

(19)



(11)

EP 1 503 642 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
13.05.2009 Bulletin 2009/20

(21) Application number: **03726963.6**

(22) Date of filing: **28.03.2003**

(51) Int Cl.:
A47B 91/02 (2006.01)

(86) International application number:
PCT/ZA2003/000043

(87) International publication number:
WO 2003/094665 (20.11.2003 Gazette 2003/47)

(54) **DEVICE TO PREVENT ROCKING OF TABLES**

VORRICHTUNG ZUR VERMEIDUNG DES KIPPENS VON TISCHEN

DISPOSITIF PERMETTANT D'EVITER QUE DES TABLES NE BRANLENT

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**

(30) Priority: **07.05.2002 ZA 200203604**

(43) Date of publication of application:
09.02.2005 Bulletin 2005/06

(73) Proprietor: **Gild, Keith**
3630 Durban (ZA)

(72) Inventor: **Gild, Keith**
3630 Durban (ZA)

(74) Representative: **Townsend, Victoria Jayne et al**
Fry Heath & Spence LLP
The Gables
Massetts Road
Horley, Surrey RH6 7DQ (GB)

(56) References cited:
DE-B- 1 264 709 **DE-U- 29 803 366**
GB-A- 518 642 **US-A- 2 857 707**

EP 1 503 642 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

TECHNICAL FIELD OF THE INVENTION

[0001] This invention relates to a device for stabilizing tables in particular and preventing the rocking of such articles located on uneven surfaces or having legs of slightly different length.

BACKGROUND ART

[0002] Restaurateurs in particular, are constantly frustrated by having to try to stabilize tables which rock due to the unevenness of floors. Tables must be moved constantly for cleaning purposes and to re-arrange settings for different-sized groups. Typically, the problem is attempted to be solved using wedges in the form of folded paper or even wooden wedges, but most often this achieves very little. A slight movement of the table requires readjustment, adding to the frustration of waiters, patrons and the like.

[0003] It is an object of this invention to provide a stabilizer which is not only effective, but inexpensive to manufacture, easy to operate and further which is required to be fitted to only one leg of a table to be stabilized.

[0004] One example of a device used to address this problem is disclosed in GB 518642 which discloses use of a cam device in relation to a table leg to adjust the table by height with respect to other legs of the table.

DISCLOSURE OF THE INVENTION

[0005] According to the invention, a device for stabilizing tables, chairs and other similar articles including a cam means mountable at the lower end of a leg of the article and being rotatable from a first position which, when the other legs of the article are flush with the surface upon which it is located, is spaced apart from the surface, and a second position in which a portion of the cam means is in contact with the surface, such that the article is not susceptible to rocking when the cam means is in the second position, **characterised in that** rotation of the cam is non-reversible, rotation being possible in one direction only.

[0006] In the one form of the invention, the cam comprises a wheel or pair of wheels. The wheel operates as a cam by engaging a transverse shaft (wheel axle) at a point remote from the centre of the wheel. The eccentric attachment causes raising or lowering of the leg upon rotation of the wheel.

[0007] In the preferred form of the invention, the wheel has braking means associated with the axle. The brake means preferably comprises a pawl and the axle comprises a ratchet-wheel. Rotation of the wheel about the axle in the clockwise direction is uninhibited, but attempted rotation in the anti-clockwise direction results in immediate engagement of the pawl with the inclined teeth of the ratchet-wheel to act as a brake.

[0008] The ratchet-wheel is housed within the hollow body of the wheel and is rotatable about the wheel hub. Integral with the ratchet wheel is a central cylindrical shaft which forms the wheel axle which extends through the wheel hub, through an opening to engage a mounting bracket.

[0009] In the preferred form of the invention, the mounting bracket for attaching the device to the leg of the article is a right-angled bracket, one portion of which is securable to the leg of the table etc., the other providing a mounting point for the eccentric wheel. A mounting screw fastens the bracket to a wheel axle.

[0010] In this form, mounting screw engages a central bore in the axle, the outer end of the axle including a polygonal protrusion for engaging a complimentary opening in the bracket. This ensures that the axle is fixed to the bracket and hence the table leg, with the wheel rotating about the axle. The bracket is easily screwed or otherwise fastened to the table leg.

[0011] In an alternative form of the invention, the cam comprises a two-wheeled castor having an eccentrically located transverse axle, the wheel including a weighted section biasing the wheel towards a particular orientation and enabling gravity-assisted rotation of the wheel.

[0012] This form of the invention may be secured to the leg of the table or other article by means of a suitable clamp or the like which is in turn secured to a shaft including at the lower end thereof a short transverse tubular section for receiving the transverse shaft of the cam. It is important to note that the angle of the leg does not affect the operation of the device in that regardless of whether the leg is vertical, horizontal or at an angle therebetween, the cam will always engage the ground at the lowest point in its rotation path. The transverse tubular section is provided with a clutch bearing with which the transverse shaft of the wheel is rotatable in one direction only.

[0013] In use, the device is fitted to one leg of a table for example. When the table is located in a desired position and it is found that the table is not stable due to unevenness of the floor, the cam wheel is rotated clockwise into a position in which the rocking of the table is eliminated as the cam has effectively filled the gap between the floor and the bottom of the leg to which it is attached. At this point the cam cannot be rotated in the reverse direction due to the non-reversible nature of the cam.

[0014] The diameter of the wheel will determine the size of the leg lengthening or put differently, the size of the gap which the device will take up to eliminate unsteadiness. The advantage of the device is that incremental adjustments are possible down to fractions of a millimetre ensuring that the exact height adjustment required is achievable.

[0015] The device of the invention may be retro-fitted to an existing table or may be supplied integral with a table. Thus, according to a second aspect of the invention, a table or the like includes a cam means attached to at

least one leg thereof, the cam means being movable from a first position which, when the other legs of the article are flush with the surface upon which it is located, is spaced apart from the surface, and a second position in which a portion of the cam means is in contact with the surface, such that the article is not susceptible to rocking when the cam means is in the second position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] An embodiment of the preferred form of the invention is described below with reference to the accompanying drawings in which:

Figure 1(a) is an isometric view of the legs of a 4-legged table fitted with a device according to the invention;
 Figures 1(b) and 2 are magnified isometric side views of a device of Figure 1 in minimum and maximum leg lengthening positions respectively;
 Figures 3 and 4 are identical views to Figures 1 and 2 but with the cover plate removed;
 Figure 5 is a side view with the brake disengaged;
 Figures 6 and 7 are side views of the device with the brakes engaged in the position of Figures 1 and 3; 2 and 4 respectively;
 Figures 8 and 9 are rear views of the device in the position of Figures 1, 3 and 2, 4 respectively,
 Figure 10 is an exploded isometric view of the device;
 Figure 11 is a magnified isometric view of the front of the wheel, ratchet-wheel and brake;
 Figure 12 is a rear view of the components of Figure 11;
 Figure 13 is a front isometric view of the bracket and cover plate;
 Figure 14 is a rear isometric view of the components of Figure 13.

DESCRIPTION OF THE BEST MODE

[0017] In the drawings, a device according to the invention comprises an eccentric wheel 10 fastened at or near the base of a table leg 12. The eccentric wheel operates as a cam and when rotated, effectively raises the table leg by any desired amount between the minimum and maximum positions shown in Figures 1 and 2 respectively. The wheel is rotatable in one direction only, namely clockwise. Attempted rotation in an anti-clockwise direction results in a brake engaging. This allows the device to be set at the correct position to prevent it from rocking.

[0018] The wheel is mount on a table leg using a bracket 14 fastened to the leg by a bolt or screw. Where the table has built-in levellers, one may be removed and replaced with the device of the invention. Mounting screw 16 fastens the bracket to the wheel axle 18 which protrudes from the rear of the wheel hub 20. The rear of the axles has a central bore 22 of receiving the mounting

screw and is further square in section. The bracket includes an identical square hole 24 for engaging the square rear 23 of the axle, preventing rotation of the axle relative to the bracket and hence the table leg. As shown in Figure 12, the axle 18 comprises a central cylindrical shaft 26 affixed at the inner end to a ratchet-wheel 28 of greater diameter than the cylindrical shaft 26. The channel formed between the shaft and the ratchet-wheel fits onto the wheel hub 20 and rotates therearound.

[0019] The ratchet-wheel 28 is housed within the hollow body of the wheel 10. The braking mechanism associated with the axles comprises a pawl 30 pivotally mounted at 32 and which includes a bracing element 34. This arrangement permits inhibited clockwise rotation of the wheel about the axle, but rotation in an anti-clockwise direction causes immediated engagement of teeth 36 of the brake with the teeth 38 of the ratchet-wheel.

[0020] As can be seen from Figures 3 through 7, the wheel 10 is mounted eccentrically, the wheel axle 18 and the wheel hub 20 being located between the centre of the wheel and the edge thereby. Rotation thereof consequently follows a path which causes the distance from the centre of the axle 18 to the ground (distance A - A in Figure 5) to progressively increase to a maximum measured by distance B - B in Figures 6 and 7. This rotation therefore effectively increases the gap between the bottom of the leg 12 and the floor to stabilise the table and prevent it from rocking. This is further illustrated by comparing the distance between the base of the leg 40 and the base of the wheel 42 (distances X-Y and X-Z in Figures 8 and 9). The rotation may be stopped and locked at any point between the positions shown in Figures 3 and 4 to effectively reduce the gap by the amount required to stabilise the table. Further clockwise rotation towards the starting point shown in Figure 3 results in the table become progressively less stable.

