



(11) **EP 2 021 574 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
05.05.2010 Bulletin 2010/18

(21) Application number: **07722608.2**

(22) Date of filing: **14.05.2007**

(51) Int Cl.:
E06C 7/18 (2006.01)

(86) International application number:
PCT/DK2007/000229

(87) International publication number:
WO 2007/131508 (22.11.2007 Gazette 2007/47)

(54) **A SYSTEM AND ANTI-FALL PROTECTION FOR INDIVIDUALS USING LADDERS**
SYSTEM UND ABSTURZSICHERUNG FÜR PERSONEN, DIE LEITERN VERWENDEN
SYSTÈME DE PROTECTION ANTICHUTE POUR LES UTILISATEURS D'ÉCHELLES

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR

(30) Priority: **16.05.2006 DK 200600685**

(43) Date of publication of application:
11.02.2009 Bulletin 2009/07

(73) Proprietor: **Avanti Stigefabrik A/S**
DK-3400 Hillerod (DK)

(72) Inventor: **MIDTGAARD, Søren**
1820 Frederiksberg C (DK)

(74) Representative: **Münzer, Marc Eric**
Zacco Denmark A/S
Hans Bekkevolds Allé 7
2900 Hellerup (DK)

(56) References cited:
DE-U1- 8 606 240 DE-U1- 20 314 230
FR-A1- 2 437 846

EP 2 021 574 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The invention relates to a system for protecting individuals during work on ladders with rungs, which system encompasses anti-fall protection that comprises a first and a second side and a displaceable hinge that can be secured to an individual by means of a safety line, safety harness or the like and a rail for being attached in an essentially vertical position on or at the ladder; said anti-fall protection and rail having cooperating locking means that are adapted such that the anti-fall protection is able to slide on the rail when the hinge is displaced in one direction, and is secured on the rail when the hinge is displaced in another direction, said rail and anti-fall protection being also configured with complementary and asymmetrical engagement means such that the anti-fall protection can be mounted on the rail with only one side up, and wherein said first and second sides can be displaced relative to each other to the effect that the engagement means can be caused to engage and disengage the rail.

[0002] When work is to be performed at great heights, eg during maintenance of wind turbines, it is often required that the person at work stands for long durations on internal or external ladder structures. This is due to the fact that, on the one hand, the person performing such tasks is often to climb long distances on the ladders and, on the other hand, some of the work is also to be performed while standing on the ladders. The ascending and descending being in particular associated with physical strain, there is an increased risk of errors due to exhaustion and there is there for a need for equipment that is not only reliable, but also unailing and easy to operate and which may provide safety against individuals falling.

[0003] Equipment for anti-fall protection is known which is used in connection with eg work on ladders. Such equipment usually comprises a anti-fall protection which is able to slide on a rail intended therefor. The anti-fall protection usually comprises a brace or a hinge which, via eg one or more snap hooks and a safety harness, can be connected to the worker who uses the equipment. This kind of anti-fall protection functions in that the anti-fall protection slides on the rail at the rates and accelerations that occur in case of normal use of the ladder and, in return, locks securely onto the rail at the rates and accelerations that usually occur in case of a fall. Often the underlying mechanical principle of these anti-fall protection systems is based on an eccentric mechanism accommodated at the bottom of the brace or the hinge which is rotatably journalled. The eccentric mechanism functions in that it is forced into locking engagement with the rail when the brace or the hinge is influenced relatively by a downwards force. When the anti-fall protection is used by a person who climbs the ladder, the hinge thus occupies such position where the eccentric is released from the rail, whereas a fall will influence the brace or the hinge in a direction where the eccentric engages lockingly with the rail.

[0004] DE 20314230 U1 shows a system according to the preamble of claim 1 and an anti-fall protection according to the preamble of claim 3.

[0005] From US patent application No. US 2003/0217887 a system is known for securing individuals against falls. The system comprises an anti-fall protection provided with brace/hinge which is mounted on a rail configured therefor. The anti-fall protection allows the individual using it to move up and down in case of normal use of the ladder, but in case an individual using the system slides or falls, the slider instantly locks onto the rail. The anti-fall protection functions by means of an eccentrics mechanism as described above which is connected to the hinge or the brace and which, when the hinge/brace is influenced by a sufficient force in a downwards direction, is forced to lockingly engage the associated rail. To prevent faulty orientation of this anti-fall protection on the rail to the effect that, instead of preventing quick movement in downwards direction, it allows same, the rail and the anti-fall protection are adapted such to each other that the anti-fall protection can be oriented on the rail in only one way.

[0006] US patent No. US 6,725,969 B1 discloses another system for safeguarding against falls from ladders. This system also comprises an anti-fall protection which, during use of the ladder, has to be mounted on a rail. That anti-fall protection functions by means of a latch/pawl which is forced into engagement with holes intended therefor if the individual using the anti-fall protection falls.

[0007] Neither of those anti-fall protections can be mounted or dismounted just anywhere on the rail; rather they have to be mounted or dismounted at the top or at the bottom of the rail. This is inconvenient in case of large and complex structures such as eg. wind turbines. As it is, in those structures, there is often a need to be able to leave the ladder on the way, wind turbines often having landings and apparatuses at several different levels.

[0008] There is therefore a need for an anti-fall protection which allows dismounting and mounting anywhere on the rail and which is simultaneously safe against unintentional opening to the effect that the slider cannot fall off the rail.

[0009] Besides, there is a need to ensure that the anti-fall protection does not disengage the rail while it is preventing an individual from falling.

