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(54) Apparatus for wearing stockings, socks, knee-high socks, orthopaedic stockings and the like

(57) Herein described is an apparatus for wearing stockings, socks, knee-high socks, orthopaedic stockings and the like, particularly useable by people with pathologic problems affecting the ankle, the knee, the hip, the vertebral column, more generally, with low mobility of the limbs or with limited possibility of reaching the tip of the feet, for whom the daily operation of wearing stockings is considerably complex. Such apparatus provides for the use of a collar (1), on which there is manually applied the stocking, such collar being mounted on means which allow wearing the aforementioned stocking on the limb of the person.

Such operation allows wearing the stocking on the limb of the person and may be unrolled completely automatically or manually.

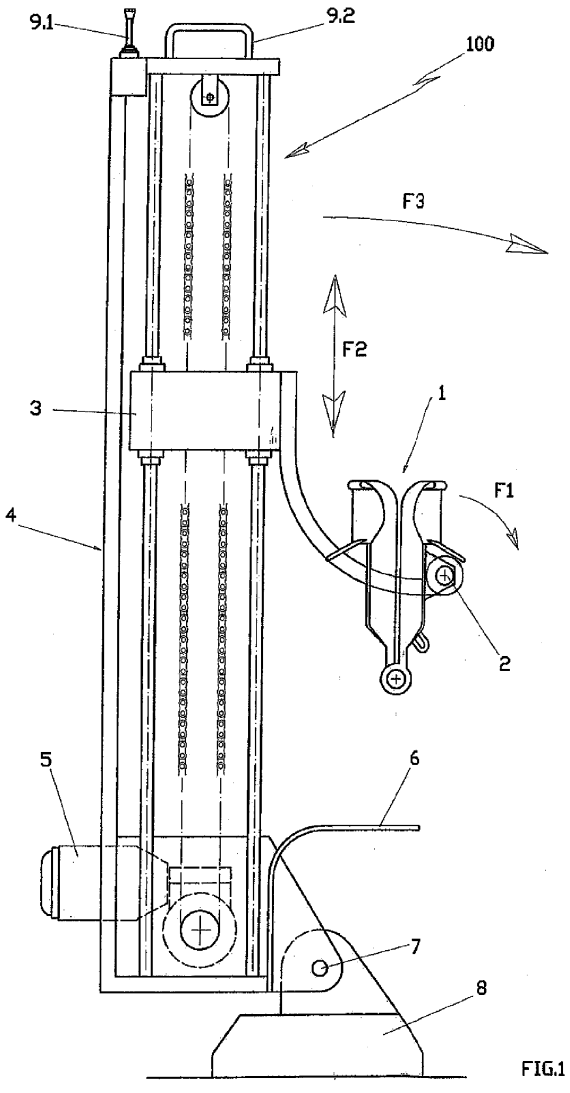

FIG.1

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Description

[0001] The present invention regards an apparatus for wearing and removing stockings, socks, knee-high socks, orthopaedic stockings and the like, according to the introducing part of claim 1.

[0002] As well known, as regards people with pathologic problems affecting the ankle, the knee, the hip, the vertebral column and, more generally, with low mobility on the limbs or with limited possibility of reaching the tip of the feet, the daily operation of wearing and removing the stockings is considerably complex.

[0003] In the current state of the art in the market there are available various devices used to facilitate the fitting of the foot into a stocking, just like there are numerous apparatuses which serve to help performing the operation of wearing the stocking unrolling it completely, starting from the foot and thus on the ankle and lastly along the calf.

[0004] The following patent documents US 2, 828, 057, US 3, 727, 812, US6, 234, 370, JP2011147737, JP 2004195108, WO2004/023944, WO 2010/044119, DE 10 2004 025 299, WO 95/14414, DE 198 03 503 and DE 20 2008 015999 are mentioned by way of example.

[0005] In particular there are mentioned two patent documents that describe two equipments available on the market: the first document WO 2009/153825 describes a device constituted by a semi-cylindrical-shaped body, on which there is fitted the stocking, provided, in the rear part thereof, with two vertical rods, possibly telescopic, that the user grasps to stretch the stocking on the limb; the second document WO 2011/051582 describes a device constituted by an articulated structure which confers the stocking a transverse extension which facilitates the fitting of the limb. Practically the aforementioned device and other similar ones reveal considerable drawbacks, such as considerable overall dimension and weight, or poor manoeuvrability, all these conditions limiting the use thereof to the sole cases of actual need.

[0006] An object of the present invention is to provide an apparatus for helping wearing a stocking that is free of the drawbacks revealed by the similar products of the known type.

[0007] Specifically, an object of the invention is to provide an apparatus that is small in size and weight, that is easy to manoeuvre and, above all, that operates entirely automatically.

[0008] This object is obtained by an apparatus which provides for the use of a collar, on which there is manually fitted the stocking, suitably rolled and which is applied on means suitable to allow fitting the aforementioned stocking on the limb of a person, said means possibly being made up of an electromechanical apparatus, for automatically moving the collar or a mechanical apparatus, for manually moving the aforementioned collar.

[0009] The characteristics of the invention will be described further in detail through the description of two possible embodiments, provided by way of non-limiting example, with reference to the attached drawings, wherein:

- fig. 1 represents an elevational view, in a first embodiment of the invention, with automatic movement, by means of an electromechanical apparatus;
- figs. 2-3-4-5 represent, respectively, three orthogonal views of the collar, as well as the collar completely open;
- figs. 6-7 represent the initial step of the operation, with the collar raised, provided with the stocking rolled;
- figs. 8-9 represent the step of lowering the collar, for the positioning thereof at the foot;
- figs. 10-11 represent the step of opening the collar, lowered and open to allow the fitting of the foot;
- fig. 12 represents the final step of the operation, with the raising of the collar to obtain the unrolling of the stocking on the limb;
- figs. 13-14 represent the respective initial and final steps of removing the stocking from the limb;
- figs. 15-16 represent the elevational views of the hand-operated second embodiment of the invention, respectively in the conditions with the collar closed and with the collar open;
- figs. 17-18-19 represent the steps of using the embodiment of the invention according to fig. 15;
- figs. 20-21-22 represent the steps of fitting the stocking in the collar.

[0010] As observable in fig. 1, the first embodiment of the apparatus according to the invention, indicated in its entirety with reference 100, comprises a collar, indicated in its entirety with reference 1, splined, idle and rotatable on the pin 2 (see arrow F_1), on a bracket 3, in turn applied on a column, indicated in its entirety with reference 4, provided with electromechanical means 5, adapted to confer to the collar 1 a reciprocal rectilinear automatic movement (see arrow F_2) and, at a lower position, with a bracket 6, which serves as a lower support of the aforementioned collar.

[0011] The column 4 is hinged, by means of the pin 7, on a base 8, which allows the inclination thereof (see arrow (F_3) and it is provided, at the upper part, with gripping and control members, such as a button 9.1 for the electrical control and a handle 9.2 for transporting the apparatus.

[0012] As observable in figs. 2-4, the collar 1 comprises a substantially cylindrical body 10, provided with a rounded upper edge 11, on which there is rolled the stocking K, said body being constituted by two opposite half-shells 12 and 13, mutually pivoted on the pin 14, arranged at the base of two extensions 15 and 16.

[0013] On one of the two extensions 15 there is welded, with perpendicular direction with respect to the axis of the collar, the projecting pin 2, which supports the entire collar and it is splined on the bracket 3 to allow the rotation of said collar (see the following description of the oper-

ating steps of the device according to the invention).

[0014] On the other extension 16 there is welded a projecting pin 17, parallel to the previous pin 2, provided with a wheel 18, which lies on the bracket 6 (also see the subsequent description).

[0015] Lastly, as observable in fig. 5, the collar 1 is also provided with an end stop mechanism 19 which holds the two half- shells 12 and 13 when they are in their maximum opening position.

[0016] Operatively, as observable in fig. 6, in a first step there occurs the manual fitting of the stocking "K" on the collar 1, which is, advantageously, positioned at the highest part of the column 4, for facilitating at most the operation by the user.

[0017] In particular, as observable in fig. 7 and, hereinafter, better specified through the description of figs. 20-21-22, the stocking "K" is applied on the collar 1, by fitting the tip "P" into the cavity, while the foot element "G" is rolled outside the two half-shells 12 and 13.

[0018] Then, as observable in figs. 8- 9, the user, operating on the button 9.1, activates the electromechanical means 5, which move the collar 1 (arrow F_2) downwards so as to move the wheel 18 to lie on the bracket 6, so as to cause the rotation of the collar 1 on the pin 2 (arrow F_1) ; this makes the apparatus 100, alongside the rotation of the column 4 on the pin 7 of the base 8 (arrow F_3) , assume a more a anthropomorphic configuration with respect to the foot.

[0019] Further on, as observable in fig. 10, a further minimum final sliding of the collar 1 downwards leads to the opening of the two half-shells 12 and 13 (see arrow F_4), this dilating the rolled part "G" and facilitating the fitting of the tip of the foot into the stocking (fig. 11).

