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(54) Apparatus for supporting a leg of an animal

(57) The invention relates to an apparatus (1) for supporting a leg (P) of an animal, for instance for the purpose of inspection or treatment. The apparatus comprises a supporting element (2) and a winch (5) for hoisting he respective leg (P) onto the supporting element (2). The winch (5) comprises a rotatable spool (8) with a drive element (12) for winding and unwinding an elongated element (6) that can be fastened around the leg. The winch further comprises blocking means for blocking the unwinding of the spool, releasing means for eliminating this blocking action and immobilizing means for immobilizing the drive element in at least the unwinding direction for as long as the blocking action of the blocking means (10) is deactivated.

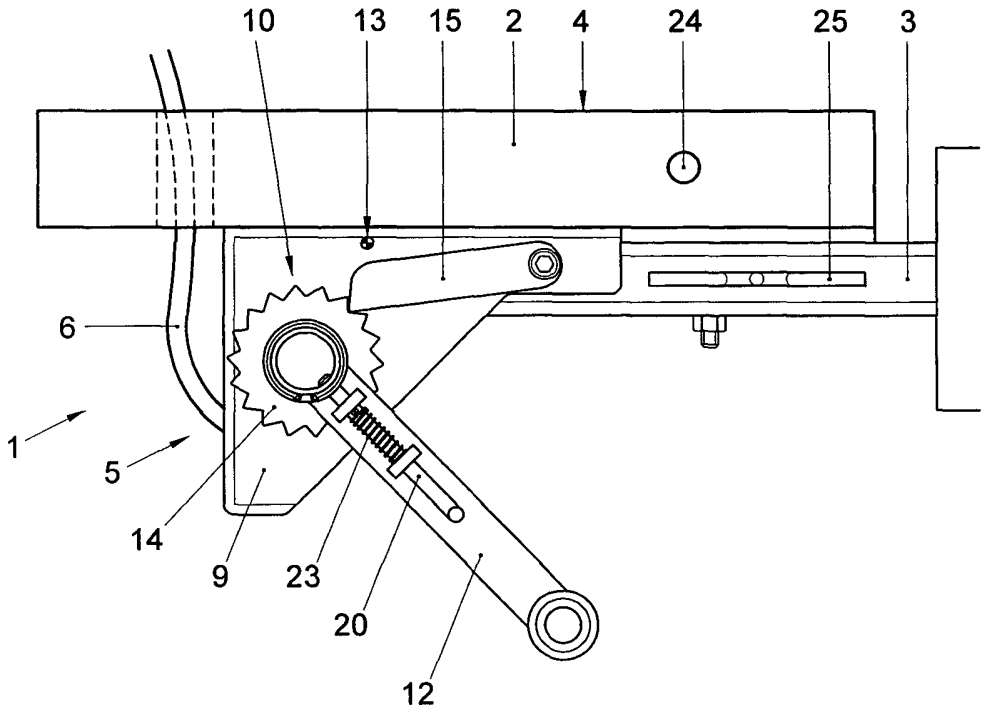

Fig. 2

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Description

[0001] The invention relates to an apparatus for supporting a leg of an animal, in particular a foreleg of a four-legged animal, in order to, for instance, inspect and/or treat a claw or hoof of the animal.

[0002] Such an apparatus is known from practice and usually comprises a supporting element on which the respective leg can be fixed in a suitable position, and a winch with which the leg can be hoisted onto the supporting element. To this end, the winch is provided with a spool and a cord that can be fastened by one end around the leg of the animal and then, with the aid of a crank or like drive element, can be wound onto the spool. Further, blocking means can be provided for blocking the unwinding of the spool so that during winding, the cord cannot be unwound through resisting movements of the animal. Also, releasing means can be provided, with which the blocking action of the blocking means can be at least temporarily eliminated, in order to give the user the opportunity to, for instance, unwind the cord to a sufficient extent for it to be fastened around the leg, or in order to, afterwards, lower the leg from the supporting element. In particular in the latter case, dangerous situations may arise through unexpected jerking movements to the cord by the animal, so that the spool and the drive element are suddenly accelerated and can inflict injuries or damage to a person or object present in the path of movement of the drive element. Due thereto, also, damage may be done to the apparatus itself, in particular to the drive element.