[0010] Experience has shown that exhausted people may act irrationally, such as open an anti-fall protection unintentionally. Experience has also shown that, provided an individual is to perform three logical/conscious acts to obtain a specific effect, it is very likely that the individual obtains that effect unintentionally. By thus providing an anti-fall protection with means to allow it to be dismounted only after three conscious acts have been performed, the risk of opening/maloperating is reduced considerably and hence there is a very high degree of reliability against an even very exhausted user unintentionally opening and/or dismounting the anti-fall protection.

[0011] The object of the invention is accomplished by

a system according to claim 1.

[0012] According to one embodiment the anti-fall protection, latch, ladder and rail are adapted to each other to be such that the latch will hit the rungs of the ladder when the anti-fall protection is mounted on the rail, and the latch occupies the position in which it allows a movement of the stop means to enable it to occupy a position where the hinge can be moved to a position in which the first and the second sides can be shifted out of engagement with the rail.

[0013] By adapting anti-fall protection, latch, ladder and rail to each other in this way it is prevented that the anti-fall protection is unable to slide on the rail and hence becomes useless in practice if just one of the three required actions is performed. This entails an increased degree of safety as the system is more or less self-controlling.

[0014] The invention further relates to an anti-fall protection as featured in claims 3-4.

[0015] It should be emphasized/stressed that the designation 'hinge' comprises any kind of displaceable mechanism to which an individual is able to secure a line.

[0016] In the following the invention will be described in further detail with starting point in the figures, where

Figure 1 is a perspective view of an anti-fall protection on which a rail is mounted;

Figure 2 is a perspective view of an anti-fall protection in a partially exploded view;

Figure 3 is a perspective view of an anti-fall protection as shown in Figure 1 in a partially exploded view, from another angle;

Figure 4 shows an anti-fall protection as shown in Figure 1 with its latch in pressed-in position;

Figure 5 shows the anti-fall protection shown in Figure 4 with mounted and pressed-in latch;

Figure 6 shows the anti-fall protection shown in Figure 3 with mounted and pressed-in latch, where the hinge is turned forwards to the position where the sides can be pulled apart;

Figure 7 shows a latch seen from the side.

[0017] An embodiment of the invention will now be explained in further detail with reference to the figures.

[0018] Figure 1 is a perspective view of an anti-fall protection 1 on which a rail (2) is mounted. The anti-fall protection comprises a first and a second side 10, 11 and a displaceable hinge 12, to which an individual can be secured by means of a safety line, safety harness or the like (not shown). The system further comprises a rail 20 for attachment in an essentially vertical position on or at the ladder (not shown either). Anti-fall protection 1 and

rail 20 are configured with co-operating locking means that are adapted such that the anti-fall protection is able to slide on the rail 20 when the hinge 12 is displaced in one direction and locked onto the rail 20 when the hinge is displaced in another direction. In the case shown in Figure 1, the locking means are constituted by an eccentric 15 at the bottom of the hinge 12 which can be forced downwards towards the ladder 20 when the anti-fall protection is mounted on the rail, and the hinge is turned about the axis 18. The rail 20 and the anti-fall protection are also configured with complementary and asymmetrical engagement means 13, 14 and 21, 22 which, in the shown case, are constituted by flanges 21, 22 on the rail and cavities 13, 14 configured therefor in the anti-fall protection. On the rail as such there is, on the one side, configured a longitudinally extending edge 23 that fits into a corresponding recess in the one cavity 13 of the anti-fall protection (best seen in Figure 2). That edge 23 and the associated recess 16 ensure that the anti-fall protection can be mounted on the rail in only one way. The anti-fall protection is constructed such that the two sides 10 and 11 can be shifted in such a way relative to each other that the cavities 13, 14 can be pulled off the flanges of the rail and thereby the anti-fall protection can be mounted and dismantled anywhere on the rail. In the shown case, this functionality is obtained through the use of a guide 17 on which the part 10 can be mounted slideably by means of an opening 18 corresponding to the guide.

[0019] To prevent that the anti-fall protection is unintentionally dismantled from the rail, the technical means that connect the first 10 and the second side 11 of the anti-fall protection are configured such that the side can be shifted out of engagement with the rail 20 only when the hinge 12 is in a specific position.

[0020] This functionality will now be explained in further detail with reference to figures 2 and 3.

[0021] In Figure 3, on the right side 10 of the anti-fall protection, an opening 40 will appear which is, to the right of the Figure, round and, further into the side 10, it proceeds to assume a substantially square shape. The square part of the opening 40 extends such distance into the side 10 that the corresponding head 41 on the shaft 19 allows a relative and axial movement between the shaft 19 and the side 10 when the head is in the square part of the opening 40. When the shaft 19 is to be mounted on the anti-fall protection, it takes place by firstly pulling its thin part through the opening 40 and then (turnably fixing it) through the hinge 12 in order to finally secure it in the other side 11 of the anti-fall protection. This attachment takes place by means of rivets 30, 31 (shown in Figure 2) that are able to engage with a corresponding recess in the one end of the shaft when the latter is introduced into the other side 11 of the anti-fall protection, and the rivets 30, 31 are mounted in holes configured therefore (not shown) underneath the openings 31a and 32a (as are shown in Figure 3). The length of the shaft 19 is adapted such to the anti-fall protection that the head

41 is located in the round part of the hole 40 when the anti-fall protection is mounted on the rail 20, and thereby a rotation of the shaft is allowed and hence also of the hinge 12 when the anti-fall protection is used on the rail. In order to dismount or mount the anti-fall protection to/from the rail, all it takes is thus that the hinge is turned to a position where the square head of the shaft is able to slide into the corresponding square part of the hole 40, following which the side 10 can be displaced relatively relative to the side 11, the head now being able to slide into the square part of the hole 40. Besides, in the examples shown in the figures, the anti-fall protection is secured against the sides being entirely dismounted, the internal diameter 42 of the hole 40 (best seen in Figure 2) being of such size and shape that the head 41 is unable to pass there through.

