(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 February 2003 (13.02.2003)

PCT

(10) International Publication Number
WO 03/011636 A1

(51) International Patent Classification[7]: B60P 1/64, B62D 53/06

(21) International Application Number: PCT/GB02/03388

(22) International Filing Date: 24 July 2002 (24.07.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0118128.8 25 July 2001 (25.07.2001) GB

(71) Applicants *(for all designated States except US)*: **WILLIAMSON, Robert** [GB/GB]; Broadfield Manor House, Old Soar Road, Plaxtol, Kent TN15 OQX (GB). **RAVEN, Paul** [GB/GB]; 6 Elm Close, Stowmarket, Suffolk IP14 1QW (GB).

(71) Applicant and
(72) Inventor: **RAVEN, Kevin** [GB/GB]; Ormesby House, 25 Gipping Road, Great Blakenham, Ipswich, Suffolk IP6 0JH (GB).

(74) Agent: **MCLEAN, Robert, Andreas**; Dummett Copp, 25 The Square, Martlesham Heath, Ipswich IP5 3SL (GB).

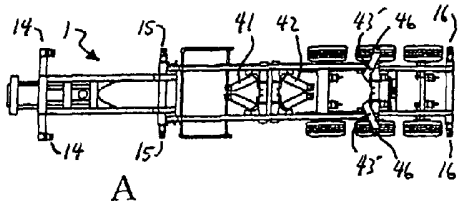
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

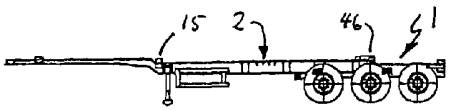
Published:
— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

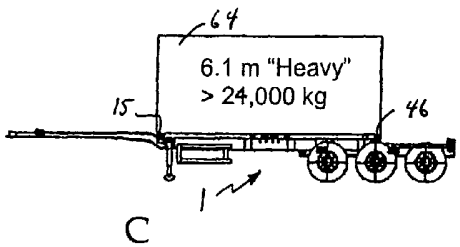
(54) **Title:** TRAILERS FOR CARRYING CONTAINERISED LOADS



A



B



C

(57) **Abstract:** The present invention relates to trailers for carrying containerised loads. The trailer (1) comprises a chassis section (2) formed utilising two substantially parallel elongate members (4), and one or more support members (41, 42, 43') for supporting containerised loads (64). The support member (41, 42, 43') being movable between a first position (41, 42) in which the support member is stowed between the elongate members (4) when not in use to support the containerised load (64), and a second position (43') in which the support member extends away from the elongate members (4) for supporting said containerised load (64).

WO 03/011636 A1

Trailers for Carrying Containerised Loads

The present invention relates to trailers for carrying containerised loads.

Flatbed and skeletal trailers often have a rear sliding bogie section that allows the trailers to be extendible between two lengths, for example 6.1m (20 feet) and 12.2 m (40 feet). In one mode of usage, the length of the trailer is locked at either of these lengths for mounting of containers with these lengths. A 13.6 m (45 feet) container may also be carried on a 12.2 m trailer. Alternatively, the length of the trailer may be locked in the extended position to permit greater axle loading, according to the law. For example, a 6.1 m (20 feet) container above a certain weight may be required by law to be carried by a 12.2 m trailer in order to spread the axle loading.

The extension may be accomplished by having the set of wheels on a bogie which is itself fixed to a slider mechanism for slidably moving the bogie relative to the chassis section.

Extendible trailers allow a driver to load various types of ISO container configurations, namely 1 x 12.2 m (40 feet) container standard or "High Cube" height, 1 x 13.6 m (45 feet) container standard or "High Cube" height, 1 x 9.1 m (30 feet) container, 1 x 6.1 m (20 feet) "Heavy" (at least 24 tonne) container standard or "High Cube" height placed in the centre of the trailer for axle loading laws and 2 x 6.1 m (20 feet) containers standard or "High Cube" height. The containers are collected from the docks and given to the operators for delivery. Due to nature of the work the haulier does not know in advance which type of container he may have

CONFIRMATION COPY

to carry for the next delivery.

When the trailer is extended, it is able to carry all of the above container sizes, however the "Heavy" 6.1 m container must be centrally mounted in order to comply with axle loading laws. In the extended position, the rear "Heavy" 6.1 m container doors cannot be accessed for unloading without retracting the trailer into the closed position. To close the trailer the driver can operate the locking mechanism from his cab to unlock the section, and then with the rear wheels locked, reverse the cab into its retracted position, closing the trailer fully allowing the container doors to become flush with the rear of the trailer for off-loading.

A number of problems arise from requirement to carry a variety of container types, particularly but not exclusively with such sliding bogie trailers. Firstly, this type of trailer is not able to carry all container configurations, loaded and unloaded, legally in compliance with both UK and Continental European axle and height laws. The UK and Continental European road haulage industry standard generally insists, due to cost and breakdown availability, that sliding container chassis are operated on super single 385 x 65 x R22.5 tyre size. This has split the UK and Continental European trailer manufactures into producing various types of the skeletal sliding bogie trailers. None of these variations has managed to overcome the divide. In Continental Europe there is a bridge height law setting a minimum clearance height of 4 m. As a result, the Continental European market requires what is known as a "Goose Neck" front to the trailer allowing a 13.6 m or 12.2 m (45 feet or 40 feet) "High Cube" container to sit lower on the chassis beams, thus reducing

the container height by around 120 mm to 160 mm in order to get the overall height of the loaded container underneath the 4 m bridge clearance height. To comply with current Continental European laws and regulations, Continental European manufactures build sliding skeletal trailers with axle weight configurations that would not meet current British axle weight laws. The UK does not allow such low bridge heights on main routes, so it is not as beneficial to have a "Goose Neck" front to the trailer. Consequently, trailers for use in the UK are much cheaper to produce, and a "High Cube" container can be carried sitting on top of the trailer chassis as opposed to within the neck of a trailer chassis.

Many trailer manufactures have produced sliding bogie trailers with low profile, and consequently high cost, tyre sizes in order to overcome the problem of bridge clearance. A low profile tyre means the UK trailer can then be built with a "Goose Neck" front whilst still allowing the 6.1 m (20 feet) "Heavy" container to travel to the rear. With the rear bogie section locked, the rear fixed twist lock beam is able to clear the spray suppression and axle assemblies. This is made possible owing to the low height of the wheel size.

Trailers with this lower axle / tyre size have not proved to be a success, and have become a costly alternative to obtaining a true UK/European sliding bogie skeletal trailer. Low profile tyres are not standard or widely available, and so a breakdown due to tyre failure can result in lengthy delays while a replacement tyre is located and fitted. Therefore, trailers that require an uncommon low profile tyre size are not economic for normal ISO container road haulage.

There is therefore a need for a UK/European trailer, and particularly an extendible trailer, that allows all container configurations, including "High Cube" containers. Such a trailer should ideally comply with all current axle weight laws including relevant bridge height legislation on the super single 385 x 65 x R22.5 tyre size or equivalent, which is the industry standard low cost tyre specification.

According to the invention, there is provided a trailer for carrying a containerised load, comprising a chassis section formed utilising two substantially parallel elongate members, and one or more support members for supporting said containerised load, the or each support member being movable between a first position in which the support member is stowed between the elongate members when not in use to support a containerised load, and a second position in which the support member extends away from the elongate members for supporting said containerised load.

Support members may then be moved into positions in which they may be used to support a containerised load, or stowed in positions where they are out of the way, allowing other support members and/or non-movable support members to be used, thus enabling the trailer to carry different configurations of containerised loads.

To facilitate this, it is preferred if the or each support member when in the first position lies substantially at or below the level the elongate members between which the support member is stowed. The containerised load may then rest on the elongate members. When the support members are fully below the elongate members, loaded containers may sit flush onto the top chassis beams.

Also, it is preferred if the or each support member when in the second position lies substantially at or above the level of elongate members from which the support member extends. The container may then more readily be secured to such a support in the second position.

The trailer may include coupling means at a front end for coupling the chassis to a fifth wheel of a tractor unit.

In preferred embodiments of the invention, the or each support member when in the second position is supported by an elongate member, for example by lying above and directly on the elongate member when in the second position.

It will normally be the case that there is at least one pair of support members which when in the second position are arranged directly opposite each other with respect to a longitudinal central line of the elongate members. Such paired support members may then engage with directly opposite support points on an ISO containerised load.