DESCRIPTION OF ALTERNATIVE MODE OF THE INVENTION

[0021]

Figures 15, 16 and 17 are isometric front views of the device according to the invention in three different positions equating to three (of many) possible height adjustments;

Figure 18 is an exploded isometric view of the device; Figure 19 is an isometric view of the table with the device attached to one leg; and

Figure 20 is a magnified view of the lower end of the table leg.

[0022] In Figures 15 to 18, a device 50 according to the invention comprises a two-wheeled castor having an eccentrically located transverse axle 52 to which is attached a vertical shaft 54. The vertical shaft is clamped (Figures 19 and 20) to a leg 56 of a table 58 to be stabilized. In this illustration the table leg is vertical and hence

shaft 54 is vertically orientated. Should the table leg be horizontal or angled, the shaft would simply be orientated at a similar angle for ease of clamping.

[0023] At least one wheel of the castor includes a weighted segment 60 in the form of a metal insert which biases the wheel to the desired orientation under the action of gravity.

[0024] The castor acts as a non-reversible cam which only turns in a clock-wise direction and accordingly, once the wheels have been rotated into the required location in which the effective length of the table leg has been increased, the wheels cannot roll backwards and reverse the leg extension. The non-reversible motion of the cam is achieved by mounting the transverse axle, which may be provided in two sections 52a and 52b, within a clutch bearing 64 provided within the tubular section 66 at the base of shaft 54. The clutch bearing permits rotation in one direction only.

[0025] In Figures 15 to 17, three different positions or orientations of the device are illustrated. In Figure 1, the transverse shaft or axles 52 of the device is located at the top of the wheel and hence in a position to give the greatest height extension. In Figure 16, the axle is approximately at the midpoint of the wheel and the extension provided is approximately half of that of Figure 1. In Figure 17, however, the extension given by the device is minimal.

[0026] In Figures 19 and 20, the device of the invention is shown locked in a position in which the table 58 is stabilized, level and will not rock. Clamp 62 mounts the device onto the table leg 56.

Claims

1. A device for stabilizing tables, chairs and other similar articles including a cam means (10) mountable at the lower end of a leg (12) of the article and being rotatable from a first position which, when the other legs of the article are flush with the surface upon which it is located, is spaced apart from the surface, and a second position in which a portion of the cam means (10) is in contact with the surface, such that the article is not susceptible to rocking when the cam means (10) is in the second position, **characterised in that** rotation of the cam is non-reversible, rotation being possible in one direction only.
2. A device according to claim 1, **characterised in that** the cam comprises an eccentric wheel (10), the eccentric attachment of the wheel axle (18) to the wheel resulting in raising and/or lowering of the leg (12) upon rotation of the wheel.
3. A device according to claim 2, **characterised in that** the wheel has braking means associated with the wheel axle.

4. A device according to claim 3, **characterised in that** the braking means comprises a pawl (30) and the axle comprises a ratchet-wheel (28).
5. A device according to claim 4, **characterised in that** rotation of the wheel (10) about the wheel axle in the clock-wise direction results in immediate engagement of the pawl (30) with the inclined teeth of the ratchet-wheel (28) to act as a brake.
6. A device according to claim 4, **characterised in that** the ratchet-wheel (28) is housed within the hollow body of the wheel and is rotatable about the wheel hub (20), the ratchet-wheel (28) including an integral central cylindrical shaft which forms the wheel axle which extends through the wheel hub (20) through an opening to engage a mounting bracket (14).
7. A device according to claim 2 **characterised in that** a mounting screw (16) engages a central bore (22) in the wheel axle (18) the outer end of the wheel axle (18) including a polygonal protrusion (23) for engaging a complimentary opening (24) in a mounting bracket (14).
8. A device according to claim 2, **characterised in that** the cam (10) comprises a two-wheeled castor having an eccentrically located transverse axle (52), the wheel including a weighted section (60) biasing the wheel towards a particular orientation and enabling gravity-assisted rotation of the wheel.
9. A device according to claim 8, **characterised in that** the castor is secured to the leg of the table or other article by means of a suitable clamp or the like which is in turn secured to a shaft (54) including at the lower end thereof a short transverse tubular section (66) for receiving the transverse shaft (54) of the cam.
10. A device according to claim 9, **characterised in that** the transverse tubular section (66) is provided with a clutch bearing with which the transverse shaft (54) of the wheel is rotatable in one direction only.

Patentansprüche

1. Eine Vorrichtung zur Stabilisierung von Tischen, Stühlen und anderen ähnlichen Gegenständen wobei ein Nockensystem (10) mit einbegriffen ist, das am unteren Ende eines Beins (12) des Gegenstandes anzubringen ist und in der ersten drehbaren Stellung von der Oberfläche entfernt ist, während die anderen Beine des Gegenstandes eben mit der Oberfläche worauf er steht sind und eine zweite Stellung hat, in der ein Teil des Nockensystems (10) in Berührung mit der Oberfläche kommt, und zwar so, dass der Gegenstand nicht empfänglich für Erschüt-

terungen ist, wenn das Nockensystem (10) in der zweiten Stellung steht, **dadurch gekennzeichnet, dass** die Drehung der Nocke nicht rückgängig gemacht werden kann, da die Drehung nur in einer Richtung möglich ist.

2. Eine Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** die Nocke ein exzentrisches Rad (10) enthält, dessen exzentrische Befestigung der Radachse (18) an das Rad ein Erhöhen und/oder Erniedrigen des Beins (12) beim Drehen des Rades erzielt. 10
3. Eine Vorrichtung nach Patentanspruch 2, **dadurch gekennzeichnet, dass** das Rad Bremsmittel hat, die mit der Radachse zusammenwirken,. 15
4. Eine Vorrichtung nach Patentanspruch 3, **dadurch gekennzeichnet, dass** das Bremsmittel eine Sperrklinke (30) aufweist und dass die Achse ein Sperrrad (28) mit einbezieht. 20
5. Eine Vorrichtung nach Patentanspruch 4, **dadurch gekennzeichnet, dass** die Drehung des Rades (10) um die Achse im Uhrzeigersinn zum sofortigen Einrasten der Sperrklinke (30) führt, wobei die schrägen Zähne des Sperrrads (28) als Bremse dienen. 25
6. Eine Vorrichtung nach Patentanspruch 4, **dadurch gekennzeichnet, dass** das Sperrrad (28) innerhalb des hohlen Körpers des Rades untergebracht ist und drehbar um die Radnabe (20) ist, das Sperrrad (28) schliesst eine integrale, zentrale, zylindrische Welle ein, die die Radachse formt, diese erstreckt sich durch die Radnabe (20) durch eine Öffnung, um in eine Haltevorrichtung (14) einzurasten. 30
7. Eine Vorrichtung nach Patentanspruch 2, **dadurch gekennzeichnet, dass** die Befestigungsschraube (16) in ein zentrales Bohrloch (22) in der Radachse (18) einrastet, wobei das äussere Ende der Radachse (18) einen polygonalen Vorsprung (23) zum Einrasten in eine passende Öffnung (24) in eine Haltevorrichtung (14) einschliesst. 35
8. Eine Vorrichtung nach Patentanspruch 2, **dadurch gekennzeichnet, dass** die Nocke (10) einen zweirädrigen Roller enthält, der eine transversale Achse hat, die exzentrisch plaziert ist (52), das Rad enthält einen beschwerten Teil (60), welcher das Rad beeinflusst eine bestimmte Richtung einzunehmen und durch Schwere geholfene Drehung des Rades zu ermöglichen. 40
9. Eine Vorrichtung nach Patentanspruch 8, **dadurch gekennzeichnet, dass** der Roller am Bein des Tisches oder eines anderen Gegenstandes mit Hilfe einer dienlichen Klemmbacke oder etwas Ähnlichem 45

befestigt ist, welche wiederum an einer Achse (54) befestigt ist, die an ihrem unteren Ende ein kurzes transversales röhrenförmiges Teil (66) zum Empfang der transversalen Achse (54) der Nocke enthält.