[0022] Other embodiments of the invention will now be explained with reference to figures 4 and 5.

[0023] Figure 4 shows an embodiment of the invention where the hinge is shifted to a position where the eccentric mechanism 15 (not shown in Figure 4) is not in engagement with the rail, but wherein the sides 10 and 11 can be shifted mutually to the effect that the anti-fall protection can be dismounted from and mounted on the rail 20. Figure 5 schematically shows how the anti-fall protection further comprises a stop means which, in its shown position, allows the hinge to be moved to the position where the anti-fall protection is able to slide on the rail and simultaneously be dismounted from or mounted on the rail. This stop means 32 is journaled rotatably on a shaft 34 and the stop means comprises an edge 32 (shown in Figure 3) which is able to lockingly engage with a corresponding edge 33 on the hinge (also shown in Figure 3). In one embodiment, the shaft 34 of the stop means 32 is spring-biased such that the stop means seeks towards the position in which it prevents the hinge from turning towards the position in which the anti-fall protection can be separated from the rail. Thereby further preventive measures against the anti-fall protection being unintentionally dismounted from the rail 20 are provided.

[0024] According to a further embodiment, the hinge 12 can also be securely locked in engagement with the stop means 32, it being possible to fixate the stop means in this position by means of a latch 50. The latch 50 which is shown in greater detail in Figure 7 is, in this embodiment of the invention, mounted such - in the second side 11 of the anti-fall protection, as shown in figures 1 and 3 - that it can be displaced in its longitudinal direction. As will best appear from Figure 2, the latch has an area which is able to engage with an essentially flat piece 35 on the shaft of the stop means 32, and the length of the latch is adapted to be such that it takes place precisely when the latch is, as shown in Figure 1, pressed partially into the anti-fall protection. Thereby the stop means 32 is locked, which in turn locks the hinge 12 in a position where the anti-fall protection cannot be opened. As will appear from Figure 7, the latch further has an area 51 of

reduced diameter and that area is adapted to the shaft on the stop means to enable the stop means to rotate when that part 51 of the latch is arranged opposite the shaft 35 of the stop means. By configuring the latch in this way and with a length ratio between head and narrowed portion suitable for the anti-fall protection, the latch allows rotation only when the latch is pressed completely into the anti-fall protection, as shown by figures 4 and 5. As will further appear, the anti-fall protection and the latch can be adapted to be such that the lower end 52 of the latch protrudes out through the underside of the anti-fall protection. It is the object of this that the end 52 of the latch - when the latch allows rotation of the stop means 32 - can and will hit the rungs of a ladder (not shown in the figures) on which the rail 20 and anti-fall protection are mounted.

Claims

1. A system for protecting individuals during work on ladders with rungs, said system comprising an anti-fall protection (1) comprising a first (10) and a second (11) side and a displaceable hinge (12) that can be secured to an individual by means of safety line, harness or the like, and a rail (20) for attachment in an essentially vertical position on or at the ladder; said anti-fall protection (1) and rail (20) having co-operating locking means that are adapted to be such that the anti-fall protection (1) is able to slide on the rail (20) when the hinge (12) is displaced in one direction and is locked on the rail (20) when the hinge (12) is displaced in another direction, said rail (20) and anti-fall protection (1) being also configured with complementary and asymmetrical engagement means (13,14,21,22) to the effect that the anti-fall protection (1) can be mounted on the rail (20) with only one side up, and said first and second sides being mutually displaceable to the effect that the engagement means can be caused to engage and disengage the rail the anti-fall protection also comprises between the first (10) and the second (11) sides connection means (19,41) that cooperate with the hinge (12) to the effect that the first (10) and the second (11) sides of the anti-fall protection (1) can be shifted out of engagement with the rail (20) only when the hinge (12) is shifted in one direction and installed in a specific position, said connection means (19,41) being configured such that the first (10) and second sides of the anti-fall protection (1) can be displaced out of engagement with the rail (20) only when the hinge (12) is displaced in the direction where it does not lock the anti-fall protection against the rail; and that the anti-fall protection (1) further comprises a stop means (32) allowing the hinge (12) to be moved to a position in which the anti-fall protection (1) is able to slide on the rail (20), prevents the hinge (12) from being moved to said specific position in which the

first (10) and the second (11) sides can be shifted out of engagement with the rail, **characterised in that** said stop means (32) cooperating with a displaceable latch (50) to the effect that the latch (50) is to be taken to a predetermined position before the stop means (32) can be moved to a position where the first (10) and the second (11) sides can be shifted out of engagement with the rail (20).

