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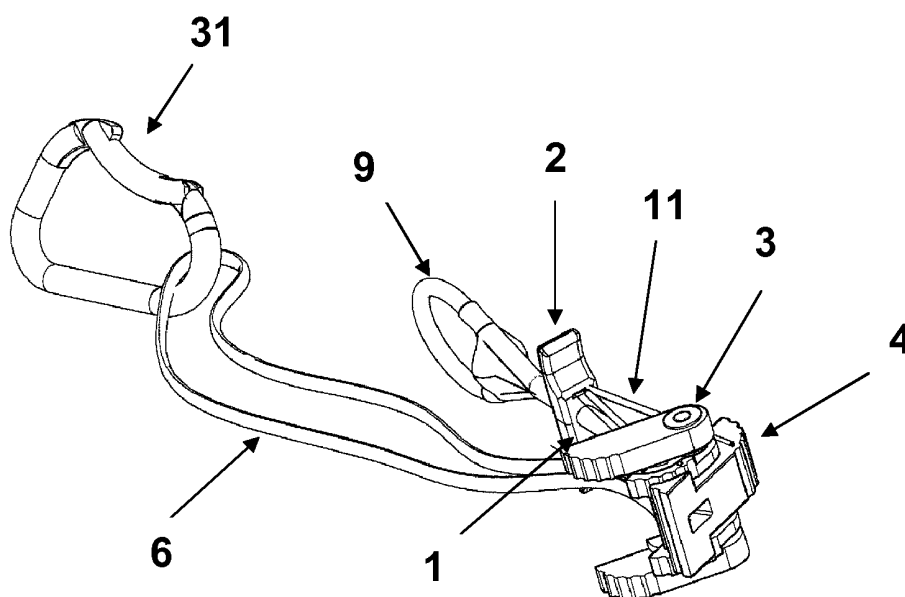
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(54) **CLIMBING FRIEND**

(57) The invention relates to a climbing friend comprising: a clamping mechanism (4) joined to a stem (1), a trigger (2), an anchoring belt or sling (6), and an axle (3). The clamping mechanism (4) is retractable, mobile and formed by a central block, unique or divided into two symmetrical parts, articulated with at least one cam on each of the sides thereof, said cams having curved

toothed edges and all of the parts being connected by springs and traversed by a steel axle (3) connected in turn to the stem (1) which rotates freely through 90 degrees in relation to the central block. The stem (1) and the anchoring sling (6) include an end hoop (9) (31) and are joined to the clamping mechanism (4) by means of a tensioning element (11) and a screw respectively.

FIG.1



Description

Subject matter of the Invention

[0001] The invention described herein relates to a climbing friend, thanks to its structure and conformation, it becomes a single article on the market which significantly improves the state of the art.

[0002] Specifically, this patent develops a climbing friend for climber progression taking advantage of the natural or artificial rock fissures which, by its configuration, has broader aperture ranges as compared to existing similar items, allowing a perfect fit and grip in cracks and fissures of different sizes, being as well an item of very small size, light weight and easy maneuverability.

Background of the Invention and state of the art

[0003] There are well-known the support tools for climbing known as climbing friends or "friends". It involves metal pieces designed to fit and fix it in cracks or fissures in the rocks, creating support points that help in the progression of the climber. These climbing friends are characterized for being fixed without the intervention of any tools, for example without using a hammer to fit them with a punch and they can be mechanical or passive. The most popular ones are mechanical climbing friends incorporating springs that are usually pieces of extensive nature formed by movable cams which are introduced into the crack and are trapped by the action of the spring that expands to fix it or retracts for removal. The passive climbing friends are recessed parts acting as a wedge.

[0004] In terms of industrial property there are some patents that develop gripping systems into cracks and fissures in the rock, such as utility model U0294824 referred to an improved expansion cam type climbing friend, which is constituted by an axle where cams are mounted on end zones and which introduces a new flexible stem preferably consisting of a braided steel cable and closed coupled to the axle and covered by a sheath with a manually displaceable element and interconnected to the cams via filiform resistant elements and end hooks.

[0005] Other patents that develop escalation tools which are recessing type or climbing friends are American US 4, 923.160, US 4,712,754, US 6,119,993. US 2004213633 or US 6042069, the technique is based on extensible cams, or as is the case of the recessing ones known as Alien Cams which incorporates a spring system within the cam.

[0006] The climbing tools disclosed in these patents and other climbing friends existing in the market are perfectly functional parts but tend to be of a considerable size and weight, in a climb, they can be annoying to carry and handle. We must also consider that prolonged use affects the work of the cams and leads to its deformation.

[0007] However, the main disadvantage of the existing climbing friends is that their opening range is limited, that

is, each climbing friend is suitable to fit in a crevice of a given amplitude because the degree of displacement of the cam is determined by the size of the same and its axis of rotation. Therefore, the climber is forced to have a wide collection of climbing friends of different ranges to cover cracks and fissures of different diameters, implying to have to carry greater weight in climbing and to have the ability to choose the right one at all times.

[0008] The applicant considers that there should be a more versatile climbing friend, with larger opening ranges, easy to handle, low weight, low volume, higher strength and greater gripping surface in cracks and fissures.

Description of the invention

[0009] Thus, the invention presented in this patent concerns a climbing friend, of the type used as a tool for climbing and aims to assist in the progression of climbing to get into cracks and fissures in the rocks to create supporting points and grip and safer security in falls.

[0010] The climbing friend claimed is characterized by its compact shape and by comprising, in its standard embodiment, of five mobile and movable parts, which means a greater gripping ability and adaptability to different amplitude cracks, all with a better handling and ease of use and portability.

[0011] Specifically, the climbing friend comprises five main parts: stem, trigger, anchoring sling, axle and clamping mechanism, the latter consisting of a central block and a set of 4 cams, whose number is likely to be extended or reduced.

[0012] The stem is the element that holds the entire assembly and which allows its handling. It is a tubular piece associated at one end with a hoop and the other is assembled with a clamping mechanism. Between these extremes the stem acts as a guide for the trigger.

[0013] This trigger is the activating element of the clamping mechanism, i.e. it facilitates the easy removal and placement of the climbing friend in the cracks. It is formed as a substantially rectangular piece of small thickness and, with a central opening through which the stem passes and is attached to the clamping mechanism by a tensioning element which becomes a combination of wire and slings. When acting on the trigger the mechanism retracts, increasing or decreasing its amplitude depending on the force applied on the trigger.

[0014] The axle is a round steel bar attached to the central block forming integrally one piece with said block and having a plurality of holes in principle four in number, two for linking the largest cams with the block and the other two for receiving the rivet or screw for the closure or stopper of the cam assembly.

[0015] The clamping mechanism is the key element of this climbing friend and it is the part submitting the most innovative and functional design. It continues the tradition of the climbing friends with extendable cam but it adds a central block which becomes critical to ensure greater

resistance and better grip in the crack or fissure and, with the complicity of the cams, it allows clamping into cracks and fissures of different sizes.

[0016] In its standard conformation, this clamping mechanism includes five moving parts capable of movement, namely a central block and some cams, preferably four in number, distributed in groups of two, all located on an axle linked in turn to the stem that freely rotates 90 degrees relative to the central block and having four springs linking together some of parts of the assembly and other parts with the tension element.

[0017] The central block has a rectangular box shape with its ends substantially with semicircular shape and toothed, with two projections and two recesses in its lower part, one arranged horizontally intended to receive the stem and the other one as a through hole, arranged vertically to house the anchoring sling. It also has a series of transverse passages or ducts, five in number: a first step situated on one side of the block for receiving the anchorage of two of the ends of the retraction system, whose two other ends are fastened by means of perforations in the small cams; two other steps placed on the center block, near the steel axle, one on each side of the center block and that allow the fastening of the springs that interact the small cams with the central block; a fourth step is located on the central block, near one of the ends, perforated transversely for the location of a steel screw that is the connecting link and of the application of all the forces resulting from the movements of the climber as this step in order to accommodate the screw goes through the through hole positioned to detain the tape or the anchoring sling, so that, being said screw with thread, the anchoring sling can be easily removed and easily replaced if damaged. The last conduit or step is a through hole centrally located and sized to accommodate the axle.

