(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 824 255 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
24.02.2016 Bulletin 2016/08

(51) Int Cl.:
E04G 21/32 *(2006.01)*

(21) Application number: **13176281.7**

(22) Date of filing: **12.07.2013**

(54) **Attachment system**

Befestigungssystem

Système de fixation

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(43) Date of publication of application:
14.01.2015 Bulletin 2015/03

(73) Proprietor: **Safety Solutions Jonsereds AB**
832 96 Frösön (SE)

(72) Inventor: **Cooper, Paul**
835 94 Aspås (SE)

(74) Representative: **Awapatent AB**
P.O. Box 665
831 27 Östersund (SE)

(56) References cited:
CA-A1- 2 381 640
FR-A- 1 581 615
FR-A1- 2 532 674

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EP 2 824 255 B1

Printed by Jouve, 75001 PARIS (FR)

Description

FIELD OF THE INVENTION

[0001] The present invention relates to an attachment system for a safety net in the construction or maintenance industries, which attachment system utilizes mounting hooks to secure the safety net to a support surface.

BACKGROUND OF THE INVENTION

[0002] Safety nets have long been employed to minimize the risk of serious injury or death from accidental falling at construction sites and other hazardous structures. Such safety nets are typically mounted below the areas from which an accidental fall may potentially occur, and are commonly required at construction sites to protect the construction workers as well as the general public. Although being an important tool in preventing accidents, ever so often safety nets are not used as many known attachment systems for securing safety nets to the construction are considered too time-consuming and difficult to use. Traditionally ropes have been utilized to secure safety nets which may give varying results and which is very time consuming. More recently safety net mounting devices, such as mounting hooks which are anchored to the construction elements of the building under construction and to which the safety net is engaged have been shown. A known attachment system utilizing mounting hooks to secure a safety net to a construction element is shown in JP3013538U, which discloses a hanger with a gate-shaped body formed to be installed on top of a beam element. A spiral-shaped hook is provided on the hanger to receive meshes or ropes of a safety net. During mounting the hanger is straddled over the beam element, and the safety net is mounted onto the spiral-shaped hook. The known attachment system is disadvantageously dependent on the shape and accessibility of the construction elements to engage the mounting hook. FR 2532 674 also already discloses an attachment system with the technical features of claim 1.

SUMMARY OF THE INVENTION

[0003] It is an object of the present invention to at least provide an improved attachment system that alleviates the above-mentioned drawbacks of the prior art.

[0004] This object is achieved by an attachment system as defined in claim 1. Thus, in accordance with an aspect of the present invention, there is provided an attachment system for securing a safety net to a support surface. The attachment system comprises a holding unit comprising at least one attachment portion arranged for receiving at least a portion of the safety net, and a support unit arranged for engaging with the support surface. The holding unit is adapted to engage with the support unit by means of a hitching element.

[0005] Thus, the attachment system of the present invention is provided as a two part system, in which the support unit may advantageously be premounted onto construction elements to provide possible anchorage points for the safety net. This facilitates, and dramatically reduces time consumption for, the process of mounting a safety net at the construction site. When a safety net is required, as preferably a number of support units are already premounted to provide possible anchorage points for the safety net, holding units are hitched onto to selected support units in a very quick and simple manner. The safety net is then mounted onto the attachment portions of the holding units. Typically, a perimeter rope of the safety net is received in the attachment portions of the holding units. The safety net may then be further tightened by attaching a required number of meshes of the safety net to the attachment portions. Further, when joining safety nets, traditionally two methods are used: overlap and lacing the safety nets together with a rope. In both methods, the present inventive concept is applicable as the nets can advantageously be installed in the same attachment portion where they meet.

[0006] In accordance with an embodiment of the attachment system, the hitching element is arranged having an elongated opening, i.e. a receiving track, adapted to receive a portion of the support unit, which facilitates hitching the holding unit onto the support unit.

[0007] In accordance with an embodiment of the attachment system, the hitching element is substantially U-shaped, which is an advantageous way of forming the elongated opening suitable for receiving a portion of the support unit in the holding unit. The U-shaped hitching element may advantageously extend into two attachment portions connected to a respective leg of the U-shaped portion. Thereby, the load of a safety net when mounted onto the holding unit is distributed between the attachment portions such that the holding unit is balanced over the support unit. Further, the heavier the load from the safety net acts on the attachment portions, the more the U-shaped portion is compressed about the support unit, which thereby prevents the U-shaped portion from sliding off the support unit.

[0008] According to a shown embodiment herein, the hitching element is provided as a U-shaped bent steel rod which is arranged to be hitched over a portion of the support unit when mounted. In a preferred embodiment, the entire holding unit is made of a bent steel rod, where the U-shaped portion and double attachment portions, the latter each preferably arranged as a respective (open) hook, are provided by the bent steel rod. Here each of the attachment portions is connected with a respective leg of the U-shaped portion. This is advantageous as it provides a simple mechanical, unitary device with low cost of manufacturing. Further, by utilizing a rounded profile of the steel rod, the number of sharp edges of the holding unit can be kept down thereby lowering the risk of the holding unit cutting the safety net.

