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(54) Torque wrench

Drehmomentschlüssel

Clé dynamométrique

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EP 1 847 354 B1

Description

BACKGROUND OF INVENTION

1. Field of the Invention

[0001] The present invention relates generally to a torque wrench, and more particularly to a design that offers overload dislocation component.

[0002] US 2 358 discloses a torque wrench as defined in the preamble of independent claim 1.

2. Description of Related Art

[0003] So as to prevent the structure being damaged by the unbearable outside force, the torque wrench usually has overload protection measures, so that when the end of grip handle of the torque wrench exceeds the pre-determined value, its sheath and the end of grip handle will create dislocation to prevent the users from damaging the structure; as for the conventional structure of the overload protection measure mentioned herein, one of the typical one is one that has a ratchet ring inside the slot on one end of the torque wrench, and the inner edge of the ratchet ring provides the supporting surface when the sheath is turned clockwise or counterclockwise, and one side of the outer edge of the ratchet ring is positioned and supported by a resilient bearing; with this structural design, when the end of grip handle of the torque wrench exceeds the pre-determined value, the sheath will drive the ratchet on the outside of the ratchet ring cross the resilient bearing, so that the sheath and the end of grip handle will create dislocation to prevent the damage. However, during the process when the ratchet part of the ratchet ring is crossing over the resilient bearing, because the conventional structure is pointed, which creates the fraction between the slots of the torque wrench, hence, it also damages the ratchet shape of the ratchet ring, and reduce the value of the overload protection of the handle of the force end, and greatly shortens the life span of the torque wrench. Because the fraction is serious, which causes inaccurate torque value, it is not an ideal structure; moreover, another conventional structure of the overload protection measure is to place it inside the middle section of the end of grip handle; the principle is to use the dislocation between the two components to achieve the protective purposes. However, with this conventional structure design, if the user continues to apply force when the dislocation occurs, one of the components will further hit the structure of the handle and create damages.

[0004] US 2 972 271 discloses another prior art torque wrench.

[0005] Thus, to overcome the aforementioned problems of the prior art, it would be an advancement if the art to provide an improved structure that can significantly improve the efficacy.

[0006] To this end, the inventor has provided the present invention of practicability after deliberate design and evaluation based on years of experience in the production, development and design of related products.

SUMMARY OF THE INVENTION

[0007] The improved fact of the present invention is described as followed:

1. It provides an overload dislocation ring 40 that has multiple sides, and a containment groove 43 is placed between the side surfaces 42 for the roller post 50. It is the first seen in the industry.

2. Through the special improved structure, when the overload dislocation ring 40 dislocates, the roller post 50 and the joint slot 21 is rolling and touching each other, which greatly reduces the fraction between the components to prevent damage and disfigure its shape, and extends the component's shelf life.

3. The structural feature of the roller post 50 and the joint slot 21 makes the dislocation of the overload dislocation ring 40 smoother, hence, the prediction of the torque value is more accurate.

4. The design of multiple sides of the overload dislocation ring 40. Every time the torque wrench dislocates, the support unit 63 of the movable post 61 will cross a set of the roller post 50 to form resilient withdraw followed by protruding out against the nest side surface 42 before returning to the original state. Therefore, even though the torque wrench of the present invention continue to have dislocating motion, however, the force of the supporting unit 63 is in the cycle of tightening and loosening, hence, it would not cause the structural damage, which is more durable and practical.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

FIG. 1 shows a perspective view of the torque wrench of the present invention.

FIG. 2 shows an exploded perspective view of the internal structure of the torque wrench of the present invention.

FIG. 3 shows a horizontal cutaway view of the internal structure of the present invention.

FIG. 4 shows a vertical cutaway view of the internal structure of the present invention.

FIG. 5 shows the overload state of the torque wrench of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0009] The features and the advantages of the present invention will be more readily understood upon a thoughtful deliberation of the following detailed description of a preferred embodiment of the present invention with reference to the accompanying drawings.

