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(54) CROWD CONTROL BARRIER

BARRIERE ZUR KONTROLLE VON MENSCHENMASSEN

BARRIÈRE DE CONTRÔLE DE FOULE

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Description

FIELD OF THE INVENTION

[0001] The present invention pertains to a support device, a barrier panel and a corresponding crowd control barrier system.

BACKGROUND OF THE INVENTION

[0002] Road block construction barriers, crowd control barriers and the like are typically used for controlling traffic and pedestrians during road work or special events. A pedestrian/bicycle restraining barrier system is typically a temporary construction formed by side by side interconnected barriers comprising some sort of panel, and support devices to which the panels are mounted as to form a barrier along an edge of a road work site, or as a demarcation for pedestrians and bicyclists. The barrier system needs to be designed to withstand loads and actions caused by pedestrians/bicyclists when walking, leaning, falling, stumbling or cycling into the barrier system.

[0003] Laid open US. Patent Application US5779227A discloses such a crowd control barrier formed by a plurality of congruent rectangular panels joined end to end by pins in a plurality of sleeves secured to panel end posts in axially aligned vertically staggered relation. A knee brace secured to adjacent panel end posts by cooperating knee brace sleeves stabilizes the barrier in cooperation with a base platform hingedly connected longitudinally with each fence panel opposite the knee brace on which pedestrians stand when adjacent the fence panels.

[0004] The known crowd control barrier generally provides a robust construction which is applicable when the ground is leveled and when traffic is limited to one side of the barrier system. There is however a need for a less complicated, more flexible construction which is applicable also on broken or unleveled ground.

[0005] FR2899911 discloses a support device, i.e. a control barrier, having a guide section provided with three orifices arranged on the support device such that the support device is capable of allowing repositioning of tube posts which may be received in the respective orifice from one orifice to another. The orifices are specially shaped for receiving circular or polygonal sections of the tube posts. The contour of each orifice is defined by a combination of shapes combining a circular shape and a polygonal shape.

[0006] NL9401555A discloses a support device comprising two parallel and distanced oval-shaped openings for receiving posts. Each oval-shaped opening is dimensioned in such a way that in each case, two lower ends of uprights can be placed therein. The object of the disclosed support device is to provide a control barrier which does not have drawbacks such as e.g. disadvantage of weight, cumbersome transport and storage from the manufacturer to the user.

SUMMARY OF THE INVENTION

[0007] It is an object of the present invention to at least provide an improved support device for barrier systems and a corresponding barrier system, which is flexible and allows mounting on broken ground. It would further be advantageous to achieve a support device with an improved safety for pedestrians and bicyclists. Preferred embodiments are set forth in the dependent claims and in the following description and drawings.

[0008] Thus, in accordance with the present inventive concept, there is provided a support device for a barrier system comprising a foot for engaging with the ground, and a connection means arranged for connecting at least one connection post of a respective barrier to the foot. The connection means comprises a first and a second compartment, of which at least the first compartment is elongated providing a preselected play for the mounting position and mounting angle of a connection post. The first and second compartment may be formed by a respective sleeve or similar containment, which according to an embodiment of the support device together provide the at least three different mounting positions for engaging one or more connection posts. The elongated compartment (in addition to providing a range of horizontal mounting positions) is arranged to provide a play or clearance for the mounting angle of a connection post received therein which will be described more in detail herein under in the detailed description. Thereby the corresponding barrier is allowed to be mounted in an angle with respect to the ground. A flexible support device is thus provided, in which multiple horizontal mounting positions and multiple mounting angles for connection posts are selectable.

[0009] According to an embodiment of the support device, the connection means is arranged to provide at least three selectable mounting positions for the connection post. The connection means are preferably arranged for receiving substantially upright standing connection posts at the at least three positions (which are simultaneously selectable by at least two connection posts). Thereby, a support device is provided that allows two barriers to be mounted in a straight line, or-which is preferable in e.g. ditches, - side by side with an overlap. According to the invention, the three positions are interrelated such that they form the corner/end points of an L or T- shape in the horizontal plane.

[0010] Further, the longitudinal extension of the elongated first compartment is dimensioned for accommodating at least two connection posts of a respective barrier. The second compartment may be adapted to receive and support a single connection post perpendicularly with respect to the foot. Further, the first and second compartment may be dimensioned to allow the connection posts to be rotatable, or be dimensioned to fixate the connection posts with respect to rotation about their own longi-

tudinal axis.

