



- (51) **International Patent Classification:**
B65D 90/00 (2006.01)
- (21) **International Application Number:**
PCT/EP2012/056169
- (22) **International Filing Date:**
4 April 2012 (04.04.2012)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
201 15334 7 April 2011 (07.04.2011) FI
- (71) **Applicant (for all designated States except US):** OY LANGH SHIP AB [FI/FI]; Alaskartano, FI-21500 Piikkio (FI).
- (72) **Inventor; and**
- (75) **Inventor/Applicant (for US only):** LANGH-LAGER-LÖF, Laura [FI/FI]; Alaskartano, FI-21500 Piikkio (FI).
- (74) **Agent:** KOLSTER OY AB; Klaus Roitto, Iso Roobertintinkatu 23, P.O.Box 148, 00121 Helsinki (FI).
- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,

DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(H))
- of inventorship (Rule 4.17(iv))

Published:

- with international search report (Art. 21(3))

(54) **Title:** CONTAINER

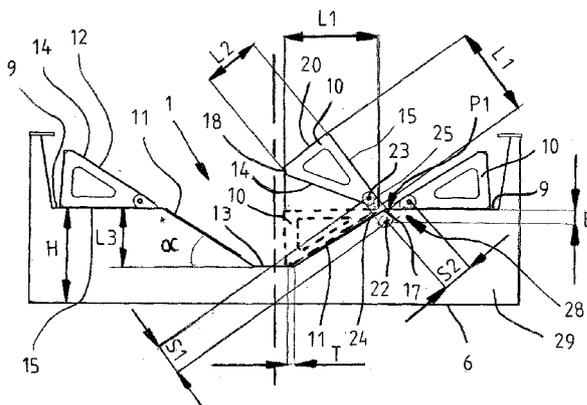


FIG. 19

(57) **Abstract:** The invention relates to a container comprising a chute (1) for supporting reels, the chute comprising a bottom (13), a lower wall zone (11) and an upper wall zone (12), and a support frame (29) for supporting the chute. To make the container suitable for various purposes allowing not only reels but other cargo of various kinds to be transported, it comprises a horizontal support plane (9) on both sides of the chute (1), the upper wall zone (12) being formed by a first support surface (14) of a wedge-like support member (10) placed onto the support plane (9), a second support surface (15) of the support member (10) resting against the support plane (9) when the support member is in a first position of use; a pivot mechanism (28) allowing the support member (10) to be turned in relation to a support frame (29) of the chute so that the first support surface (14) of the support member sets against the lower wall zone (11) of the chute (1) and the second support surface (15) of the support member sets onto the same height level as the support plane (9) for forming a uniform loading plane and for placing the support member to a second position of use, the pivot mechanism (28) comprising two pivots (22 and 23), a first pivot (23) of which in the support member (10) and a second pivot (22) under the support platform (9) at a distance (B) from the support platform, a pivot arm (24) connecting the first pivot (23) to the second pivot (22).



WO 2012/136706 A1

Container

Background of the invention

[0001] The invention relates to a container comprising a chute for supporting cylindrical objects, such as reels and tubes, the chute comprising a bottom and a wall structure that extends upward and outward from the bottom of the chute on both sides thereof and is bipartite on both sides of the chute, comprising a lower wall zone and an upper wall zone as an extension of the lower wall zone, and a support frame for supporting the chute.

[0002] This type of container is known from publication WO 2009/1 18459 A 1. A problem with this prior art container is that it is not suitable for carrying other than cylindrical cargo items. When used for carrying a cylindrical item from point A to point B, the cylindrical item being unloaded in point B, the container is not useful for the continued transport unless other cylindrical objects are to be carried from point B. As a result, the container returning from point B is typically empty until reloaded again in point A (or some other point) with cylindrical cargo items.

Brief description of the invention

[0003] An object of the invention is to provide a new container which is easily modifiable to be adapted to carry cylindrical cargo items or, alternatively, in principle any other cargo. The container allows a cylindrical cargo item to be carried to its destination and in principle any cargo on the way back - or vice versa. The container even enables both cylindrical cargo items and other cargo to be carried at the same time.

[0004] The container of the invention is characterized by what is disclosed in the accompanying claim 1.

[0005] There is preferably a first pivot at a tip of a wedge-shaped support member and a second pivot close to the top edge of the lower wall zone, below the surface of the lower wall zone. This type of arrangement enables the support member to be dimensioned in such a manner that a distance between the lower wall zone and the upper wall zone, i.e. a transition area, can be made small and the chute as uniform as possible without a wide interfering transition or discontinuation when the support member is in a first position of use and serves as the upper wall zone of the chute.

[0006] Both sides at the respective ends of the support member are preferably provided with a pivot mechanism because this type of pivoting increases the solidity of the structure.

[0007] The support member preferably comprises a third support surface arranged to rest on the bottom of the chute when the support member is in the second position of use. The resting of the support member against the chute bottom is highly recommended because the bottom of the chute is easy to make structurally strong.

[0008] The container preferably comprises a multitude of support members at a distance from one another, with pivot mechanisms at both ends of the pieces, the ends of the support members being also preferably formed as stopping means for preventing cylindrical objects from sliding in a longitudinal direction of the chute. Because of the multitude of support members, the container offers a wide variety of modification options, and the weight of the support members remains relatively low which makes the support members easy to turn manually. It is recommended to prevent reels and rolls from sliding in the chute, because sliding causes high impact loads on the structures. When a support member is turned down, its side serves as a means of stopping a reel or a roll. A risk of reels sliding and moving arises when the container is subject to high acceleration forces during transport.

[0009] The preferred embodiments of a container according to the invention are disclosed in the dependent claims.