[0003] The invention contemplates providing an apparatus of the type described hereinabove, wherein said drawback of the known apparatus is obviated, while maintaining the advantages thereof. To that end, an apparatus according to the invention is characterized in that immobilizing means are provided, allowing immobilization of the drive element at least in an unwinding direction, for as long as the blocking action of the blocking means is deactivated. In this manner, during unwinding, the drive element can maintain a substantially fixed position, irrespective of any jerking forces applied on the spool via the cord to be unwound. Thus, the safety of the apparatus is considerably increased.

[0004] The immobilizing means can be continuously activated, for instance through the use of a freewheel mechanism or ratchet mechanism connecting the drive element to the spool in a manner secured against rotation in winding direction, but allowing free rotation in unwinding direction. However, the immobilizing means can also be only temporarily activated, in particular when the blocking means are deactivated.

[0005] This activating of the immobilizing means is preferably done "automatically", for instance by designing the releasing means such that, when the blocking means are deactivated, they instantaneously activate the immobilizing means. Alternatively, the releasing means and optional operating means of the immobilizing means may be designed such that the releasing means can be operated only after the immobilizing means have been activated. Thus, the immobilizing means will always be activated at the right time, and they cannot be inadvertently forgotten so that a particularly safe, foolproof apparatus is obtained.

[0006] Immobilizing the drive element can be effected in different manners. For instance, the drive element can be physically blocked or held, for instance by a blocking element that can be temporarily provided in the path of movement of the drive element, thus preventing rotation of the drive element in unwinding direction. If desired, a freewheel mechanism can be provided between the spool and the drive element, in order not to hinder the unwinding of the spool.

[0007] In an alternative embodiment, the drive element can be immobilized by uncoupling this element from the spool, at least temporarily, so that a movement of the spool, in particular a rotation in unwinding direction is not transmitted to the drive element. To that end, the drive element can for instance be uncoupled from the spool, or a connection secured against rotation between the two can be eliminated so that the spool and the drive element can rotate freely relative to each other. Alternatively, the drive element can be connected to the spool via a freewheel mechanism which, in the winding direction, connects the drive element to the spool in a manner secured against rotation and, in the unwinding direction, allows free rotation. As a result, the drive element is permanently immobilized in unwinding direction, which leads to a very safe apparatus.

[0008] The blocking means too can be designed in different manners. They can for instance directly engage the elongated element, so as to prevent it from unwinding, or indirectly engage the spool so as to prevent rotation in unwinding direction. In this latter case, use may be made of a freewheel mechanism or ratchet mechanism allowing rotation of the spool in winding direction but blocking it in unwinding direction. Such a ratchet mechanism can have a relatively simple and robust construction and can absorb great forces, whereby such a mechanism is highly suitable for use in an apparatus according to the invention.

[0009] In a particularly advantageous embodiment, the blocking means and the drive element can be connected to the spool via a common coupling part, while this coupling part can be connected to the spool, at wish, in a manner secured against rotation or in a rotatable manner, by means of the releasing means. As a result, the blocking means and the drive element can simultaneously be uncoupled from the spool, with one single operating movement of the releasing means, so that the blocking action of the blocking means is eliminated and the drive element is immobilized. Such an embodiment can therefore be operated in a simple and foolproof manner and can furthermore be constructed relatively simply with a minimum of parts.

[0010] The coupling part may be designed as a ring

which is arranged for free rotation around an end of the spool, and the releasing means can for instance comprise a displaceable coupling pin or key which, in a coupled position, can project through the coupling part and the spool in order to connect the two parts in a manner secured against rotation and which, for the purpose of a releasing position can be (manually) removed in order to have the two parts rotate freely relative to each other.

