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(71) Applicant: **COMERCIAL IGENA, SA**
08339 Vilassar de Dalt, Barcelona (ES)

(72) Inventor: **Van Erps, Paul**
08339 Vilassar de Dalt, Barcelona (ES)

(74) Representative: **Manresa Val, Manuel et al**
Manresa & De Rafael, S.L.
Roger de Llúria, 113, 4a planta
08037 Barcelona (ES)

(54) **Intermediate support for a life line**

(57) Comprising a base (1) for securing the piece to a fixed element (2) by means of fixing elements (6), with the referred lifeline likewise comprising an anti-fall carriage (3) with a safety harness (5), said anti-fall carriage (3) is moved along
a cable, characterised in that it comprises a tilting element connected to said base (1) by means of an articulated device (8), with said tilting element (7) comprising two prolongations, a first (9) and a second (10).

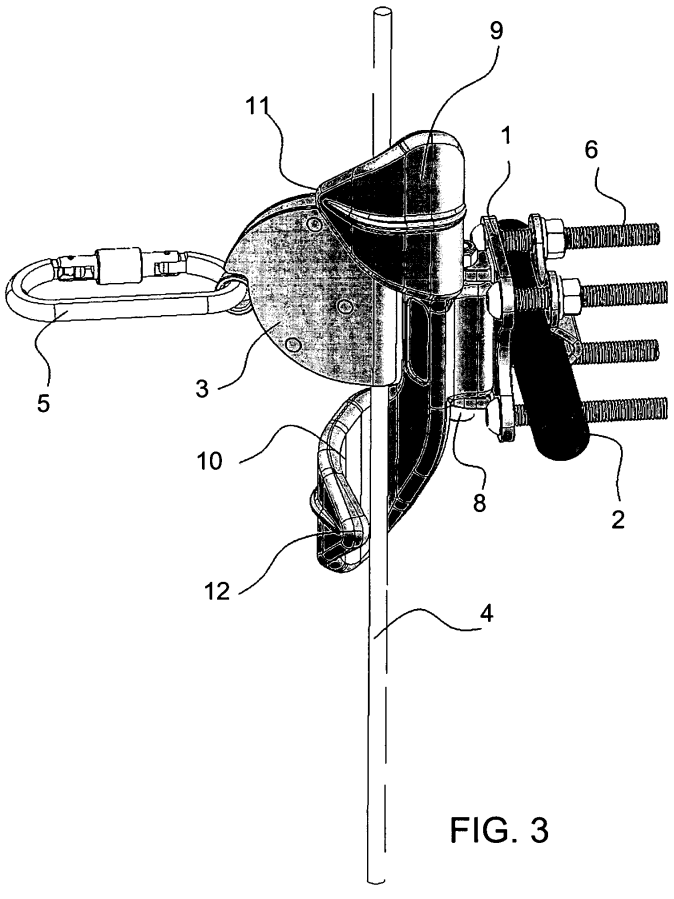

FIG. 3

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Description

[0001] An intermediate piece for a lifeline of the type comprising a base for securing the piece to a fixed element by securing means, with the referred lifeline likewise comprising an anti-fall carriage with a safety harness, said anti-fall carriage is moved along a cable, which is characterised in that it comprises a tilting element connected to said base by means of an articulated device, with said tilting element comprising two prolongations, a first and a second:

[0002] Located one at each end of the tilting element, transversally disposed with respect to the cable, which narrow as they move closer to the ends of each prolongation in opposite directions between them, and likewise partially enveloping the cable so that in the rest position, the end of the second prolongation blocks the passage of the anti-fall carriage and, in the active position, when the anti-fall carriage comes into contact with the second prolongation, the mentioned narrowing directs the anti-fall carriage towards the referred end, tilting the tilting element of the intermediate piece and allowing the passage of the anti-fall carriage, at the same time that the first prolongation, by the tilting action, blocks the passage of the anti-fall carriage and, as said anti-fall carriage continues its movement along the cable when the anti-fall carriage advances and comes into contact with the first prolongation, the mentioned narrowing directs the anti-fall carriage towards the end, tilting the tilting element in the opposite direction to that produced by the second prolongation and allowing the passage of the anti-fall carriage at the same time that the second prolongation, by the tilting action, locks the passage of the anti-fall carriage.

BACKGROUND TO THE INVENTION

[0003] Various accessories are known in the state of the art for lifelines.