10. Eine Vorrichtung nach Patentanspruch 9, **dadurch gekennzeichnet, dass** der transversale röhrenförmige Teil (66) mit einem Kupplungskugellager ausgerüstet ist, bei dem die Drehung der transversalen Achse (54) des Rades nur in einer Richtung möglich ist. 50

Revendications

1. Un dispositif pour stabiliser des tables, des chaises et d'autres objets similaires comprenant un organe de came (10) à monter au bas bout d'un pied (12) de l'objet et pouvant tourner d'une première position laquelle est distante de la surface lorsque les autres pieds de l'objet sont alignés avec la surface sur laquelle il est localisé, et d'une deuxième position où une partie de l'organe de came (10) est en contact avec la surface, de telle façon que l'objet n'est pas susceptible de balancement lorsque l'organe de came (10) se trouve à la deuxième position, **caractérisé** de sorte que la rotation de la came est irréversible, la rotation étant possible dans une direction seulement.
2. Un dispositif selon la revendication 1, **caractérisé en** sorte que la came comprend une roue excentrique (10), la fixation excentrique de l'essieu de roue (18) à la roue faisant lever et/ou baisser le pied (12) avec la rotation de la roue.
3. Un dispositif selon la revendication 2, **caractérisé en** sorte que la roue a un organe de freinage associé avec l'essieu de roue.
4. Un dispositif selon la revendication 3, **caractérisé en** sorte que l'organe de freinage comprend un crochet d'arrêt (30) et que l'essieu comprend une roue à cliquet (28).
5. Un dispositif selon la revendication 4, **caractérisé en** sorte que la rotation de la roue (10) autour de l'essieu de la roue dans le sens des aiguilles d'une montre mène à l'engrènement immédiat du crochet d'arrêt (30), les dents inclinées de la roue à cliquet (28) faisant fonction de frein.
6. Un dispositif selon la revendication 4, **caractérisé en** sorte que la roue à cliquet (28) est encastrée à l'intérieur du corps creux de la roue et qu'elle peut tourner autour du moyeu de la roue (20), la roue à cliquet (28) comprenant un arbre intégral central cylindrique lequel forme l'essieu de la roue lequel 55

s'étend à travers le moyeu de la roue (20) à travers une ouverture pour engager un accessoire de fixation (14).

7. Un dispositif selon la revendication 2, **caractérisé en** sorte que la vis d'assemblage (16) engage un perçage central (22) dans l'essieu de roue (18), le bout extérieur de l'essieu de roue (18) comprenant une protubérance polygonale (23) pour engager une ouverture complémentée (24) dans un accessoire de fixation (14). 5
10

8. Un dispositif selon la revendication 2, **caractérisé en** sorte que la came (10) comprend une roulette à deux roues ayant un essieu transversal disposé excentriquement (52), la roue comprenant une section lestée (60) guidant la roue diagonalement envers une orientation particulière et permettant une rotation assistée par gravité de la roue. 15
20

9. Un dispositif selon la revendication 8, **caractérisé en** sorte que la roulette est immobilisée au pied de la table ou à un autre objet par moyen d'une bride de serrage convenable ou chose pareille qui est à son tours consolidée à un arbre (54) comprenant au bout inférieur une section transversale tubulaire courte (66) pour recevoir l'arbre transversal (54) de la came. 25

10. Un dispositif selon la revendication 9, **caractérisé en** sorte que la section transversale tubulaire (66) est pourvue d'un coussinet d'embrayage permettant à l'arbre transversal (54) de la roue la rotation dans une seule direction. 30
35

40

45

50

55

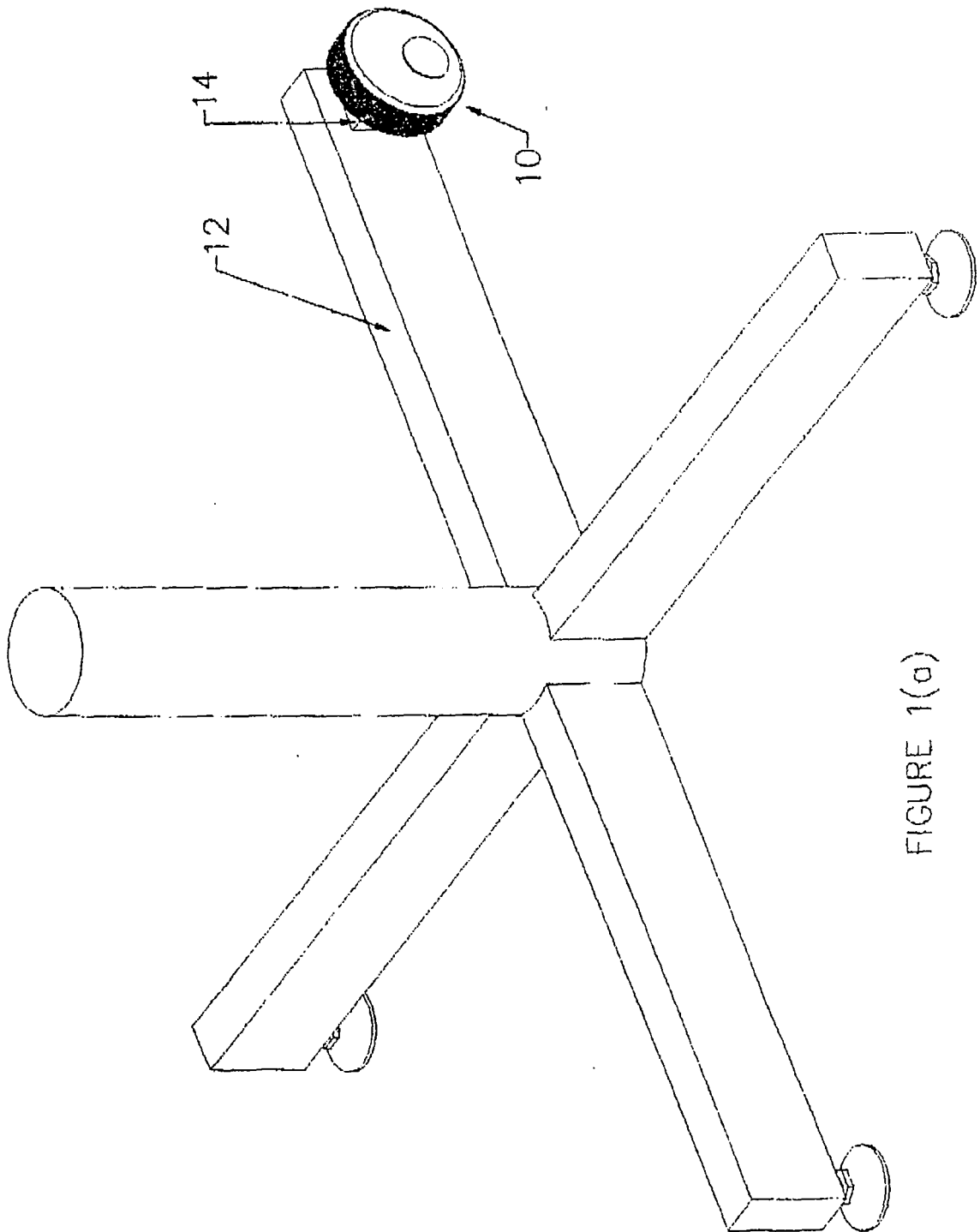


FIGURE 1(a)

