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(71) Applicant: **Cronos Equipment (Bermuda) Limited**
Hamilton, HM11 (BM)

(72) Inventor: **Borjesson, Kent Evert**
442 73 Kama (SE)

(74) Representative: **Bardo, Julian Eason et al**
Abel & Imray
20 Red Lion Street
London WC1R 4PQ (GB)

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(54) **Freight container suitable for carrying coils**

(57) The invention relates to a freight container suitable for transporting coils of sheet metal and to a method of transporting such coils in a freight container. The freight container (1) includes side walls (3), end walls (4), a base (5) including a floor (6), and a detachable roof (7). The container has a first configuration, in which re-

arrangeable parts (14) of the container define a plurality of holders which project upwardly from the floor of the container (1) and are suitable for receiving coils of sheet metal. The container also has a search configuration in which the rearrangeable parts (14) are rearranged and no longer define the plurality of holders projecting upwardly from the floor.

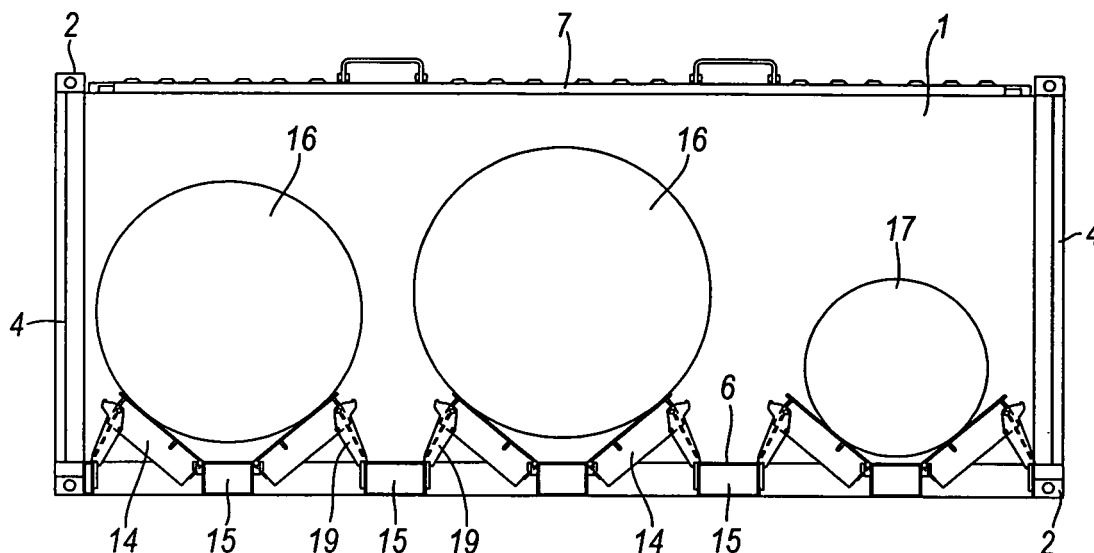


Fig. 1

Description

[0001] This invention relates to the transport of goods and to a freight container for transporting goods. More particularly the invention relates to a freight container suitable for transporting coils of sheet metal and to a method of transporting such coils in a freight container.

[0002] Coils of sheet metal are preferably transported in particular ways to enable the coils to be transported securely and easily with little risk of damage. Accordingly, when transporting coils of sheet metal, a desirable configuration involves opposing walls that slope upwardly from a floor at approximately 45 degrees to the horizontal and can receive a coil in the space formed between the walls with the cylindrical periphery of the coil resting on the opposing walls. Those opposing walls are, however, inconvenient if other goods are desired to be placed on the floor.

[0003] According to the invention there is provided a freight container including side walls, end walls, a base including a floor, and a detachable roof, wherein the container has a first configuration, in which rearrangeable parts of the container define a plurality of holders projecting upwardly from the floor of the container and suitable for receiving coils of sheet metal, and a second configuration, in which the rearrangeable parts of the container are rearranged and no longer define the plurality of holders projecting upwardly from the floor.

[0004] The freight container according to the invention can therefore be used in the first configuration to transport coils of sheet metal and, once it has reached its destination, the coils can be unloaded and the container then converted into the second configuration and used for transporting other goods, for example, back to the location at which the coils were loaded, or to another destination.

[0005] Whilst the holders are defined as being suitable for receiving coils of sheet metal, which would most often be sheet steel, it is within the scope of the invention for the holders to receive sometimes coils of other material or even other cylindrical objects.

