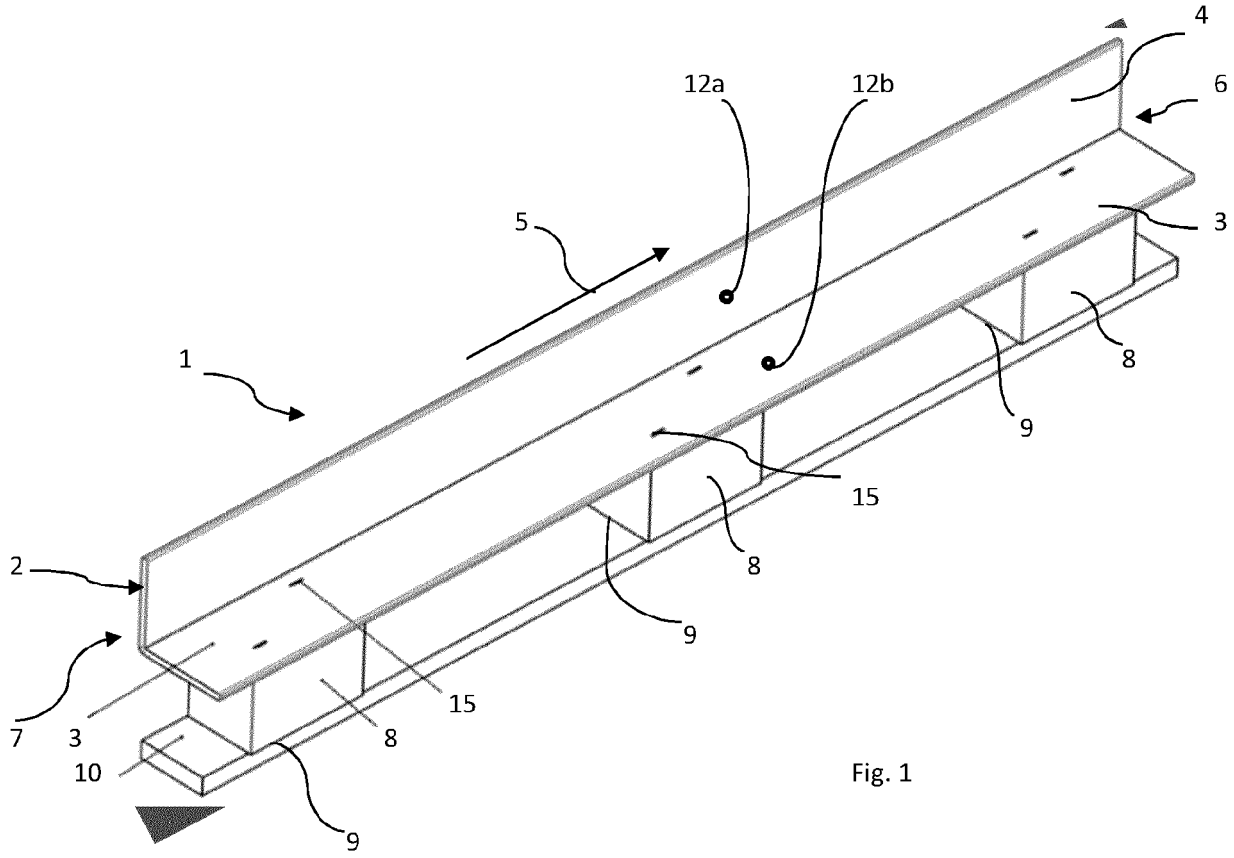
4
6
12a
12b
5
3
1
8
9
15
2
8
9
15
7
3
8
10
9

Fig. 1

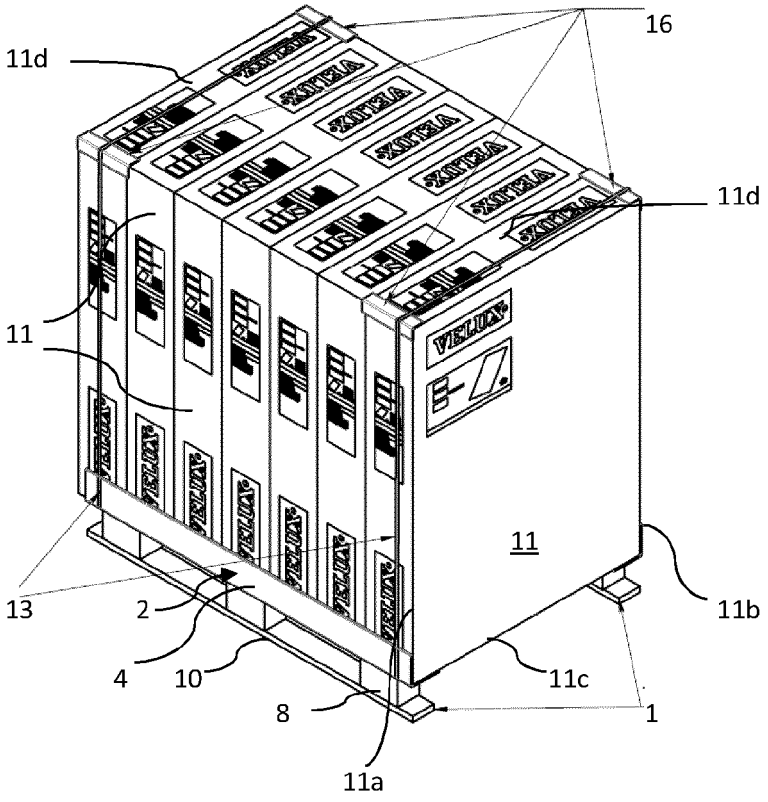
16
11d
11d
11
11
13
2
4
10
8
11a
11c
1
11b

