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(54) **A HOUSEHOLD APPLIANCE**

HAUSHALTSGERÄT

APPAREIL MENAGER

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(73) Proprietor: **Arçelik Anonim Sirketi
34950 Istanbul (TR)**

(72) Inventors:
• **SAHIN, Abdurrahman,
Arcelik Anonim Sirketi
34950 Istanbul (TR)**
• **AKIN, Tolga,
Arcelik Anonim Sirketi
Tuzla,
34950 Istanbul (TR)**

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Description

[0001] This invention relates to a household appliance comprising a height adjusting mechanism adjusting the foot heights preferably the rear foot heights from the front part that is easily attained.

[0002] In state of art, the position of the household appliance is adjusted with respect to the floor by having the screwed feet carrying the household appliances moved upwards and downwards by the user. It may be difficult or often impossible especially for the feet at the back part to be moved. Thus the back feet are moved by controlling from the front part.

[0003] In known applications, German Patent 19606460 discloses a height adjusting device for household appliance, which moves in the body and is locked by its form.

[0004] In another application in state of art, European Patent Application 1103206 defines a height adjusting mechanism, which provides the required position by a roller.

[0005] French Patent Application 2618208 describes a height adjusting mechanism, comprising foot attached to screws for increasing the height by means of the adjustment links.

[0006] German Utility Model 9421684U defines a household appliance having feet which can be elevated by screws.

[0007] United States Patent 1417639 discloses a mechanism, which elevates by worm gears. DE 74 35 483 U describes a household appliance with a height adjusting mechanism according to the preamble of claim 1.

[0008] The object of this invention is to provide a household appliance comprising a height adjusting mechanism, which levels the foot at unreachable points by preventing the excess of the limit heights.

[0009] The household appliance realized in order to attain above-mentioned objects of the present invention has been illustrated in the attached drawings, wherein;

[0010] Figure 1 is a perspective view of a household appliance.

[0011] Figure 2 is a perspective view of a height adjusting mechanism.

[0012] Figure 3 is an exploded view of a height adjusting mechanism.

[0013] Figure 4 is a top perspective view of the top position of the ring gear wherein a foot, which comprises a moving ring gear and to which a foot stopper ramp is attached.

[0014] Figure 5 is a side perspective view of the position of the ring gear on the foot gear wherein a foot which comprises a moving ring gear and to which a foot stopper ramp is attached.

[0015] Figure 6 is a bottom perspective view of the top position of the ring gear wherein a foot, which comprises a moving ring gear and to which a foot stopper ramp is attached.

[0016] The components shown in the figures have been enumerated as below:

1. Body
2. Foot
3. Foot stopper
4. Worm gear
5. Ring gear
6. Extension shaft
7. Height adjusting mechanism
8. Foot housing
9. Fixing surface
10. Body gear teeth
11. Foot gear teeth
12. Cam housing
13. Cam
14. Foot stopper ramp
15. Button
16. Household appliance
17. Worm gear housing
18. Stopper housing
19. Stopper fixation claw
20. Stopper fixation housing
21. Fixation ring
22. Worm gear fixation snap
23. Worm gear fixation housing
24. Bearing support
25. Ring gear
26. Support Extension
27. Gear pitch
28. Assembly housing
29. Holder

[0017] The household appliance (16) preferably a built-in household appliance which is the subject of the invention comprises a button (15) providing the adjustment of height, a height adjusting mechanism (7) providing the adjustment of the foot heights preferably the rear foot heights from the front part and an extension shaft (6) transferring the command from the button (15) to the height adjusting mechanism.

[0018] Height adjusting mechanism (7) comprises a body (1) protecting itself and its parts, a foot (2) which carries and levels the household appliance (16), an worm gear (4) attached to the extension shaft (6) which moves the foot (2), a ring gear (5) which transfers the level the user uses as worm gear (4) to the foot (2), a foot stopper (3) on the foot (2) which prevents the elevation of the household appliance (16) over than the highest possible level without preventing its being lowered.

[0019] The body (1) comprises a foot housing (8) into which the foot (2) is mounted on the body (1), more than one body gear tooth (10) inside the foot housing (8) and a worm gear housing (17) where the worm gear (4) is bedded.

[0020] The foot (2) comprises more than one foot gear tooth (11) which is activated by moving among the body gear teeth (10), one or more cam housing (12) on the

foot gear tooth (11), a fixing surface (9) for being fixed onto the floor below and a stopper housing (18) in which the foot stopper (3) is placed.