2. A system for protecting individuals during work on ladders with rungs in accordance with claim 1, **characterised in that** anti-fall protection (1), latch (50), ladder and rail (20) are adapted such to each other that the latch (50) will hit the rungs of the ladder when the anti-fall protection (1) is mounted on the rail (20), and the latch (50) occupies the position in which it allows a movement of the stop means (32) to the effect that it may occupy a position in which the hinge (12) can be moved to a position where the first (10) and second (11) sides can be shifted out of engagement with each other.
3. An anti-fall protection (1) for use in a system with a rail (20) as defined in claims 1 or 2, comprising a first (10) and a second (11) side and a displaceable hinge (12) that can be secured to a person by means of a safety line, harness or the like, the anti-fall protection comprises between the first (10) and the second (11) sides connection means (19,41) that co-operate with the hinge (12) to the effect that the first (10) and second (11) sides of the anti-fall protection (1) can be shifted mutually only when the hinge (12) is displaced in one direction and installed in a specific position; and that the anti-fall protection (1) further comprises a stop means (32) that prevents the hinge (12) from being moved to a position in which the first (10) and the second (11) side can be shifted out of engagement with the rail, **characterised in that** said stop means (32) co-operating with a latch (50) to the effect that the latch (50) must be moved to a specific position before the stop means (32) can be moved to a position in which the first (10) and second (11) sides can be shifted out of engagement with the rail (20).
4. An anti-fall protection (1) according to claim 3, **characterised in that** latch (50), ladder and rail (20) are adapted such to each other that the latch (50) will hit the rungs of the ladder when the anti-fall protection (1) is mounted on the rail (20), and the latch (50) occupies the position in which it allows a movement of the stop means (32) to the effect that it is able to occupy a position in which the hinge (12) can be moved to a position where the first (10) and second (11) sides can be moved out of engagement with the rail (20).

Patentansprüche

1. System zum Schutz von Personen während der Arbeit auf Sprossenleitern, wobei das System einen Absturzschutz (1) mit einer ersten (10) und einer zweiten (11) Seite und einem verschiebbaren Scharnier (12), das mittels Sicherheitsleine, Gurt o. Ä. an einer Person befestigt werden kann, und eine Schiene (20) zum Anbringen in einer im Wesentlichen vertikalen Position auf oder an der Leiter umfasst, wobei der Absturzschutz (1) und die Schiene (20) zusammenwirkende Verriegelungsmittel haben, die derart ausgelegt sind, dass der Absturzschutz (1) auf der Schiene (20) gleiten kann, wenn das Scharnier (12) in einer Richtung verschoben wird, und auf der Schiene (20) verriegelt ist, wenn das Scharnier (12) in einer anderen Richtung verschoben wird, wobei die Schiene (20) und der Absturzschutz (1) auch so mit komplementären und asymmetrischen Eingriffsmitteln (13, 14, 21, 22) konfiguriert sind, dass der Absturzschutz (1) mit nur einer Seite nach oben auf der Schiene (20) montiert werden kann, wobei die erste und die zweite Seite so gegenseitig verschiebbar sind, dass veranlasst werden kann, dass die Eingriffsmittel die Schiene in Eingriff nehmen und sie ausrücken können, wobei der Absturzschutz auch Verbindungsmittel (19, 41) zwischen der ersten (10) und der zweiten (11) Seite umfasst, die mit dem Scharnier (12) zusammenwirken, so dass die erste (10) und die zweite (11) Seite des Absturzschutzes (1) nur dann außer Eingriff mit der Schiene (20) geschoben werden können, wenn das Scharnier (12) in eine Richtung geschoben wird und in einer spezifischen Position installiert ist, wobei die Verbindungsmittel (19, 41) so konfiguriert sind, dass die erste (10) und die zweite (11) Seite des Absturzschutzes (1) nur dann außer Eingriff mit der Schiene (20) geschoben werden können, wenn das Scharnier (12) in der Richtung verschoben wird, in der es den Absturzschutz nicht an der Schiene verriegelt, wobei der Absturzschutz (1) ferner ein Stoppmittel (32) umfasst, das gestattet, dass das Scharnier (12) in eine Position bewegt wird, in der der Absturzschutz (1) auf der Schiene (20) gleiten kann, aber verhindert, dass das Scharnier (12) in die spezifische Position bewegt wird, in der die erste (10) und die zweite (11) Seite außer Eingriff mit der Schiene geschoben werden können, **dadurch gekennzeichnet, dass** das Stoppmittel (32) mit einem verschiebbaren Riegel (50) so zusammenwirkt, dass der Riegel (50) in eine vorbestimmte Position gebracht werden muss, bevor das Stoppmittel (32) in eine Position bewegt werden kann, in der die erste (10) und die zweite (11) Seite außer Eingriff mit der Schiene (20) geschoben werden können.
2. System zum Schutz von Personen während der Arbeit auf Sprossenleitern nach Anspruch 1, **dadurch**

gekennzeichnet, dass Absturzschutz (1), Riegel (50), Leiter und Schiene (20) so aneinander angepasst sind, dass der Riegel (50) auf die Sprossen der Leiter trifft, wenn der Absturzschutz (1) auf der Schiene (20) montiert ist, und der Riegel (50) die Position einnimmt, in der er eine Bewegung des Stoppmittels (32) gestattet, so dass es eine Position einnehmen kann, in der das Scharnier (12) in eine Position bewegt werden kann, in der die erste (10) und die zweite (11) Seite außer Eingriff miteinander geschoben werden können.

3. Absturzschutz (1) für den Einsatz in einem System mit einer Schiene (20) nach Anspruch 1 oder 2, mit einer ersten (10) und einer zweiten (11) Seite und einem verschiebbaren Scharnier (12), das mittels einer Sicherheitsleine, eines Gurts o. Ä. an einer Person befestigt werden kann, wobei der Absturzschutz Verbindungsmittel (19, 41) zwischen der ersten (10) und der zweiten (11) Seite umfasst, die mit dem Scharnier (12) zusammenwirken, so dass die erste (10) und die zweite (11) Seite des Absturzschutzes (1) nur dann gegenseitig geschoben werden können, wenn das Scharnier (12) in eine Richtung verschoben wird und in einer spezifischen Position installiert ist, und wobei der Absturzschutz (1) ferner ein Stoppmittel (32) umfasst, das verhindert, dass das Scharnier (12) in eine Position bewegt wird, in der die erste (10) und die zweite (11) Seite außer Eingriff mit der Schiene geschoben werden können, **dadurch gekennzeichnet, dass** das Stoppmittel (32) mit einem Riegel (50) so zusammenwirkt, dass der Riegel (50) in eine spezifische Position bewegt werden muss, bevor das Stoppmittel (32) in eine Position bewegt werden kann, in der die erste (10) und die zweite (11) Seite außer Eingriff mit der Schiene (20) geschoben werden können.
4. Absturzschutz (1) nach Anspruch 3, **dadurch gekennzeichnet, dass** Riegel (50), Leiter und Schiene (20) so aneinander angepasst sind, dass der Riegel (50) auf die Sprossen der Leiter trifft, wenn der Absturzschutz (1) auf der Schiene (20) montiert ist, und der Riegel (50) die Position einnimmt, in der er eine Bewegung des Stoppmittels (32) gestattet, so dass es eine Position einnehmen kann, in der das Scharnier (12) in eine Position bewegt werden kann, in der die erste (10) und die zweite (11) Seite außer Eingriff mit der Schiene (20) geschoben werden können.

