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(54) **Safety anchor for climbing**

Sicherheitsanker zum Klettern

Ancre de sécurité pour escalade

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EP 1 854 511 B1

Description

Object of the Invention

[0001] The present invention relates to a safety anchor for climbing, specifically provided for achieving an optimal binding of the anchor which is arranged on a crevice of the wall or rock which is being climbed.

[0002] Therefore, an object of the invention is to provide an anchor of the type formed by two pairs of cams or eccentrics, which can swivel and which in a rest position are introduced in a crevice of a wall, so that by means of pulling a pull rod provided in the suspension rope such pairs of cams can be swiveled outwards and pressed against the walls of the crevice, such that according to the invention, in addition to the swiveling movement of the cams for their binding on the crevice, a transverse movement thereof occurs which increases the binding of the anchor on the crevice.

Background of the Invention

[0003] There is a type of safety anchor used in high mountain climbing which is formed by two pairs of eccentrics assembled such that they can swivel with respect to respective fixed shafts, and associated to a support to which the corresponding rope that the climber is tied to is linked, further having tighteners joined at the end by a pull rod and connected to the two cams, such that the pulling of the pull rod entails the swiveling of the cams towards a closing position for the purpose of introducing the anchor in a crevice of the face or wall which is being climbed, such that based on internal springs and when the pull rod is released, the pairs of cams tend to open and press against the walls of the crevice, thus forming the corresponding binding of the anchor to prevent the possible fall of the climber suspended from the rope linked to the anchor.

[0004] Said anchors usually work in a satisfactory manner, although occasionally and due to the existence of moisture, mud, moss, considerably polished crevice walls etc, they may be certain tendency for the anchor to slip on the rock, i.e. the initial friction considerably decreases, such that the sudden pulling of the anchor, for example the anchor which supports during a fall, can be insufficient to make the pairs of cams rotate and the friction against the rock increase so as to stop the fall.

[0005] US 2002/162927 discloses a camming device comprising a stem, one or more spindles mounted on the support, at least two cam members adapted to engage the walls of a crack or hole by their cam profiles pivotally mounted on the spindle or spindles and adapted for opposite pivotal movement from a closed position to an open position, means to apply a force to each cam member to urge it to its open position, means for pivoting the cams to the closed position, characterised in that the stem includes means for movement of at least a major part thereof about an axis other than that of the or of

either spindle.

[0006] US 2005/161565 discloses a connection system for use with an active or passive protection device that minimizes weight. A single stem connection system for use with an active protection device includes a single bent cable that is attached to the single cable terminal of the active protection device. A stem tube is fitted over a portion of the bent cable giving the appearance and benefits of a single stem. However, a portion of the bent cable is left separated thereby automatically forming a clip-in point for the entire active protection device. The single stem system only requires coupling the cable to the cable terminal thereby reducing manufacturing cost and minimizing overall weight.

[0007] US 2003/006351 discloses an anchoring device for use in a rock crevice. The anchoring device is movable from a non-activated position to an activated position. The anchoring device comprises a first axle member and a first cam rotatable about the first axle member with the first cam having a first side surface, a first bottom surface, and a first contact surface, the first contact surface contactable with the first rock wall. A second axle member is provided in a spaced in a parallel configuration from the first axle member with a second cam rotatable about the second axle member. The second cam has a second side surface, a second bottom surface, and a second contact surface, the second contact surface contactable with the second rock wall, wherein in a non-activated position, the first axle member is closer to the first rock wall than the second axle member, the second axle member is closer to the second rock wall than the first axle member, and the first bottom surface of the first cam is free from overlap with the second bottom surface of the second cam.

[0008] US 4643377 discloses an improved climbing aid which includes one or more pair of opposing cam members, two parallel axles on which the opposing cam members pivot separately with crossed radii, axle joining members situated between the opposing cam members, a looped cable member connected to the axle joining members which provides the means for attachment of a climbing rope, spring members which act to simultaneously move the cam members toward their fully expanded positions, and an operating member which is connected to each cam member such that when it is pulled the cam members retract in order to allow insertion or removal of the improved climbing aid into or out of a crack in rock.