[0011] According to an embodiment of the support device, the foot is a base plate, i.e. a flat rectangular plate, onto which connection means in the form of e.g. sleeves are arranged. The base plate is easy to pass with a stroller a bicycle, a wheelchair or similar. The width and the weight of the foot is selected such that the barrier can sufficiently withstand loads and actions caused by pedestrians/bicyclist walking, leaning, falling, stumbling or cycling into the restraint system. The width and weight also prevents the barrier from falling over due to wind.

[0012] According to an embodiment of the support device, it further comprises fixation means for fixating the connection means to the foot arranged at at least two different fixation positions, such that the connection means can be positioned in different positions on the foot, which is applicable for different applications.

[0013] According to an embodiment of the support device, it further comprises at least one protrusion arranged on an underside of said foot to increase the stability of the support device on rough ground.

[0014] According to an embodiment of the support device, an upper surface of the foot is provided with a rough surface. This is advantageous to avoid fall accidents. The base plate may be provided with a rough sand painted surface, which eliminates both the risk of slipping and tripping. It also makes it easy to pass with a stroller, a bicycle, a wheelchair or similar.

[0015] To facilitate the mounting of the foot, the base plate has a lifting handle. The handle can also be used to lift the foot with a trolley.

[0016] According to an aspect of the invention, there is provided a barrier panel for a barrier system comprising at least one connection post for connecting to a support device according to any preceding claim. The barrier panel comprises a framework provided with a net, of which the mesh size is selected to be less than 5 cm, such that accidents caused by a bicycle handlebar getting stuck in the mesh are prevented.

[0017] According to an embodiment of the barrier, it further comprises a reflecting device. To alert pedestrians and bicyclists, a well-known pattern is used on the reflex tube to create a visual line, which in combination with a yellow mesh of the net is applied to make it easy to detect the barrier. In addition, the position of the reflex is optimized to be seen in the light of the bicycle lamp, at about 0.8-1.0 meters above ground. In addition, a lower horizontal rail, or base, of the barrier is preferably painted with a bright color that is easy to detect for visually impaired people.

[0018] According to an embodiment of a barrier, the reflecting device consists of a reflex pipe and/or comprises a curved envelope surface to reflect light in all directions. The reflecting device may thus be a bright colored tube with reflective tape attached to the net, for visualization in day light or at night. Due to the utilization of a round tube, the wind load on the barrier is significantly lower than for the more commonly seen reflective plate, which thus lowers the risk of the barrier falling over. The tube further gives the possibility to use LED light as an optional accessory.

[0019] According to an embodiment of a barrier of the present invention, the reflecting device is arranged at a height adapted to be visible for a cyclist, and preferably at 0.8 - 1.0 meters above ground when mounted. The barrier is arranged to be at least 1.4 meters high to prevent a cyclist from falling over the net in case of collision, which otherwise could lead to great danger.

[0020] According to a second aspect of the invention, there is provided a barrier system comprising at least one panel, and at least two support devices according to present inventive concept, which benefits from the support device according to the invention in that it is flexible such that it may be arranged in a variety of ways and easily fitted to broken ground. The barrier system further benefits from all other advantages as described above with respect to embodiments of the barrier panel and support device of the invention.

[0021] These and other aspects, features, and advantages of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] The invention will now be described in more detail and with reference to the appended drawings in which:

Fig. 1 is a schematic perspective view of an embodiment of a barrier system according the present invention;

Figs. 2a and 2b are schematic perspective views of an embodiment of a support device according to the present invention; and

Fig. 3 is a schematic perspective view of an embodiment of a barrier system according to the present invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0023] The present invention will now be described more fully hereinafter with reference to the accompanying drawings. The below embodiments are provided by way of example so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout.

[0024] Referring now to Fig. 1, a barrier system 100 according to the present invention comprises a barrier 101, defined by a base 110, a top 111, and two opposite sides 112, is here formed by means of a framework 107 provided with a net 102. Each side 112 of the barrier 101 is at the base 110 provided with a respective connection post 114, which is typically a downwards protruding portion of the framework 107, which each is arranged to be

removably connected to a respective connection means 130 of a support device 120. When the connection posts 114 are connected to a respective support device 120, a free standing barrier system is provided. The barrier 101 is here made of metal, but may alternatively be made from a molded plastic material. The net 102 is preferably finely meshed to prevent that e.g. handlebars get stuck if a cyclist gets too close to the barrier with the bicycle.