[0010] Major advantages of the container of the invention are its suitability for various uses and extreme ease of modification according to need: it is suitable for carrying not only round cargo items but also other types of load. Moreover, when heavy reels are transported, the mass centre is low. The pivot mechanism with two pivots and a pivoting arm connecting them enables a uniform chute to be formed in which the pivot mechanism does not protrude from the chute. Such a protrusion would be in the way during loading or transport and thus prone to damage. In addition, the pivot mechanism allows the chute to be provided with a friction-increasing material with the aim of improving friction against cylindrical objects to be carried and avoiding damage to the cargo, without the friction-increasing material causing high loads to the pivot mechanism when the container is used for transporting other than cylindrical objects and when the support members are turned into a position in which they and the horizontal support plane together form a uniform loading plane.

Brief description of figures

[001 1] The invention will now be described in greater detail by means of two embodiments and with reference to the attached drawing, in which:

Figure 1 illustrates a container from one end;

Figure 2 illustrates the container of Figure 1 along a section line II-II of Figure 1;

Figures 3 to 6 show a central operating mechanism of the container in a first position of use;

Figures 7 to 10 show a central operating mechanism of the container in a second position of use;

Figures 11 to 18 show the setting of the central operating mechanism of the container in different positions of use (cf. the positions of use in Figures 3 to 6 and 7 to 9);

Figure 19 is an enlargement of Figure 13 and aims at illustrating in greater detail the central operating mechanism of the container and its structure; and

Figure 20 illustrates a second embodiment of the invention comprising an operating mechanism similar to the solution in Figures 1 to 19.

Detailed description of the invention

[0012] Figure 1 is a perspective end view illustrating a container of the invention and Figure 2 is a side view illustrating the container of Figure 1 along a section line II-II of Figure 1. The dimensions of the container correspond to those of a standard container of 20 feet. Hence the width of the container is 8 feet and the height of the container is approximately 8.5 feet.

[0013] The container comprises a chute 1 in a longitudinal direction thereof, with three reels 2 loaded in the chute. The reels are steel reels, but they could be paper reels or other cylindrical objects, such as tubes. At one end of the container there is a plate load 3 (see Fig. 2). An operating mechanism included in the container allows a desired length to be chosen for the chute 1. In Figure 2 the length of the chute 1 has been set equal to about three reels, the chute being filled close to one end thereof with wedge-like support members 10 belonging to the operating mechanism. The structure and operation of the support pieces is described below. A support member 10 may be

considered to comprise three main surfaces and two ends which form respective sides of the support member.

[0014] The container may be loaded through stowage doors 4 provided either at an end or ends thereof or through a roof structure 5 of the container. The roof structure 5 of the container can thus be opened. The roof structure forms a top plane of the container.

[0015] All corners of the container bottom 6 are provided with fastening means 7 for fastening the container to a transport vehicle, such as a train, ship or truck (not shown). Means conventionally used in containers for fastening them to a platform or bottom of a vehicle are recommended for use as fastening means 7. The corners of the roof structure 5 are provided with corresponding fastening devices 8. Likewise, prior art container fastening devices allowing containers to be loaded one on top of the other are recommended for use as fastening devices 8.

[0016] In Figure 2 a plate load 3 has been piled on top of the loading plane of the container.

[0017] Figure 1 shows that the chute 1 is formed of a bottom 13 and of a lower wall zone 11 and an upper wall zone 12 extending upward from the bottom and on both sides thereof. The upper wall zones 12 form an extension of the lower wall zone 11. The upper wall zones 12 are formed of support surfaces 14 of the wedge-shaped support members 10. The lower surfaces 15 of the support members 10 are supported by the horizontal support plane 9 on both sides of the chute 1. A reel 2 rests against an upper area of the lower wall zone 11. However, the upper wall zones 12 are needed to prevent a reel from drifting during transport to the support plane 9 of the container, which could easily cause the reel to penetrate a side wall of the container or make the container and the vehicle, such as a railway carriage, underneath it to fall on its side. Although not shown in the Figures, it is conceivable that the reel 2 rests against the upper wall zone 12. The latter may be the case when large reels are transported.

[0018] Figure 2 shows that each reel 2 is supported by two support members 10 on one side, each reel being thus supported by a total of four support members. The support members 10 are depicted by a broken line. The support members 10 under the plate load 3, altogether $3 + 3 = 6$ of them, have been turned to a position in which they allow a plate load 3 (or some other load) to be placed onto the loading plane. Turning of the support members

is enabled by a pivot mechanism, which in Figure 2 is generally indicated by reference numeral 28.

[0019] Figures 3 to 6 show how the reel 2 is supported in the chute. For the sake of simplicity, Figures 3 to 6 only show part of the length of the container chute 1. Figure 4 is a front view, Figure 5 a side view and Figure 6 a top view of an operating mechanism and the reel 2 according to Figure 3. In Figures 3 to 6 the support members 10 are in a first position of use, the support surface 14 of the support members forming the upper wall zone 12 of the chute. Figures 3 and 4 show that a lower edge 16 of the support surface 14 of the support member 10 sets close to a top edge 17 of the lower wall zone 11 of the chute and that the height position of the support plane 9 sets at the top edge 17 and the lower edge 16. Because there is no wide and deep discontinuation between the lower edge 16 and the top edge 17, support from the chute 1 to the reel 2 is uniform even if the reel momentarily, for example during marine transport, were to shift upwards in the chute 1. In Figures 3 to 6 the support plane 9 does not serve as an actual loading plane but as a support plane against which the support surfaces 15 of the support members 10 rest.

[0020] Figures 7 to 10 how the support members 10 fill the chute and covered it. In Figures 7 to 10 the support members 10 have been turned down, their first support surface 14 resting against the lower wall zone 11 of the chute and the relatively short support surface 18 of the support members 10 resting against the chute bottom 13. It is possible to have a support member rest against the chute only on its support surface 18 or support surface 14, but it is recommended to provide the support member with a large support surface formed by the lower wall zone of the chute and the chute bottom 13.