[0020] Further on, as observable in fig. 12, the user, operating once again on the button 9.1, activates the electromechanical means 5 which move the collar 1 (arrow F_5) upwards, leading to removing the stocking "K", completely and automatically unrolling it, starting from the foot and thus on the ankle and lastly along the calf. Advantageously, during the latter step, the foot fitted into the stocking lies on the base 8, thus conferring total stability to the person.

[0021] At the end of the operation, when the stocking "K" is completely worn, it is totally removed from the collar 1, which is thus free, hence the two half-shells 12 and 13 (see fig, 3) rotate on the pin 14, opening completely, to allow the lateral extraction of the limb in an extremely comfortable manner.

[0022] Lastly, as observable in figs. 13 and 14, the apparatus 100 allows removing the stocking from the limb in an equally quick manner.

[0023] This is obtained by providing each of the two half-shells 12 and 13 with a rostrum, respectively 12.1 and 13.1 (see figs. 2-5), which has two functions.

[0024] As observable in fig. 7 a first function of the two rostra 12.1 and 13.1 is that of supporting the turned part "G" during the ascent of the collar, for wearing the stocking.

[0025] On the contrary, automatically removing the stocking from the limb simply requires hooking, on at least one of the two rostra 12.1 or 13.10, the upper collar "C" of the stretched stocking " K" (see fig. 13), so that, by sliding the collar 1 downwards, due to the aforementioned hooking the foot element "G" is pulled downwards, progressively coming off the limb.

[0026] When the collar 1 reaches the lowest and inclined position, the user removes the foot, dragging the tip from the stocking (see fig 14), which, at the end of the operation, remains hanged on the collar 10 (pos.K_1).

[0027] As observable in figs. 15-16, a second embodiment of the apparatus according to the invention, indicated in its entirety with reference 200, comprises a collar, indicated in its entirety with reference 1.1, constituted by a cylindrical body 10, provided with a rounded upper edge 11, on which there is rolled the stocking K, said body 10 being constituted by two opposite half-shells 12 and 13, mutually pivoted on the pin 2.1, integral with the support base 21.

[0028] From a construction point of view, as observable in figs. 16.A and 16.B, the apparatus 200 comprises two parts, a fixed part, indicated with reference numeral 201, constituted by the support base 21, provided with the pin 2.1, on which there is welded, by means of the extension 22, the half-shell 13 and a mobile part, indicated with reference numeral 202, made up of the half-shell 12 provided with the extension 23 which is splined on the pin 2.1 and on which there is hinged, by means of a pin 24, a rod 25 which has the function of manoeuvring the entire apparatus, from the inoperative position (see fig. 15) to the operative position (see fig. 16). Operatively, as observable from the sequence of figures. 17-19, the apparatus 200, is arranged on a base 8, with the rod 24, substantially vertical so as to generate the opening of the two half-shells 12 and 13, this dilating the rolled part "G" and facilitating the fitting of the tip of the foot into the stocking (fig. 17).

[0029] Then, as observable in fig. 18, upon grasping the rod 24, the user moves, in the direction of the limb, the collar 1 upwards, leading to removing the stocking "K", completely and automatically unrolling it, starting from the foot and thus on the ankle and lastly along the calf.

[0030] Advantageously, during the latter step the foot fitted into the stocking lies on the base 8, thus conferring total stability to the person.

[0031] At the end of the operation, when the stocking "K" is completely worn it is totally removed from the collar 1, hence the two half-shells 12 and 13, rotating on the pin 2.1, open freely, to allow the lateral extraction of the limb from the apparatus, which is held by the user by the rod 25 (fig. 19) in an extremely comfortable manner. Furthermore, as observable from the figures and from the description outlined above, the invention is also characterised by the way in which the stocking "K" is positioned on the collar 1, in that the stocking is positioned "inside out" and, by unrolling, it is fitted into the limb which re-

mains immobile; this procedure is the contrary to the normal procedure, wherein it is the limb that is fitted into the stocking, which remains immobile.

[0032] Practically, with the limb on which the stocking is unrolled immobile, besides the fact that the limb is never at contact with the apparatus (a mandatory requirement when operating in sterile environments) the stocking can be advantageously fitted without drawbacks even on feet and calves that are wet, rough or however revealing resistance to the sliding of the stocking/ limb.

[0033] Such characteristic is better outlined by the sequence of figures 20 to 22.

[0034] As observable in fig. 20, the stocking "K" is fitted into the collar 1 with the foot element "G" positioned within the cylindrical body 10.

[0035] Then, as observable in fig. 21, the foot element "G" is gradually turned outside in and fitted outside the cylindrical body 10.

[0036] Such operation also continues with the foot "P", until the portion "P1" of the foot ends up closing the cylindrical body 10 (see fig. 22).

[0037] Basically, the entire stocking "K", when fitted into the collar 1, is packed "inside out" and shows the internal part "S" thereof as the one, in the subsequent unrolling step, at contact with the limb.

[0038] As observable from the above, the invention fully meets the preset objectives, and in particular:

- it allows the user to wear and, possibly, also remove the stocking automatically and without requiring the help of other people;
- allows to keep the fitted foot supported, hence guaranteeing the maximum stability during the entire operation;
- allows wearing the stocking with the foot at any condition, moist, wet or rough, in that the foot is simply "placed" on the stocking which, being rolled on the collar in the so-called "inside out" mode, envelops on the limb by unrolling it; practically, the foot does not penetrate into the stocking but, on the contrary the stocking gradually contains the foot.

[0039] The invention thus conceived is susceptible to modifications and variants and the construction details thereof can be replaced by technically equivalent elements, the entirety falling within the inventive concept outlined by the following claims.

Claims

1. APPARATUS FOR WEARING STOCKINGS, SOCKS, KNEE-HIGH SOCKS, ORTHOPAEDIC STOCKINGS AND THE LIKE, particularly useable by people with pathologic problems affecting the ankle, the knee, the hip, the vertebral column and, more generally, with low mobility of the limbs or with limited possibility of reaching the tip of the feet, for whom the daily operation of wearing stockings is considerably complex, said apparatus providing for the use of a collar (1, 1.1), on which there is manually applied the stocking (K), said collar (1, 1.1) being mounted on means which allow wearing the aforementioned stocking on the limb of the person, said operation allowing wearing the stocking on the limb of the person and allowing the unrolling thereof completely automatically or manually,
said apparatus being characterised in that the stocking (K) is positioned on the collar (1,1.1) in the "inside out" condition, by fitting the stocking (K) into the collar (1,1.1), with the foot element (G) positioned within the cylindrical body (10); then the foot element (G) is gradually turned outside in and fitted, in the "packed" condition, outside the cylindrical body (10) and such operation also continuing with the foot (P) of the aforementioned stocking until the end portion (P1) ends up closing the cylindrical body (10).

2. APPARATUS FOR WEARING STOCKINGS, SOCKS, KNEE-HIGH SOCKS, ORTHOPAEDIC STOCKINGS AND THE LIKE, according to claim 1, **characterised in that** the collar (1, 1.1) is splined, idle and rotatable, at a pin (2, 2.1) and wherein, in order to provide the collar (1) with a reciprocal rectilinear automatic movement, the pin (2) is applied on means mounted on a bracket (3), applied on a column (4) provided with electromechanical means (5) or, for manually moving the collar (1.1), the pin (2.1) is hinged on means (200) provided with a support base (21).

3. APPARATUS (100), according to claim 2, **characterised in that** the column (4) is hinged, at a pin (7), on a base (8), which allows the inclination thereof.

4. APPARATUS (100), according to one or more of the preceding claims, **characterised in that** the collar (1) comprises a substantially cylindrical body (10), provided with a rounded upper edge (11), on which there is rolled the stocking (K), said body being constituted by two opposite half-shells (12, 13), mutually pivoted on the pin (14), arranged at the base of two extensions (15, 16).

5. APPARATUS (100), according to one or more of the preceding claims, **characterised in that** on one of the two extensions (15) there is welded, with perpendicular direction with respect to the axis of the collar (1), the projecting pin (2), which supports the entire collar and it is engaged on the bracket (3), on the opposite extension (16) there being welded a further projecting pin (17), parallel to the previous pin (2), provided with a wheel (18), which lies on the bracket (6).

6. APPARATUS (100), according to one or more of the

preceding claims, **characterised in that** the collar (1) is provided with an end stop mechanism (19), which holds the two half-shells (12, 13) in the position of maximum opening of the same.

7. APPARATUS (100), according to one or more of the preceding claims, **characterised in that** on the column (4) there are present gripping and control members, such as a button (9.1), for the electrical control of the electromechanical unit (5) and a handle (9.2), for transporting the apparatus.

8. APPARATUS (100) according to one or more of the preceding claims, **characterised in that** each of the two half-shells (12, 13) is provided with a rostrum (12.1, 13.1), said rostra having the function of supporting the turned part (G), during the ascent of the collar (1), for wearing the stocking.