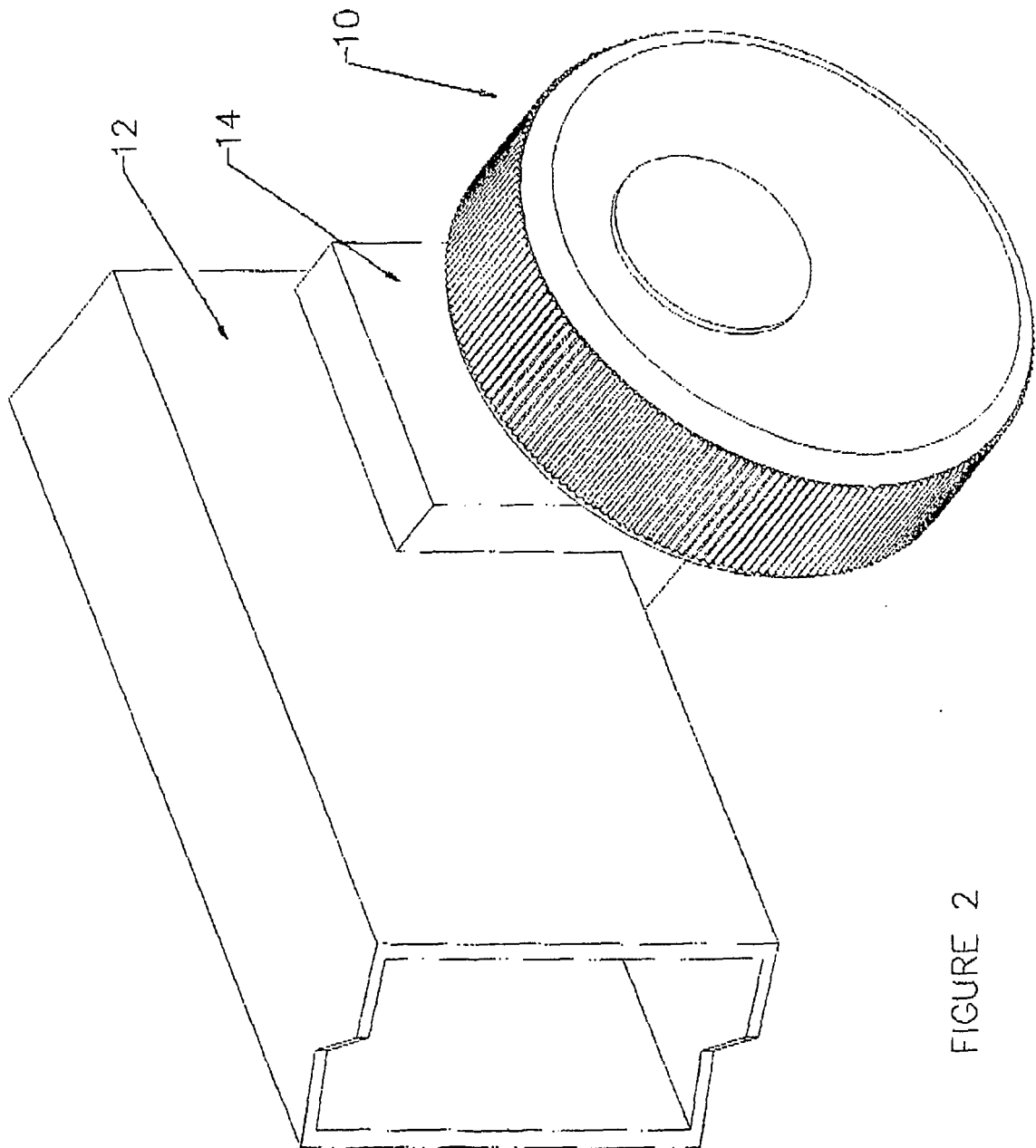


FIGURE 2

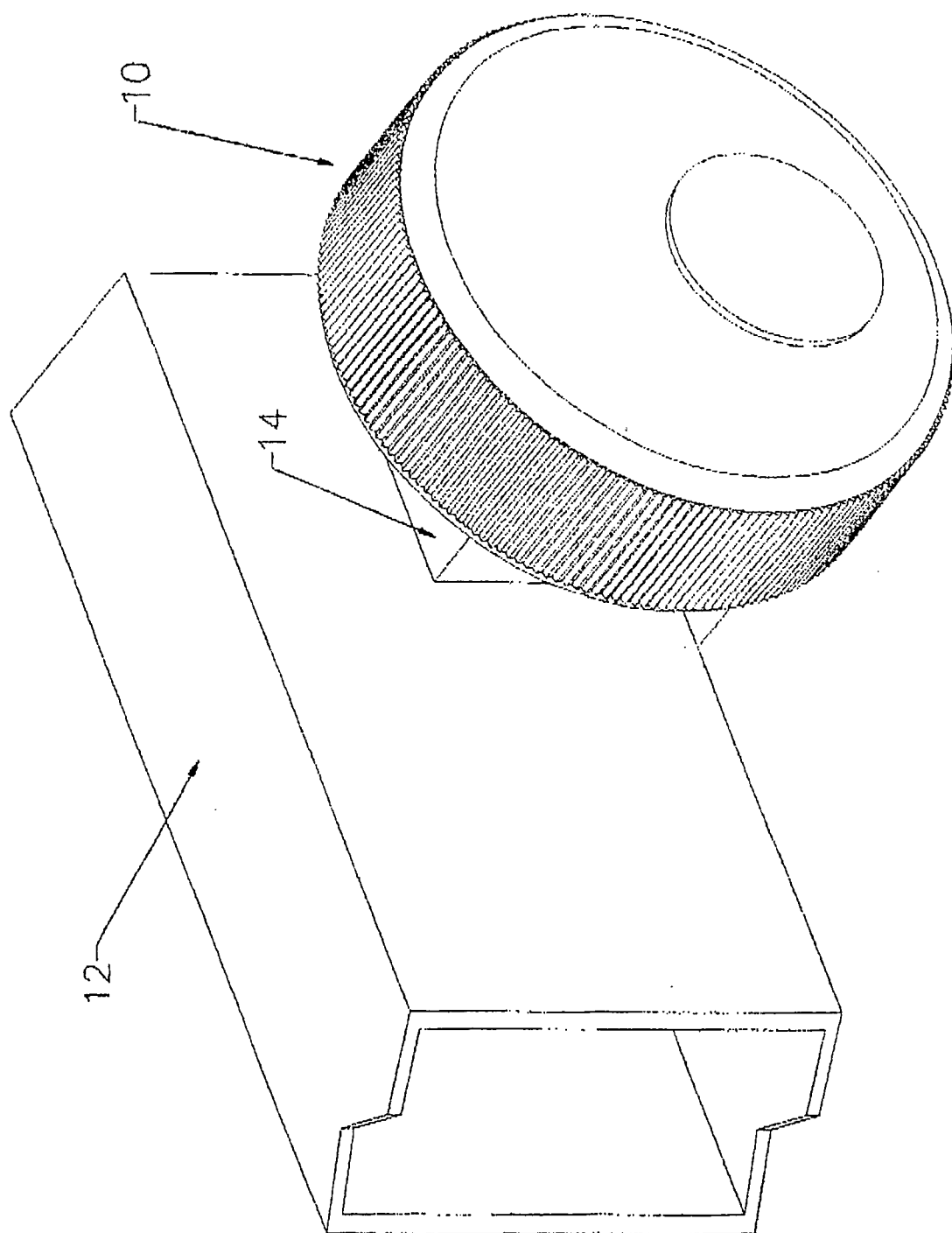


FIGURE 1(b)