[0021] The support members 10 are easy to install into the position shown in Figures 7 to 10 because of a pivot mechanism 28 joining the support members 10 to the support frame 29 of the chute. The pivot mechanism of the support members 10 will be described in greater detail below with reference to Figure 19. The structure of the support frame 29 is not shown in detail in the figures because it does not require special effort from a skilled professional to achieve. Naturally, the support frame 29 must be sufficiently strong to be able to support the chute and the cargo placed therein. The support frame 29 is preferably made so strong that it allows a container full of heavy reels or other cargo to be lifted by a crane.

[0022] When the support members 10 are turned to the position shown in Figures 7 and 8 their support surface 15 sets to the same height level as the support plane 9. The support members 10 and the support plane 9 thus form a uniform loading plane onto which cargo of various kinds may be loaded, i.e. cargo which is usually transported in containers. As shown in Figures 7 and 10, there is hardly any gap between adjacent support members but the support surfaces 15 continue in the longitudinal direction of the chute, forming a continuous support surface.

[0023] Figures 11 to 16 illustrate how a support member 10 belonging to the operating mechanism is turned from the first position of use shown in Figures 3 to 6 to the second position of use shown in Figures 7 to 10.

[0024] In Figures 11 and 12 one support member 10 has been lifted upwards so that its support surface 15 is at an angle of about 35 degrees to the support plane 9. In Figures 13 and 14 the angle is about 120 degrees and in Figures 15 to 17 it is 180 degrees, the support surface 15 being at the same level as the support plane 9. When all the support members of Figures 15 to 17 in the upper position are turned down, the situation shown in Figures 7 to 10 is arrived at.

[0025] The support members 10 are turned by hand. To facilitate the turning, all - or possibly only some - of the support surfaces 15 and 14 of the support members 10 may be provided with openings 21, see Figures 14 and 16 and 17, openings (not shown) being possibly also provided in support member surfaces 20 (see surface 20 in Figure 15). The openings 21 allow to take hold for lifting the support members 10.

[0026] In Figure 19 the operating mechanism associated with the chute 1 is shown in greater detail than above. Both sides of the ends of the support members 10 are articulated to the support frame by a pivot mechanism 28 comprising two pivots 22, 23. The pivots 22, 23 are at a distance S_1 from one another and connected by a pivot arm 24. The distance S_1 between the pivots 22, 23 exceeds the distance of the second pivot 22 from the top edge 17 of the lower wall zone 11. The distance S_1 is preferably 10 to 20 mm. The pivot 22 is linked to the support frame 29 of the chute, the pivot 23 being located at the tip 25 of the support member 10 (the support member tip closer to the top edge 17 of the lower wall zone 11) or very close to it. The pivot 22 is below the support plane 9, at a distance B from the support plane. The pivot 22 is preferably a bar (see reference numeral 31 in Figure 17) extending in a longi-

tudinal direction of the container, the pivot arm 24 being provided with an opening to serve as a bearing of the bar 31 (see Figure 17). The distance B is preferably 5 to 10 mm. The pivot 23 is preferably a bar (see reference numeral 32 in Figure 17) extending from one end of the support member 10 to the other end thereof. The bar 32 (see Figure 17) has been welded to the pivot arms 24 at the ends of the support member, the tip 25 of the support member being provided with openings at the ends thereof to serve as a bearing of the bar 32. This type of bar 32 welded to the pivot arms 24 and connecting them stabilizes the pivot mechanism 28 and greatly facilitates the turning of the support member 10 to a desired position of use. The support surface 15 of the support members has a length L1 which is 40 to 50 cm, preferably about 45 cm. The chute has an angle α , which is 30 to 40 degrees, preferably about 35 degrees. In broader terms the angle may be 25 to 45 degrees. Outside this range it is likely that the chute does not support the reels well. The support surface 9 has a height H, i.e. a distance from the bottom 6, which is about 40 to 50 cm, preferably about 45 cm. In broader terms the distance H from the bottom 6 may be 25 to 50 cm. Height L2 of the surface 20 of the support member 10 corresponds to height L3 of the lower wall zone of the chute and is 15 to 30 cm. Seen from an end, the support member 10 has the shape of a right-angle triangle in which the smallest angle corresponds to the inclination of the chute (i.e. about 35 degrees). The dimensions and values given are based on a container width of 8 feet, i.e. about 2.4 m.

[0027] The disclosed dimensioning and arrangement of the different parts of the operating mechanism allows the lower edge 16 of the support surface 14 of the support member 10, which is close to the tip 25 of the support member and forms part of the chute, to set close to the top edge 17 of the lower wall zone 11, when the support member is in its first position of use, leaving no harmful discontinuation at point P1 between the top edge 17 and the lower edge 16.

[0028] The disclosed arrangement also allows the tip 25 of the support member 10 to be turned over the top edge 17 of the lower wall zone 11 and past it without the tip 25 touching the top edge 17 of the wall zone 11 at point P1, which would prevent the tip 25 from turning past the top edge.

[0029] Because of the disclosed arrangement no harmful gap is left between the support surfaces 15 of two opposite support members 10 turned down; see arrow 19 in Figure 8, which depicts an extremely small gap that is

not harmful. It may be said that in practice the opposite support surfaces 15 form a uniform loading surface or a loading surface area.

[0030] Because of the disclosed arrangement, no harmful discontinuation is left in point P2 between a support member 10 turned down and the top edge 17 of the lower wall zone 11; see arrow 26 in Figure 8.

[0031] Because of the disclosed pivot mechanism and arrangement no component of the pivot mechanism (pivot 22, 23 or the pivot arm 24 connecting the pivots) reaches above the surface of the loading plane when the support member 10 is in its second position of use, in which it forms part of the loading plane (cf. Figure 8). Further, because of the disclosed pivot mechanism and arrangement no component of the pivot mechanism (pivot 22, 23 or the pivot arm 24 connecting the pivots) reaches above the support surfaces formed by the inclined wall zones 11, 12 of the chute when the support member 10 is in its first position of use, in which it forms part of the chute (cf. Figure 4).

