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(54) **Socket wrench with light source arrangement**

(57) A socket wrench and light source arrangement includes a wrench (10), and a connector (20) coupled to the wrench (10) which is alternatively set between a front working position and a rear working position. A battery (34) is installed in the wrench (10). An illumination element (300) is installed in the connector (20) and

adapted to emit light through the front open side of the connector (20). The illumination element (300) is electrically connected to the battery (34) to emit light when the connector (20) is set in the rear working position, or electrically disconnected from the battery (34) to turn off light when the connector (20) is set in the front working position or separated from the wrench (10).

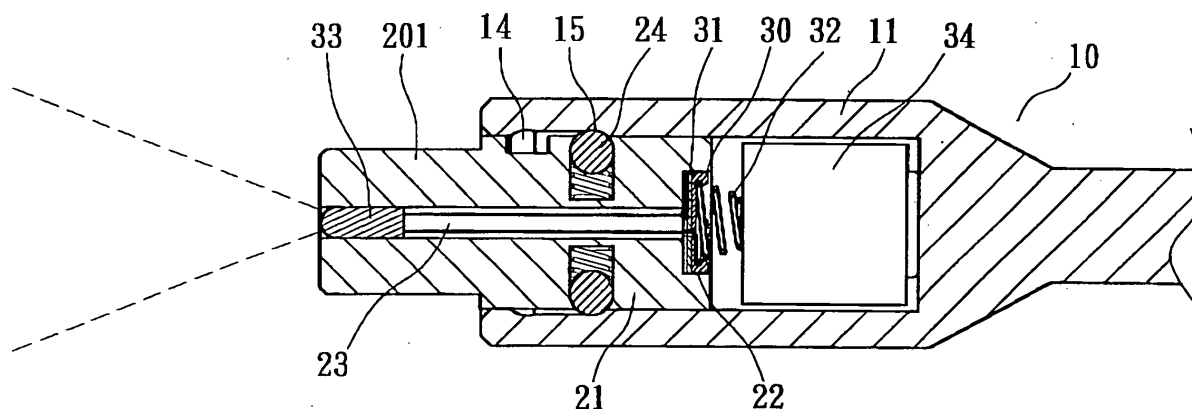


FIG.4

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a sleeve wrench and, more specifically, to a sleeve wrench with a light source arrangement, which is inexpensive to manufacture and easy to operate.

BACKGROUND OF THE INVENTION

[0002] Various screwdrivers with light source means have been disclosed, and have appeared on the market. A screwdriver with light source means is practical for use in a dark place. Further, different wrenches may be used when repairing the tires or parts of a motor vehicle. However, regular commercially available wrenches for motor vehicle repair works are not equipped with light source means. When using a wrench to repair a motor vehicle in the dark, an external light source must be provided.

SUMMARY OF THE INVENTION

[0003] Accordingly, the primary object of the present invention is to provide an illumination device of a sleeve wrench. The sleeve wrench has a wrench, a connector, and an illumination element. A front end of the polygonal hole of the sleeve head is installed with an upper buckling recess and a lower buckling recess. A rear end of the polygonal hole is formed with a receiving space for receiving a battery. A polygonal connecting section of the connector is formed with a receiving groove for receiving the battery. A bottom of the illumination element is firmly secured with an elastic conducting element which is communicated with one electrode of a battery. Installing of the illumination element will not affect the volume of the wrench and the sleeve head. By inserting the polygonal connecting section to the sleeve head; the steel balls can be buckled to the upper or lower buckling recess to control the illumination of the illumination element.

[0004] The various objects and advantages of the present invention will be more readily understood from the following detailed description when read in conjunction with the appended drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005]

Fig. 1 is the exploded perspective view and partial cross sectional view of the present invention.

Fig. 2 is an assembled view of the present invention.

Fig. 3 is an exploded cross sectional view of the present invention.

Fig. 4 is a schematic cross sectional view showing a conduction state of the present invention.

Fig. 5 is a schematic cross sectional view showing

an interruption state of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0006] Referring to Figs. 1 to 5, the sleeve wrench of the present invention is illustrated. The present invention includes a wrench 10, a connector 20, and an illumination element 300. The wrench 10 includes a handle 102, a tube body 101, an extending section 103, and a sleeve head 11 having a polygonal hole 12. The connector 20 includes a polygonal connecting section 21 and an engaging section 201. A lateral side of the polygonal connecting section 21 of the connector 20 is arranged with springs 25. Thereby, the steel balls 24 can be embedded into the springs 25. Thus, the connector 20 is inserted into the polygonal hole 12 of the sleeve head 11. The features of the present invention will be described herein.

