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(54) **EQUIPMENT FOR ADJUSTING SUPPORT FEET FOR FURNITURE UNITS RELATIVE TO A SUPPORTING SURFACE**

HÖHENVERSTELLBARER MÖBELFUSS UND WERKZEUG DAFÜR

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Description

[0001] This invention relates to an equipment for adjusting support feet for furniture units relative to a supporting surface and a supporting device for furniture units relative to the supporting surface.

[0002] More specifically, this invention falls within the sector of furniture units and is preferably used for the kitchen units designed to be placed on the floor (also known as bases) or, generically, on a supporting surface.

[0003] These kitchen furniture units are supported by a plurality of feet which keep each furniture unit spaced from the floor. The support feet are normally adjustable in height such a way as to increase or decrease the distance of the furniture unit relative to the floor.

[0004] In effect, once all the components of the kitchen are assembled (bases and cupboards) it is necessary to level these components in such a way as to optimise the functionality of the components and obtain a better aesthetic effect, with horizontal alignment of all the surfaces.

[0005] The levelling of the kitchen bases is performed by the micrometric adjustment of the feet which are fixed beneath each base. The adjustment is performed by a known system which is based on a rotation of a wide end of the foot known as the "rule" which acts on a system for movement in height of the foot. In other words, in order to lengthen a foot it is necessary to rotate the rule in a direction of rotation, whilst in order to shorten it the rule must be rotated in the opposite direction.

[0006] These feet are positioned both at the front and at the rear of the bases according to a point of view of a user who observes the kitchen.

[0007] More specifically, the feet positioned at the rear (closest to the wall to which the kitchen units are applied) are sometimes difficult to reach since the assembly technician must lie on the floor, stretching his/her arm beneath the unit to rotate "blind" the rule of the foot (manual adjustment) until reaching, by trial and error, the perfect levelling of the base itself. In other words, the above mentioned disadvantages relate to:

the fact that the assembly technician must stretch his/her arm beneath the furniture unit to reach the rear feet (a very uncomfortable position);

the fact that during adjustment of the feet the assembly technician, lying on the ground, cannot see the spirit level resting on the upper surface of the furniture unit (the adjustment is carried out by the trial and error);

the adjustment of the feet is difficult since the latter are of limited height (for example, 100 mm) and it is therefore often difficult to turn the rule by hand (which has approximately the same dimensions).

[0008] Moreover, bases for kitchen units with depths (measured from the front part towards the wall for application of the kitchen unit) that are greater than those in the past are becoming much more common, so that a

base which once had a depth of 600 mm may now reach 700 mm or more in depth. This makes the operation for adjusting the feet by the assembly technicians even more complicated and difficult as it is necessary to stretch the arm completely beneath the furniture unit.

[0009] Alternatively, the patent document WO2015/053637 proposes a system for adjusting the height of a foot having a wide base which is rotatable (and integral with the rod) with a circular rack. Moreover, the system also comprises a separate tool having a gripping fork designed to embrace the wide base and a pinion designed to mesh with the circular rack to rotate it. However, the latter system has several disadvantages due to the fact that the pinion is substantially co-planar with the fork and the latter embraces the base rotatably for making the movement. Consequently, the user must push the tool towards the wide base and rotate a handle connected to the pinion. In this way, a contrast of movements is created, as the thrust of the tool towards the wide base prevents the rotation of the latter which must rotate on itself to perform the adjustment.

[0010] In this situation, the aim of this invention is to provide an equipment for adjusting feet which overcomes the above-mentioned disadvantages.

[0011] More specifically, the aim of this invention is to provide an equipment for adjusting the feet which facilitates the assembly of the kitchen bases during the step of levelling the latter.

[0012] Another aim of this invention is to provide an equipment for adjustment of the feet which facilitates rotation of the rule during adjustment of the foot by using separate tools.

[0013] The aims indicated are substantially achieved by an equipment for adjusting feet as described in the appended claims.

[0014] Further characteristic features and advantages of this invention will emerge more clearly from the detailed description of several preferred, but not exclusive embodiments of an equipment for adjusting feet illustrated in the accompanying drawings, in which:

- Figure 1a is an axonometric side view of the equipment for adjusting the feet according to the invention in a rest configuration in which the means of actuating the adjustment of the foot are detached from the foot;
- Figure 1b is an axonometric side view of the equipment for adjusting the feet according to the invention in an operating configuration in which the means of actuating the adjustment of the foot are engaged in the foot;
- Figure 2 is a flat side view of the equipment for adjusting the feet of Figures 1a and 1b, where the equipment is engaged in one of the feet;
- Figure 3 shows a rear axonometric view of a part of the equipment for adjusting feet according to this invention;
- Figures 4 and 5 are perspective and lateral views,

- respectively, of the adjustment equipment designed to engage in the respective feet to be adjusted;
- Figures 6a and 6b show an axonometric and side view, respectively, of a first alternative embodiment of the equipment according to this invention;
 - Figure 7a shows an axonometric view of a second alternative embodiment of the equipment according to this invention;
 - Figure 7b is an axonometric view of a variant of the second embodiment illustrated in Figure 7a wherein the retaining element is not present.

[0015] With reference to the above-mentioned drawings, the numeral 1 denotes in its entirety the equipment which comprises at least one support foot 11 for furniture units 100 and an adjustment tool 10.

[0016] The support foot 11 comprises a rotating rule 12 rotating about a main axis of extension of the foot. The rotating rule 12 is operatively connected to a system for varying the height of the foot relative to a supporting surface (usually the floor) so that the height of the foot is varied by rotating the rotating rule 12 (rotation in one direction increases the height whilst rotation in the opposite direction reduces the height). In other words, the rule rotates relative to the rest of the foot.

[0017] Preferably, the rotating rule 12 is widened relative to the rest of the foot 11 in a direction at right angles to the axis of the foot. Moreover, the rule 12 is preferably positioned at a lower end of the foot (in contact with the supporting surface) in such a way as to give greater stability to the foot.

[0018] In other words, the foot 11 comprises a fixed rod 24 and the rotating rule 12 connected to the rod 24. The rod 24 is in contact with the furniture unit 100, whilst the rule is in contact with the supporting surface (e.g. the ground). The system for varying the height of the foot may be made in various ways. More specifically, a first variant embodiment is defined by a thread inside the lower end of the rod 24 (inner surface of the hollow rod 24) and a corresponding thread on the outside of a pin of the rotating rule 12 the pin protruding from the rotating rule 12 towards the rod 24 for insertion in the latter. Each thread extends in a direction parallel to the axis of the foot. The two threads are coupled with each other for the lengthening/shortening of the foot by rotation.

[0019] In a second variant embodiment, the system for varying the height of the foot comprises a thread on the outside of the lower end of the rod 24 and a corresponding thread inside a cavity of the rotating rule 12, wherein the rod 24 is inserted. Each thread extends in a direction parallel to the axis of the foot. The two threads are coupled with each other for the lengthening/shortening of the foot by rotation.

[0020] Basically, for both the embodiments described above, the rotation of the rotating rule 12 relative to the rod 24 results in the sliding of one thread on the other in such a way as to lengthen or shorten the foot according to the direction of rotation of the rotating rule 12. It should

be understood that the two variant embodiments described above are non-limiting for the inventive since the system for varying the height of the foot might be achieved in various ways even different from those described in this document.