[0010] As shown in FIGS. 1~4, a preferred embodiment of an improved structure of a torque wrench, which comprising

a grip handle grip handle 10, which has a hollow hole 11 inside;

a sheathing end 20, which is placed on one end of the grip handle 10 mentioned above, and it has a joint slot 21 and a through hole 22 is placed on one side of the joint slot, and the joint slot 21 is interconnected with the hollow hole 11 toward one side of the grip handle 10;

a directional braking component 30, which is placed inside the joint slot 21 of the sheathing end 20, and it includes a column 31, a braking unit 32 and a controlling unit 33; and the column 31 is usually a block shape, in terms of the figure, the column 31 can be extended from the top side of the joint slot 21 through the through hole 22 down, and the bottom of the joint slot 21 is limited by a space 34 and a C hook 35, and the braking unit 32 can be placed in the middle of the directional braking component 30, and there are many types, such as a double swing type mentioned in the present invention, and clockwise/counterclockwise braking edges 321 322 are placed on both ends, and the controlling unit 33 can be placed on the top of the directional braking component 30, which can a button type, so that the user may manually adjust the direction (which is clockwise/counterclockwise braking edge) of the braking unit 32.

an overload dislocation ring 40, which is placed between the braking unit 32 of the directional braking component 30 and the joint slot 21, and the inner edge of the overload dislocation ring is the annular edge 41, which can be controlled by the clockwise braking edge 321 or the counterclockwise braking edge 322 of the braking unit 32 of the directional braking component 30, and the outside of the overload dislocation ring 40 has multiple sides, and containment groove 43 that goes through both sides is placed between the side surfaces 42, and the outside of the containment groove is the wall of the joint slot 21 facing the opening of the small end;

several predetermined roller posts 50, which are placed inside the containment groove 43 outside the overload dislocation ring 40, and the outside of the roller post 50 is protruding out of the opening of the containment groove 43 so that it can touch the wall of the joint slot 21 tightly;

a resilient component 60, which is inside the hollow hole 11 of the grip handle 10, which includes a movable post 61 and a resilient component 62, among them, the first end of the movable post 61 is supported by the resilience of the resilient component 62, and the resilient component 62 of the embodiment is a spiral spring, and a support unit 63 is placed on the second end of the movable post 61 that goes through the joint slot 21 of the sheathing end 20, which is pushing against a side surface 42 corresponding to the outside of the overload dislocation ring 40, and by so doing to create controlling effect (keep it from turning) for the overload dislocation.

[0011] Among them, as shown in FIG. 3, the side surfaces of the multiple sides of the overload dislocation ring 40 can be flat and straight shape.

[0012] Through the above structure and design, under the normal condition, the side surface 42 of the overload dislocation ring 40 can be supported resilient by the support unit 63 of the movable post 61, and this resilient value is taken from the resilient force of the resilient component 62, and under normal condition, the supporting force of the support unit 63 is sufficient to drive the overload dislocation ring 40 synchronously, which drives the column 31 of the directional braking component 30 to tighten or loose the screw and bolt; however, when the resistant force created by the tightness of the screw and bolt exceeds the fixed force of the overload dislocation ring 40, the overload dislocation ring 40 will be driven by the column, at the same time, because of the outside edge of the overload dislocation ring 40 rolls over the joint slot 21 of the roller post 50 and the sheathing end 20, which causes the overload dislocation ring 40 to create the motion in the joint slot 21, when it is turning, the supporting unit 63 of the movable post 61 will touch a set of the roller post 50 from the side surface 42 that was pushed against the overload dislocation ring 40(as shown in FIG. 5), and then touch the next side surface 42 and back to the position shown in FIG. 3.

Claims

1. Torque wrench comprising:

a grip handle (10), which has a hollow hole (11) inside;

a sheathing end (20) placed on one end of said grip handle (10) and having a joint slot (21) and a through hole (22) placed on one side of said joint slot (21), said joint slot (21) being interconnected with said hollow hole (11) toward one side of the grip handle (10);

a directional braking component (30) placed inside the joint slot (21) of the sheathing end (20) and including a column (31), a braking unit (32), wherein the column (31) is extended from the top side of the joint slot (21) through the through hole (22) down