[0011] In an advantageous embodiment, biasing means can be provided for biasing the releasing means in one of the above-mentioned positions, preferably in the coupled position. In this position, it is standard that the spool be secured against unwinding and ready to be wound without further operations being required thereto, and thus, a very safe and easy to operate apparatus is obtained.

[0012] Further, locking means can be provided, with which the releasing means can be fixed in a releasing position, in which releasing position the drive element is immobilized and the spool can be unwound. As a result, a user needs not hold the releasing means in said releasing position by hand (against a biasing force) so that his hands remain free for, for instance, treating and guiding the leg.

[0013] In the further subclaims, further advantageous embodiments are described of an apparatus according to the invention, and an apparatus equipped therewith for treating a four-legged animal.

[0014] In clarification, hereinafter, an exemplary embodiment of an apparatus according to the invention and the use thereof will be further elucidated with reference to the drawing. In the drawing:

Fig. 1 shows, in perspective side view, a leg rest according to the invention, with a foreleg to be treated of an animal thereon;
Fig. 2 shows the leg rest according to Fig. 1, in side view;
Fig. 3 shows the leg rest according to Figs. 1 and 2, in bottom view, with a view on the winch; and
Fig. 4 shows, in cross-section, the winch according to Fig. 3.

[0015] The leg rest 1 shown in Figs. 1 - 4 comprises a substantially block-shaped supporting element 2 and a frame 3 with which the supporting element 2 can be connected to the fixed world W, this in a manner such that a side facing upwards of the supporting element 2 extends substantially horizontally and can thus serve as bearing face 4 for a leg P to be treated as shown in Fig. 1.

[0016] The supporting element 2 can for instance be designed as a block of wood, the side of which that serves as bearing face 4 preferably having a slight concave shape so that the leg P can be supported comfortably and the leg P can be better prevented from sliding from the bearing face.

[0017] The fixed world W can for instance be a box stall or, as is the case in the exemplary embodiment shown in Fig. 1, a cage-shaped construction in which the animal, during treatment, can be temporarily accommodated in order to limit its freedom of movement. If desired, such a construction can be designed to be wheeled. Herein, the term "fixed world" W is therefore to be interpreted broadly.

[0018] The leg rest 1 further comprises a winch 5 for winding and unwinding an elongated element such as a band or cord 6. In use, this cord 6 is fastened by one free end around the leg P to be treated, whereupon the leg P is hoisted with the winch onto the supporting element 2. If desired, the free cord end can be provided with suitable fastening means such as a loop, belt or hook (not shown) so that fastening around the leg P is simplified and/or the comfort for the animal is enhanced.

[0019] The winch 5 comprises a spool 8 (see Fig. 3) which is suspended for rotation in the frame 3 between two side pieces 9. The above-mentioned cord 6 is fastened by a first end to this spool 8 and run by the free end through the supporting element 2, via an opening 1 provided thereto, all this being arranged such that, due to rotation of the spool 8, this cord 6 is wound in a winding direction (counter-clockwise in Fig. 2), and is unwound in an unwinding direction. For rotating the spool 8, a drive element 12 is provided which, in the example shown, is designed as a manually operable crank which is detachably coupled to an end of the spool 8 in a manner to be described further. The spool 8 further comprises blocking means 10 which, in a blocking position, allow rotation of the spool 8 in the winding direction but block in the unwinding direction.

[0020] In the exemplary embodiment shown, the blocking means 10 comprise a ratchet mechanism, provided with a toothed wheel 14, which, in a manner to be described further, is fastened to the spool 8 and can, thus, rotate along with the spool 8, a pawl 15, connected for rotation to the frame 3 and engaging, by a free end, the toothing of the wheel 14, and a stroke limiting device 13 in the form of a pin 13, arranged in the path of rotation of the pawl 15 and, thus, limiting the angle of rotation of the pawl 15 so that it cannot be rotated beyond its range of operation by too abrupt an acceleration of the wheel 14.