[0021] It should be noted that the accompanying drawings illustrate substantially two embodiments of the equipment 1: the first embodiment illustrated in Figures 1 to 6 shows a foot 11 having a set of teeth positioned on the top of the rotating rule 12; whilst the second embodiment illustrated in Figures 7a and 7b defines a foot 11 having a set of teeth positioned on a lower annular surface of a protruding edge 29 of the rotating rule 12 (basically the rotating rule 12 is overturned). As regards the first embodiment, two variant embodiments of the tool 10 for adjusting the height of the foot 11 are shown wherein the first has a motion transmission system which is more simplified than the motion transmission system illustrated in the second variant. Moreover, the second variant embodiment has an elastic retaining element 27 parallel to the upper fork 21 for retaining the rod 24 of the foot.

[0022] In accordance with this invention, the equipment 1 for adjusting the foot comprises an adjustment tool 10 in turn comprising a rotary bar 13 (Figures 1, 2 and 3) extending between a relative operating end 25 and a relative movement end 26. Preferably, the rotary bar 13 has an extension greater than or equal to the distance of the rear foot from a front panel of the kitchen cabinet.

[0023] The accompanying drawings show that the rotating bar 13 comprises a manual grip 14 positioned at the movement end 26 to manually rotate the bar about its own axis of extension.

[0024] Moreover, the equipment 1 comprises first drive means 15 positioned at the operating end 25 of the bar 13 and configured to be moved by rotating the bar on itself. Preferably, the first drive means 15 comprise at least one gear wheel or a worm screw.

[0025] In the preferred embodiment illustrated in Figure 2, it can be seen, for example, that the first drive means 15 comprise a first gear wheel 16 directly keyed to the operating end 25 of the bar 13, a second gear wheel 17 meshing with the first according to a predetermined transmission ratio and a third gear wheel 18 coaxial with the second.

[0026] Moreover, the equipment 1 comprises second drive means positioned at the rotating rule 12 of a support foot and configured to make the latter rotate. Preferably, the second drive means comprise a set of teeth 19 located on an outer part of the rotating rule 12.

[0027] The accompanying drawings show that the set of teeth 19 of the second drive means extend along a circular direction around the rotating rule 12, that is, preferably on its upper circular crown. Advantageously, the set of teeth extends along the entire circumference of the upper circular crown.

[0028] It should be noted that the rotating rule 12 pro-

trudes laterally relative to the rest of the foot defining a peripheral lateral surface facing upwards, that is to say, toward the furniture unit 100 located above. The second drive means are applied at the peripheral lateral surface.

[0029] According to this invention, the first and second drive means are configurable between an operating condition in which they are in mutual contact for the mechanical transmission of the movement of the bar 13 towards the rotating rule 12, and a non-operating condition in which the first drive means are detached relative to the second drive means. In practice, to bring the first drive means from the rest condition to the operating condition it is sufficient to manually move the bar towards the foot to be adjusted.

[0030] In the embodiment illustrated in the accompanying drawings the first and second drive means comprise drive teeth and together form a cone type coupling. The teeth of the second drive means may be straight or helical.

[0031] In the embodiment illustrated in the accompanying drawings, the first drive means comprise a third gear wheel 18. Moreover, the teeth 19 of the rotating rule 12 are of the conical type and form a conical torque defined by the rotation of each wheel on two mutually orthogonal axes in such a way as to form a mechanical coupling for transmitting the motion of the bar. In effect, the third gear wheel 18 of the first drive means has a substantially horizontal axis, whilst the rotating rule 12, on whose upper crown the teeth 19 are made, has a substantially vertical axis.

[0032] In an alternative embodiment not illustrated in the accompanying drawings, the first drive means 15 comprise a worm screw that rotates about an axis substantially horizontal and the second drive means comprise a plurality of teeth. Preferably, the latter may be shaped with a helical form in such a way as to follow the shape of the worm screw.

[0033] In a first variant of this alternative embodiment the first drive means 15 comprise a conical pair of gears (straight teeth) and a worm screw. More specifically, the first gear wheel and the second gear wheel of the first drive means define the conical torque, whilst instead of the third gear wheel there is a worm screw keyed onto the second gear wheel. In this way, the worm screw couples with the second drive means 19. In other words, the conical torque moves the rotation shaft of the bar 13 by 90°. The second drive means 19 comprise an outer series of teeth made on the late surface of the rotating rule 12 with straight or helicoidal teeth.

[0034] In a second variant of this alternative embodiment the first drive means 15 comprise a cascade of gear wheels with straight or helical teeth and a worm screw. More specifically, the first gear wheel and the second gear wheel of the first drive means define the cascade of gear wheels coupled together, whilst instead of the third gear wheel there is the worm screw keyed onto the second gear wheel. In this way, the worm screw couples with the second drive means 19. The second drive means

19 comprise an outer series of teeth made on the late surface of the rotating rule 12 with straight or helicoidal teeth.

[0035] Moreover, in an alternative embodiment not illustrated in the accompanying drawings, the equipment 1 may comprise motor-driven means associated with the movement end 26 of the rotating bar during the operating condition for moving the bar about the respective axis of extension in a motor-driven fashion.

[0036] In addition to the foregoing, the equipment 1 comprises means 20, 21 and 22 for holding the operating end 25 of the bar in position relative to the rotating rule 12 during the operating condition so as to maintain the coupling between the first drive means and the second drive means. In effect, the rotation of the gear wheel of the first drive means relative to the second drive means could move the bar laterally.

[0037] Consequently, the holding means in position are configured to prevent lateral movements of the first drive means relative to the second drive means in such a way as to prevent the drive from being interrupted.

[0038] Preferably, the holding means 20 comprise an upper fork 21 located above the position of the rule on the foot and having a seat at least partly shaped to match the rod 24. The upper fork 21 has a seat located on a plane substantially at right angles to the axis of the foot.

[0039] More specifically, the upper fork 21 is spaced in height relative to the rule in such a way as not to influence the rotation of the rule.

[0040] In that way, during the operating condition, the upper fork 21 embraces the rod 24 in such a way as to maintain the drive from the bar to the rotating rule 12. It should be noted that preferably the holding means (and, more specifically, the fork) are connected to the operating end 25 of the bar and protrude from it.

[0041] Preferably, the holding means are located above the first drive means. In other words, the upper fork 21 is preferably spaced from the rotating rule 12. In other words, the upper fork 21 is preferably not rested on the rotating rule 12 and does not act as a supporting element on the latter.

[0042] It should be noted that the holding means comprise a retaining element 27 which is elastically deformable positioned at the upper fork 21 and offset relative to the first drive means along the main axis of extension of the rod 24.

[0043] More specifically, the retaining element 27 comprises an open ring at its relative front side 28 and defines an inner seat shaped substantially to match the rod 24 of the foot. More in detail, the opening of the front side of the ring 28 is less than the diameter of the rod 24 in such a way that the open ring embraces more than half of the outer surface of the rod 24. Moreover, the front side 28 of the open ring has a guide widening towards the outside in order to facilitate the receiving of the rod 24 in such a way as to favour the connection of the tool 10 with the latter.

[0044] In the embodiment illustrated in Figures 6a, 6b,

the retaining element 27 is preferably positioned beneath the upper fork 21 but always above the rotating rule 12.

[0045] More specifically, the retaining element 27 is formed by two separate elements connected laterally relative to the rod 24 of the foot on opposite sides in such a way as to form the open ring.