[0025] According to an embodiment of the barrier system, at a mid section of the barrier 101 a reflecting device 104 is attached for providing high visibility of the barrier system 100. The reflecting device 104 may alternatively be integrated in the net 102. The reflecting device 104 is preferably arranged with well known colored stripes, which colors typically signals road work. In the shown embodiment, the reflecting device 104 consists of a reflex pipe having a curved envelope surface to reflect light in a wide range of directions. According to an embodiment of the barrier system, it further comprises light sources, which for instance may be LEDs (light emitting diodes). The light sources can be arranged in a separate pipe, in addition to or instead of the reflecting device 104, or they can be integrated with the reflecting device 104. The reflecting device 104 is horizontally arranged at a height adapted to be visible for a cyclist. In an embodiment of the barrier system, the height at which the reflecting device is mounted onto the barrier 101 is selected within the range of 0.8-1.0m above ground when the barrier is in a mounted position.

[0026] Fig. 2a is a perspective close up view schematically illustrating an embodiment of a support device 120 for a barrier system according to the present invention. The support device 120 comprises connection means 130 in the form of a sleeve 121 adapted to receive connection posts. The sleeve 121 comprises a first compartment 123 and a second compartment 125. The support device 120 further comprises a foot 122 for engaging with the ground, to which the sleeve is fixated by means of fixation means 126b which here comprises a plate with holes which is attached to the foot 122 by means of screws, rivets or the like. An alternative mounting position 126a, is indicated with dashed lines in Fig. 2a. The sleeve 121 is arranged for simultaneously allowing connection of a multiple of connection posts of a respective barrier to the foot, and at least three selectable positions. The first compartment 123 is an upright standing, in the horizontal plane, elongated sleeve, which has a substantially rectangular/rounded rectangular cross section in the horizontal plane. The elongated first compartment is preferably arranged such that its long side extends perpendicular to the long side of the foot 122, as illustrated in Fig. 2a. The second compartment 125 is adapted to receive (and fit) only one connection post, and is arranged at an end of the elongated first compartment, such that the resulting allowed mounting positions project onto an L-shape in the horizontal plane. The first compartment 123 is elongated for providing a preselected play for the mounting position of a connection post.

[0027] According to an embodiment, the foot 122 is provided with holes 131 for fastening of the foot 122 to the ground with soil nails if necessary. To increase the stability of the support device 120 when used on uneven ground, the underside of the foot 122 is provided with protrusions 128, which in a preferred embodiment are arranged under each corner of the foot 122. The foot 122 is a flat plate, and the upper surface 129 of the foot 122 is provided with a rough surface.

[0028] As illustrated in Fig. 2a, the foot 122 is in an embodiment of the invention provided with a handle 127 arranged at a midsection on the side of the foot 122.

[0029] Fig. 2b is a close up schematically illustrating in more detail how two barriers 101 and 101' are connected to an embodiment of a support device 120. Connection post 114 of barrier 101 is here arranged at a midsection of the elongated first compartment 123, while the connection post 114'of barrier 101' is connected to compartment 125 of the support device 120. The connection post 114 is thus movable along the longitudinal extension of the receiving opening formed by the sleeve which constitutes compartment 123, and if necessary, the barrier 101 may be tilted with respect to the support device 120. If required, when mounting the connection post 114 in to the first compartment 123, it may be fixated in a specific horizontal position or tilting angle in the first compartment by means of e.g. a rivet, a screw or the like (not shown). The two barriers 101, 101' may be mounted with an interrelated preselected azimuth angle by rotating the connection post in their respective compartments 123,125 such that the formed barrier system is adapted to a current traffic situation, road work place etc. Consider for instance now, looking at the setup in Fig. 2b, first rotating barrier 101' to be parallel with the shown orientation of barrier 101, and then rotating barrier 101 180° degrees and moving the connection post 114 to the farthest end position of the first compartment 123. The result is a side by side barrier system with an overlap of the two barrier panels 101, 101'.

[0030] Some further examples of the flexibility of the current barrier system is given in Fig. 3. The shown barrier system 100 comprises four barriers, 101 - 101''', as previously described with reference to Fig. 1. The two connection posts (114 in Fig. 1) of each barrier panel is mounted in a support device 120. Consider first barrier 101", which is positioned at substantially leveled ground. The respective connection posts 114"of barrier 101 "are here mounted in the second compartment 125 of corresponding support devices 120. Barriers 101, 101' and 101 ", are placed on unleveled ground and need to be tilted with respect to the ground. At least one of their respective connection posts 114, 114', 114" are therefore mounted in first compartment 123 of the respective support devices 120 to allow the respective barrier to be tilted.