[0021] In the exemplary embodiment shown, the drive element (crank) 12 and the blocking means (toothed wheel) 14 are fastened to the spool 8 so they can be uncoupled via releasing means, in particular a coupling ring 18, which has been slid for rotation around a free end 17 of the spool 8 and can be coupled to this spool end 17 in a manner secured against rotation with the aid of a coupling pin 20, while the coupling pin 20 is run through opposing holes 21, 22, in the coupling ring 18 and the spool end 17, respectively.

[0022] In the exemplary embodiment shown, the coupling pin 20 is slideably connected to the crank 12 and is preferably biased in the above-mentioned coupled position, via biasing means 23, for instance a spiral spring as shown in Figs. 3 and 4. This coupled position can be eliminated by manually pulling the coupling pin 20 back

against the biasing force to an uncoupled position in which the pin 20 has been pulled from the holes 21, 22 in the direction of arrow A, in Fig. 4. If desired, a locking option may be provided (not shown) for securing the coupling pin 20 in the uncoupled position so that a user can keep his both hands free for guiding the leg P. In the uncoupled position, the connection secured against rotation between the spool 8 and coupling ring 18 will be eliminated. As a result, the spool 8 will be able to rotate freely relative to the coupling ring 18 and the drive element 12 and ratchet mechanism 10 connected thereto, while the blocking action of this ratchet mechanism 10 in unwinding direction will be eliminated.

[0023] The leg rest 1 can further comprise various fastening provisions, such as an opening 24 and/or a cleat (as shown in Fig. 2) for fastening further cords, tensioning means or the like with which the leg P can be fixed on the supporting element 2 in a position for treatment.

[0024] The above-described leg rest 1 can be used as follows. An animal to be treated is positioned adjacent the leg rest 1, whereupon the cord 6 is unwound to such an extent that it can be fastened around the leg P of the animal. To unwind the cord 6, the blocking means (the ratchet mechanism 10) are to be eliminated with the aid of the releasing means (coupling ring 10, coupling pin 20). To that end, the coupling pin 20 is pulled by hand in the direction of the arrow A, against the biasing force. As a result, also, the drive element (crank 12) is uncoupled, which is fixedly connected to the coupling ring 18. Hence, this crank 12 will not rotate along with the unwinding the cord 6 and the associated rotation of the spool 8. After the cord 6 has been unwound to a sufficient extent, the coupling pin 20 is let go of or unlocked, so that it is brought by the biasing means 23 in the coupled position in which the coupling ring 18, the ratchet mechanism 10 and the crank 12 are connected to the spool 8 in a manner secured against rotation. As a result, further unwinding of the cord 6 will be prevented by the ratchet mechanism 10, and a user has his hands free for fastening the cord 6 around the leg P of the animal. Then, the cord 6 can be wound by operating the crank 12, the leg P being pulled along by the cord 6 in the direction of the supporting element 2. The ratchet mechanism 10 prevents the cord 6 from being unwound due to any resisting forces of the animal. Thus, the cord 6 can be wound up until the leg P is located on the bearing face 4. Then, the leg P can be fixed in a desired position with further cords, tensioning means or the like that can be secured in the fastening means 24, 25. Thereupon, the leg P can be inspected and/or treated. Upon termination of the treatment, the blocking action of the ratchet mechanism 10 is eliminated in a manner described hereinabove, that is to say by pulling the coupling pin 20 by hand from the coupled position against the biasing force. As a result, also, the crank 12 will be uncoupled so that it will not rotate along with the spool 8. Instead thereof, the crank 12 is held in a position of rest by the pawl 15. In this manner, dangerous situations can be avoided as sudden jerks to the cord by the animal, and associated sudden rotation of the spool 8 cannot be transmitted to the crank 12.

[0025] The invention is not limited in any manner to the exemplary embodiments represented in the description and the drawing. All combinations of (parts of) embodiments described and/or shown are understood to fall within the inventive concept. Moreover, many variants thereon are possible within the framework of the invention as outlined by the claims.