[0009] GB 2347360 discloses a camming device for removably inserting into openings when climbing comprising: a support means; and a plurality of cam means mounted on said support means, at least two of the cam means being rotatable about a pivot means between extended and contracted positions, and at least one of the cam means being able to rotate through a greater angle than at least one other cam. The device preferably includes first and second actuator means for moving the cam means towards the extended and contracted posi-

tions, respectively. The pivot means may comprise a single axle which may be straight, stepped or curved so that the cams are offset. The pivot means may also comprise more than one axle. On pulling the handle, the cams rotate, when the ball meets the loop the cams rotate. Thus the cams may rotate further than the cams. The cams may be different sizes and have an arcuate cam surface. The support means may have a receiving means for receiving a rope used in climbing.

Description of the Invention

[0010] The anchor proposed in claim 1, based on two pairs of rotating or swiveling cams, the support to which the rope that the climber is tied to is fixable, and the two shafts of the ropes of the cams, has the peculiarity that the mentioned support has two elongated and oblique holes in which the shafts of the cams are precisely positioned, such that when the mentioned support is pulled downwards, and precisely by virtue of the elongated configuration and inclination of the holes of the shafts, there is a transverse movement of the mentioned shafts of the cams parallel to the swiveling of such cams, two stresses being generated on the crevice, a conventional and classic stress due to the rotation of the cams and another stress corresponding to a transverse movement of such cams with respect to the crevice, which movement is considerably perpendicular to the walls of the mentioned crevice, therefore these two pressing stresses of the cams on the crevice prevent any type of slipping of the anchor, the effectiveness of the binding being thus considerably increased.

[0011] Springs have been provided in the elongated holes of the support in which the shafts work in, which springs make the shafts be separate at rest, for the purpose that they are always separate so as to act in the case of a pull, because when the latter occurs, said shafts tend to move closer together due to the orientation and configuration of the holes in which they are placed, tending to separate the cams in addition to the separation caused as is conventional, i.e. by means of springs tending to make the cams separate and press against the walls of the crevice in which it is applied.

Description of the Drawings

[0012] To complement the description which is being made and for the purpose of aiding in better understanding the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of said description, in which the following has been shown with an illustrative and non-limiting character:

Figure 1 shows a perspective view of the support of the anchor, in which the cams are assembled.

Figure 2 shows a perspective view of the anchor of the invention, in the closing position of the cams, to

introduce said anchor in a crevice.

Figure 3 shows a front view of the safety anchor object of the invention in the position of Figure 2.

Figure 4 shows another front view of the same anchor, in this case with cams released so that they swivel outwards and press against the walls of the crevice.

Figure 5 shows a view like that of the previous figure, in which, in addition to the swiveling of the cams according to Figure 2, there is a transverse movement thereof caused by the shafts working in the elongated holes of the intermediate support to which the corresponding suspension rope of the climber is fixable moving closer together.

Preferred Embodiment of the Invention

[0013] In view of the described figures, it can be observed how the anchor of the invention comprises two pairs of cams (1, 1') in the form of eccentrics and with an irregular outer surface for the purpose of achieving a correct binding thereof on the walls (3) of a crevice (4) corresponding to a rock or wall which is being climbed.

[0014] Said cams (1, 1') are assembled on a support (5), with guide rods (6), Figure 1, to which the corresponding suspension rope of the climber, not shown, is fixable, further including a pair of tighteners (7) which at one end are joined to a pull rod (8) and at the other end are joined to the two cams (1, 1') at attachment points (9, 9'), such that to introduce the anchor in the crevice (4), the pull rod (8) is pulled, whereby the tighteners (7) pull the two pairs of cams (1, 1') tending to close them as shown in Figures 2 and 3, for their introduction in the crevice (4). This operation can also be carried out manually by the climber.

[0015] On the other hand, the two pairs of cams (1, 1') are assembled such that they can swivel on respective shafts (10) located in elongated and oblique holes (11) provided for that purpose in the support (5), all this with the following peculiarities:

[0016] As already mentioned, once the anchor is introduced in the crevice (4) as shown in Figure 3, it is enough to release the pull rod (8) for the tighteners (7) to slacken, or in the event of having carried it out manually, release the cams (1-1') so that in any case such cams, due to the action of the springs associated thereto, tend to swivel outwards so as to press against the walls (3) of the crevice (4), as shown in Figure 4.