an overload dislocation ring (40) placed between the braking unit (32) of the directional braking component (30) and the joint slot (21), the inner edge of the overload dislocation ring (40) being an annular edge (41) for the braking unit (32), the outside of the overload dislocation ring (40) having multiple surfaces (42), wherein

a containment groove (43) is placed between adjacent side surfaces (42), and the outside of each containment groove (43) has a further joint slot that faces said through hole (22) of said sheathing end (20);
a resilient component (60) placed inside the hollow hole (11) of the grip handle (10) and including a movable post (61) and a resilient component (62) among them, wherein the first end of the movable post (61) is supported by the resilience of said resilient component (62), and a support unit (63) is placed on the second end of said movable post (61) that goes through the joint slot (21) of the sheathing end (20) and is pushing against one of said side surfaces (42) corresponding to the outside of the overload dislocation ring (40), and by so doing to create controlling effect for the overload dislocation ring (40)
said torque wrench **characterised in that** further comprising a controlling unit (33) and the controlling unit (33) is used to adjust the direction of the braking unit (32);
several predetermined roller posts (50) placed inside the containment grooves (43) at the outside of the overload dislocation ring (40), wherein the outside of
each roller post (50) is protruding out of the further joint slot of each containment groove (43) so that it can touch the wall of said through hole (22) of the sheathing end (20) tightly.

2. Torque wrench according to claim 1, **characterized in that** each side surface (42) of the overload dislocation ring (40) has a flat and straight shape.

3. Torque wrench according to claim 1 or 2, **characterized in that** the resilient component (62) is a screw spring.

4. Torque wrench according to one of claims 1 to 3, **characterized in that** the braking unit (32) of the directional braking component (30) is a double-side swinging block having a clockwise/counterclockwise braking edge on both ends, and the controlling unit (33) of the directional braking component (30) is placed on the top end and in a button type.

Patentansprüche

1. Drehmomentschlüssel umfassend:

einen Haltegriff (10), der im Inneren eine hohle Öffnung (11) aufweist;
ein Hülsenende (20), das an einem Ende des Haltegriffs (10) angeordnet ist und eine Verbindungsaussparung (21) und eine Durchgangsöffnung (22) aufweist, die an einer Seite der Verbindungsaussparung (21) angeordnet ist, wobei die Verbindungsaussparung (21) mit der hohlen Öffnung (11) in Richtung einer Seite des Haltegriffs (10) verbunden ist;
eine Richtungsbremsenbaugruppe (30), die innerhalb der Verbindungsaussparung (21) des Hülsenendes (20) angeordnet ist und eine Säule (31) und eine Bremseinheit (32) umfasst, wobei die Säule (31) sich von der oberen Seite der Verbindungsaussparung (21) durch die Durchgangsöffnung (22) nach unten erstreckt;
einen Überlastversetzungsring (40), der zwischen der Bremseinheit (32) der Richtungsbremsenbaugruppe (30) und der Verbindungsaussparung (21) angeordnet ist, wobei der innere Rand des Überlastversetzungsrings (40) ein kreisförmiger Rand zu der Bremseinheit (32) ist, wobei die Außenseite des Überlastversetzungsrings (40) mehrere Flächen (42) aufweist, wobei eine Aufnahmenut (43) zwischen benachbarte seitlichen Flächen (42) angeordnet ist und wobei die Außenseite von jeder Aufnahmenut (43) weiterhin einen Verbindungsschlitz aufweist, der gegenüber der Durchgangsöffnung (22) des Hülsenendes (20) liegt;
eine elastische Baugruppe (60), die innerhalb der hohlen Öffnung (11) des Haltegriffs (10) angeordnet ist und einen beweglichen Pfosten (61) und ein elastisches Bauteil (62) unter ihnen umfasst, wobei das erste Ende des beweglichen Pfosten (61) durch die Elastizität des elastischen Bauteils (62) gestützt wird und wobei eine Stützeinheit (63) an dem zweiten Ende des beweglichen Pfosten (61), das durch die Verbindungsaussparung (21) des Hülsenendes (20) dringt, angeordnet ist und gegen eine der seitlichen Flächen (42) entsprechend der Außenseite des Überlastversetzungsrings (40) drückt und wodurch somit ein Kontrolleffekt für den Überlastversetzungsring (40) erzeugt wird