[0006] The detachable roof of the container is advantageous in enabling large coils to be lifted out of the container through the top. Preferably an end wall of the container comprises a pair of end doors, as is a standard feature of freight containers. Smaller coils and other goods may be loaded into, or unloaded from, the container through the end doors.

[0007] The rearrangeable parts preferably include a pair of supports which in the first configuration of the container slope upwardly at opposite inclined angles to define a space therebetween suitable for receiving a coil of sheet metal. Preferably, in the second configuration of the container, the pair of supports form part of the floor. Preferably the floor is substantially flat across substantially all of its area in the second configuration of the container. Thus, the container can be used in a conventional manner when it is not being used to carry coils.

[0008] The container preferably includes a locking arrangement for locking the pair of supports in the first configuration, and preferably also includes a locking arrangement for locking the pair of supports in the second configuration. When locked in the first configuration, the supports are locked against movement downwards towards the second configuration and when locked in the second configuration, the supports are preferably locked against movement upwards towards the first configuration, but are in any case prevented from further downward movement.

[0009] Each support preferably includes a respective locking member movably mounted on a body part of the support. The locking member may be resiliently biased into a position in which it locks the support in the second configuration. The locking member may be pivotally mounted on the support, preferably at a location remote from the axis of pivoting of the support. In an embodiment of the invention the locking member is able to be rotated through an angle in the range of 30 to 120 degrees relative to the body part of the support to move between the first and second configurations of the container. Preferably the locking member is resiliently biased, for example by a torsion spring, in the direction from the first configuration towards the second configuration. In the first configuration, the locking member preferably acts as a prop to support the free end of the body part of the support.

[0010] Whilst it is within the scope of the invention to provide just a single pair of supports in a container, it is preferred that a plurality of pairs of supports are provided. A plurality of pairs of supports are preferably provided spaced along the length of the container. That may allow a plurality of coils to be carried in a single container. A plurality of pairs of supports are also preferably provided spaced across the width of the container. That may allow a plurality of coils to be carried across the container and/or allow a single coil to be supported by more than one pair of supports.

[0011] Preferably, ISO container fittings are provided in the region of each corner of the container. The container can then, for example, be lifted by a spreader arm of ISO load handling equipment engaging the top corner fittings and locked to a trailer, for example, using the bottom corner fittings.

[0012] Where reference is made in the specification to "ISO corner fittings", it should be understood that the corner fittings do not necessarily comply with all the requirements of ISO standards, but that they are suitable for engaging ISO load handling equipment and/or ISO fittings on trailers.

[0013] A standard width for a freight container to be handled by ISO load handling equipment is 2438 mm. Accordingly, it is preferred that the overall width of the container is in the range of 2300 mm to 2600 mm. In an embodiment of the invention described below, the overall width of the container is 2438 mm.

[0014] Similarly, the overall length of an ISO freight

container is usually 10 foot (2991 mm), 20 foot (6058 mm), 40 foot (12192 mm) or 45 foot (13716 mm). Preferably the containers are about 20 foot (6058 mm) long. Accordingly, the overall length of the container is preferably in the range of 5900 mm to 6300 mm. In an embodiment of the invention described below, the overall length of the container is 20 foot (6058 mm).

[0015] Whilst it is possible for some or all of the side walls, end walls and roof to be partly open, for example, as a result of being constructed as a framework, it is preferred that they are all closed so that, when the container is closed, the interior of the container is an entirely enclosed space; such an arrangement provides good protection for coils or other goods carried in the container.

[0016] It is common for the interior side walls of a freight container to be formed by sheet metal supported from the inside by a series of vertical posts. With such a construction, the interior faces of the side walls are ridged where each vertical post is disposed. Whilst it is within the scope of the invention to use a construction of this kind in the present invention, it is preferred that the interior faces of the side walls are flat, and also preferably smooth. That facilitates discharge of scrap steel or another bulk cargo from the container and reduces the risk of damage to the side walls during such discharge. Preferably the interior faces of the end walls are also flat, and also preferably smooth, for similar reasons.

[0017] According to another aspect of the invention, there is provided a method including the steps of:

providing a freight container including side walls, end walls, a base including a floor and a detachable roof, wherein the container has a first configuration, in which rearrangeable parts of the container define a plurality of holders projecting upwardly from the floor of the container and suitable for receiving coils of sheet metal, and a second configuration, in which the rearrangeable parts of the container are rearranged and no longer define the plurality of holders projecting upwardly from the floor, transporting the freight container to a destination with the container in the first configuration and with coils of sheet metal received in the holders, removing the top from the container, unloading the coils from the container through the top of the container, and converting the container into the second configuration.

[0018] Once the container has been converted into the second configuration it is well suited to carrying other goods. The method preferably further includes the subsequent step of loading the container with goods while it is in the second configuration.