[0032] The chute 1 and the support members 10 of the container are made of steel. A reel 2 made of steel has a low friction against steel. Because of the above, it is recommended to arrange an elastomer layer (e.g. a rubber layer or a rubber coating) on top of the lower or higher wall zone 11 or 12 of the chute - or on top of both the lower and the higher wall zone. For the sake of simplicity the elastomer layers are shown in slightly greater detail only in Figure 12, in which reference numeral 33 indicates an elastomer layer laid on top of the lower wall zone 11 and reference numeral 34 an elastomer layer laid on top of the upper wall zone 12, i.e. the support surface 14 of the support member 10. The elastomer layers 33, 34 increase the friction of the chute 1 against the cargo being carried, which reduces the tendency of the cargo to slide in a longitudinal direction of the chute during transport. A further advantage of the elastomer layers is that they attenuate shocks possibly caused by the load placed onto the chute 1. The pivots 22 and 23 and the pivot arms 24 interconnecting them allow the elastomer layers 33, 34 laid on top of the support surfaces 14 of the support members 10 and the wall zones 11 to be placed parallel against each other in the position shown in Figure 8 (in which the support members 10 have been turned against the wall zones) without the pivots 22, 23 being subjected to high torsional loads during loading of cargo onto the support surfaces 15.

[0033] Figure 20 illustrates a second embodiment of the invention. A container comprises three chutes in a transverse position to a longitudinal direction of the container. Similarly as in Figure 2 the container is a container of standard dimensions and comprises fastening arrangements at its corners to allow the container to be fastened to a platform and to receive another container on top of it. The container of Figure 20 has four reels 2': two reels one after the other in a chute 1a' and two reels one after the other in a chute 1b'. At the left-hand end of the container there is a plate load 3' loaded on the loading plane and another load 30' on top of the plate load. The support members 10' of the container in Figure 20 are functionally and structurally similar to the support members 10 in Figure 2. The container in Figure 20 comprises stowage doors (not shown) provided in a longitudinal wall of the container.

[0034] The invention is described above by means of two examples only. It is to be noted that the details of the invention may be implemented in various ways within the scope of the attached claims. Hence the number of the support members 10, 10', for example, may vary. The disclosed dimensions of the operating mechanism associated with the chute of the container may vary to some extent although not much because otherwise all the disclosed advantages are not obtained. The disclosed dimensioning specifically allows the above-identified advantages to be obtained, which is why the disclosed dimensioning is significant. The container does not need to be a standard container of 20 feet, as disclosed, but may be a standard container of 40 or 45 feet, for example. The container does not need to be 8 feet wide but its width may correspond to that of a container known as a pallet-wide container, which is slightly more than 8 feet and is about 2.5 to 2.6 m. The container does not need to be 8.5 feet high but a container known as a high cube container having a height of 9.5 feet or about 2.9 m is possible. All of these standard containers allow the advantages of the invention to be achieved. As to the possibilities of modification, it should be mentioned that the roof of the container does not need to be detachable, although in view of the loading of the container this is highly recommended. The container is naturally suitable for transporting not only reels but other types of cylindrical loads as well, such as paper rolls, tubes or round bars.

Claims

1. A container comprising a chute (1, 1a', 1b') for supporting cylindrical objects, such as reels (2, 2') and tubes, the chute comprising a bottom (13) and a wall structure that extends upward and outward from the bottom (13) of the chute on both sides thereof and is bipartite on both sides of the chute, comprising a lower wall zone (11) and an upper wall zone (12) as an extension of the lower wall zone, and a support frame (29, 29') for supporting the chute, the container comprising on both sides of the chute (1) a horizontal support plane (9, 9') the height position of which in the container sets at a top edge (17) of the lower wall zone (11) and at a lower edge (16) of the upper wall zone (12), each upper wall zone (12) being formed of a first support surface (14) of a wedge-like support member (10, 10') placed onto the support plane (9, 9'), a second support surface (15) of the support member (10, 10') resting against the support plane (9, 9') when the support member is in a first position of use, the support member (10, 10') being turnable by a pivot mechanism (28) in relation to the support frame (29, 29') of the chute so that the first support surface (14) of the support member sets against the lower wall zone (11) of the chute (1) and the second support surface (15) of the support member sets at the same height level as the support plane (9, 9') for forming a uniform loading plane and for placing the support member to a second position of use, the pivot mechanism (28) comprising two pivots (22 and 23, 23'), a first pivot (23, 23') of which is in the support member (10, 10') and a second pivot (22) is under the support plane (9, 9') at a distance (B) from the support plane, a pivot arm (24) connecting the first pivot (23) to the second pivot (22).

2. A container as claimed in claim 1, characterized in that the first pivot (23) is at a tip (25) of the support member (10, 10') and in that the second pivot (22) is close to the top edge (17) of the lower wall zone (11), below the support surface formed by the lower wall zone (11).

3. A container as claimed in claim 1 or 2, characterized in that the pivot mechanism (28) is arranged to both ends of the support member (10, 10').

4. A container as claimed in claim 1 or 2, characterized in that the support member (10, 10') comprises a third support surface (18) arranged to be supported by the bottom (13) of the container (1) when the support member is in the second position of use.

5. A container as claimed in claim 1, characterized in that the wall structure of the chute is at an angle (a) of 30 to 40 degrees to the horizontal.

6. A container as claimed in claim 1, characterized in that the chute (1) is disposed in a longitudinal direction of the container and extends from one container end to the other and in that the container comprises a stowage door (4) at an end of the container.

7. A container as claimed in any one of the preceding claims, characterized in that the container comprises a multitude of support members (10, 10') at a distance from one another, with a pivot mechanism (28) at both ends thereof.

8. A container as claimed in claim 7, characterized in that the ends of the support members (10, 10') are formed as stopping means to prevent cylindrical objects from sliding in a longitudinal direction of the chute.