[0026] For instance, the drive element and the blocking means can be coupled to the spool of the winch via separate coupling and/or releasing means, while the releasing means for uncoupling (eliminating) the blocking means can be operated or become accessible only after the drive element has been uncoupled. As a result of this too, the drive element is prevented from not being connected to the spool when this spool can unwind. Alternatively, the drive element can be fastened to the spool of the winch by means of a second ratchet mechanism, whereby, in a winding direction, the drive element is connected to the spool in a manner secured against rotation and can rotate freely in opposite direction relative to the spool. Further, the blocking means for blocking the unwinding of the cord can engage the cord itself instead of the spool. In this case too, the releasing means for removing these blocking means are designed such that engagement or operation thereof can be effected only after the drive element has been uncoupled from the spool.

[0027] These and many variations are understood to fall within the framework of the invention as set forth in the following claims.

Claims

1. An apparatus (1) for supporting a leg (P) of an animal, comprising a supporting element (2) and a winch (5) for hoisting the respective leg (P) on the supporting element (2), the winch comprising a rotatable spool (8) provided with a drive element (12) for winding and unwinding an elongated element (6), blocking means for blocking the unwinding of the elongated element (6) and releasing means for deactivating the blocking means (10) at least releasing the unwinding of the elongated element (6), **characterized in that** further, immobilizing means are provided for immobilizing, at least in an unwinding direction, the drive element (12) for as long as the blocking means (10) are deactivated.

2. An apparatus (1) according to claim 1, wherein the immobilizing means can be activated and deactivated.

3. An apparatus (1) according to claim 1 or 2, wherein the releasing means are designed such that through deactivation of the blocking means (10), the immo-

bilizing means are activated, so that the drive element (12) is immobilized.

4. An apparatus (1) according to any one of the preceding claims, wherein the immobilizing means are designed for connecting the drive element (12) to the spool (8), at wish, in a manner secured against rotation or in a freely rotatable manner.

5. An apparatus (1) according to any one of the preceding claims, wherein the immobilizing means comprise a freewheel mechanism or ratchet mechanism which connects the drive element (12) to the spool (8) in a manner secured against rotation in the winding direction, and allows rotation in the unwinding direction.

6. An apparatus (1) according to any one of the preceding claims, wherein the blocking means (10) comprise a ratchet mechanism, provided with a wheel (14) with a toothed circumference and a pawl (15) which is arranged for movement into and out of the path of movement of the toothed circumference.

7. An apparatus (1) according to claim 6, wherein, with the aid of the releasing means, the wheel (14) can, at wish, be connected to the spool (8) in a manner secured against rotation or in a freely rotatable manner.

8. An apparatus (1) according to any one of the preceding claims, wherein the blocking means (10) and the immobilizing means are connected via a common coupling part (18) to the spool (8), which coupling part (18) can be connected to the spool (8) by means of the releasing means, at wish in a manner secured against rotation or in a freely rotatable manner.

9. An apparatus (1) according to claim 8, wherein the coupling part comprises a coupling ring (8) which is provided around an end of the spool (8).

10. An apparatus (1) according to claim 8 or 9, wherein the releasing means comprise a coupling pin (20) which can be displaced between a coupled position in which the pin (20) extends into the coupling part (18) and the spool (8), and a releasing position in which the coupling part (18) can rotate freely relative to the spool (8).

11. An apparatus (1) according to any one of the preceding claims, wherein the releasing means (20) are biased in a coupled position, in which position the blocking means (10) are activated.

12. An apparatus (1) according to any one of the preceding claims, wherein locking means are provided for fixing the releasing means (20) in a releasing position, in which position the blocking means are deactivated.

13. An apparatus (1) according to any one of the preceding claims, wherein the elongated element (6) is provided with fastening means for fastening around a leg (P) to be supported.

14. An apparatus (1) for treatment of a four-legged animal, comprising a cage-shaped construction, designed for limiting the freedom of movement of an animal accommodated within this construction, wherein the apparatus comprises at least one supporting apparatus (1) according to any one of the preceding claims.

