(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 587 922 A1**

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **92115633.7**

(51) Int. Cl.[5]: **B25B 13/46**

(22) Date of filing: **12.09.92**

(43) Date of publication of application:
23.03.94 Bulletin 94/12

(84) Designated Contracting States:
CH DE ES FR GB IT LI NL SE

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(54) **Control device for ratchet wrenches.**

(57) A ratchet wrench including a housing (10), a recess (11) formed in an upper portion of the housing (10), a ratchet wheel (16) rotatably disposed in one end of the housing (10), a pawl (15) pivotally disposed beside the ratchet wheel (16) for engagement with the ratchet wheel, a slide (20) slidably disposed in the recess (11), and a resilient member (24) having one end (241) engaged in the slide (20) and the other end (242) slidably engaged with the pawl (15), the pawl is caused to engage with the ratchet wheel (16) when the slide (20) is pushed toward and away from the pawl (15).

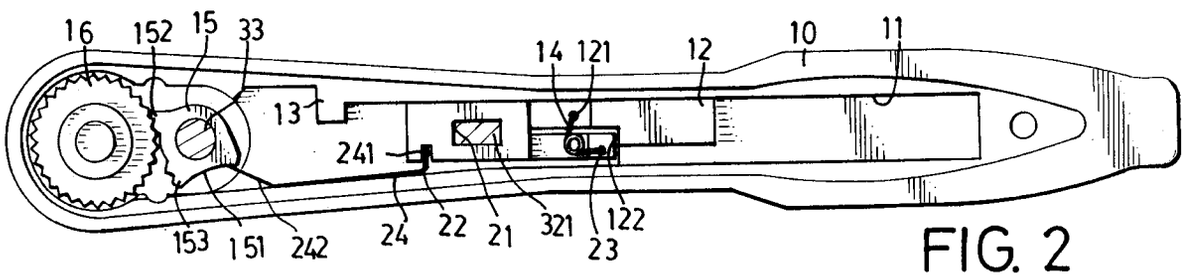

FIG. 2

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The invention relates to a control device for ratchet wrenches.

The closest prior art of which applicant is aware is his prior U.S. Patent No. 4,862,775 to Chow, entitled "CONTROL DEVICE FOR RATCHET WRENCHES", filed October 19, 1988. In this ratchet wrench, the knob is caused to move along the groove of the control element in order to switch the rotational directions of the ratchet wrench; however, the knob can not move along the groove of the control element smoothly.

The objective of the invention is to provide a control device of a ratchet wrench which can be operated smoothly.

A ratchet wrench comprising a housing including a recess formed in an upper portion thereof and enclosed by a cover, a ratchet wheel rotatably disposed in a first end of the housing, a pawl pivotally disposed in the first end of the housing and including a first tooth and a second tooth for engagement with the ratchet wheel respectively, a depression formed in one side of the pawl, a slide slidably disposed in the recess and including a slit formed therein, and a resilient member including a first end engaged in the slit of the slide and a second end slidably engaged with the depression, whereby, the first tooth and the second tooth of the pawl are caused to engage with the ratchet wheel respectively when the pawl is rotated by engagement between the second end of the resilient member and the depression of the pawl and when the slide is pushed toward and away from the pawl.

FIG. 1 is an exploded view of a ratchet wrench;

FIGS. 2, 3 and 4 are top plane view of the ratchet wrench, with the cover removed, illustrating the operations of the ratchet wrenches.

Referring to FIGS. 1 and 2, a ratchet wrench comprises a housing 10 including a recess 11 formed in the upper portion and enclosed by a cover 30, a cap 36 enclosing the lower portion of the housing 10 and including two openings formed therein, a ratchet wheel 16 rotatably received in the first end of the housing 10, and a pawl 15 rotatably rotatably supported in the housing 10 by a pin 33 which is fixed between the cover 30 and the cap 36, the pawl 15 including a curved depression 151 formed in one side portion thereof and a first tooth 152 and a second tooth 153 formed thereon for engagement with the ratchet wheel 16 respectively.

The control device for the ratchet wrench includes a block 12 formed integral in the middle portion of the recess 11 of the housing 10 and having a hole 121 and a notch 122 formed therein, a stop 13 formed in the housing 10 and located between the first end of the housing 10 and the block 12, a slide 20 slidable between the stop 13 and the block 12 and including an orifice 21 and a slit 22 formed therein, an extension 201 extended from the slide 20 and slidably engaged in the notch 122 of the block 12 and having a hole 23 formed therein, a sprang 14 engaged in the holes 121 and 23 of the block 12 and the extension 201 of the slide 20, and a resilient member 24 including a flange 241 formed in one end for engagement in the slit 22 of the slide 20 and a bent portion 242 formed in the other end for slidable engagement with the curved depression 151 of the pawl 15, and a knob 32 including a stub 321 extended downward through the oblong hole 31 of the cover 30 and engaged in the orifice 21 of the slide 20 in order to move the slide 20, the stop 13 and the block 12 limit the movements of the slide 20.