In preferred embodiments of the invention, the upper surface of the support member when in the second position lies substantially in line with a remote part of the trailer. This enables the trailer to support a flat bottomed containerised load on both that remote part of the trailer and that support member.

The trailer may be arranged to be extendible between extended and retracted positions by further comprising a sliding bogie.

In preferred embodiments of the invention, the chassis comprises a nested pair of paired elongate members, these paired elongate members being relatively movable between extended and retracted positions in order respectively to extend or retract the length of the trailer. The trailer includes means by which the nested pair of paired elongate members may be secured into engagement with each other when in the extended and retracted positions.

The support members may then be arranged when in the second position to clear the trailer running gear, that is axles and tyres, when the paired elongate members are moved between extended and retracted positions.

In preferred embodiments of the invention, the support member is mounted so as to pivot between the first and second positions, for example by a pivot pin.

The or each support member may therefore include a pivot by which the support member is pivotably attached to the chassis and by which the support member may pivot between the first and second positions. An arm may then extend between this pivot and a mounting point on the support member to which a containerised load may be secured when the support member is in the second position.

In a first embodiment of the invention the arm extends diagonally with respect to the length of the elongate members when the support member is in the first position.

Also in the first embodiment, the arm extends substantially transversely to the length of the elongate members when the support member is in the second position.

In a second embodiment of the invention, the arm pivots in a plane transverse to the length of the elongate members when moved between the first and second positions, and has an arm extends perpendicularly to the length of the elongate members when the support member is in the second position.

The invention is particularly useful with a so-called "Goose Neck" trailer for carrying a "High Cube" container, that is, a trailer having a forwards upwards rising section for connection to a tractor unit.

The support member may be moved manually between the first and second positions. To maximize safety and convenience, each rotating support member may optionally have extended handles for ease of operation. Alternatively, the trailer may include at least one actuator by which the or each support member may be activated to move between the first and second positions. The actuator may be a hydraulically or pneumatically driven actuator, for example being extended and/or retracted by an air driven piston or diaphragm mechanism.

The trailer preferably has mounting points for carrying containerised loads that cooperate with the or each support member to support the load when the support member(s) are in the second position.

The trailer may also comprise pullout or removable mounted twist lock beams for supporting a containerised load on top of the pullout or removable twist lock beams.

Also according to the invention there is provided a support

member adapted for use in a trailer according to the invention.

The invention further provides a method of changing the container loading configuration of a trailer for carrying a containerised load, the trailer being according to the invention, the method comprising the steps of moving at least one support member between the first position, in which the trailer cannot carry a containerised load using the elongate members, to said second position in which the trailer can carry a containerised load supported using the support member.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:

Figures 1A and 1B are, respectively, top and side plan views of an extendible skeletal trailer according a first embodiment of the invention, with the trailer in its extended position and showing three pairs of support members for supporting containerised loads laterally retracted within a pair of parallel main chassis members;

Figures 2A and 2B are, respectively, top and side plan views of the trailer of Figure 1, with the trailer in its extended position and three pairs of support members in a laterally extended position so that these may connect to various sizes of container;

Figures 3A and 3B are, respectively, top and side plan views of the trailer of Figure 1, with the trailer in

its retracted position and the three pairs of support members laterally retracted within the upper chassis members;

Figures 4A and 4B are, respectively, top and side plan views of the trailer of Figure 1, with the trailer in its retracted position and the support members in a laterally extended position so that these may connect to various sizes of container;

Figure 5A shows top and two side views of the support member incorporated in the trailer of Figure 1, and Figure 5B shows a fragmentary perspective view of this support member; and

Figures 6A and 6B are reduced scale drawings of, respectively, the extended trailer of Figures 1A and 1B, while Figures 6C and 6D show how such an extended trailer with retracted support members may be loaded with 12.2 m or 13.6 m containers that are either of standard height or of the "High Cube" height;

Figures 7A and 7B are reduced scale drawings of, respectively, the extended trailer of Figures 2A and 2B, while Figure 7C shows how such an extended trailer with extended support members may be loaded with two 6.1 m containers of normal height;

Figures 8A and 8B are reduced scale drawings similar to those of, respectively, the extended trailer of Figures 1A and 1B, but with one pair of directly opposite support members positioned to extend away from chassis elongate members to show how such an extended trailer

may be loaded with one 6.1 m "Heavy" container having a weight in excess of 24,000 kg;

Figures 9A and 9B are reduced scale drawings similar to those of, respectively, the retracted trailer of Figures 3A and 3B, showing how such a retracted trailer with retracted support members may be loaded with one 6.1 m "High Cube" container or one 6.1 m container of normal height;

Figures 10A and 10 B are reduced scale drawings similar to those of, respectively, the retracted trailer of Figures 4A and 4B, showing how such a retracted trailer with extended support members may be loaded with one 9.1 m container of normal height;

Figures 11A and 11B are fragmentary perspective views of a trailer according to a second embodiment of the invention, similar to the first embodiment but with support members that rotate between a stowed position as seen in Figure 11A to an extended position as seen in Figure 11B, through a plane that extends transverse to the longitudinal extent of elongate chassis members; and

Figures 12A, 12B and 12C show how each support member according to the second embodiment of the invention moves between, respectively, the extended and retracted positions, and particularly how each support member includes a telescopic arm that is shortened when stowed in the retracted position.

Figures 1A, 1B, 2A, 2B, 3A, 3B, 4A and 4B show an extendible skeletal trailer 1 for carrying containerised loads,

according to a first embodiment of the invention. The trailer 1 has a steel chassis section 2 with two main parallel elongate load bearing chassis members 4. The trailer 1 is a skeletal "Goose Neck" trailer, with the main beam 4 having a load bearing upper surface 6 set 160 mm below the level of two load bearing "Goose Neck" chassis members 8 that extend forwards of the main members 4.

Each of the pair of main chassis members 4 and forwards chassis members 8 are spaced apart by several transverse load bearing tie beams, including a forwards transverse beam 10 and a middle transverse beam 11 each of which extends laterally outside the parallel chassis members 4,8 to support two corresponding pairs of standard twist lock mounts 14,15 for connecting to various ISO standard containers.

The main chassis members 4 are in the form of steel I-beams or C-beams, which present an inwards facing C-section shape. The trailer has a rear bogie section 18 with a pair of elongate parallel beams 20 that are nested inside and slidably retained in the C-section shape of the main chassis beams 4. A rearmost portion of the bogie section 18 has a transverse tie beam 12 which extends laterally outside the parallel chassis members 20 to support one corresponding pair of standard twist lock mounts 16 for connecting to the rearmost mounts of various ISO standard containers.

The main chassis section 2 has one transverse beam 22 from which projects a downwardly facing pin 24 that may engage with two opposed or inwardly facing clasp mechanisms 26 in the bogie section as the trailer chassis and bogie sections 2,18 are moved relative to one another into an extended position, as shown in Figures 1A, 2A, 2A and 2B or a

retracted position, as shown in Figures 3A, 3B, 4A and 4B.

The trailer 1 also has a forward transverse beam 28 from which projects a downwardly facing kin pin 30 for connection with a known fifth wheel on a tractor unit (not shown).

The bogie section 18 has conventional running gear including section 44 has a set of six wheels 32, three to a side, joined by three axles 33.

The front chassis has retractable support landing legs 34, shown in the down position, which would normally be in the up position if a tractor unit (not shown) were attached to the trailer 1.

So that the trailer may accommodate both 12.2 m and 13.6 m ISO containers, the rear transverse beam 12 and container mounts 16 of the bogie section 18 are on a sliding extension 35 that can be moved between an extended position as shown in Figures 1A, 1B, 2A ad 2B, and a retracted position, as shown in Figures 3A, 3B, 4A and 4B.

The main chassis section 2, has mounted within the elongate beams 4 six support members 40, arranged in three pairs 41,42,43 at forwards, middle and rear locations along the elongate members 4, for supporting various sized of containerised loads. As will be explained in more detail below, each one of the pairs may be moved between a retracted orientation, as indicated by unprimed reference numerals 41,42,43, and a laterally extended orientation, as indicated by primed reference numerals 41′,42′,43′.

The operation of the support members 40 will now be described

also with reference to Figures 5A and 5B. Each support member 40 is elongate in form, having at one end a pivot 44 and at the other end a twist lock mount 46 for an ISO standard container. An arm 48 extends between the pivot 44 and mount 46. The pivot has an axis 50 that is angled at 70° to the length of the arm 48.

