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PREFABRICATED UNIT

(57)

A prefabricated unit (10), comprising a frame for the floor (11), a frame for the roof (12), and posts (13) for connection between the frames (11, 12), and which

further comprises means for removable mutual connection (14) between the posts (13) and the frames (11, 12).

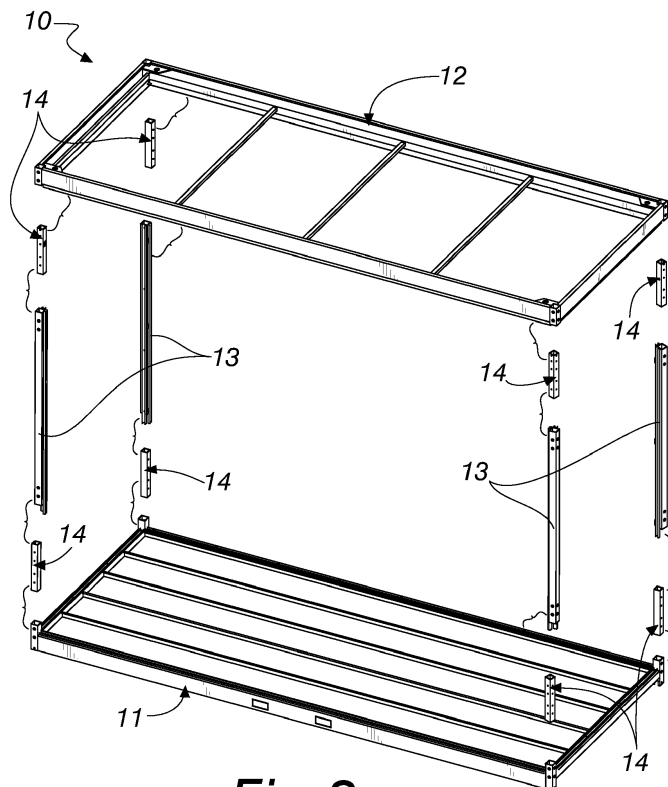


Fig.2

Description

[0001] The present invention relates to a prefabricated unit.

[0002] The invention can be applied in the area of construction, industry and agriculture.

[0003] In particular the invention can be applied on building sites or plant engineering sites, but it can also be advantageously applied in other areas such as, for example, intermodal goods transport, air quality analysis and monitoring stations or habitats.

[0004] Nowadays there is wide scope for using prefabricated units, including emergency dwellings, construction sites, intermodal transport, and medical clinics in the inaccessible regions of some countries.

[0005] Generally a prefabricated unit comprises a structure provided with elements made of different types of materials: for example, wood and metals but also cement, which are made separately and then assembled in the factory or on site.

[0006] In particular, prefabricated units with a structure made of metallic material are usually represented by parallelepipeds with internationally-standardized measurements. The floor, the side walls and the roof are connected by way of structural elements (posts and beams) which are welded together. The structure is fully assembled during production and is then transported to the place of use.

[0007] Such known art has a number of drawbacks.

[0008] The welding between structural elements entails fixed connections. The structure must therefore be transported in its final configuration, resulting in onerous transport costs; in addition, there is a high level of atmospheric pollution due to the emission of gases by the necessary transport vehicles.

[0009] Furthermore the welded structures require considerable storage spaces.

[0010] Last but not least, the provision of welded structures determines major limitations on the versatility of use of the product.

[0011] The aim of the present invention is to provide a prefabricated unit that is capable of improving the known art in the above mentioned aspects.

[0012] Within this aim, an object of the invention is to provide a prefabricated unit that reduces the costs of transport and the pollution associated therewith.

[0013] Another object of the invention is to provide a prefabricated unit that reduces the storage space necessary.

[0014] A further object of the invention is to provide a prefabricated unit that offers greater versatility and multifunctionality.

[0015] Furthermore, another object of the present invention is to overcome the drawbacks of the known art in an alternative manner to any existing solutions.

[0016] Another object of the invention is to provide a prefabricated unit that is highly reliable, easy to implement and low cost.