In operation, referring next to FIGS. 2, 3 and 4, when the slide 20 is moved rearward to the position as shown in FIG. 2, the first tooth 152 of the pawl 15 is caused to engage with the ratchet wheel 16 such that the ratchet wheel 16 can not rotate clockwise and is rotatable counterclockwise. When the slide 20 is moved to the middle position as shown in FIG. 3, both the teeth 152, 153 of the pawl 15 are not engaged with the ratchet wheel 16 such that the ratchet wheel 16 is rotatable in both directions. When the slide 20 is moved forward to the position as shown in FIG. 4, the second tooth 153 of the pawl 15 is caused to engage with the ratchet wheel 16 such that the ratchet wheel 16 can not rotate counterclockwise and is rotatable clockwise.

It is preferable that the spring 14 is a compression and coil spring and arranged such that the slide 20 can be maintained at the positions as shown in FIGS. 2 to 4.

Accordingly, the control device for the ratchet wrench can be operated smoothly.

Claims

1. A ratchet wrench comprising a housing (10) including a recess (11) formed in an upper portion and enclosed by a cover (30), a ratchet wheel (16) rotatably disposed in a first end of said housing (10), a pawl (15) pivotally disposed in said first end of said housing (10) and including a first tooth (152) and a second tooth (153) for engagement with said ratchet wheel (16) respectively, a depression (151) formed in one side of said pawl (15), a slide (20) slidably disposed in said recess (11) and including a slit (22) formed therein, and a resilient member (24) including a first end (241) engaged in said slit (22) of said slide (20) and a second end (242) slidably engaged with said depression (151), whereby, said first tooth (152) and said second tooth (153) of said pawl (15) are caused to engage with said ratchet wheel (16) when said slide (20) is pushed toward and away

from said pawl (15).

2. A ratchet wrench according to claim 1 further comprising means (12, 13) for limiting movement of said slide (20).

3. A ratchet wrench according to claim 2, wherein limiting means (12, 13) includes a block (12) formed in a middle portion of said recess (11) and a stop (13) formed in said recess (11) and located between said block (12) and said pawl (15), said slide (20) is slidable between stop (13) and said block (12).

4. A ratchet wrench according to claim 3, wherein said block (12) includes a notch (122) formed therein, said slide (20) includes an extension (201) slidably engaged in said notch (122) of said block (20).

5. A ratchet wrench according to claim 4 further comprising a spring (14) engaged between said extension (201) of said slide (20) and said block (12).

6. A ratchet wrench comprising a housing (10) including a recess (11) formed in an upper portion and enclosed by a cover (30), a ratchet wheel (16) rotatably disposed in a first end of said housing (10), a pawl (15) pivotally disposed in said first end of said housing (10) and including a first tooth (152) and a second tooth (153) for engagement with said ratchet wheel (16), a depression (151) formed in one side of said pawl (15), a slide (20) slidably disposed in said recess (11) and including a slit (22) formed therein, a block (12) formed in a middle portion of said recess (11) and including a notch (122) formed therein, said slide (20) including an extension (201) slidably engaged in said notch (122) of said block (12), a spring (14) engaged between said extension (201) of said slide (20) and said block (12), a stop (13) formed in said recess (11) and located between said block (12) and said pawl (15), said slide (20) being slidable between stop (13) and said block (12), and a resilient member (24) including a first end engaged in said slit (22) of said slide (20) and a second end slidably engaged with said depression (151), whereby, said first tooth (152) and said second tooth (153) of said pawl (15) are caused to engage with said ratchet wheel (16) when said slide (20) is pushed toward and away from said pawl (15).

