

EP-0, 046, 891 A2 (Fig. 7) discloses an abseiling device in which the rope slides around a slide cylinder firmly arranged on a base plate and a (sic) around a further slide body likewise firmly arranged on the base plate, the base plate being provided with an opening for securing the person to be lowered, and in which, on the further slide body, the rope runs along a flat braking surface, a control lever which is provided with an eccentric braking surface and, when taken along by the rope in the direction of running of the latter, is pressed against the braking surface on the slide body and thus brakes it, being arranged pivotably opposite the braking surface of the slide body on the base plate.

It is a disadvantage of this abseiling device that a spring (reference 66) is required in order to press the control lever at all times against the rope with a force such that - in particular when, as a result of fainting or the like, the person to be lowered releases the control lever - automatic braking is guaranteed even without the action of a person. This spring requires its functioning to be checked at regular intervals. A further disadvantage is that fine regulation of the speed of descent is possible only with difficulty, since it must be effected by pressure counter to this self-clamping force. This must be controlled with great accuracy by the user himself. Otherwise a very jerky descent is the result.

FR-A-2,472,395 discloses an abseiling device in which the rope likewise slides around a slide cylinder firmly arranged on a base plate and around a further slide body likewise firmly arranged on the base plate.

This slide body has a braking surface, by which it cooperates with a control lever which is swivellably arranged on the base plate and which likewise has a braking surface. The rope is guided - approximately along an angle at the circumference of 90° - over this braking surface of the control lever. On the control lever there is an eye for securing the person to be lowered or for attaching the abseiling device to a fixed point. The

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control lever is swivelled on the base plate by the weight of the person to be lowered (in both modes of use) such that its eccentrically extending braking surface presses the rope with sufficient force against the braking surface of the slide body. The speed of descent is regulated by the control lever 3 being pressed by a person counter to the direction in which it is turned by the rope running through the device.

A disadvantage of this device is that the entire weight of the person to be lowered (in both modes of use) stresses the pin about which the control lever is swivellably arranged on the base plate. If this location breaks, the person falls, because he hangs with his full weight on this connecting element.

In addition, fine regulation of the speed is not possible with the device according to FR-A-2,472,395, since the user must hold the control lever exactly in a certain position since, in the case of even a slight deviation, a very marked increase in the braking force in the self-clamping direction of the rope takes place. Thus, with this device too, there is the disadvantage that the speed can only be regulated jerkily.

GB-A-2,044,414 discloses an abseiling device which has a slide cylinder firmly arranged on the base plate and a further further (sic) slide body which is arranged so as to be moveable and at the same time acts as control lever. This slide body has two bosses, the one boss, in the case of rotation of the control lever as a result of being taken along by the rope, or the other boss, as a result of actuation of the control lever counter to the running direction of the rope, presses the latter against a braking pin (reference 54) and in the process brakes it. Although, in this abseiling device, the person to be lowered hangs on the base plate - which is not the case with the devices discussed above - it is nevertheless a disadvantage that the weight of the person to be lowered is required to ensure that the base plate and also the slide bodies assume the vertical position required for

functioning. Only when this weight comes into effect - and the weight of a small child is probably not sufficient for this purpose - is the desired self-locking in the case of complete release of the control lever in danger situations possible. Otherwise, the frictional force of the rope surrounding the rotatably articulated control lever is not sufficient to press it counter to the force of a flat coil spring (reference 64), which presses it in an opposite direction, into the self-locking position.

It is likewise a disadvantage of this device that the pin by means of which the control lever is arranged in articulated manner on the base plate has to absorb a very great force. This is a dangerous weak point, in particular when the device has been stored unused in an unclean environment for a long time. In addition, the device is difficult to handle since, without the action of the weight of the person to be lowered, a pull on the rope has the effect that the device rotates in a clockwise direction out of its operational position. It is therefore absolutely necessary for the speed of descent to be additionally controlled and secured by grasping the rope.

The object on which the invention is based is therefore to create an abseiling device in which, on the one hand, both the speed of descent can be finely controlled and, on the other hand, full braking occurs automatically when the control lever is released. At the same time, the device should be particularly simple and reliable in construction and adjustable, within certain limits, to a change in the diameter of the rope, such as that which occurs, for example, as the result of absorption of moisture or after stretching of the rope by heavy loading. Overall, this thus fulfils the requirement for greater operational reliability and simplicity.

An abseiling device by means of which this object is achieved is defined in Patent Claim 1.