9. APPARATUS (100), according to one or more of the preceding claims, **characterised in that** removing the stocking from the limb requires hooking, on at least one of the two rostra (12.1, 13.1), the upper collar (C) of the unrolled stocking, so that, by sliding the collar (1) downwards, due to the aforementioned hooking, the foot element (G) is pulled downwards, progressively coming off the limb and when the collar (10) reaches the lowest and inclined position the user may extract the foot, dragging the tip from the stocking, which remains hanged on the collar (10) at the end of the operation.

10. USE OF THE APPARATUS (100), according to one or more of the preceding claims, **characterised in that** it provides for the following operative steps:

- at the beginning there occurs the manual fitting of the stocking (K) on the collar (1); said collar is advantageously positioned at the highest part of the column (4); said stocking (K) is applied on the collar (1), by fitting the tip (P) into the cavity of the collar, while the foot element (G) is rolled outside the two half-shells (12,13), in "inside out" condition;
- then, the person, by operating on the button (9.1), activates the electromechanical means (5), which move the collar (1) downwards, so as to move the wheel (18) to lie on the bracket (6), so as to cause the rotation of the collar (1) on the pin (2), thus making the apparatus (100), alongside the possible rotation of the column (4) on the pin (7) of the base (8), assume a more a anthropomorphic configuration with respect to the foot;
- then, a further minimum final sliding of the collar (1) downwards causes the opening of the two half-shells (12, 13), this dilating the rolled part (G) and facilitating fitting the tip of the foot into the stocking;
- then, the user - by operating on the button (9.1) again - activates the electromechanical means (5), which move the collar (1) upwards, leading to removing the stocking (K), completely and automatically unrolling it, from the foot, thus on the ankle and lastly along the calf;
- then, when the stocking (K) is completely worn on the limb and the collar (1) is free, the user, manually, spaces the two half-shells (12, 13), making them rotate on the pin (14), so as to be able to comfortably extract the limb from the apparatus.

11. APPARATUS (200), according to claims 1 and 2, **characterised in that** it comprises a collar (1.1), constituted by a cylindrical body (10), provided with a rounded upper edge (11), on which there is rolled the stocking (K), said body (10) being constituted by two opposite half-shells (12, 13), mutually pivoted on the pin (2.1), integral with the support base (21).

12. APPARATUS (200) according to claim 11, **characterised in that** it comprises a fixed part (201), constituted by the support base (21), provided with the pin (2.1), on which there is welded, by means of the extension (22), the half-shell (13) and a mobile part (202), made up of the half-shell (12) provided with the extension (23), which is splined on the pin (2.1) and on which there is hinged, by means of a pin (24), a rod (25), which has the function of manoeuvring the entire apparatus, from the inoperative position to the operative position.

13. USE OF THE APPARATUS (200), according to claims 1, 2, 11 and 12, **characterised in that** it provides for the following operative steps:

- initially the apparatus (200) is arranged on a base (8), with the rod (24), substantially vertical so as to generate the opening of the two half-shells (12, 13), this dilating the rolled part (G, P) for facilitating fitting the tip of the foot into the stocking (fig. 17).
- then the user, grasping the rod (24) moves the collar (1) upwards in the direction of the limb, leading to removing the stocking (K), completely and automatically unrolling it, starting from the foot and thus on the ankle and lastly along the calf;
- then when the stocking (K) is completely worn it is totally removed from the collar (1), hence the two half-shells (12, 13), rotating freely on the pin (2.1), open, to allow the lateral extraction of the limb from the apparatus, which is held by the user by the rod (25).

14. USE OF THE APPARATUS (100, 200), according

to claim 1, **characterised in that** during the operation of wearing the stocking the limb remains immobile and the stocking moves and starts with the foot simply "directed" towards the stocking which, being rolled on the collar in the "inside out" condition, envelops on the limb by unrolling it.