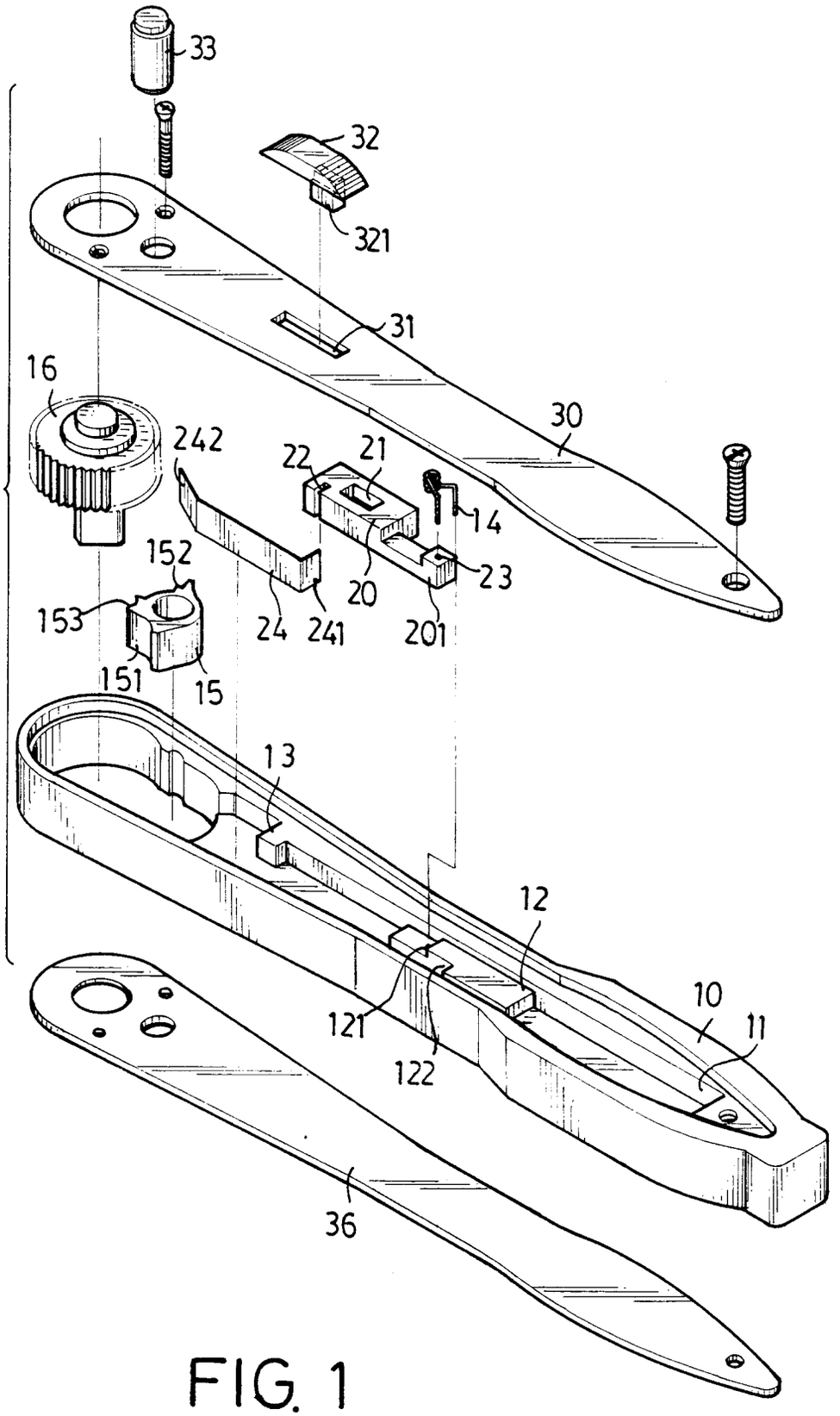
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FIG. 1