9. A container as claimed in any one of the preceding claims, characterized in that the loading platform extends substantially over the entire bottom surface of the container when the support members (10, 10') have been turned to the second position of use.

10. A container as claimed in any one of the preceding claims, characterized in that the dimensioning of the container corresponds to the dimensioning of a standard container and that its bottom (6) comprises fastening means (7) at the corners thereof for fastening the container to a transport vehicle and that its top plane comprises fastening devices (8) at the corners thereof for receiving another container, the fastening devices being dimensioned to allow the container to be lifted by a crane.

11. A container as claimed in claim 1, characterized in that the top plane of the container is formed of a detachable roof structure (5).

12. A container as claimed in claim 1, characterized in that it comprises a plural number of chutes in a transverse position to the longitudinal direction of the container.

13. A container as claimed in any one of the preceding claims, characterized in that the lower wall zone (11) or the first support surface (14) of the support member (10) comprises an elastomer layer (33, 34).

1/4

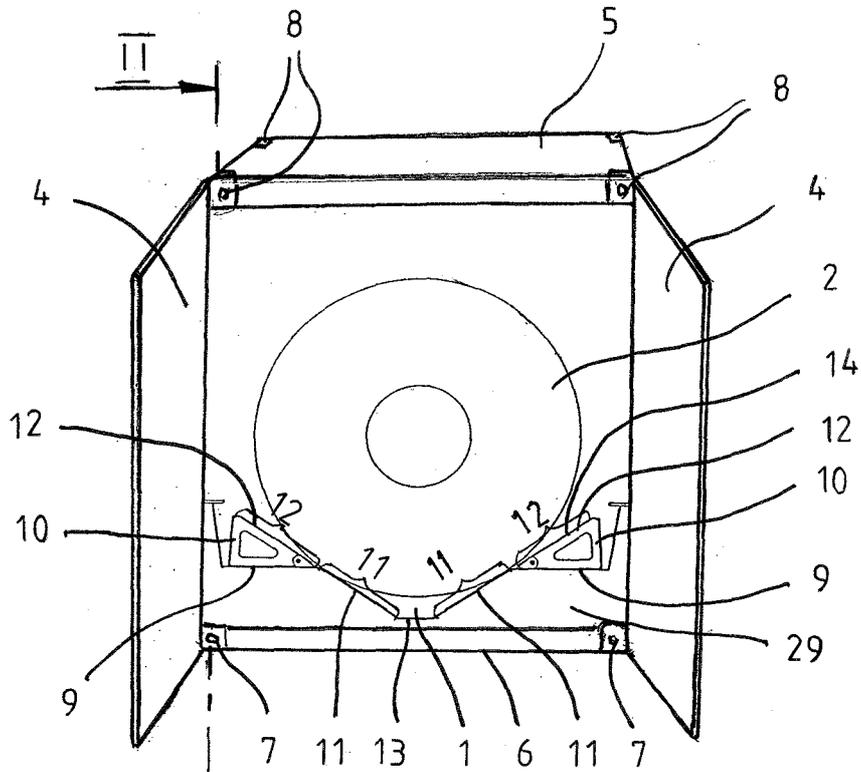


FIG. 1

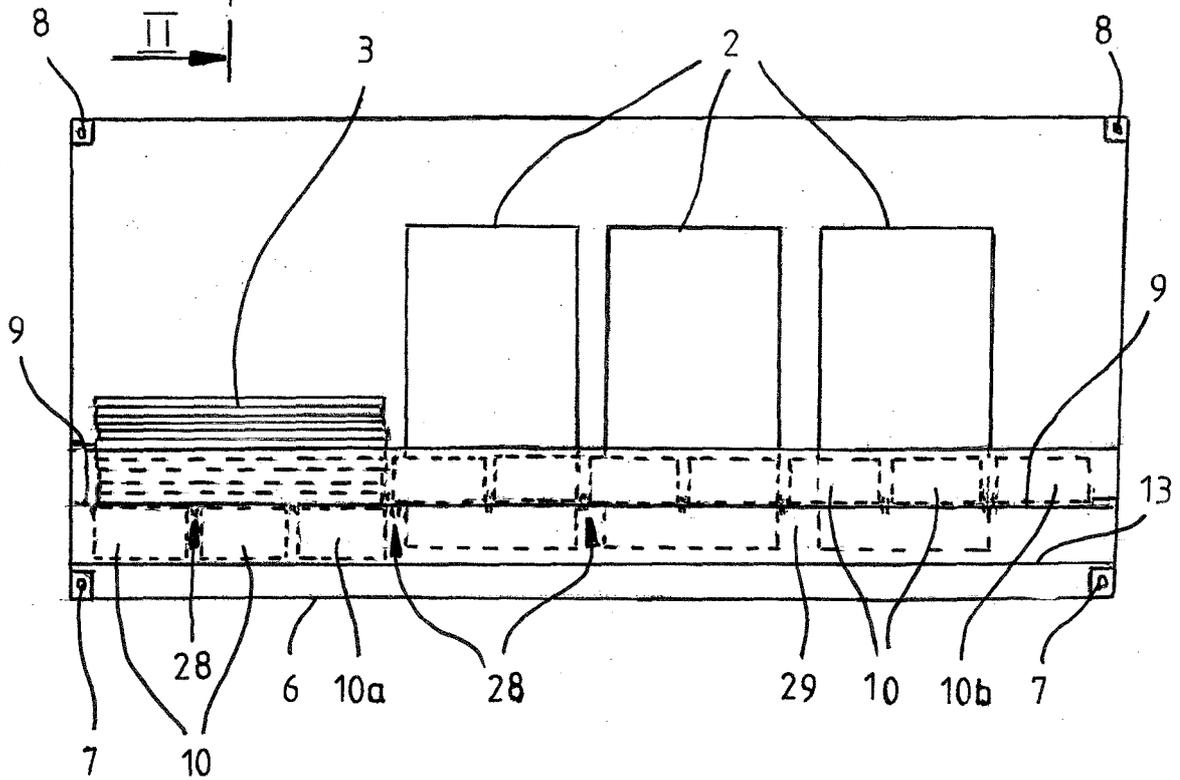


FIG. 2

2/4

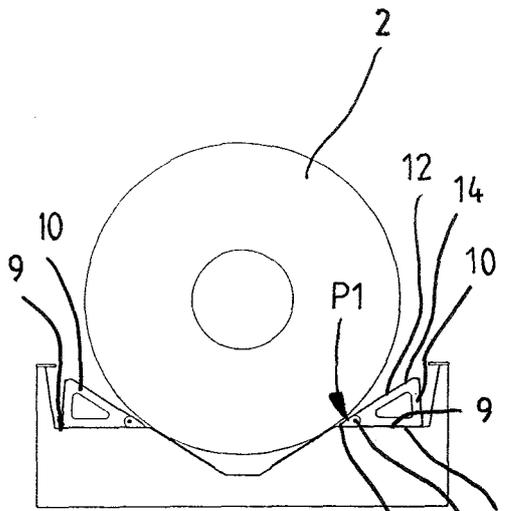


FIG. 4

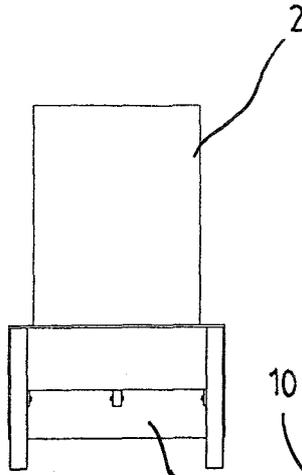


FIG. 5

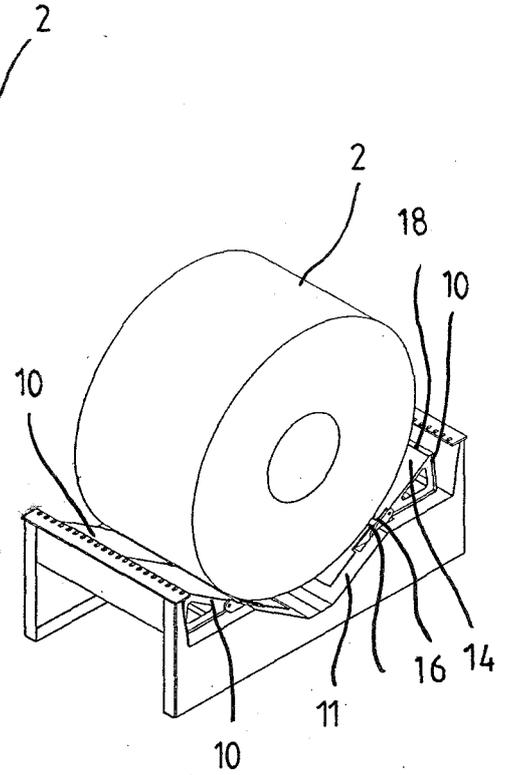


FIG. 3

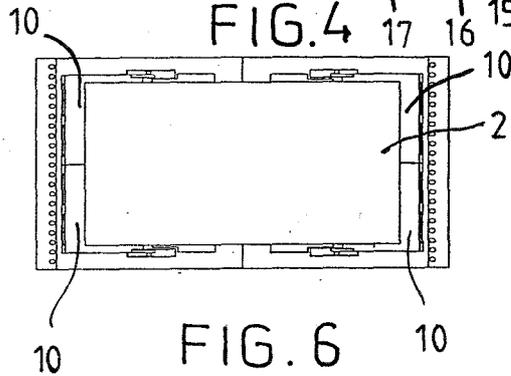


FIG. 6

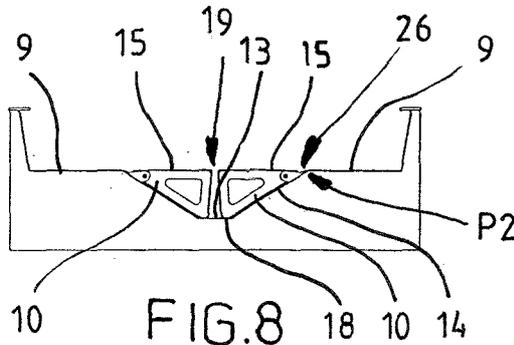


FIG. 8

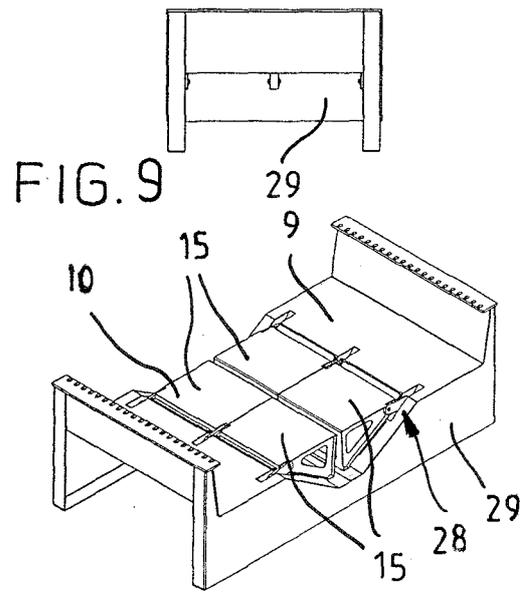


FIG. 7

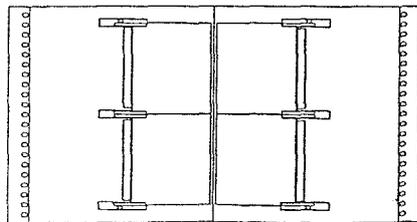


FIG. 10

3/4

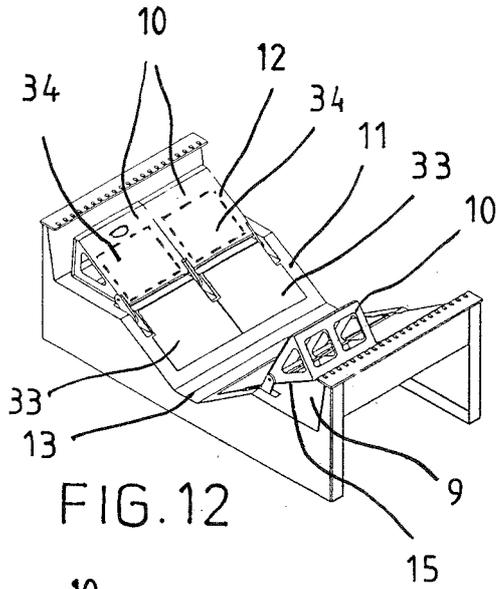


FIG. 12

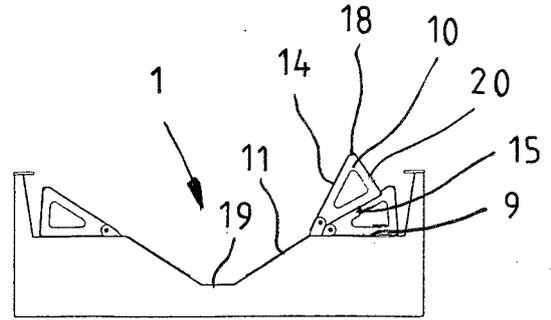


FIG. 11

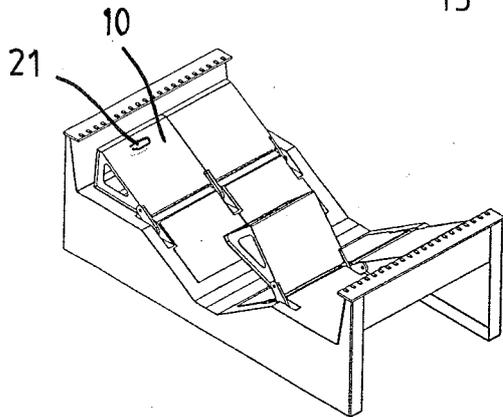


FIG. 14

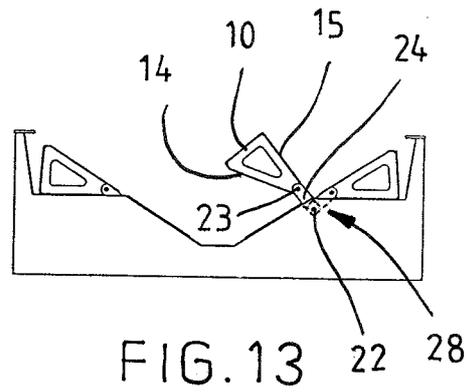


FIG. 13

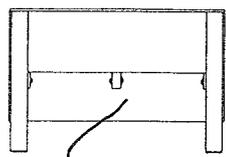


FIG. 18

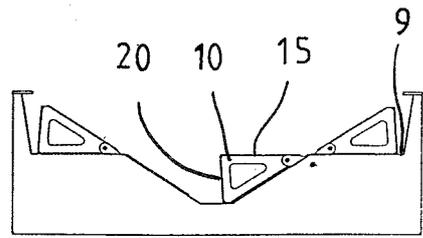


FIG. 15

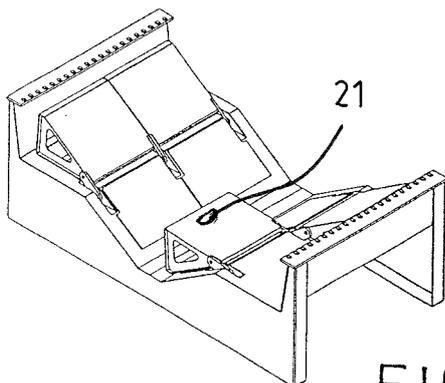


FIG. 16

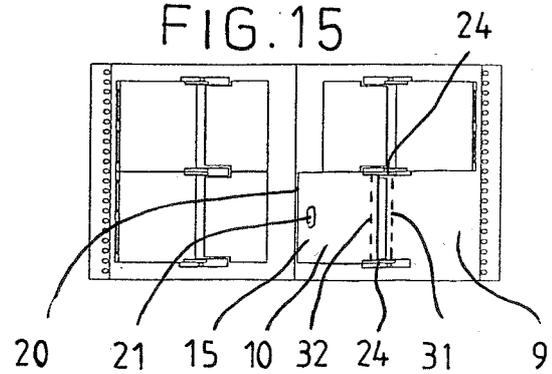


FIG. 17

4/4

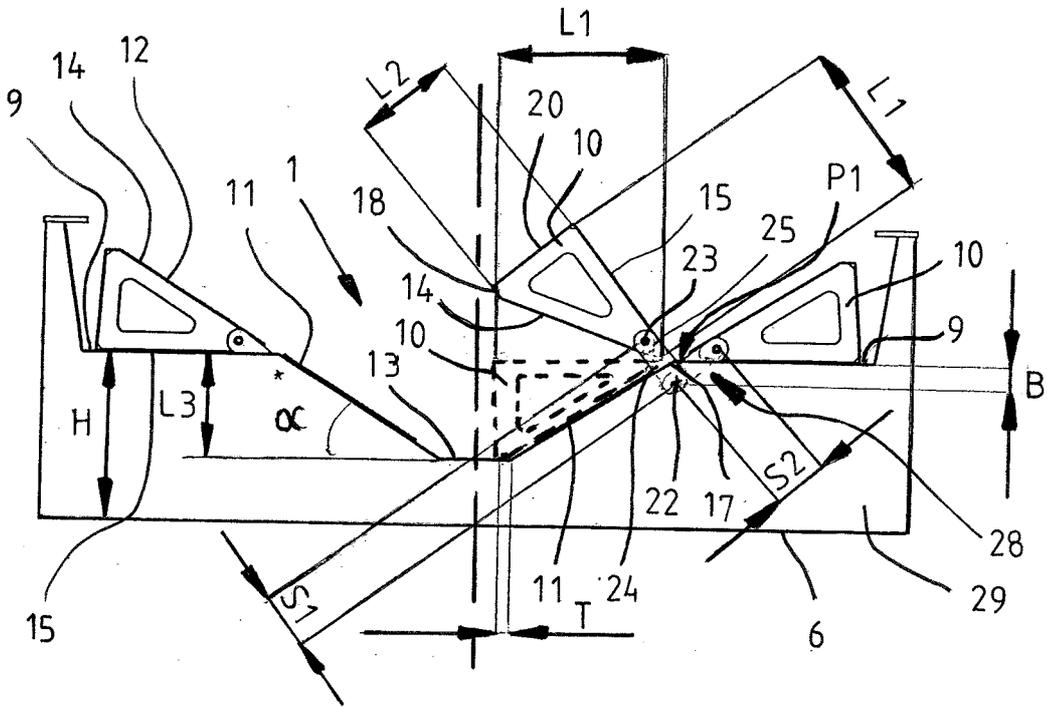