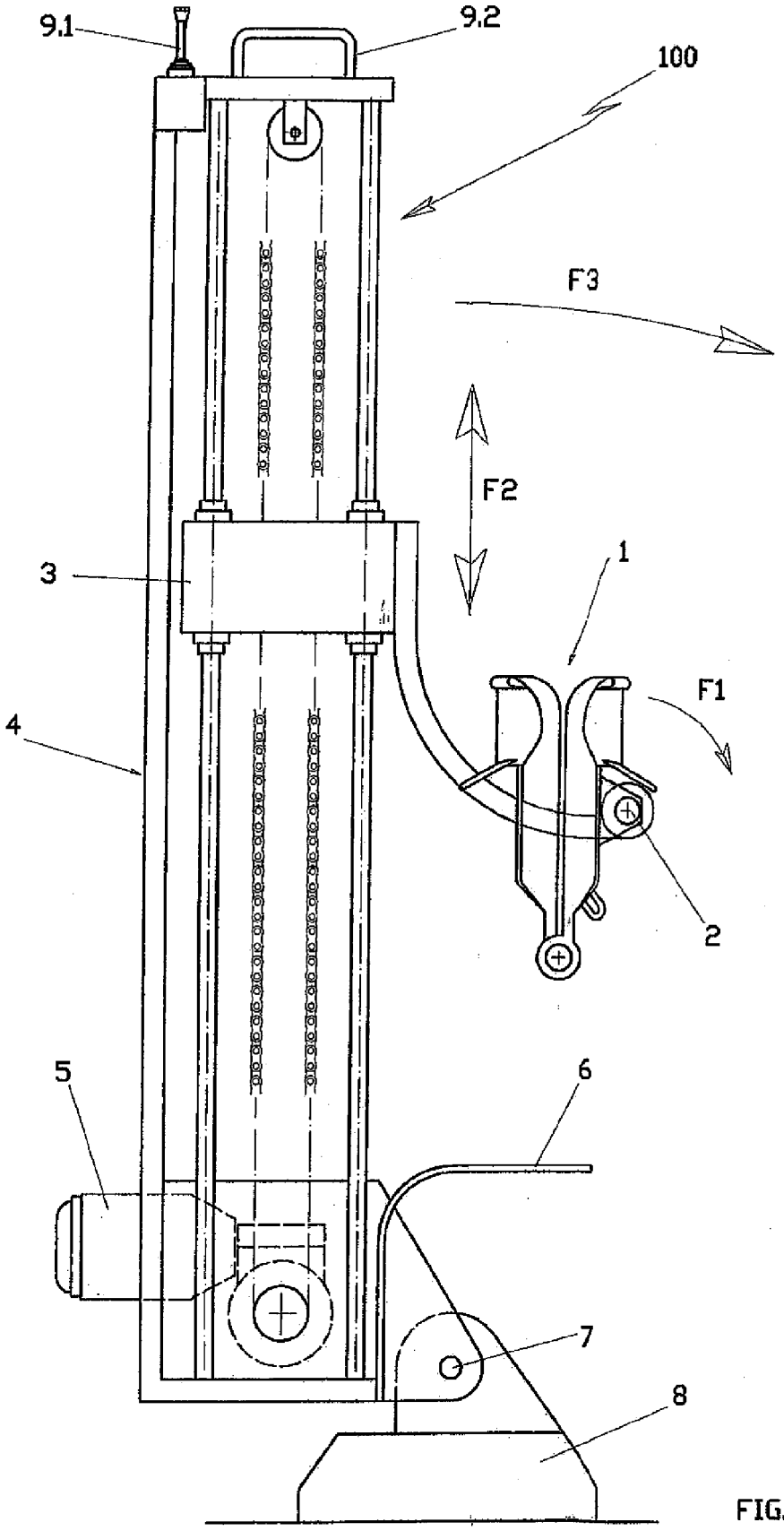


FIG.1

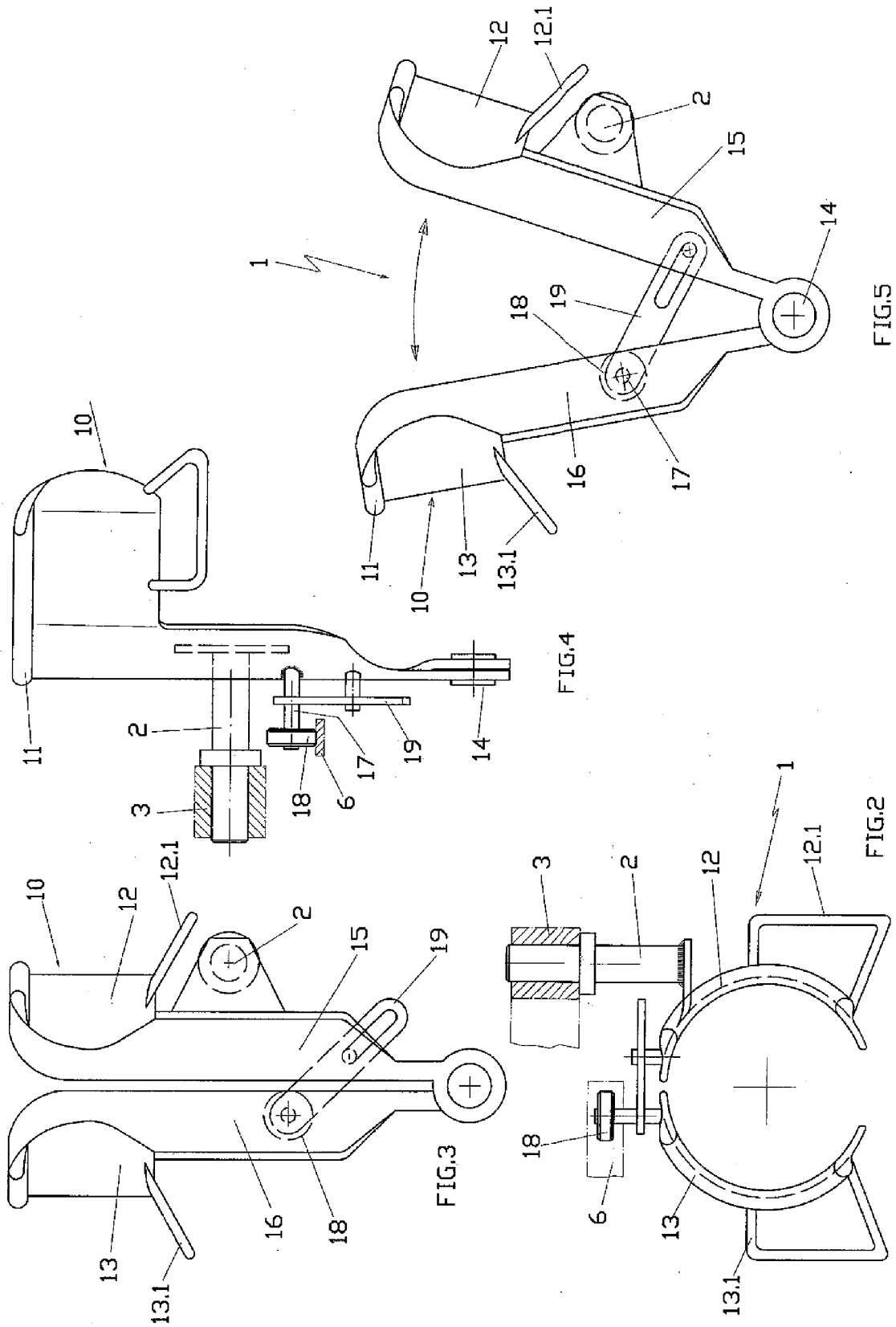


FIG.2

FIG.3

FIG.4

FIG.5

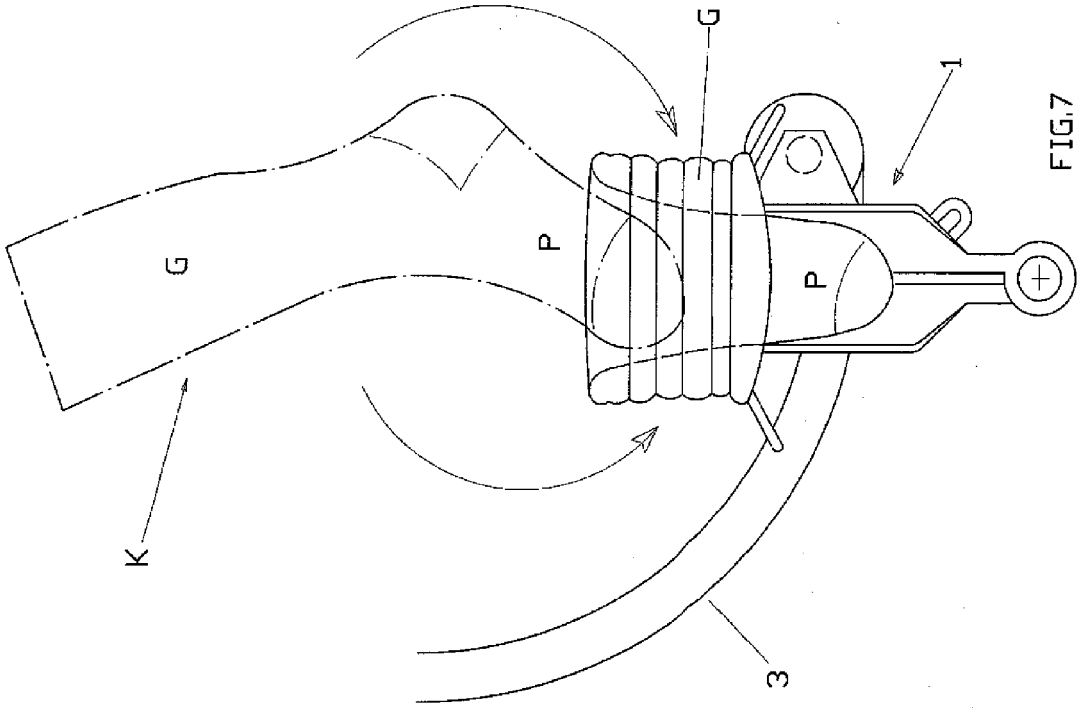


FIG.7

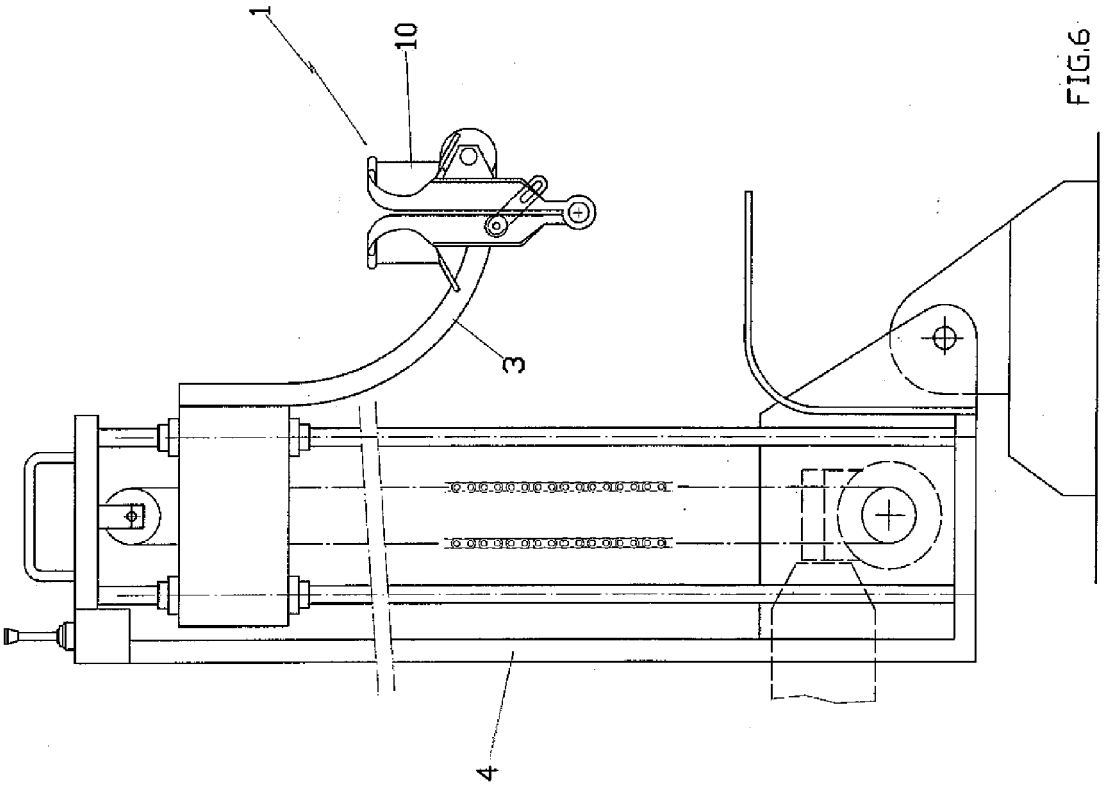


FIG.6

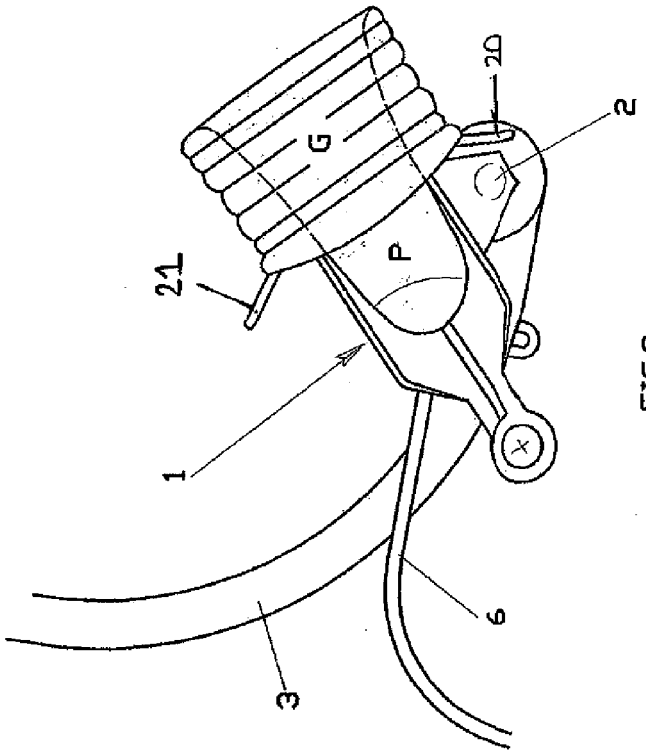