[0009] In accordance with an embodiment of the attachment system, the hitching element is arranged such

that the elongate opening is elbowed (angled) a predetermined angle α. In the case of the U-shaped bent steel rod, the legs of the U-shaped hitching element defines the elongated opening, and in this embodiment the legs are thus bent a predetermined angle α. By providing an elbow in the elongated opening, the hitching element needs to be tilted during mounting or demounting of the hitching element onto the support unit, which provides mounting and demounting in two steps, and therefore a more secure installation of the holding unit onto the support unit as the holding unit is prevented from accidentally being detached from the support unit. The fixation of the holding unit to the support unit is further fortified by the strained safety net.

[0010] In accordance with embodiments of the attachment system, the predetermined angle α, or elbow angle, is preferably selected between 1 and 90 degrees, and more particularly between 20 - 70 degrees which is advantageous. The allowed maximum value of the elbow angle is depending on and limited by the configuration of the support unit, for instance the depth of a receiving slot of the support unit. If the slot is narrow, the allowed maximum elbow angle is smaller, than for a deeper/wider slot. Also the bend radius of the elbow will influence the selection of the elbow angle. Further, the elbow angle is preferably selected to be sufficiently large to prevent the holding unit from being unintentionally unhitched when in a mounted state.

[0011] In accordance with an embodiment of the attachment system, the hitching element comprises a guiding portion for facilitating the hitching of the holding unit onto the support unit. In the exemplifying embodiments, the elongated opening is widened at its open end to provide guiding of the hitching element onto the support unit and thereby facilitates mounting of the holding unit onto the support unit.

[0012] In accordance with an embodiment of the attachment system, the at least one attachment portion comprises a hook element, which is advantageous and facilitates easy installation of the safety net. By shaping the attachment portions as (open) hooks, the safety net may easily be adjusted, e.g. be strained or loosened by adjusting the number of meshes of the safety net being put over the hooks.

[0013] In accordance with an embodiment of the attachment system, the support unit comprises a main body provided with a slot. The hitching element and the slot are preferably arranged to mutually receive each other in a mounted state which provides a stable engagement.

[0014] In accordance with an embodiment of the attachment system, the slot is at least partly circumferentially arranged in the main body, which allows the holding unit to be rotated along the slot and about the support unit. This is advantageous to allow the orientation of the holding unit to at least partly adapt with respect to the direction of the force from the safety net which acts on the attachment system. The slot is preferably arranged in a direction parallel with a backplane of the support unit (although other directions may be applicable).

[0015] In accordance with an embodiment of the attachment system, the slot has a rounded bottom, which is advantageous to provide a good engagement between the hitching element and the slot.

[0016] In accordance with an embodiment of the attachment system, the support unit comprises at least one stop element for limiting movement of the hitching element in a forward direction with respect to the support surface. The stop element may be formed by the slot itself or be provided by a protrusion arranged in the front portion (opposite to the backplane) of the main body of the support unit.

[0017] In accordance with an embodiment of the attachment system, the main body of the support unit is substantially cylinder shaped, which is advantageous for distributing the load of the support net over the support unit. It is further advantageous from a manufacturing point of view, since it allows for turning of a slot therein etc.

[0018] According to a second aspect of the invention, there is provided a safety net system comprising a safety net and a plurality of attachment systems according to the present inventive concept, having the described advantages above for facilitating securing and adjustment of the safety net to a support surface.

[0019] The support unit according to the present inventive concept may, depending on the type of construction element, be engaged with the support structure of the construction element by means of welding, soldering, gluing, screwing, or to be engaged with the support surface via a distribution plate, or via some other applicable beam attachment element.

[0020] 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

[0021] The invention will now be described in more detail and with reference to the appended drawings in which:

Fig. 1a is a schematic perspective front view showing an embodiment of an attachment system according to this invention, Fig. 1b is a schematic perspective side view of the embodiment of an attachment system shown in Fig. 1a, and Fig. 1c is a cross sectional side view of a support unit according to an embodiment of the invention when engaged with a construction element;

Figs. 2a-b schematically illustrate different positions during mounting of a holding unit onto a support unit according to an embodiment of an attachment system of the present invention;

Fig. 3 schematically illustrates a safety net system according to an embodiment of the present inven-

tion; and

Fig. 4 is a schematic perspective view of a holding unit according to an embodiment of an attachment system of the present invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0022] Referring now to Figs. 1a and 1b, an exemplifying embodiment of an attachment system 100 according to the present invention is shown in a perspective front view and a perspective side view, respectively. The attachment system 100 comprises a holding unit generally indicated at 110, and a support unit generally indicated at 120. The support unit 120 is arranged for engaging with a support surface 20 of a construction element, see e.g. Fig. 1c which is a cross sectional side view and a schematic illustration of a support unit 120 which is fixated to a construction element having a support surface 20 onto which a backplane 125 of the support unit 120 abuts when mounted. In the exemplifying embodiment of the inventive concept, the support unit 120 has a cylinder shaped main body 123 made of steel, which along a centre axis CA is provided with a through hole for a bolt 50, screw or other applicable fastening means. Depending on the construction element, e.g. if it is made of steel, concrete or wood etc., the support unit 120 is fixated thereto by applicable means, e.g. welding, soldering, gluing, screwing, or by being engaged with the support surface via a distribution plate, or via a beam attachment element as the person skilled in the art will recognize. In the case of soldering or gluing of the support unit, the main body is preferably left without a through hole, such that the whole backplane (one of the flat surfaces of the cylinder shaped main body) may be used for fastening the support unit to the support surface.