[0007] A front end of the polygonal hole 12, for example, a rectangular hole, a hexagonal hole, or a dodecagonal hole, is installed with an upper buckling recess 14 and a lower buckling recess 15. A rear end of the polygonal hole 12 is formed with a receiving space for receiving the battery 34 of the illumination element 300.

[0008] The polygonal connecting section 21 of the connector 20 is formed with a receiving groove 22 for receiving the battery 34 of the illumination element 300. An interior of the engaging section 201 has a through hole 23 which is communicated with the receiving groove 22 for installing the illumination element 300 and light from the illumination element 300 can pass through the through hole 23.

[0009] The illumination element 300 includes an insulating seat 30. A bottom of the illumination element 300 is firmly secured with an elastic conducting element 32 which is communicated with one electrode of a battery 34. A front surface of the insulating seat 30 has a conducting piece 31. The insulating seat 300 is assembled into the receiving groove 22 of the polygonal connecting section 21. Another electrode of the battery 34 is conductive to the sleeve head 11. Moreover, the conducting piece 31 and the elastic conducting element 32 are communicated to an LED light 33 (or a general used bulb). The LED light 33 passes through the through hole 23 of the polygonal connecting section 21 of the connector 20. Thereby, the illumination element 300 is mounted in the connector 20 and the battery 34 is replaceable.

[0010] In manufacturing of the present invention, the receiving groove 22 and through hole 23 are formed at the time for forming the engaging section 201 of the connector 20 and the polygonal connecting section 21. Thereby, the cost is reduced. Moreover, the illumination element 300 is formed by the LED light 33, the insulating seat 30, the conducting piece 31, and the elastic conducting element 32. It is only necessary to enforce the illumination element 300 into the polygonal connecting section 21 of the connector 20 for assembly. Thereby,

the assembly work is easy.

[0011] Referring to Fig. 3, in use, the battery 34 is mounted in the polygonal hole 12 of the sleeve head 11. Then the polygonal connecting section 21 of the connector 20 is inserted into the polygonal hole 12 of the sleeve head 11 of the wrench 10. Thus, the polygonal connecting section 21 of the connector 20 can be embedded into a hole of a work piece for rotating an object. Or another object (for example, a screw, a bolt or a nut) can be engaged with the polygonal connecting section 21 for rotating a work piece.

[0012] Referring to Fig. 4, when the polygonal connecting section 21 of the connector 20 applies a force toward the battery 34 of the sleeve head 11, the buckling steel balls 24 will buckle the lower buckling recess 15 of the sleeve head 11 so that the elastic conducting element 32 of the illumination element 300 is communicated to one electrode of the battery 34 (for example, a negative electrode). Another end of the battery 34 (for example, a positive electrode) is communicated to the sleeve head 11. The conducting piece 31 of the illumination element 300 is communicated to the polygonal connecting section 21 of the connector 20. The polygonal connecting section 21 and the sleeve head 11 are communicable to one another (the two are made of metal materials). Therefore, the battery 34 and the LED light 33 are formed as a loop so that light can be emitted through the through hole 23 of the connector 20.

[0013] Furthermore, referring to Fig. 5, it is only necessary to pull the connector 20 forwards (away from the battery) through a predetermined distance so that the buckling steel ball 24 is buckled to the upper buckling recess 14 of the sleeve head 11. As a result, the elastic conducting element 32 of the illumination element 300 can not resist against the battery 34. Thus the power is turned off and no light is emitted.

[0014] Moreover, in the present invention, the battery 34 can be detached. Namely, no power source is installed between the connector 20 and the sleeve head 11 so as to be formed as a no light source wrench. Moreover, the sleeve head 11 can be directly engaged with a work piece or a sleeve of a general size.

[0015] In the present invention, the illumination element 300 is well hidden within the wrench 10 and the enhanced door lock capable of being locked from an inner side of a doorplate. No protrusion is formed on the wrench body. Thereby, the volume of the wrench is retained as a general one.