[0021] The extension shaft (6) comprises one or more worm gear fixation housings (23) for being fixed to the height adjusting mechanism (7) to transfer the motion current on the extension shaft (6).

[0022] The worm gear (4) comprises more than one gear pitch (27) for moving the foot (2) in the same number with the rotation amount when it is rotated around its own axis by the extension shaft (6), one bearing support (24) on both sides of the gear pitches for moving above, one or more worm gear fixation snap (22) close to the extension shaft (6) from the bearing supports (24) for attaching with the extension shaft (6) passing through the worm gear fixation housing (23) and one or more fixation ring (21) for preventing the removal of the worm gear fixation snap (22).

[0023] Ring gear (5) comprises more than one ring gear (25) for transferring the drive force from the worm gear (4) to the foot (2), one or more cam (13) for moving on the foot gear tooth (11) sliding in the cam housing (12) and a support extension (26) for fixing into the foot housing (8).

[0024] The body (1) comprises an assembly housing (28) for easy pass of the cam (13) on the top front surface of the foot housing (8) and easy mounting of the ring gear (5) and one or more holders (29) for holding the ring gear (5) on the foot housing (8) following the assembly.

[0025] The foot stopper (3) comprises more than one foot stopper ramp (14) for preventing the excessive elevation of the foot (2) and returning to the prior gear pitch and one or more stopper fixation claw (19) for fixing into the stopper housing (18).

[0026] The foot (2) comprises one or more stopper fixation housing (20) for providing its pass and fixation into the fixation claw (19).

[0027] In a preferred embodiment of the invention, height adjusting mechanism (7) is grouped and fixed to the household appliance (16). When the height adjusting mechanism (7) is being grouped, the ring gear (5) is firstly fixed on the foot housing (8) in the mechanism body (1) in a way to be placed under the holder (29) and the cams (13) in the ring gear (5) are attached by rotating in a way to pass through the cam housing (12). After the foot (2) is attached to the body (1) of the mechanism, the foot stopper (3) is fixed to the foot (2) and after the worm gear (4) is fixed on the worm gear housing (17) in the body (1), the extension shaft (6) is attached to the worm gear (4).

[0028] When the said extension shaft (6) and the worm gear (4) are rotated, it rotates the ring gear (5) and the cams (13) on the ring gear (5) rotate the foot (2) by standing on the walls of the cam housings (12) and foot gear tooth (11) moves the foot (2) in upwards and downwards direction by rotating between the body gear tooth (10) of the mechanism.

[0029] Due to the foot gear tooth (11) on the foot (2)

designed to pass through the gear tooth (10) in the body (1), the foot (2) and the body (1) acts as a screw and a "fixed nut" respectively. As the cam (13) slides inside the cam housing (12), there is no force applied in the vertical direction but only a rotational force is applied. When the ring gear (5) rotates, gear inside rotates on the foot (2) and pulls the foot (2) upwards.

[0030] When the foot stopper (3) is elevated on the body (1), it prevents the leaving of the foot (2) from the body (1) at the limit height. When the ring gear (5) is rotated in the clockwise direction, the cams (13) rotate the foot (2) around its own axis by standing on the foot gear tooth (11) in the cam housing (12). As the foot gear tooth (11) moves in the body gear tooth (10) fixed to the body (1), it elevates the body (1) and the household appliance (16) connected to the body (1) towards the upper part of the foot (2). While the ring gear (5) moves dependent with the body (1) towards the upper parts of the foot (2), the cams (13) move together with the ring gear (5) in the cam housings (12). When the cams (13) reach to the foot stopper (3) at the peak of the foot (2), the cams (13) exceed the foot stopper ramps (14) and enter into the cam housing (12) in which the other cam moves by making the foot stopper ramp (14) flexible when it reaches at the peak point. Similarly when it is continued to be rotated, the cams go on top of the foot stopper ramp (14) and back to its cam housing (12) by making the foot stopper ramp (14) flexible. Therefore both the leaving of the body (1) from the foot (2) is prevented and no matter it is continued to be rotated, ring gear (5) can not rotate the foot (2) around its axis and the elevation of the body (1) in other words of the household appliance (16) is stopped.

