



(11)

EP 1 652 789 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
03.05.2006 Bulletin 2006/18

(51) Int Cl.:
B65D 73/00 (2006.01)

(21) Application number: **05014267.8**

(22) Date of filing: **30.06.2005**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR**
Designated Extension States:
AL BA HR LV MK YU

(72) Inventor: **Tuan, Hsien-Chung**
408 Taichung (TW)

(74) Representative: **Winkler, Andreas Fritz Ernst**
Forrester & Boehmert
Pettenkoferstrasse 20-22
80336 München (DE)

(30) Priority: **29.10.2004 US 975485**

(71) Applicant: **Lea Way Hand Tool Corporation**
408 Taichung (TW)

(54) Tool display rack for a ratchet wrench having holding and rotation test function

(57) A tool display rack includes a main body (21), a mounting portion (211) mounted on the main body to allow passage of the drive stud (110) of the tool (10) and having a peripheral wall provided with a plurality of elastic locking portions (212) urged on a peripheral wall of the drive stud (110), and a pressing member (22) pivotally

mounted on the main body and urged on the neck portion (12). Thus, the locking portions (212) are urged on the peripheral wall of the drive stud of the tool to retain the drive stud of the tool in the retaining portions closely, so that the drive stud of the tool is secured on the mounting portion of the tool display rack rigidly and stably.

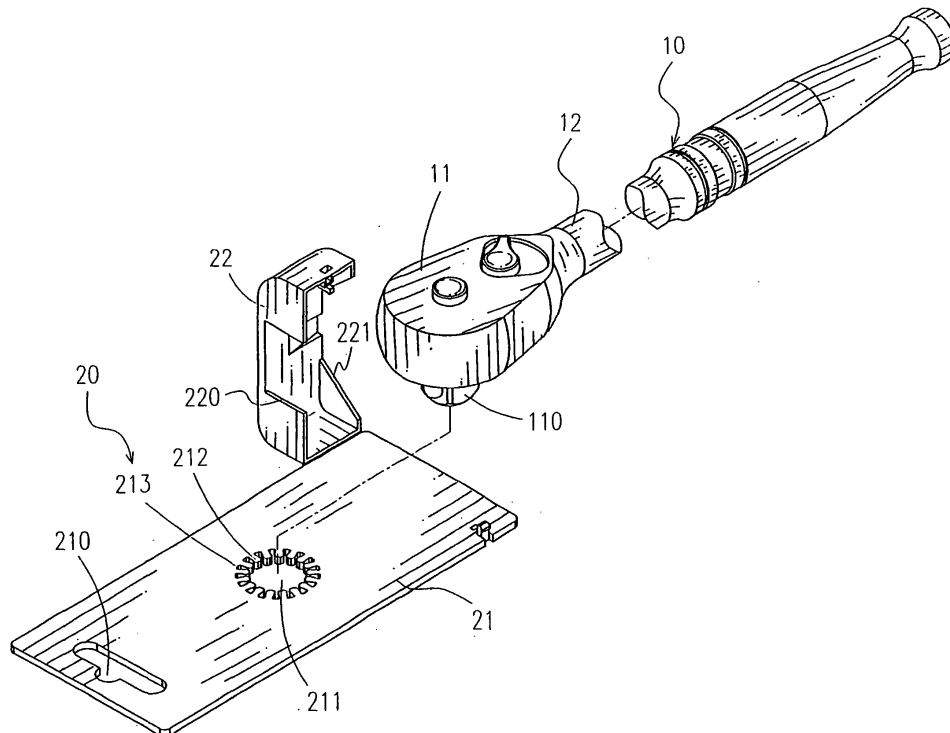


Fig. 2

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a tool display rack, and more particularly to a tool display rack having holding and rotation test functions.

2. Description of the Related Art

[0002] A conventional tool display rack in accordance with the prior art shown in Figs. 8 and 9 comprises a main body 40 formed with a circular hole 41 for mounting the square drive stud 310 of the drive head 31 of a wrench 30, and a pressing member 42 secured on the main body 40 and urged on the neck portion of the wrench 30. However, the wrench 30 cannot be rotated relative to the main body 40 of the tool display rack to test the rotation angle of the drive stud 310 of the wrench 30.

[0003] Another conventional tool display rack in accordance with the prior art shown in Figs. 10 and 11 comprises a main body 40 formed with a square hole 43 for mounting the square drive stud 310 of the drive head 31 of the wrench 30. Thus, the square drive stud 310 of the wrench 30 is mounted in the square hole 43 of the main body 40, and the wrench 30 is rotated relative to the main body 40 of the tool display rack to test the rotation angle of the drive stud 310 of the wrench 30. However, the square hole 43 of the main body 40 is larger than the drive stud 310 of the wrench 30, so that the rotation angle of the drive stud 310 of the wrench 30 is not tested exactly.