By virtue of the configuration of the control lever with two bosses and its arrangement opposite the

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The abseiling device according to Fig. 1 has a housing 1, formed by a base plate 2 and edge portions 3. In Fig. 1, the housing is opened; the cover 4 is swung open. It can be swung over to the right in Fig. 1. Closure is effected by a knurled screw 5 being screwed tight in the thread 6 (see also Fig. 3).

At the top, the base plate 2 has a first opening 7 and, at the bottom a second opening 8 which are used in different types of abseiling. The edge portions 3 have a first opening 9, a second opening 10 and a third opening 11.

A fixed slide cylinder 12 is provided in the housing. A further, likewise fixed slide body 13 is arranged above the slide cylinder 12. It is approximately pear-shaped, has a lower convex surface region 14, and an upper and laterally arranged concave surface region 15.

A control lever 19 which can be operated by means of a handle 20 is arranged opposite the concave surface region 15 of the slide body 13. The control lever 19 can be swivelled about a pin 21 and, at its end facing the concave surface region 15, has two bosses 22 and 23. These bosses are formed by virtue of the fact that, at these points, the distance of the rounded surface of the end of the control lever 19 from the axis of the pin 21 is in each case greater than in the adjoining region. The arrangement is such that, when the control lever 19 is swivelled downwards or upwards, the boss 22 and the boss 23 respectively move towards the concave surface region 15 in such a way that the clearance between the respective boss and the concave surface region decreases. The two bosses 22 and 23 are arranged approximately opposite one another relative to the pin 21. This does not necessarily have to be strictly adhered to; the essential point is that between the two bosses there should be a surface region of the control lever 19, the distance of which from the axis of the pin 21 is noticeably smaller than that of the surfaces of the two bosses 22 and 23.

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According to Fig. 1, the rope 16 lies in the housing 1 in such a way that a "descent on the rope" takes place. This means, as illustrated in Fig. 5, that the upper end of the rope 16 is fixed at a fixed point. The person to be lowered hangs in an abseiling harness 17 which is secured in the opening 8 in the base plate 2 with the aid of a snap link 18. The rope runs through the opening 11 into the housing 1 from below. It is then guided over the slide body 13, initially over the concave surface region 15 and then - following a deflection of about 180° - around the convex surface region 14. The rope 16 then surrounds the cylindrical slide body 12 over an angle of approximately 270° ($3/4$ -circle) and runs upwards from there back out of the housing 1 through the opening 9.

During this process, the rope runs in two planes. As can be seen from Fig. 2, the floor of the base plate 2 is designed so as to slope in such a way that the course of the rope from the uppermost point A, at which it is guided round the slide body 13, to the point B, at which it runs round the bottom of the slide cylinder 12, shifts downwards by once the diameter of the rope, in a direction perpendicular to the plane of Fig. 1.

In the mode of operation which has been described and is in accordance with Figs. 1 and 5, two positions are now to be distinguished: in the first case, the person lowering himself releases the control lever 19. The weight of the person to be lowered, which is suspended at the opening 8 of the abseiling device by means of abseiling harness 17 and snap link 18, pulls said abseiling device downwards. This produces the tendency for the rope 16 to be pulled upwards out of the opening 9. The rope thus runs into the housing 1 from below through the opening 11 and is first of all moved between the boss 22 and the concave surface region 15 of the slide body 13. During this process, the boss 22 is taken along by frictional force and swivelled in the clockwise direction, with the result that the clearance between boss 22 and concave surface region 15 decreases. The control lever 19 automatically

device and also runs downwards out of the device again. At the same time, the rope can in principle run in either

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Patent Claims

1. Abseiling device, having a housing (1) which has a base plate (2) and a closable cover (4), having a first opening (7) in that end section of the base plate (2) which faces away from the weight hanging on the rope and/or having a second opening (8) in that end section of the base plate (2) which faces away from the fixing point of the rope (16) at a fixed point, having a slide cylinder (12) and a slide body (13), which elements are in each case firmly arranged on the base plate (2), extend between the base plate and the cover (4) and about which the rope (16) is in each case at least partially guided, having a swivelling axis (21), which extends between base plate (2) and cover (4), for a control lever (19) which protrudes laterally out of the housing (1) and, on its end section arranged opposite the slide body (13), has two bosses (22, 23) which are arranged in such a way opposite a concave surface region (15) of the slide body (13) that, when the rope (16) runs between the concave surface region (15) of the slide body (13) and that end section of the control lever (19) which is arranged opposite the latter, one of the two bosses (22, 23), in either direction of movement, is always taken along by virtue of frictional force in the direction of the concave surface region (15) in such a way that automatic braking occurs by virtue of the clamping of the rope (16).

2. Abseiling device according to Claim 1, characterized in that the two bosses (22, 23) are arranged approximately opposite to one another in relation to a pin (21) about which the control lever (19) can be swivelled.