[0031] When the ring gear (5) is rotated in the anti-clockwise direction at the last position, the foot stopper ramp (14) lean against the side walls and starts to rotate foot stopper ramp (14) together with the foot (2) it is fixed. In this way, ring gear (5) returns to its lower gear pitch and allows the foot (2) gets into the ring gear (5). When the foot (2) starts to rotate, it lowers the body (1) and the household appliance (16) to which the body (1) is fixed towards the lower part of the foot (2) due to the body gear tooth (10) including the foot gear tooth (11). Meanwhile the cams (13) move towards the lower part of the foot (2) in the cam housings (12) and rotate the foot (2) at the same time. The lowering process of the body (1) and the household appliance (16) to which the body is fixed continues up to the point where the body gear teeth (10) lean against the fixing surface (9) and ring gear (5) can not be rotated by the worm gear (4).

[0032] In an embodiment of the invention, when all of the feet (2) of the household appliance (16) are wanted to be moved independent from each other, at least one height adjusting mechanism (7), at least one button (15) and at least one extension shaft (6) connecting the button (15) with the height adjusting mechanism (7) are used for each foot (2).

[0033] In another embodiment of the invention, when

couple feet (2) of the household appliance (16) are wanted to be moved dependent to each other, the height adjusting mechanism (7) where there are feet wanted to be moved together is controlled by the same button (15) and the same extension shaft (6).

[0034] In another embodiment of the invention, when all of the feet (2) of the household appliance (16) is wanted to be moved dependent to each other, the height adjusting mechanisms (7) where there are feet wanted to be moved together are controlled by the same button (7) and the same extension shaft (6).

[0035] In another embodiment of the invention, the extension shaft (6) and the worm gear (4) are made as one piece and the drive force received from the button is transferred to the foot (2) by means of the ring gear (5).

[0036] Thanks to the application, which is the subject of the invention, the user can elevate the feet (2) of the household appliance (16) without removing the foot (2) from the body and fix it at the desired position.

Claims

1. A household appliance (16) comprising a button (15) providing the height adjustment, feet (2) for holding itself, a height adjusting mechanism (7) adjusting the foot (2) heights preferably the rear foot heights from the front part and an extension shaft (6) transferring the commands from the button (15) to the height adjusting mechanism (7) and with a foot stopper (3) which prevents the elevation of the household appliance (16) over than the highest possible level, further **characterized in that** the foot stopper (3) prevents the elevation of the household appliance (16) over the highest possible level without obstructing foot level adjustment, and leaving from the height adjusting mechanism (7).
2. A household appliance (16) as defined in Claim 1 characterized with a height adjusting mechanism (7) comprising a body (1) carrying and protecting itself and its parts together, an worm gear (4) elevating the foot (2) attached to the activated extension shaft (6) and a ring gear (5) transferring the level adjustment applied by the user as the gear of the worm gear (4) to the foot (2).
3. A household appliance (16) as defined in Claim 1 and 2 characterized with a foot stopper (3) comprising more than one foot gear tooth (11) and foot (2) having one or more cam housing (12), a ring gear (5) having one or more cams (13) for allowing the foot (2) move on the foot gear teeth (11) by sliding in the cam housings (12) and one or more foot stopper ramp (14) for preventing the excessive elevation of the foot (2) and returning to the prior gear pitch.
4. A household appliance (16) as defined in Claim 1 to 3 **characterized by** a body (1) comprising a foot housing (8) in which the foot (2) is mounted, one or more ring gear tooth (10) in the foot housing (8) and an worm gear housing (17) in which the worm gear (4) is embedded.
5. A household appliance (16) as defined in Claim 1 to 4 **characterized by** a foot (2) comprising a fixing surface (9) for being fixed onto the floor below and a stopper housing (18) in which the foot stopper (3) is placed.
6. A household appliance (16) as defined in Claim 1 to 5 **characterized by** an extension shaft (6) comprising one or more worm gear fixation housings (23) for being fixed to the height adjusting mechanism (7) to transfer the motion current on the extension shaft (6).
7. A household appliance (16) as defined in Claim 1 to 6 **characterized by** an worm gear (4) comprising more than one gear pitch (27) for moving the foot (2) in the same number with the rotation amount when it is rotated around its own axis by the extension shaft (6), one bearing support (24) on both sides of the gear pitches for moving above, one or more worm gear fixation snap (22) close to the extension shaft (6) from the bearing supports (24) for attaching with the extension shaft (6) passing through the worm gear fixation housing (23) and one or more fixation ring (21) for preventing the removal of the worm gear fixation snap (22).
8. A household appliance (16) as defined in Claim 1 to 7 **characterized by** ring gear (5) comprising more than one ring gear (25) for transferring the drive force from the worm gear (4) to the foot (2), one or more cam (13) for moving on the foot gear tooth (11) sliding in the cam housing (12) and a support extension (26) for fixing into the foot housing (8).
9. A household appliance (16) as defined in Claim 1 to 7 characterized with a body (1) comprising an assembly housing (28) for easy pass of the cam (13) and easy mounting of the ring gear (5) on the top front surface of the foot housing (8).
10. A household appliance (16) as defined in Claim 1 to 7 **characterized by** a foot stopper (3) comprising one or more stopper fixation claws (19) for being fixed into the stopper housing (18).
11. A household appliance (16) as defined in Claim 1 to 7 **characterized by** a foot (2) comprising one or more stopper fixation housing (20) for being fixed into the fixation claw (19).