[0018] About this screw it is important to note that it is located on one end of the central block, i.e. it is not centered on the whole clamping mechanism. This eccentricity with respect to the assembly results in the generation a certain amount of forces resulting from the movements of the climber or from the climber falling, which allows both to resist and absorb more climber falls as well as falls of greater distance. With proper placement of the climbing friend, the impact force of a fall by the climber will fall on the center block and on said screw, which prevents the steel axle of the central block to be subjected to the total load of the impact caused by the climber falling.

[0019] The practical result of the formation described is that the climbing friend has greater durability and resistance to breakage and wear, being almost indestructible since, as the work of the climber in a fall is largely absorbed and almost entirely in the central block and steel screw, the more fragile parts of the system, cams and steel axle, are virtually relegated to the work of gripping and clamping of the climbing friend in the rock.

[0020] As indicated, the clamping mechanism com-

prises cams that are distributed in two pairs of two of different lengths and sizes and moving in the same direction.

[0021] The minor cams are located on either side of the central block and fasten to the axle. They are also linked to the trigger through a small hole where the slings are fastened. Its travel is approximately 180 degrees about the axle, acting as a stop the protrusion of the central block mentioned before.

[0022] These minor cams work by way of a spring fastened, at one end to the central block and on the other end to the minor cam. The spring forces the cam to remain retracted on its respective stop of the central block.

[0023] The function of the minor cams is to ensure adherence of the central block when acting in small cracks.

[0024] The larger cams are located next to the minor cams, being located on the outside of the assembly. Their features and functionality are basically the same that the smaller cams, especially for holding the clamping system into larger cracks. In this case the springs link them to the axle, through the perforations already described.

[0025] The large cams as well as the minor cams have a protuberance that link them between themselves in the moment of retracting the clamping mechanism, in such a way that the minor cams drag the larger cams. Therefore, these larger cams do not need to be fastened directly to the trigger.

[0026] All parts of the clamping mechanism interacting directly on the rock have the contact surface fully or partially grooved or toothed to increase the coefficient of friction.

[0027] The last part of the Climbing friend is the sling or anchoring strap, which at one end ends up with a snap hook and the other end is attached and linked to the central block by the screw already described that goes through said central block near one of its ends.

[0028] The different parts of the Climbing friend and especially the clamping mechanism are made of aluminum alloy. The end of the stem next to the hoop may be formed of plastic material of sufficient hardness and strength.

Description of the drawings

[0029] For a better understanding of what is described herein, some drawings are attached, which must be analyzed and considered merely as an example but not as a limiting or restricting condition.

Figure 1. Perspective view of the climbing friend in use and almost completely open

Figure 2. Perspective view of full clamping mechanism

Figure 3. Bottom View clamping mechanism

Figure 4. Front view of clamping mechanism

Figure 5. Side view of the clamping mechanism

Figure 6. Plan view of the central block

Figure 7. Bottom view of the central block

Figure 8. Side view of the central block
 Figure 9. Front view of the central block
 Figure 10. Cut-away view of the central block
 Figure 11. Perspective view of the central block associated with the axle and the stem
 Figure 12. Perspective view of the bottom of the central block and the associated axle and stem
 Figure 13. Detailed view of the central block with screw connection with the anchoring sling
 Figure 14. Full view of the central block with screw connection with the anchoring sling
 Figure 15. Detailed view of the central block with the axle and springs
 Figure 16. Side view of the large cam
 Figure 17. Perspective view of the large cam
 Figure 18. Back view of the large cam
 Figure 19. Perspective view of the large cam
 Figure 20. Perspective view of the minor cam
 Figure 21. Perspective view of the minor cam
 Figure 22. Back view of the minor cam
 Figure 23. Perspective view of the minor cam
 Figure 24. View of large cam in its elongated conformation
 Figure 25. View of large cam in its elongated conformation
 Figure 26. View of minor cam in its elongated conformation
 Figure 27. View of minor cam in its elongated conformation
 Figure 28. Detailed view of the protective backing of large cam
 Figure 29. Detailed view of the protective backing of large cam
 Figure 30. Detailed view of the protective backing of minor cam
 Figure 31. Detailed view of the protective backing of minor cam
 Figure 32. Detailed view of the trigger assembly, tensing element and clamping mechanism
 Figure 33. Detailed view of the trigger assembly, tensing element and clamping mechanism
 Figure 34. Detailed view of the trigger assembly, tensing element and clamping mechanism
 Figure 35. Detailed view of the stem assembly, trigger and tensing element.
 Figure 36. Detailed view of the stem assembly, trigger and tensing element.
 Figure 37. Perspective view of the climbing friend almost fully retracted for minor cracks
 Figure 38. Perspective view of the almost completely open climbing friend for large cracks
 Figure 39. Perspective view of the almost completely open climbing friend for large cracks
 Figure 40. Perspective view of the almost completely open climbing friend for large cracks
 Figure 41. Perspective view of the almost completely open Climbing friend for large cracks
 Figure 42. Perspective view full climbing friend in

closed position for transport flat and stackable.

Figure 43. Perspective view full climbing friend in closed position for transport flat and stackable.

5 Description of a preferred embodiment

[0030] In these figures are detailed the climbing friend conformation of the claim, which is formed as shown in Figure 1 by five interrelated parts: one stem (1), a trigger (2), a sling or anchoring belt (6) an axle (3) and a clamping mechanism (4), which in turn, and according to this preferred embodiment is formed by a central block (5), two large cams (7) and two minor cams (8).

[0031] As shown in this figure 1, the element that holds the whole assembly together is the stem (1), formed by a tubular piece which is linked to a hoop (9) on one end, and on the other is assembled to the clamping mechanism (4), which is the active part of the climbing friend, placed in the path of the stem (1) and in an intermediate part of the same trigger (2).

[0032] The active part of the climbing friend is the clamping mechanism (4) as it is the one with mobility and changes its position to adjust itself and embedding in the cracks and fissures of the rocks. Figures 2, 3, 4 y 5 show different views of this clamping mechanism (4), formed by a central block (5) and cams, all these elements being crossed by an axle, which allows for independent articulation among them. In this preferred embodiment, the cams are distributed in two pairs, placed one on each side of the central block (5), each pair made up by a large cam (7), placed on the outer part of the clamping mechanism (4) and a minor cam placed between the central block (5) and the large cam (7); all these element being crossed by a steel axle (3) linked in turn to the stem (1) which turns freely by 90 degrees with respect to the central block (5); this axle (3) supports springs (29) and (30) which work in the articulation of the assembly.

[0033] These figures show the mostly circular and toothed conformation (14) (23) (27) of one of the ends of these parts - central block (5), large cams (7) and minor cams (8). As the large cams (7) and minor ones (8) are mobile and can turn, the respective toothed edges (23) and (27) and the toothed edges (14) of the central block (5) may not coincide in their position as shown in Figures 2 and 5.

[0034] Figure 3 also shows the position of the springs (29) and (30) that articulate part of the movement of the minor cams (8) with respect to the central block (5) and between the large cams (7) and the axle (3).

[0035] Figures 6, 7, 8, 9, 10, 11 and 12 show the central block (5) with more detail; this has a rectangular shape with its ends, having a mostly semicircular and toothed shapes (14), with projections (15) and two recesses in its lower part, a recess (16A) disposed horizontally and destined to house the stem (1), and the other a hole (16B) disposed vertically to house the anchoring sling (6). This central block (5) has a through hole (33) centrally situated

and sized to house the axle (3), and several ducts or transverse passages of smaller diameter: a first passage (17), situated on one side of the central block (5) to house the anchorage of two of the ends of the retraction system or tensioning element (11), whose other two ends are secured by means of small perforations (25) existing in the minor cams (8); another two passages (18) are situated on both sides of the central block (5) to fasten the springs (29), which in their turn are secured to the minor cams (8) by means of perforations (24), provided in the same for that purpose and which link them to the central block (5); and a fourth and last passage (19), eccentric, which is situated above the central block (5), near one of its ends, is perforated transversally to house a steel screw (32) related to the anchoring sling or tape (6) as shown in detail in figures 13 and 14. This anchoring sling or tape (6) is associated by one end to a snap hook (31) and by the other end thanks to the screw (32) already described which passes through the central block (5), is linked to the clamping mechanism (4).

[0036] This axle (3) is a round steel bar joined in an integral manner, forming a single piece with the central block (5) and it has holes: two (12) through holes to join the large cams (7) with the central block (5), and two others (23) to house the rivet or screw for the closure or stopper of the cam assembly.