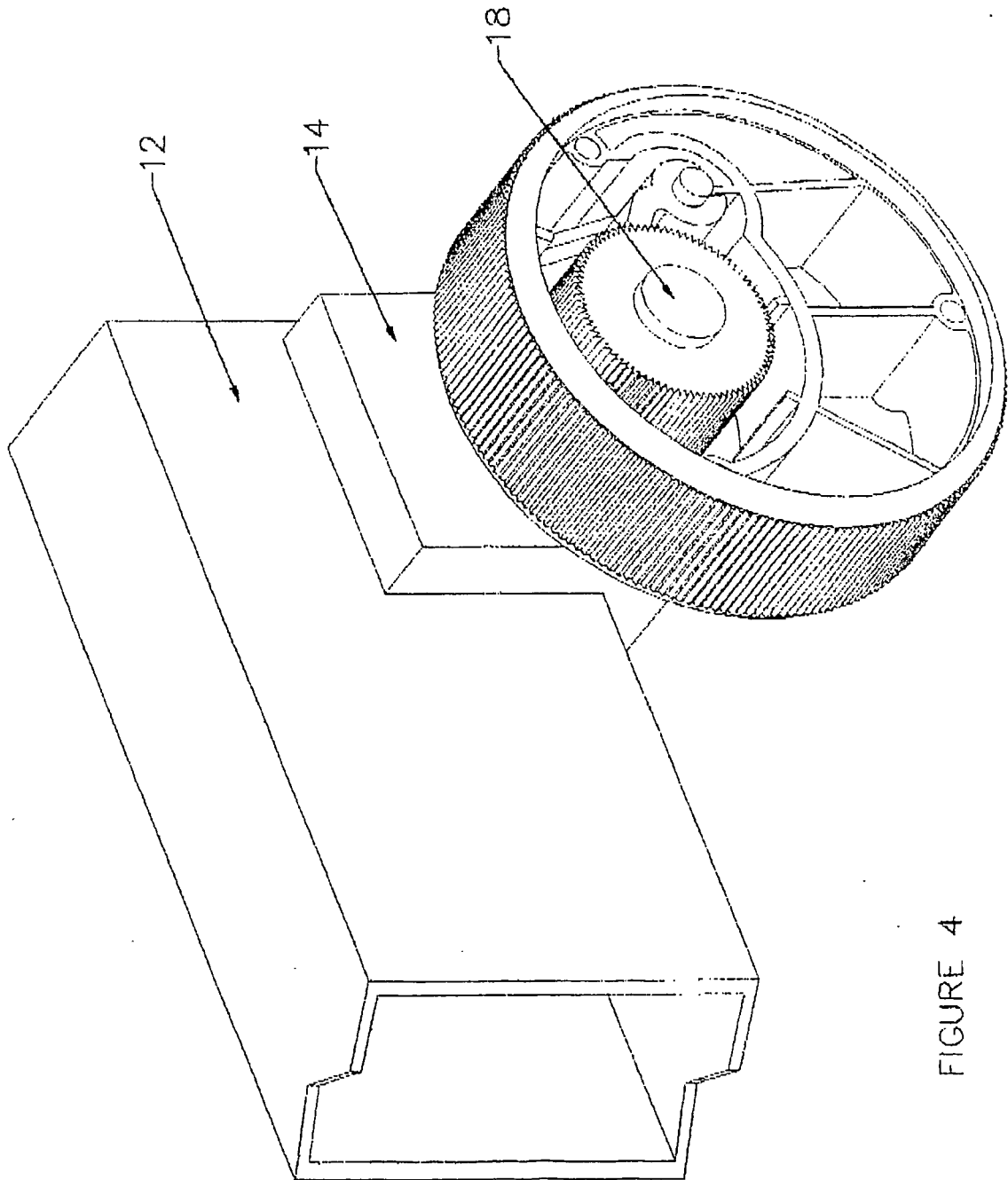


FIGURE 4

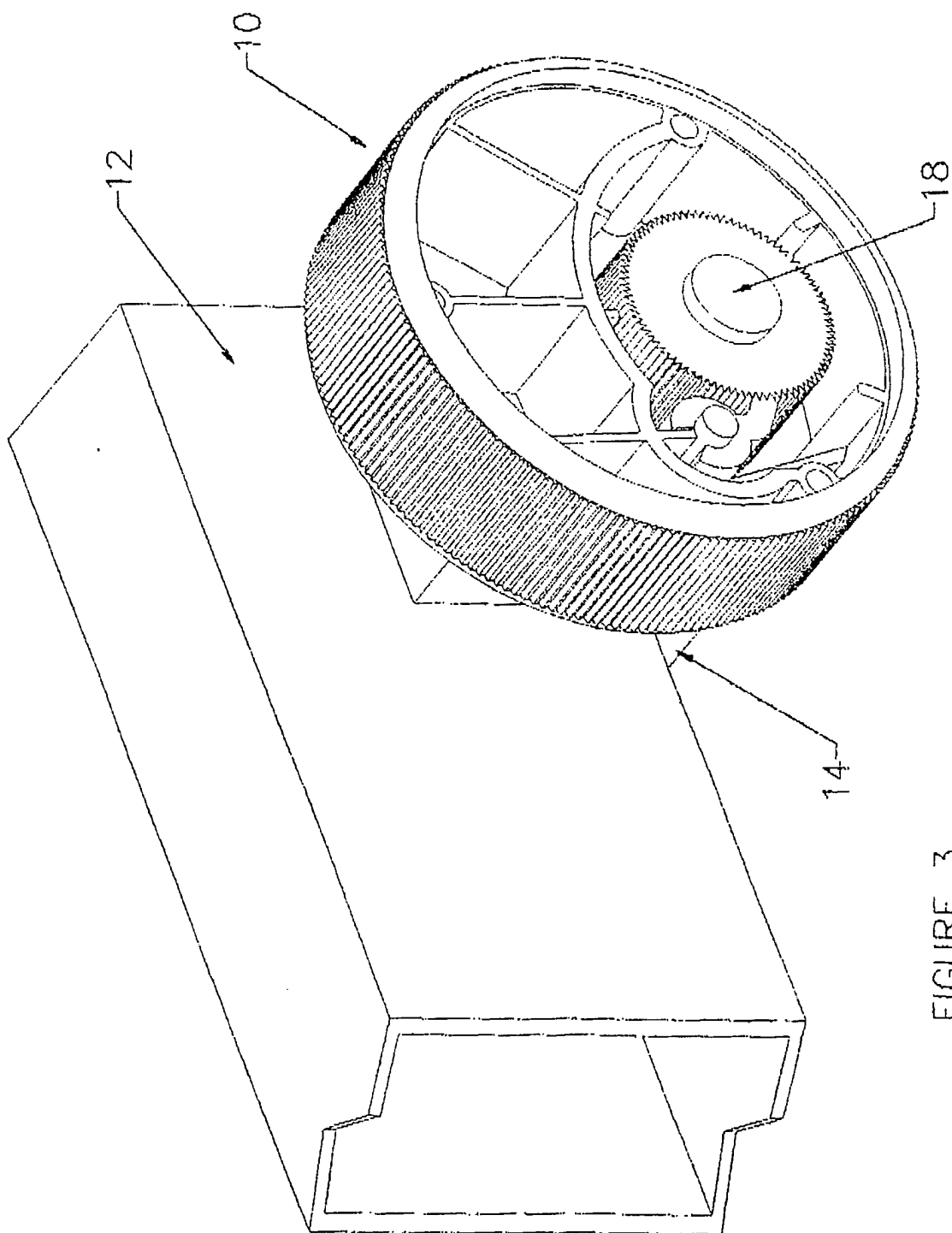