[0046] More in detail, each separate element is connected to the adjusting tool 10 at a wall facing the foot.

[0047] In the embodiment illustrated in Figure 7a the retaining element 27 is preferably positioned above the upper fork 21. In the embodiment illustrated in Figure 7b the retaining element 27 is not present.

[0048] In addition, in the embodiments illustrated in Figures 1 to 6, the holding means comprise a fork 22 beneath the position of the rotating rule 12 on the foot and having a seat at least partly shaped to match the foot in such a way that, during the operating condition, the fork embraces part of the foot. Preferably, the retaining element 27 is connected between the upper fork 21 and the lower fork 22.

[0049] In the preferred embodiment, the rotating rule 12 defines the lower end of the foot. Preferably, the rotating rule 12 has at the bottom a spacer configured to keep the rest of the rotating rule 12 raised from the supporting surface in such a way as to being able to insert the lower fork 22 between the rotating rule 12 and the supporting surface. In this case, the seat of the lower fork 22 is shaped to receive the spacer of the rotating rule 12. The lower fork 22 is preferably connected to the operating end 25 of the bar 13 and protrudes from it. In other words, the two forks, upper 21 and lower 22, protrude from the bar 13 in parallel directions.

[0050] In the alternative embodiment illustrated in Figures 8 and 9, the rotating rule 12 has an edge 29 which protrudes more than the rest of the rotating rule 12 defining a lower axial surface 30 (facing the supporting surface) on which the circular set of teeth are made (first drive means). In this case, the second drive means 17 are positioned below the first drive means 15.

[0051] More specifically, the rotating rule 12 has a lower part 31 extending from the protruding edge 29 up to the supporting surface with a diameter less than that of the protruding edge 29.

[0052] In that case, the distance of the first drive means 15 from the ground is equal to the between the top of the second drive means 17 from the ground.

[0053] Advantageously, this embodiment makes it possible to use the weight force of the furniture unit 100 on the foot 11 (and thus also on the rotating rule 12) for maintaining the connection between the first drive means 15 and the second drive means 17 without the two moving away according to a mutual-repulsive force generated during the motion transmission.

[0054] As regards the transmission of the motion from the bar 13 to the second drive means 17, it should be noted that the first gear wheel 16 located on the end of the bar 13 and second gear wheel 17 meshing with the first are inserted, with the possibility of rotation on parallel

axes, in at least one supporting plate 23, which forms a mutual constraining means. More specifically, the at least one supporting plate 23 is perforated at the passage of the pins of the gear wheels 16 and 17. It should be noted that the pin of the gear wheel 16 corresponds to the end of the bar 13 on which it is keyed.

[0055] The plate 23 also constitutes in this case a support for the two forks, the upper fork 21 and the lower fork 22, and, more specifically, each of the sides of the plates opposite the respective fork is fixed at right angles to the plate. In a variant of the preferred embodiment there could be present only the upper fork 21 or the lower fork 22.

[0056] Moreover, the bar 13 may comprise one rigid intermediate joint in such a way as to be able to use the bar along directions at an angle.

[0057] This invention also relates to a tool 10 for adjusting the height of a support foot of the type described previously. More specifically, the tool 10, already described above which is here below incorporated in its entirety, comprises:

- the rotating bar 13 extending between its own operating end 25 and its own movement end 26;
- the first drive means 15 associated with the operating end 25 of the bar and configured to be moved by rotating the bar on itself;
- the means 20, 21 and 22 for holding the operating end 25 of the bar 13 in position relative to the rotating rule 12 during the operating condition.

[0058] More specifically, as described above, the holding means 20, 21 and 22 comprise at least a fork 21 offset relative to the first drive means 15 along the main axis of extension of the rod 24 and having a seat at least partly shaped to match the rod 24 to embrace the latter during the operating condition in such a way as to exert a hold against the lateral movements of the equipment relative to the rod 24 without influencing the rotation of the rotating rule 12.

[0059] More specifically, the second drive means 17 are positioned above the first drive means 15 or below the first drive means 15 depending on the shape of the rotating rule 12. In effect, if the first drive means 15 are located on an upper axial surface (preferably corresponding to the top of the rotating rule 12), then the second drive means 17 are positioned above the first drive means 15. Otherwise, if the first drive means 15 are located on a lower axial surface 30, then the second drive means 17 are positioned below the first drive means 15.

[0060] More specifically, in the case of the embodiment illustrated in Figures 1 to 6, the tool 10 comprises a fork 22 lower than the position of the rotating rule 12 on the foot and has a seat at least partly shaped to match a base 32 of the rotating rule 12 in such a way that during the operating condition the fork 22 embraces part of the base 32.

[0061] An example not according to the invention re-

lates to a device for supporting furniture units 100 relative to a supporting surface. The supporting device is derived directly from what is described above, in relation to the equipment 1, which is here below incorporated in its entirety.

[0062] More specifically, the device comprises one or more support feet 11 described above, each extending between the supporting surface and the furniture unit 100 to space the latter from the supporting surface.

[0063] Moreover, the device comprises a system for adjusting the height of the foot configured to increase or decrease the height of the foot so as to increase or decrease the distance of the furniture unit 100 relative to the supporting surface. More specifically, the adjusting system comprises the rotating rule 12 rotatable about the relative main axis of extension of the foot and connected to a mechanism for vertically moving the foot so that a rotation of the rotating rule 12 defines a vertical movement of the foot to adjust the height of it, as mentioned above.

[0064] More specifically, the rotating rule 12 has the mechanical drive means 19 (corresponding to the second mechanical drive means described above) located on an outer surface and designed to be coupled with the first mechanical drive means 15 of an outer bar.

[0065] In detail, the second mechanical drive means of the rotating rule 12 comprise a series of teeth positioned along the entire circumference of the circular crown of the rotating rule 12.

[0066] As already mentioned, the rod 24 of the foot extends from the furniture unit 100 to the rotating rule 12 and has portion above the rotating rule 12 configured to be embraced by the fork of the adjustment tool 10. In other words, the upper portion is a band of outer surface of the rod 24 positioned above the rotating rule 12.

[0067] As regards the operation, the adjustment tool 10 makes it possible to rotate the rotating rule 12 by means of an extension (defined by the bar) which compensates for the distance of the rear foot 11 from the front of the furniture unit 100. More specifically, the adjustment tool 10 makes it possible to fasten the rod 24 by a fork, whilst the drive means 15, 17 operate on the rotating rule 12 rotatable freely without there being a braking by the fork 21.

[0068] The adjustment is performed through the rotation of the extension which can be carried out either manually using a special grip or by using a motor-driven system (for example, electric screwdriver).

[0069] This allows the furniture unit 100 to be arranged horizontally and at the desired height. Moreover, this operation is performed in a easy way because the assembly technician does not need to lie down on the floor in front of or partly beneath the furniture unit 100, but can perform the necessary adjustment operations remaining in front of the furniture unit 100 and controlling in real time the variations in height and inclination made to the base 32 of the kitchen unit through the rotation of the rotating rule 12 of the foot. In effect, the assembly technician is posi-

tioned in front of the furniture unit 100 (and not lying on the ground) and may easily observe tool 10 with a spirit level positioned, for example, on the top surface of the furniture unit 100.

5 **[0070]** In effect, the foot 11 equipped with toothed gear the rotating rule 12 may be controlled in exactly the same way as the feet currently fitted on the furniture units 100 base 32 (that is to say, by direct manual rotation), having the same dimensions.