[0004] European patent 1188459 of 2001 is known in the state of the art, in the name of DALLOZ FALL PROTECTION SOCIÉTÉ ANONYME, which refers to a horizontal lifeline slider comprising a cable that extends along a wall and joined to the same by supports, with said slider being of the type comprising a body that presents a pipe inside of which the cable slides, a grip intended to receive one of the ends of a belt, the other end of which is joined to a safety harness and a moving jaw so that it forms a groove in the pipe so that the slider can be mounted over the cable, with said slider characterised in that it presents means to maintain the jaw slightly separated in a first intermediate position so that it forms a groove corresponding to the thickness of the cable supports, the means to control the jaw separation in order to be able to mount the slider over the cable and the means to automatically put the slider in a safe position if traction is applied to the grip, tilting the moving jaw so that the groove is completely covered.

[0005] Spanish utility model 200501866 (ES1060931) of 2005, in the name of Ms Leticia FERNANDEZ SOTO, also belongs to the state of the art, which refers to a lifeline carriage, of the type comprising two half bodies that are joined by a threaded shaft, incorporating between said half bodies, a tilting element fitted with a ring for the user's hook and toothed discs for establishing the interlocking of the block over the lifeline guide when the user falls, characterised in that, in relation to the connecting shaft of the half-body components are fitted with a locking trigger for said shaft in the tightened position, while at least one elastic accessory disc is incorporated into the tilting element.

DISCLOSURE OF THE INVENTION

[0006] The present invention is intended to be an improvement and modernisation of the system of pieces or currently existing intermediate steps for those workers that have to move using a cable in order to carry out their jobs.

[0007] In accordance with EN 353.1:2002, a vertical lifeline (anchor line) is a device installed along a stairway or fixed vertical structure intended to prevent the risk of fall during the climbing up, stay or coming down of workers by said stairway. Its presence and use is necessary for all vertical stairways in order to guarantee work safety (whether installation or maintenance). In the case of wind farm and communications and antenna towers, their use is even more essential because of the height of such installations.

[0008] Thus, a lifeline comprises an upper anchor, an energy absorber, the cable, and intermediate piece, an anti-fall carriage (connection between cable and worker) and a lower anchor.

[0009] As can be seen from the background to the invention, one of the drawbacks that is encountered when using anti-fall carriages comprises the difficulty in passing the pre-established safety points, together with the obligation of using a single specific model for passing, compatible with said intermediate piece.

[0010] In other words, today, there are two different types of systems on the market for maintaining the cable immobile: the first, known in the sector as detachable, is an intermediate piece that grips the cable to prevent it moving. When the worker approaches this intermediate point, the cable must be removed from the intermediate piece by hand, passed and then reinserted into the rubber piece after passing. The worker must release a hand to accomplish this operation.

[0011] If the worker forgets to replace the cable, it will remain outside its intermediate piece. Many workers complain that the intermediate or rubber piece "deteriorates in the sun" and finally breaks. It can be used with a carriage on the market.

[0012] The second type is the one that is also known in the sector as the "special anti-fall carriage". In some cases, the cable passes inside the intermediate piece

and remains fixed inside. It cannot be removed and there is no danger of it being left outside.

[0013] The intermediate pieces are passed without any intervention by the worker. However, it only works with one type of carriage (that of the lifeline manufacturer), preventing the user from employing the one in possession (the one the worker is used to).

[0014] The idea, therefore, is to find a solution that is safe but, above all, facilitates the operability by the worker and which makes it possible to use it with the various models of anti-fall models on the market.

[0015] The intermediate pieces or steps in lifelines are used to guide the cable and, at the same time, to prevent cable sagging and impacts against the wall or stairway, which could cause damage to the cable being used by the worker, increasing the risk of work-related accidents to the worker.

[0016] The invention mainly refers to an intermediate piece of a vertical cable lifeline used for working at height with complete safety along a stairway or inclined plane with a slope exceeding 15° without the need to unhook at any time. The vertical lifeline comprises a cable, a connection between the worker and the cable, called the anti-fall carriage, together with the two anchors, upper and lower, for securing the cable and an energy absorber to reduce the impact in case of a fall.

[0017] Its design comprises an elongated stylised piece, always located longitudinally over the ascent cable with its completely symmetric and opposite ends, leaving a passage upwards from below and downwards from above, completely free so that the carriage is able to smoothly slide along the cable (going up and coming operations).