Each support member 40 is pivotably connected to the main chassis 2 at a right-angled corner formed between the elongate main beams 4 and transverse tie beams 12,47. When the support members 40 are connected to the main chassis 2 at a pivot mount 52, each pivot axis 50 is orientated at 45° to the length of the elongate chassis members 4. As a result, each support member is angled at 65° to the length of the elongate chassis members 4 when pivoted to lie between the chassis members 4. This angled orientation allows each support member 40 to be longer than half the distance between the opposite pairs of stowed support members 41,42,43, and as a result increases the reach of the laterally extended support members 41'42'43' so that these match the positions of ISO standard container mounts.

Each pivot mount 52 lies beneath the level of the upper surface 6 of the main chassis members 4. The support member pivot axis 50 lies to one side of the extent of the arm 48 so that when each support member 40 is retracted 41,42,43, the support member 40 lies fully beneath the level 6 of the main chassis members 4. The arrangement is such that when each support member if pivotably moved into the laterally extended orientation, each extended support member 41'42'43' is raised substantially above the level 6 of the main chassis members 4 so that a lower surface 54 of each arm 48 rests directly on the main chassis beam upper surface 6. The weight

of a container connected to the support member twist locks 46 is then born by this contact between the arms 48 and main chassis beams 4, together with a restoring force provided through the pivot mounts 52.

The extended support members 41′,42′,43′ are at a height which allows clearance for the running gear, including tyres and any mud guards (not shown) to move longitudinally with respect to the extended support members 41′,42′,43′. The trailer described herein may use industry standard super single 385 x 65 x R22.5 tyres, or an equivalent tyre size.

Reference is now made also to Figures 6 through 10, which show how the trailer 1 can be extended or retracted, with the support members 40 either extended 41′,42′,43′ or retracted 41,42,43, in order to load various types of ISO standard container onto the trailer, including both "High Cube" and "Heavy" containers.

In Figures 6A and 6B, the trailer 1 is extended with all six support members 41,42,43 retracted. In this configuration of the trailer 1, Figure 6C shows a 13.6 m container 60 mounted to the forwards and rearwards twist lock mounts 14,16. The trailer may alternatively carry a 13.6 m "High Cube" container. This configuration of the trailer may also be used to carry a 12.2 m "High Cube" container 61, as shown in Figure 6D. Alternatively, the trailer may carry a 12.2 m normal height container.

In Figures 7A and 7B, the trailer 1 is extended with all six support members 41′,42′,43′ laterally extended. In this configuration of the trailer 1, Figure 7C shows two 6.1 m normal height containers 62,63 mounted to the trailer, one 63

behind the other 62. The forwards 6.1 m container 62 is mounted to the forwards twist lock mounts 14 and the twist lock mounts 46 of the forwards support members 41'. The rearwards container 63 is mounted to the twist lock mounts 46 of the middle support members 42' and to the rearwards twist lock mounts 16. The rearwards support member 43', although extended, is not used and so, optionally, this may remain retracted.

According to ISO standards, the 31.6 m and 12.2 m "High Cube" containers have a forwards central raised floor section (not shown) into which the "Goose Neck" forward chassis members 8 are seated when such a container 61 is mounted to the trailer 1.

In Figures 8A and 8B, the trailer 1 is retracted with the forwards two support members 41,42 retracted, and the rearwards support members 43' laterally extended. In this configuration of the trailer 1, Figure 8C shows one 6.1 m normal height "Heavy" container 64, having a gross weight in excess of about 24,000 kg, mounted to the middle twist lock mounts 15 and to twist lock mounts 46 of the rear support members 43'. Such an arrangement may be required to spread the axel loading of the combined tractor and trailer unit.

In Figures 9A and 9B, the trailer 1 is retracted with all six support members 41,42,43 retracted. In this configuration of the trailer 1, Figure 9C shows one 6.1 m "High Cube" container 65 mounted to the middle twist lock mounts 15 and to the rear twist lock mounts 16. Alternatively, one normal height 6.1 m container of less than about 24,000 kg may be mounted to the same twist lock mounts 15,16.

In Figures 10A and 10B, the trailer 1 is retracted with all six support members 41',42',43' laterally extended. In this configuration of the trailer 1, Figure 10C shows one 9.1 m container 66 mounted to the forward twist lock mounts 14 and to the rear twist lock mounts 16. Optionally, if the container has intermediate mounting points, one or more of the extended pairs of support members 41',42',43' may also be connected to the container 66.

Reference is now made to Figures 11A and 11B, which show fragmentary perspective views of a trailer 101 according to a second embodiment of the invention, in which components corresponding to those of the first embodiment 1 are indicated by reference numeral incremented by 100. The trailer 101 has a similar construction and operation to that of the first embodiment, and differs in the form of the support members 140.

The support members 140 are essentially linear, and have a pivot axis 150 which is at right angles to the length of a telescopically extendible arm 148. For clarity, Figures 11A and 11B omit a connecting pivot pin which secures each support member 140 to a pivot mount 152 at an adjacent transverse beam 147.

Each arm 148 is made from two telescopic steel sections 70,71: a hollow outer section 70 that has a box cross-section and which is integral with the pivot 144, and a hollow inner section that has a square "U" cross-section, the "U" being inverted when the arm 148 is extended as shown in Figures 11B and 12A. The sections 70,71 are slidably engaged and movable from a compressed orientation, in which the length of each arm 148 is sufficiently short so that a pair of opposed

support members may be stowed between the parallel elongate main chassis members 104, to an expanded orientation, in which a container twist lock mount 146 at the end of each arm 148 is positioned to connect with a corresponding mount on an ISO container when the support member 140 is laterally extended.

The movement and expansion of the telescopic arms 148 is depicted in Figures 12A, 12B and 12C, as the support member is moved between an extended position as shown in Figure 12A to a retracted position as shown in Figure 12C.

In order to secure the telescopic arms 148 in a contracted or expanded orientation, each arm 148 has on an upper surface 75 of the inner telescopic section 71 a latch mechanism having an externally accessible sprung lever 72 that can be activated manually when the arm is rotated from within the main chassis section 102 to rest on an elongate chassis member 104. When the arm is moved between contracted and expanded orientations, the lever 72 slides in a slot 78 that extends through an upper surface 79 of the outer telescopic box section 70.

A free end 73 of the lever 72 can be pulled upwards or pushed down to raise or lower a transverse pin 74 that extends from an opposite end of the lever 72 through each telescopic section 70,71 of the arm 148. When the arm 148 is fully contracted or expanded, the pin 74 projects through one of two holes 80,81 in a lower surface 77 of the outer telescopic box section 70 to hold these sections in place when the arm 148 is in the contracted or expanded orientations.

In order to provide a greater degree of longitudinal support

to each of the six support members 140, six flanges 82 extend laterally away from the elongate main chassis member 104. Each flange 82 is flush with the upper surface 106 of the elongate chassis member 104 from which it projects, and each has a through hole 84 that is aligned with the corresponding hole 81 in the outer telescopic section 70 when the arm is latched in the expanded orientation. The transverse pin 74 then extends into the flange through hole 84. In the event of sudden braking or an accident involving the trailer/tractor unit, the engagement of the transverse pins 74 in the through holes 84 provides additional longitudinal support to the support members 140 and hence the containerised load.

It should also be noted that the holes 80 in the outer telescopic sections 70 that correspond with the contracted orientation of each arm 148, are positioned to oppose the upper surfaces 106 of the elongate chassis members 104 when the arm is first rotated to rest on these chassis members, but prior to extension of the arms 148, as shown in Figure 12B. The pin when fully engaged in each hole 80,81 projects beyond the outer telescopic section 70. As a result, when the arm 148 is oriented as shown in Figure 12B, the pin 74 comes into contact with the chassis upper surface 106 thus raising pin 74 and the lever 72, so partially disengaging the pin 74 from the hole 80 and making it easier for an operator to lift the lever 72 prior to pulling out the inner telescopic section 71 to expand the support member 140.

Although the first embodiment of support member 40 is mechanically simpler than the second embodiment 140, the second embodiment 140 provides the advantage of being lighter to manufacture than the first embodiment 40, which increases the load carrying ability of the trailer 101.