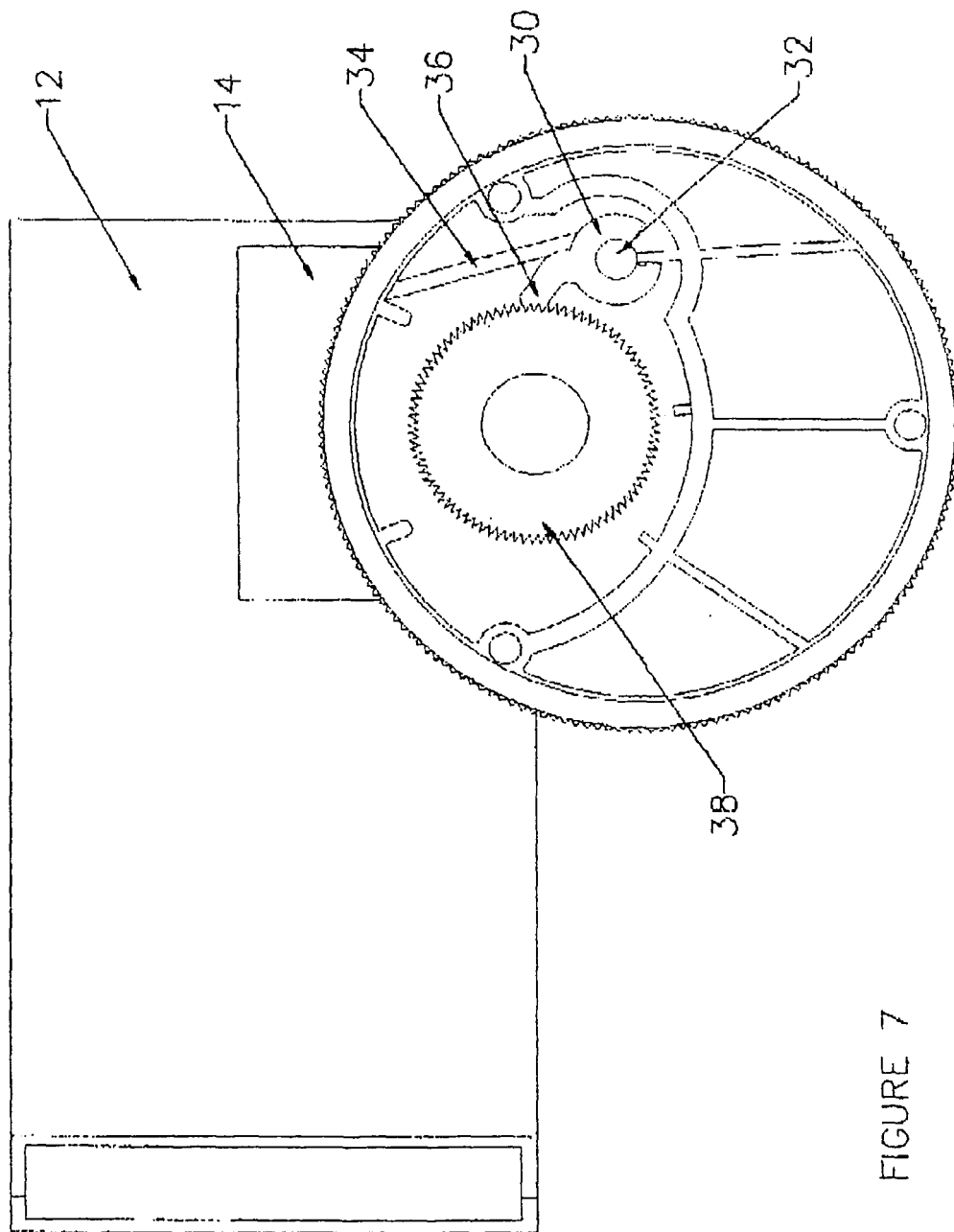
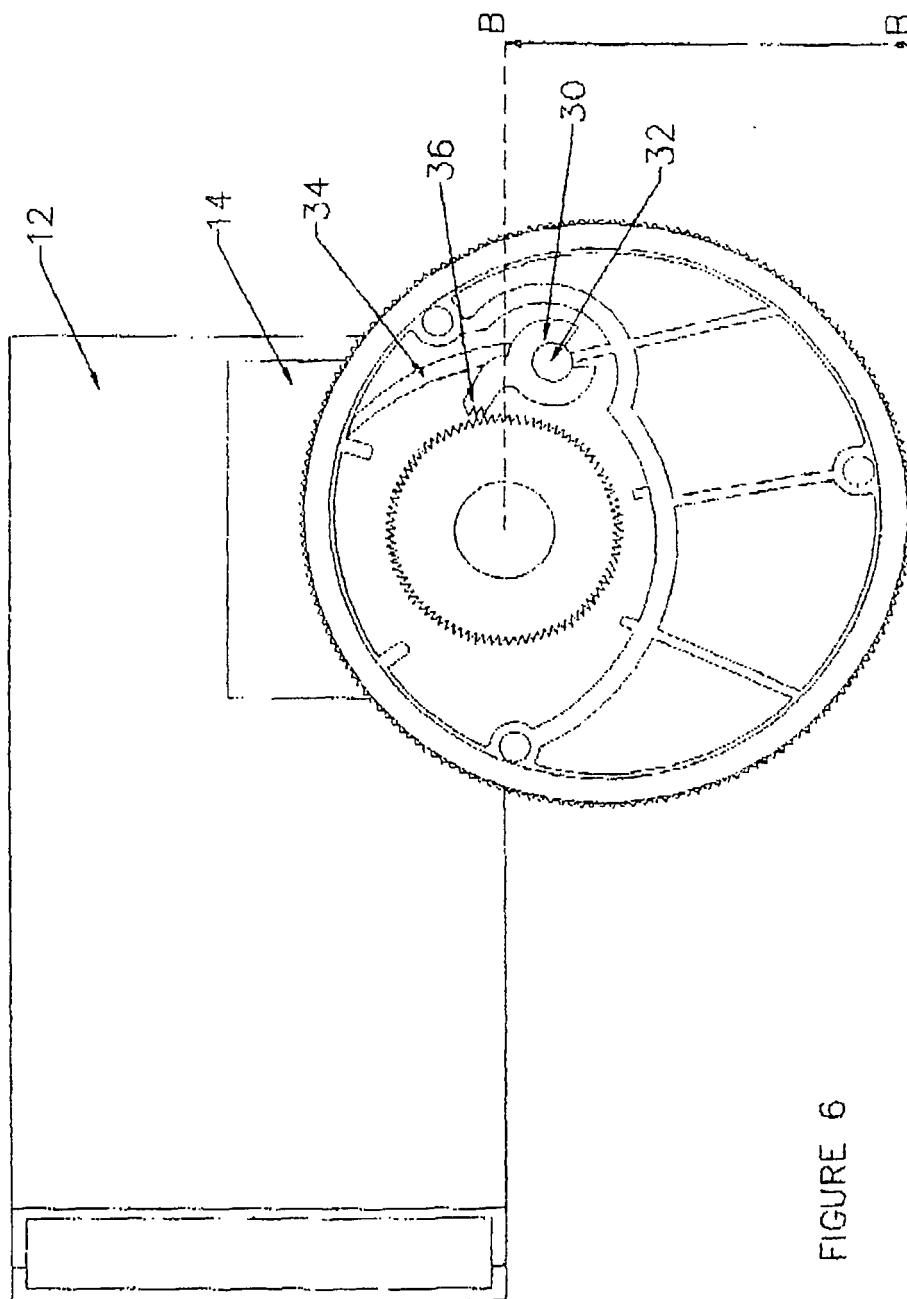
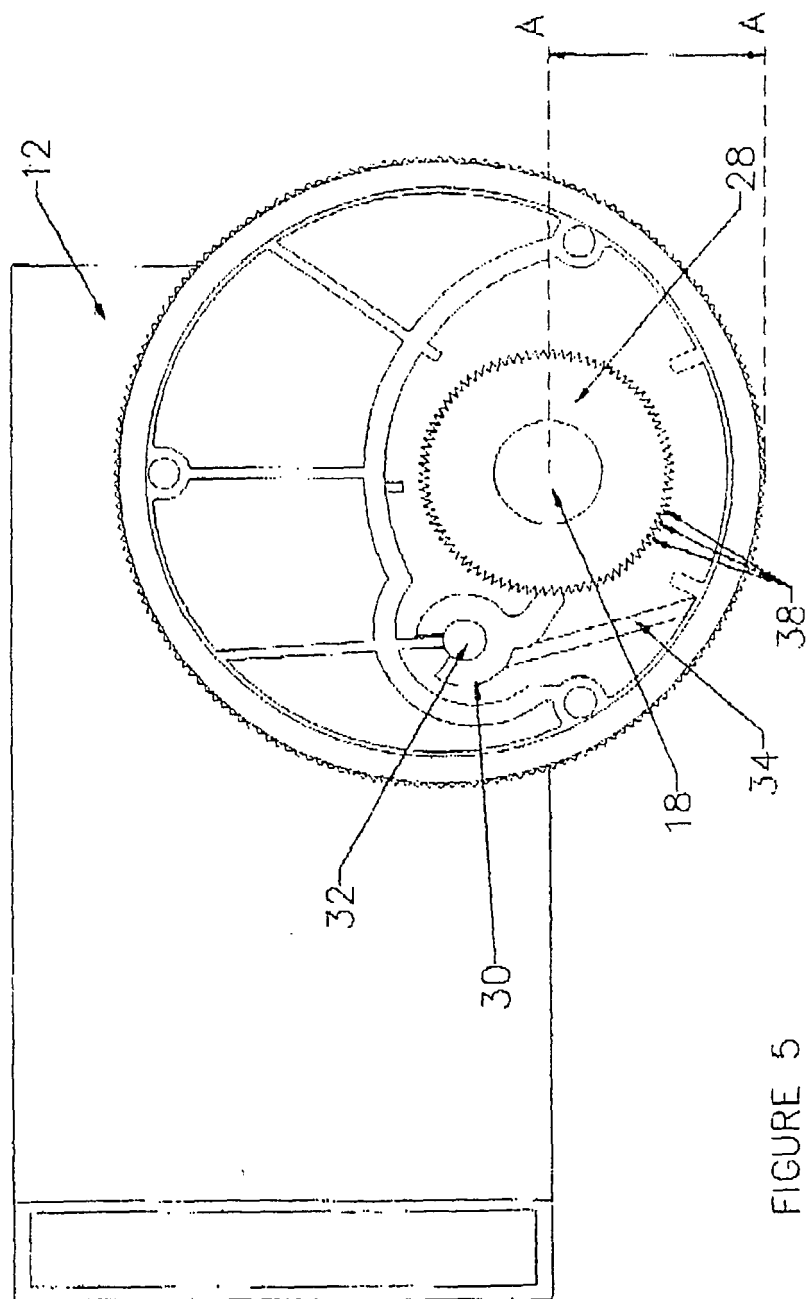