[0017] This aim and these and other objects which will become better apparent hereinafter are achieved by a prefabricated unit according to the invention which comprises a structure constituted by modular elements.

[0018] Further characteristics and advantages of the invention will become better apparent from the detailed description that follows of a preferred, but not exclusive, embodiment of the prefabricated unit according to the invention, which is illustrated for the purposes of non-limiting example in the accompanying drawings wherein:

Figure 1 is a general view of the prefabricated unit according to the invention;

Figure 2 is an exploded view of the prefabricated unit of Figure 1;

Figure 3 is a view of a detail of the prefabricated unit of Figure 1;

Figures 4 and 5 are views of details of the prefabricated unit of Figure 1.

[0019] With reference to the figures, the prefabricated unit according to the invention, generally designated by the reference numeral 10, comprises a frame 11 for the floor, a frame 12 for the roof and some tubular posts 13 for connection between the frames, at the corners of the structure. These metallic elements can be made of, for example, galvanized steel. The frames 11 and 12 are represented by grids constituted by bars, generally tubular, arranged in the most advantageous configuration to support the floor or the roof and the loads placed thereon.

[0020] The peculiarity of this structure is the connection system between the posts 13 and the frames 11 and 12.

[0021] At the corners of the frame 11 of the floor there are angular elements 15, which have a tubular cross-section and which comprise vertical tabs, also tubular, which are directed upward. The angular elements 15 have a tubular cross-section that coincides with that of the posts 13. Similarly, at the corners of the frame 12 of the roof there are angular elements 18, with a tubular cross-section that coincides with that of the posts 13 and which is parallel to the plane of extension of the frame 12. To join frames and posts, means for removable mutual connection 14 are used. The means for mutual connection 14 can be for example pins, which have a smaller tubular cross-section than that of the posts 13 and of the tubular elements 15 and 18. The pins 14, made for example from steel, are inserted partially into the posts 13 and partially into the angular elements 15 and 18 which are arranged at the corners respectively of the frames 11 and 12.

[0022] The frames 11 and 12 can have the most advantageous dimensions for the specific sector of use of the prefabricated unit. Similarly, the height of the posts 13 can also be the most advantageous according to the field of use of the prefabricated unit.

[0023] In particular the cross-section of the tubular posts 13 could be for example square, measuring 80 mm on a side and with a thickness of 4 mm, and the tubular

cross-section of the pins 14 could also be square, measuring 70 mm on a side and with a thickness of 6 mm.

[0024] At the ends of each post 13, on the faces that will define the outer corner of the structure, and on each angular element 15 and 18, on the faces that will define the outer corner of the structure, there are advantageously through holes 16, for example arranged on vertical rows, two for each face. In the same way, on each means for mutual connection 14, there are, on the faces that will line up with the outer corners of the structure, through holes 17 with a similar arrangement to that of the holes 16. After having inserted the pins 14 into the posts 13 and into the angular elements 15 or 18 and after having lined up the holes 16 with the corresponding holes 17, each "post/pin/angular element" connection is fixed by way of screws, not shown in the figures. Flared flat head screws could be used, for example.

[0025] In this manner the posts 13 can be removed from the frames 11 and 12 as needed.

[0026] On the internal faces of the posts 13, instead, there are elements 20 which are suitably provided for attaching external walls, if any. Similarly, on the external perimetric bars of the frame 11 there are elements 21 and below the perimetric bars of the frame 12 there are elements 22 for anchoring thereon floors and ceilings which are prefabricated or assembled on site.

[0027] By way of using the elements 20, 21 and 22 it is possible to also couple a plurality of wall elements, which are advantageously provided as a function of the purpose of the prefabricated unit. For example, walls can be coupled which are provided with a layer of thermal or acoustic insulation for prefabricated units for use as machine rooms in production plants, walls can be inserted with a plurality of doors for prefabricated units for use as technical areas for accommodating electrical switchboards, or also walls can be coupled which are provided with tool holders for prefabricated units for use as workshops.

[0028] Internal divider walls can advantageously be coupled to the external walls to define a plurality of rooms inside the prefabricated unit.