10 **[0071]** Moreover, once the furniture unit 100 base 32 is positioned, fixed to the other adjoining bases through specific prior art connections which join the sides, the kitchen units are positioned and with the aid of a level the various heights from the floor are adjusted in a surprisingly easy way by rotation of the operating end 26 of the bar which protrudes in front of kitchen units 100. The adjustment of the height of the feet occurs in a safe and fast manner, because the assembly technician works in front of the furniture unit 100, without having to pass his/her arm beneath the furniture unit 100. It should be noted that his operation may be performed either with the furniture unit 100 full or empty.

20 **[0072]** Lastly, this offers even more evident advantages in the case of kitchen furniture units 100 base 32 with large depths and in the case of corner bases.

25 **[0073]** It should also be noted that this allows an easier rotation of the rotating rule 12 since the adjustment tool 10 is not on the moving part represented, precisely, by the rotating rule 12.

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Claims

1. An equipment (1) for adjusting the distance of a furniture unit (100) relative to a supporting surface, comprising:

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at least one supporting foot (11) in turn comprising:

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a fixed rod (24) extending between a relative lower end positioned, in use, in contact with the supporting surface, and a relative upper end connected, in use, to the furniture unit (100);

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a rule (12) rotating with respect to the rod (24) about a main axis of extension of the rod (24) operatively connected to a system for varying the height of the foot relative to the supporting surface in such a way that rotating the rule (12) varies the height of the supporting foot (11),

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at least one adjusting tool (10) comprising:

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a rotating bar (13) extending between a relative operating end (25) and a relative movement end (26);

first drive means (15) associated with the operating end (25) of the bar and configured to be moved by rotating the bar on itself; second drive means (17) positioned at the rotating rule (12) of a support foot (11) and configured to make the latter rotate; the first (15) and second (17) drive means being configurable between an operating condition in which they are in mutual contact for the mechanical transmission of the movement of the bar (13) towards the rule (12), and a second non-operating condition in which the first drive means (16) are detached relative to the second drive means (19); means (20, 21 and 22) for holding the operating end (25) of the bar (13) in position relative to the rule (12) during the operating condition;

characterised in that the holding means (20, 21 and 22) comprise at least a fork (21) offset relative to the first drive means (15) along the main axis of extension of the rod (24) and having a seat at least partly shaped to match the rod (24) to embrace the latter during the operating condition in such a way as to exert a hold against the lateral movements of the equipment relative to the rod (24) without influencing the rotation of the rule (12).

2. The equipment (1) according to claim 1, **characterised in that** the holding means (20, 21 and 22) comprise a retaining element (27) which is elastically deformable positioned at the fork (21) and offset relative to the first drive means (15) along the main axis of extension of the rod (24).
3. The equipment (1) according to any one of the preceding claims **characterised in that** the rotating rule (12) has an upper axial surface on which are formed the first drive means (15); the second drive means (17) being located above the first drive means (15).
4. The equipment (1) according to claim 1 or 2, **characterised in that** the rotating rule (12) has an edge (29) which protrudes more relative to the rest of the rotating rule (12) defining a lower axial surface (30) on which are made the first drive means (15); the second drive means (17) being positioned below the first drive means (15).
5. The equipment (1) according to any of the preceding claims, **characterised in that** it comprises a fork (22) lower than the position of the rotating rule (12) on the foot (11) and having a seat at least partly shaped to match a lower base (32) of the rotating rule (12); during the operating condition, the fork (22) embracing part of the lower base (32) of the rotating rule (12).

6. The equipment (1) according to any one of the preceding claims, **characterised in that** the first (15) and the second (19) drive means comprise drive teeth and together define a gear coupling with straight teeth having parallel or incident axes of conical type.
7. The equipment (1) according to any one of claims 1 to 5, **characterised in that** the first drive means (15) comprise a worm screw and the second drive means (19) comprise a plurality of teeth.
8. The equipment (1) according to any one of the preceding claims, **characterised in that** the rotating bar (13) comprises a manual grip (14) positioned at the movement end (26) to manually rotate the bar (13) about its own axis of extension.

20 Patentansprüche

1. Ausrüstung (1) zur Einstellung des Abstands einer Möbeleinheit (100) relativ zu einer Stützfläche, umfassend:
zumindest einen Stützfuß (11), wiederum umfassend:

einen festen Stab (24), der sich zwischen einem relativen unteren Ende, das im Gebrauch in Kontakt mit der Stützfläche positioniert ist, und einem relativen oberen Ende erstreckt, das im Gebrauch mit der Möbeleinheit (100) verbunden ist;

eine Leiste (12), die sich in Bezug auf den Stab (24) um eine Haupterstreckungsachse des Stabs (24) dreht, der betriebswirksam mit einem System verbunden ist, um die Höhe des Fußes relativ zur Stützfläche so zu variieren, dass das Drehen der Leiste (12) die Höhe des Stützfußes (11) variiert,
zumindest ein Einstellwerkzeug (10), umfassend:

eine Drehstange (13), die sich zwischen einem relativen Betriebsende (25) und einem relativen Bewegungsende (26) erstreckt;
erste Antriebsmittel (15), die mit dem Betriebsende (25) der Stange assoziiert sind und konfiguriert sind, um durch das Drehen der Stange auf sich selbst bewegt zu werden;

zweite Antriebsmittel (17), die an der Drehleiste (12) eines Stützfußes (11) positioniert und konfiguriert sind, um diesen zu drehen; wobei die ersten (15) und die zweiten (17) Antriebsmittel zwischen einem Betriebszustand, in dem sie für die mechanische Übertragung der Bewegung der Stange (13) in

- Richtung der Leiste (12) in gegenseitigem Kontakt stehen, und einem zweiten Nicht-Betriebszustand, in dem die ersten Antriebsmittel (16) relativ zu den zweiten Antriebsmitteln (19) losgelöst sind, konfigurierbar sind;
- Mittel (20, 21 und 22) zum Halten des Betriebsendes (25) der Stange (13) in Position relativ zur Leiste (12) während des Betriebszustands;
- dadurch gekennzeichnet, dass** die Haltemittel (20, 21 und 22) zumindest eine Gabel (21) umfassen, die relativ zu den ersten Antriebsmitteln (15) entlang der Haupterstreckungsachse des Stabs (24) versetzt sind und einen Sitz aufweisen, der zumindest teilweise geformt ist, um mit dem Stab (24) übereinzustimmen, um diesen während des Betriebszustands zu umschließen, so dass ein Halten gegen die seitlichen Bewegungen der Ausrüstung relativ zum Stab (24) ausgeübt wird, ohne die Drehung der Leiste (12) zu beeinflussen.
2. Ausrüstung (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Haltemittel (20, 21 und 22) ein Rückhalteelement (27) umfassen, das elastisch verformbar ist, an der Gabel (21) positioniert und relativ zu den ersten Antriebsmittel (15) entlang der Haupterstreckungsachse des Stabs (24) versetzt ist.
3. Ausrüstung (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Drehleiste (12) eine obere axiale Fläche aufweist, auf der die ersten Antriebsmittel (15) ausgebildet sind; wobei die zweite Antriebsmittel (17) sich oberhalb der ersten Antriebsmittel (15) befinden.
4. Ausrüstung (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Drehleiste (12) eine Kante (29) aufweist, die gegenüber dem Rest der Drehleiste (12), die eine untere axiale Fläche (30) definiert, auf der die ersten Antriebsmittel (15) ausgebildet sind, mehr hervorsteht; wobei die zweiten Antriebsmittel (17) unterhalb der ersten Antriebsmittel (15) positioniert sind.
5. Ausrüstung (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** sie eine Gabel (22) umfasst, die niedriger als die Position der Drehleiste (12) am Fuß (11) ist und einen Sitz aufweist, der zumindest teilweise geformt ist, um mit einer unteren Basis (32) der Drehleiste (12) übereinzustimmen; wobei die Gabel (22) während des Betriebszustands einen Teil der unteren Basis (32) der Drehleiste (12) umschließt.
6. Ausrüstung (1) nach einem der vorhergehenden An-

sprüche, **dadurch gekennzeichnet, dass** die ersten (15) und die zweiten (19) Antriebsmittel Antriebszähne umfassen und zusammen eine Zahnradkupplung mit geraden Zähnen mit parallelen oder einfallenden Achsen vom konischen Typ definieren.