FIGURE 3







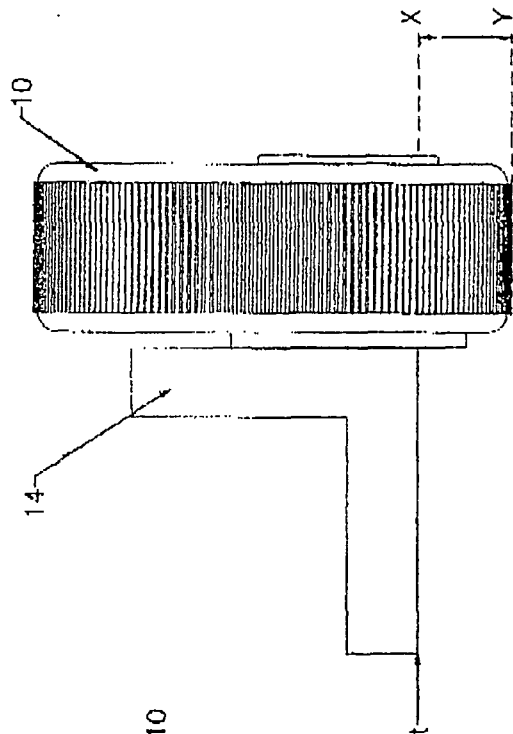


FIGURE 8

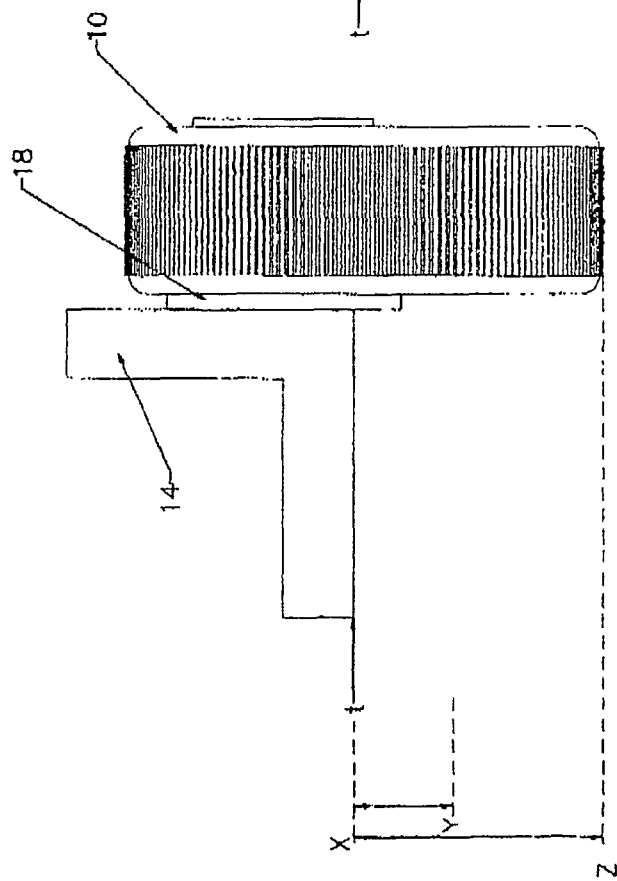


FIGURE 9

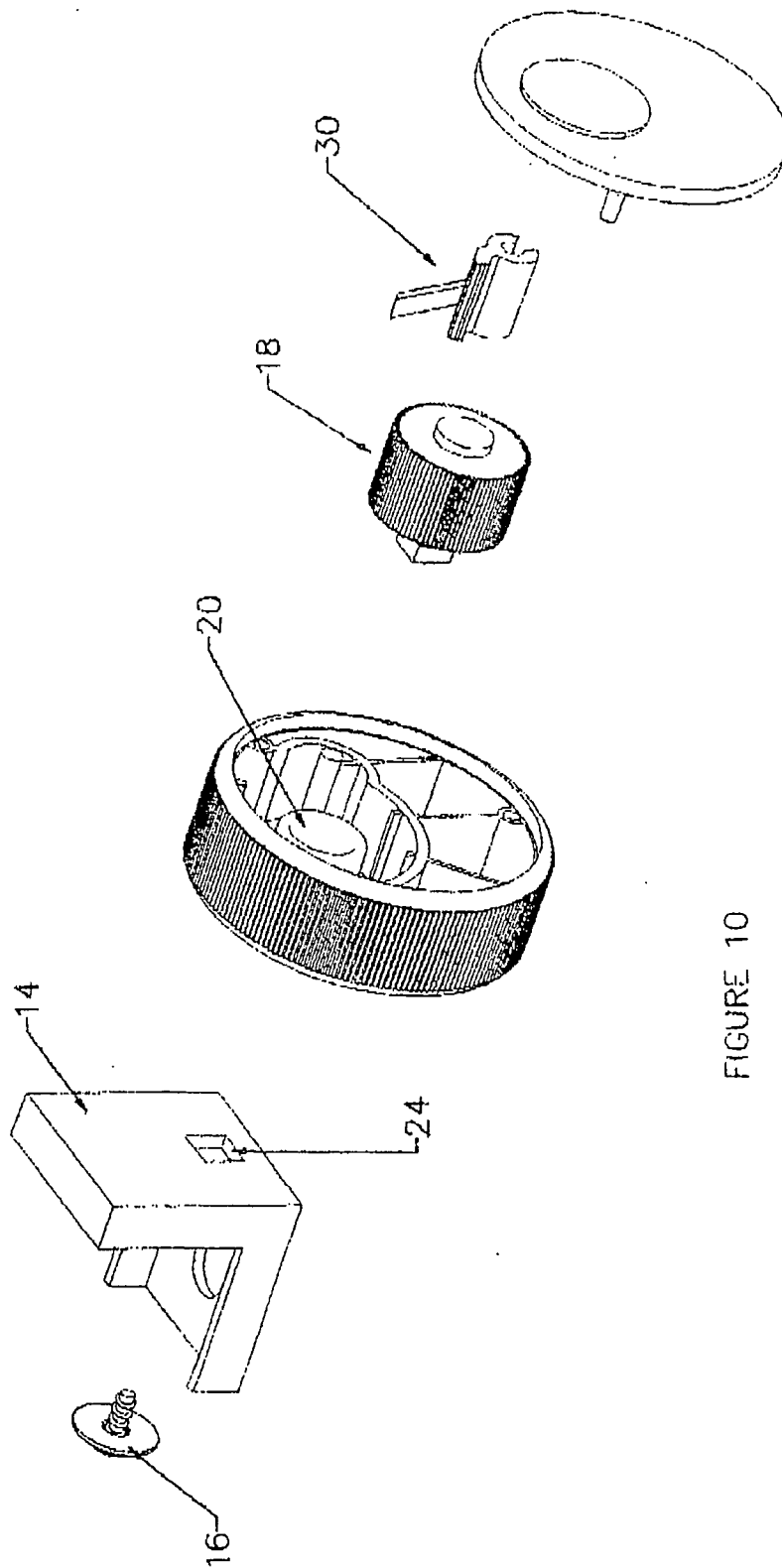


FIGURE 10

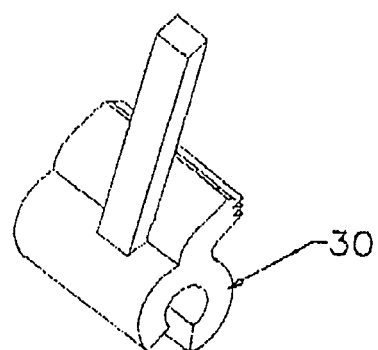
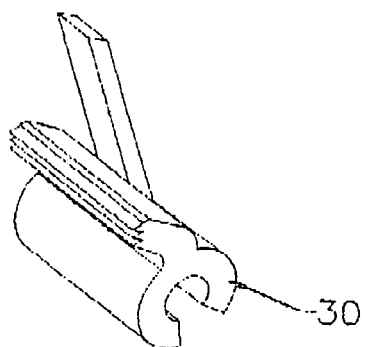
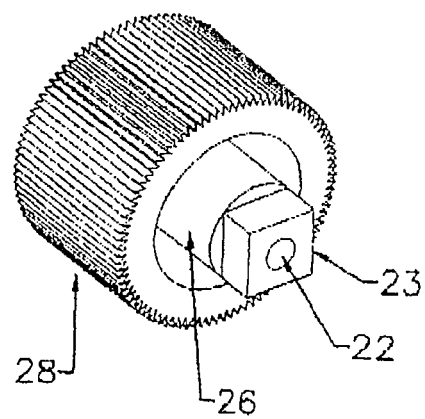
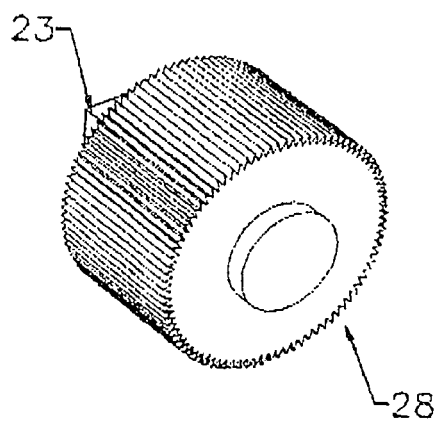
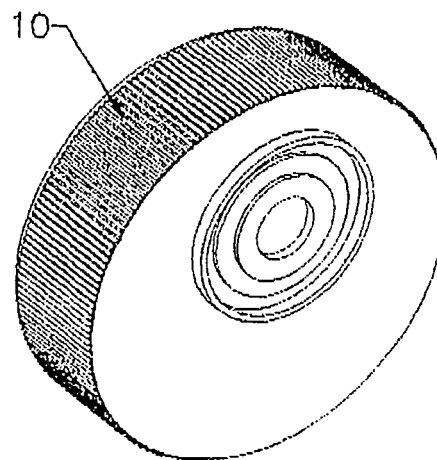
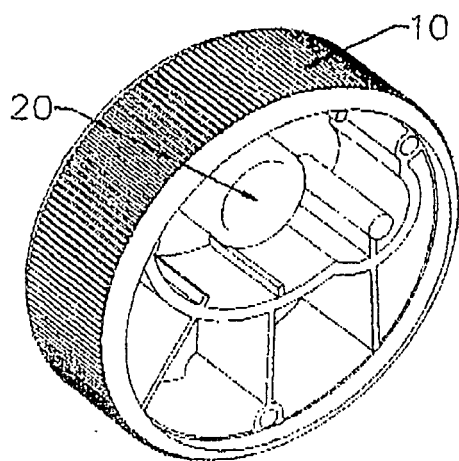


FIGURE 11

FIGURE 12

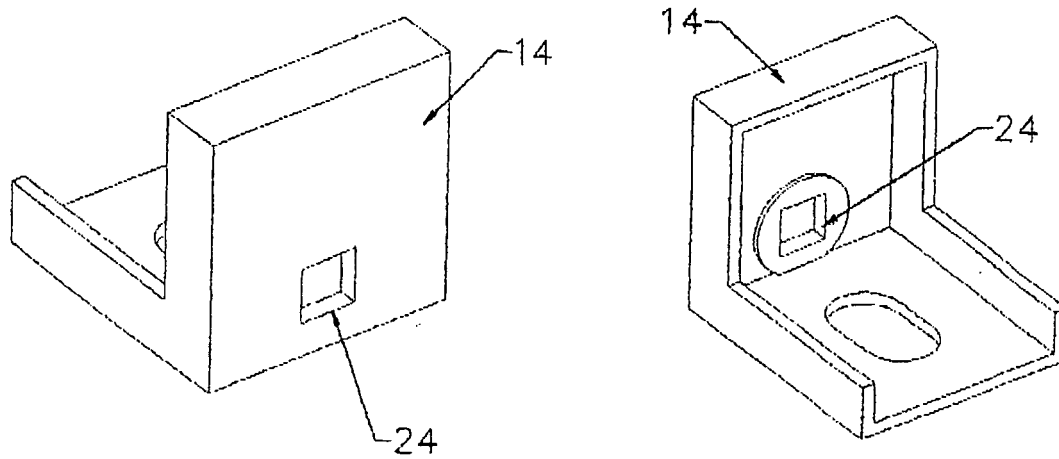


FIGURE 13

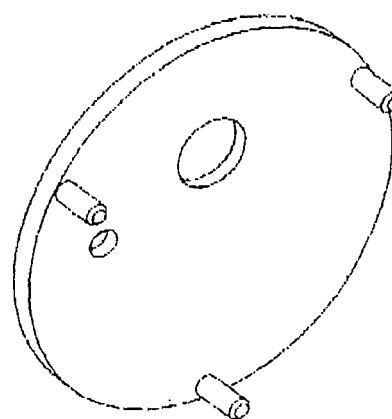


FIGURE 14

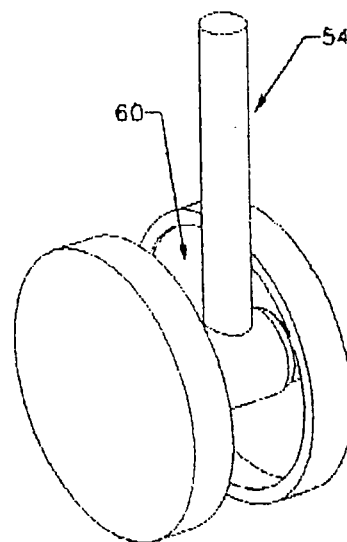
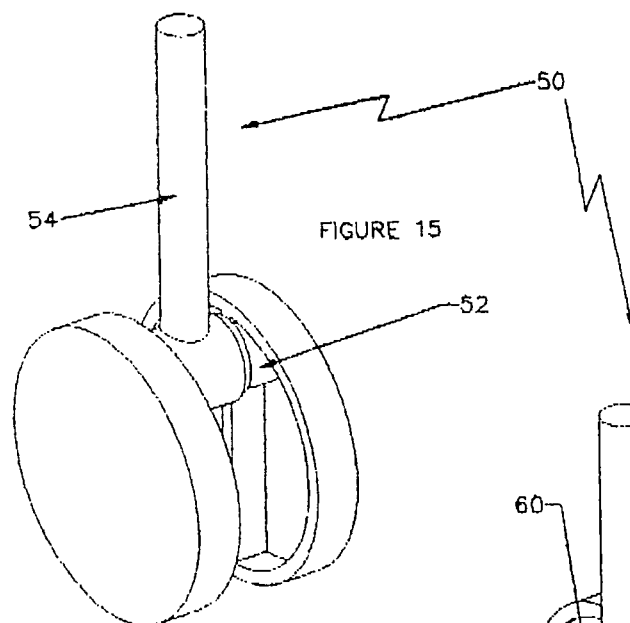