[0029] With reference to Figure 4, on the pin 14 intended to be inserted into the frame for the roof 12 there is a tab 19 that protrudes from the angular element 18. The presence of the tab 19 makes it possible to stack several prefabricated units one on top of the other. The tab 19 can have, for example, a height of 30 mm and the tubular cross-section corresponding to that of the pin 14. The tab 19 is inserted at the base of the angular element 15 and its through holes 23 are made to line up with the through holes 24 provided in the lower part of the angular element 15. There are at least two holes 23 on each pin 14, one per external angular face, and a corresponding number of holes 24 on each element 15. Then screws are introduced into the holes to fix the upper prefabricated unit on the lower one. Such screws, not shown in the figures, can be, for example, flared flat head screws.

[0030] The pin 14, with its tab 19, is also compatible

with some types of prefabricated unit with a welded structure which already exist on the market.

[0031] It should be noted that the presence of the frames 11 and 12, of the posts 13 and of the pins 14 enables the on-site assembly of the prefabricated unit, thus reducing the costs of transport and the pollution owing to exhaust gases of the vehicles necessary for transport.

[0032] It should also be noted that the presence of modular elements enables a greater versatility of the product: the prefabricated unit can be configured by choosing a frame for the floor and for the roof from a range of frames of different sizes and by selecting the posts of the most advantageous height; furthermore it will be possible to provide a complex by stacking several prefabricated units according to the invention.

[0033] Finally, it should be noted that a prefabricated unit according to the invention necessitates reduced storage space precisely because of the ability to separate its constituent elements.

[0034] In practice it has been found that the invention fully achieves the intended aim and objects by providing a prefabricated unit with modular elements.

[0035] The invention, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims. Moreover, all the details may be substituted by other, technically equivalent elements.

[0036] In practice the materials employed, provided they are compatible with the specific use, and the contingent dimensions and shapes, may be any according to requirements and to the state of the art.

[0037] The disclosures in Italian Patent Application No. 102017000067562 from which this application claims priority are incorporated herein by reference.

[0038] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A prefabricated unit (10), comprising a frame for the floor (11), a frame for the roof (12), and posts (13) for connection between the frames (11, 12), **characterized in that** it comprises means for removable mutual connection (14) between said posts (13) and said frames (11, 12).
2. The prefabricated unit (10) according to claim 1, **characterized in that** said posts (13) have a tubular cross-section.
3. The prefabricated unit (10) according to one or more

of the preceding claims, **characterized in that** said frames (11, 12) are provided with angular elements (15, 18) which have a tubular cross-section.

4. The prefabricated unit (10) according to one or more of the preceding claims, **characterized in that** said means for mutual connection (14) have a tubular cross-section smaller than that of said posts (13) and of said angular elements (15, 18). 5
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5. The prefabricated unit (10) according to one or more of the preceding claims, **characterized in that** said means for mutual connection (14) are inserted partially into the ends of said posts (13) and partially into said angular elements (15, 18). 15
6. The prefabricated unit (10) according to claim 5, **characterized in that** said posts (13) and said angular elements (15, 18) are provided with through holes (16) and **in that** said means for mutual connection (14) are provided with corresponding through holes (17). 20
7. The prefabricated unit (10) according to claim 6, **characterized in that** said means for mutual connection (14) are fixed to said posts (13) and to said angular elements (15, 18) by way of screws. 25
8. The prefabricated unit (10) according to one or more of the preceding claims, **characterized in that** said means for mutual connection (14) which are adapted to be inserted into said frame of the roof (12) are provided with tabs (19) which are adapted to protrude from said angular elements (18) of said frame for the roof (12). 30
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9. The prefabricated unit (10) according to one or more of the preceding claims, **characterized in that** said tab (19) is provided with through holes (23) and **in that** said angular elements (15) are provided with corresponding through holes (24). 40
10. The prefabricated unit (10) according to claim 9, **characterized in that** said tabs (19) are fixed to said angular elements (15) by way of screws. 45
11. The prefabricated unit (10) according to one or more of the preceding claims, **characterized in that** said posts (13) and the perimetric bars of said frames (11, 12) are provided with elements (20, 21, 22) which are adapted to engage walls, floor and ceiling. 50