[0037] Figure 15 shows in detail the housing of the axle (3) in the central block (5) and the placement of the springs (29) (30) which link the minor cams (8) with the central block (5) and the large cams (7) with the axle (3).

[0038] The groups of figures 16, 17, 18 and 19, and 20, 21, 22 and 23 describe the conformation of the large cams (7) and minor cams (8) respectively, these have a mostly rectangular shape, with a generally curved back edge and a front edge arched and toothed (23) (27) respectively. Both pairs of cams (7) and (8) differ in length and size but have the capacity to move in the same direction, they have a through hole (22) and (28) of appropriate size to house the axle (3), and show projections (20) (26) that link them at the moment of retracting the clamping mechanism (4), so that the minor cams (8) situated next to the central block (5), in an inside plane, drag the large cams (7), situated on the outer part of the clamping mechanism assembly (4).

[0039] The minor cams (8) are linked to the trigger (2) through a small perforation (25), where the tension element (11) is anchored formed by the anchoring slings and wires, with a travel of approximately 180 degrees on the axle (3). As has been pointed out previously, the relationship of these minor cams (8) with the central block (5), is achieved by the intervention of the spring (29) secured by one end to the central block by means of a duct or passage (18), and for the other to the minor cam (8) by means of the perforation (24) which forces the minor cam (8) to try to keep itself folded over its respective stopper of the central block (5).

[0040] The large cams (7) that have been mentioned are situated at the side of the minor cams (8) and remain

placed on the outer side of the assembly, they also have a perforation (21) in which the spring (30) is secured, to link them to the axle (3), by means of the through hole (12) made in said axle (3). This spring (30) also forces to try to maintain the maximum opening of the climbing friend.

[0041] Figures 24, 25, 26 and 27 show a modification of the cams, both large (7) and minor (8), consisting in a lengthening of their structure so that the through hole (22) and (28) to house the axle (3) is situated in a mostly central position. This lengthened configuration implies a greater gripping capacity but also entails a substantial increase in weight, so it is understood that this is an option where all aspects related to the practical uses must be evaluated and applied in specific circumstances.

[0042] Figures 28, 29, 30 and 31 show the large cams (7) in detail and of the minor cams (8) with a curved and projecting prolongation which becomes a protector (34) and reinforcement that covers and hides the springs (29) (30), as described.

[0043] Figures 32, 33 and 34 show in detail the trigger assembly, tensioning element and clamping mechanism. The trigger (2) is the element that activates the clamping mechanism (4), that is to say facilitates the extraction and placement of the climbing friend in the cracks. It is formed as a basically rectangular part, of small thickness, with a central opening (10) crossed by the stem (1). The trigger (2) is joined to the clamping mechanism (4) by means of the tensioning element (11) preferably formed by a combination of slings and wire. When the trigger (2) is activated the clamping mechanism (4) is retracted, increasing or decreasing its amplitude.

[0044] Figures 35 and 36 show the detail of the stem, trigger, and tensioning element assembly, the rectangular conformation of the trigger (2) being evident and the manner in which the stem (1) acts as a guide for that trigger (2), which it goes through by means of the central opening (10) of the same. The tensioning element (11) formed by a combination of slings and wires, goes out from said trigger (2) which remains linked to the clamping mechanism (4) by means of the minor cams (8) and the central block (5). In its turn, the stem (1) is associated at its free end to a ring, to grasp and manipulate it.

[0045] The last figures of this descriptive memory show the claimed climbing friend with the clamping mechanism in different degrees of opening.

[0046] In Figure 37, the climbing friend is almost fully retracted to obtain the placement and adjustment in small fissures, with the central block (5) and the large cams (7) and minor cams (8) in an almost horizontal plane.

[0047] In figures 38, 39, 40 and 41, the climbing friend is almost fully open to obtain the placement and adjustment in large cracks and fissures, with the central block (5) and the large cams (7) and minor cams (8) displaced and situated in a mostly vertical position.

[0048] In figures 42 and 43 the clamping mechanism is fully open, and remains in a fully folded position for its transport, it being evident that the different parts of the

clamping mechanism (4) - central block (5), large cams (7) and minor cams (8) - together with the trigger (2) and the stem (1) are kept in a flat position, occupying a minimal volume and making easy the stashing of several climbing friends each over another. On the basis of the description and especially in view of Figures 12, 37, 38, 39, 40, 41, 42 and 43 it is explained that the stem has a free movement of about ninety degrees comprised from a totally perpendicular to totally co-planar with the clamping mechanism.

[0049] In view of this description, the advantages of this innovative climbing friend are evident.

[0050] Its conformation with five moving and shifting parts implies not only a greater gripping surface, but also that the displacement of the three groups (central block, minor cams and large cams) allows each part to remain fixed in the position and point that is most convenient, according to the configuration of the crack in question, making it possible, for example, that some cams may remain ahead of the central block, or that the same central block can shift in different degrees and remain in one angle or another

[0051] As a result of the above, the climbing friend encompasses a large range of crack sizes, so that a single climbing friend can perfectly fulfill the need of at least three or four of the climbing friends existing in the market.

[0052] Regarding its practical application, its robust design allows it to withstand the variation of tensions caused by the climber's rope and the inherent movements of the climber himself. This same robust condition, joined to its different gripping points in the rock, makes it withstand greater fall forces, especially if the central block is firmly inserted in the rock.

[0053] The holes existing at the back of the central block and destined to house the stem and the anchoring sling make the climbing friend a pliant and compact tool which, added to its low weight, makes its transport much easier, as they can also be stacked one on top of another.

[0054] Regarding improvements in its design, as mentioned in the description of the figures, it is foreseen that the springs should be covered by a prolongation of the cams as a tube, which would mean a reinforcement of the axle associated to the clamping mechanism assembly.

[0055] Concerning the cams, they curving radius or their length can vary to improve the grip on the crack.

[0056] This grip can also be improved varying the degree of striation or teeth on the surface of the central block and of the cams.

[0057] The number of cams may also vary, reducing or increasing their number.

[0058] In any case, the climbing friend described in the invention patent supposes a clear and evident improvement as compared to similar tools existing in the market: better design, better adjustment in the cracks with greater gripping surface, greater resistance, better withstanding effort on falls, less weight and smaller size, greater opening range and therefore positive application in a larger

range of cracks, etc.

[0059] It is not considered necessary to make this description any longer for any expert in the matter to understand the scope of the invention and the advantages deriving from it. The materials, shape, size and arrangement of the elements may be changed, provided this does not mean an alteration in the essential nature of the invention. The terms in which this report has been drawn up must always be taken in their broadest, non-restrictive sense.

Claims

1. Climbing friend, of the type used as tool to help in climbing, characterized essentially because it has a clamping mechanism (4) formed by movable and replaceable gripping parts. This mechanism being linked to a stem (1) with an associated trigger (2), an anchoring sling or tape (6) and an axle (3) comprising also springs (29) and (30), which link some parts of the assembly among them and other parts with the tensioning element (11).
2. Climbing friend, according to the 1st claim, characterized essentially in that the clamping mechanism (4) has mobility and comprises a central block (5) articulated with cams, preferably four and distributed in two pairs situated on both sides of said central block (5), each pair composed by a large cam (7) situated on the exterior of the clamping mechanism (4) and a minor cam (8) situated between the central block (5) and the large cam (7), all these elements being linked by springs (29) and (30) and crossed by an axle (3) linked in turn to a stem (1) which turns freely by 90 degrees in respect to the central block (5).
3. Climbing friend, according to the 1st and 2nd claims, characterized essentially in that the central block (5) has a rectangular shape with its ends mostly semi-circular and toothed (14) with projections (15) and two recesses in its lower part, a recess (16A) disposed horizontally and destined to house the stem (1), and the other a through hole (16B) disposed vertically to house the anchoring sling (6).
4. Climbing friend, according to the 1st, 2nd and 3rd claims, characterized essentially in that this central block (5) has a through hole (33) centrally situated and sized to house the axle (3) and various ducts or transverse passages of lesser diameter: A first passage (17) is placed on a side of the central block (5) to house the anchoring of two of the ends of the retraction system or tensioning element (11) another two passages (18) are situated on both sides of the central block (5) to fasten the springs (29) joined to the minor cams (8) and a last passage (19) eccentric

located above the central block (5) where a steel screw (32) is housed, linked to the anchoring sling or tape (6).