[0031] In the exemplifying embodiments herein, the elongated connection posts 114 and the sleeves 123, 125 of the base 120 merely constitute an example of a

connection means 130 that is applicable to connect the barrier 101 to the support device 120. Other arrangements are applicable.

[0032] While the invention has been illustrated and described in detail in the drawings and foregoing description, such illustration and description are to be considered illustrative or exemplary and not restrictive; the invention is not limited to the disclosed embodiments. Other variations to the disclosed embodiments can be understood and effected by those skilled in the art in practicing the claimed invention, from a study of the drawings, the disclosure, and the appended claims. In the claims, the word "comprising" does not exclude other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. A single processor or other unit may fulfill the functions of several items recited in the claims. Any reference signs in the claims should not be construed as limiting the scope.

Claims

1. A support device (120) for a barrier system comprising

   a foot (122) for engaging with the ground; and
   a connection means (130) arranged for connecting at least one connection post (114) of a respective barrier (101) to said foot, said connection means (130) wherein comprise a first and a second compartment (123, 125), of which at least said first compartment is elongated for providing a preselected play for the mounting position of said at least one connection post (114) when received therein, **characterized in that** said first and second compartment together form an L or T shape in the horizontal plane.

2. A support device (120) according to claim 1, wherein the longitudinal extension of the first compartment is adapted to accommodate at least two connection posts of a respective barrier.

3. A support device (120) according to any preceding claim, further comprising means (126a, 126b) for fixating said connection means (130) to said foot (122) at at least two fixation positions on said foot.

4. A support device (120) according to any preceding claim, further comprising at least one protrusion (128) arranged on an underside of said foot (122).

5. A support device (120) according to any preceding claim, wherein said foot (122) is a flat plate.

6. A support device (120) according to any preceding claim, wherein an upper surface (129) of said foot (122) is provided with a rough surface.

7. A barrier system (100) comprising at least one barrier (101) comprising at least one connection post (114) connected to at least one support device (120) according to any of claims 1-6.

8. A barrier system (100) according to claim 7, comprising a framework (107) provided with a net (102).

9. A barrier system according to claim 7 or claim 8, further comprising a reflecting device (104).

10. A barrier system according to claim 9, wherein said reflecting device (104) consists of a reflex pipe and/or comprises a curved envelope surface to reflect light in all directions.

11. A barrier system according to claim 9 or claim 10, wherein said reflecting device (104) is arranged at a height adapted to be visible for a cyclist, and preferably at 0.8 -1.0 m above ground when mounted.

12. A barrier system according to any of claims 9 to 11, further comprising light sources.

Patentansprüche

1. Stützvorrichtung (120) für ein Barrieresystem, umfassend
   einen Fuß (122) zum Eingreifen mit dem Boden und ein Verbindungsmittel (130), das zum Verbinden mindestens eines Verbindungspfostens (114) einer jeweiligen Barriere (101) mit dem Fuß angeordnet ist, wobei das Verbindungsmittel (130) eine erste und eine zweite Kammer (123, 125) umfasst, von denen mindestens die erste Kammer länglich ist, um ein vorgewähltes Spiel für die Montageposition des mindestens einen Verbindungspfostens (114) bereitzustellen, wenn er darin aufgenommen ist, **dadurch gekennzeichnet, dass** die erste und die zweite Kammer zusammen eine L- oder T-Form in der horizontalen Ebene bilden.

2. Stützvorrichtung (120) nach Anspruch 1, wobei die Längserstreckung der ersten Kammer ausgelegt ist, um mindestens zwei Verbindungspfosten einer jeweiligen Barriere unterzubringen.

3. Stützvorrichtung (120) nach einem der vorhergehenden Ansprüche, ferner umfassend Mittel (126a, 126b) zum Befestigen des Verbindungsmittels (130) an dem Fuß (122) an mindestens zwei Befestigungspositionen auf dem Fuß.

4. Stützvorrichtung (120) nach einem der vorhergehenden Ansprüche, ferner umfassend mindestens einen Vorsprung (128), der auf einer Unterseite des Fußes (122) angeordnet ist.

5. Stützvorrichtung (120) nach einem der vorhergehenden Ansprüche, wobei der Fuß (122) eine flache Platte ist.

6. Stützvorrichtung (120) nach einem der vorhergehenden Ansprüche, wobei eine obere Fläche (129) des Fußes (122) mit einer rauen Fläche bereitgestellt ist.