[0023] To continue with reference to Fig. 1c, a slot 121 is cut out peripherally in the main body 123. The slot 121 may be circumferential, as in the shown exemplifying embodiment which illustrate a slot formed in the main body by means of e.g. turning, or form a partly circumferential void arranged in a peripheral portion of the support unit. The slot 120 is preferably arranged to correspond to a shape of the hitching element, i.e. it is arranged to be able to receive the hitching element. In the shown embodiment herein, the slot is shaped like (at least a portion of) a hollow torus, i.e. the inner profile is rounded. However, other shapes of the slot are applicable, e.g. cornered bottom etc. The slot is here arranged perpendicularly with reference to the centre axis CA of the main body 123.

[0024] Referring again to Figs. 1a and 1b, the holding unit 110 is in the exemplifying embodiment manufactured as a unitary element by bending a thick steel rod or strip that is suitably protected against corrosion. Other shapes and materials are applicable, the holding unit may for instance be cut out and bent starting with a steel plate as initial material, e.g. be extruded from a aluminium plate, as is described below with reference to Fig. 4, or be moulded.

[0025] The holding unit 110 comprises a first attachment portion 111 and a second attachment portion 113, which each is generally hook shaped and which each is arranged for engaging with a safety net by receiving a perimeter rope and/or meshes of the safety net over respective free end portions 111a, 113a. As visible in Fig. 1b for the attachment portion 111, the free end portions 111a, 113a of the first attachment portion 111 and second attachment portion 113, respectively, are substantially oriented to be parallel with the support surface of the construction element when the attachment system 100 is in a mounted state, although other orientations may be applicable. In alternative embodiments the holding unit comprises a single attachment portion, or more than two attachment portions. Additional bends 112 (barbs) are provided at the outer tip of the respective free end portions 111a, 113a to further keep the safety net hitched (optional), for instance to prevent ascending winds to catch the safety net and lift the safety net from the holding units. The first attachment portion 111 and the second attachment portion 113 are further each connected to a substantially U-shaped hitching element 115 of the holding unit 110 in that a first limb 115a and second limb 115b, which form the legs of the U-shaped hitching element, are extensions of the respective attachment portion 111, 113. In addition, as is shown in Fig. 1b, the first limb 115a is elbowed such that the first limb is angled a predetermined angle α with respect to a plane in which the upper portion 115c of the hitching element 115 extends, such that the lower portion 115d of the first limb 115a simultaneously forms part of the hook shape of the first attachment portion 111. Further, at the elbow of the first limb 115a the lower portion 115d thereof is (optionally) folded outwardly with respect to a centre normal of the holding unit with respect to said plane in which the upper portion of hitching element extends. In a similar manner as described with respect to Fig. 1b for the first limb 115a, the second limb 115b is elbowed, folded outwards and forms part of attachment portion 113. The outwardly bent elbowed lower portions 115d together provide a guiding portion, i.e. a guiding functionality of the U-shaped hitching element 115 as the holding unit 110 is hitched onto/lowered over the support unit 120 as indicated with an arrow in Fig. 1a. In Fig. 1b, the holding unit 110 is in a mounted state where the hitching element 115 is received in the slot 121, such that the hitching element 115 and the support unit 120 mutually receive each other. Due to the circumferential slot 121, the holding unit 110 is, at least before applying the safety net thereto but also possibly when the safety net is in a mounted state, in the shown embodiment allowed to be oriented in a required radial direction with respect to the centre axis CA of the support unit. In alternative embodiments, where the slot and elongated opening are not circular in their receiving portions, but restricted, for instance by the closed end of the elongated opening being square shaped, the freedom in orientation of the holding

unit is correspondingly limited.

[0026] Referring now to Fig. 2a, three different positions during mounting of the holding unit 110/hitching of the holding unit onto the support unit 120 are illustrated. Initially the holding unit 110" is positioned centred above the support unit 120 and oriented with the lower portions 115d of the hitching element 115 perpendicular to the centre axis CA such that the key functionality of the outwardly folded, elbowed first and second limbs of the hitching element 115 (as previously described and with reference now also to Figs. 1a and 1b) facilitates hitching of the holding unit onto the support unit by guiding the elongated opening 117 into the slot 121. In the next state, the holding unit 110' is, due to the elbowed hitching element, forced to be tilted an angle $\beta \pm \Delta$ corresponding to the elbow angle (predetermined angle α in Fig. 1b) and a tolerance angle Δ associated with the width and height of the slot 121 to allow the elongated opening 117 to be guided over the support unit 120. Finally, the upper portion 115c of the hitching element, or more precisely the closed end of the elongated opening 117, is received in the slot 121 and the holding unit 110 is in a mounted position, where the holding unit is oriented such that the upper portion of the hitching element 115 is perpendicular to the centre axis CA.

[0027] In Fig. 2b, a perimeter rope 51 of a safety net 50 is received by the attachment portion 111. The safety net 50 will cause a load F acting on the holding unit 110. Due to the elbowed hitching element, and as illustrated by the dashed illustration of the holding unit 110"', if the holding unit 110"' is pulled, or pushed upwards for instance by ascending winds catching the safety net, the holding unit 110"' will not get unhitched, but the slot 121 of the support unit 120 will prevent the angled lower portion of the hitching element from passing. The load F from the safety net 50 further keeps the holding unit 110 in place in the holding unit 110. If the direction of the force F from the net is altered, due to the circumferential slot the holding unit may at least tilt in a radial direction with respect to the centre axis to adapt thereto and to decrease any imbalance in corresponding forces acting on the attachment system.