dadurch gekennzeichnet, dass
der Drehmomentschlüssel weiterhin umfasst
eine Kontrolleinheit (33), wobei die Kontrolleinheit (33) zum Einstellen der Richtung der Bremseinheit (32) dient;
mehrere vorherbestimmte Rollsäulen (50), die innerhalb der Aufnahmenuten (43) an der Außenseite des Überlastversetzungsrings (40) angeordnet sind, wobei die Außenseite jeder Rollsäule (50) aus dem weiteren Verbindungsschlitz von jeder Aufnahmenut (43) hervorragt, so dass sie die Wand der Durchgangsöffnung (22) des Hülsenendes (20) fest berühren kann.

2. Drehmomentschlüssel nach Anspruch 1, **dadurch gekennzeichnet, dass**

jede seitliche Fläche (42) des Überlastversetzungsrings (40) eine flache und gerade Form aufweist.

3. Drehmomentschraubenschlüssel nach Anspruch 1 oder 2,
dadurch gekennzeichnet, dass
das elastische Bauteil (62) eine Schraubfeder ist.

4. Drehmomentschraubenschlüssel nach einem der Ansprüche 1 bis 3,
dadurch gekennzeichnet, dass
die Bremseinheit (32) der Richtungsbremsenbaugruppe (30) ein doppelseitiger schwingender Block ist, der an beiden Enden einen im Uhrzeigersinn bzw. gegen den Uhrzeigersinn bremsenden Rand aufweist, und die Kontrolleinheit (33) der Richtungsbremsenbaugruppe (30) ist an dem oberen Ende angeordnet und in einer Schalterform.

Revendications

1. Clé dynamométrique comprenant :

une poignée de préhension (10) dotée d'un trou creux (11) à l'intérieur;
une extrémité de protection (20) placée sur une extrémité de ladite poignée de préhension (10) et ayant une fente commune (21) et un trou traversant (22) placés sur un côté de ladite fente commune (21), ladite fente commune (21) étant interconnectée avec ledit trou creux (11) en direction d'un côté de la poignée de préhension (10) ;
un élément de freinage directionnel (30) placé à l'intérieur de la fente commune (21) de l'extrémité de protection (20) et comprenant une colonne (31), une unité de freinage (32), la colonne (31) s'étendant du côté supérieur de la fente commune (21) à travers le trou traversant (22), vers le bas ;
une bague de dislocation de surcharge (40) placée entre l'unité de freinage (32) de l'élément de freinage directionnel (30) et la fente commune (21), le bord intérieur de la bague de dislocation de surcharge (40) étant un bord annulaire (41) prévu pour l'unité de freinage (32), l'extérieur de la bague de dislocation de surcharge (40) ayant de multiples surfaces (42), une rainure de contention (43) étant placée entre les surfaces latérales (42) adjacentes et l'extérieur de chaque rainure de contention (43) étant pourvu d'une fente commune supplémentaire faisant face audit trou traversant (22) de ladite extrémité de protection (20) ;
un élément élastique (60) placé à l'intérieur du trou creux (11) de la poignée de préhension (10) et comprenant un montant mobile (61) et un élément élastique (62) parmi eux, la première extrémité du montant mobile (61) étant soutenue par l'élasticité dudit élément élastique (62), et une unité de support (63) étant placée sur la seconde extrémité dudit montant mobile (61) traversant la fente commune (21) de l'extrémité de protection (20) et poussant contre une desdites surfaces latérales (42) correspondant à l'extérieur de la bague de dislocation de surcharge (40), créant ainsi un effet de commande pour la bague de dislocation de surcharge (40) ;

caractérisée en ce que ladite clé dynamométrique comprend en outre :

une unité de commande (33), l'unité de commande (33) étant utilisée pour régler la direction de l'unité de freinage (32) ;
plusieurs montants de rouleau (50) prédéterminés placés à l'intérieur des rainures de contention (43) à l'extérieur de la bague de dislocation de surcharge (40), l'extérieur de chaque montant de rouleau (50) ressortant de l'autre fente commune de chaque rainure de contention (43) de façon à pouvoir toucher de façon serrée la paroi dudit trou traversant (22) de l'extrémité de protection (20).