7. Barrieresystem (100), umfassend mindestens eine Barriere (101), die mindestens einen Verbindungspfosten (114) umfasst, der mit der mindestens einen Stützvorrichtung (120) nach einem der Ansprüche 1-6 verbunden ist.

8. Barrieresystem (100) nach Anspruch 7, umfassend einen Rahmen (107), der mit einem Netz (102) bereitgestellt ist.

9. Barrieresystem nach Anspruch 7 oder Anspruch 8, ferner umfassend eine reflektierende Vorrichtung (104).

10. Barrieresystem nach Anspruch 9, wobei die reflektierende Vorrichtung (104) aus einem Reflexrohr besteht und/oder eine gekrümmte Hüllfläche umfasst, um Licht in alle Richtungen zu reflektieren.

11. Barrieresystem nach Anspruch 9 oder Anspruch 10, wobei die reflektierende Vorrichtung (104), wenn sie montiert ist, in einer Höhe, die ausgelegt ist, um für einen Radfahrer sichtbar zu sein, und vorzugsweise 0,8 - 1,0 m über dem Boden angeordnet ist.

12. Barrieresystem nach einem der Ansprüche 9 bis 11, ferner umfassend Lichtquellen.

Revendications

1. Dispositif de support (120) pour un système de barrière, comprenant :

   un pied (122) destiné à s'engager avec le sol ; et
   un moyen de connexion (130) conçu pour connecter au moins un montant de connexion (114) d'une barrière (101) respective audit pied,
   dans lequel
   ledit moyen de connexion (130) comprend un premier et deuxième compartiment (123, 125), parmi lesquels au moins ledit premier compartiment est allongé pour fournir un jeu prédéfini pour la position de montage dudit au moins un montant de connexion (114) lorsque celui-ci est reçu dedans,
   caractérisé en ce que
   lesdits premier et deuxième compartiments forment ensemble une forme en L ou en T dans le plan horizontal.

2. Dispositif de support (120) selon la revendication 1, dans lequel l'extension longitudinale du premier compartiment est adaptée pour accueillir au moins deux montants de connexion d'une barrière respective.

3. Dispositif de support (120) selon l'une quelconque des revendications précédentes, comprenant en outre des moyens (126a, 126b) permettant de fixer ledit moyen de connexion (130) audit pied (122) en au moins deux positions de fixation sur ledit pied.

4. Dispositif de support (120) selon l'une quelconque des revendications précédentes, comprenant en outre au moins une saillie (128) disposée sur un côté inférieur dudit pied (122).

5. Dispositif de support (120) selon l'une quelconque des revendications précédentes, dans lequel ledit pied (122) est une plaque plate.

6. Dispositif de support (120) selon l'une quelconque des revendications précédentes, dans lequel une surface supérieure (129) dudit pied (122) est pourvue d'une surface rugueuse.

7. Système de barrière (100) comprenant au moins une barrière (101) comprenant au moins un montant de connexion (114) connecté à au moins un dispositif de support (120) selon l'une quelconque des revendications 1 à 6.

8. Système de barrière (100) selon la revendication 7, comprenant un cadre (107) pourvu d'un filet (102).

9. Système de barrière selon la revendication 7 ou la revendication 8, comprenant en outre un dispositif réfléchissant (104).

10. Système de barrière selon la revendication 9, dans lequel ledit dispositif réfléchissant (104) consiste en un tuyau réfléchissant et/ou comprend une surface d'enveloppe courbe pour réfléchir la lumière dans toutes les directions.

11. Système de barrière selon la revendication 9 ou la revendication 10, dans lequel ledit dispositif réfléchissant (104) est disposé à une hauteur adaptée pour être visible pour un cycliste, et de préférence de 0,8 à 1,0 m au-dessus du sol lorsque celui-ci est monté.