5. Climbing friend, according to the 1st and 2nd claims, characterized essentially in that the large cams (7) and the minor cams (8) differing in their length and size, have the same roughly rectangular shape, with a back edge roughly curved and a front edge arched and toothed (23) (27) have the capacity to move in the same direction, show a projection (20) (26) which link them at the moment of retracting the clamping mechanism (4) and have a through hole (22) and (28) of appropriate dimensions to house the axle (3). 5
6. Climbing friend, according to the 1st, 2nd and 5th claims, characterized essentially in that the minor cams (8) link to the trigger (2) through a small perforation (25) which houses the tensioning mechanism (11) with a travel of approximately 180 degrees over the axle (3) and are linked to the central block (5) through the perforation (24) where is anchored the spring (29) which links to that central block (5). 10
7. Climbing friend, according to the 1st, 2nd and 5th claims, characterized essentially in that the large cams (7) have a perforation (21) in which the is secured the spring (30) to link them to the axle (3), 15
8. Climbing friend, according to the 1st, 2nd and 5th claims, characterized essentially in that the large cams (7) and the minor cams (8) have a curved and projecting prolongation which turns into a protection (34) and reinforcement that covers and hides the springs (29) (30). 20
9. Climbing friend, according to the 1st, 2nd and 5th claims, characterized essentially in that the large cams (7) and minor cams (8) modify their structure with a lengthening that situates the through hole (22) and (28) to house the axle (3) in a roughly centered position. 25
10. Climbing friend, according to the 1st and 2nd claims, characterized essentially in that This axle (3) is a round steel bar joined in an integral manner and forming a single piece with the central block (5), this axle has two through holes (12) to join the large cams (7) with the central block (5), and two holes (13) to house the rivet or screw for the closure or stopper of the cam assembly. 30
11. Climbing friend, according to the 1st, 2nd, 6th, 7th and 10th claims, characterized essentially in that the springs (29) and (30) are situated on the axle (3). 35
12. Climbing friend, according to the 1st and 3rd claims, characterized essentially in that the clamping sling 40

or tape (6) is associated on one end to a snap hook (31) and to the other end, thanks to the screw (32) goes through the central block (5) being linked to the clamping mechanism (4).

13. Climbing friend, according to the 1st claim, characterized essentially in that the trigger (2) is a part basically rectangular and of small thickness, with a central opening (10) crossed by the stem (1), this trigger (2) being joined to the clamping mechanism (4) by means of the tensioning element (11). 45
14. Climbing friend, according to the 1st claim, characterized essentially in that the stem (1) is formed by a tubular one of whose ends is linked to a hoop (9) and on the other end it is assembled to the clamping mechanism (4), by means of the axle (3) where it freely pivots by ninety degrees going from a totally perpendicular position to a totally co-planar position with the clamping mechanism. 50