FIG.9

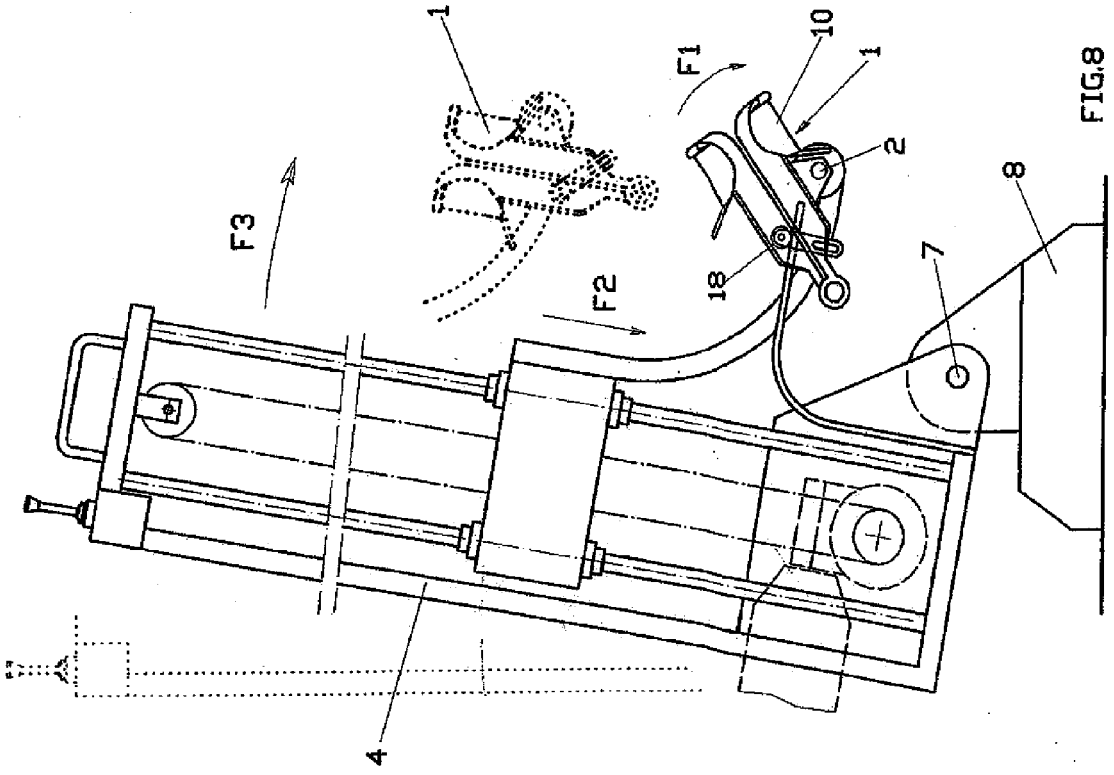


FIG.8

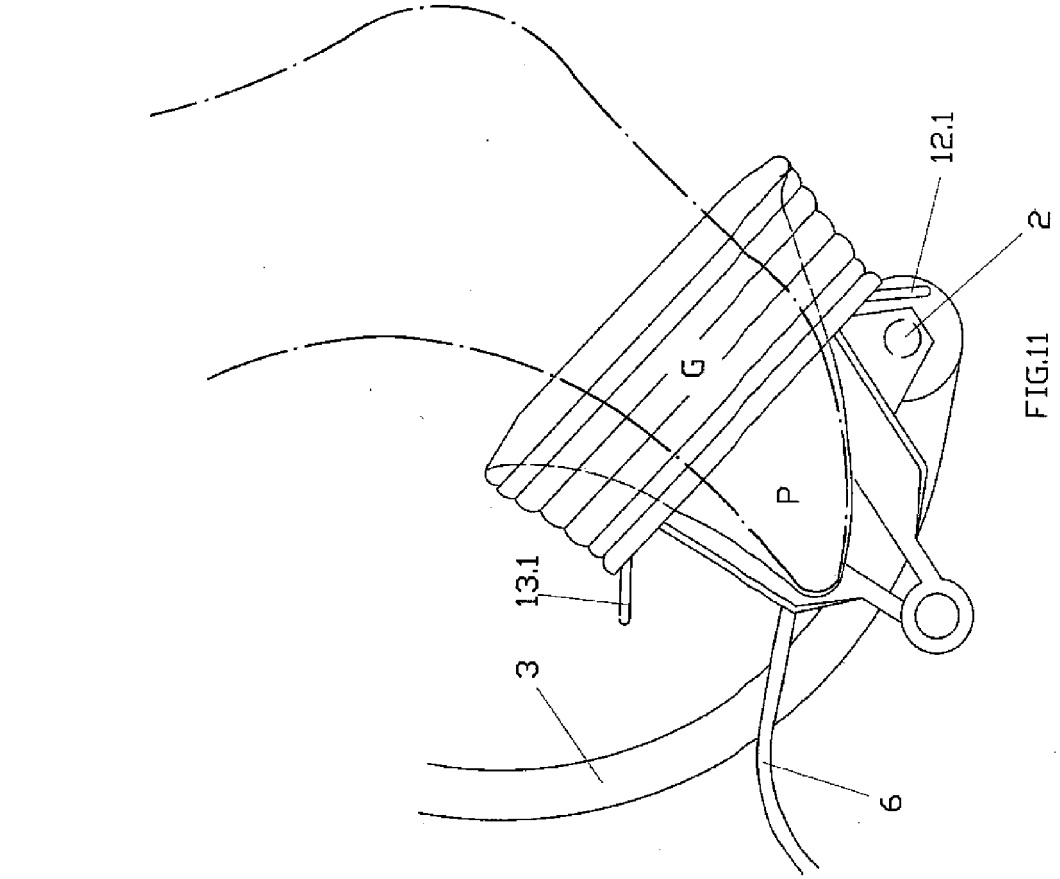


FIG.11

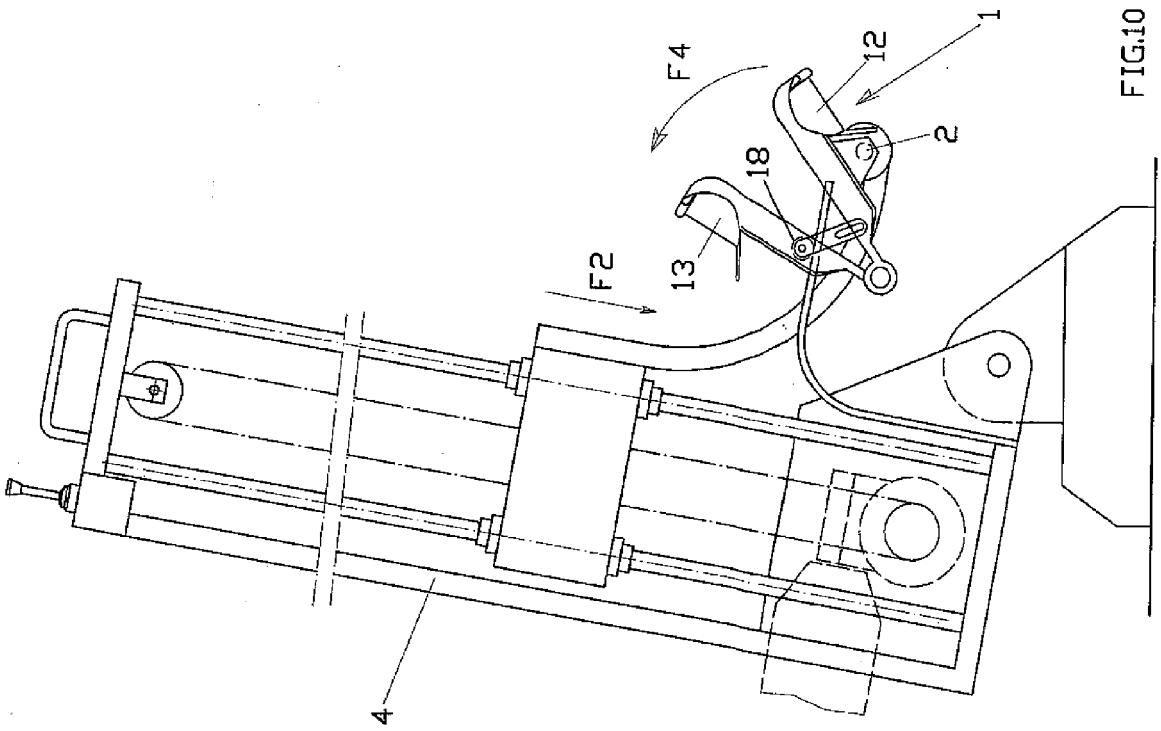


FIG.10

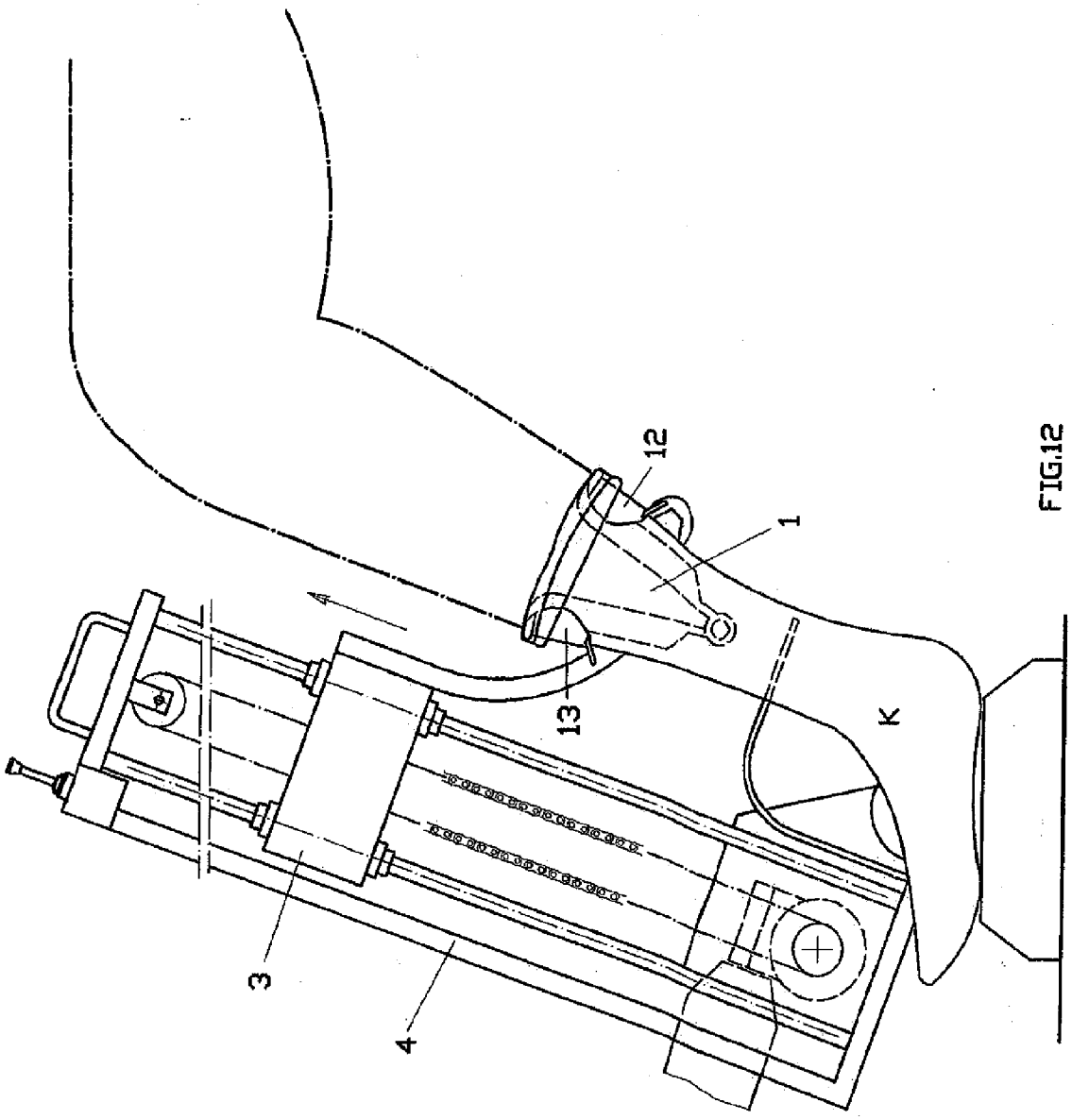


FIG.12

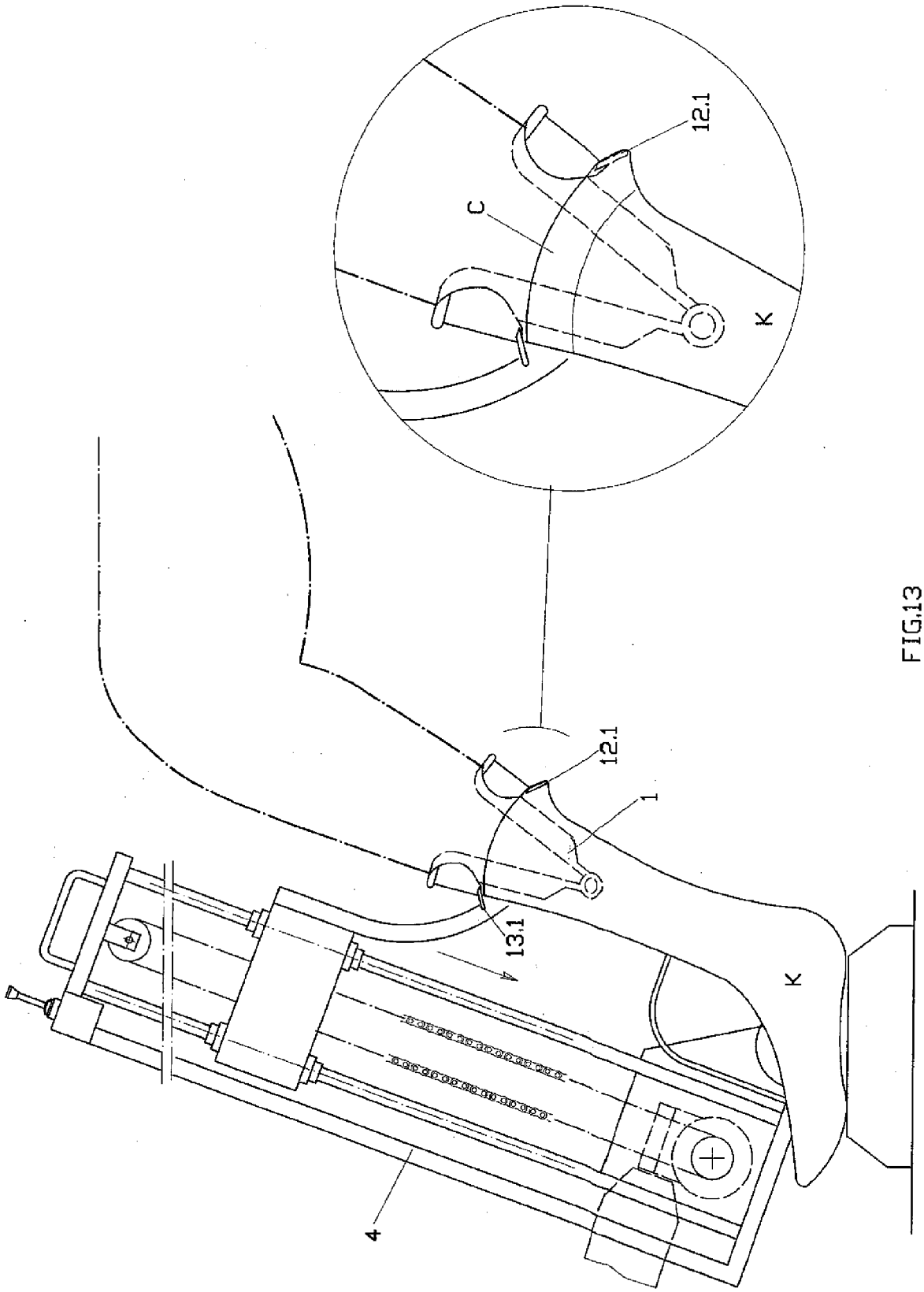