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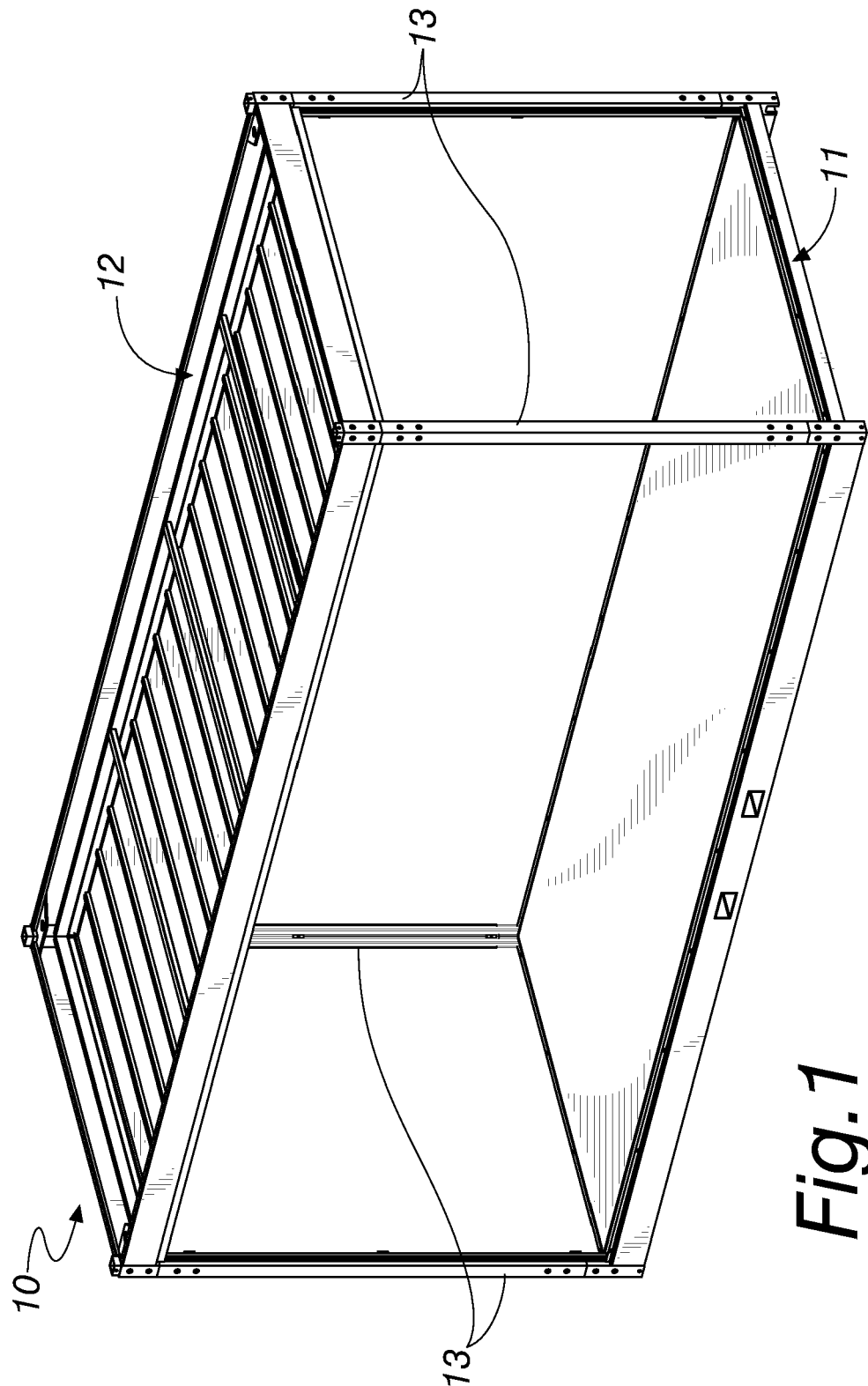