3. Abseiling device according to Claim 1 or 2, characterized in that the slide body (13) furthermore has a convex surface region (14) which merges into the said concave surface region (15) in such a way that the rope (16) is deflected by approximately 180°.

4. Abseiling device according to Claim 3, characterized in that the slide body (13) is arranged in such a



way relative to the slide cylinder (12) that, when the rope (16) runs off at a tangent from the slide cylinder (12), it runs along a tangent towards the convex surface portion (14) of the slide body (13).



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Revendications

1. Dispositif pour la descente contrôlée le long d'une corde, avec un boîtier (1) présentant une plaque de base (2) et un couvercle (4) qui peut se fermer, avec une première ouverture (7) dans le segment terminal de la plaque de base opposé au poids suspendu à la corde et/ou une deuxième ouverture (8) dans le segment terminal de la plaque de base (2) opposé au point de fixation de la corde (16) à un point fixe, avec un cylindre de coulissement (12) et un corps de coulissement (13), ces éléments étant chacun montés fixes sur la plaque de base (2), en s'étendant entre la plaque de base et le couvercle (4) et autour desquels la corde (16) est guidée au moins partiellement, avec un axe de pivotement (21) s'étendant entre la plaque de base (2) et le couvercle (4) pour un levier de commande (19) sortant latéralement du boîtier (1) et présentant, sur son segment terminal disposé à l'opposé du corps de coulissement (13), deux cames (22, 23) qui sont disposées, face à une zone de surface concave (15) du corps de coulissement (13) de telle façon, que lors du passage de la corde (16) entre la zone de surface concave (15) du corps de coulissement (13) et le segment terminal du levier de commande (19) qui lui fait face, dans les deux sens de déplacement, une des deux cames (22, 23) est constamment entraînée par la force de frottement en direction de la zone de surface concave (15), de telle façon qu'il se produit un freinage automatique par serrage de la corde (16).

2. Dispositif pour la descente contrôlée le long d'une corde selon la revendication 1, caractérisé en ce que les deux cames (22, 23) sont disposées pratiquement face à face, par rapport à un pivot (21) autour duquel le levier de commande (19) est pivotable.

3. Dispositif pour la descente contrôlée le long d'une corde selon la revendication 1 ou 2, caractérisé en ce que le corps de coulissement (13) présente en outre une zone de surface convexe

(14), qui se poursuit en la zone de surface concave (15) mentionnée, de telle façon que la corde (16) est déviée d'environ 180°.

4. Dispositif pour la descente contrôlée le long d'une corde selon la revendication 3, caractérisé en ce que le corps de coulissement (13) est disposé par rapport au cylindre de coulissement (12) de façon que la corde (16), lorsqu'elle se déroule le long d'une tangente du cylindre de coulissement (12), monte le long d'une tangente sur la partie de surface convexe (14) du corps de coulissement (13).

Claims

1. Abseiling device, having a housing (1) which has a base plate (2) and a closable cover (4), having a first opening (7) in that end section of the base plate (2) which faces away from the weight hanging on the rope and/or having a second opening (8) in that end section of the base plate (2) which faces away from the fixing point of the rope (16) at a fixed point, having a slide cylinder (12) and a slide body (13), which elements are in each case firmly arranged on the base plate (2), extend between the base plate and the cover (4) and about which the rope (16) is in each case at least partially guided, having a swivelling axis (21), which extends between base plate (2) and cover (4), for a control lever (19) which protrudes laterally out of the housing (1) and, on its end section arranged opposite the slide body (13), has two bosses (22, 23) which are arranged in such a way opposite a concave surface region (15) of the slide body (13) that, when the rope (16) runs between the concave surface region (15) of the slide body (13) and that end section of the control lever (19) which is arranged opposite the latter, one of the two bosses (22, 23), in either direction of movement, is always taken along by virtue of friction in the direction of the concave surface region (15) in such a way that automatic braking occurs by virtue of the clamping of the rope (16).

2. Abseiling device according to Claim 1, characterized in that the two bosses (22, 23) are arranged approximately opposite to one another in relation to a pin (21) about which the control lever (19) can be swivelled.

3. Abseiling device according to Claim 1 or 2, characterized in that the slide body (13) furthermore has a convex surface region (14) which merges into the said concave surface region (15) in such a way that the rope (16) is deflected by approximately 180°.

4. Abseiling device according to Claim 3, characterized in that the slide body (13) is arranged in such a way relative to the slide cylinder (12) that, when the rope (16) runs off at a tangent from the slide cylinder (12), it runs along a tangent towards the convex surface portion (14) of the slide body (13).