FIG.13

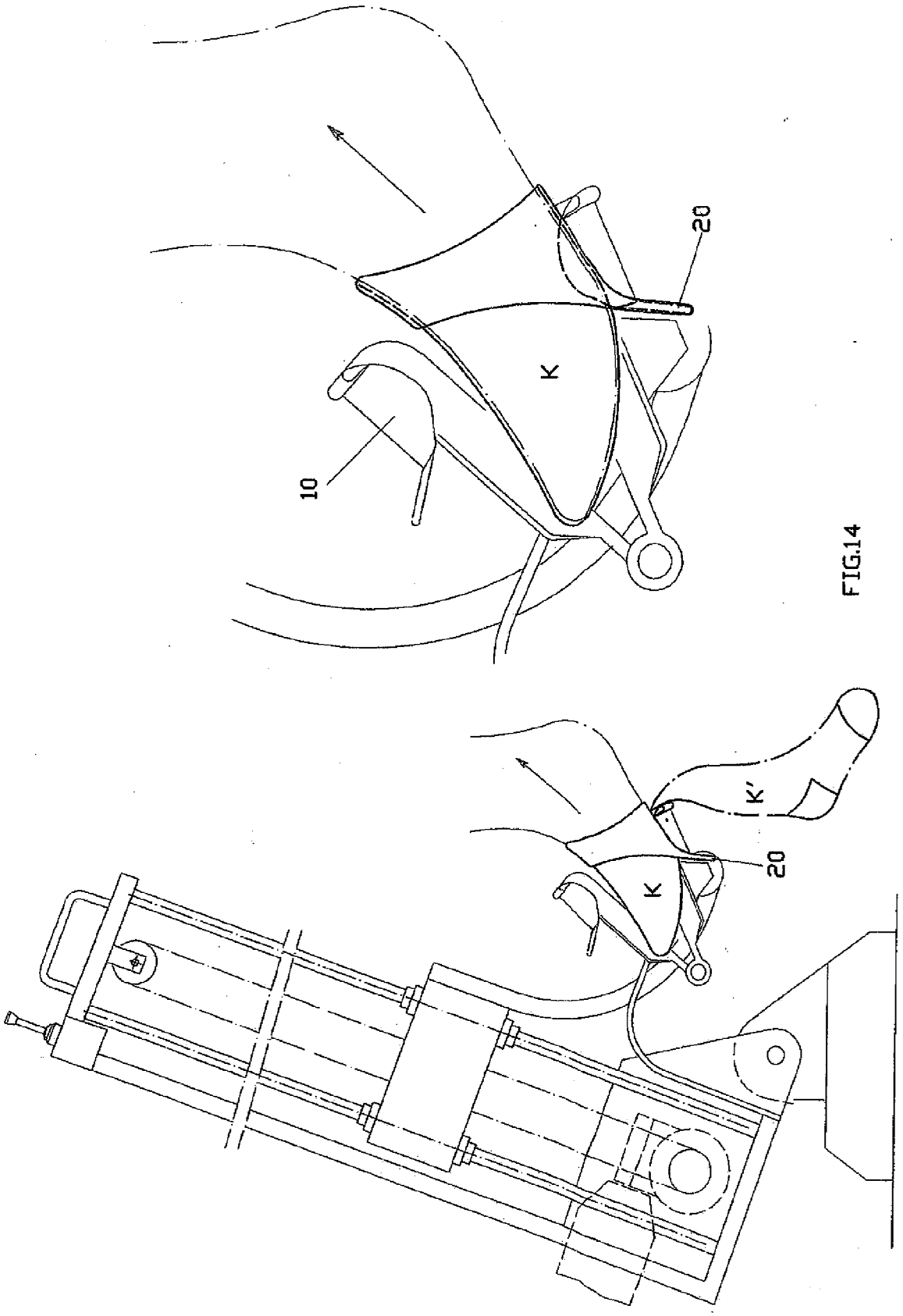


FIG.14

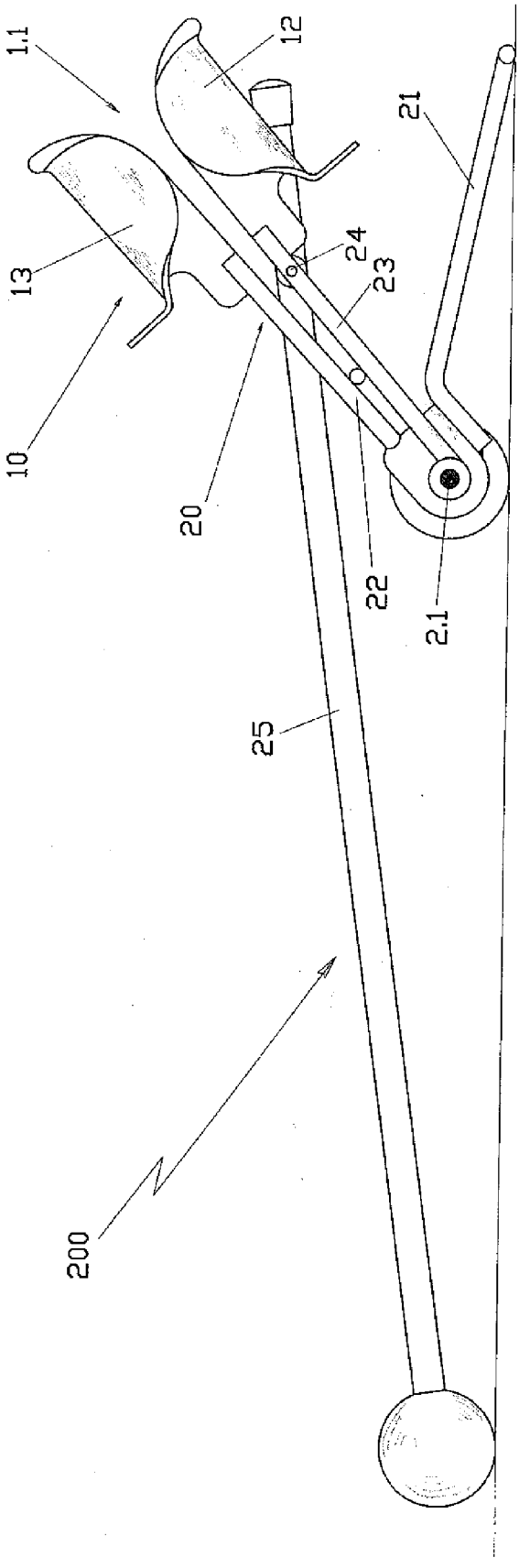


FIG.15

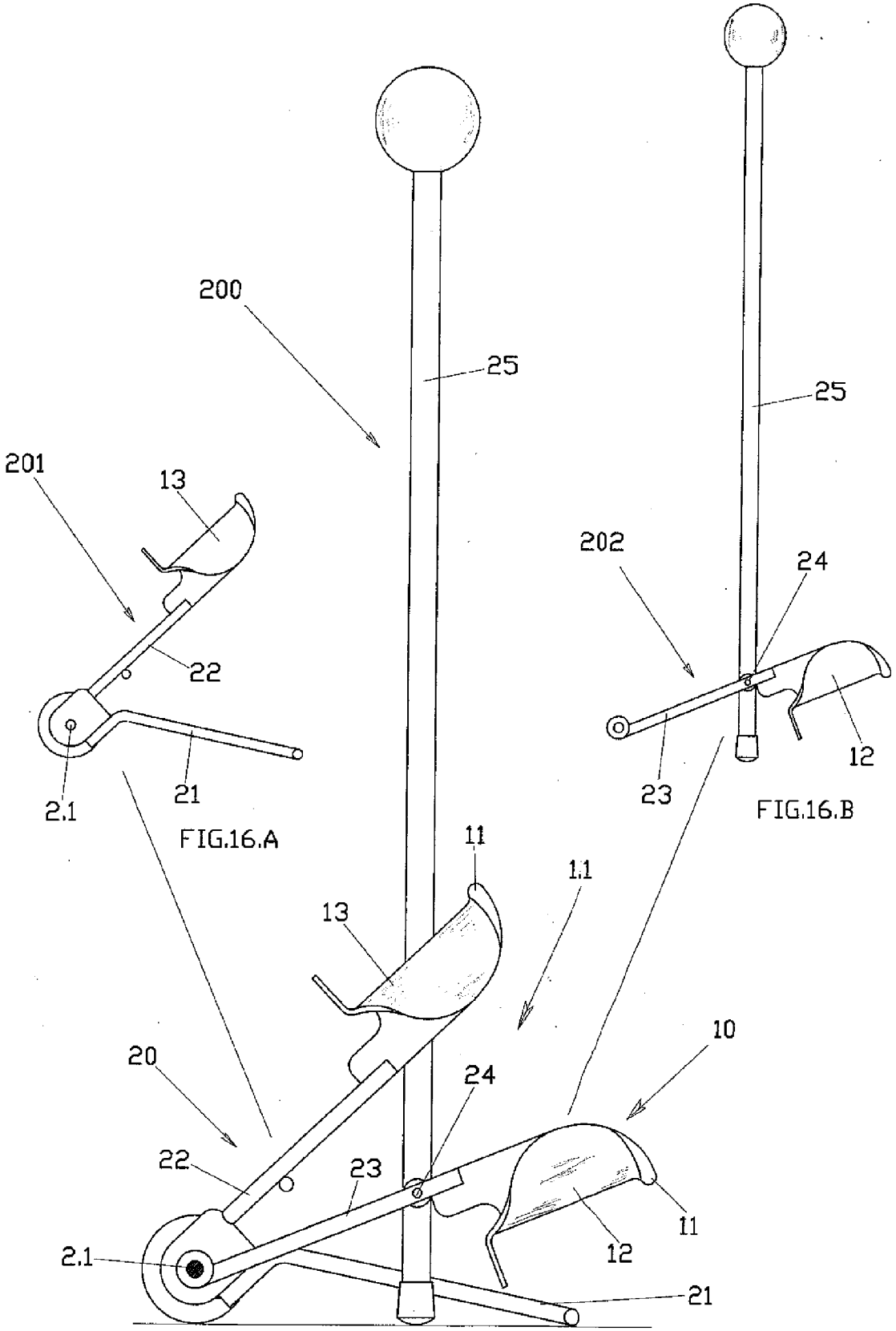
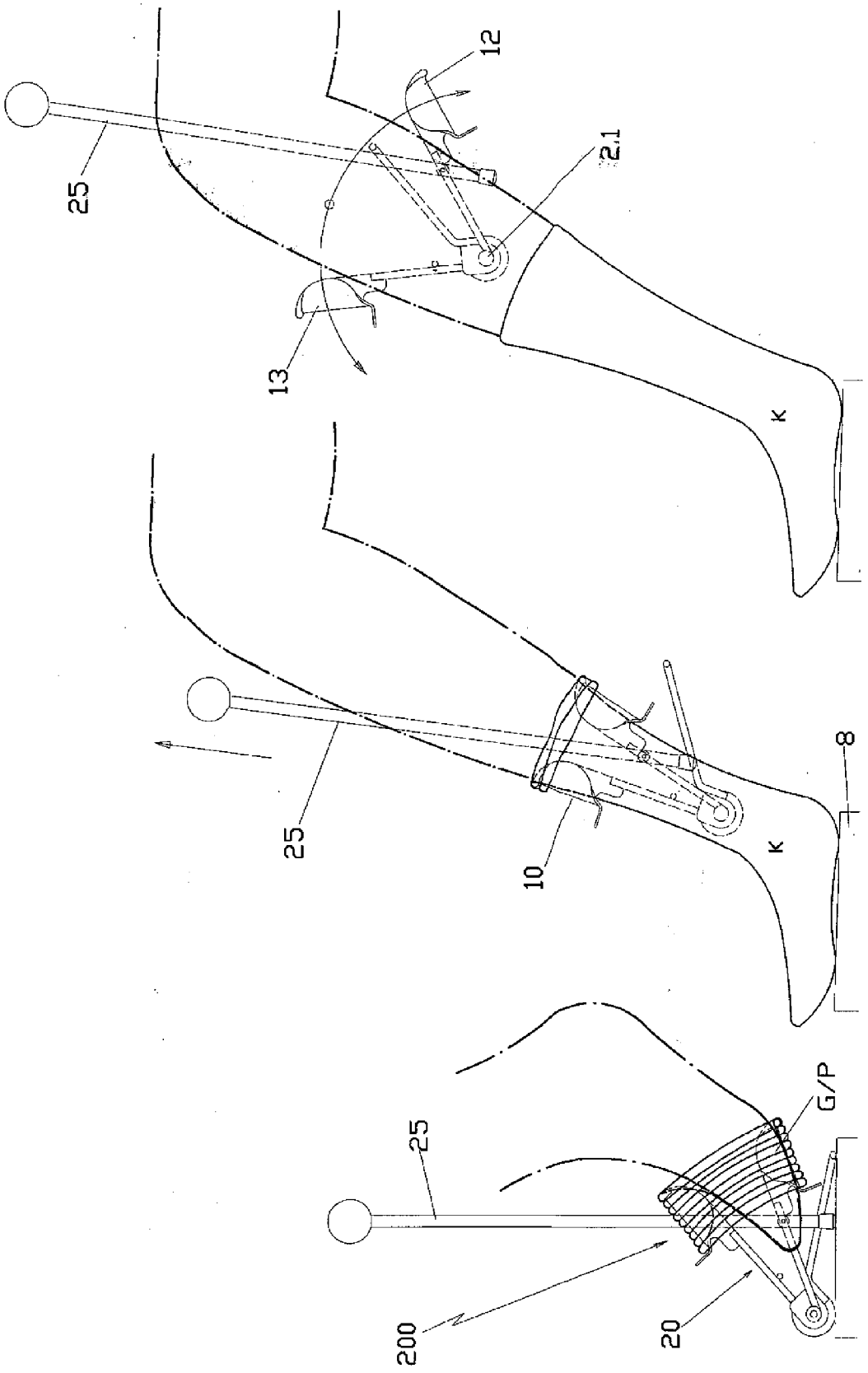

200
25
201
13
22
21
2.1
FIG.16.A
25
202
24
12
23
FIG.16.B
11