Fig. 1

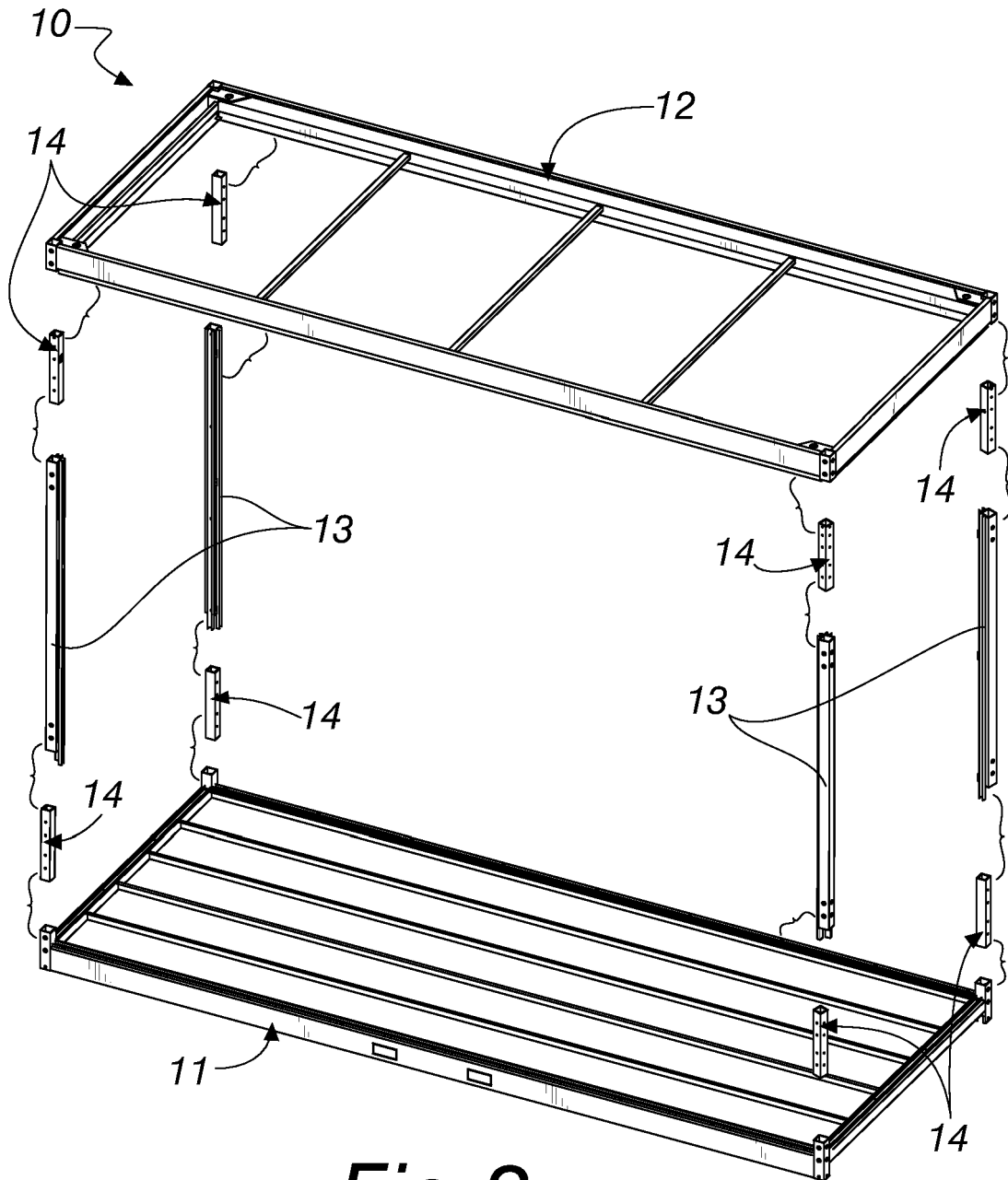
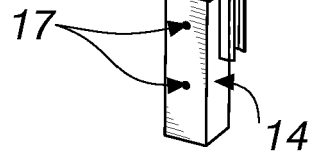