FIG. 19

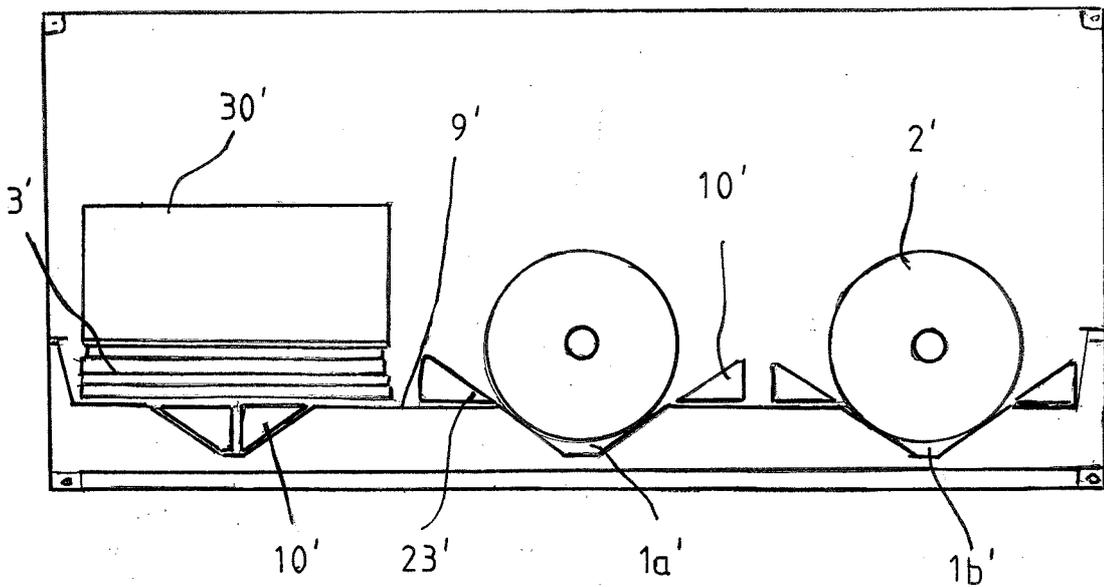


FIG. 20

INTERNATIONAL SEARCH REPORT

International application No PCT/EP2012/056169
--

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D90/00
 ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 967 466 A1 (CRONOS EQUIPMENT BERMUDA LTD [BM]) 10 September 2008 (2008-09-10) paragraph [0023] - paragraph [0037] ; figures 1-5c -----	1-13
A	Wo 2007/008815 A2 (COIL TAINER LTD [US] ; SMOLENSKJI MICHAEL J [US] ; POSTHUMUS RUDY [BE] ;) 18 January 2007 (2007-01-18) paragraph [0029] - paragraph [0044] ; figures 1-4 -----	1-13
A	EP 0 460 715 A2 (FURUKAWA SHIGENOBU [JP]) 11 December 1991 (1991-12-11) column 5, line 31 - column 19, line 48; figures 1-23 -----	1-13
	-/- .	

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search 5 July 2012	Date of mailing of the international search report 24/07/2012
---	---

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Lammel , Gunnar
--	--

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/056169