Patentansprüche

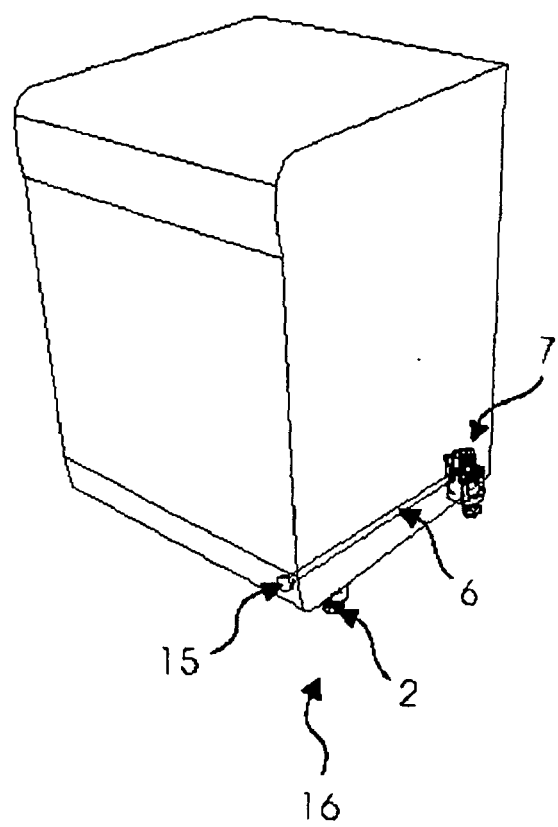
1. Haushaltsgerät (16), das Folgendes umfasst: eine Taste (15), welche die Höheneinstellung ermöglicht, Füße (2) zum Halten des Geräts, einen Höheneinstellmechanismus (7) zum Einstellen der Höhe der Füße (2), vorzugsweise der hinteren Füße, von dem vorderen Teil aus, und eine Verlängerungswelle (6), welche die Befehle von der Taste (15) an den Höheneinstellmechanismus (7) überträgt, und einen Fußanschlag (3), der das Anheben des Haushaltsgeräts (16) über die höchstmögliche Stufe hinaus verhindert, ferner **gekennzeichnet dadurch, dass** der Fußanschlag (3) das Anheben des Haushaltsgeräts (16) über die höchstmögliche Stufe hinaus verhindert, ohne die Fußeinstellung zu behindern, und ausgehend von dem Höheneinstellmechanismus (7).
2. Haushaltsgerät (16) nach Anspruch 1, **gekennzeichnet durch** einen Höheneinstellmechanismus (7), Folgendes umfasst: einen Grundkörper (1), der sich selbst und seine Bauteile trägt und schützt, und ein Schneckenrad (4), das den Fuß (2) anhebt, der an der aktivierten Verlängerungswelle (6) angebracht ist, und ein Hohlrad (5), das die Höheneinstellung, die von dem Benutzer angewandt wird, als Rad des Schneckenrads (4) auf den Fuß (2) überträgt.
3. Haushaltsgerät (16) nach Anspruch 1 und 2, **gekennzeichnet durch** einen Fußanschlag (3), der Folgendes umfasst: mehr als eine Fußverzahnung (11) und einen Fuß (2) mit einem oder mehreren Nockengehäusen (12), ein Hohlrad (5) mit einem oder mehreren Nocken (13), die es ermöglichen, dass der Fuß (2) sich an der Fußverzahnung (11) bewegt, indem sie in die Nockengehäuse (12) gleiten, und eine oder mehrere Fußanschlagrampen (14), die dazu dienen, eine übermäßige Anhebung des Fußes (2) zu verhindern, und in die vorangehenden Radeinteilung zurückzukehren.
4. Haushaltsgerät (16) nach Anspruch 1 bis 3, **gekennzeichnet durch** einen Grundkörper (1), der Folgendes umfasst: ein Fußgehäuse (8), in dem der Fuß (2) angeordnet ist, eine oder mehrere Hohlradverzahnungen (10) in dem Fußgehäuse (8), und ein Schneckenradgehäuse (17), in dem das Schneckenrad (4) eingebettet ist.
5. Haushaltsgerät (16) nach Anspruch 1 bis 4, **gekennzeichnet durch** einen Fuß (2), der Folgendes umfasst: eine Befestigungsfläche (9) zum Befestigen am darunter liegenden Boden, und ein Anschlaggehäuse (18), in dem der Fußanschlag (3) angeordnet ist.
6. Haushaltsgerät (16) nach Anspruch 1 bis 5, **gekennzeichnet durch** eine Verlängerungswelle (6), die Folgendes umfasst: ein oder mehrere Schneckenradbefestigungsgehäuse (23) zum Befestigen an dem Höheneinstellmechanismus (7), um den Bewegungsstrom an der Verlängerungsachse (6) zu übertragen.
7. Haushaltsgerät (16) nach Anspruch 1 bis 6, **gekennzeichnet durch** ein Schneckenrad (4), das Folgendes umfasst: eine oder mehrere Radeinteilungen (27) zum Bewegen des Fußes (2) entsprechend der Drehmenge, wenn es von der Verlängerungswelle (6) um seine eigene Achse gedreht wird, ein Traglager (24) auf beiden Seiten der für die Bewegung vorgesehenen Radeinteilungen, eine oder mehrere Schneckenradbefestigungsklemmen (22) nahe der Verlängerungswelle (6) von den Traglagern (24) für eine Befestigung an der Verlängerungswelle (6), die durch das Schneckenradbefestigungsgehäuse (23) verläuft, und einen oder mehrere Befestigungsringe (21), um das Lösen der Schneckenradbefestigungsklemmen (22) zu verhindern.
8. Haushaltsgerät (16) nach Anspruch 1 bis 7, **gekennzeichnet durch** ein Hohlrad (5), das Folgendes umfasst: mehr als ein Hohlrad (25) zum Übertragen der Antriebskraft von dem Schneckenrad (4) auf den Fuß (2), einen oder mehrere Nocken (13) zum Bewegen an der Fußverzahnung (11), die in das Nockengehäuse (12) gleiten, und eine Stützverlängerung (26) zum Befestigen im Fußgehäuse (8).
9. Haushaltsgerät (16) nach Anspruch 1 bis 7, **gekennzeichnet durch** einen Grundkörper (1), der Folgendes umfasst: ein Montagegehäuse (28) zum leichten Durchtreten des Nockens (13) und leichten Anbringen des Hohlrads (5) an der vorderen Oberfläche des Fußgehäuses (8).
10. Haushaltsgerät (16) nach Anspruch 1 bis 7, **gekennzeichnet durch** einen Fußanschlag (3), der Folgendes umfasst: eine oder mehrere Anschlagbefestigungsklauen (19) zum Befestigen in dem Anschlaggehäuse (18).
11. Haushaltsgerät (16) nach Anspruch 1 bis 7, **gekennzeichnet durch** einen Fuß (2), der Folgendes umfasst: ein oder mehrere Anschlagbefestigungsgehäuse (20) zum Befestigen in der Befestigungsklaue (19).

