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54 **Device for lowering a load along a line.**

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Description

The invention relates to a device as defined in the preamble of Claim 1. Such a device is known from GB-A-2 065 838, particularly page 3, lines 35-59 and figure 7.

In this known device the force with which the brake shoe is pressed against the belt depends upon the weight of the load, such that with a heavier load a greater braking action is exerted. However, when the lever is not loaded by a load the brake shoe floats freely in the holder without contacting the belt so that, to prevent the load from falling freely during the first part of its travel an auxiliary brake mechanism must be used provided to act upon the belt when the device is not in use. The consequence is that, when a person wants to use this known device to escape he first has to fasten himself to the device and, when hanging suspended on it, must then remember to activate the auxiliary brake lever to free the belt and to activate the device. It is clear that this is a great drawback; unconscious person cannot be brought into safety with this known device — the auxiliary brake must be kept in the inactive state during the entire descent — and even conscious persons, are likely to forget to activate this brake lever in moments of panic or to release it during the descent so that the latter is halted. The device is totally unsuitable for children who will not understand how the device is to be operated.

The invention aims to provide an escape device which always operates surely and reliably, has a simple structure and can be used without executing movements or actions other than to fasten the load to the device.

According to the invention this aim is achieved by providing features in accordance with the characterising portion of Claim 1. By this spring tension the brake shoe is always in contact with the belt, resulting in a certain initial braking when the load is applied. After the load has been released the braking force will quickly build up to a value which depends upon the weight of the load resulting in a safe and sure descent at a controlled speed. There is no physical force or action necessary to initiate the lowering and the use of the device does not, contrary to the known device, necessitate any insight into the way in which it operates; unconscious people can be brought into safety without any danger.

Preferably the device is constructed according to Claim 2.

Other preferred embodiments are described in the Claims 3—7.

The invention is explained with reference to the drawing.

Fig. 1 is a front view of one half of the housing of a device according to the invention with the parts fitted therein, and thus with the front wall removed.

Fig. 2 is a cross-section of the complete device.

The device illustrated in the figure, which is intended in particular as an easily transportable escape device, comprises a housing indicated in

its entirety by reference numeral 1, and constructed from the halves 2 and 3, which connect with each other and each have a flat bottom 2a and 3a respectively, sides perpendicular thereto — of which only the sides 2b, 2c are shown — and which are connected together, and narrow ends 2d and 3d respectively. The latter have protuberances 4 and 5 respectively, containing sealing elements 6 between which the belt — to be described in greater detail — is guided. The two halves of the housing are fixed in relation to one another by means of dowels 7 and suitable fastening points 8.

The housing contains two levers 9a, 9b, each mounted to rotate about a journal 10a, 10b, fixed to housing half 2. Each of the levers 9a, 9b is hinged at 11a and 11b respectively to a flange 12a and 12b respectively of a brake shoe 13a and 13b respectively. Since the points of rotation 10a and 10b are eccentric in relation to the points of rotation 11a and 11b, when downward forces are exerted on the other ends of the levers 9a, 9b (as shown in the drawing), the brake shoes will be pressed towards each other.

These forces are exerted by means of pull rods 14a, 14b, which are fixed by their bottom end 15a, 15b to the closing plate 16 which carries the grip 17. The top end 18c and 18b, which is provided with screwthread, is screwed into the bottom end of a draw piece 19a, 19b, which is attached via a hinge pin 20a, 20b to the outside end of the lever 9a, 9b. A compression spring 21a, 21b is fitted between a stop 22a, 22b fixed on the bottom 2a and the closing plate 16.

The pull belt 23 running between the brake blocks 13a, 13b projects with its free end 24 from the housing and has an eye 25, the belt is wound up on the reel 26, whose axis of rotation 27 is mounted in housing half 2 and is located in a replaceable cassette 28. Suitable belt conducting edges 29 are located between the brake shoes 13a, 13b and the cassette 28.

The device operates as follows:

By means of a springs 21a, 21b, even in the rest position a certain force is exerted on the belt 23 by the brake shoes 13a, 13b. When the device is in use, either the belt end 25 or the grip 17 is fixed; if the former is the case, the load — i.e. the person who wishes to reach safety — hangs on the grip 17, and in the latter case the load hangs on the belt end 25. During the descent the weight is distributed uniformly over the two pull rods 14a, 14b, which transfer the force exerted to the outside ends of the levers 9a, 9b, as a result of which the points of rotation 11a, 11b exert a pressure force on the belt 23 which is in proportion to the weight of the load. In consequence, the load will move downwards at virtually constant speed along the belt 23 within wide limits irrespective of the weight of the load.