Revendications

1. Système de protection des individus pendant qu'ils travaillent sur des échelles avec des barreaux, ledit système comprenant une protection antichute (1) comprenant un premier (10) et un second (11) côté et une charnière déplaçable (12), qui peut être soli-

dement fixée à un individu au moyen d'un filin de sécurité, un harnais ou quelque chose de semblable, et un rail (20) à fixer sur ou à l'échelle dans une position pour l'essentiel verticale, ladite protection antichute (1) et ledit rail (20) comportant des moyens de verrouillage qui fonctionnent l'un avec l'autre et sont conçus de telle sorte que la protection antichute (1) est capable de coulisser sur le rail (20) quand on déplace la charnière (12) dans un sens et se verrouille sur le rail (20) quand on déplace la charnière (12) dans l'autre sens, ladite protection antichute (1) et ledit rail (20) étant aussi configurés avec des moyens d'enclenchement (13, 14, 21, 22) complémentaires et asymétriques, afin que l'on ne puisse monter la protection antichute (1) sur le rail (20) qu'avec un seul côté vers le haut, et lesdits premier et second côtés pouvant être déplacés l'un par rapport à l'autre afin que l'on puisse faire en sorte que les moyens d'enclenchement s'engagent sur le rail et s'en dégagent, la protection antichute comprenant aussi entre le premier (10) et le second (11) côtés des moyens de liaison (19, 41) qui interagissent avec la charnière (12) afin que l'on ne puisse sortir le premier (10) et le second (11) côtés de la protection antichute (1) de leur enclenchement avec le rail (20) que lorsque la charnière (12) est déplacée dans un sens et installée dans une position spécifique, lesdits moyens de liaison (19, 41) étant configurés de telle sorte que l'on ne puisse sortir le premier (10) et le second (11) côtés de la protection antichute (1) de leur enclenchement avec le rail (20) que lorsque la charnière (12) est déplacée dans le sens où elle ne verrouille pas la protection antichute contre le rail ; la protection antichute (1) comprenant en outre un moyen de butée (32) qui permet de bouger la charnière (12) jusqu'à une position dans laquelle la protection antichute (1) est capable de coulisser sur le rail (20) mais empêche de bouger la charnière (12) jusqu'à ladite position spécifique dans laquelle on peut sortir le premier (10) et le second (11) côtés de leur enclenchement avec le rail **caractérisé en ce que** ledit moyen de butée (32) interagit avec un verrou déplaçable (50) afin que l'on doive mettre le verrou (50) dans une position prédéterminée avant de pouvoir bouger le moyen de butée (32) jusqu'à une position où l'on peut sortir le premier (10) et le second (11) côtés de leur enclenchement avec le rail (20).

2. Système de protection des individus pendant qu'ils travaillent sur des échelles avec des barreaux selon la revendication 1, **caractérisé en ce que** protection antichute (1), verrou (50), échelle et rail (20) sont conçus les uns par rapport aux autres de telle sorte que le verrou (50) heurtera les barreaux de l'échelle quand la protection antichute (1) sera montée sur le rail (20) et le verrou (50) occupera la position dans laquelle il permet un mouvement du moyen de butée

(32) afin qu'il puisse occuper une position dans laquelle on peut bouger la charnière (12) jusqu'à une position où l'on peut désolidariser le premier (10) et le second (11) côtés.

5

3. Protection antichute (1) pour utilisation dans un système avec un rail (20) selon la revendication 1 ou 2, comprenant un premier (10) et un second (11) côté et une charnière déplaçable (12), qui peut être solidement fixée à une personne au moyen d'un filin de sécurité, un harnais ou quelque chose de semblable, la protection antichute comprenant entre le premier (10) et le second (11) côtés des moyens de liaison (19, 41) qui interagissent avec la charnière (12) afin que l'on ne puisse déplacer l'un par rapport à l'autre le premier (10) et le second (11) côtés de la protection antichute (1) que lorsque la charnière (12) est déplacée dans un sens et installée dans une position spécifique, la protection antichute (1) comprenant en outre un moyen de butée (32) qui empêche de bouger la charnière (12) jusqu'à une position dans laquelle on peut sortir le premier (10) et le second (11) côtés de leur enclenchement avec le rail **caractérisée en ce que** ledit moyen de butée (32) interagit avec un verrou (50) afin que l'on doive bouger le verrou (50) jusqu'à une position spécifique avant de pouvoir bouger le moyen de butée (32) jusqu'à une position dans laquelle on peut sortir le premier (10) et le second (11) côtés de leur enclenchement avec le rail (20).