Revendications

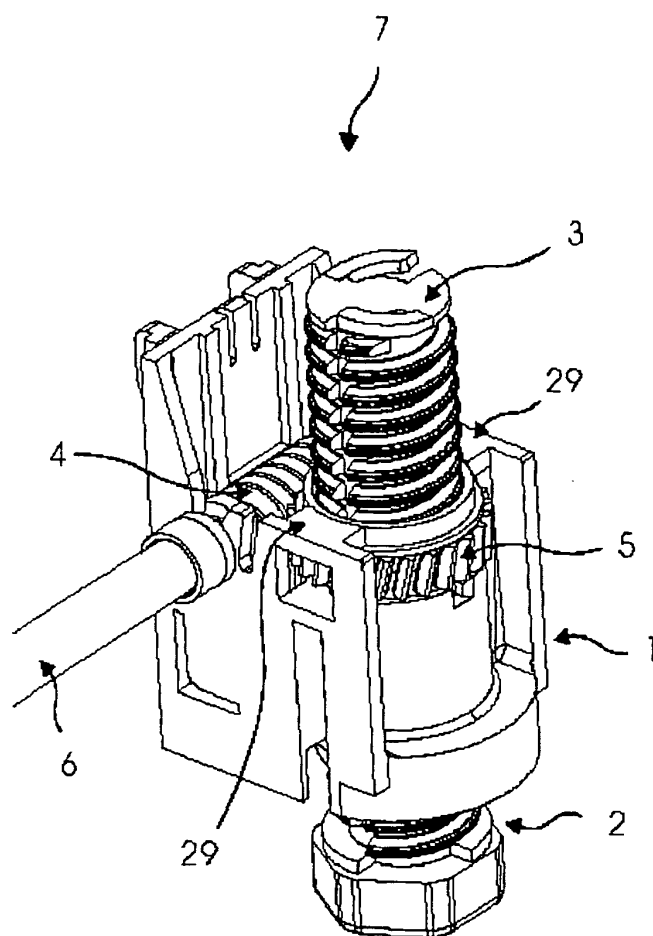
1. Un appareil de ménage (16) comprenant un bouton (15) assurant l'ajustement d'hauteur, des pieds (2) pour que l'appareil puisse rester en équilibre, un mé-