[0016] The present invention is thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the present invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

Claims

1. An illumination device of a sleeve wrench, the sleeve wrench (10) having a wrench body (101), a connector (20), and an illumination element (300); the wrench body including a handle (102), a tube body (101), an extending section (103), and a sleeve head (11) having a polygonal hole (12); the connector (20) including a polygonal connecting section (21) and an engaging section (201); a lateral side of the polygonal connecting section (21) of the connector (20) being arranged with springs (25), and steel balls (24) being embedded into the springs (25); thus, the connector (20) being inserted into the polygonal hole (12) of the sleeve head (11); **characterized in that:**

a front end of the polygonal hole (12) is installed with an upper buckling recess (14) and a lower buckling recess (15); a rear end of the polygonal hole (12) is formed with a receiving space for receiving a battery (34) of the illumination element;

the polygonal connecting section (21) of the connector (20) is formed with a receiving groove (22) for receiving the battery (34) of the illumination element (300); an interior of the engaging section (201) having a through hole (23) which is communicated with the receiving groove (22) for installing the illumination element (300) and light from the illumination element (300) passes through the through hole (23);

the illumination element (300) includes an insulating seat (30); a bottom of the illumination element (300) is firmly secured with an elastic conducting element (32) which is communicated with one electrode of a battery (34); a front surface of the insulating seat has a conducting piece (31); the insulating seat is assembled into the receiving groove (22) of the polygonal connecting section (21); another electrode of the battery (34) is conductive to the sleeve head (11), the conducting piece (31) and the elastic conducting element (32) are communicated to an LED light (33); the LED light (33) passes through the through hole (23) of the polygonal connecting section (21) of the connector (20); thereby, the illumination element is mounted in the connector and the battery (34) is replaceable;

wherein installing of the illumination element will not affect the volume of the wrench and the sleeve head; by inserting the polygonal connecting section (21) into the sleeve head (11); the steel balls (24) can be buckled to the upper buckling recess (14) and lower buckling recess (15) so as to control

the illumination of the illumination element.

2. The illumination device of a sleeve wrench as claimed in claim 1, wherein the polygonal hole (12) is one of a rectangular hole, a hexagonal hole, a dodecagonal hole.

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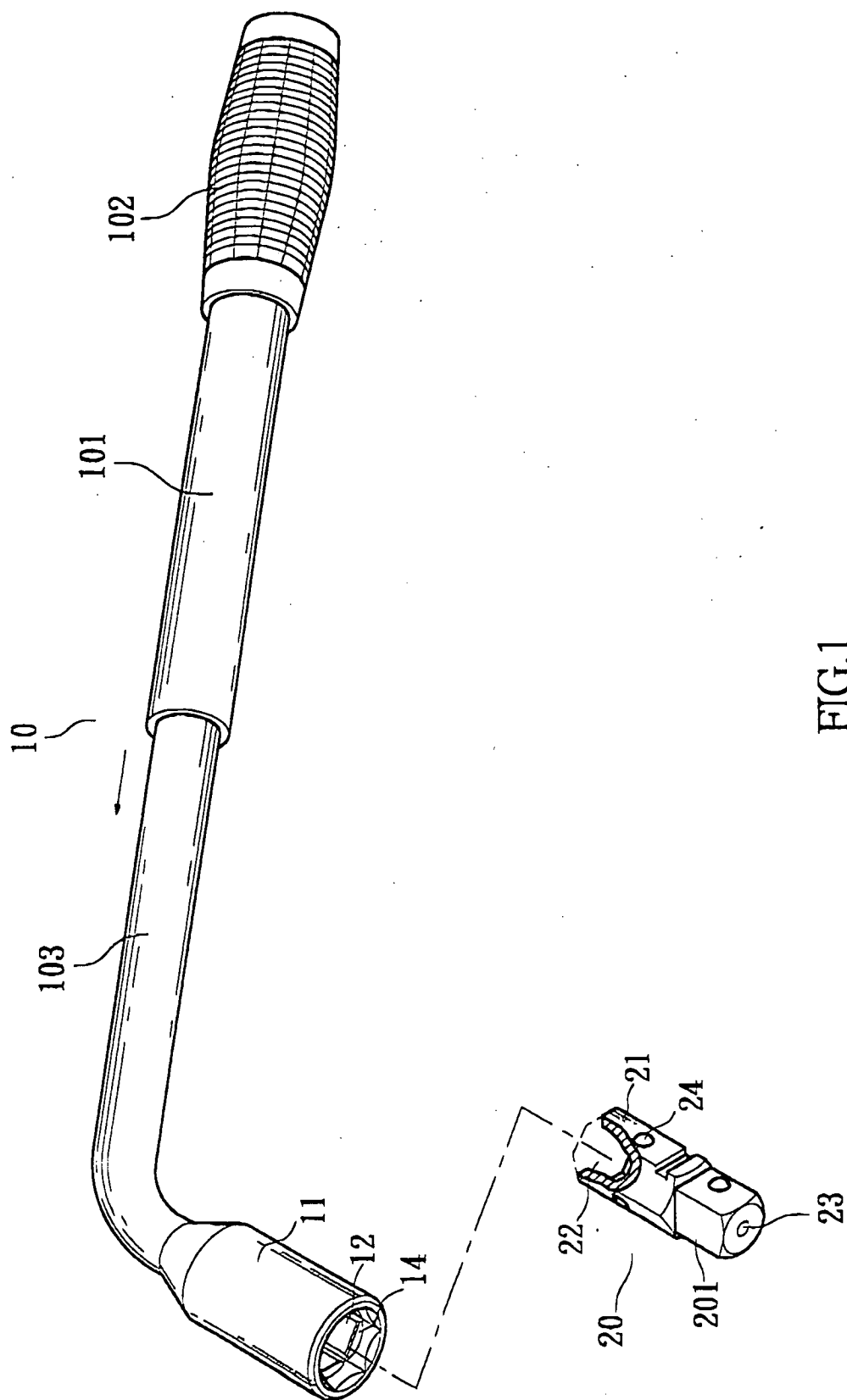