7. Ausrüstung (1) nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die ersten Antriebsmittel (15) eine Schneckenschraube umfassen und die zweiten Antriebsmittel (19) eine Vielzahl an Zähnen umfassen.
8. Ausrüstung (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Drehstange (13) einen manuellen Griff (14) umfasst, der am Bewegungsende (26) positioniert ist, um die Stange (13) manuell um ihre eigene Erstreckungsachse zu drehen.

Revendications

1. Équipement (1) permettant de régler la distance d'un meuble (100) par rapport à une surface de support, comprenant :
- au moins un pied de support (11) comprenant à son tour :

une tige fixe (24) se prolongeant entre une extrémité inférieure relative positionnée, en fonctionnement, en contact avec la surface de support et une extrémité supérieure relative reliée, en fonctionnement, au meuble (100) ;

un réglet (12) tournant par rapport à la tige (24) autour d'un axe principal d'extension de la tige (24) reliée fonctionnellement à un système permettant de faire varier la hauteur du pied par rapport à la surface de support de telle sorte que la rotation du réglet rotatif (12) varie la hauteur du pied de support (11),

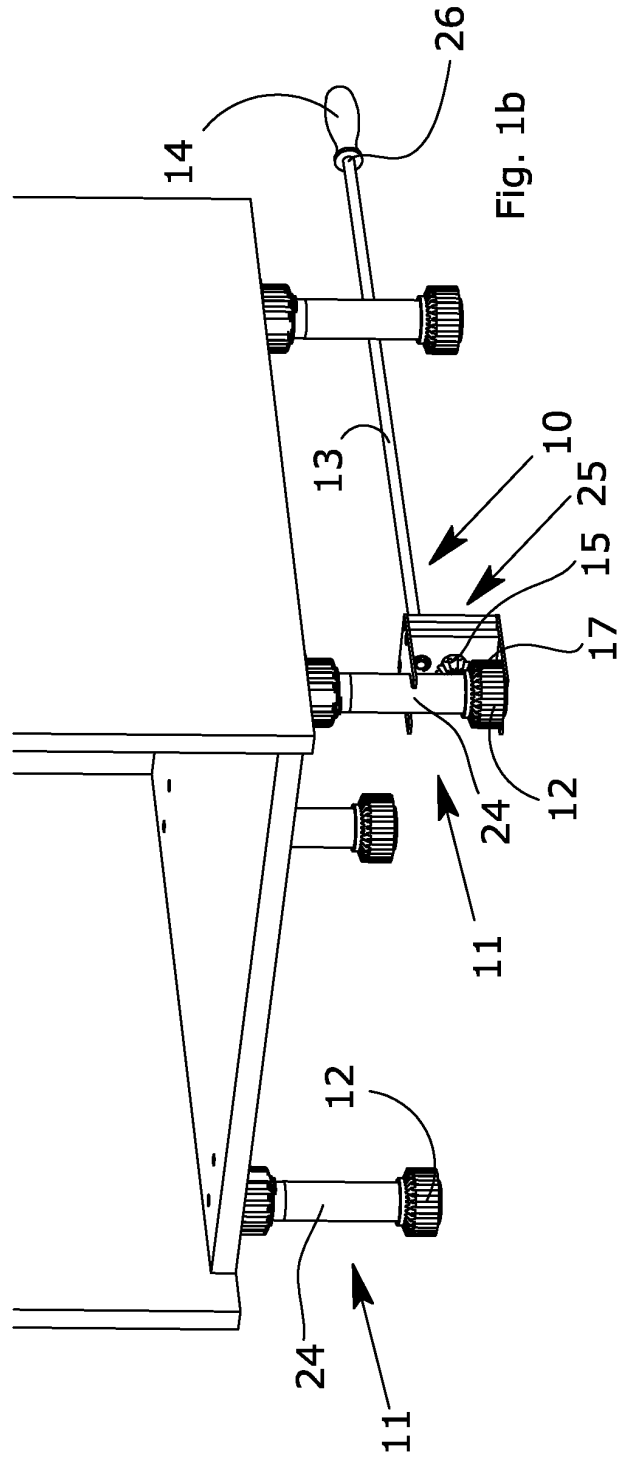
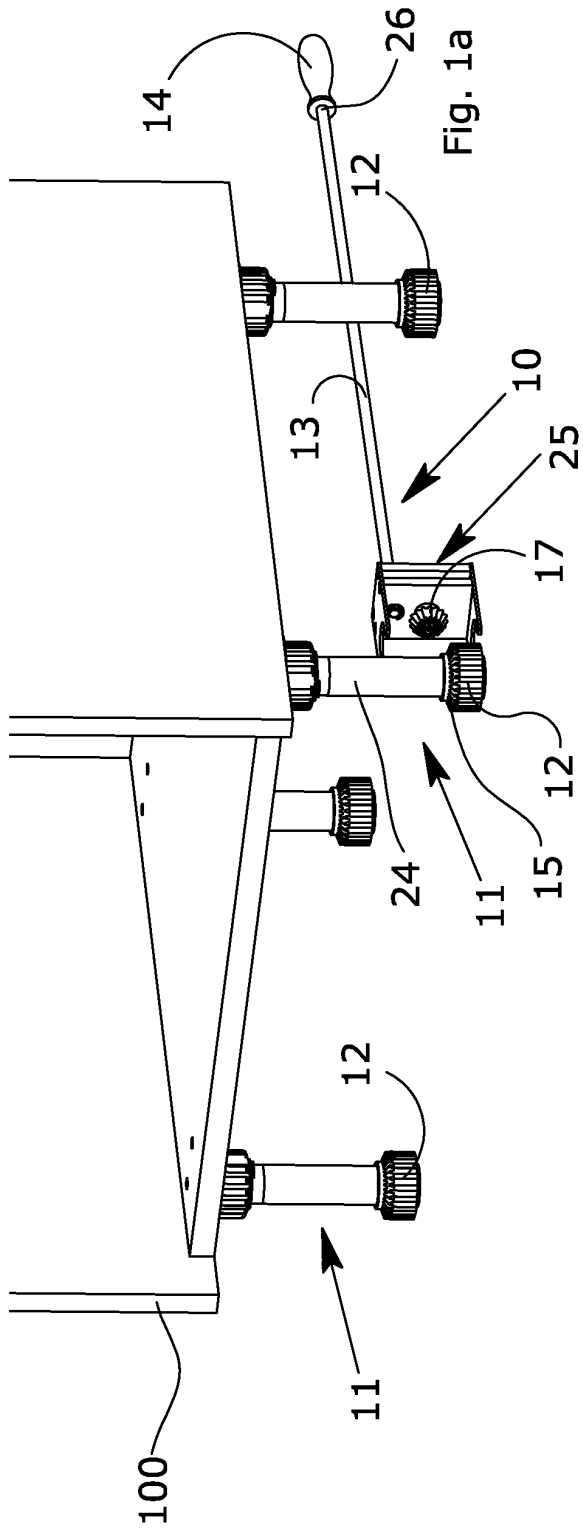
au moins un outil de réglage (10) comprenant :