It should be noted that the invention is not limited to trailers that may be combined with a tractor unit to form an articulated vehicle. For example, the invention is equally applicable to a trailer that includes an integral articulated or non-articulated motive unit. Therefore, the term "trailer" as utilised herein is intended to mean any form of movable support structure capable of supporting a freight container or tanker container for transportation and is not limited to a trailer arranged for use with a separate tractor unit or road going vehicle.

Modifications may be incorporated without departing from the scope of the present invention as claimed. For example, although the invention has been described with reference to a sliding bogie trailer the invention is applicable to a standard single length trailer, although it may have particular advantages when utilised with a sliding bogie trailer. Similarly, although the invention has been described when used with a skeletal trailer, the invention may also be useful for flatbed trailers, or any trailer in which a section has a load bearing floor.

Claims

1. A trailer (1,101) for carrying a containerised load (60-66), comprising a chassis section (2,102) formed utilising two substantially parallel elongate members (4,104), and one or more support members (40,140) for supporting said containerised load (60-66), the or each support member (40,140) being movable between a first position (41,42,43;141,142) in which the support member (40,140) is stowed between the elongate members (4,104) when not in use to support a containerised load (60-66), and a second position (41',42',43';141',142') in which the support member (40,140) extends away from the elongate members (4,104) for supporting said containerised load (60-66).

2. A trailer (1,101) as claimed in Claim 1, in which the or each support member (4,104) when in the first position (41,42,43;141,142) lies substantially at or below the level (6,106) the elongate members (4,104) between which said support member (40,140) is stowed.

3. A trailer (1,101) as claimed in Claim 1 or Claim 2, in which the or each support member (40,140) when in the second position (41',42',43';141',142') lies substantially at or above the level (6,106) of elongate members (4,104) from which said support member (20) extends.

4. A trailer (1,101) as claimed in any preceding claim, in which the or each support member (40,140) when in said second position (41',42',43';141',142') is supported by an elongate member (4,104).

5. A trailer (1,101) as claimed in any preceding claim, in

which there is at least one pair of support members (40,140) which when in the second position (41',42',43';141',142') are arranged directly opposite each other with respect to a longitudinal central line of the elongate members (4,104) (20).

6. A trailer (1,101) as claimed in any preceding claim, in which the upper surface (46,146) of said support member (40,140) when in said second position (41',42',43';141',142') lies substantially in line with a remote part (14,15,16) of the trailer, so as to support a flat bottomed containerised load (60-66) on both said remote part (14,15,16) and said support member (40,140).

7. A trailer (1,101) as claimed in any preceding claim, arranged to be extensible between extended and retracted positions by further comprising a sliding bogie (18).

8. A trailer (1,101) as claimed in any preceding claim, in which the chassis section (2,102) comprises a nested pair of paired elongate members (4,20), said paired elongate members (4,20) being relatively movable between extended and retracted positions in order respectively to extend or retract the length of the trailer (1,101), at which positions said nested pair of paired elongate members (4,20) may be secured (24,26) into engagement with each other.

9. A trailer (1,101) as claimed in Claim 8, in which the support member (40,140) when in the second position (41',42',43';141',142') clears running gear (32) of the trailer (1,101) when the paired elongate members (4,20) are moved between extended and retracted positions.

10. A trailer (1,101) as claimed in any preceding claim, in which the support member (40,140) is mounted so as to pivot between the first position (41,42,43;141,142) and the second position (41',42',43';141',142').

11. A trailer (1,101) as claimed in any preceding claim, which the or each support member (40,140) includes a pivot (44,144) by which the support member (40,140) is pivotably attached (52,152) to the chassis section (2,102) and by which the support member (40,140) may pivot between the first position (41,42,43;141,142) and the second position (41',42',43';141',142'), a mounting point (46,146) to which a containerised load (60-66) may be secured when the support member (40,140) is in the second position (41',42',43';141',142'), and an arm (48,148) that extends between said pivot (46,146) and said mounting point (46,146).

12. A trailer (1,) as claimed in Claim 11, in which the arm (48) extends diagonally with respect to the length of the elongate members (4) when said support member (40) is in the first position (41,42,43).

13. A trailer (101) as claimed in Claim 11, in which the arm (148) extends transversely to the length of the elongate members (104) when said support member (140) is in the second position (141',142').

14. A trailer (101) as claimed in Claim 11 or Claim 13, in which the arm (148) pivots in a plane transverse to the length of the elongate members (104) when moved between the first position (141,142) and the second position (141',142').

15. A trailer (101) as claimed in Claim 14, in which the arm

is telescopically expandable between a contracted position in which the support member (140) may be stowed in the first position (141,142) and an expanded position in which the support member (140) may be used in the second position (141',142') to support a containerised load (60-66).

16. A trailer (101) as claimed in Claim 15, in which the support member (140) included a latch mechanism (72,74,78,80,81) that may be engaged to secure the arm (148) in its expanded or contracted positions.

17. A trailer (1,101) as claimed in Claim 16, in which the latch includes a pin (74) that may be moved to secure together telescopically moving parts (70,71) of the arm (148).

18. A trailer (1,101) as claimed in Claim 16 or Claim 17, in which the latch mechanism (72,74,78,80,81), when engaged when the support member (140) is in the second position (141',142'), serves also to provide support (82,84) for a containerised load (60-66) in the longitudinal direction of the elongate members (104).

19. A trailer (1,101) as claimed in any preceding claim, in which the trailer (1,101) has a forwards upwards rising section (8) for connection to a tractor unit.

20. A trailer (1,101) as claimed in any preceding claim, comprising an actuator by which the or each support member (40,140) may be activated to move between said first position (41,42,43;141,142) and second position (41',42',43';141', 142').

21. A trailer (1,101) as claimed in any preceding claim, in which the trailer (1,101) has mounting points (14,15,16) for carrying a containerised load (60-66) that cooperate with the or each support member (40,140) to support said load when said support member(s) (40,140) are in the second position (41',42',43';141',142').

22. A trailer (1,101) as claimed in any preceding claim, comprising pullout or removable mounted twist lock beams (14,15,16) for supporting a containerised load (60-66) on top of said pullout or removable twist lock beams (14,15,16).

23. A trailer (1,101) as claimed in any preceding claim, in which the trailer (1,101) is a skeletal trailer (1,101).

24. A trailer (1,101) as claimed in any of Claims 1 to 22, in which a section has a load bearing floor.

25. A support member (40,140) adapted for use in a trailer (1,101) as claimed in any preceding claim.

26. A method of changing the container loading configuration of a trailer (1,101) for carrying a containerised load (60-66), the trailer being as claimed in any preceding claim, comprising the steps of moving at least one support member (40,140) between said first position (41,42,43;141,142), in which said trailer (1,101) cannot carry a containerised load (60-66) using said elongate members (4,104) to said second position (41',42',43';141',142') in which said trailer (1,101) can carry a containerised load (60-66) supported using said support member (40,140).