[0018] Said intermediate piece comprises a base for securing to another fixed element (such as stairway treads or rises) by means of a clip or clamp system. The connection of said base by means of an articulated device enables the piece in question to be tiltable.

[0019] In this way, the inventor has developed an intermediate piece with two prolongations that alternatively allow passage and block in order to combine safety with ease of operation. This is obtained through the tilting ability of the tilting element and also the opposite directions of the prolongations so that, when the anti-fall carriage passes through one of the prolongations, the cable exit is blocked by the other prolongation.

[0020] One objective of the present invention is an intermediate piece for a lifeline of the type comprising a base for securing the piece to a fixed element by means of fixing elements, with the referred lifeline likewise comprising an anti-fall carriage with a safety harness, said anti-fall carriage is moved along a cable, which is characterised in that it comprises a tilting element connected to said base by means of an articulated device, with said tilting element comprising two prolongations, a first and a second: located one at each end of the tilting element, transversally disposed with respect to the cable, which narrow as they move closer to the ends of each prolongation, with said prolongations projecting in opposite directions between them, and likewise partially enveloping the cable so that in the rest position, the end of the second prolongation blocks the passage of the anti-fall carriage and, in the active position, when the anti-fall carriage advances and comes into contact with the second prolongation, the mentioned narrowing directs the anti-fall carriage towards the referred end, tilting the tilting element and allowing the passage of the anti-fall carriage, at the same time that the first prolongation, by the tilting action, blocks the passage of the anti-fall carriage and when said anti-fall carriage continues its movement along the cable when the anti-fall carriage advances and comes into contact with the first prolongation, the mentioned narrowing directs the anti-fall carriage towards the end, tilting the tilting element in the opposite direction to that produced by the second prolongation and allowing the passage of the anti-fall carriage at the same time that the second prolongation, by the tilting action, blocks the passage of the anti-fall carriage.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] In order to facilitate the description, the present report is accompanied by four sheets of drawings that show a practical case of exemplary embodiment, which is cited as a non-limiting example of the scope of the present invention.

- Figures 1, 2 and 3 are views of the object of the present invention, comprising the three operational phases of same.

- Figure 4 is a view of the tilting element.

SPECIFIC EXEMPLARY EMBODIMENT OF THE APPLIED-FOR PATENT

[0022] Thus, figures 1,2 and 3 show a base 1, an anti-fall carriage 3 with its safety harness 5, a cable 4, a fixed element 2, fixing elements 6, an articulated device 8, first 9 and second 10 prolongations, with their respective first 11 and second 12 ends.

[0023] Figure 4 shows a tilting element 7, the first prolongation 9, the second prolongation 10 with its end 12.

[0024] In a specific exemplary embodiment, when the worker or user decides to move along the cable 4 using the anti-fall carriage 3, on advancing (Fig. 1), said anti-fall carriage 3 has its way blocked by the tilting element 7.

[0025] As the anti-fall carriage 3 advances, it exerts pressure on one of the sides of the second prolongation 10. Said pressure cause the tilting element 7 to rotate in the opposite direction to end 12 of the second prolongation 10. On tilting, assisted by the narrowing of the prolongation 10, it allows the advance of the anti-fall carriage 3 until the end 12 rotates and allows the anti-fall carriage 3 to pass.

[0026] While this tilting movement is being performed

due to the second prolongation 10 and the first prolongation 9 being projected in opposite directions, at the moment when one of the prolongations tilts permitting the passage of the anti-fall carriage 3, said movement causes the other prolongation to block the passage, in other words, when the second prolongation 10 allows the passage of the anti-fall carriage, the first prolongation 9 completely blocks the passage of the anti-fall carriage 3.

[0027] Subsequently, the anti-fall carriage 3 continues its movement and carries out an identical operation to that of the second prolongation 10 but, on this occasion, with the first prolongation 9.

[0028] It is necessary to point out that, on this occasion, the rotation or tilting of the tilting element 7 is made in the opposite direction to that of the second prolongation.

[0029] Once the anti-fall carriage 3 passes the end 11 of the first prolongation, said tilting element 7 rotates in the opposite direction to that previously made and returns to the rest position.

[0030] An example of a vertical lifeline has been developed in this specific exemplary embodiment especially for those that are installed on a stairway or an inclined plane exceeding 15°, although it could also be applied to guide a cable in confined spaces, such tunnels or sewers.