2. Clé dynamométrique selon la revendication 1, **caractérisée en ce que** chaque surface latérale (42) de la bague de dislocation de surcharge (40) a une forme plate et droite.

3. Clé dynamométrique selon la revendication 1 ou 2, **caractérisée en ce que** l'élément élastique (62) est un ressort à vis.

4. Clé dynamométrique selon l'une quelconque des revendications 1 à 3, **caractérisée en ce que** l'unité de freinage (32) de l'élément de freinage directionnel (30) est un bloc oscillant double-face ayant un bord de freinage agissant dans le sens des aiguilles d'une montre / dans le sens contraire des aiguilles d'une montre sur les deux extrémités, et **en ce que** l'unité de commande (33) de l'élément de freinage directionnel (30) est placée sur l'extrémité supérieure et est de type bouton.

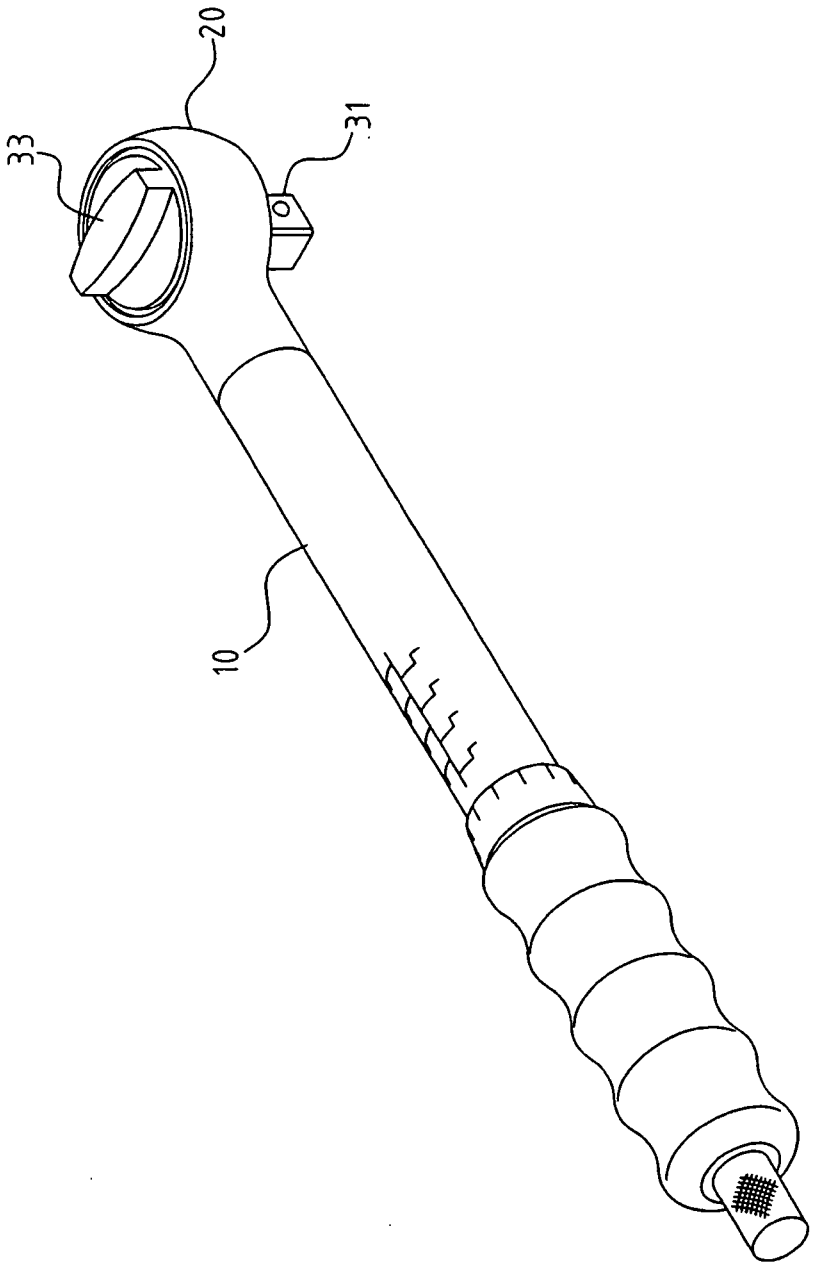


FIG.1

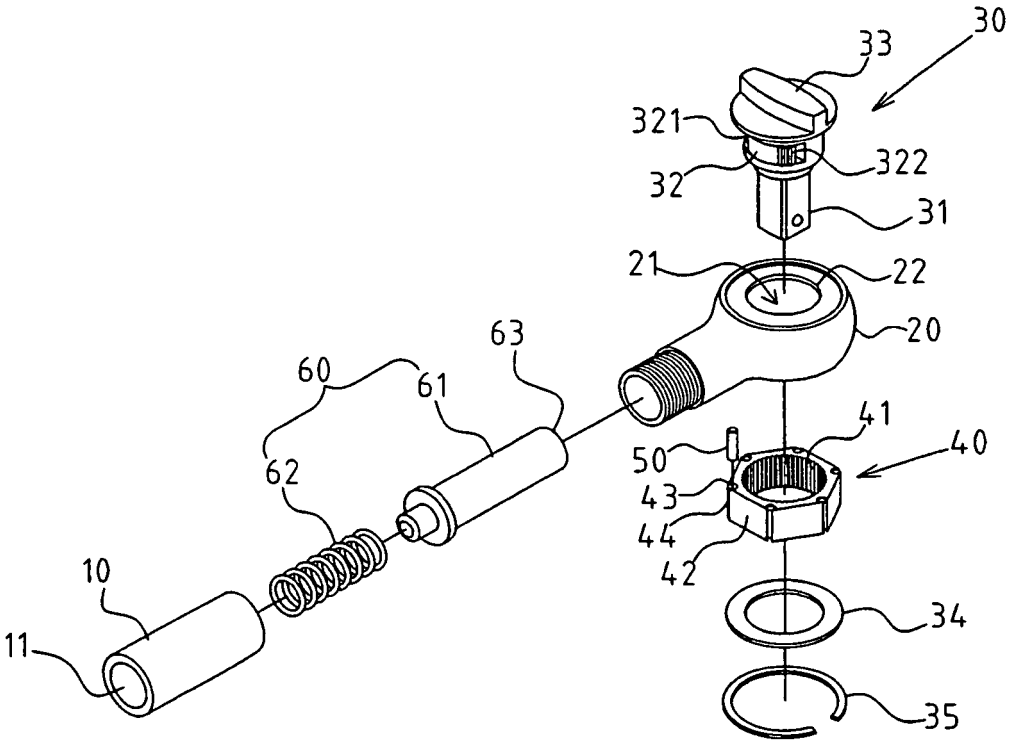
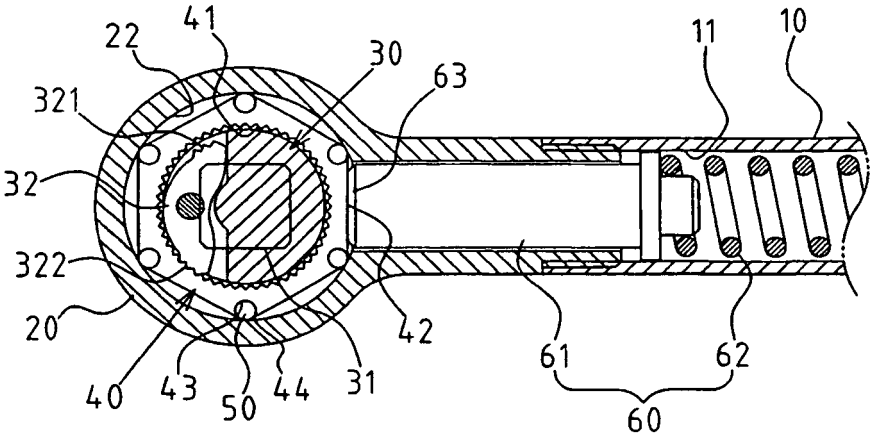