[0017] In addition to this binding effect of the anchor, as it is conventionally carried out, there is a transverse movement of the cams (1, 1'), Figure 5, as a result of the fact that in the swiveling movement thereof, there is a parallel translational movement due to the shafts (10) moving closer together in their positioning on the elongated and oblique holes (11), forcing the pairs of cams (1, 1') to tend to open to a greater extent, or in other words, causing a greater pressure against the walls (3) of the crevice (4) and therefore increasing the binding

effect of the anchor in such crevice, especially when the rope is pulled due to the climber falling, which entails the downward movement of the support (5) and therefore the shafts (10) move closer together with the aforementioned effect.

Claims

1. A safety anchor for climbing, which being provided to achieve an optimal binding in a crevice (4) of a wall (3) or face which is being climbed, and being formed by means of two pairs of swiveling cams (1, 1') assembled on respective shafts (10) arranged in a support (5) to which the suspension rope of the climber is securable, and further having tighteners (7) associated to a manual pull rod (8) enabling the cams (1, 1') to be folded for their introduction in the corresponding crevice (4), is **characterized in that** the shafts (10) for swiveling the cams (1, 1') are arranged in respective elongated and oblique holes (11) provided for that purpose in the support (5) itself, the arrangement of which entails a movement for bringing such shafts (10) closer together when the support (5) to which the suspension rope of the climber is securable is pulled, it being provided that the shafts (10) for swiveling the cams (1, 1') moving closer together entails a transverse outward movement of such cams (1, 1') to increase the binding effect thereof on the crevice (4).

Patentansprüche

1. Ein Sicherheitsanker zum Bergsteigen, der dazu ausgelegt ist, eine optimale Verbindung in einem Spalt (4) einer Wand (3) oder Bergseite zu erreichen, die erklettert wird, und der mittels zwei Paar schwenkbarer Nocken (1, 1') gebildet wird, die auf entsprechenden Achsen (10) montiert sind, welche in einem Träger (5) angeordnet sind, an dem das Tragseil des Kletterers gesichert werden kann, und der weiterhin Spanner (7) besitzt, die mit einer manuellen Zugstange (8) verknüpft sind, welche es den Nocken (1, 1') ermöglicht, für deren Einführung in den entsprechenden Spalt (4) zusammengeklappt zu werden, **dadurch gekennzeichnet, dass** die Achsen (10) zur Schwenkung der Nocken (1, 1') in entsprechenden langen und schrägen Löchern (11) angeordnet sind, die zu diesem Zweck im Träger (5) selbst vorgesehen sind, wobei die Anordnung derselben eine Bewegung nach sich zieht, um derartige Achsen (10) näher aneinander zu bringen, wenn an dem Träger (5), an dem das Tragseil des Kletterers gesichert werden kann, gezogen wird, wobei vorgesehen ist, dass die Annäherungsbewegung der Achsen (10) zur Schwenkung der Nocken (1, 1') eine Querbewegung derartiger Nocken (1, 1') nach Au-

ßen nach sich zieht, um die Verbindungswirkung derselben mit dem Spalt (4) zu vergrößern.

Revendications

1. Un ancrage de sécurité pour l'escalade, qui est conçu pour obtenir une fixation optimale dans une crevasse (4) d'une paroi (3) ou d'une face que l'on est en train d'escalader, et qui est constitué de deux paires de cames pivotantes (1, 1') assemblées sur des axes respectifs (10) disposés dans un support (5) auquel la corde de suspension du grimpeur est à attacher, et possédant en outre des tendeurs (7) associés à une tige de traction manuelle (8) permettant aux cames (1, 1') d'être repliées pour leur introduction dans la crevasse correspondante (4), il est **caractérisé en ce que** les axes (10) pour faire pivoter les cames (1, 1') sont disposés dans des trous allongés et obliques respectifs (11) prévus à cet effet dans le support (5) lui-même, dont la disposition implique un mouvement pour rapprocher lesdits axes (10) l'un de l'autre lorsqu'on tire sur le support (5) auquel la corde de suspension du grimpeur est à attacher, étant prévu que les axes (10) pour faire pivoter les cames (1, 1') se rapprochant l'un de l'autre cela implique un mouvement transversal vers l'extérieur desdites cames (1, 1') afin d'accroître leur effet de fixation sur la crevasse (4).