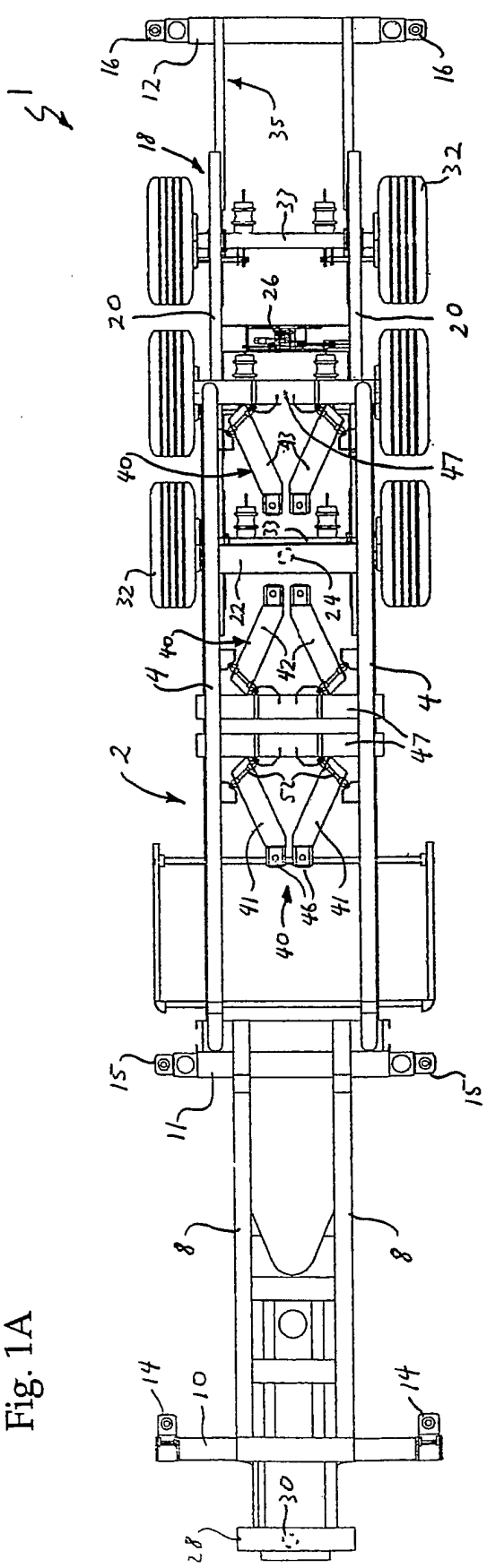


Fig. 1A

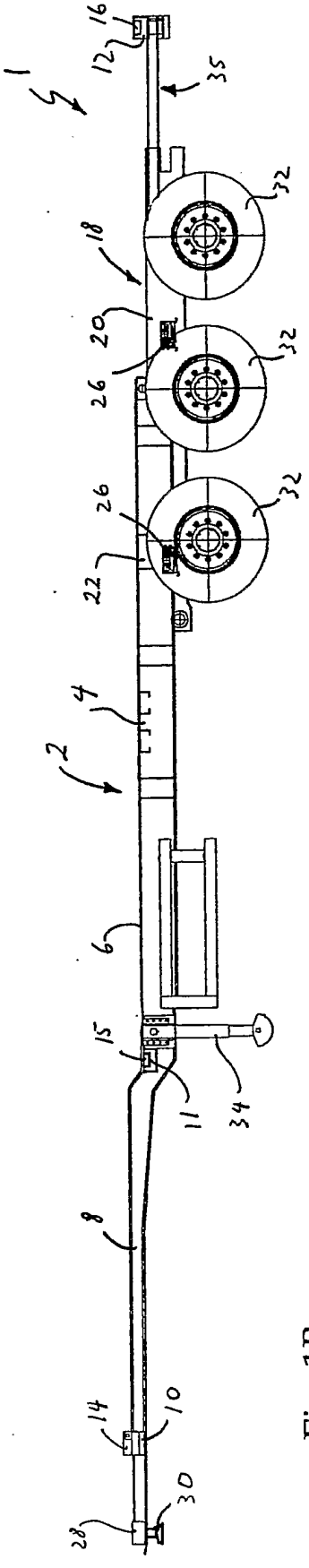


Fig. 1B

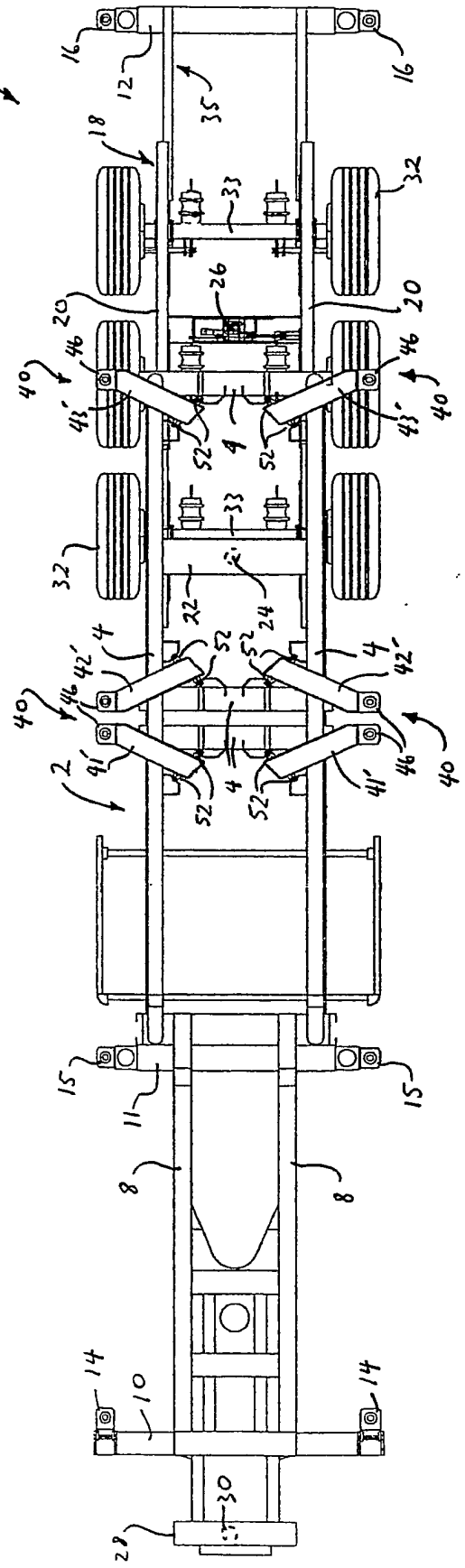


Fig. 2A

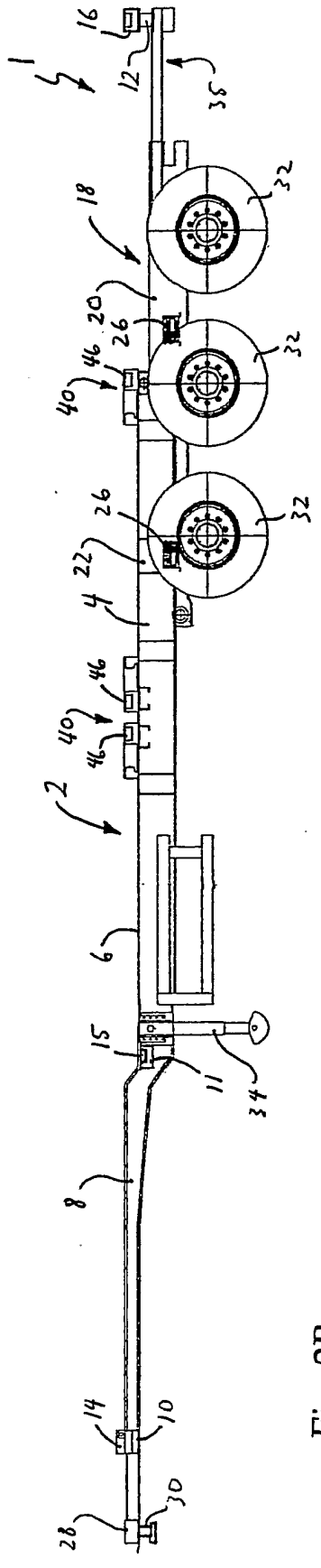


Fig. 2B

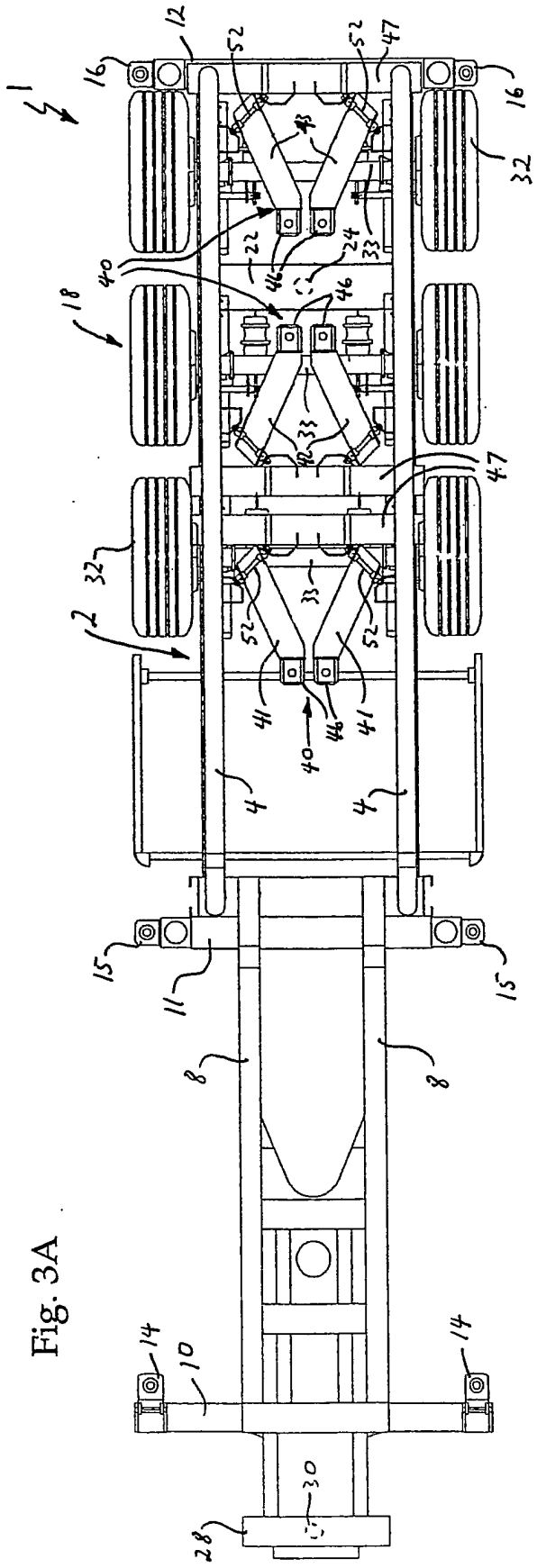


Fig. 3A

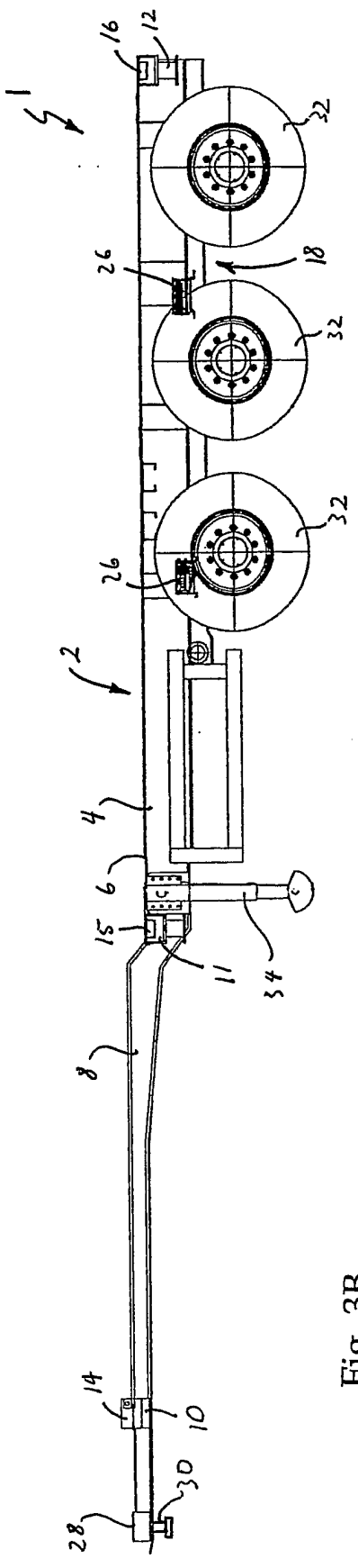


Fig. 3B

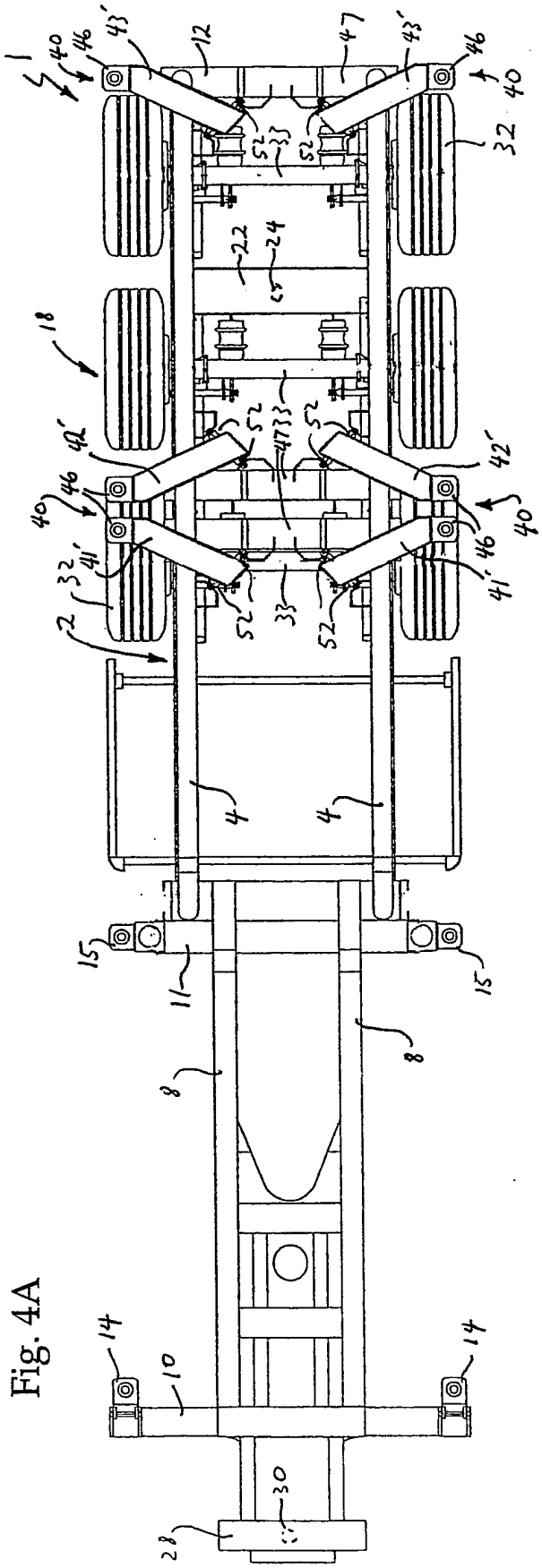


Fig. 4A

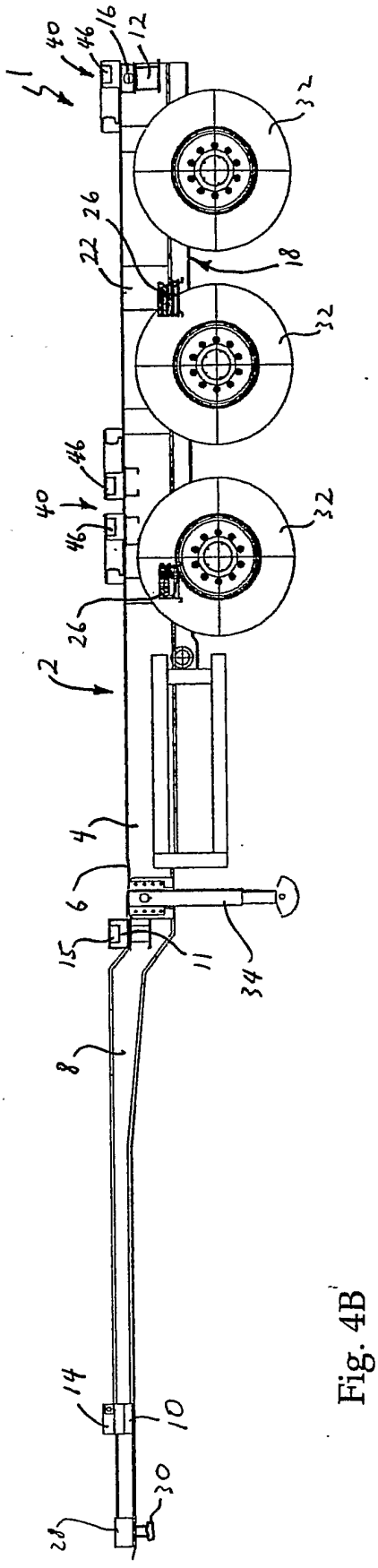


Fig. 4B

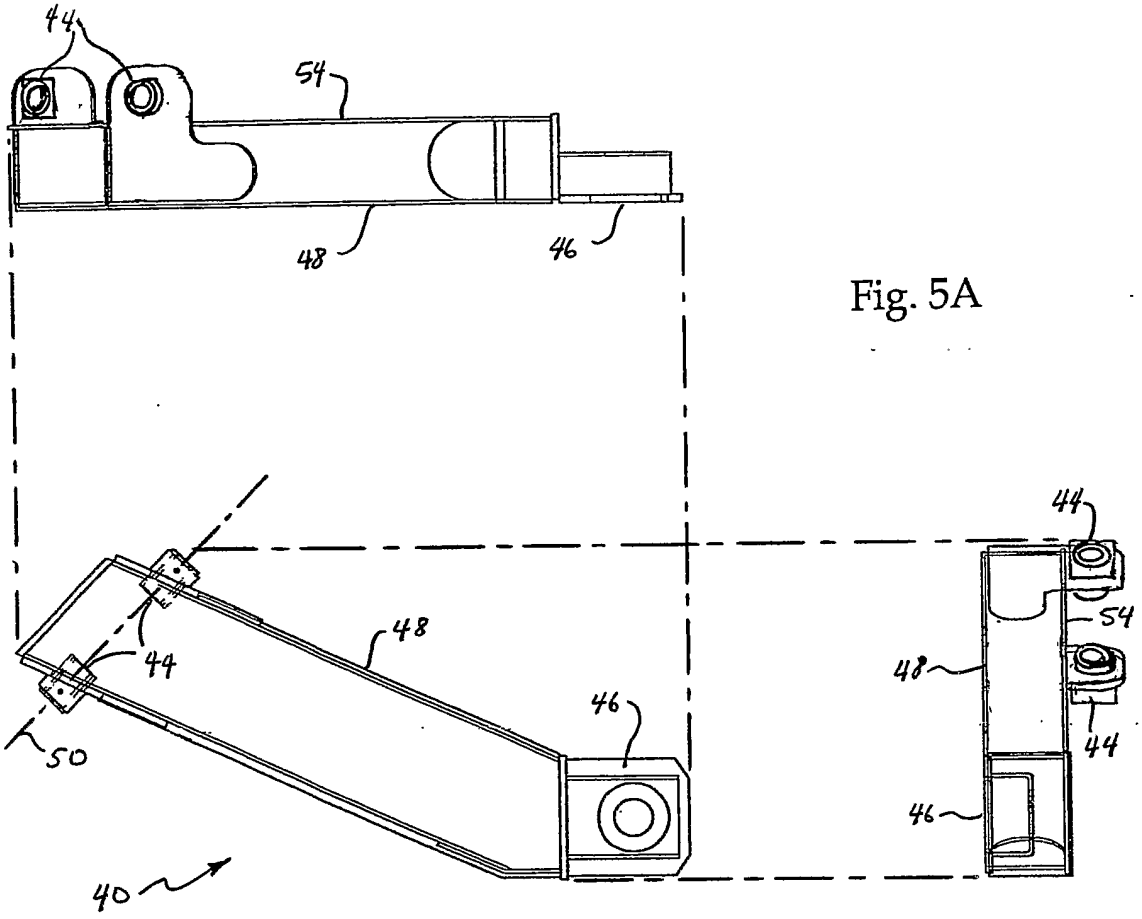


Fig. 5A

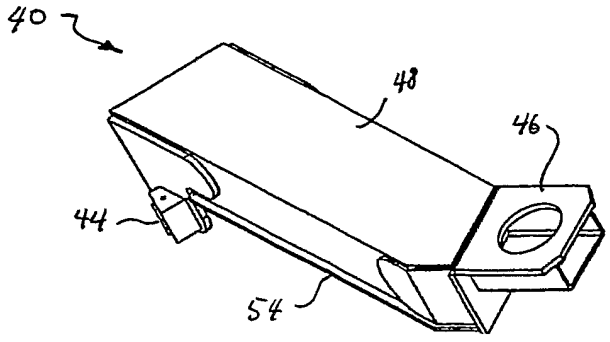


Fig. 5B

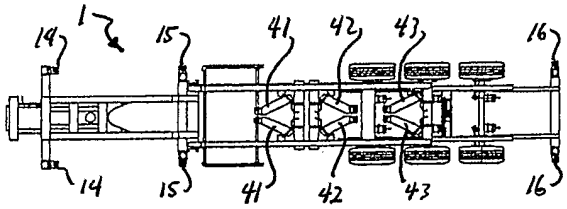


Fig. 6A

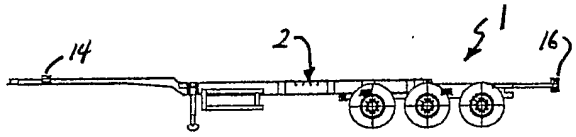


Fig. 6B

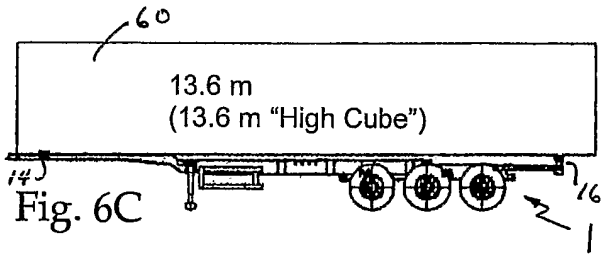


Fig. 6C

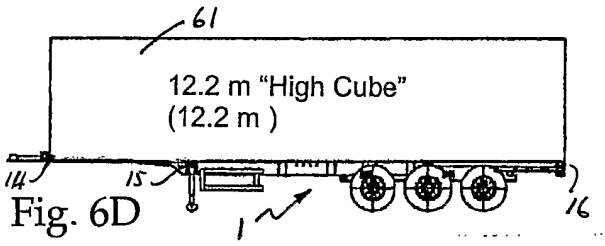


Fig. 6D

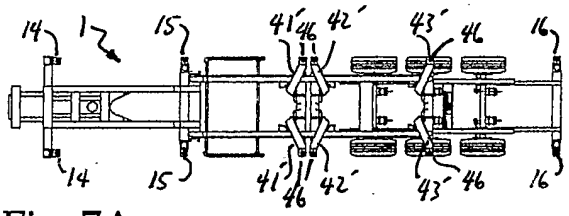


Fig. 7A

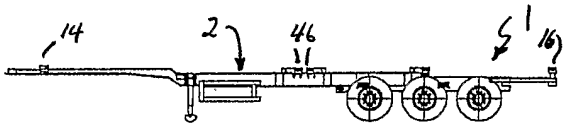


Fig. 7B

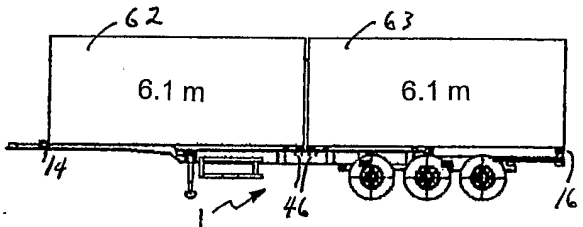


Fig. 7C