FIG.2


22
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10
321
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322
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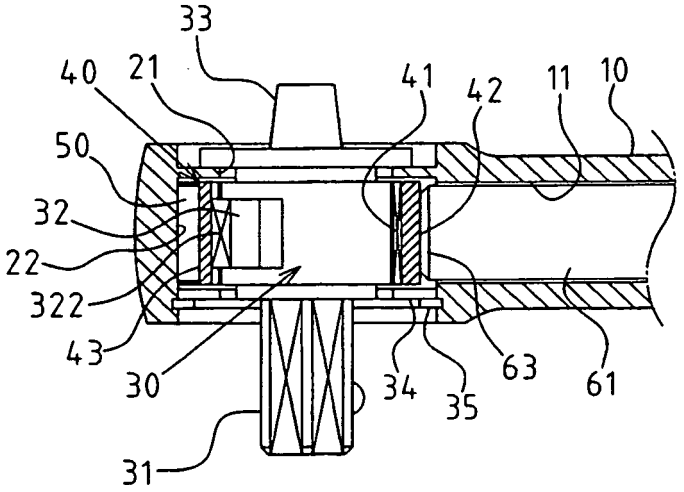
42
61
62
40
43
50
44
31
60

FIG.3


33
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42
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30
34
35
63
61
31

FIG.4

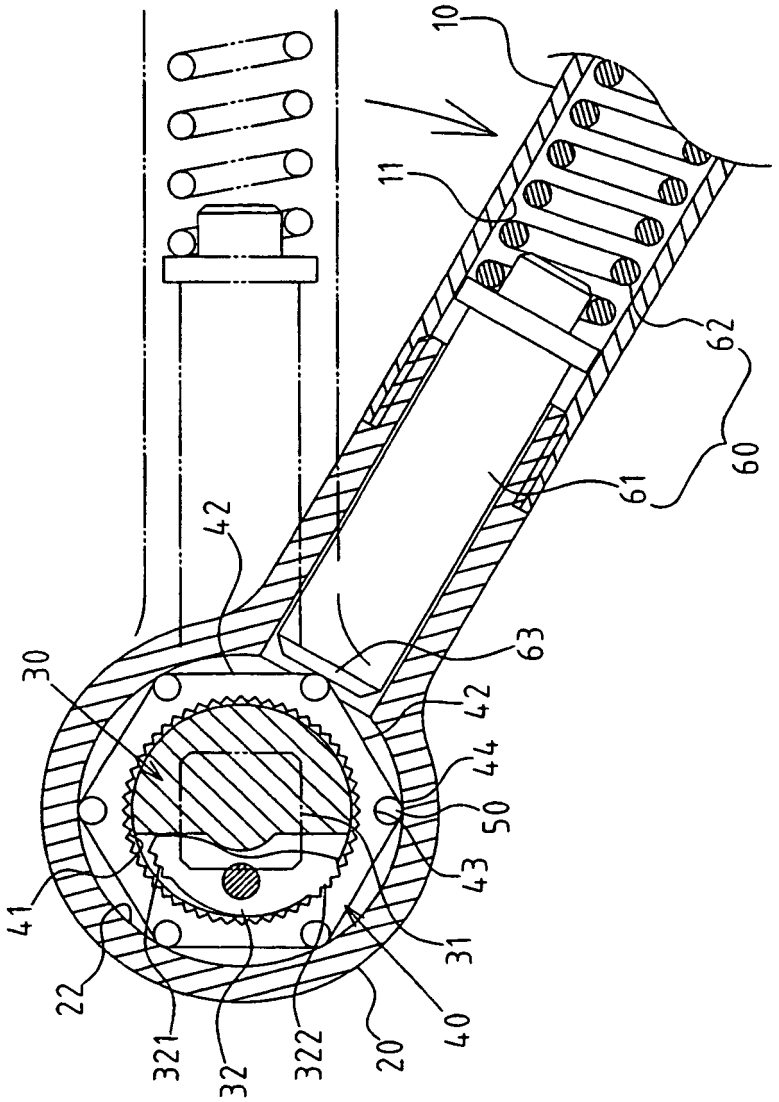

FIG.5

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- US 2972271 A **[0004]**