Of course, it is also possible to have an embodiment in which the belt is not accommodated in the housing in the wound up state, but is hanging down in an unrolled state. In that case, a suitable recess is provided in the closing plate 16.

Other modifications are also possible. The brake action exerted is, of course, dependent on the ratio

of the distances between the points of rotation 10a and 10b, on the other hand, and the points of rotation 11a and 11b, and 20a and 20b, respectively on the other hand. By making this ratio adjustable, which is possible, for example, by making the points 20a and 20b movable — for instance by a suitable slotted hole construction — the retardation achieved can be adjusted.

Claims

1. A device for lowering a load along a line, comprising a line in the form of a flat belt (23), a holder (1), at least one retarding element (12a, 12b), acting on the belt with a force dependent on the weight of the load and directed towards the belt, the retarding element being activated by the weight of the load and further comprising a lever (9a, 9b) with a first end defining a first point of application (11a, 11b) of force on the retarding element, a second end defining a second point of application (20a, 20b) of the weight of the load and a pivot point (10a, 10b) eccentric to each of said points of application characterized in that the retarding element is in the form of a brake shoe (13a, 13b) and that the second end of the lever is acted upon by spring tension for pre-tensioning the brake shoe.

2. Device according to claim 1, characterized by two each of said levers and shoes (9a, 9b, 13a, 13b) one of each located on either side of the belt (23), each brake shoe hinged (11a, 11b) to the end of a respective lever (9a, 9b) whose pivot point (10a, 10b) is located in the holder (1) and whose other end (20a, 20b) is linked to a first end of a respective pull rod (14a, 14b) which runs essentially parallel to the contact surface of the brake shoes (13a, 13b) and is acted upon by a spring (21a, 21b) also acting on the holder, while the respective other ends (15a, 16b) of the pull rods (14a, 14b) are linked to an external point of application (17) of the weight of the load.

3. Device according to claim 2, characterised by a belt reel (26) fitted between the two pull rods (14a, 14b) and located on the holder (1)

4. Device according to claim 3, characterised in that the reel is provided in a detachable cassette.

5. Device according to claims 3-4, characterised by two belt guides (29) provided on either side of the brake shoe surface between the brake shoes and the belt reel.

6. Device according to claims 3-5, characterised in that the springs (21a, 21b) are formed by compression springs fitted around the pull rods (14a, 14b) acting between a stop connected to a pull rod (22a, 22b) and a stop on the holder.

7. Device according to claims 2 to 6, characterised in that the holder (1) is formed by a housing which is made up of two halves (2, 3), each with a flat wall part (2a, 3a) and side walls (2b, 2c, 3b, 3c), perpendicular thereto and connected with each other, and the pull rods are connected to a closing plate (16) closing off the narrow bottom side thereof and carrying a grip (17).

Patentansprüche

1. Vorrichtung zum Absenken einer Last entlang einer Leine;

5 mit einer Leine in Form eines flachen Riemens (23) und einer Halterung (1);

10 Mit mindestens einem Rückhalteelement (12a, 12b), das auf den Riemen mit einer Kraft einwirkt, die von dem Gewicht der Last abhängt und auf den Riemen gerichtet ist;

wobei das Rückhalteelement durch das Gewicht der Last aktiviert wird; und

15 mit einem Hebel (9a, 9b), dessen erstes Ende einen ersten Angriffspunkt (11a, 11b) für die Kraft des Rückhalteelementes bildet, dessen zweites Ende einen zweiten Angriffspunkt (20a, 20b) für das Gewicht der Last bildet, und der einen Schwenkpunkt (10a, 10b) exzentrisch zu jedem der Angriffspunkte aufweist; dadurch gekennzeichnet, daß das Rückhalteelement in der Form eines Bremsschuhs (13a, 13b) ausgebildet ist und daß auf das zweite Ende des Hebels eine Feder-
20 spannung zum Vorspannen des Bremsschuhs einwirkt.

25 2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß zwei solcher Hebel und Schuhe (9a, 9b, 13a, 13b) vorgesehen und zu beiden Seiten des Riemens (23) angeordnet sind;

30 daß jeder der Bremsschuhe an dem Ende des entsprechenden Hebels (9a, 9b) angelenkt (11a, 11b) ist, dessen Schwenkpunkt (10a, 10b) auf der Halterung (1) liegt, und dessen anderes Ende (20a, 20b) mit einem ersten Ende einer entsprechenden Zugstange (14a, 14b) verbunden ist, die sich etwa parallel zu der Kontaktfläche der Bremsschuhe (13a, 13b) erstreckt und auf die eine gleichzeitig als Halterung wirkende Feder (21a, 21b) einwirkt; und

40 daß die entsprechenden anderen Enden (15a, 15b) der Zugstangen (14a, 14b) mit einem externen Angriffspunkt (17) des Gewichtes der Last verbunden sind.