une barre rotative (13) se prolongeant entre une extrémité de fonctionnement (25) relatif et une extrémité de mouvement (26) relatif ; des premiers moyens d'entraînement (15) associés à l'extrémité de fonctionnement (25) de la barre et configurés pour être déplacés en faisant tourner la barre sur elle-même ;

des seconds moyens d'entraînement (17) positionnés en correspondance du réglet rotatif (12) d'un pied de support (11) et configurés pour faire tourner ce dernier ;

les premier (15) et second (17) moyens d'entraînement pouvant être configurés entre une condition fonctionnelle, dans laquelle ils sont en contact mutuel pour la trans-

- mission mécanique du mouvement de la barre (13) vers le réglelet (12), et une seconde condition non fonctionnelle, dans laquelle les premiers moyens d'entraînement (16) sont détachés par rapport aux seconds moyens d'entraînement (19) ; des moyens (20, 21 et 22) servant à retenir l'extrémité de fonctionnement (25) de la barre (13) en position par rapport au réglelet rotatif (12) pendant la condition de fonctionnement ;
- caractérisé en ce que** les moyens de retenue (20, 21 et 22) comprennent au moins une fourche (21) décalée par rapport aux premiers moyens d'entraînement (15) le long de l'axe principal d'extension de la tige (24) et comportant un siège au moins partiellement formé pour s'adapter à la tige (24) afin d'encercler cette dernière pendant la condition de fonctionnement de manière à exercer une retenue à l'encontre des mouvements latéraux de l'équipement par rapport à la tige (24) sans influencer la rotation du réglelet (12).
2. Équipement (1) selon la revendication 1, **caractérisé en ce que** les moyens de retenue (20, 21 et 22) comprennent un élément de maintien (27) étant positionné de façon élastiquement déformable en correspondance de la fourche (21) et décalé par rapport aux premiers moyens d'entraînement (15) le long de l'axe principal d'extension de la tige (24).
3. Équipement (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le réglelet rotatif (12) comporte une surface axiale supérieure sur laquelle sont formés les premiers moyens d'entraînement (15) ; les seconds moyens d'entraînement (17) étant situés au-dessus des premiers moyens d'entraînement (15).
4. Équipement (1) selon la revendication 1 ou 2, **caractérisé en ce que** le réglelet rotatif (12) comporte un bord (29) qui dépasse davantage par rapport au reste du réglelet rotatif (12) définissant une surface axiale (30) inférieure sur laquelle sont constitués les premiers moyens d'entraînement (15) ; les seconds moyens d'entraînement (17) étant situés en dessous des premiers moyens d'entraînement (15).
5. Équipement (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend une fourche (22) plus basse que la position du réglelet rotatif (12) sur le pied (11) et comportant un siège au moins partiellement formé pour correspondre à une base inférieure (32) du réglelet rotatif (12) ; en condition de fonctionnement, la fourche (22) encerclant une partie de la base inférieure (32) du réglelet rotatif (12) .
6. Équipement (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les premier (15) et second (19) moyens d'entraînement comprennent des dents d'entraînement et définissent ensemble un accouplement à engrenages avec des dents droites ayant des axes parallèles ou incidents de type conique.
7. Équipement (1) selon l'une quelconque des revendications 1 à 5, **caractérisé en ce que** les premiers moyens d'entraînement (15) comprennent une vis sans fin et les seconds moyens d'entraînement (19) comprennent une pluralité de dents.
8. Équipement (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la barre rotative (13) comprend une poignée manuelle (14) positionnée à l'extrémité de mouvement (26) pour faire tourner manuellement la barre (13) autour de son propre axe d'extension.