1.1
13
10
20
24
22
23
2.1
12
11
21

FIG.16


25
12
2.1
13
K
FIG.19
25
10
8
K
FIG.18
25
G/P
200
20
FIG.17

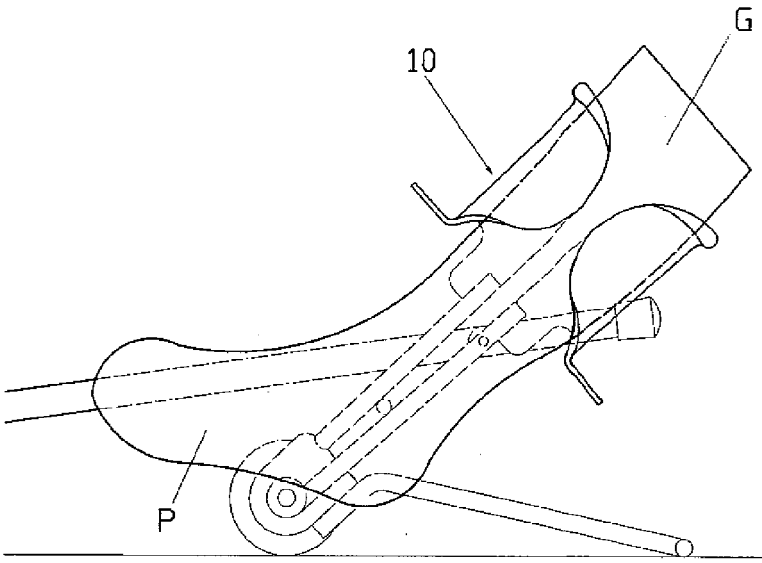


FIG.20

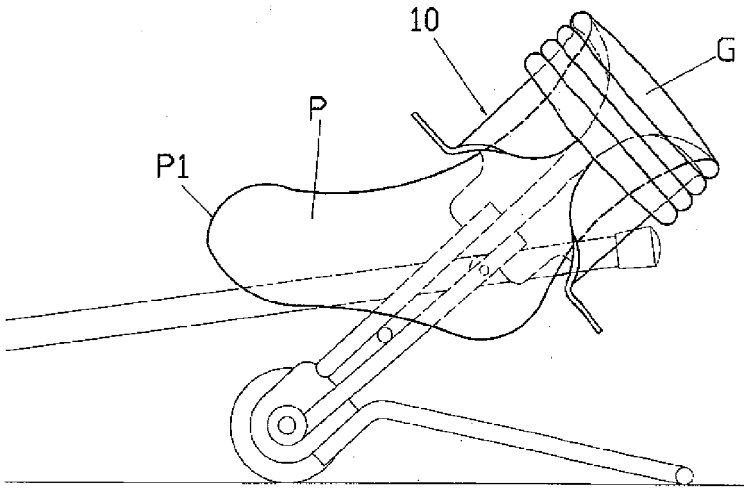


FIG.21

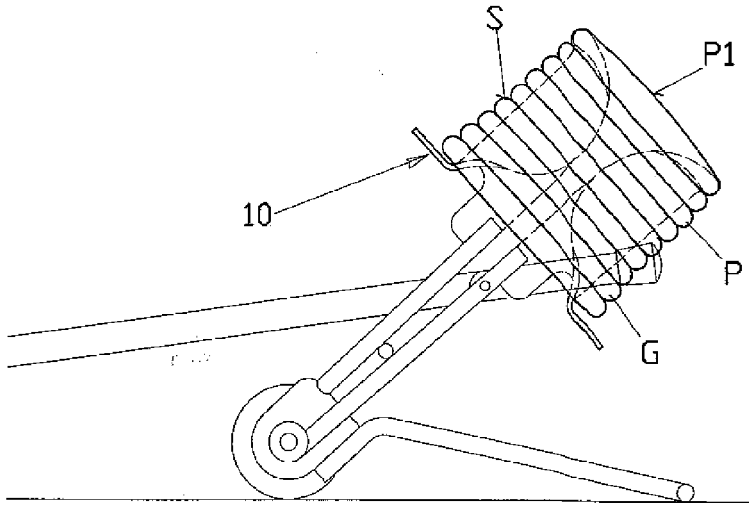


FIG.22

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EUROPEAN SEARCH REPORT

Application Number
EP 13 16 0239

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	6 August 2013	Longo dit Operti, T

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