[0019] It is often the case that when metal coils are transported to a destination it is desirable to transport scrap metal on a return journey. Thus, the goods loaded into the container while it is in the second configuration

may be scrap metal. If desired, the roof of the container may be left off so that the container is open-topped when carrying the scrap metal.

[0020] In some cases, it may be desirable for the container, once it has reached its destination and been unloaded, to be transported on to another destination different from the location at which it started, but it will more often be preferred that the method includes the subsequent step of transporting the container back to the location at which the coils were loaded into the container.

[0021] The method may be carried out with any of the forms of container described above. More generally it should be understood that features of the apparatus of the invention as described above may be reflected in features of the method of the invention and *vice versa*.

[0022] By way of example, an embodiment of the invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 is a sectional side view of a freight container in a first configuration and showing coils of sheet metal received therein,

Fig. 2A is a sectional side view of a freight container in a second configuration after unloading of the coils of sheet metal,

Fig. 2B is a sectional end view of the container as shown in Fig. 2A,

Fig. 2C is a sectional plan view of part of a floor of the container as shown in Fig. 2A,

Fig. 3 is an end view of an end of the container provided with a pair of end doors,

Fig. 4A is a sectional side view of a part of the floor of the container when the container is in the second configuration shown in Figs. 2A to 2C,

Fig. 4B is a sectional end view of the part of the floor shown in Fig. 4A,

Fig. 5A is a side view of the part of the floor shown in Fig. 4A when it is about to be moved into the second configuration,

Fig. 5B is a side view of the part of the floor shown in Fig. 4A when a locking member has been released as the first stage of moving a support into a position of the first configuration, and

Fig. 5C is a side view of the part of the floor shown in Fig. 4A when the support has been locked in a position of the second configuration.

[0023] Referring first to Figs. 1 to 3, there is shown a freight container 1 which has the dimensions of an ISO freight container, in this particular case a 20 foot (6058 mm) freight container. At each of its eight corners the container has an ISO corner fitting 2 with apertures of standard dimensions by which the container can be handled. The container also has an overall width in this particular case of 2438 mm.

[0024] The standard dimensions of the freight container 1 together with the provision of the ISO corner fittings 2, enable it to be handled by ISO handling equipment for

handling freight containers, and also to be transported by road, rail or sea in any locations designed to receive standard 20 foot (6058 mm) containers.

[0025] The container 1 has a pair of opposite side walls 3, a pair of opposite end walls 4, a base 5 including a floor 6 and a roof 7. The roof 7 is detachably fastened to the walls of the container 1, by fasteners 8 (Fig. 2B). Containers with detachable roofs of this kind are known per se and the details of the system for attaching and detaching the roof will therefore not be described in detail herein.

[0026] The floor 6 includes within it 12 pivotally mounted supports 14. Fig. 2C shows a small part of the floor with a chain dotted line showing the longitudinal centre line of the floor and with the length shown being sufficient to include two supports 14. In Fig. 1, the supports 14 are shown in the first configuration in which they are inclined upwardly at an angle of about 45 degrees from cross-members 15 to which they are pivotally connected. The supports 14 have planar upper faces on which coils of metal sheet material, commonly steel strip, are received. In Fig. 1, the outlines of two larger diameter coils 16 and a small diameter coil 17 are shown, to illustrate how different sizes of coils can be received by the supports, but it will be understood that in normal use it may be more common for all the coils to be of the same size.

[0027] Figs. 2A to 2C show the container in the second configuration, in which the supports 14 are pivoted downwardly to a position in which the planar upper faces of the supports are substantially co-planar with the rest of the floor 6 and the floor is therefore substantially flat. As can be seen from the drawings, the base 5 of the container is relatively deep and is able to accommodate the supports 14 when pivoted to this lower position.

[0028] As can be inferred from Figs. 2A and 2C the interior faces of the side and end walls are flat. They also have a smooth surface. This can be achieved by increasing the thickness of the walls on the inside by adding sheet material to the uprights along the walls.

[0029] Fig. 3 shows one end of the container and it can be seen that this end comprises a pair of end doors 13 pivotally mounted at the sides of the container for pivoting about a vertical axis and including locking bars 18 for locking the doors closed. Containers with such end doors are well known *per se* and the doors will not therefore be described in detail herein.

[0030] Figs. 4A, 4B and 5A to 5C show the supports 14 in more detail, and also show the manner in which the supports are locked in both the first and second configuration. Each support 14 is pivotally connected by a pivot 24 to a cross-member 15. Each support includes a locking member 19 pivotally mounted via an axle 20 on the body of the support 14 at the end opposite that at which the support 14 is pivotally connected to the cross-member 15.