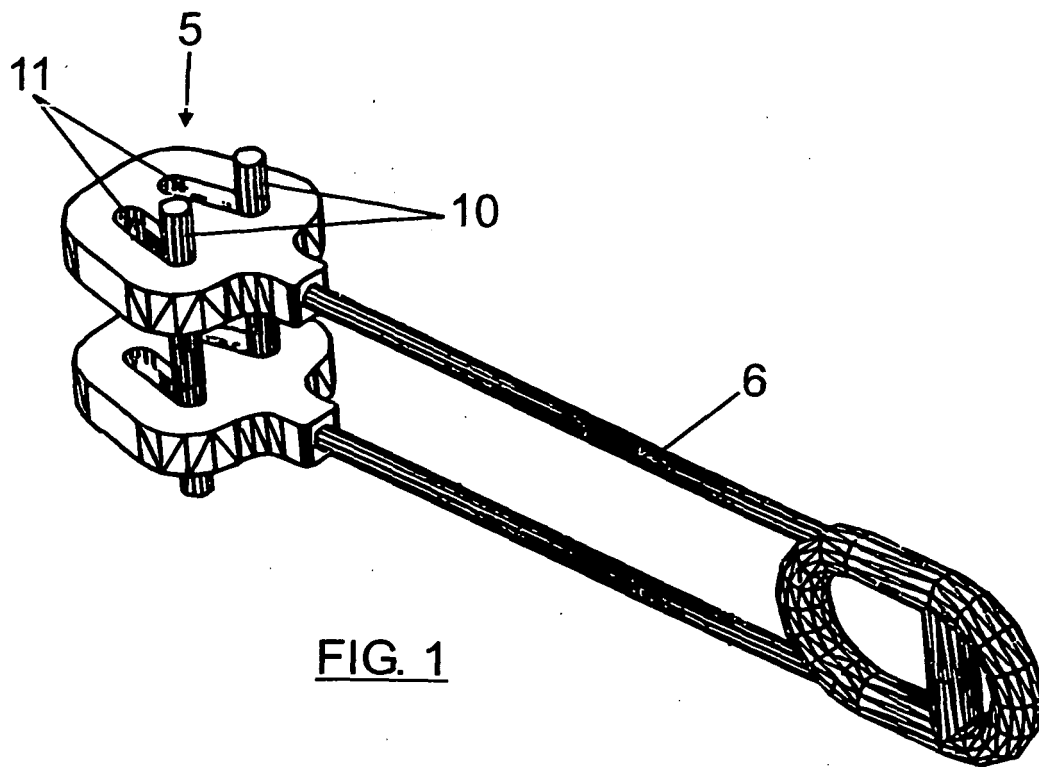


FIG. 1