FIG.1

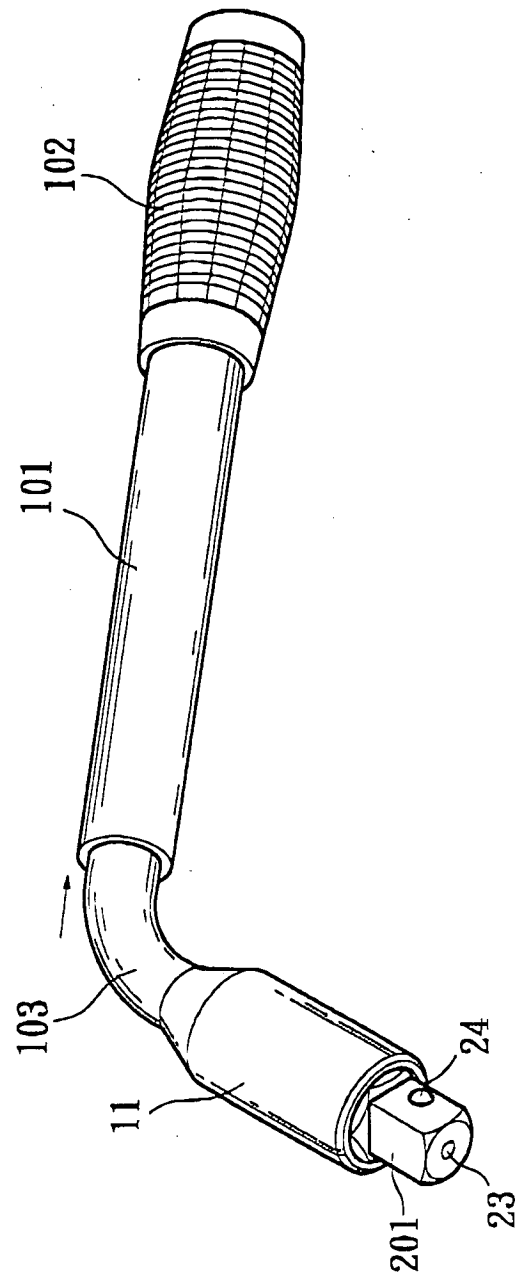