- canisme d'ajustement d'hauteur (7) qui sert à ajuster l'hauteur des pieds (2), de préférence l'hauteur du pied arrière par rapport à la partie frontale, et un arbre d'extension (6) qui transmet les commandes depuis le bouton (15) jusqu'au mécanisme d'ajustement d'hauteur (7) avec un bouchon de pied (3) empêchant la montée de l'appareil de ménage (16) au-dessus du niveau le plus haut possible, **caractérisé en ce que** ledit bouchon de pied (3) empêche la montée de l'appareil de ménage (16) au-dessus du niveau le plus haut possible sans obstruer le pied et l'ajustement de niveau, et avec un mécanisme de contrôle sur le mécanisme d'ajustement d'hauteur (7).
2. Un appareil de ménage (16) selon la revendication 1, **caractérisé par** un mécanisme d'ajustement d'hauteur (7) comprenant un corps (1) qui se protégerait et veillerait à l'entretien de soi-même et à celui de l'ensemble de ses parties, un équipement de vis sans fin (4) qui élève le pied (2) attaché à l'arbre d'extension (6) activé, et un équipement de sonnerie (5) qui transmet l'ajustement de niveau appliqué par l'utilisateur depuis la vis sans fin de l'équipement de vis sans fin (4) sur le pied (2).
 3. Un appareil de ménage (16) selon les revendications 1 et 2, **caractérisé par** un bouchon de pied (3) comprenant plusieurs équipements dentés de pied (11) et un pied (2) qui a une ou plusieurs boîte à came (12), un équipement de sonnerie (5) qui porte une ou plusieurs came (13) pour permettre au pied (2) de bouger sur l'équipement denté de pied (11) en glissant dans la boîte à came (12), et une ou plusieurs rampe de bouchon de pied (14) pour empêcher la montée excessive du pied (2) et assurer le retour de l'équipement à la position initiale.
 4. Un appareil de ménage (16) selon les revendications de 1 à 3, **caractérisé par** un corps (1) comprenant une boîte à pied (8) dans laquelle le pied (2) est monté, un ou plusieurs équipement denté de sonnerie (10) dans ladite boîte à pied (8) et une boîte à équipement de vis sans fin (17) dans laquelle l'équipement de vis sans fin (4) est placé.
 5. Un appareil de ménage (16) selon les revendications de 1 à 4, **caractérisé par** un pied (2) comprenant une surface de fixation (9) pour assurer la fixation du pied sur le sol au-dessous et une boîte à bouchon (18) dans laquelle le bouchon de pied (3) est placé.
 6. Un appareil de ménage (16) selon les revendications de 1 à 5, **caractérisé par** un arbre d'extension (6) comprenant une ou plusieurs boîte de fixation d'équipement de vis sans fin (23) pour assurer la fixation sur le mécanisme d'ajustement d'hauteur (7) et la transmission du mouvement courant sur l'arbre d'extension (6).
 7. Un appareil de ménage (16) selon les revendications de 1 à 6, **caractérisé par** un équipement de vis sans fin (4) comprenant plusieurs niveau d'équipement (27) pour faire bouger le pied (2) le même nombre de fois que le nombre de rotation réalisée par l'arbre d'extension (6) autour de son axe, un support de maintien (24) sur les deux côtés du niveau d'équipement pour assurer le mouvement au-dessus, un ou plusieurs fermoir de fixation d'équipement de vis sans fin (22) sur le support de maintien (24), près de l'arbre d'extension (6) pour assurer l'attachement à l'arbre d'extension (6), passant par la boîte de fixation d'équipement de vis sans fin (23), et un ou plusieurs fixation de sonnerie (21) pour empêcher le détachement du fermoir de fixation d'équipement de vis sans fin (22).
 8. Un appareil de ménage (16) selon les revendications de 1 à 7, **caractérisé par** un équipement de sonnerie (5) comprenant plusieurs équipements de sonnerie (25) pour la transmission de la force de conduite depuis l'équipement de vis sans fin (4) au pied (2), une ou plusieurs came (13) pour permettre au pied de bouger sur l'équipement denté de pied (11) en glissant dans la boîte à came (12), et une extension de support (26) pour la fixation dans la boîte à pied (8).
 9. Un appareil de ménage (16) selon les revendications de 1 à 7, **caractérisé par** un corps (1) comprenant une boîte d'assemblage (28) pour le passage aisé de la came (13) et le montage aisé de l'équipement de sonnerie (5) au-dessus de la surface frontale de la boîte à pied (8).
 10. Un appareil de ménage (16) selon les revendications de 1 à 7, **caractérisé par** un bouchon de pied (3) comprenant un ou plusieurs crochet de fixation de bouchon (19) pour assurer la fixation dans la boîte à bouchon (18).
 11. Un appareil de ménage (16) selon les revendications de 1 à 7, **caractérisé par** un pied (2) comprenant une ou plusieurs boîte à bouchon de fixation (20) pour assurer la fixation des crochets (19).