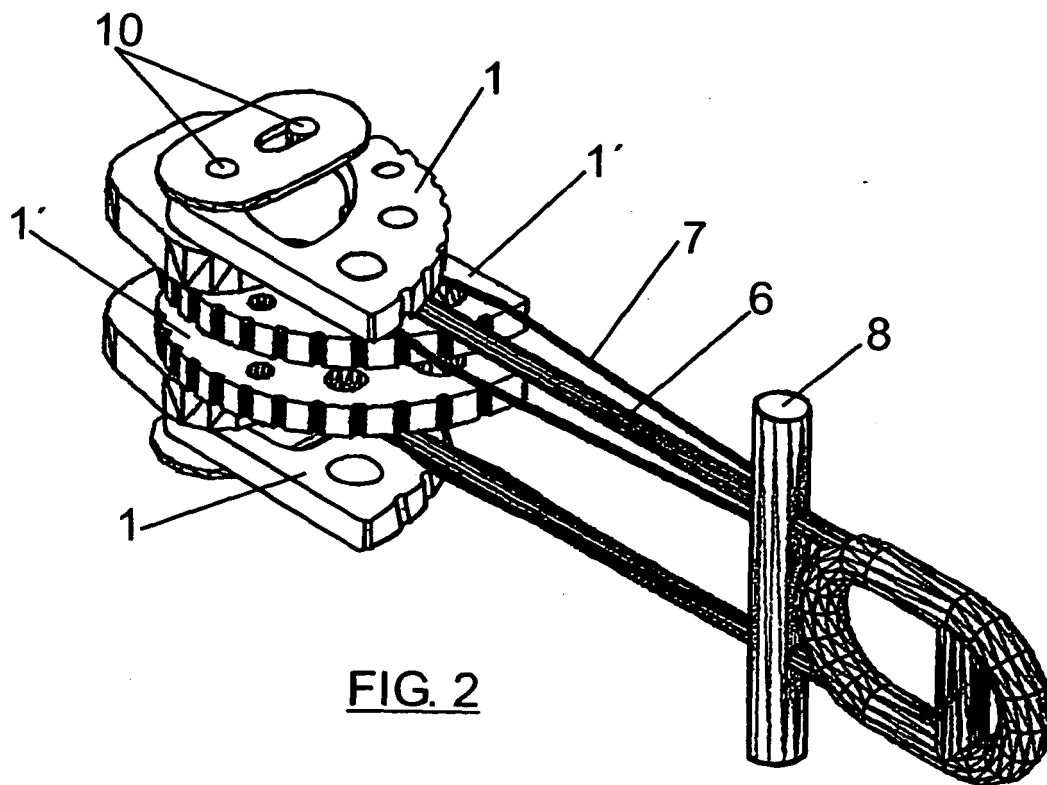


FIG. 2

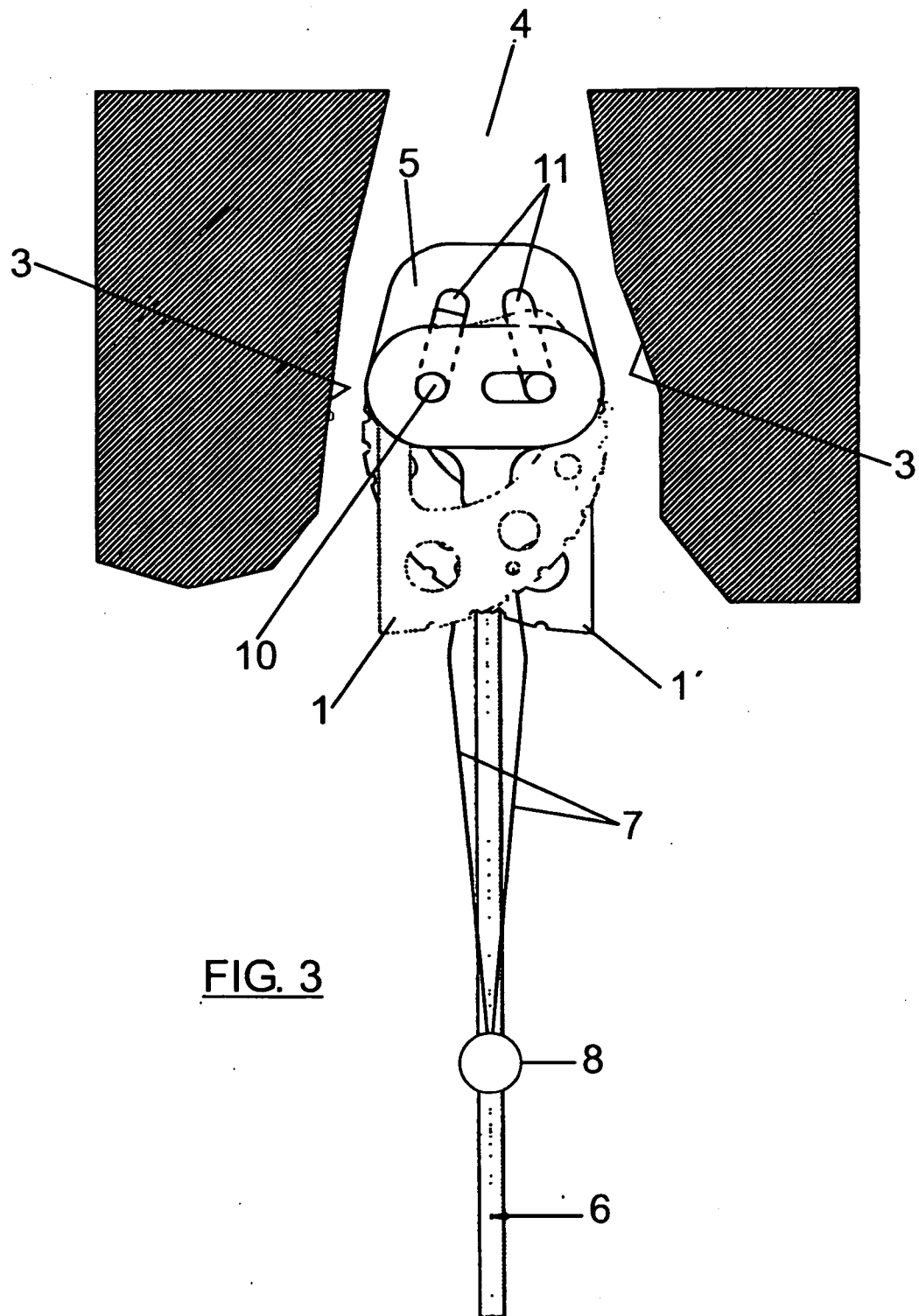