[0004] Another conventional tool display rack in accordance with the prior art shown in Figs. 12-14 comprises a main body 40 formed with a circular hole 41, and a locking member 50 extended through the drive head 31A of a wrench 30A and having a first end formed with a hexagonal positioning portion 52 secured in the drive head 31A of the wrench 30A and a second end formed with a locking hook 51 extended through the circular hole 41 and locked on a bottom of the main body 40 to secure the drive head 31A of the wrench 30A on the main body 40. In such a manner, the hexagonal positioning portion 52 of the locking member 50 is secured in the drive head 31A of the wrench 30A, and the wrench 30A is rotated relative to the main body 40 of the tool display rack to test the rotation angle of the ratchet wheel 32A of the drive head 31A of the wrench 30A. However, the tool display rack needs to provide a locking member 50, so that the tool display rack has a complicated construction, thereby increasing costs of fabrication. In addition, the locking hook 51 of the locking member 50 cannot hold the main body 40 closely, so that the locking member 50 is easily rotated with the drive head 31A of the wrench 30A, thereby decreasing the testing precision.

SUMMARY OF THE INVENTION

[0005] The primary objective of the present invention is to provide a tool display rack having holding and rotation test functions.

[0006] Another objective of the present invention is to provide a tool display rack, wherein the main body of the tool display rack is integrally formed with the mounting portion, the locking portions and the retaining portions, so that the tool display rack has a simplified construction, thereby decreasing costs of fabrication.

[0007] A further objective of the present invention is to provide a tool display rack, wherein the locking portions are urged on the peripheral wall of the drive stud of the tool to retain the drive stud of the tool in the retaining portions closely, so that the drive stud of the tool is secured on the mounting portion of the tool display rack rigidly and stably.

[0008] A further objective of the present invention is to provide a tool display rack, wherein the drive stud of the tool is closely secured on the mounting portion and cannot be rotated relative to the main body of the tool display rack, so that the drive head of the tool is rotated relative to the main body of the tool display rack to test the rotation angle of the drive stud of the tool exactly.

[0009] A further objective of the present invention is to provide a tool display rack, wherein the passage of the pressing member has a side having two ends each formed with an oblique limit portion to increase the testing travel of the tool, so that the rotation angle of the drive stud of the tool is tested more exactly.

[0010] In accordance with the present invention, there is provided a tool display rack for a tool having a drive head and a neck portion, the drive head having a drive stud, the tool display rack comprising:

- a main body;
- a mounting portion mounted on the main body to allow passage of the drive stud and having a peripheral wall provided with a plurality of elastic locking portions urged on a peripheral wall of the drive stud; and
- a pressing member pivotally mounted on the main body and urged on the neck portion.

[0011] Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

- Fig. 1 is a perspective view of a tool display rack in accordance with the preferred embodiment of the present invention;
- Fig. 2 is an exploded perspective view of the tool

display rack as shown in Fig. 1;

Fig. 3 is a bottom perspective view of the tool display rack as shown in Fig. 1;

Fig. 4 is a bottom plan operational view of the tool display rack as shown in Fig. 1;

Fig. 4A is a locally enlarged view of the tool display rack as shown in Fig. 4;

Fig. 5 is a side plan operational view of the tool display rack as shown in Fig. 1;

Fig. 6 is a bottom plan view of a tool display rack in accordance with another embodiment of the present invention;

Fig. 7 is an exploded perspective view of a tool display rack in accordance with another embodiment of the present invention;

Fig. 8 is an exploded perspective view of a conventional tool display rack in accordance with the prior art;

Fig. 9 is a plan cross-sectional assembly view of the conventional tool display rack as shown in Fig. 8;

Fig. 10 is an exploded perspective view of another conventional tool display rack in accordance with the prior art;

Fig. 11 is a plan cross-sectional assembly view of the conventional tool display rack as shown in Fig. 10;

Fig. 12 is an exploded perspective view of another conventional tool display rack in accordance with the prior art;

Fig. 13 is a plan cross-sectional assembly view of the conventional tool display rack as shown in Fig. 12;

Fig. 13A is a locally enlarged view of the conventional tool display rack as shown in Fig. 13;

Fig. 14 is an exploded perspective view of the conventional tool display rack as shown in Fig. 12.