45 3. Vorrichtung nach Anspruch 2, gekennzeichnet durch eine Riementrommel (26), die zwischen beiden Zugstangen (14a, 14b) auf der Halterung (1) angeordnet ist.

50 4. Vorrichtung nach Anspruch 3, dadurch gekennzeichnet, daß die Riementrommel in einer herausnehmbaren Kassette angeordnet ist.

55 5. Vorrichtung nach den Ansprüchen 3-4, gekennzeichnet durch zwei Riemenführungen (29), die zu beiden Seiten der Bremsschuhfläche zwischen den Bremsschuhen und der Riementrommel angeordnet sind.

60 6. Vorrichtung nach den Ansprüchen 3-5, dadurch gekennzeichnet, daß die Federn (21a, 21b) als Druckfedern ausgebildet und auf den Zugstangen (14a, 14b) angeordnet sind, und daß die Federn jeweils zwischen einem Anschlag an der Zugstange (22a, 22b) und einem Anschlag an der Halterung angreifen.

65 7. Vorrichtung nach den Ansprüchen 2-6, dadurch gekennzeichnet, daß die Halterung (1) durch ein Gehäuse gebildet wird, das aus zwei

Hälften (2, 3) besteht, die je einen flachen Wandabschnitt (2a, 3a) und Seitenwände (2b, 2c, 3b, 3c) aufweisen, die rechtwinklig miteinander verbunden sind; und daß die Zugstangen mit einer Abschlußplatte (16) verbunden sind, die die schmale Bodenseite des Gehäuses verschließt und einen Tragegriff (17) trägt.

Revendications

1. Dispositif pour descendre une charge le long d'un cordage, comprenant un cordage en forme de courroie plate (23), un boîtier (1), au moins un élément ralentisseur (12a, 12b) agissant sur la courroie avec une force dépendant du poids de la charge et dirigé vers la courroie, l'élément ralentisseur étant actionné par le poids de la charge et de plus, comprenant un levier (9a, 9b) avec une première extrémité définissant le premier point (11a, 11b) d'application de force sur l'élément ralentisseur, une deuxième extrémité définissant un second point (20a, 20b) d'application du poids de la charge et un point de rotation excentré (10a, 10b) par rapport à chacun desdits points d'application, caractérisé en ce que l'élément ralentisseur est en forme de sabot de frein (13a, 13b) et que la seconde extrémité du levier est soumise par une tension de ressort pour pré-tendre le sabot de frein.

2. Dispositif selon la revendication 1, caractérisé à la fois par deux desdits leviers et sabots (9a, 9b, 13a, 13b), chacun étant situé de chaque côté de la courroie (23), chaque sabot de frein étant articulé (11a, 11b) sur l'extrémité du levier correspondant (9a, 9b) dont le point de rotation (10a, 10b) est situé dans le boîtier (1) et dont l'autre

extrémité (20a, 20b) est reliée à la première extrémité d'une tige de traction correspondante (14a, 14b) qui est essentiellement parallèle à la surface de contact des sabots de frein (13a, 13b) et est soumise à l'action d'un ressort (21a, 21b) agissant aussi sur le boîtier, tandis que les autres extrémités respectives (15a, 15b) des tiges de traction (14a, 14b) sont reliées à un point externe d'application (17) du poids de la charge.

3. Dispositif selon la revendication 2, caractérisé par une bobine de courroie (26) adaptée entre les deux tiges de traction (14a, 14b) et logée dans le boîtier (1).

4. Dispositif selon la revendication 3, caractérisé en ce que la bobine est montée dans une cassette détachable.

5. Dispositif selon les revendications 3 à 4, caractérisé par deux guides de courroie (29) prévus de chaque côté de la surface des sabots de frein entre les sabots de frein et la bobine de courroie.

6. Dispositif selon les revendications 3 à 5, caractérisé en ce que les ressorts (21a, 21b) sont des ressorts travaillant en compression sur les tiges de tension (14a, 14b) agissant entre une butée (22a, 22b) fixée à la tige de tension et une butée sur le boîtier.

7. Dispositif selon les revendications 2 à 6, caractérisé en ce que le boîtier (1) est formé par un logement qui est constitué de deux moitiés (2, 3), chacune ayant une partie de paroi plate (2a, 3a) et des parois latérales (2b, 2c, 3b, 3c), perpendiculaires à celle-ci et reliées les unes aux autres, et les tiges de traction sont reliées à une plaque de fermeture (16), fermant le côté étroit du bas et portant une poignée (17).

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