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US R E37 575 E I (LAMBERT W I L L I A M E [US]) 12 March 2002 (2002-03-12) col umn 3, line 66 - col umn 10, line 5; f i g u r e s 1-9	1-13
A	----- w o 2009/118459 A I (O Y L A N G H S H I P A B [FI] ; L A N G H H A N S [FI]) 1 October 2009 (2009-10-01) p a r a g r a p h [0020] - p a r a g r a p h [0074] ; f i g u r e s 1-17 -----	1-13

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2012/056169

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1967466 AI	10-09-2008	EP 1967466 AI	10-09-2008
		Wo 2008107626 AI	12-09-2008
wo 2007008815 A2	18-01-2007	AT 535456 T	15-12 -2011
		AU 2006268368 AI	18-01 -2007
		CN 101242996 A	13-08 -2008
		EP 1907288 A2	09-04 -2008
		ES 2377532 T3	28-03 -2012
		US 2007012588 AI	18-01 -2007
		wo 2007008815 A2	18-01 -2007
EP 0460715 A2	11-12-1991	DE 3875085 D1	05-11 -1992
		DE 3875085 T2	15-04 -1993
		EP 0318960 AI	07-06 -1989
		EP 0460715 A2	11-12 -1991
		US 4901855 A	20-02 -1990
		US 4997086 A	05-03 -1991
US RE37575 EI	12-03-2002	US RE37575 EI	12-03-2002
		US 5515977 A	14-05-1996
wo 2009118459 AI	01-10-2009	EP 2262677 AI	22-12-2010
		FI 121372 BI	29-10-2010
		wo 2009118459 AI	01-10-2009