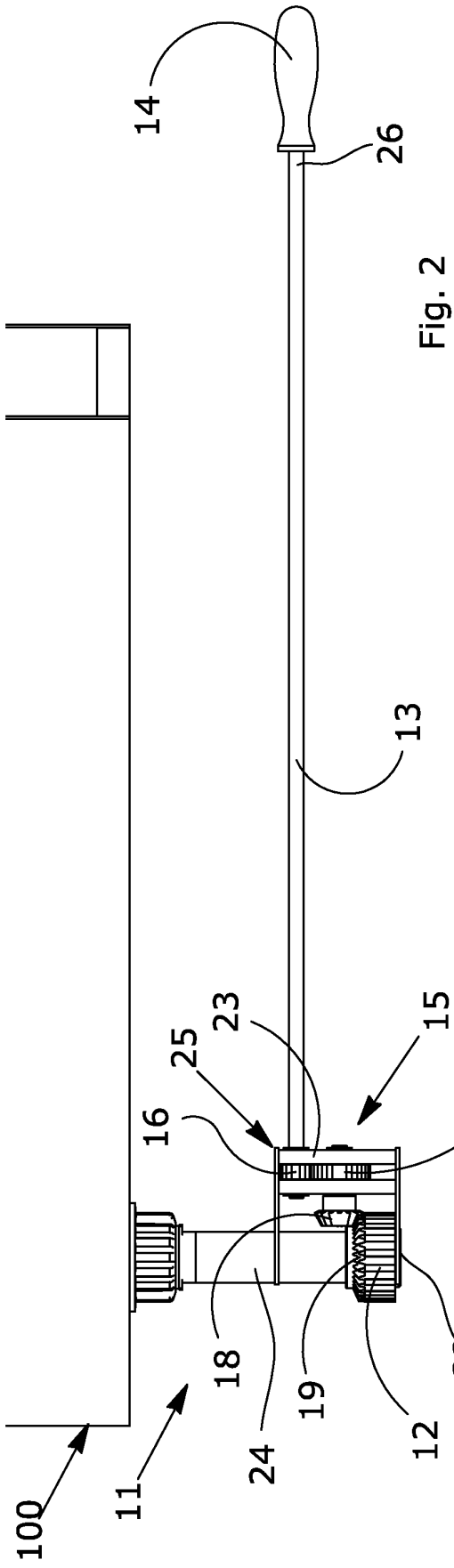


Fig. 2

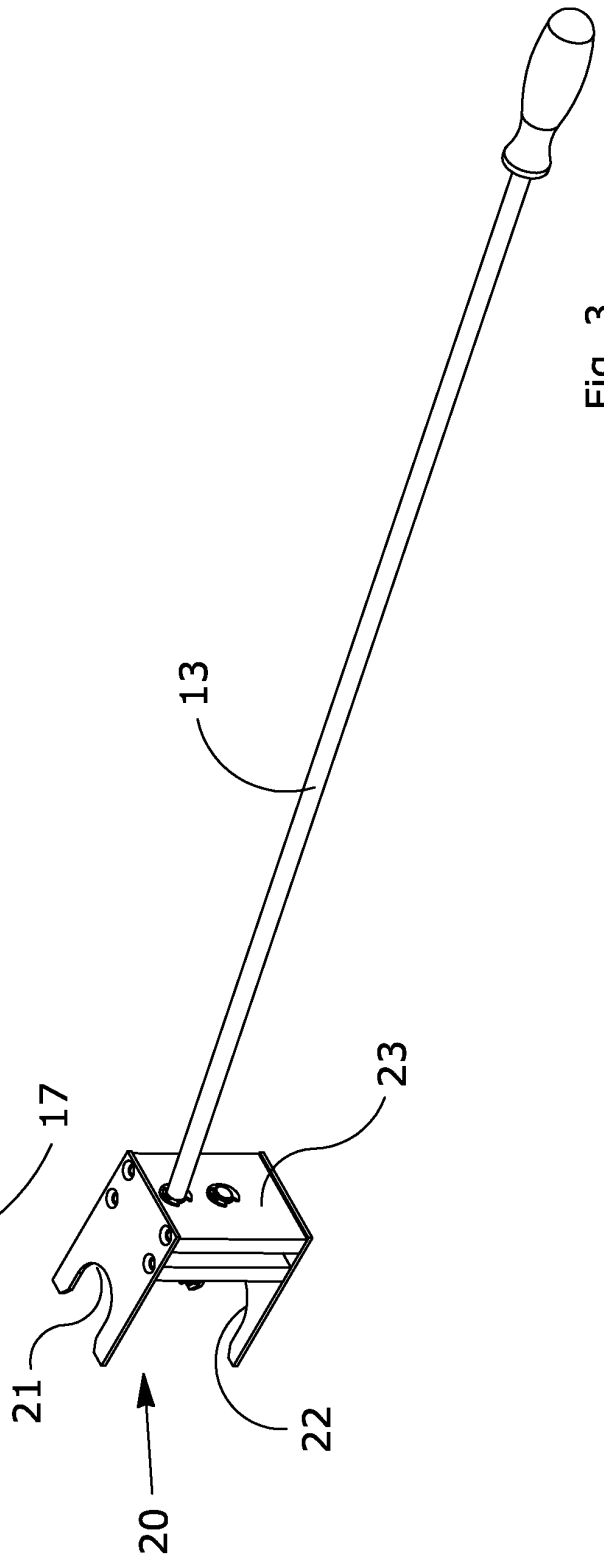
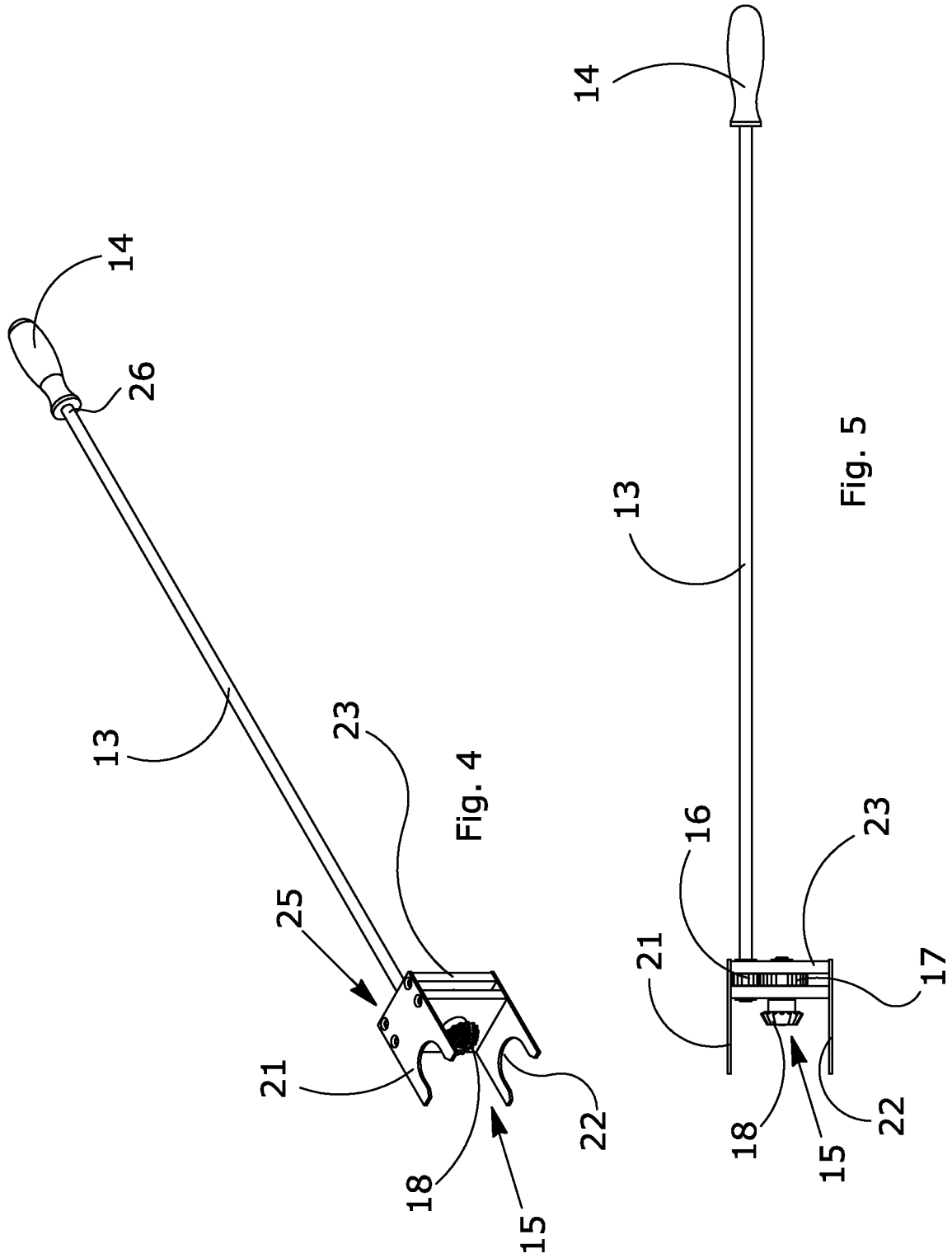


Fig. 3



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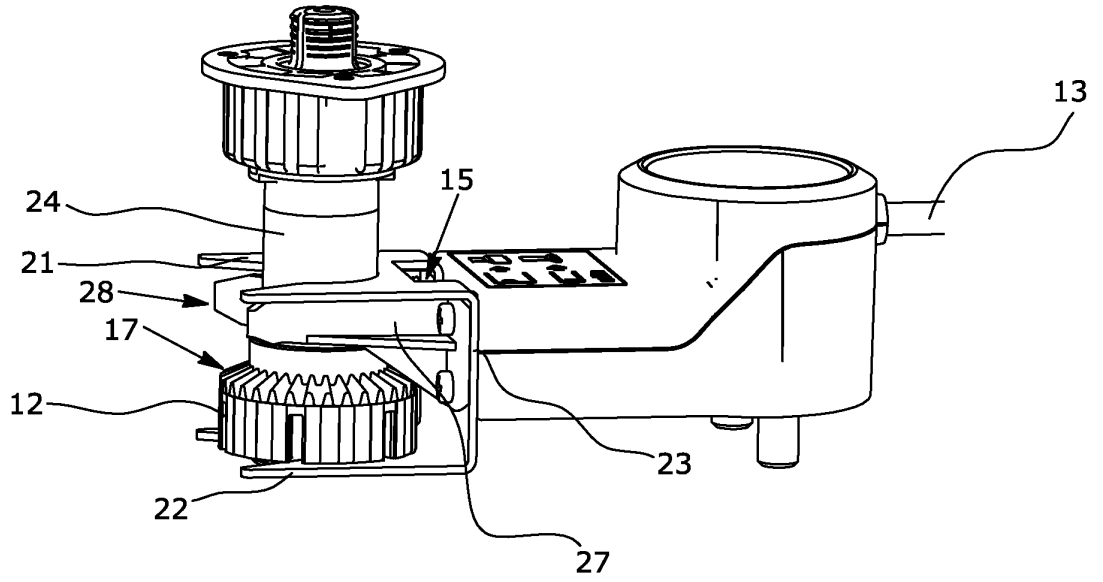