[0031] The present invention patent describes a new intermediate piece for lifelines. The examples described here do not limit the present invention and it may have various applications and/or adaptations, all of which are within the scope of the following claims.

Claims

1. An intermediate piece for a lifeline of the type comprising a base (1) for securing the piece to a fixed element (2) by means of fixing elements (6), comprising likewise the referred lifeline an anti-fall carriage (3) with a safety harness (5), said anti-fall carriage (3) is moved along a cable (4) **characterised in that** it comprises a tilting element (7) connected to said base (1) by means of an articulated device (8), said tilting element (7) comprising two prolongations, a first (9) and a second (10):

- Placed one for each end of the tilting element (7),
- disposed transversally with respect to the cable (4),
- that narrow as approach to the ends (11, 12) of each prolongation (9, 10),
- said prolongations projecting in opposite direction between them, and
- likewise partially wrapping the cable (4),

so that in the rest position, the end (12) of the second prolongation (10) blocks the passage of the anti-fall carriage (3) and, in the active position, when the anti-fall carriage (3) advances and comes into contact with the second prolongation (10), the mentioned narrowing directs the anti-fall carriage (3) towards the referred end (12), tilting the tilting element (7) and allowing the passage of the anti-fall carriage (3), at the same time that the first prolongation (9), by the tilting action, blocks the passage of the anti-fall carriage (3) and, as said anti-fall carriage (3) continues its movement along the cable (4) when the anti-fall carriage (3) advances and comes into contact with the first prolongation (9), the mentioned narrowing directs the anti-fall carriage (3) towards the end (11), tilting the tilting element (7) in the opposite direction to that produced by the second prolongation and allowing the passage of the anti-fall carriage (3) at the same time that the second prolongation (10), by the tilting action, blocks the passage of the anti-fall carriage (3)