[0028] A holding unit 420 of an embodiment of an attachment system according to the present inventive concept is illustrated in Fig. 4. As the embodiment illustrated with reference to Figs. 1 and 2, the holding unit 420 comprises a hitching element 415 comprising an elongated opening 417, which hitching element 415 is connected via a lower portion 415d thereof to an attachment portion 411, here provided as a single open hook. The hitching element 415 is bent at an elbow portion 421 such that the elongated opening 417 is provided with an elbow of a predetermined angle α, in a manner similar to the previously described embodiment with reference made to Fig. 1b. The holding unit 420 is here configured starting from a flat steel element in which the elongated opening 417 is cut out, and which is bent to provide the elbow 421 and a hook element forming the attachment portion 411. The elongated opening 417 is at its open end widened, here by means of an opening 422, which is adapted in size to be able to receive a support element similar to the previously described support elements. The opening 422 thus provides a guiding portion, arranged such that when hitching the holding unit 420 onto a support unit, the opening 422 is placed over the support unit to guide the elongated opening 417 of the holding unit onto the support unit (key functionality).

[0029] Referring now to Fig. 3, a safety net system 200 according to the present inventive concept is illustrated. A typical safety net 50 is principally comprised of a diamond or square mesh with generally uniform meshes of a preferred size, and a perimeter rope 52, e.g. a thick nylon rope, which extends the circumferential perimeter of the safety net. The perimeter rope 52 is utilized to connect the safety net 50 with attachment systems 100 according to the present invention via the attachment portions (e.g. hooks) of holding units thereof. To install the safety net, a plurality of holding units are hitched onto supports units which are either premounted to the construction elements or fixated to the construction elements at the construction site. Thereafter, the safety net 50 is simply mounted and strained by placing the perimeter rope 52 and/or a suitable number of meshes in the respective attachment portions of each attachment system 100. In Fig. 3 the attachment systems 100 are distributed along a support surface 20 of a construction element. The attachment systems 100 are typically spaced about 2 m apart (a maximum distance according to standard is 2.5 m), and may be staggered at opposite sides of the safety net.

Claims

1. An attachment system (100) for securing a safety net to a support surface, said attachment system comprising
   a holding unit (110) comprising at least one attachment portion (111) arranged for receiving at least a portion of said safety net; and
   a support unit (120) arranged for engaging with said support surface,
   wherein said holding unit (110) is adapted to engage with said support unit (120) by means of a hitching element (115), wherein said hitching element (115) is arranged having an elongated opening (117) adapted to receive a portion of said support unit (120), **characterized in that** said hitching element (115) is arranged such that the elongate opening (117) is elbowed a predetermined angle α.

2. An attachment system according to claim 1 or 2, wherein said hitching element is substantially U-shaped.

3. An attachment system according to claim 2, when

comprising two attachment portions, and wherein said attachment portions are connected to a respective leg of said U-shaped portion.

4. An attachment system according to any preceding claim, wherein said predetermined angle α is selected between 20 and 70 degrees.

5. An attachment system according to any preceding claim, wherein said hitching element comprises a guiding portion.

6. An attachment system according to any preceding claim, wherein said at least one attachment portion comprises a hook element.

7. An attachment system according to any preceding claim, wherein said holding unit is formed from a bent steel rod.

8. An attachment system according to any preceding claim, wherein said support unit (120) comprises a main body (123) provided with a slot (121), and wherein said hitching element (115) and said slot (121) are arranged to mutually receive each other in a mounted state.

9. An attachment system according to claim 8, wherein said slot (121) is at least partly circumferentially arranged in said main body.

10. An attachment system according to claim 8 or claim 9, wherein said slot (121) has a rounded bottom.

11. An attachment system according to any preceding claim, wherein said support unit (120) comprises at least one stop element (123) for limiting movement of said hitching element (115) in a forward direction with respect to said support surface.

12. An attachment system according to any preceding claim, wherein said main body of said support unit (120) is substantially cylinder shaped.

13. A safety net system (200) comprising a safety net (50) and a plurality of attachment systems (100) according to any preceding claim.

Patentansprüche

1. Befestigungssystem (100) zur Sicherung eines Sicherheitsnetzes an einer Trägeroberfläche, wobei das Befestigungssystem Folgendes umfasst:

eine Halteeinheit (110), die wenigstens einen Befestigungsabschnitt (111) umfasst, der angeordnet ist, um wenigstens einen Abschnitt des Sicherheitsnetzes aufzunehmen; und
eine Trägereinheit (120), die angeordnet ist, um mit der Trägeroberfläche in Eingriff zu kommen, wobei die Halteeinheit (110) angepasst ist, mit der Trägereinheit (120) mittels eines Ankopplungselementes (115) in Eingriff zu kommen, wobei das Ankopplungselement (115) derart angeordnet ist, dass es eine längliche Öffnung (117) aufweist, die angepasst ist, einen Abschnitt der Trägereinheit (120) aufzunehmen, **dadurch gekennzeichnet, dass** das Ankopplungselement (115) derart angeordnet ist, dass die längliche Öffnung (117) einen vorherbestimmten Winkel α abgewinkelt ist.