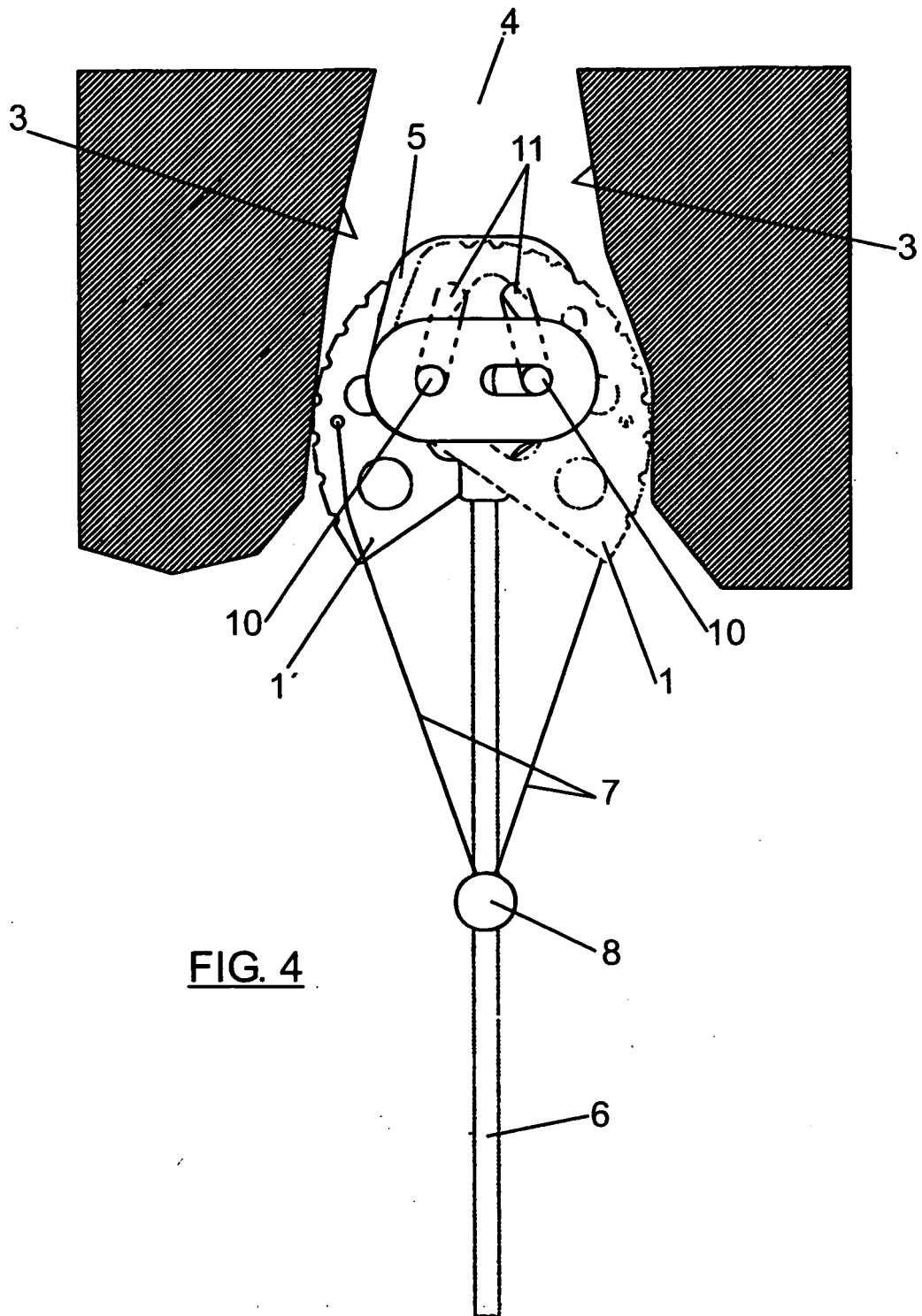