FIGURE 16

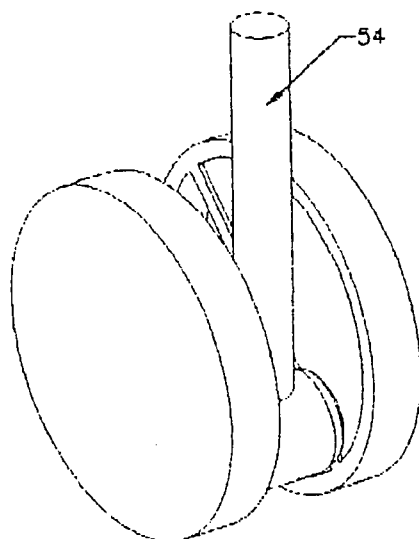
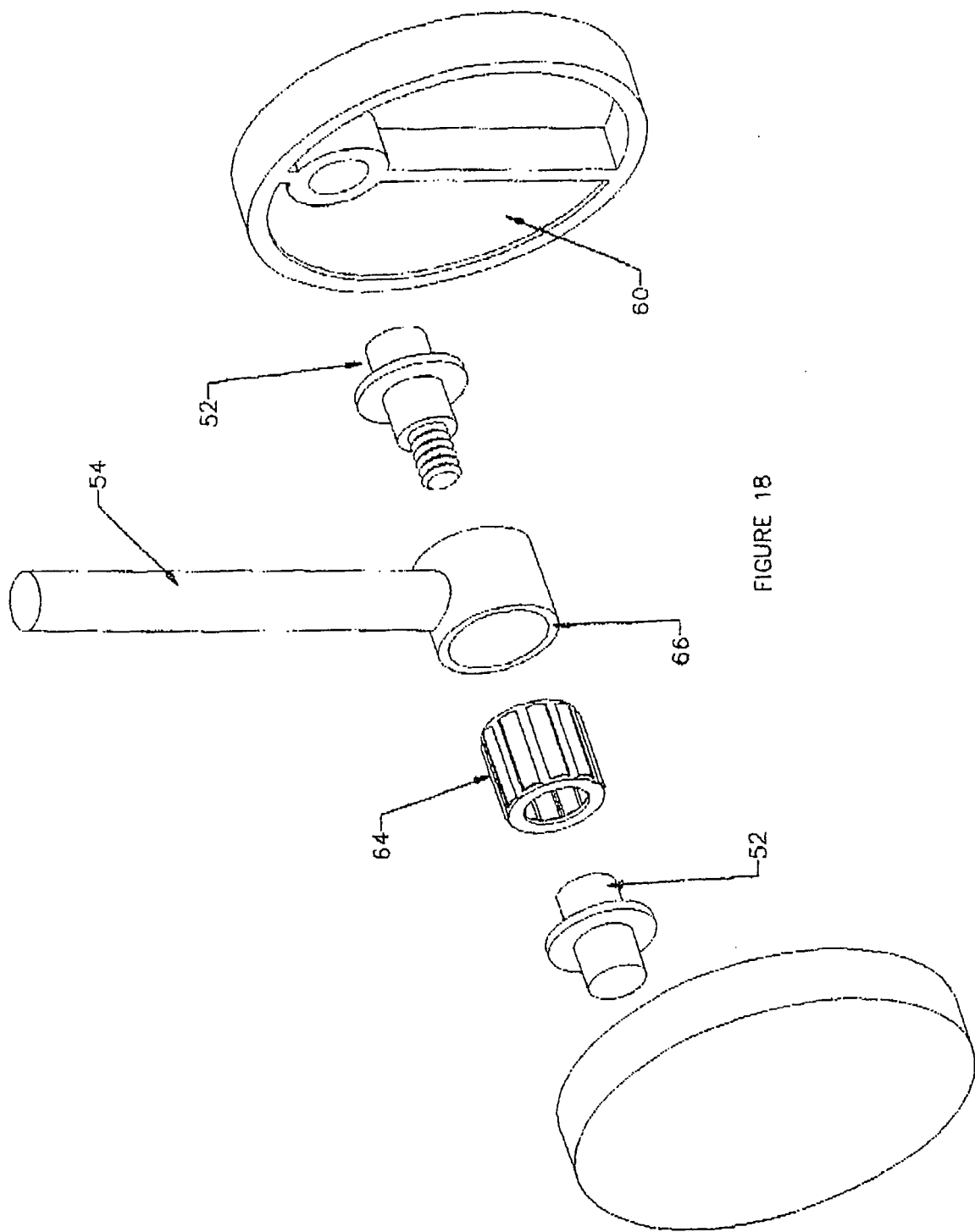
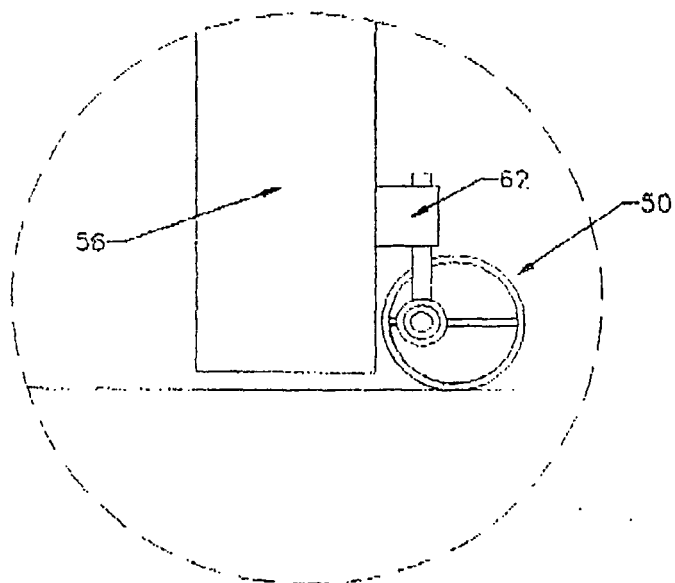
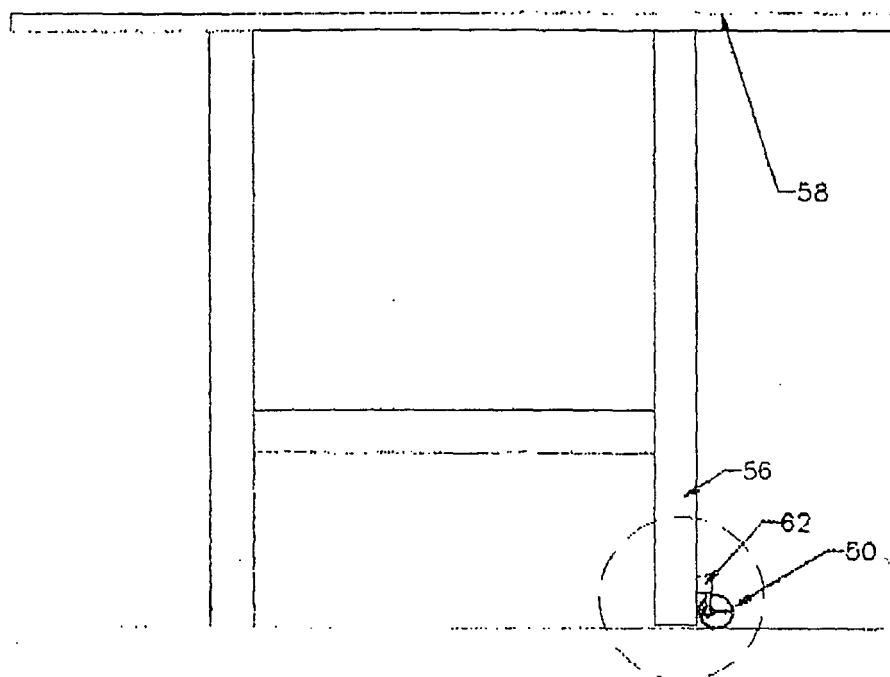


FIGURE 17





REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- GB 518642 A [0004]