2. Befestigungssystem nach Anspruch 1 oder 2, wobei das Ankopplungselement im Wesentlichen U-förmig ist.

3. Befestigungssystem nach Anspruch 2, wenn es zwei Befestigungsabschnitte umfasst, wobei die Befestigungsabschnitte mit einem entsprechenden Bein des U-förmigen Abschnittes verbunden sind.

4. Befestigungssystem nach einem der vorangehenden Ansprüche, wobei der vorherbestimmte Winkel α zwischen 20 und 70 Grad ausgewählt ist.

5. Befestigungssystem nach einem der vorangehenden Ansprüche, wobei das Ankopplungselement einen Führungsabschnitt umfasst.

6. Befestigungssystem nach einem der vorangehenden Ansprüche, wobei der wenigstens eine Befestigungsabschnitt ein Hakenelement umfasst.

7. Befestigungssystem nach einem der vorangehenden Ansprüche, wobei die Halteeinheit aus einer gebogenen Stahlstange gebildet ist.

8. Befestigungssystem nach einem der vorangehenden Ansprüche, wobei die Trägereinheit (120) einen Hauptkörper (123) umfasst, der mit einem Schlitz (121) zur Verfügung gestellt ist, und wobei das Ankopplungselement (115) und der Schlitz (121) derart angeordnet sind, dass sie sich in einem befestigten Zustand gegenseitig empfangen.

9. Befestigungssystem nach Anspruch 8, wobei der Schlitz (121) wenigstens teilweise umlaufend in dem Hauptkörper angeordnet ist.

10. Befestigungssystem nach Anspruch 8 oder Anspruch 9, wobei der Schlitz (121) einen abgerundeten unteren Teil aufweist.

11. Befestigungssystem nach einem der vorangehenden Ansprüche, wobei die Trägereinheit (120) we-

nigstens ein Stoppelelement (123) zur Beschränkung der Bewegung des Ankopplungselementes (115) in einer Vorwärtsrichtung bezüglich der Trägeroberfläche umfasst.

12. Befestigungssystem nach einem der vorangehenden Ansprüche, wobei der Hauptkörper der Trägereinheit (120) im Wesentlichen zylinderförmig ist.

13. Sicherheitsnetzsystem (200) umfassend ein Sicherheitsnetz (50) und mehrere Befestigungssysteme (100) nach einem der vorangehenden Ansprüche.

Revendications

1. Système d'attachement (100) destiné à fixer un filet de sécurité sur une surface de support, ledit système d'attachement comprenant :

une unité de rétention (110) comprenant au moins une portion d'attachement (111) agencée pour recevoir au moins une portion dudit filet de sécurité ; et
une unité de support (120) agencée pour se mettre en prise avec ladite surface de support,
dans lequel ladite unité de rétention (110) est apte à se mettre en prise avec ladite unité de support (120) au moyen d'un élément d'accrochage (115), dans lequel ledit élément d'accrochage (115) est agencé en ayant une ouverture allongée (117) apte à recevoir une portion de ladite unité de support (120), **caractérisé en ce que** ledit élément d'accrochage (115) est agencé de sorte que l'ouverture allongée (117) soit coudée d'un angle prédéterminé α.

2. Système d'attachement selon la revendication 1 ou 2, dans lequel ledit élément d'accrochage est sensiblement en forme de U.

3. Système d'attachement selon la revendication 2, comprenant deux portions d'attachement, dans lequel lesdites portions d'attachement sont reliées à une broche respective de ladite portion en forme de U.

4. Système d'attachement selon l'une quelconque des revendications précédentes, dans lequel ledit angle prédéterminé α est sélectionné entre 20 et 70 degrés.

5. Système d'attachement selon l'une quelconque des revendications précédentes, dans lequel ledit élément d'accrochage comprend une portion de guidage.

6. Système d'attachement selon l'une quelconque des revendications précédentes, dans lequel ladite au moins une portion d'attachement comprend un élément de crochet.

7. Système d'attachement selon l'une quelconque des revendications précédentes, dans lequel ladite unité de rétention est formée à partir d'une tige en acier pliée.

8. Système d'attachement selon l'une quelconque des revendications précédentes, dans lequel ladite unité de support (120) comprend un corps principal (123) pourvu d'une fente (121), et dans lequel ledit élément d'accrochage (115) et ladite fente (121) sont agencés pour se recevoir mutuellement l'un dans l'autre dans un état monté.

9. Système d'attachement selon la revendication 8, dans lequel ladite fente (121) est agencée au moins partiellement de manière circonférentielle dans ledit corps principal.

10. Système d'attachement selon la revendication 8 ou 9, dans lequel ladite fente (121) a un fond arrondi.

11. Système d'attachement selon l'une quelconque des revendications précédentes, dans lequel ladite unité de support (120) comprend au moins un élément de butée (123) pour limiter un mouvement dudit élément d'accrochage (115) dans un sens vers l'avant par rapport à ladite surface de support.

12. Système d'attachement selon l'une quelconque des revendications précédentes, dans lequel ledit corps principal de ladite unité de support (120) est de forme sensiblement cylindrique.

13. Système de filet de sécurité (200) comprenant un filet de sécurité (50) et une pluralité de systèmes d'attachement (100) selon l'une quelconque des revendications précédentes.