Fig. 2

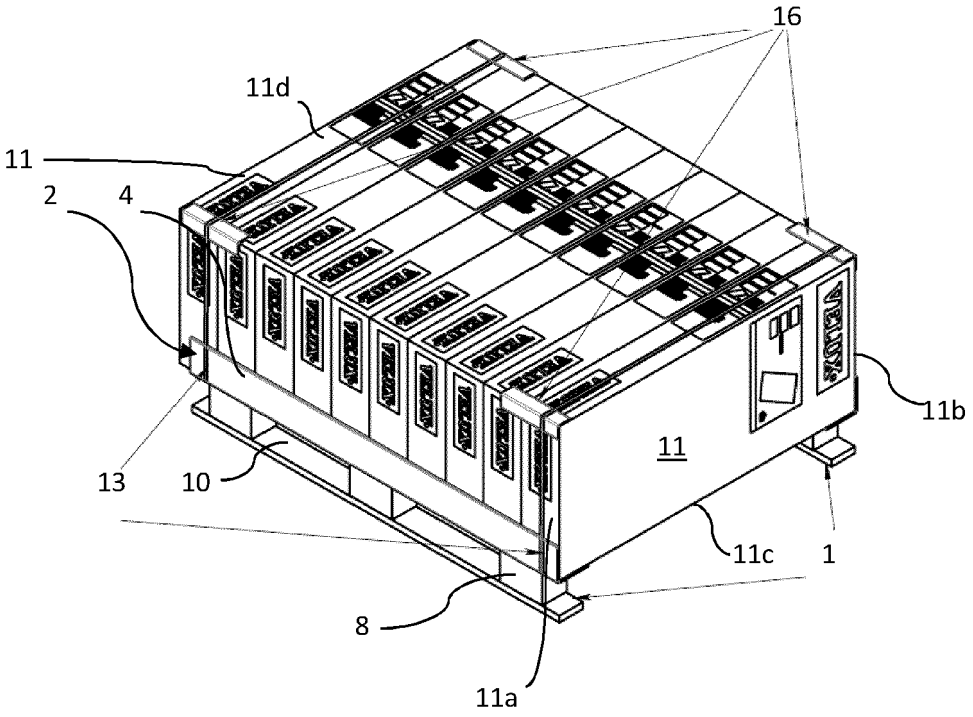

Fig. 3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 21 15 7889

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	GB 678 586 A (ADDISON SEMMES CORP) 3 September 1952 (1952-09-03) * figure 1 * * page 2, line 30 - line 48 *	1-5	INV. B65D71/00
Y,D	GB 1 492 804 A (SOUTHERN A; LANCASHIRE BOX CO LTD) 23 November 1977 (1977-11-23) * figures 1, 4, 5 * * page 2, line 24 - line 31 * * page 2, line 107 - line 113 *	6-8	
Y,D	WO 02/38471 A2 (INTER IKEA SYS BV [NL]; DICKNER ALLAN [SE]) 16 May 2002 (2002-05-16) * figure 4 * * page 1, line 4 - line 13 *	6-8	
			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
The Hague	13 July 2021	Fernandez Ambres, A

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
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 15 7889

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-07-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 678586 A	03-09-1952	NONE	
GB 1492804 A	23-11-1977	BE 832581 A	16-12-1975
		DE 2532362 A1	04-03-1976
		DE 7523104 U	12-02-1976
		FR 2282557 A1	19-03-1976
		GB 1492804 A	23-11-1977
		IT 1056409 B	30-01-1982
		JP S5149879 A	30-04-1976
		NL 7508577 A	24-02-1976
WO 0238471 A2	16-05-2002	AT 276173 T	15-10-2004
		AU 1737202 A	21-05-2002
		AU 2002217372 B2	23-06-2005
		BG 64982 B1	30-11-2006
		BR 0115248 A	12-08-2003
		CA 2426493 A1	16-05-2002
		CN 1630609 A	22-06-2005
		CZ 20031456 A3	15-10-2003
		DE 60105645 T2	29-09-2005
		DK 176428 B1	04-02-2008
		DK 1349801 T3	20-12-2004
		EE 200300178 A	16-06-2003
		EP 1349801 A2	08-10-2003
		ES 2228978 T3	16-04-2005
		HK 1077280 A1	10-02-2006
		HR P20030380 A2	31-08-2003
		HU 227899 B1	29-05-2012
		IL 155357 A	03-06-2007
		IS 6796 A	28-04-2003
		JP 3129115 U	08-02-2007
		JP 2004513041 A	30-04-2004
		KR 20030070026 A	27-08-2003
		LV 13036 B	20-12-2003
		MX PA03004185 A	02-12-2004
		NO 326476 B1	15-12-2008
		PL 366107 A1	24-01-2005
		PT 1349801 E	31-12-2004
		RO 121106 B1	29-12-2006
		RU 2275318 C2	27-04-2006
		SI 21135 A	31-08-2003
		SK 4242003 A3	07-10-2003
		US 2004025758 A1	12-02-2004
		WO 0238471 A2	16-05-2002
		YU 34603 A	12-05-2004
		ZA 200302627 B	05-04-2004

EPO FORM P0459

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

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 15 7889

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

13-07-2021

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
----------			

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 0238471 A2 **[0003] [0012]**
- GB 999546 A **[0004] [0012]**
- GB 930263 A **[0005]**
- GB 1492804 A **[0006]**