12. Système de barrière selon l'une quelconque des revendications 9 à 11, comprenant en outre des sources lumineuses.

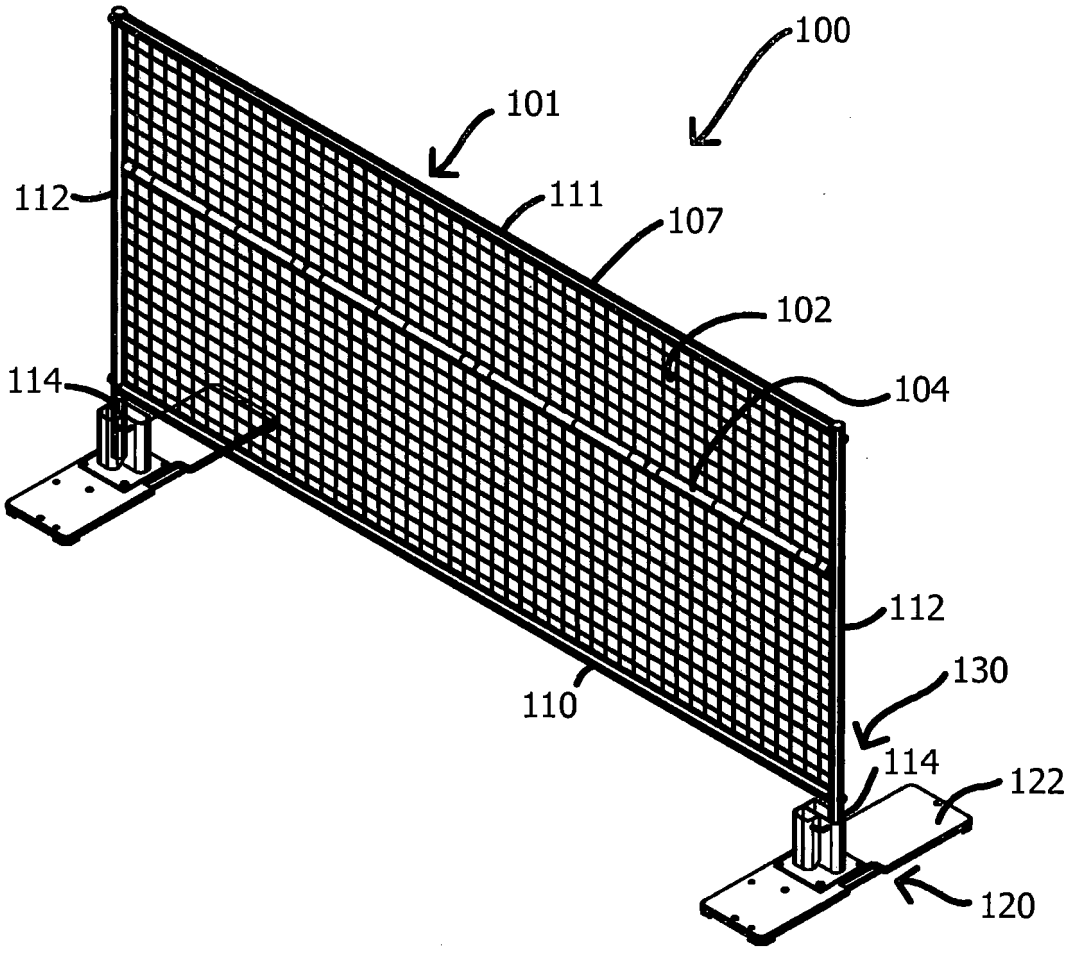