Fig 1a

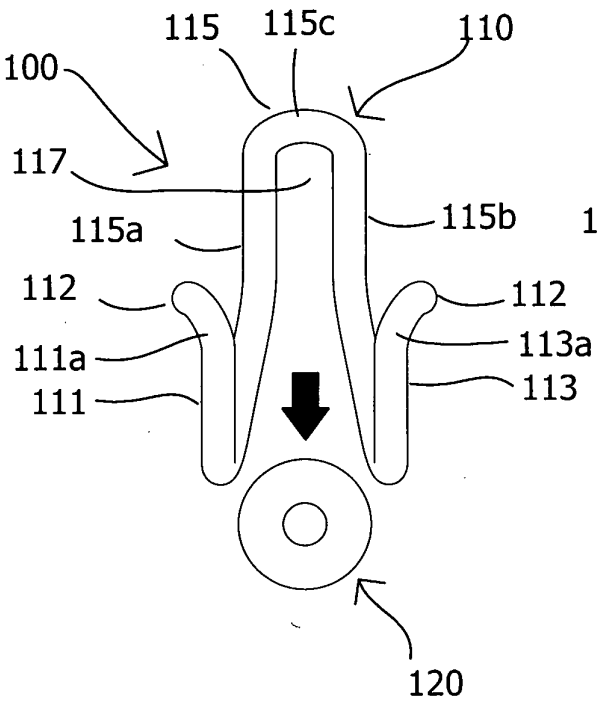


Fig 1b

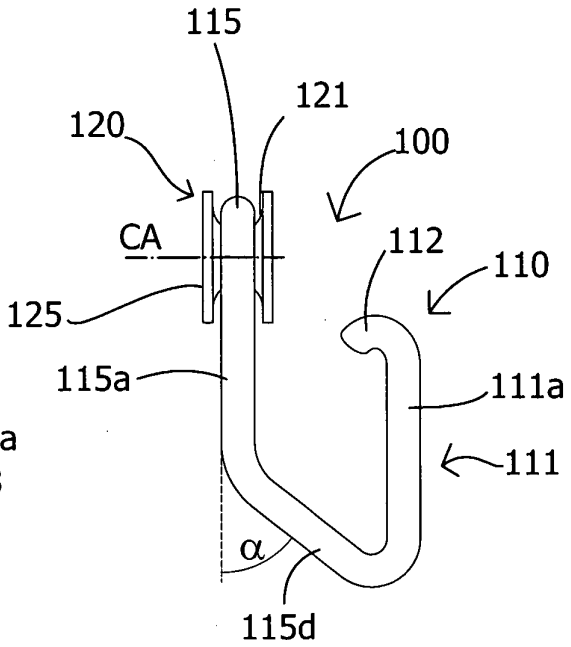


Fig 1c

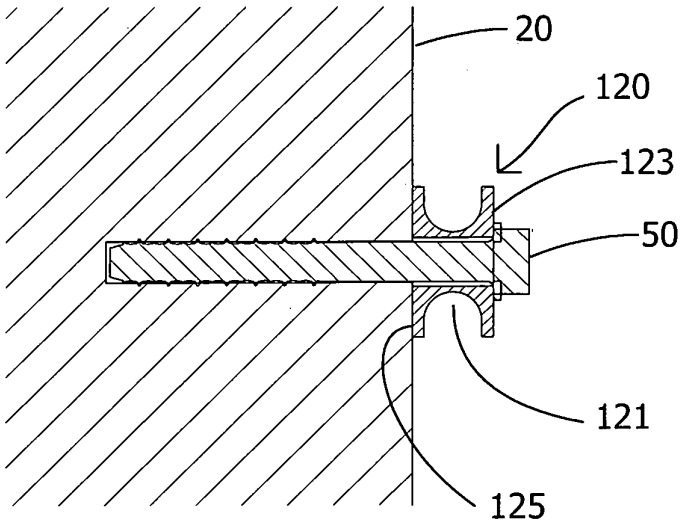