[0031] A torsion spring 21 is mounted on the axle 20 and biases the locking member 19 in a direction that moves the free end 22 of the locking member downwards

(anticlockwise as shown in Fig. 4A). A stop member 23 is mounted on the face of the cross-member 15 opposite the pivot 24; the top face of the stop member 23 provides a stop for the free end of the top of the support 14 limiting downward movement of the support, whilst the bottom face of the stop member 23 provides a stop which is shown in Fig. 4A engaged by a lug 25 formed on the locking member 19.

[0032] As may now be understood, in the configuration shown in Figs. 4A and 4B, the second configuration of the container, the top of the support 14 rests on top of the stop member 23, whilst the lug 25 of the locking member 19 is biased into engagement with the bottom face of the stop member 23, preventing upward pivoting movement of the support 14.

[0033] Referring now to Figs. 5A to 5C, the procedure to raise the support 14 is shown with reference to a support pivoted to a cross-member 15 at its right hand side, as seen in Figs. 5A to 5C. Firstly, as shown in Fig. 5A, a tool 26 is inserted through an aperture in the top of the platform and a hook on the end of the tool located around a post 27 fixed to the locking member 19. The tool 26 is then lifted manually, which lifts the locking member 19, against the bias of the spring 21, to the position shown in Fig. 5B, in which the locking member 19 has rotated about the axle 20 sufficiently for the lug 25 to move out of engagement with the bottom face of the stop member 23. Once the locking member 19 has been moved to the position shown in Fig. 5B, the tool 26 can be lifted further raising the free end of the support 14. The locking member 19 pivots clockwise relative to the support 14 and the free end 22 of the locking member bears against the side face of the stop member 23. As the support is raised to the position shown in Fig. 5C, the free end 22 of the locking member moves outwardly to engage the top corner of the stop member 23, the free end 22 being shaped with a right-angled recess for this purpose. This position shown in Fig. 5C represents the position of the parts in the first configuration of the container. It will be noted that the locking member acts in the manner of a prop to prevent the support being lowered. The tool 26 is of course unhooked from the post 27 and withdrawn through the aperture in the support before a coil is placed on the support 14.

[0034] To move the support 14 back from the position shown in Fig. 5C, the tool 26 is again inserted and hooked around the post 27. The support 14 is then raised a small amount to allow the locking member 19 to be pivoted back towards the body of the support 14 (in an anti-clockwise direction as seen in Figs. 5A to 5C), so that the free end 22 of the locking member 19 is inside the stop member 23. The platform can then be lowered through the position shown in Fig. 5B to the locked position shown in Fig. 5A, and the tool 26 unhooked and withdrawn.

[0035] The use of the container will now be described, starting from the container being empty and in the second configuration shown in Figs. 2A to 2C. Before coils are loaded into the container, the supports 14 are raised into

the positions shown in Figs. 1 and 5C. The roof 7 is then removed from the container (if not already removed) and, in this particular example, three large coils 16 lowered into the container. Each coil 16 spans the majority of the width of the coil and is therefore supported by two pairs of supports (four supports 14 in total). The coils 16 rest on the planar upper faces of the supports 14. The roof 7 is then fastened to the top of the container enclosing the three coils in an entirely enclosed space and thus giving them good protection.

[0036] The container is then transported from its starting location to a destination. During this transport, the container may be lifted, for example by a spreader arm of ISO load handling equipment engaging the top corner fittings 2 of the container, and it may be connected to a road trailer or a railway wagon via a bottom corner fitting.

[0037] Upon reaching its destination, the roof 7 is removed and the coils 16 lifted out of the container. If it is then desired to transport other goods in the container, the supports 14 may be lowered to the positions shown in Figs. 2A to 2C and 4A and 4B, so that the container has a substantially flat floor. Goods can then be loaded into the container either through the end doors 13, which can be opened outwardly, or, if the roof 7 is left detached, through the open top of the container. The container can then be transported, either with the roof refitted or as an open-topped container back to its original location or to another location. Commonly, it will be desirable to transport scrap metal in the container on a return trip. With the supports 14 in the positions shown in Figs. 2A to 2C the container is well suited for such a purpose, especially in view of its flat interior walls; if preferred, the roof 7 can be kept off the container for the return trip.