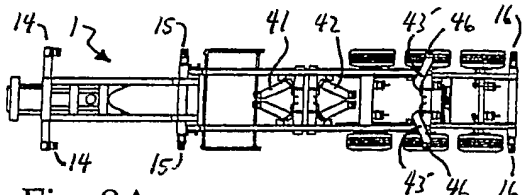


Fig. 8A

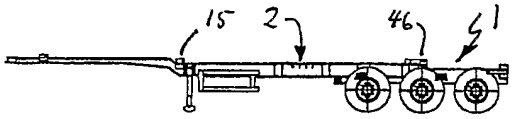


Fig. 8B

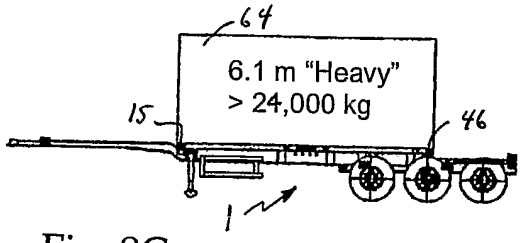


Fig. 8C

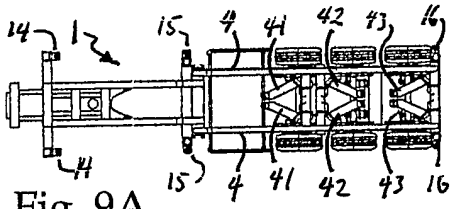


Fig. 9A

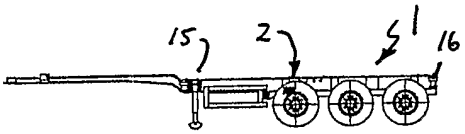


Fig. 9B

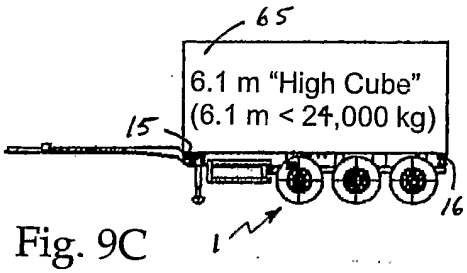


Fig. 9C

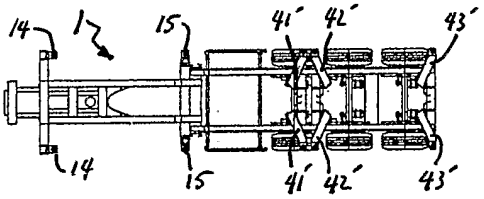


Fig. 10A

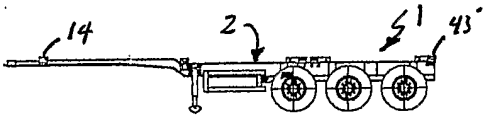


Fig. 10B

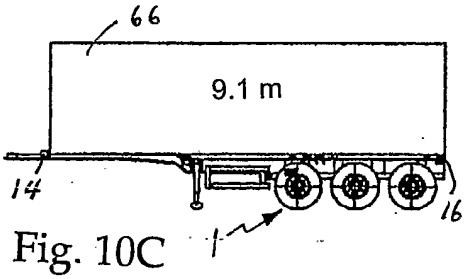


Fig. 10C

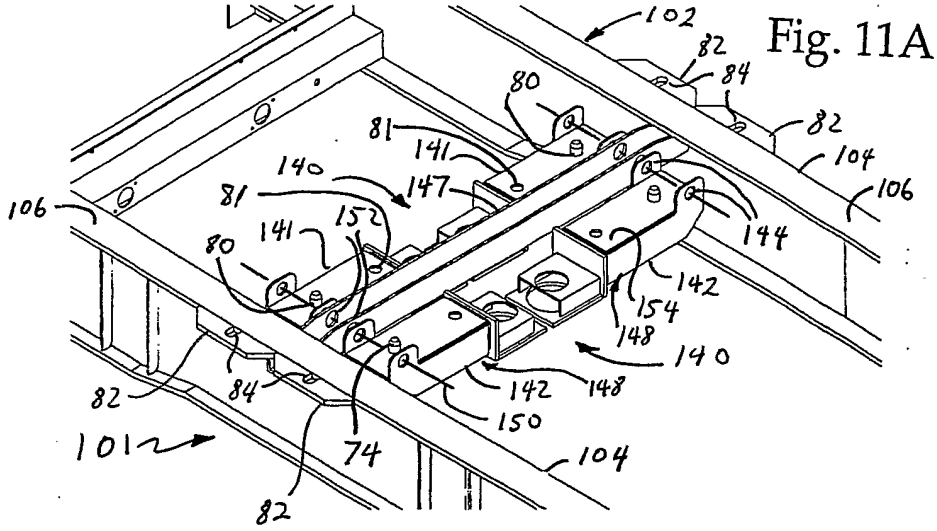


Fig. 11A

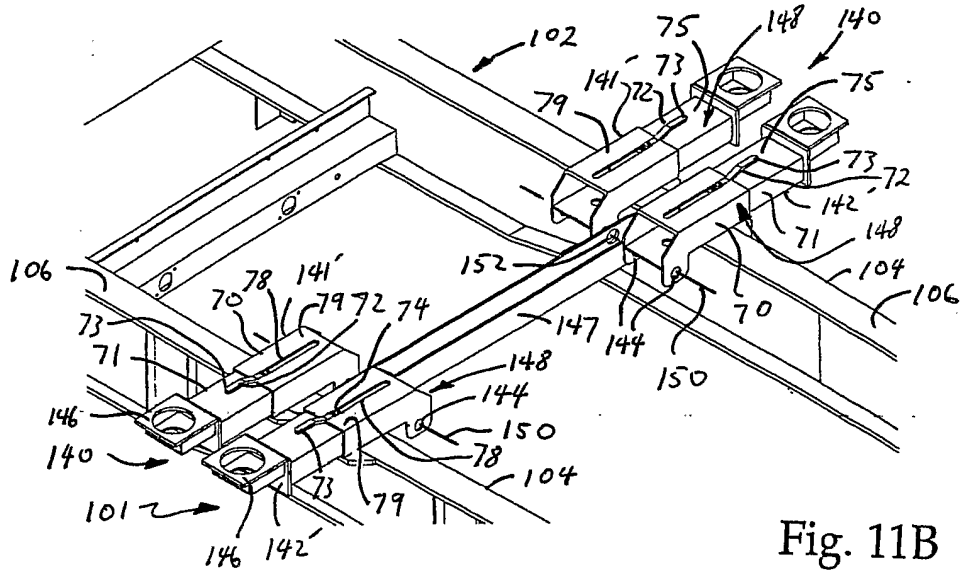


Fig. 11B

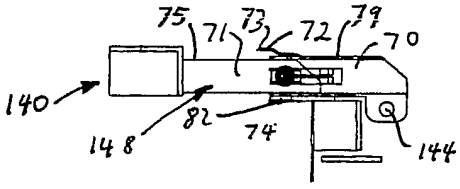
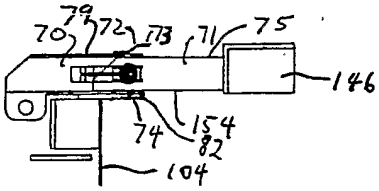


Fig. 12A



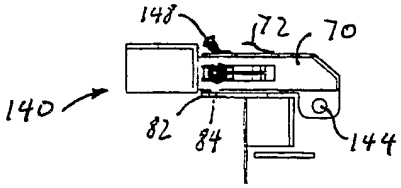
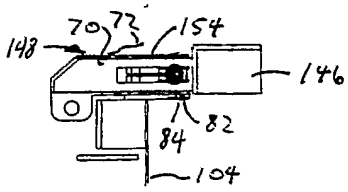


Fig. 12B



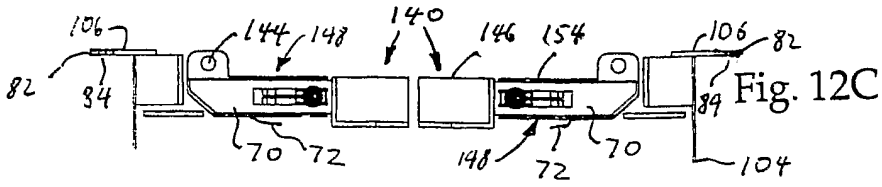


Fig. 12C

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 02/03388