Fig 2a

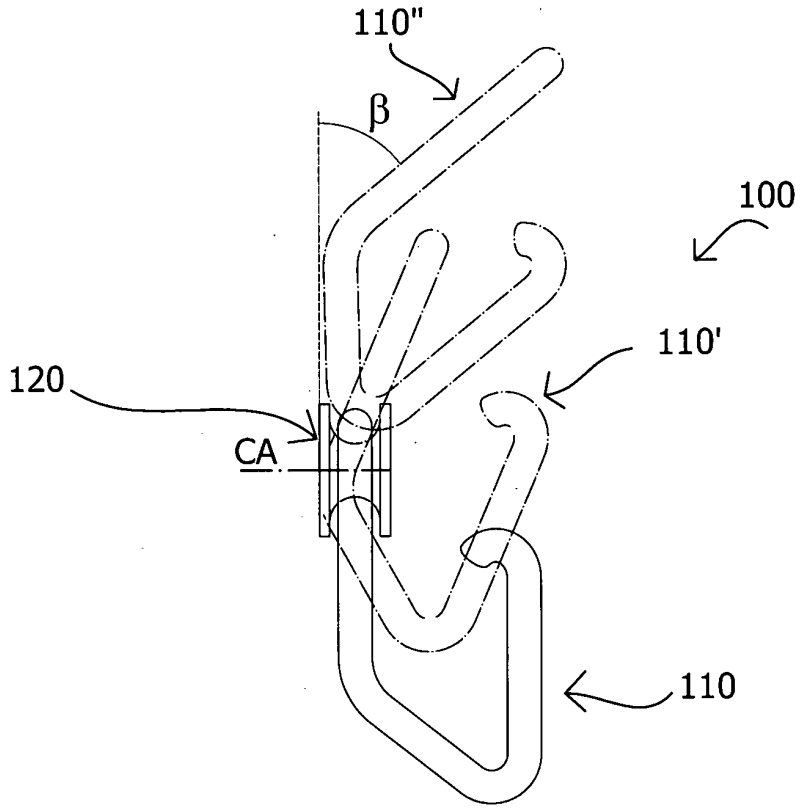


Fig 2b

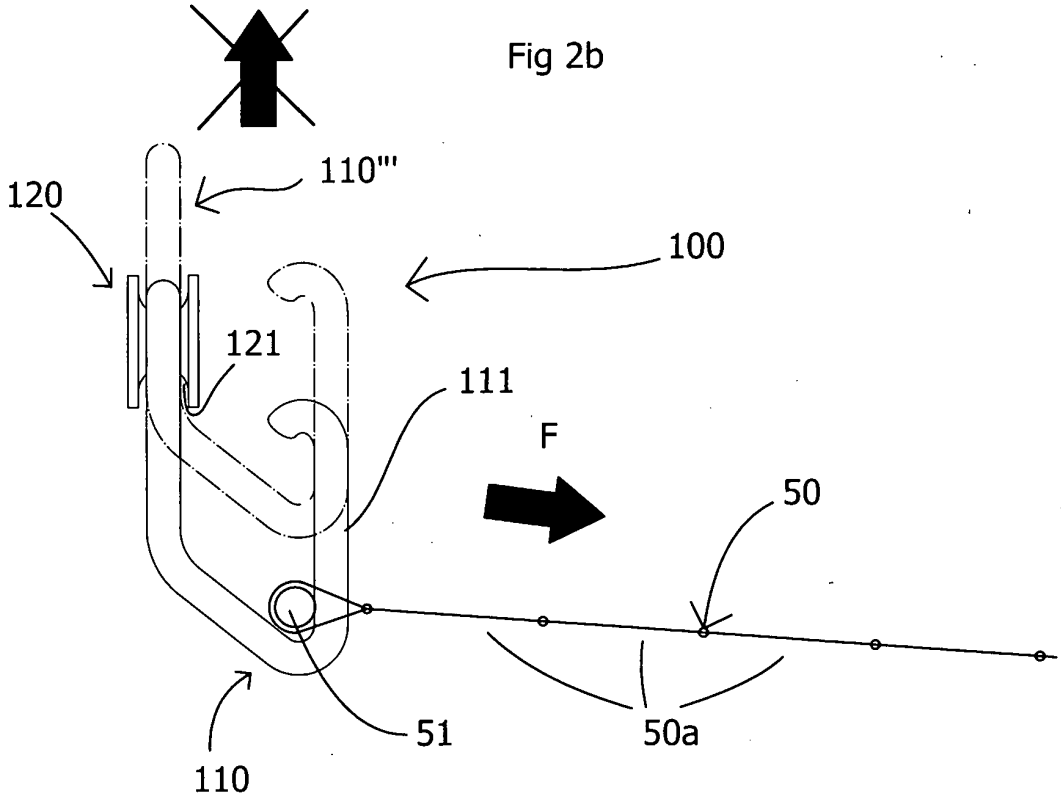


Fig 3

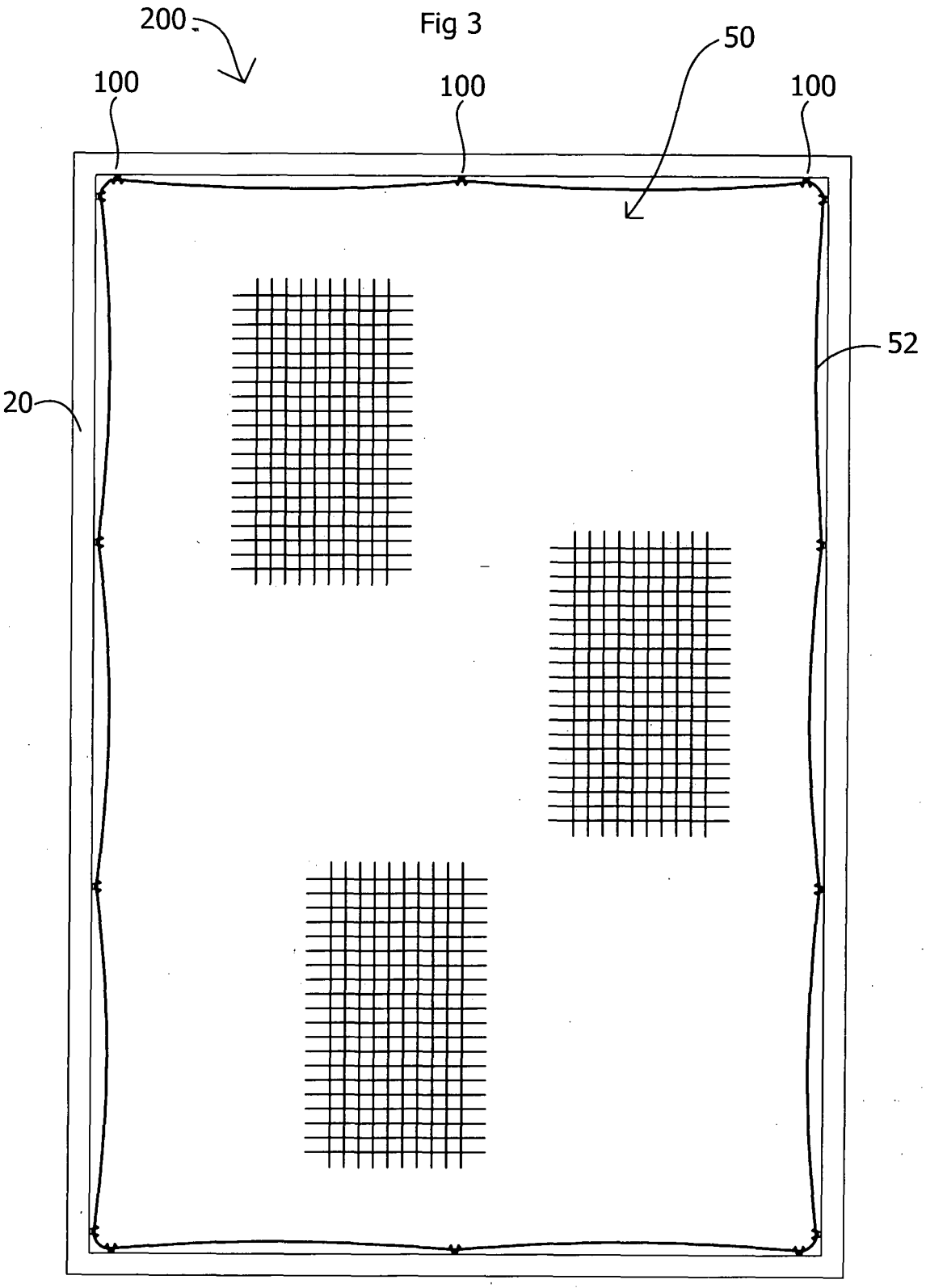