Fig. 6a

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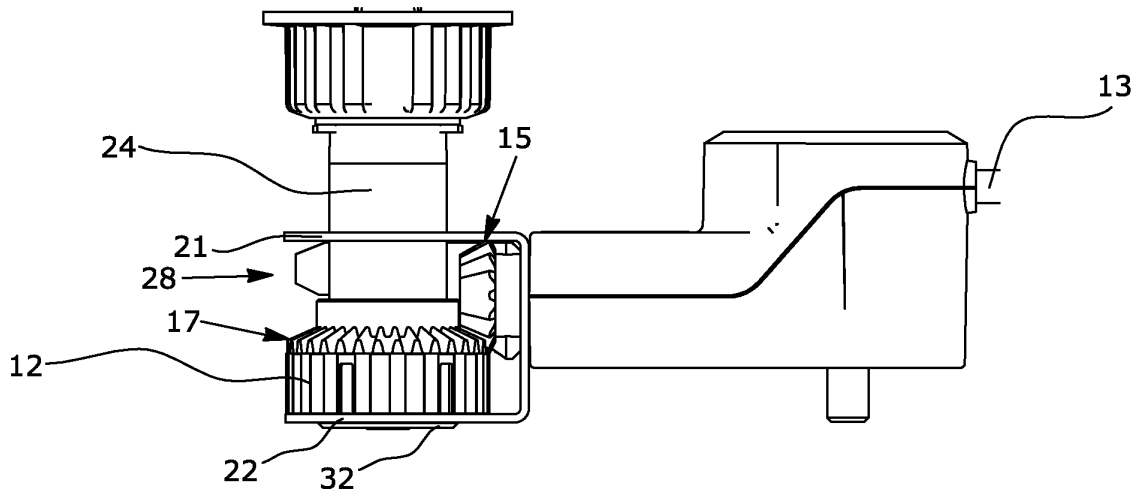


Fig. 6b

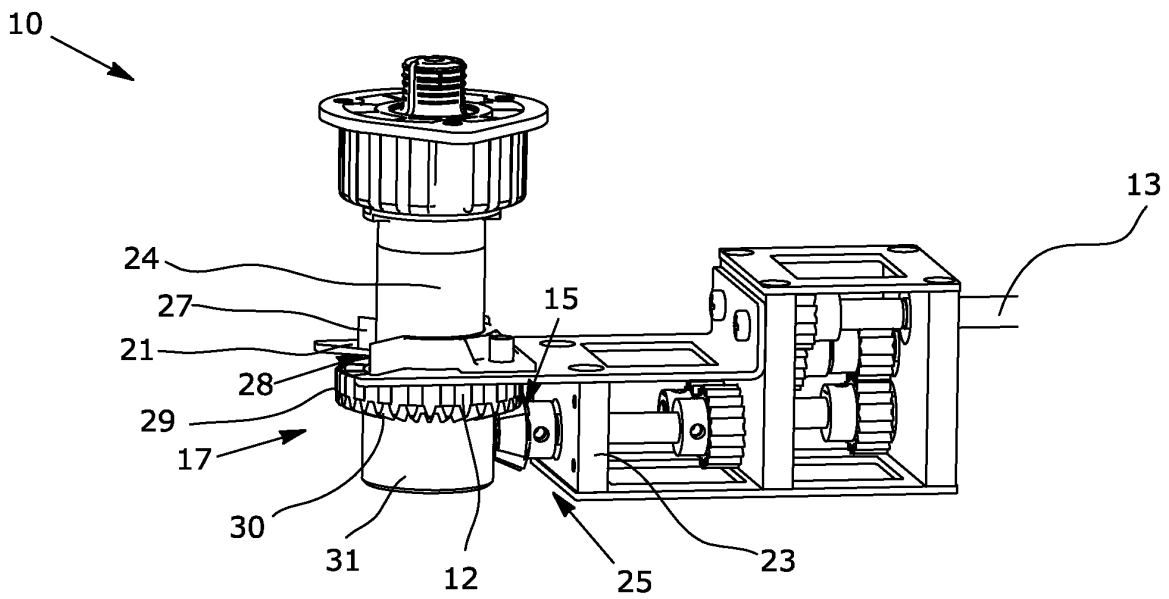


Fig. 7a

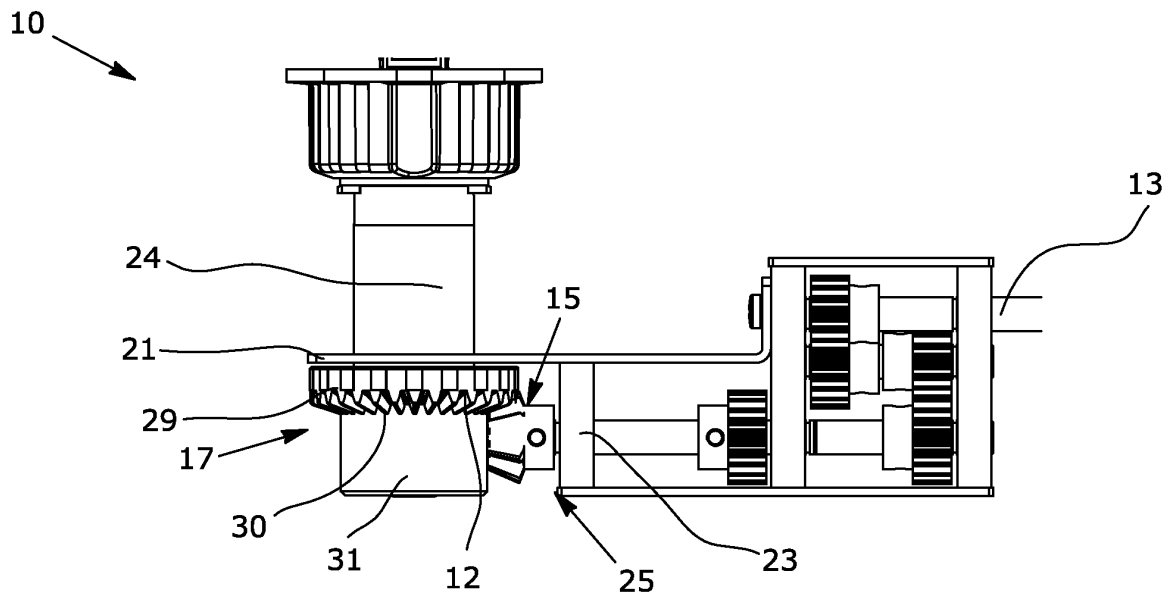


Fig. 7b

REFERENCES CITED IN THE DESCRIPTION

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