2. A piece in accordance with claim 1 **characterised in that** the articulated device (8) is hinge type.

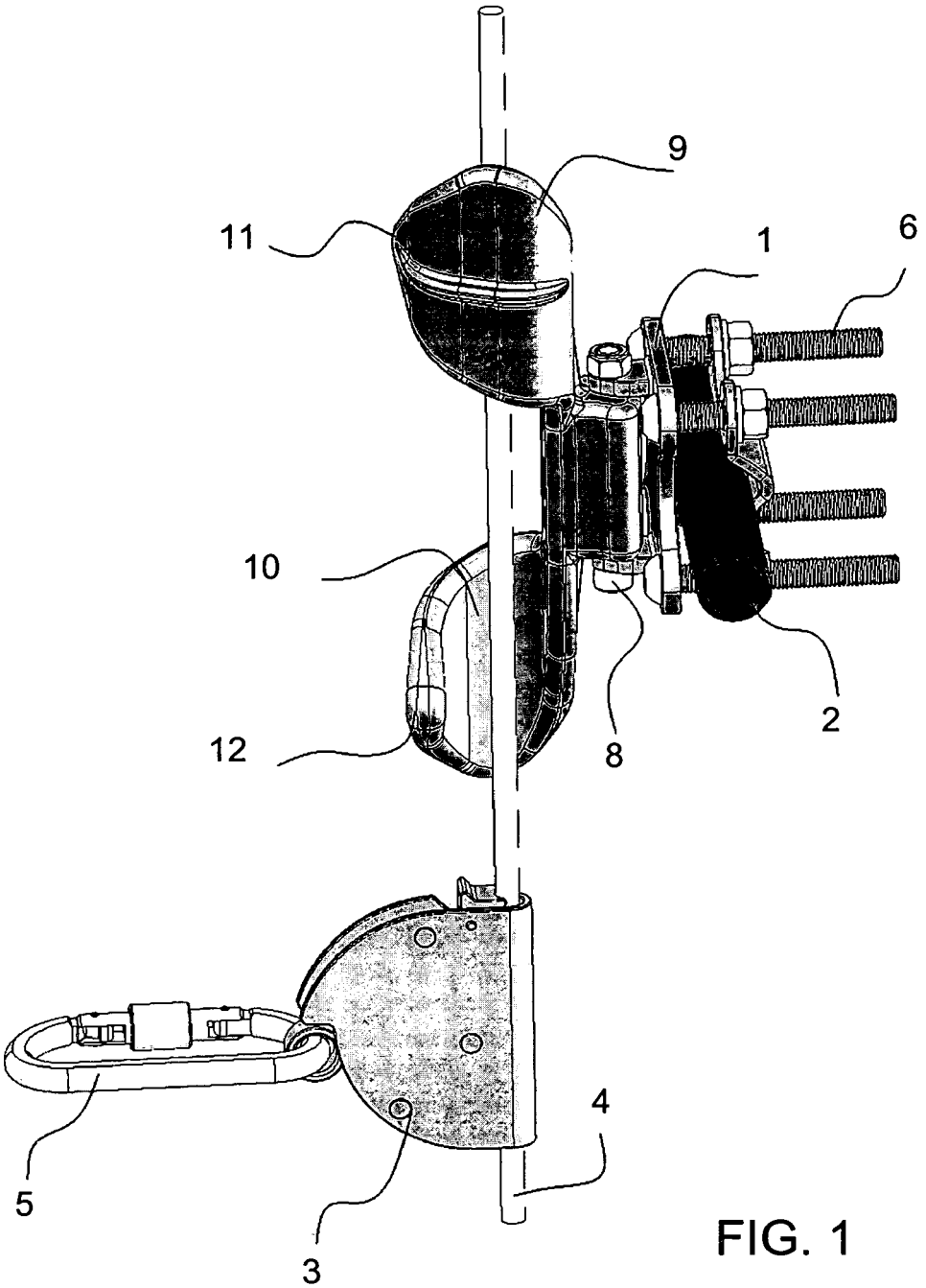

FIG. 1

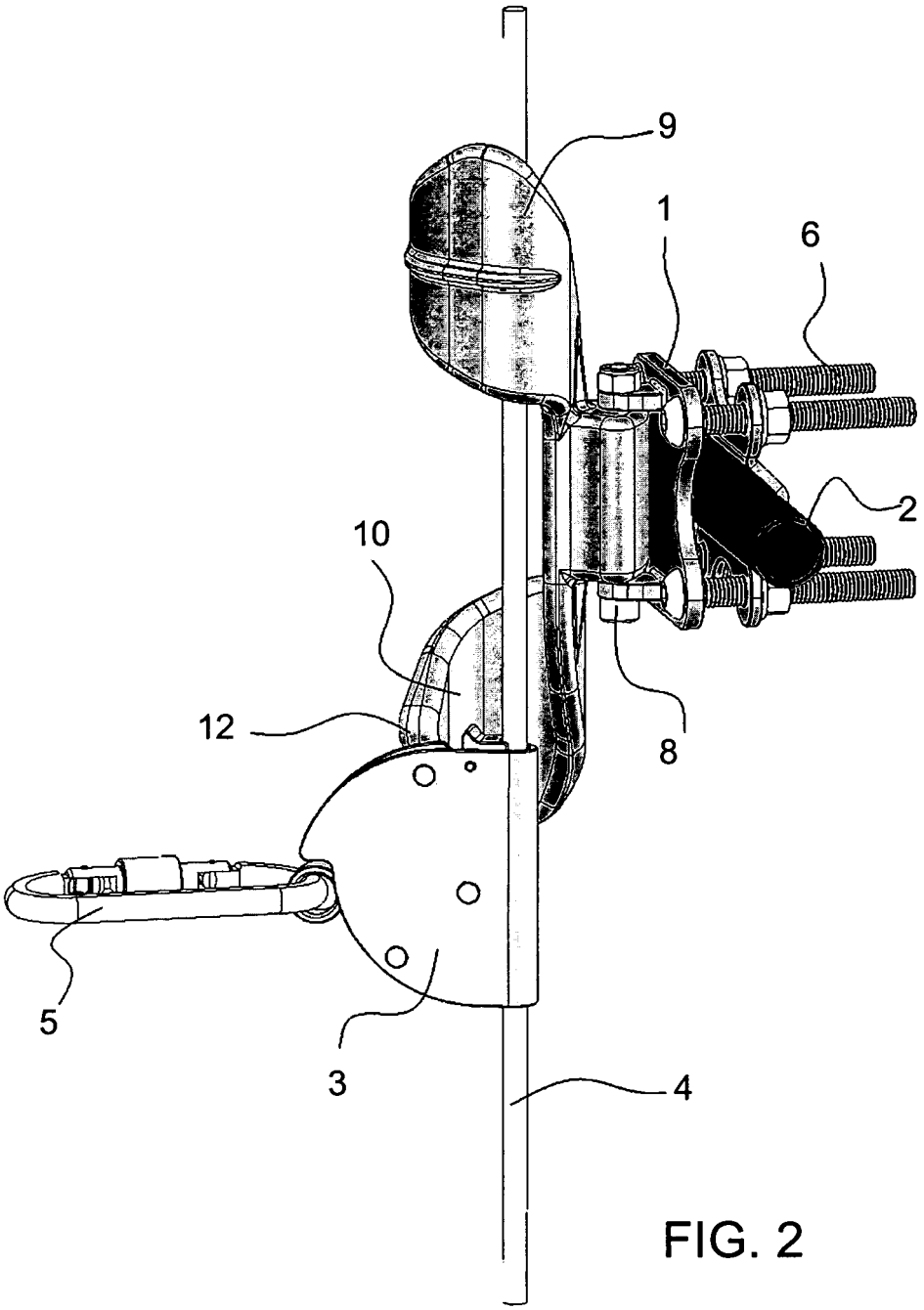

FIG. 2