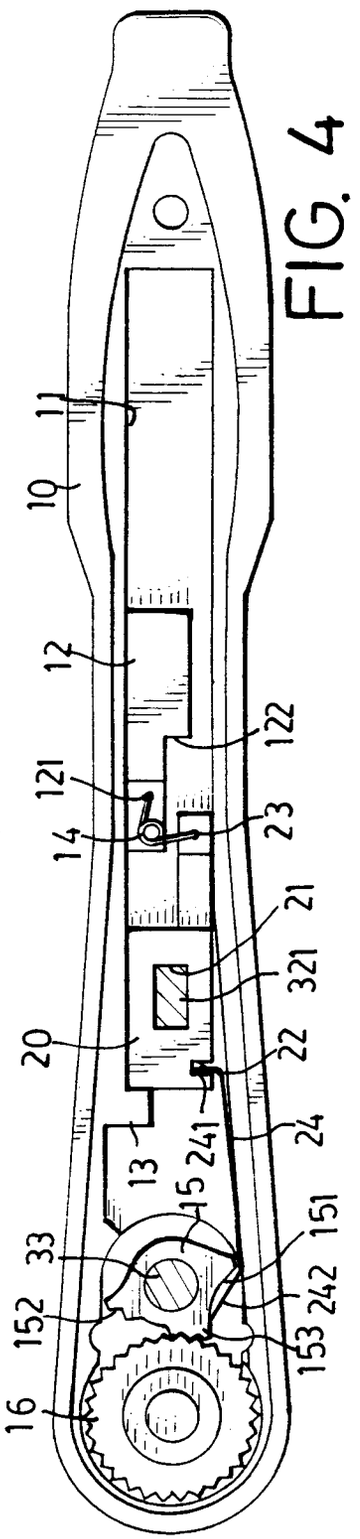

FIG. 4

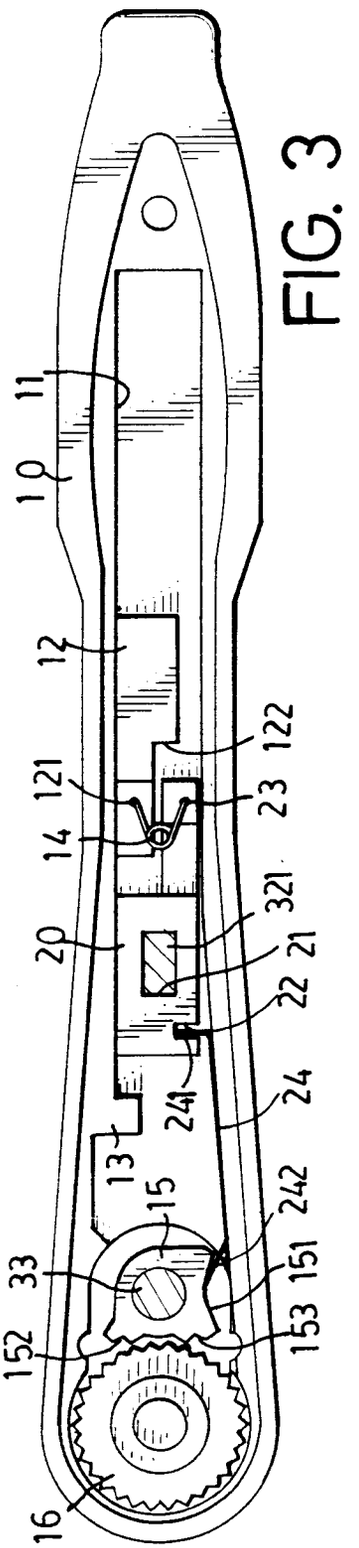

FIG. 3

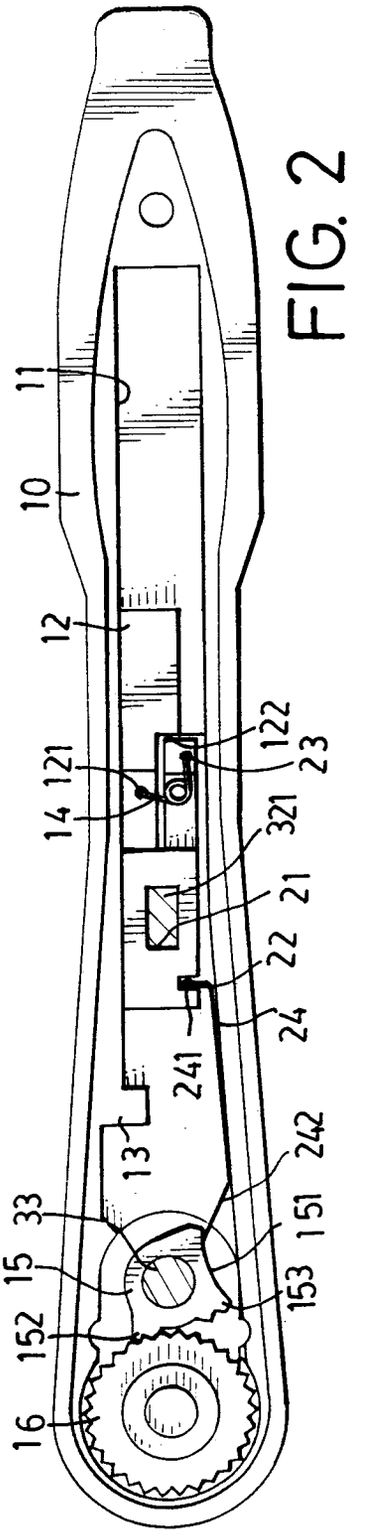

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number

EP 92 11 5633

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.5)
X A	US-A-4 722 253 (J.CHOW) * column 2, line 35 - line 39; figures 2-4 * * column 2, line 62 - column 3, line 56 *	1,2,6 3,4,5	B25B13/46
X A	US-A-5 000 066 (P.A.GENTILUOMO) * column 3, line 4; figure 3 * * column 3, line 22 - column 4, line 5 *	1,2,6 3,4,5	
A	US-A-4 445 404 (D.L.PARKER) * abstract; figure 1 *	1	
D,A	US-A-4 862 775 (J.CHOW)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)
B25B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	28 APRIL 1993	MAJERUS H.M.P.

CATEGORY OF CITED DOCUMENTS

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