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B60P1/64 B62D53/06

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)
IPC 7 B60P B62D

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 practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	GB 2 354 510 A (KAVANAGH NICHOLAS MICHAEL ;TOMKINS PHILIP (GB); PATTEN FRANCIS DAV) 28 March 2001 (2001-03-28) abstract; figures 2,6 page 11, line 9 - line 23	1-4,6, 15-17, 20,24-26 5,7-11, 19,21-23
Y A	DE 93 06 626 U (MASCHINENFABRIK BERNHARD KRONE GMBH) 8 July 1993 (1993-07-08) page 8, line 6 - line 25; claims 1,13; figures 1,2,12-19 page 11, line 15	5,7-11, 19,21-23 1-4,6, 12-18, 24-26
A	BE 1 006 469 A (FORMAT NAAMLOZE VENNOOTSCHAP) 6 September 1994 (1994-09-06) figures 1,2,4,6	1-26

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in 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 document 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	Date of mailing of the international search report
15 October 2002	22/10/2002

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Bolte, U

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	DE 94 20 484 U (PAUL JOSEF) 23 February 1995 (1995-02-23) figures 1,2,5	1-26
A	DE 200 12 977 U (METTERNICH METALLBAU GMBH R) 8 February 2001 (2001-02-08) abstract; figures 1,2	1-26
A	BE 1 002 515 A (RENDERS N V) 5 March 1991 (1991-03-05) figures 7-11	1-26

INTERNATIONAL SEARCH REPORT

Ii ional Application No
PCT/GB 02/03388

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2354510 A	28-03-2001	AU 7429401 A WO 0198181 A1	02-01-2002 27-12-2001
DE 9306626 U	08-07-1993	DE 9306626 U1	08-07-1993
BE 1006469 A	06-09-1994	BE 1006469 A6 NL 9202140 A	06-09-1994 01-06-1994
DE 9420484 U	23-02-1995	DE 9420484 U1	23-02-1995
DE 20012977 U	08-02-2001	DE 20012977 U1	08-02-2001
BE 1002515 A	05-03-1991	BE 1002515 A3	05-03-1991