Fig. 1

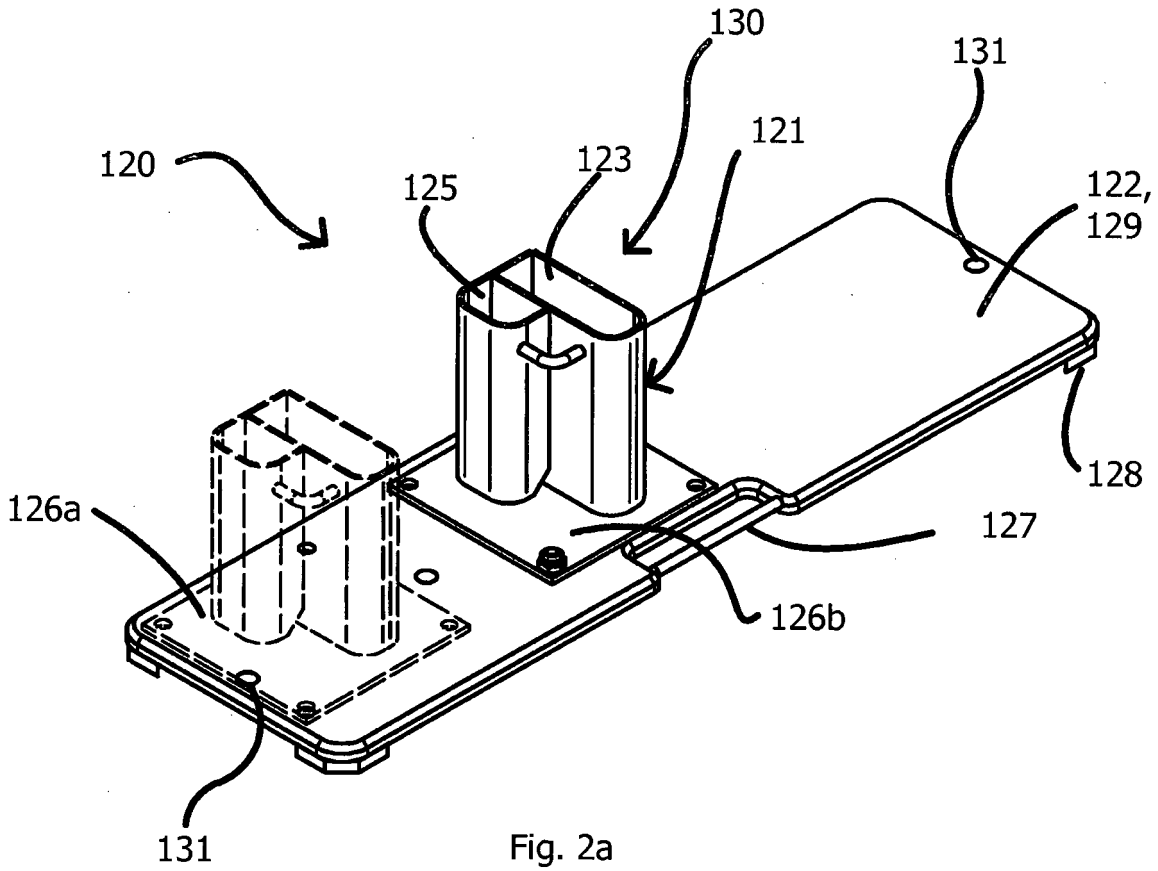


Fig. 2a

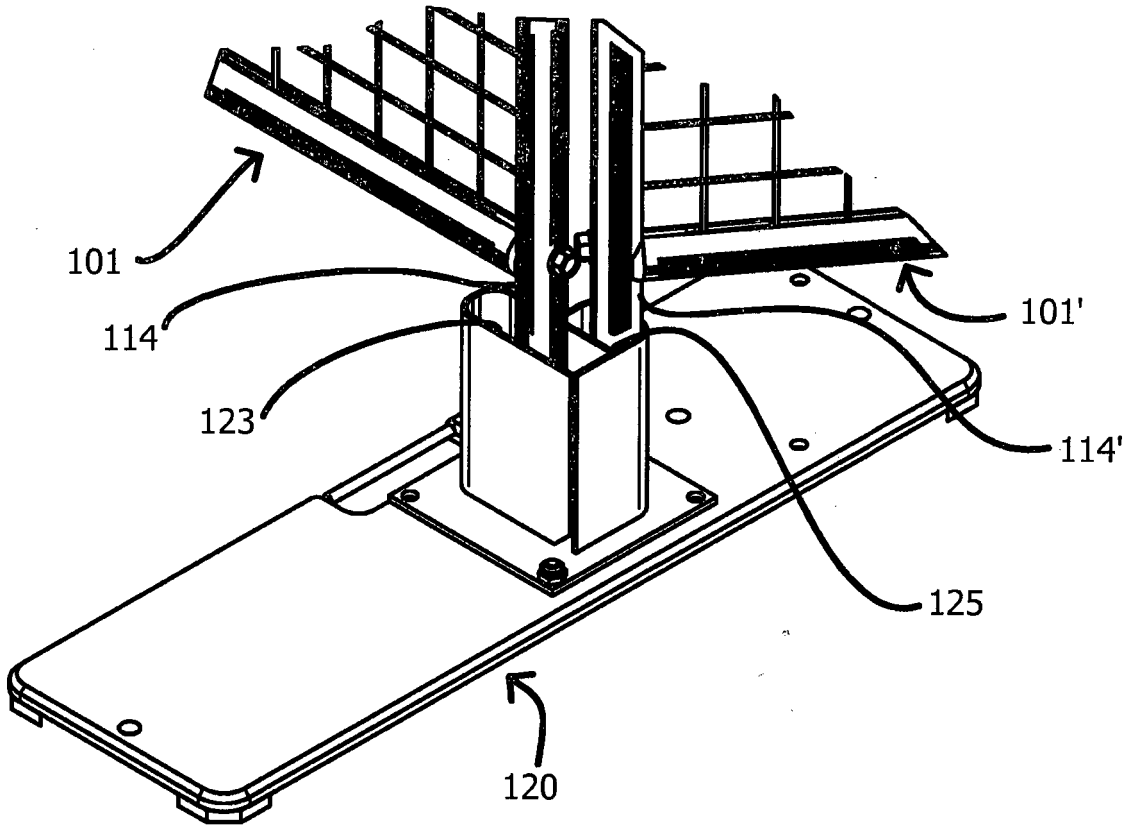


Fig. 2b

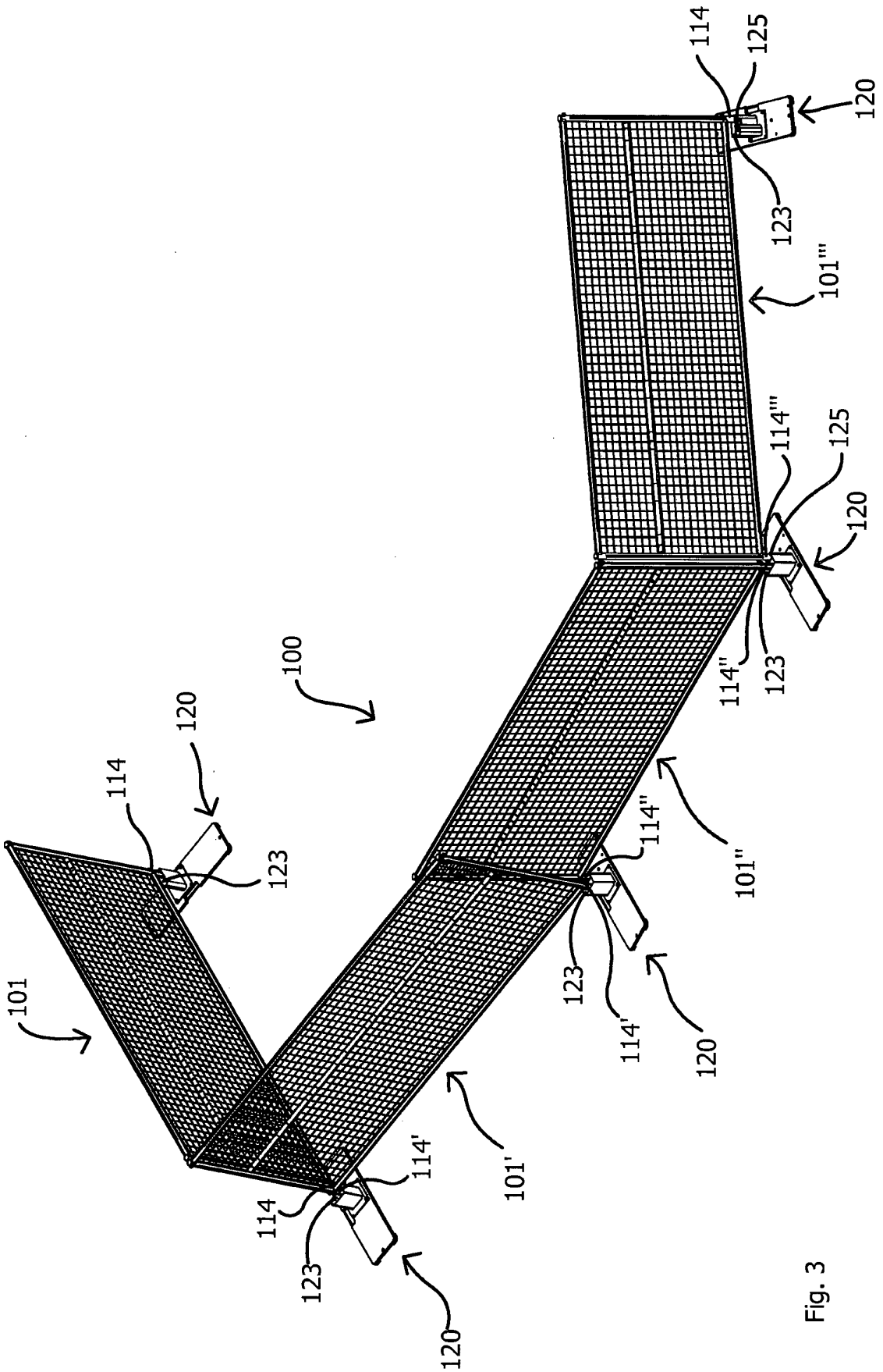


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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- FR 2899911 **[0005]**
- NL 9401555 A **[0006]**