Claims

1. A freight container including side walls, end walls, a base including a floor, and a detachable roof, wherein the container has a first configuration, in which rearrangeable parts of the container define a plurality of holders projecting upwardly from the floor of the container and suitable for receiving coils of sheet metal, and a second configuration, in which the rearrangeable parts of the container are rearranged and no longer define the plurality of holders projecting upwardly from the floor.
2. A freight container according to claim 1, in which an end wall of the container comprises a pair of end doors.
3. A freight container according to claim 1 or 2, in which the rearrangeable parts include a pair of supports which in the first configuration of the container slope upwardly at opposite inclined angles to define a space therebetween suitable for receiving a coil of sheet metal.

4. A freight container according to claim 3, in which in the second configuration of the container the pair of supports form part of the floor.
5. A freight container according to claim 3 or 4, including a locking arrangement for locking the pair of supports in the first configuration.
6. A freight container according to any of claims 3 to 5, including a locking arrangement for locking the pair of supports in the second configuration.
7. A freight container according to any of claims 3 to 6, in which each support includes a respective locking member movably mounted on a body part of the support.
8. A freight container according to claim 7, in which the respective locking member is pivotally mounted on the body part of the support.
9. A freight container according to claim 8, in which the respective locking member is able to be rotated through an angle in the range of 30 to 120 degrees relative to the body part of the support to move between the first and second configurations of the container.
10. A freight container according to any of claims 7 to 9, in which each locking member is resiliently biased into a position in which it locks the support in the second configuration.
11. A freight container according to any of claims 3 to 10, in which a plurality of pairs of supports are provided spaced along the length of the container.
12. A freight container according to any of claims 3 to 11, in which a plurality of pairs of supports are provided spaced across the width of the container.
13. A freight container according to any preceding claim, in which ISO corner fittings are provided in the region of each corner of the container.
14. A freight container according to any preceding claim, in which the interior faces of the side walls are flat.
15. A freight container substantially as herein described with reference to the accompanying drawings.
16. A method of transporting coils of sheet metal in a freight container, the method including the steps of:
 - providing a freight container including side walls, end walls, a base including a floor and a detachable roof, wherein the container has a first configuration, in which rearrangeable parts of the

- container define a plurality of holders projecting upwardly from the floor of the container and suitable for receiving coils of sheet metal, and a second configuration, in which the rearrangeable parts of the container are rearranged and no longer define the plurality of holders projecting upwardly from the floor, transporting the freight container to a destination with the container in the first configuration and with coils of sheet metal received in the holders, removing the top from the container, unloading the coils from the container through the top of the container, and converting the container into the second configuration.
17. A method according to claim 16, further including the subsequent step of loading the container with goods while it is in the second configuration.
18. A method according to claim 17, in which the goods are scrap metal.
19. A method according to any of claims 16 to 18, further including the subsequent step of transporting the container back to the location at which the coils were loaded into the container.
20. A method according to any of claims 16 to 19, in which the container is according to any of claims 1 to 15.
21. A method of transporting coils of sheet metal in a freight container, the method being substantially as herein described with reference to the accompanying drawings.

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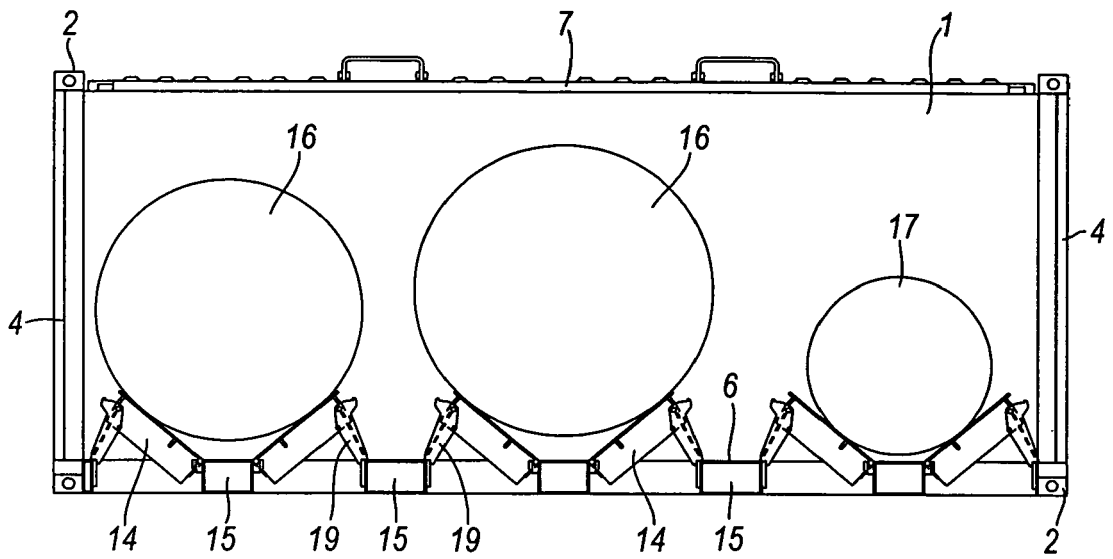