FIG.1

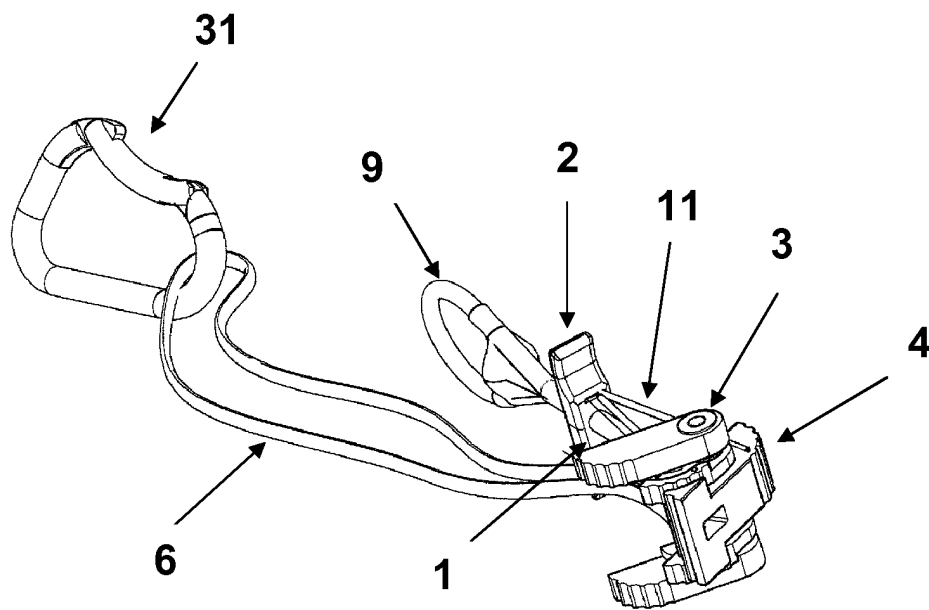


FIG.2

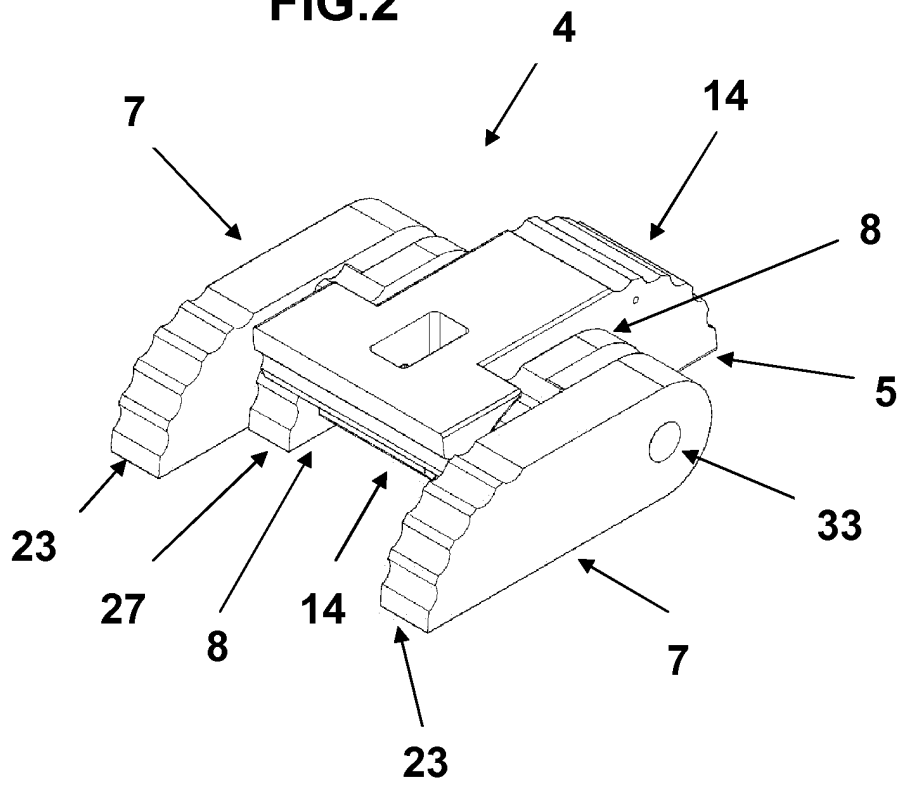


FIG. 3

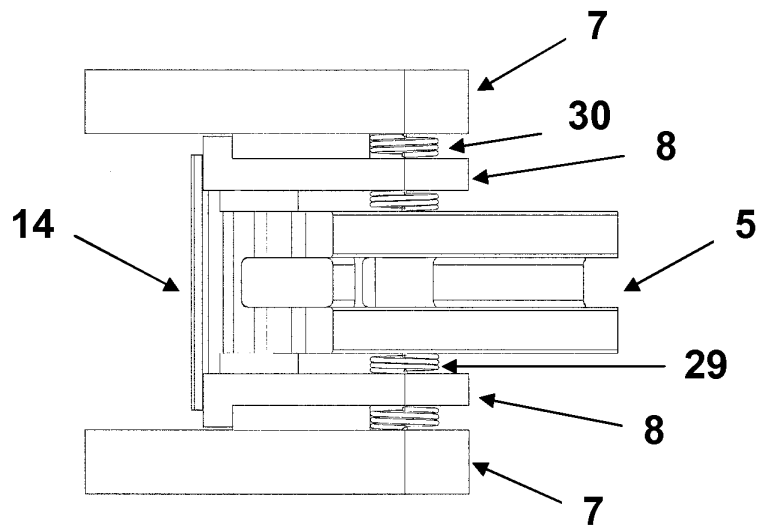


FIG. 4

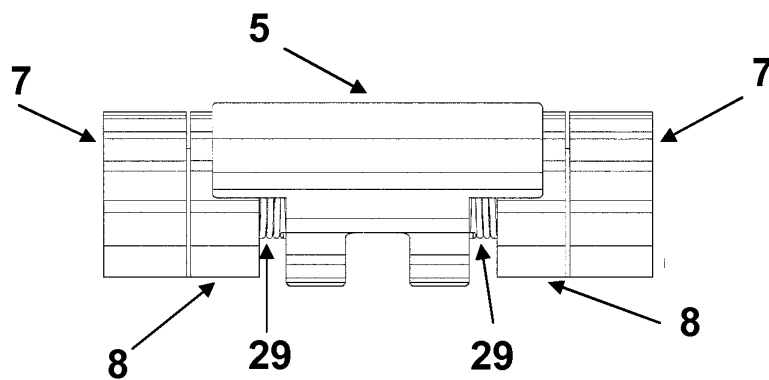


FIG. 5

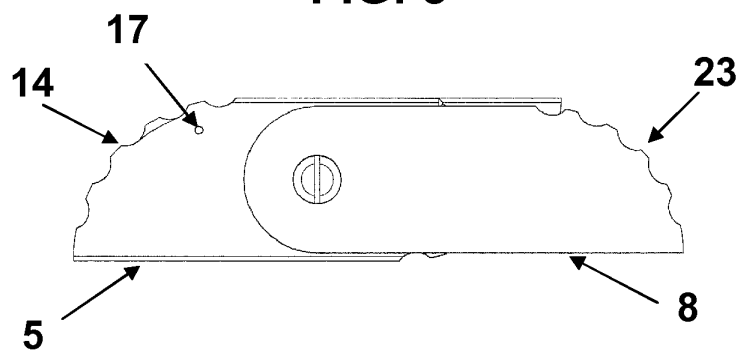


FIG. 6

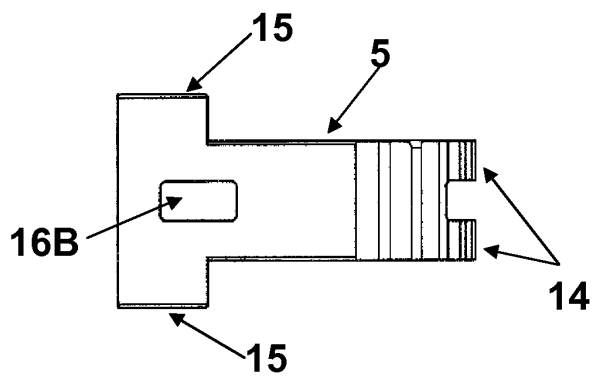


FIG. 7

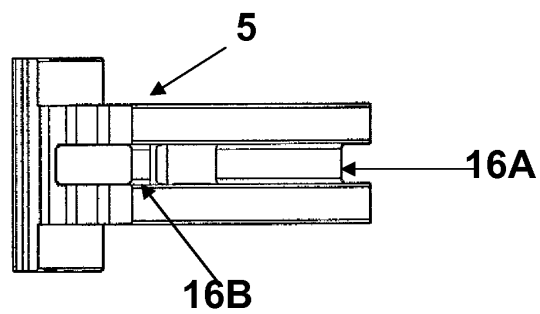


FIG. 8

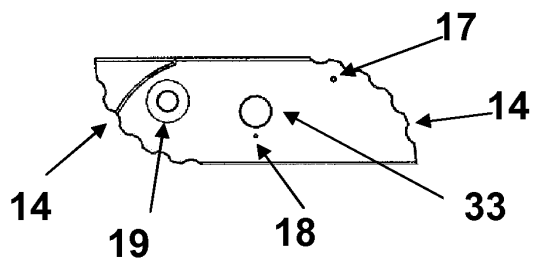


FIG. 9

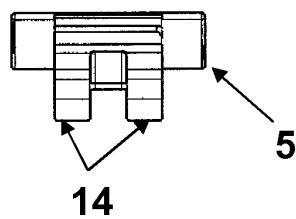


FIG. 10

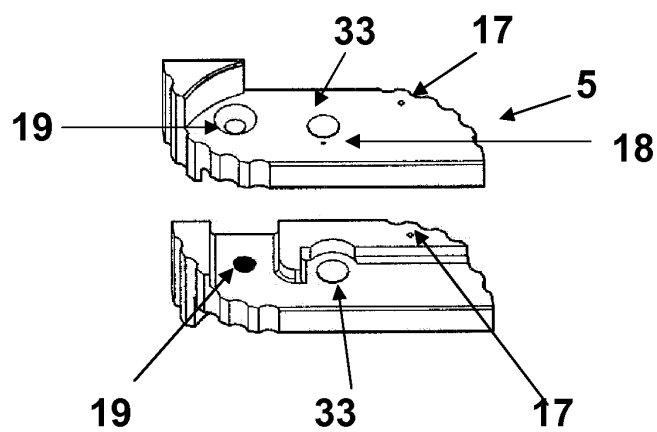


FIG. 13

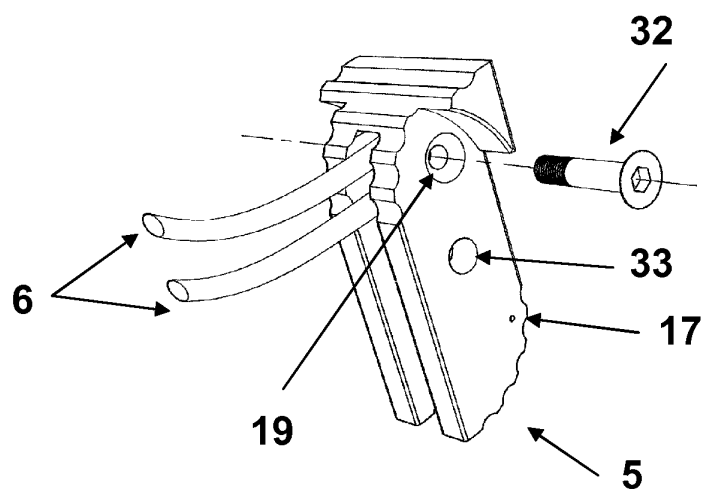


FIG. 14

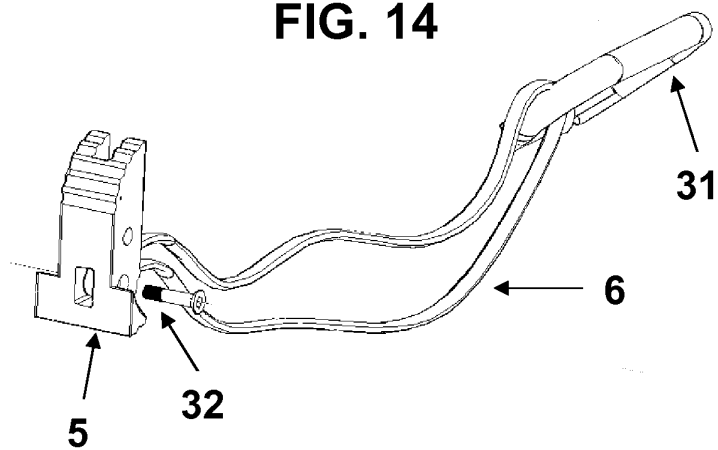


FIG. 15

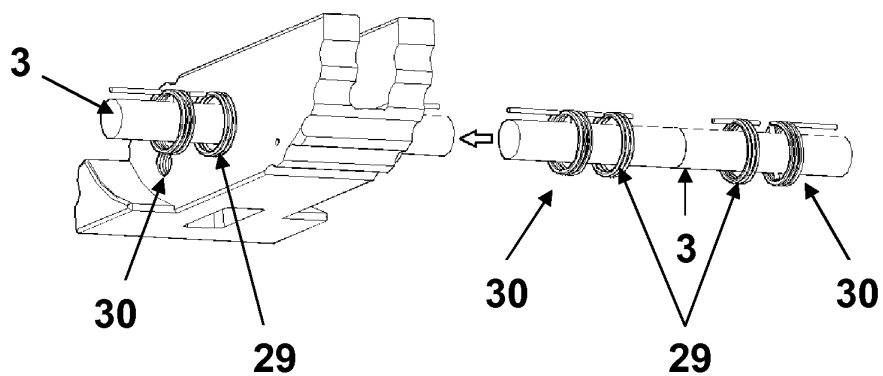