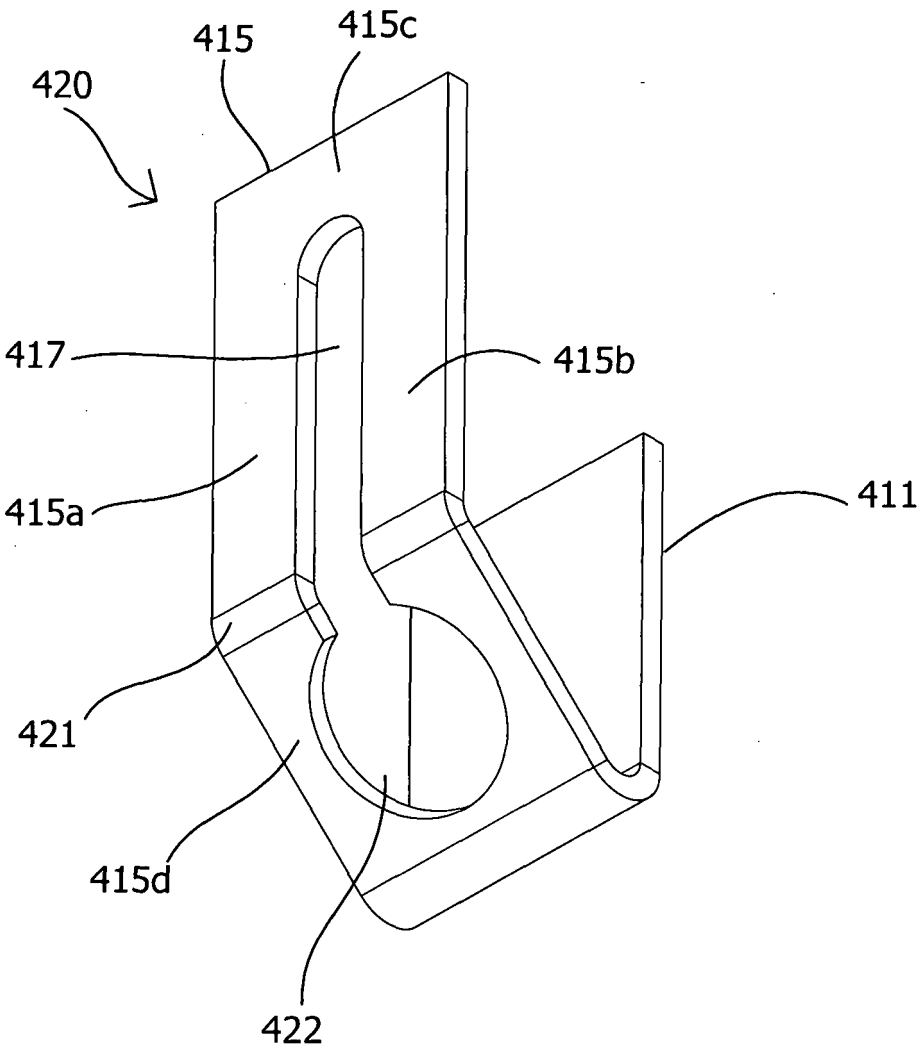


Fig 4



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 3013538 U **[0002]**
- FR 2532674 **[0002]**