Fig. 1

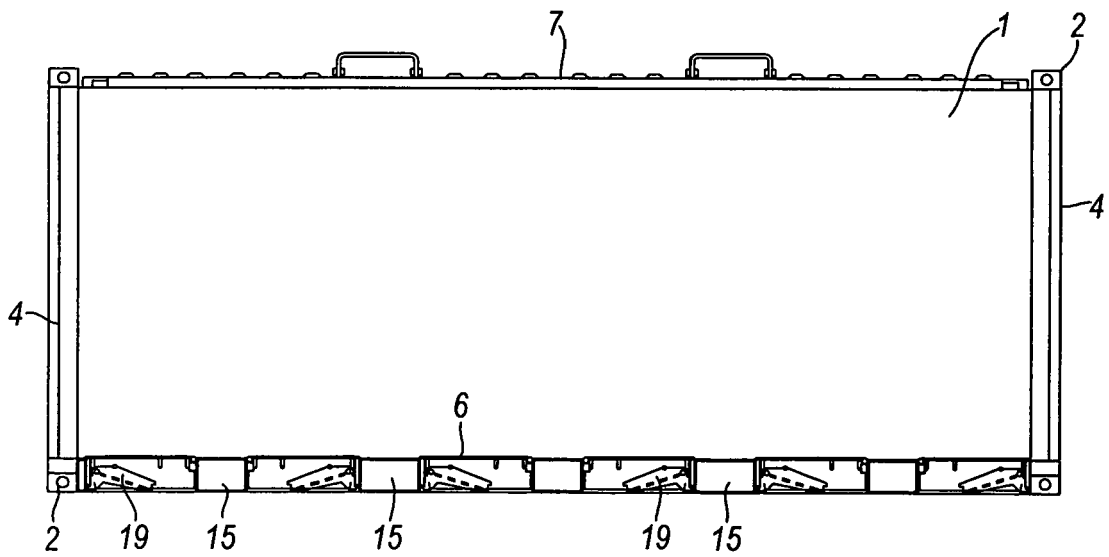


Fig. 2A

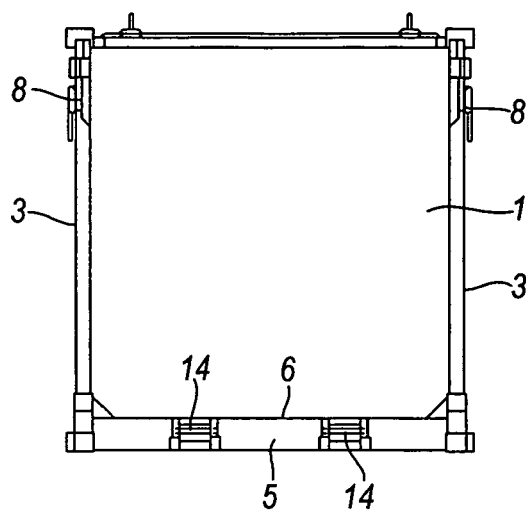


Fig. 2B

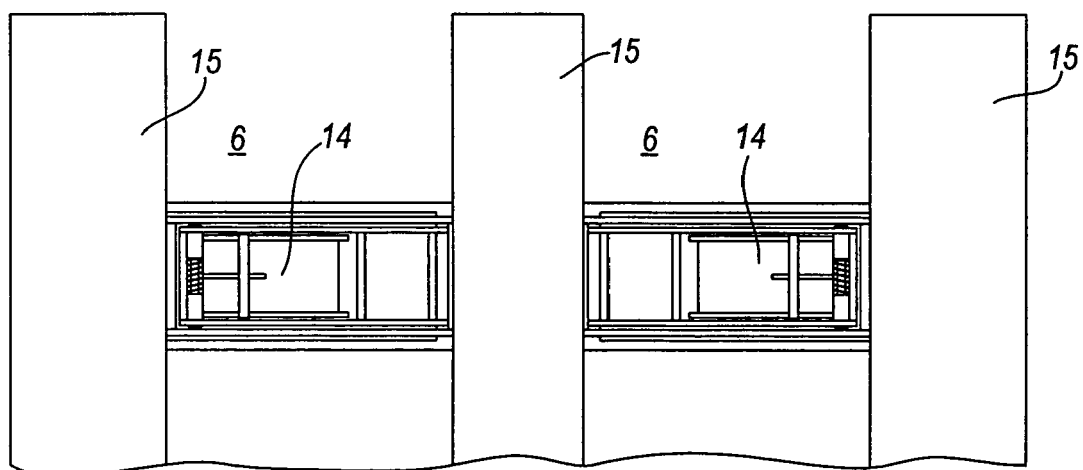


Fig. 2C

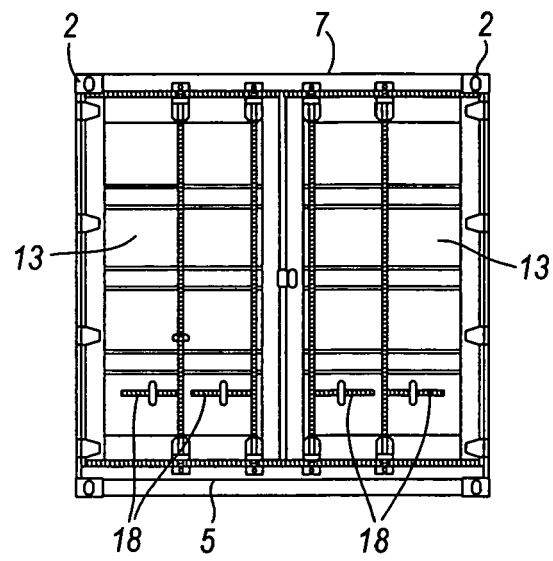


Fig. 3

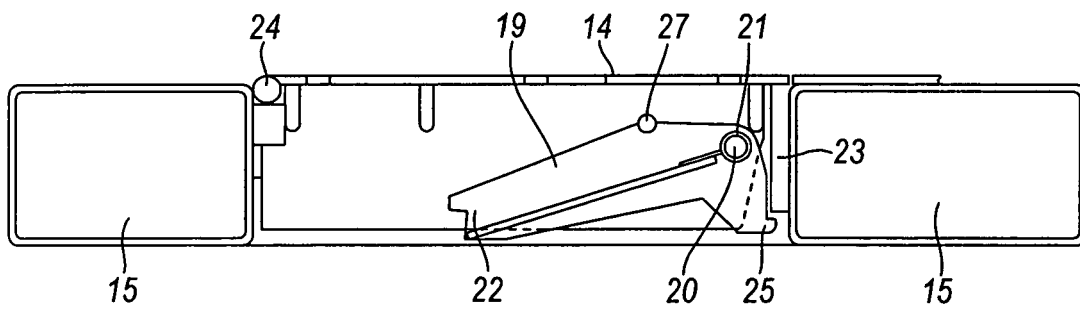


Fig. 4A

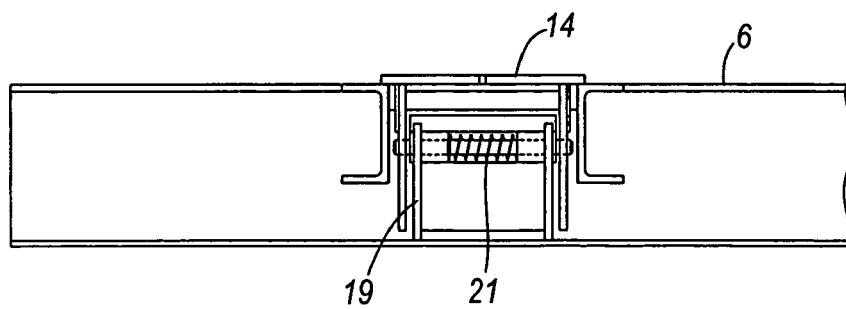
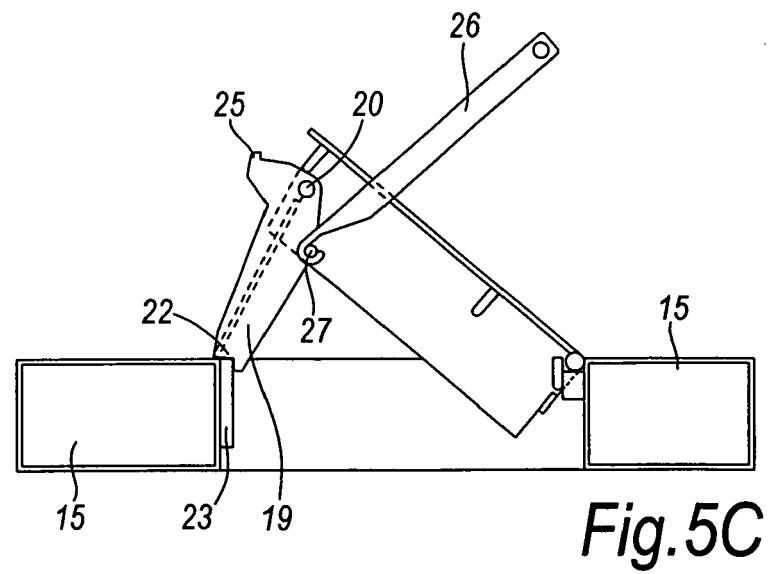
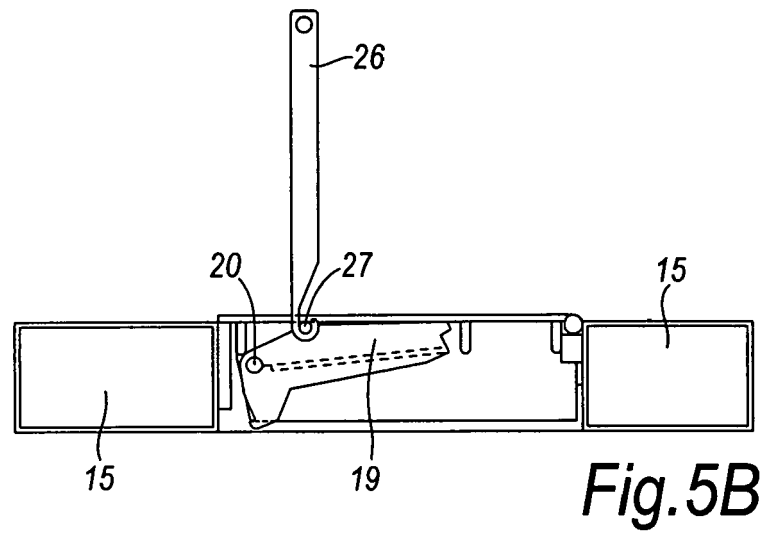
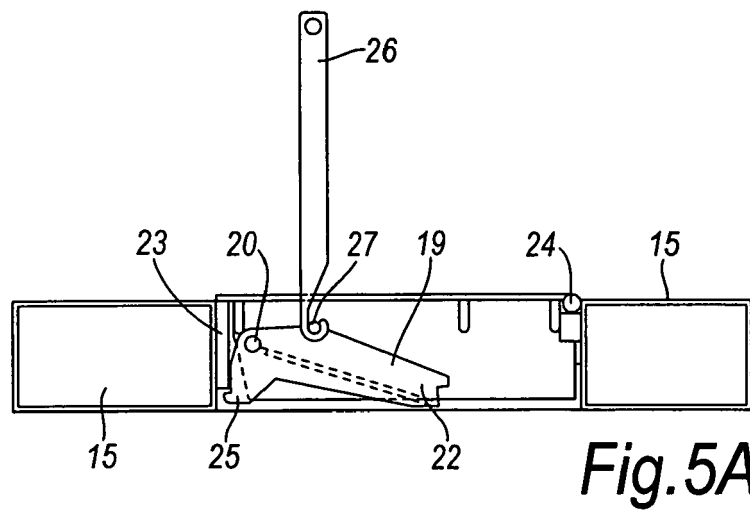


Fig. 4B





European Patent
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PARTIAL EUROPEAN SEARCH REPORT

Application Number

which under Rule 63 of the European Patent Convention EP 07 25 3626 shall be considered, for the purposes of subsequent proceedings, as the European search report

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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A	EP 0 941 945 A (BLACKROCK ENGINEERING LIMITED [GB] COIL TAINER LTD [US]) 15 September 1999 (1999-09-15) * abstract; figures 3-13 *	1,2,16	
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			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
INCOMPLETE SEARCH The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims. Claims searched completely : Claims searched incompletely : Claims not searched : Reason for the limitation of the search: see sheet C			
Place of search Munich		Date of completion of the search 12 December 2007	Examiner Piolat, Olivier
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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European Patent
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INCOMPLETE SEARCH
SHEET C

Application Number

EP 07 25 3626

Claim(s) not searched:
15, 21

Reason for the limitation of the search (non-patentable invention(s)):

Claims 15 and 21 do not meet the requirements of Rule 43(6) EPC. A meaningful search of the subject-matter of these claims is not possible.

Further limitation of the search

Claim(s) not searched:
15, 21

Reason for the limitation of the search:

Claims 15 and 21 do not meet the requirements of Rule 43(6) EPC. A meaningful search of the subject-matter of these claims is not possible.

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

EP 07 25 3626

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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12-12-2007

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