FIG. 16

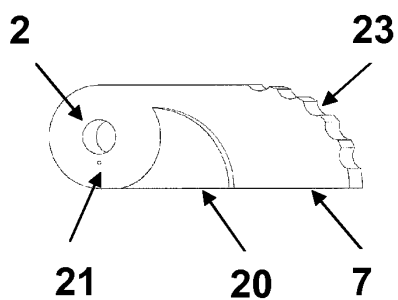


FIG. 17

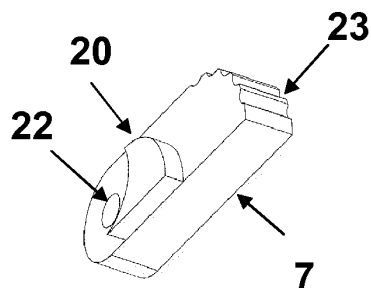


FIG. 18

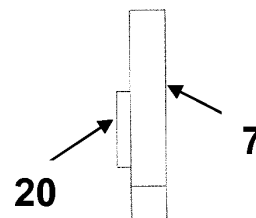


FIG. 19

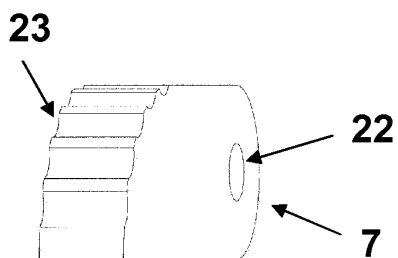


FIG. 20

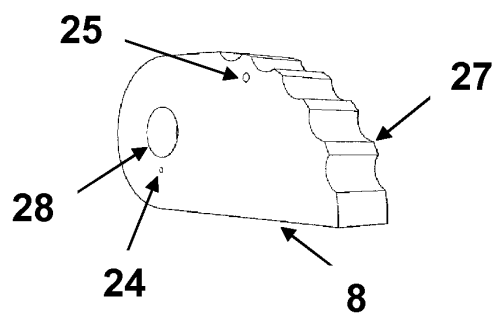


FIG. 21

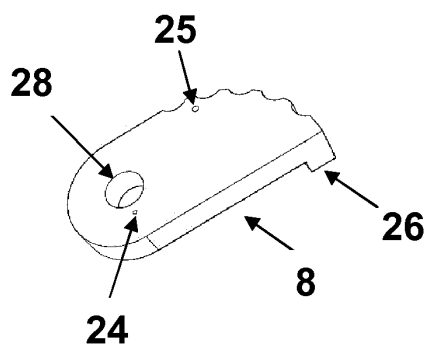


FIG. 22

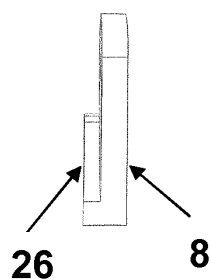


FIG. 23

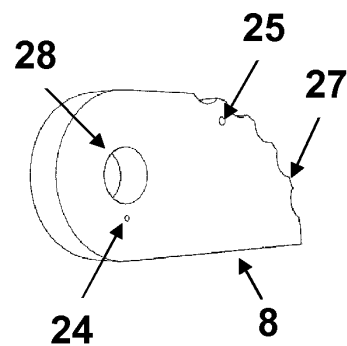


FIG. 24

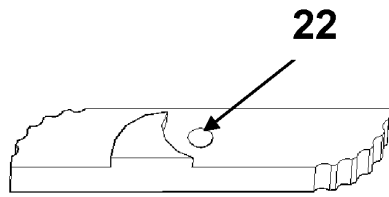
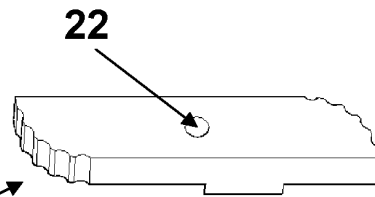


FIG. 25



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FIG. 26

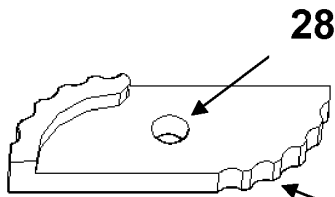
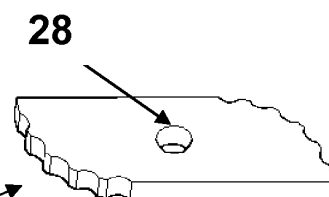