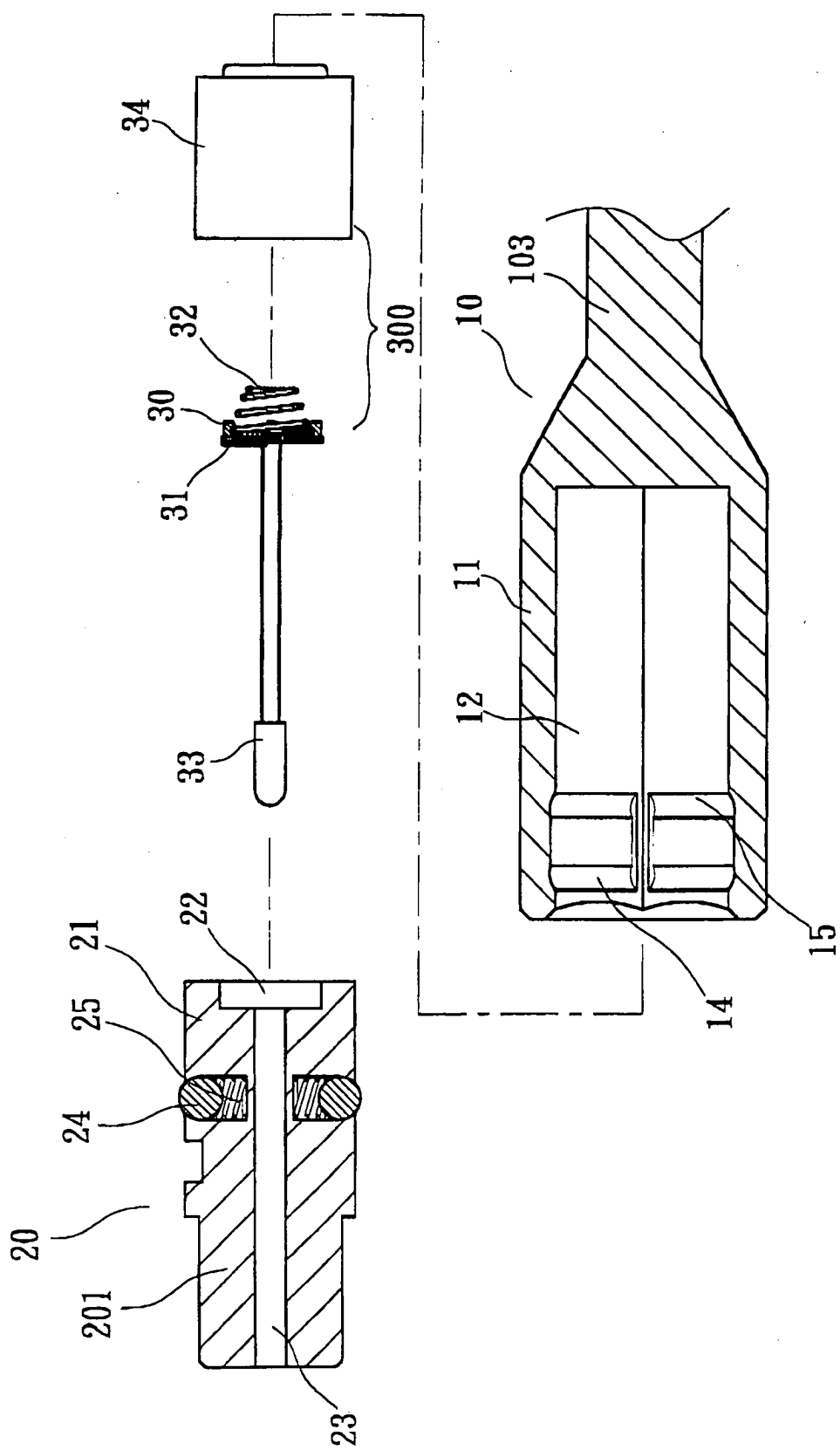