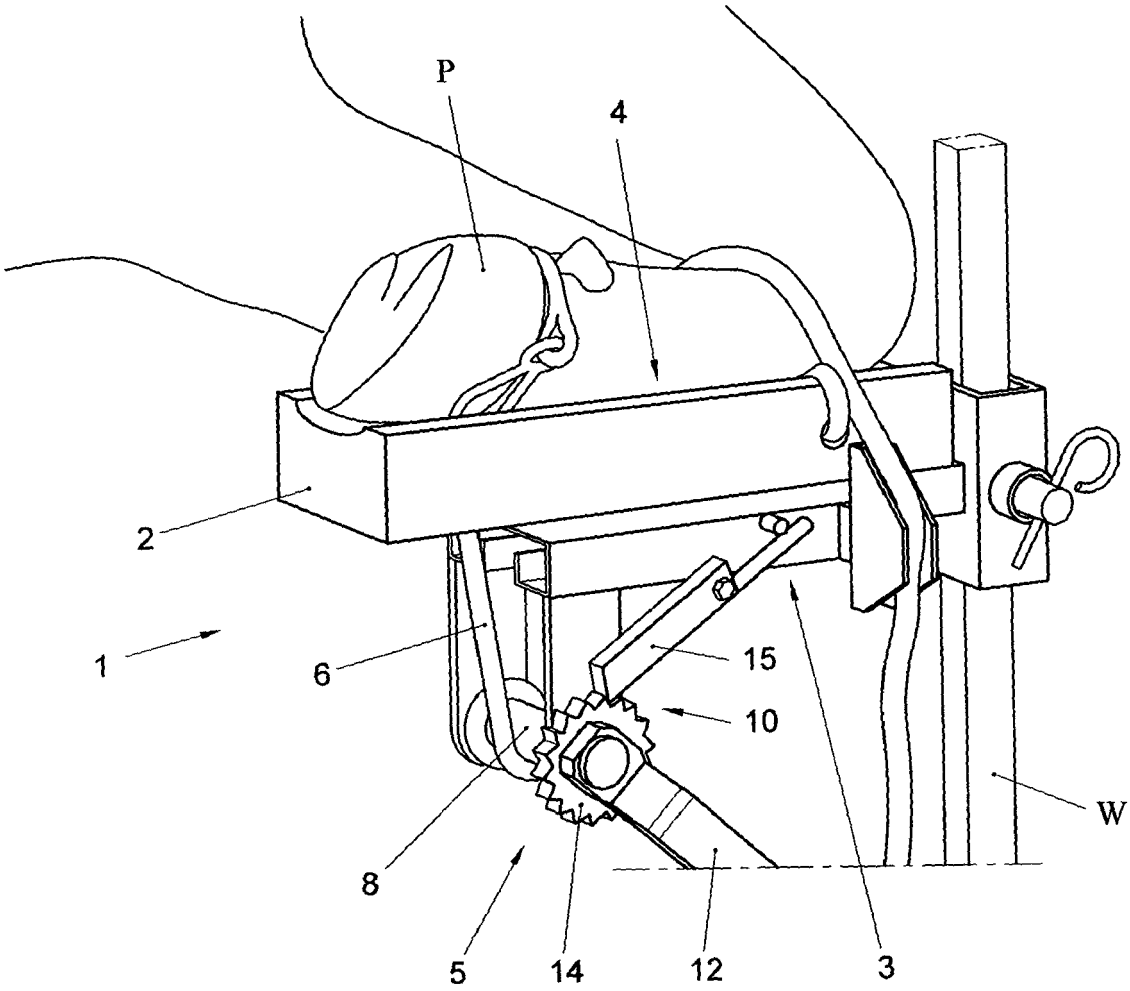

Fig. 1

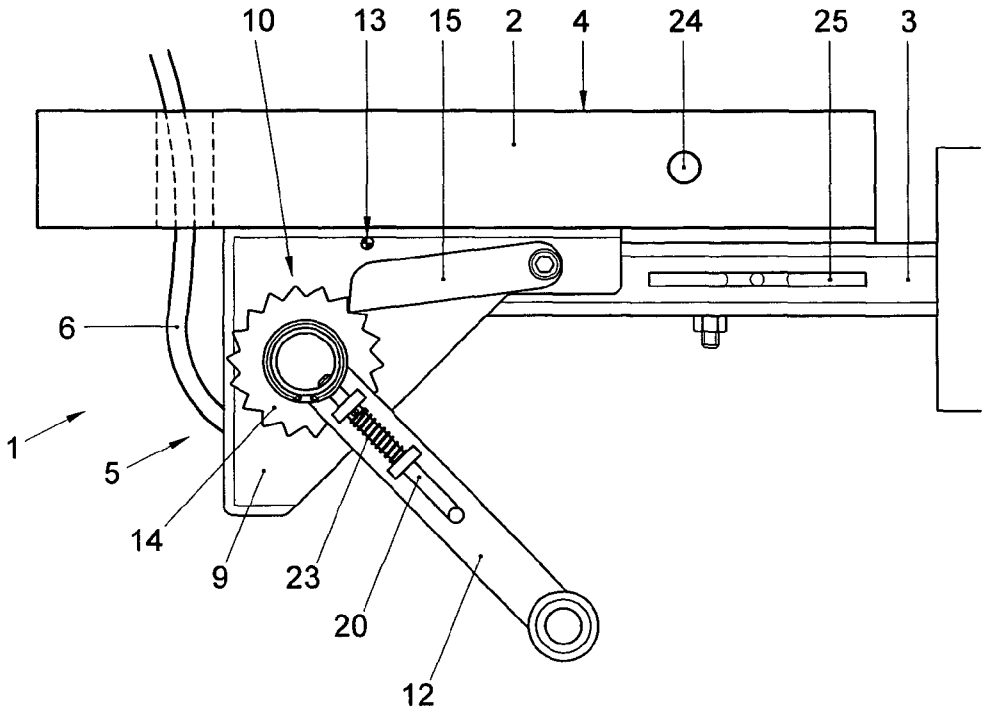

Fig. 2

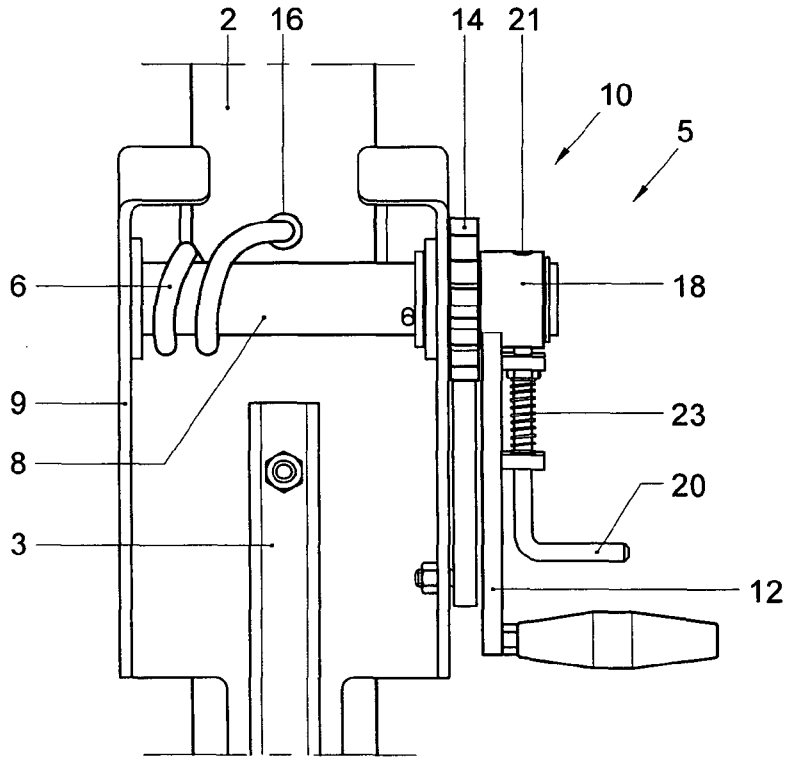

Fig. 3

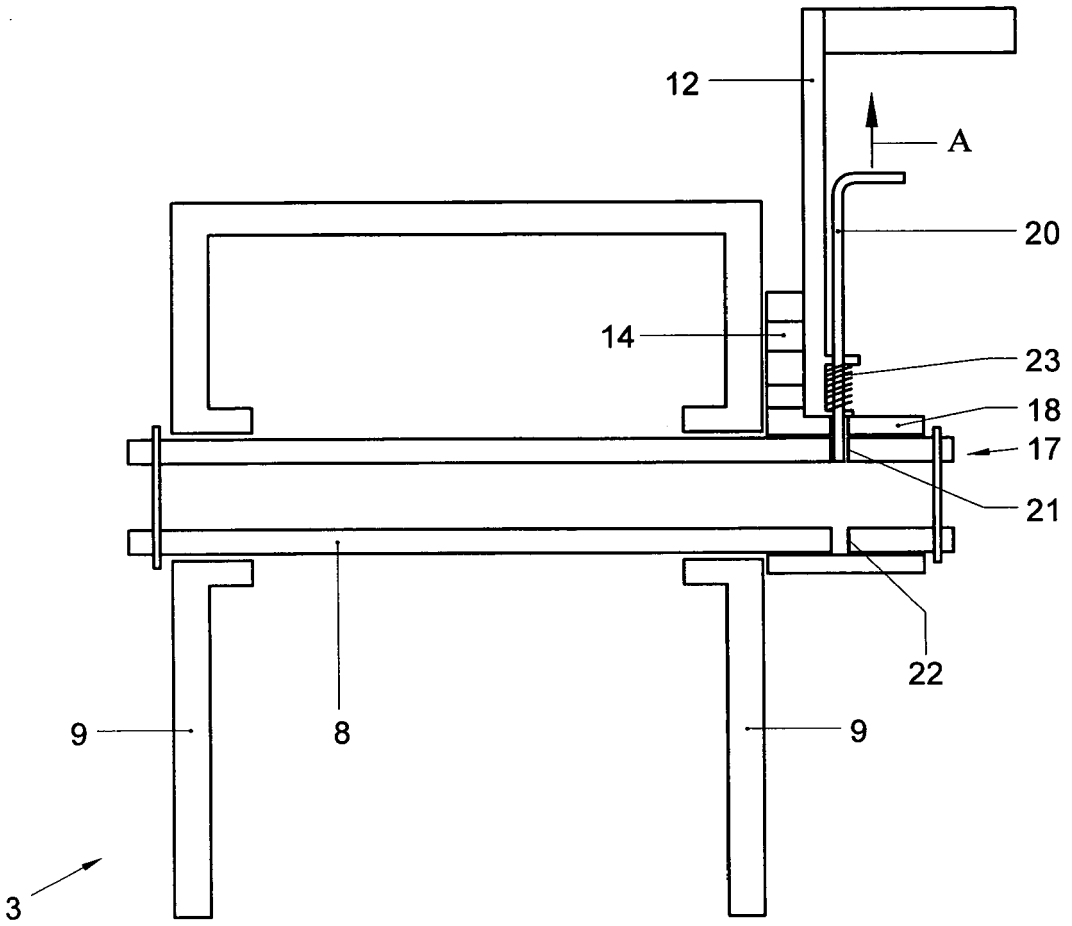

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 06 07 5910

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	FR 2 595 204 A (COLLOMB ANDRE) 11 September 1987 (1987-09-11) * page 4, line 17 - line 37 * * claims; figures *	1,2,4-6, 13,14	INV. A01L13/00 A01K15/00 B66D1/06
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TECHNICAL FIELDS SEARCHED (IPC)

A01K
A01L
A61D
B66D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	28 June 2006	von Arx, V.

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 07 5910

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28-06-2006

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