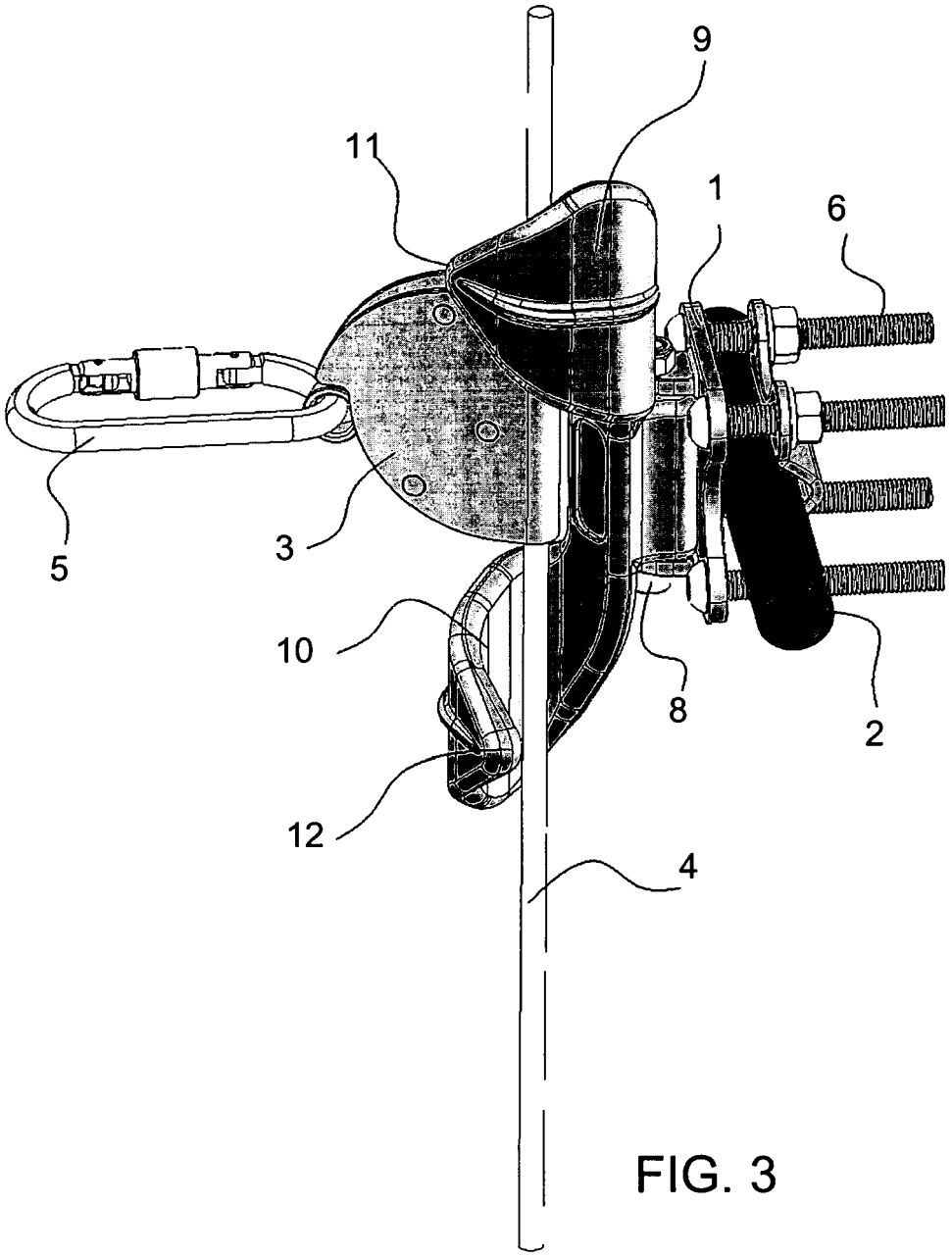

FIG. 3

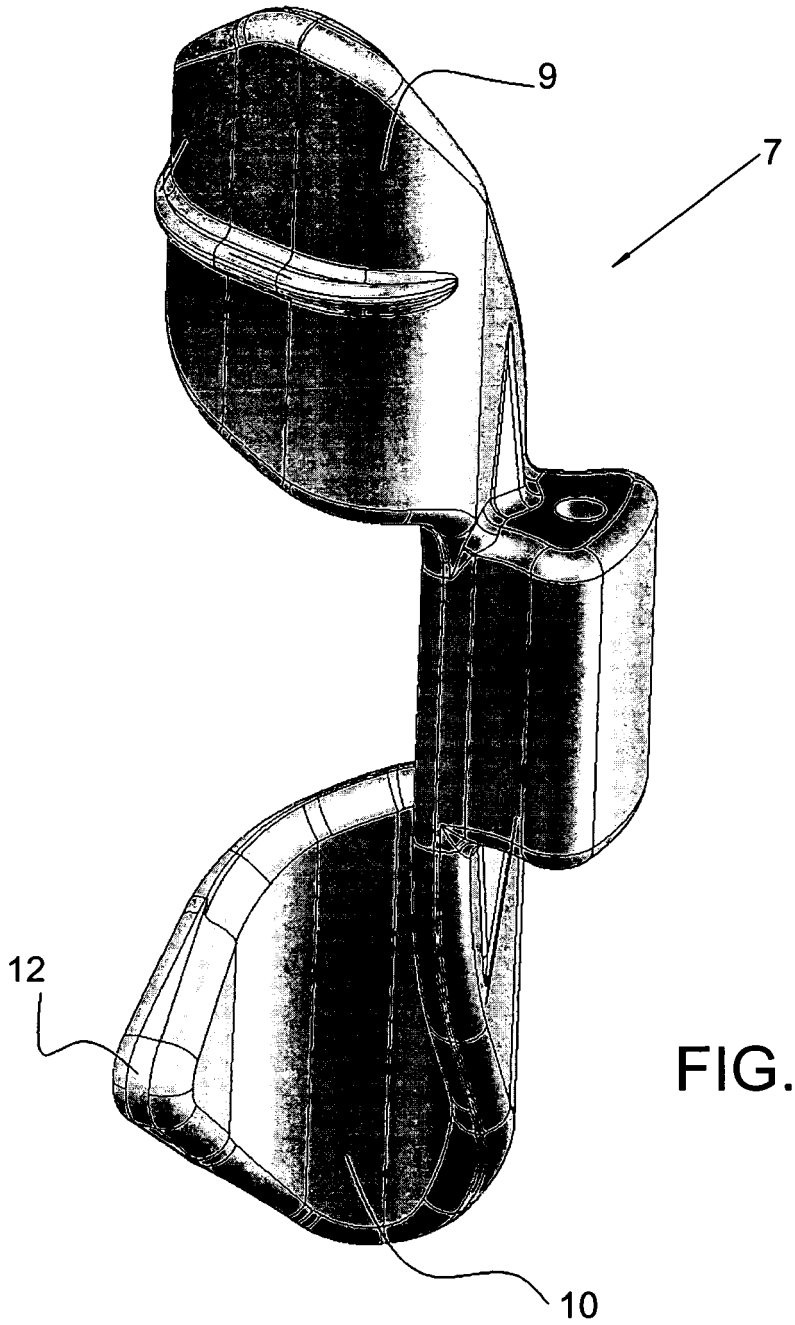

FIG. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 06 38 0249

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TECHNICAL FIELDS SEARCHED (IPC)

A62B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 March 2007	van Bilderbeek, Henk

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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