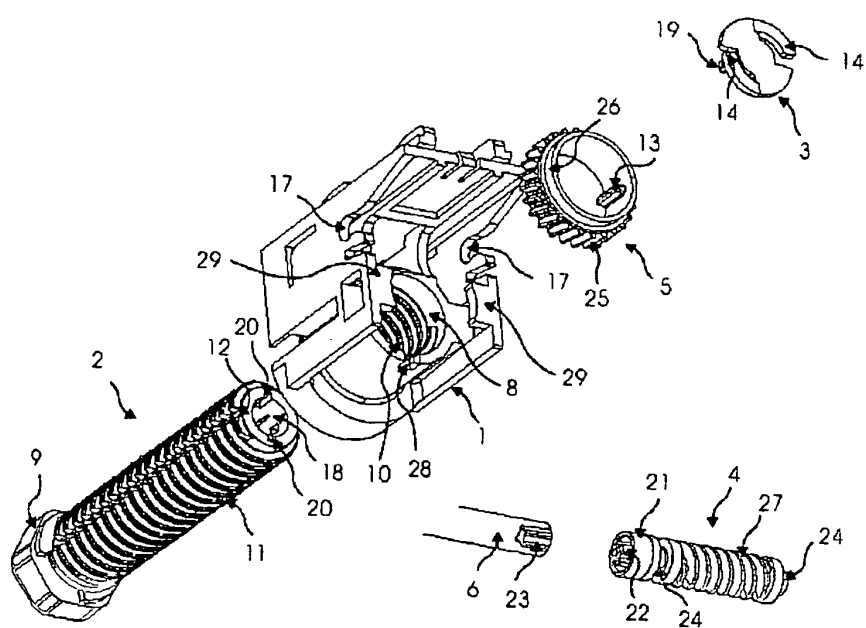
[Fig. 001]



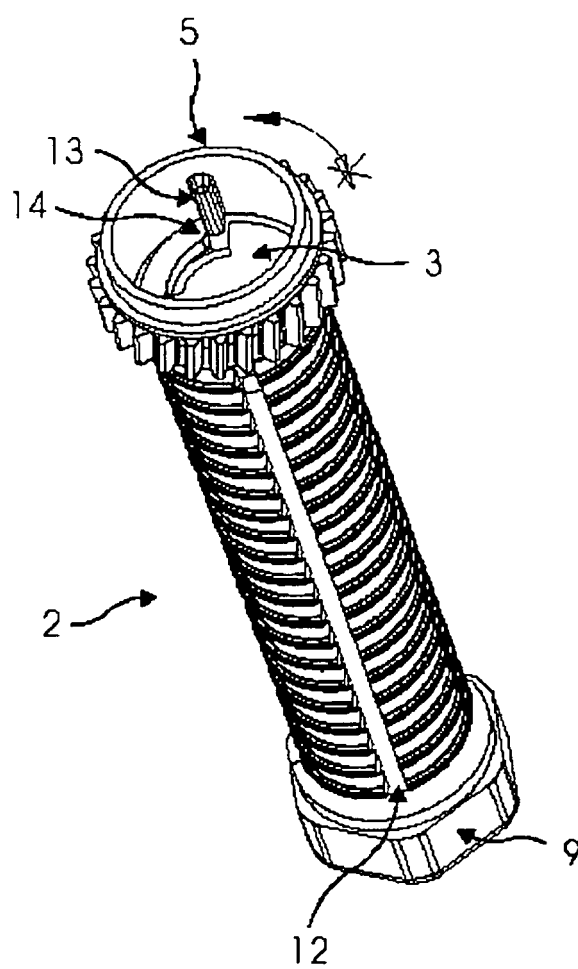
[Fig. 002]