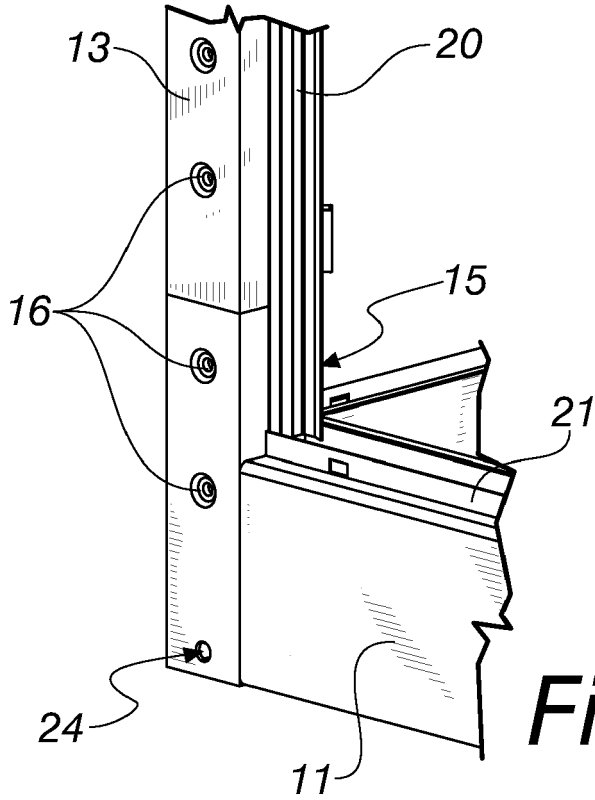
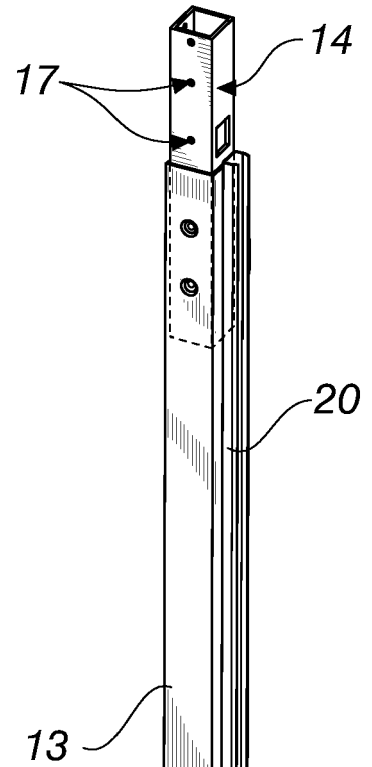
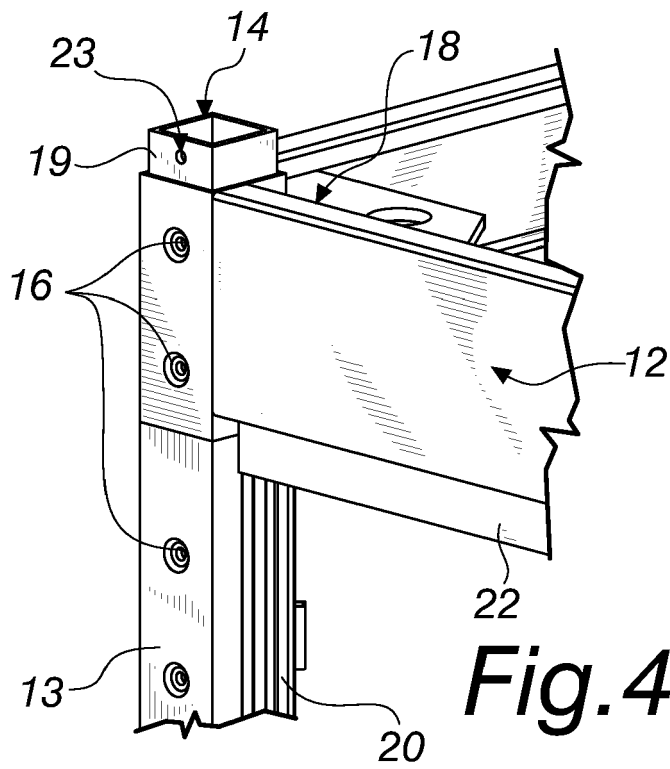