10

15

20

25

30

4. Protection antichute (1) selon la revendication 3, **caractérisée en ce que** verrou (50), échelle et rail (20) sont conçus les uns par rapport aux autres de telle sorte que le verrou (50) heurtera les barreaux de l'échelle quand la protection antichute (1) sera montée sur le rail (20) et le verrou (50) occupera la position dans laquelle il permet un mouvement du moyen de butée (32) afin qu'il puisse occuper une position dans laquelle on peut bouger la charnière (12) jusqu'à une position où l'on peut sortir le premier (10) et le second (11) côtés de leur enclenchement avec le rail (20).

35

40

45

50

55

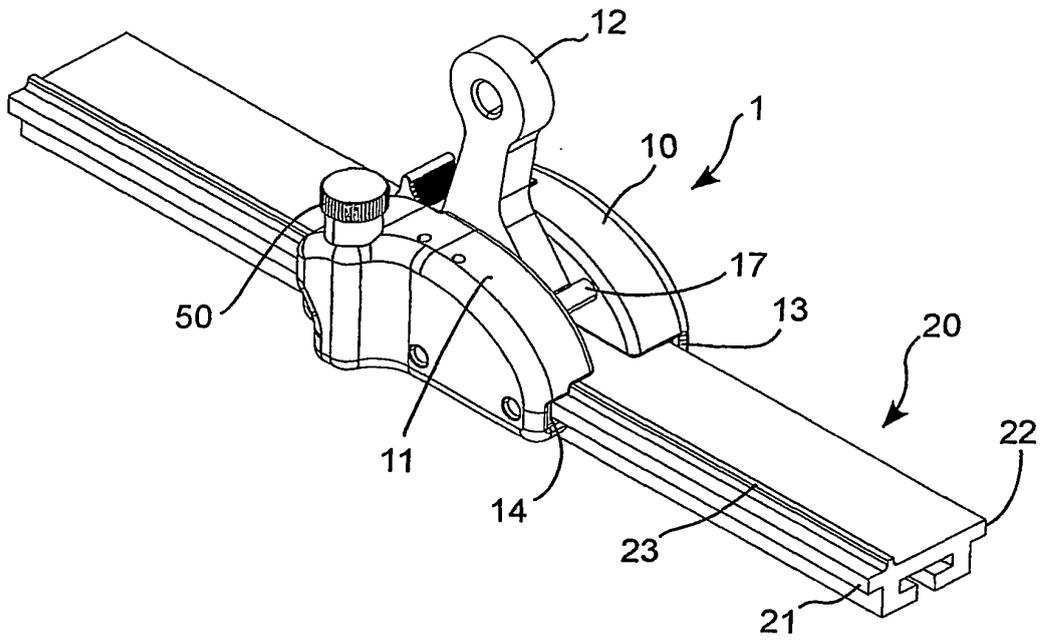


Fig. 1

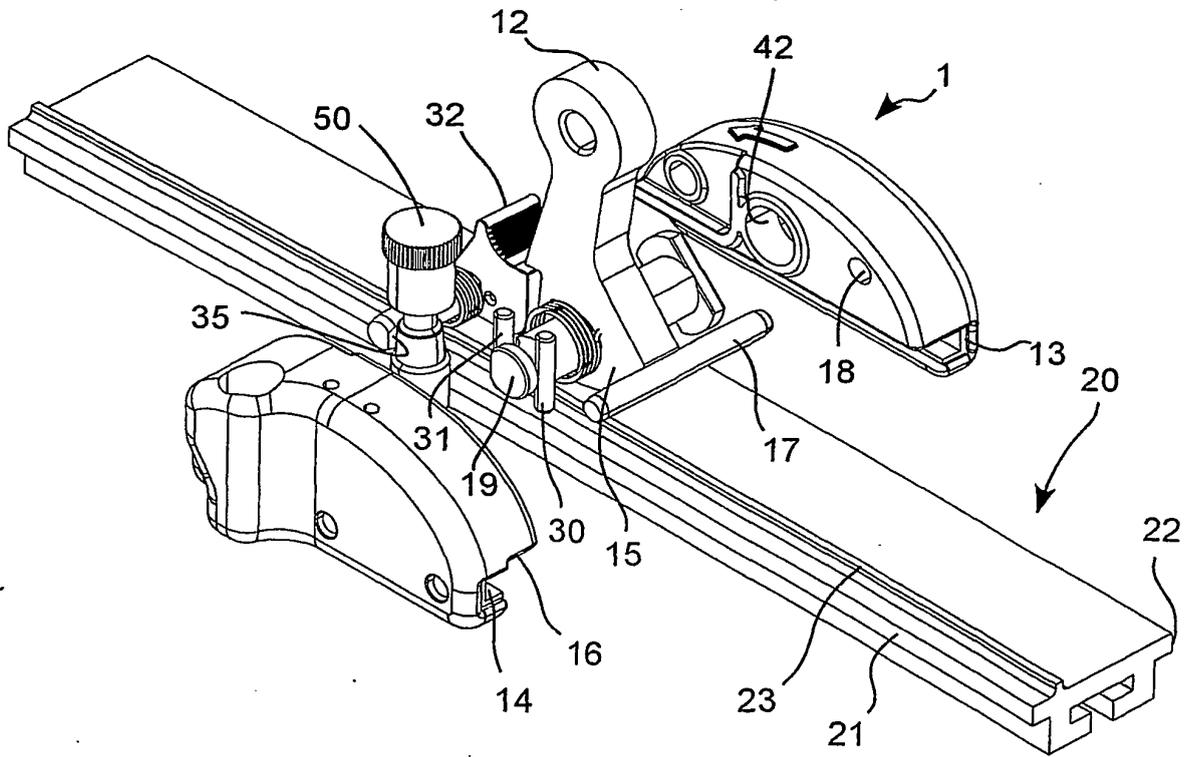


Fig. 2