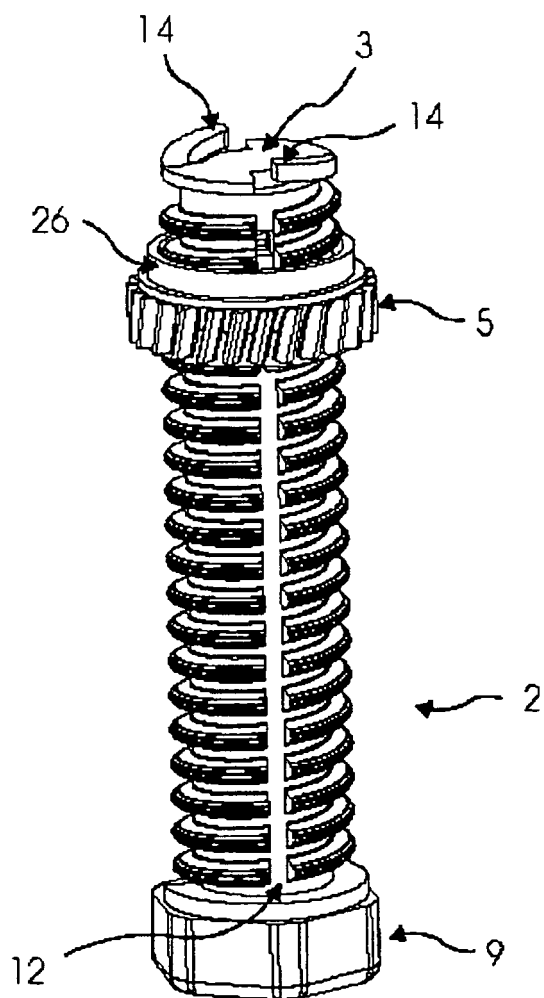
[Fig. 003]



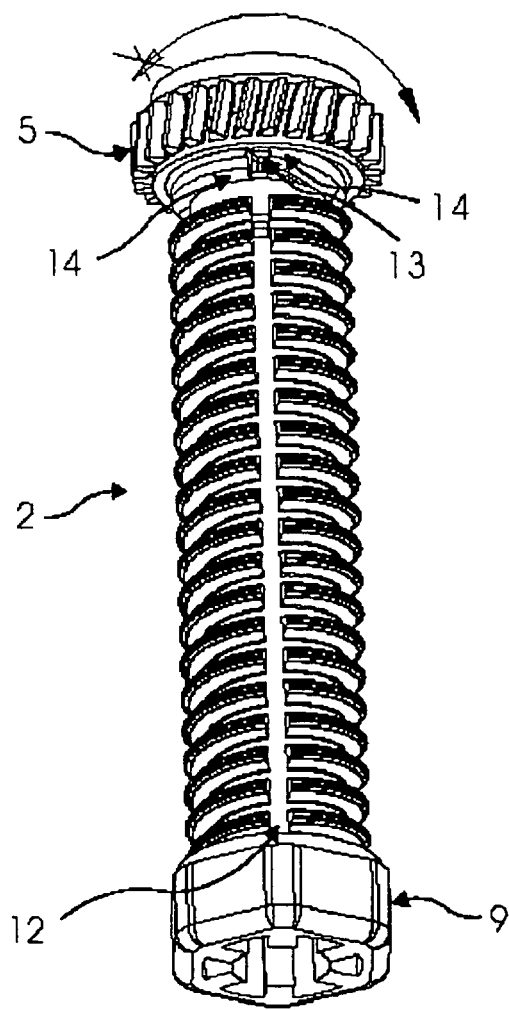
[Fig. 004]



[Fig. 005]



[Fig. 006]



REFERENCES CITED IN THE DESCRIPTION

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