FIG. 27



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FIG. 28

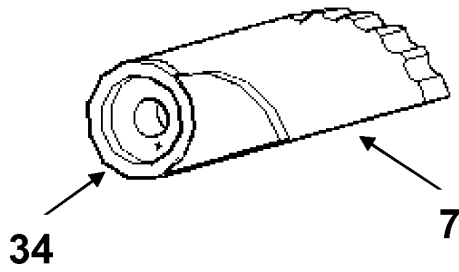


FIG. 29

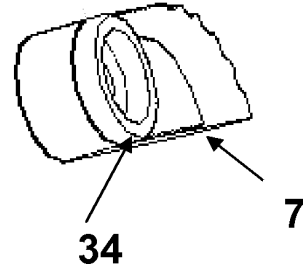


FIG. 30

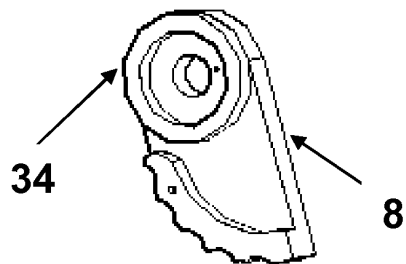


FIG. 31

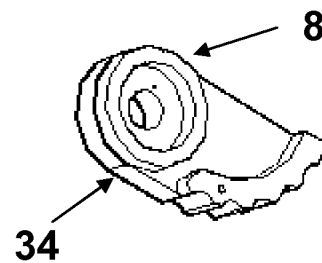


FIG. 32

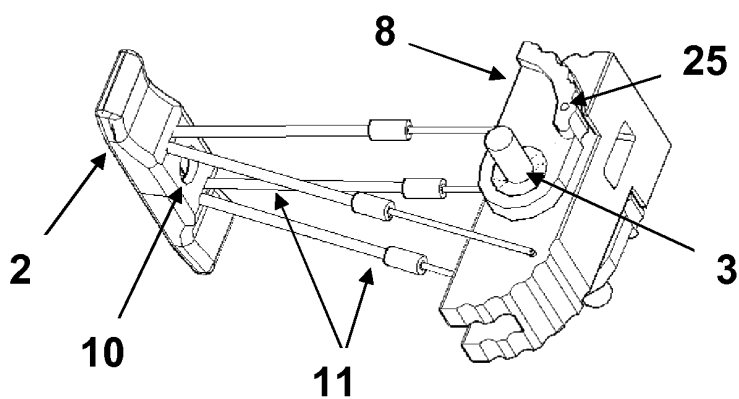


FIG. 33

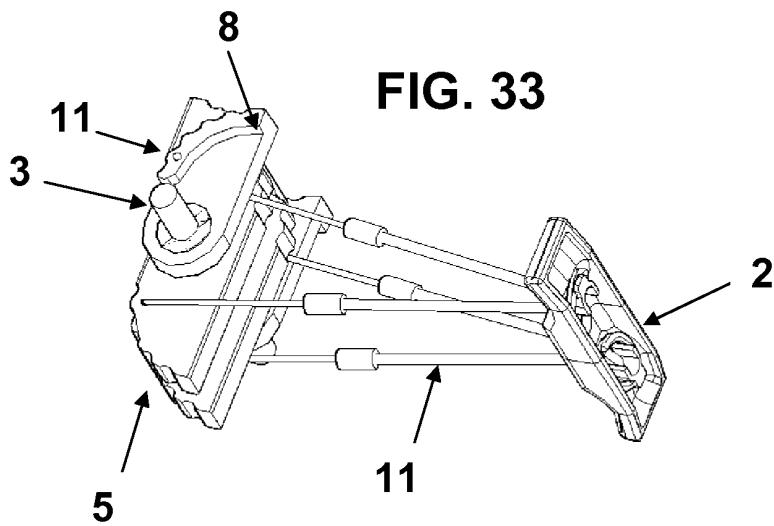


FIG. 34

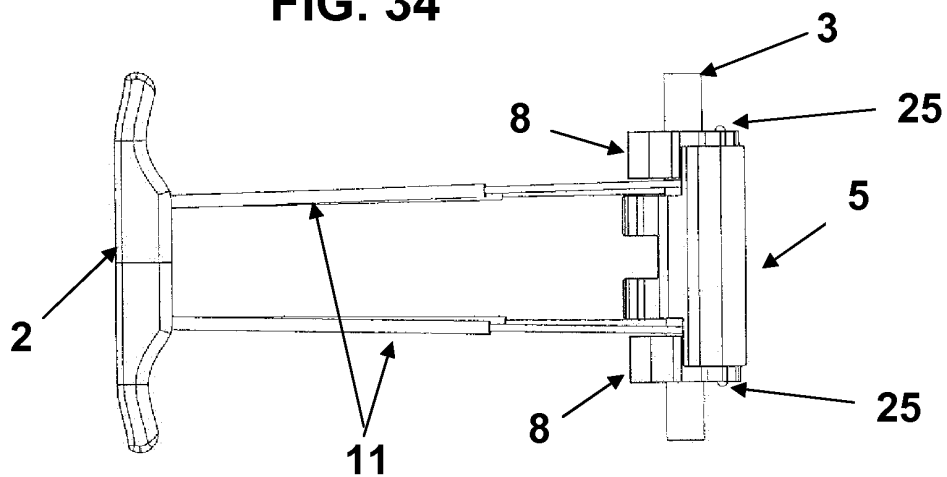


FIG. 35

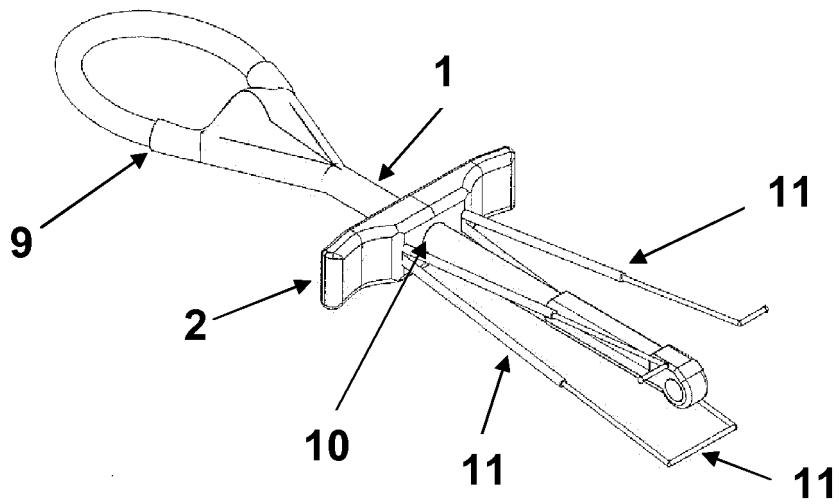


FIG. 36

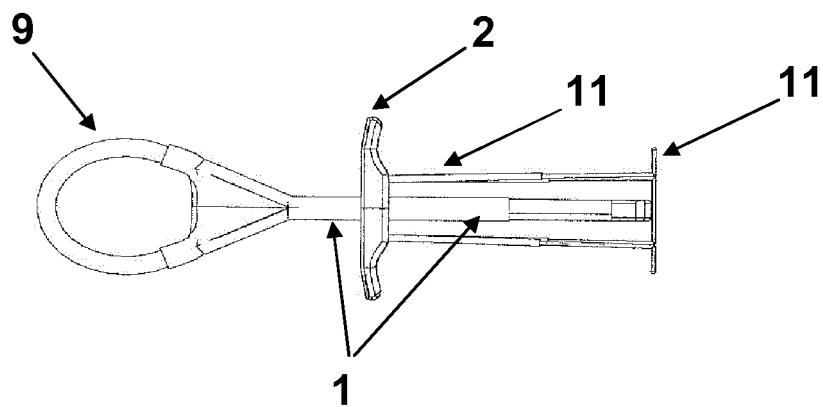


FIG. 37

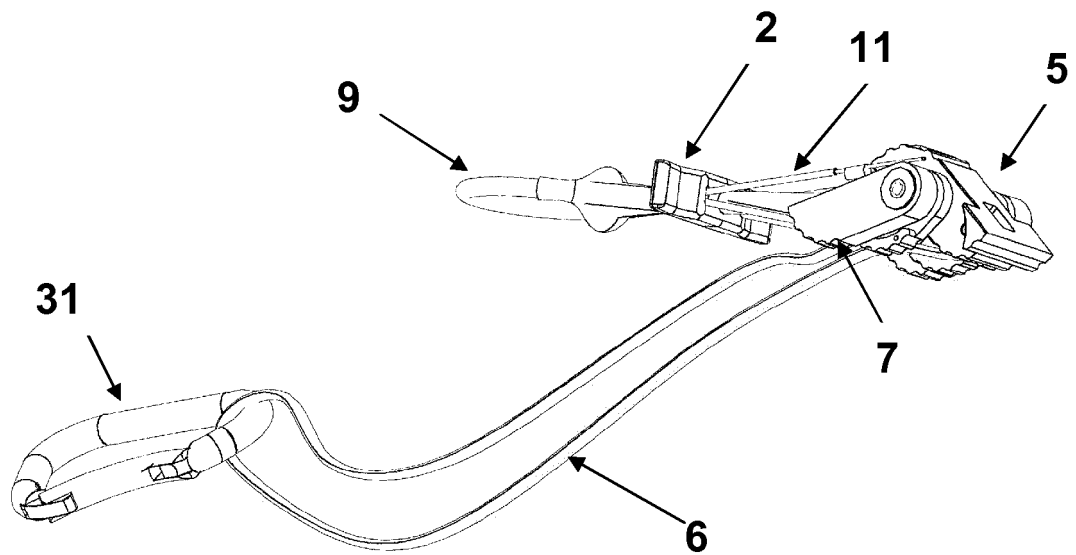


FIG. 38

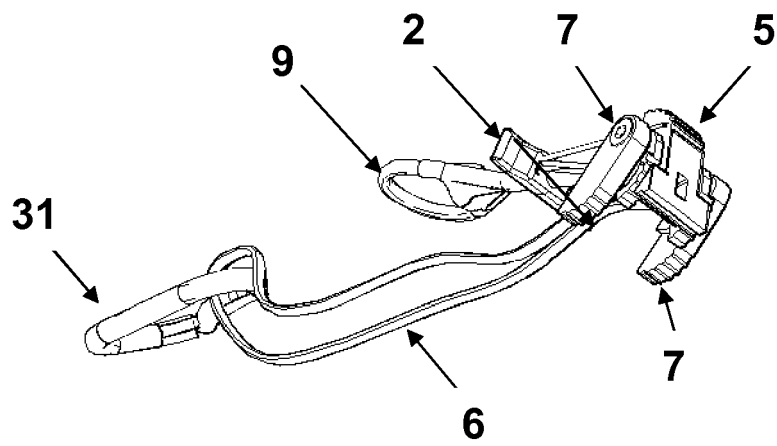


FIG. 39

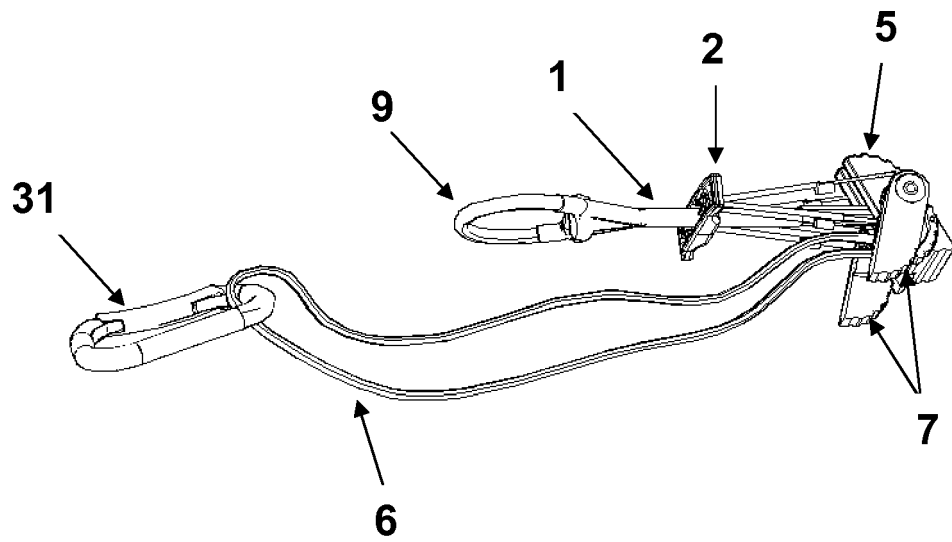


FIG. 40

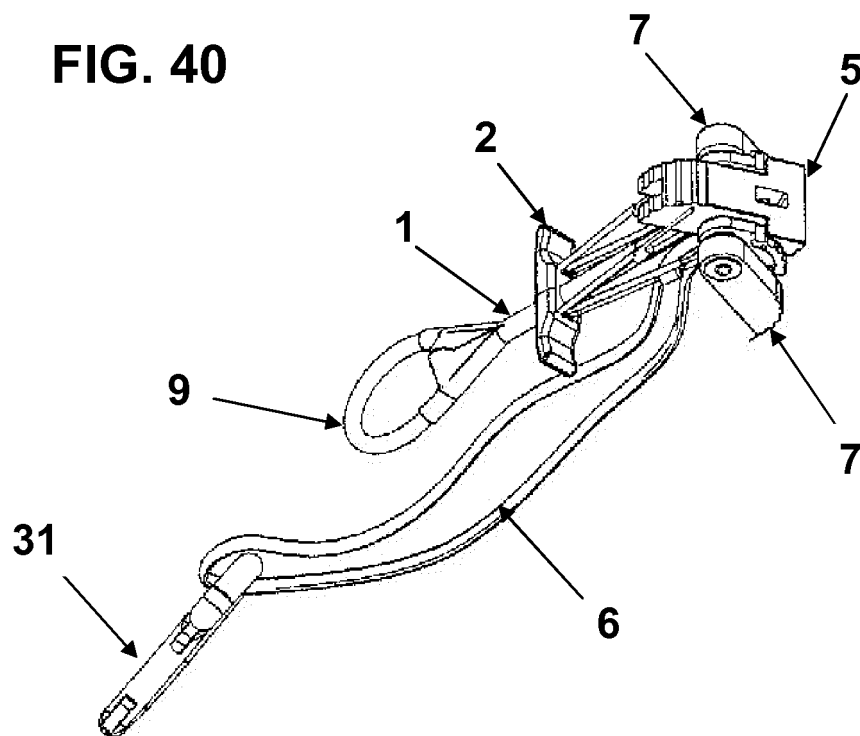


FIG. 41

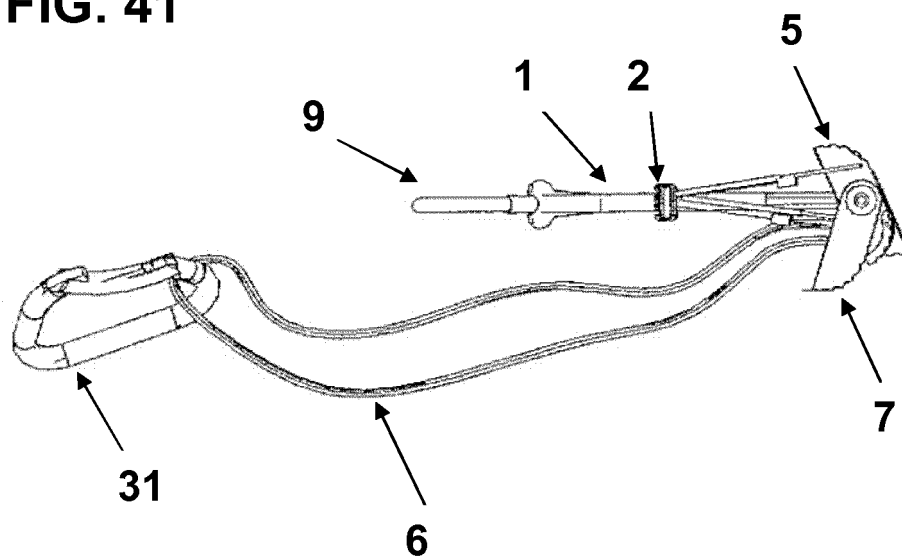


FIG. 42

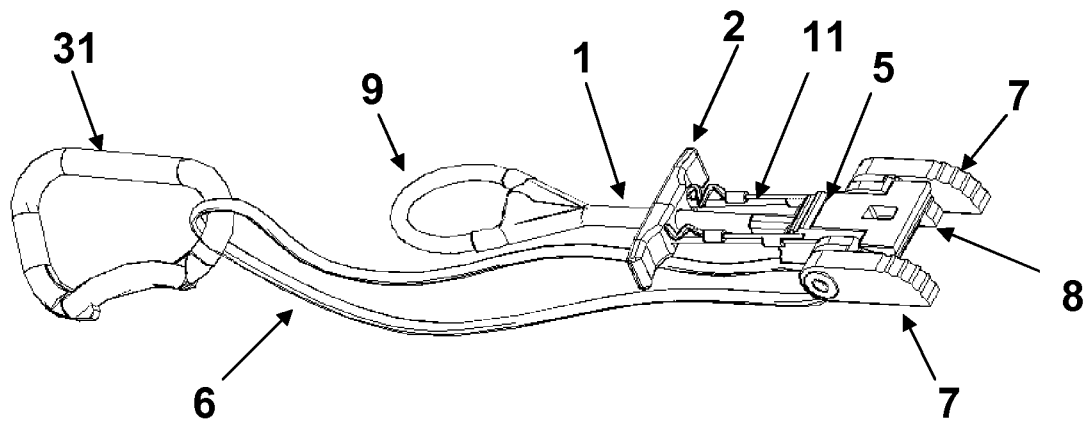
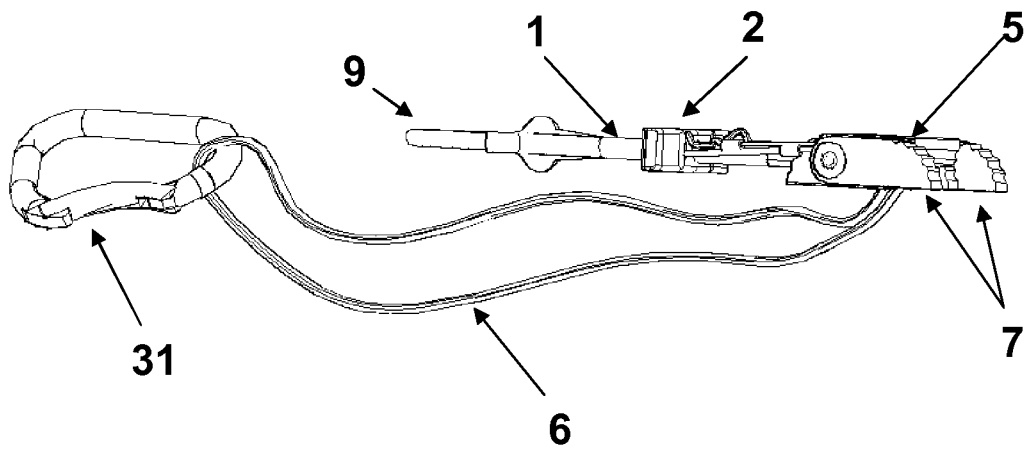


FIG. 43



INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2013/070636

A. CLASSIFICATION OF SUBJECT MATTER

A63B29/00 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4832289 A (WAGGONER DAVID L) 23/05/1989, description; figures 1 - 3.	1,13,14
Y		2,5-11
X	US 5860629 A (REED MAX W) 19/01/1999, description; figures 1 - 3.	1,13
Y	GB 2347360 A (ARRAN JOHN MICHAEL PETER) 06/09/2000, description; figures 1 - 4.2.	2,5-11
A	EP 1854511 A1 (TELLERIA GABIRIA AITZOL ET AL.) 14/11/2007, description; figures 1 - 5.	1-14
A	US 2004035992 A1 (WATTS ALLAN W) 26/02/2004, description; figures 1 - 21.	1-14

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"E" earlier document but published on or after the international filing date	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search
02/12/2013Date of mailing of the international search report
(11/12/2013)

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2013/070636

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of documents, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003006351 A1 (MURRAY SETH) 09/01/2003, description; figures 1 - 3.	1-14

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2013/070636

Information on patent family members

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US2004035992 A1	26.02.2004	NONE	
US2003006351 A1	09.01.2003	US6736359 B2	18.05.2004

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