FIG. 3



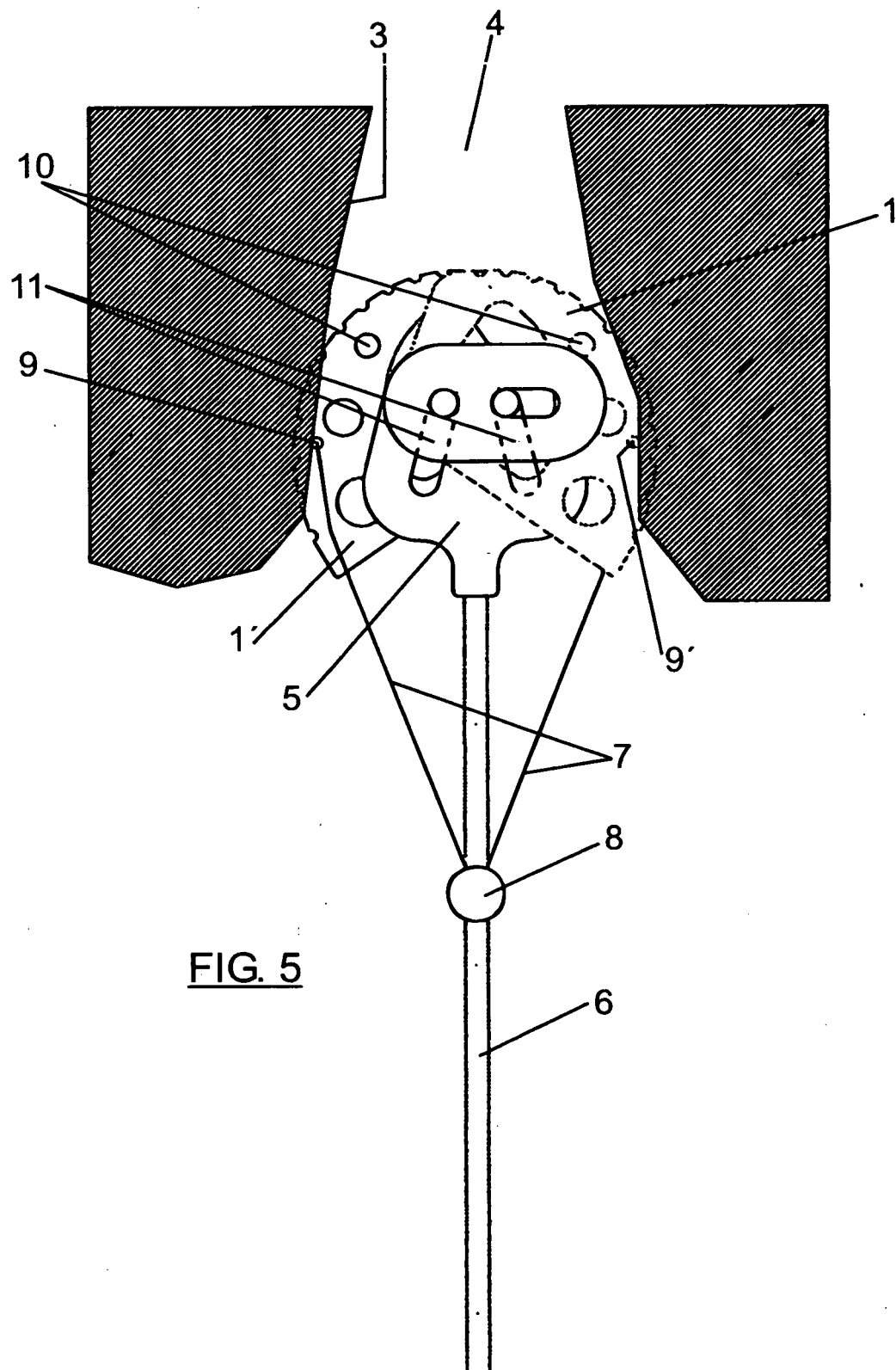


FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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