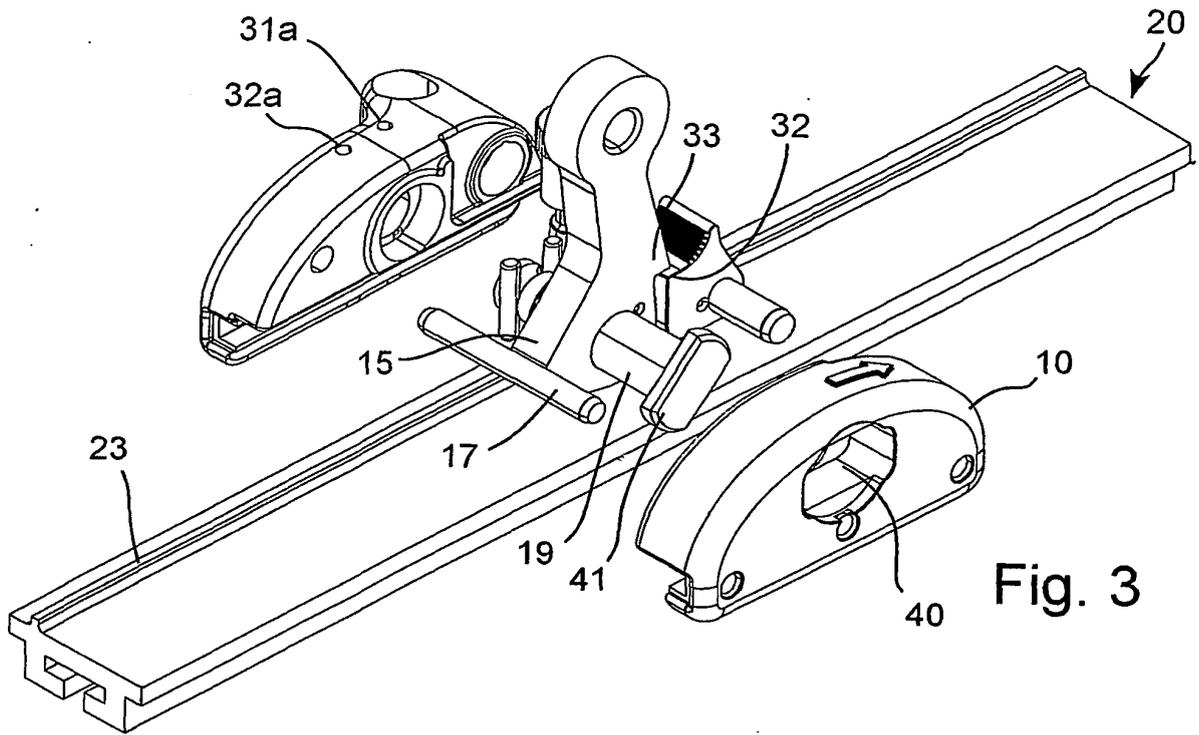


Fig. 3

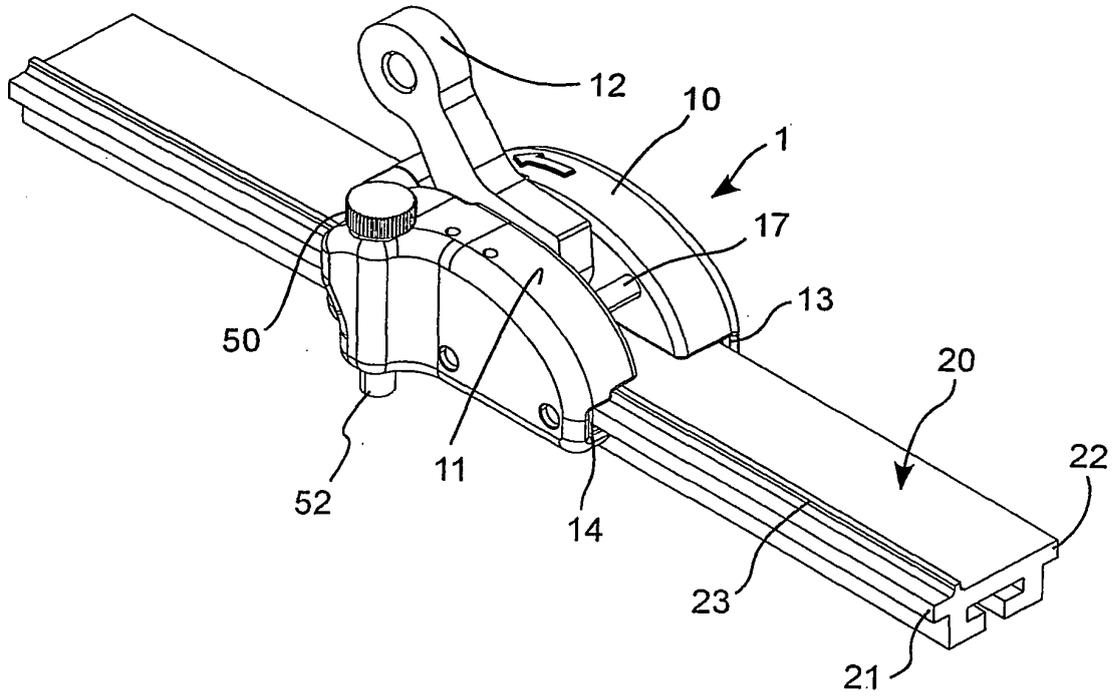


Fig. 4

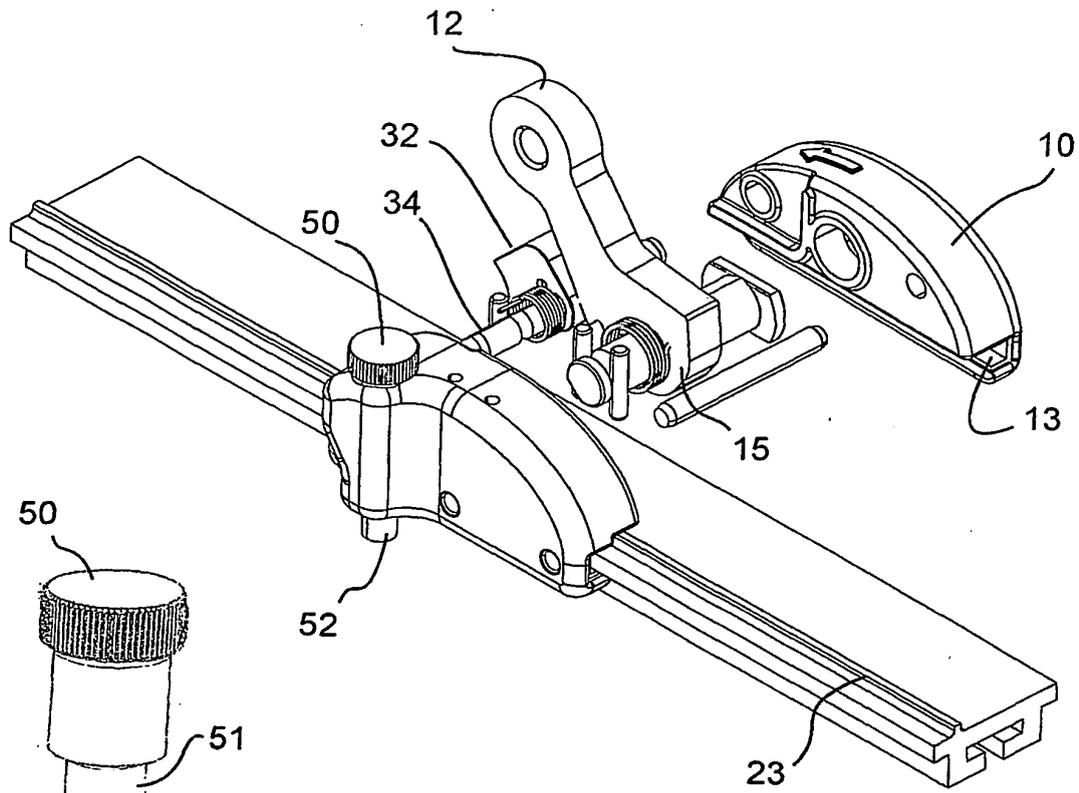


Fig. 5

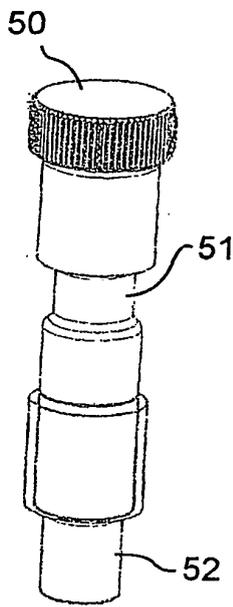


Fig. 7

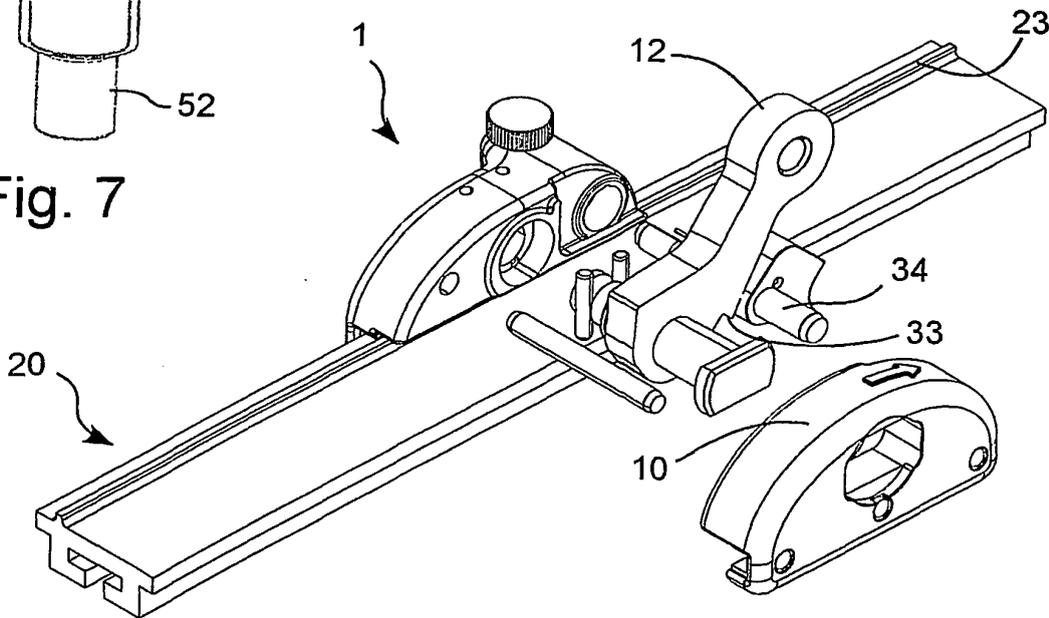


Fig. 6

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- DE 20314230 U1 [0004]
- US 20030217887 A [0005]
- US 6725969 B1 [0006]