Fig.2





EUROPEAN SEARCH REPORT

Application Number
EP 18 17 8221

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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	JP 2011 140860 A (MISAWA HOMES CO) 21 July 2011 (2011-07-21)	1-7,11	INV. E04B1/343 E04B1/348 E04H1/12 E04B1/24
A	* paragraph [0030] - paragraph [0032]; figures 1-4,5a *	8-10	
X	DE 20 2014 101864 U1 (DHV ROSCHER GMBH & CO KG [DE]) 20 August 2014 (2014-08-20)	1-7,11	
A	* paragraph [0036] - paragraph [0049]; figures 1-6 *	8-10	
X	WO 2013/120129 A1 (LIFTING POINT PTY LTD [AU]) 22 August 2013 (2013-08-22)	1-3,11	
A	* page 9, line 20 - page 12, line 27; figures 10-13,17-23 *	4-10	
X	US 4 398 841 A (KOJIMA HAJIME [JP] ET AL) 16 August 1983 (1983-08-16)	1,3,5,11	
A	* column 5, line 54 - column 8, line 66; figures 1-5,10 *		
A	JP H10 212766 A (TOYOTA MOTOR CORP) 11 August 1998 (1998-08-11)	1-7	TECHNICAL FIELDS SEARCHED (IPC)
A	* paragraph [0061]; figures 17-20 *		E04B E04H
A	EP 1 081 300 A2 (LEITNER GMBH [DE]) 7 March 2001 (2001-03-07)	8	
	* the whole document *		
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 October 2018	Examiner Galanti, Flavio
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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 17 8221

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25

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35

40

45

50

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2011140860 A	21-07-2011	JP 5615036 B2	29-10-2014
		JP 2011140860 A	21-07-2011

DE 202014101864 U1	20-08-2014	NONE	

WO 2013120129 A1	22-08-2013	AU 2013211507 A1	05-09-2013
		AU 2013220923 A1	21-08-2014
		CA 2864597 A1	22-08-2013
		CA 2864601 A1	22-08-2013
		CL 2014002137 A1	03-11-2014
		CL 2014002186 A1	02-01-2015
		CN 104114784 A	22-10-2014
		CN 104136692 A	05-11-2014
		CN 104204380 A	10-12-2014
		CO 7061060 A2	19-09-2014
		CO 7071113 A2	30-09-2014
		EA 201491439 A1	31-03-2015
		EA 201491440 A1	30-01-2015
		EP 2815037 A1	24-12-2014
		EP 2815042 A1	24-12-2014
		JP 2015510561 A	09-04-2015
		JP 2015511910 A	23-04-2015
		JP 2015513622 A	14-05-2015
		KR 20140128424 A	05-11-2014
		KR 20140143753 A	17-12-2014
		NZ 628158 A	23-12-2016
		NZ 628172 A	29-07-2016
		PE 22012014 A1	10-01-2015
		PE 22022014 A1	10-01-2015
		PH 12014501856 A1	17-11-2014
		PH 12014501858 A1	17-11-2014
		SG 11201404471Q A	26-09-2014
		SG 11201404476U A	30-10-2014
		TN 2014000332 A1	21-12-2015
		TN 2014000334 A1	21-12-2015
		US 2015014886 A1	15-01-2015
		US 2015028025 A1	29-01-2015
		US 2015034634 A1	05-02-2015
		WO 2013120129 A1	22-08-2013
		WO 2013120136 A1	22-08-2013
		WO 2013120138 A1	22-08-2013
		ZA 201406745 B	31-08-2016
		ZA 201406746 B	25-05-2016

US 4398841 A	16-08-1983	JP S5681749 A	04-07-1981
		JP S6122700 B2	02-06-1986

EPO FORM P0459

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

55

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 18 17 8221

5

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

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10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 4398841 A	16-08-1983
JP H10212766 A	11-08-1998	NONE	
EP 1081300 A2	07-03-2001	DE 29915502 U1	18-01-2001
		EP 1081300 A2	07-03-2001

15

20

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35

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EPO FORM P0459

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT 102017000067562 [0037]