FIG.2



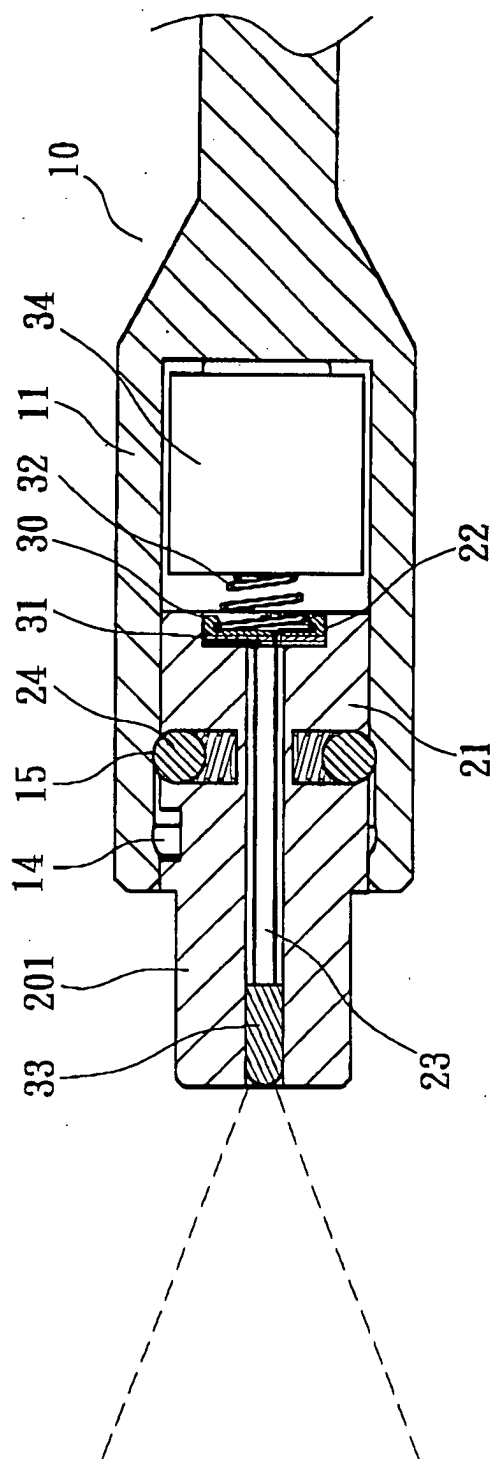


FIG.4

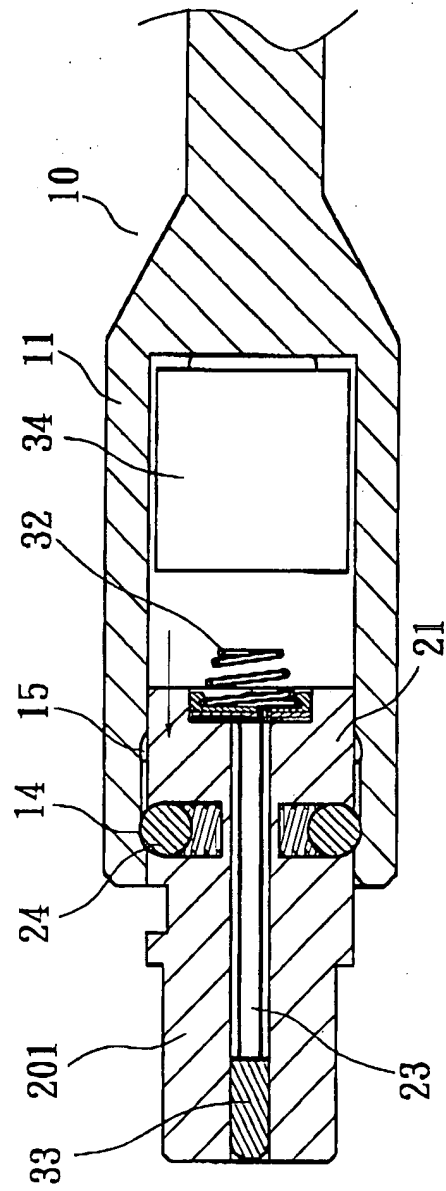


FIG.5



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 00 2011

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 6 367 944 B1 (WANG LAI-FU) 9 April 2002 (2002-04-09) * the whole document *	1,2	B25B23/18 B25G1/00
A	DE 200 12 795 U (CHU DE CHENG) 23 November 2000 (2000-11-23) * page 1, last paragraph - page 2, paragraph 2; figures *	1	
A	US 5 882 103 A (MOORE TIM S ET AL) 16 March 1999 (1999-03-16) * column 4, line 7 - column 6, line 12; figures 1-3 *	1,2	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B25B B25G
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 16 May 2003	Examiner Kühn, T
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 00 2011

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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16-05-2003

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