DETAILED DESCRIPTION OF THE INVENTION

[0013] Referring to the drawings and initially to Figs. 1-6, a tool display rack 20 in accordance with a first embodiment of the present invention is used for mounting a tool 10. The tool 10 has a drive head 11 and a neck portion 12. The drive head 11 of the tool 10 has a square drive stud 110.

[0014] The tool display rack comprises a main body 21, a mounting portion 211 mounted on the main body 21 to allow passage of the drive stud 110 of the tool 10 and having a peripheral wall provided with a plurality of elastic locking portions 212 urged on a peripheral wall of the drive stud 110 of the tool 10, and a pressing member 22 pivotally mounted on the main body 21 and urged on the neck portion 12 of the tool 10.

[0015] The main body 21 has a first end formed with a hanging portion 210 for hanging the main body 21. The mounting portion 211 is mounted on a mediate portion of the main body 21 and is preferably a through hole. Preferably, the main body 21 is integrally formed with the

mounting portion 211.

[0016] Preferably, the mounting portion 211 is integrally formed with the locking portions 212 which are extended radially inward therefrom. In addition, the peripheral wall of the mounting portion 211 is provided with a plurality of recessed retaining portions 213 mounted between the locking portions 212. Preferably, the mounting portion 211 is integrally formed with the retaining portions 213.

[0017] As shown in Figs. 3, 4 and 4A, when the drive stud 110 of the tool 10 is inserted into the mounting portion 211 of the tool display rack 20, the locking portions 212 are urged on the peripheral wall of the drive stud 110 of the tool 10 to retain the drive stud 110 of the tool 10 in the retaining portions 213 closely, so that the drive stud 110 of the tool 10 is secured on the mounting portion 211 and cannot be rotated relative to the main body 21 of the tool display rack 20.

[0018] As shown in Figs. 2 and 5, the pressing member 22 is pivotally mounted on a second end of the main body 21 and has an inside formed with a passage 220 to allow passage of the neck portion 12 of the tool 10. Preferably, the passage 220 of the pressing member 22 has a side having two ends each formed with an oblique limit portion 221 to limit a further movement of the neck portion 12 of the tool 10.

[0019] In such a manner, the neck portion 12 of the tool 10 is movable in the passage 220 of the pressing member 22 between the limit portions 221 of the passage 220, so that the drive head 11 of the tool 10 is rotated relative to the main body 21 of the tool display rack 20 to test the rotation angle of the drive stud 110 of the tool 10.

[0020] As shown in Fig. 6, each of the locking portions 212 has a reduced neck portion to enhance the elasticity of each of the locking portions 212.

[0021] Accordingly, the main body 21 of the tool display rack 20 is integrally formed with the mounting portion 211, the locking portions 212 and the retaining portions 213, so that the tool display rack 20 has a simplified construction, thereby decreasing costs of fabrication. In addition, the locking portions 212 are urged on the peripheral wall of the drive stud 110 of the tool 10 to retain the drive stud 110 of the tool 10 in the retaining portions 213 closely, so that the drive stud 110 of the tool 10 is secured on the mounting portion 211 of the tool display rack 20 rigidly and stably. Further, the drive stud 110 of the tool 10 is closely secured on the mounting portion 211 and cannot be rotated relative to the main body 21 of the tool display rack 20, so that the drive head 11 of the tool 10 is rotated relative to the main body 21 of the tool display rack 20 to test the rotation angle of the drive stud 110 of the tool 10 exactly. Further, the passage 220 of the pressing member 22 has a side having two ends each formed with an oblique limit portion 221 to increase the testing travel of the tool 10, so that the rotation angle of the drive stud 110 of the tool 10 is tested more exactly.

[0022] Referring to Fig. 7, the tool display rack 20 fur-

ther comprises an attachment 214 detachably mounted on the main body 21 and integrally formed with the mounting portion 211, the locking portions 212 and the retaining portions 213. The main body 21 is formed with a positioning hole 216 for mounting the attachment 214 and two opposite locking holes 217 located beside the positioning hole 216. The attachment 214 has a periphery formed with two opposite locking stubs 215 each locked in a respective one of the two opposite locking holes 217 of the main body 21, so that the attachment 214 is secured on the main body 21 closely.

[0023] While the preferred embodiment(s) of the present invention has been shown and described, it will be apparent to those skilled in the art that various modifications may be made in the embodiment(s) without departing from the spirit of the present invention. Such modifications are all within the scope of the present invention.

Claims

1. A tool display rack for a tool having a drive head (11) and a neck portion (12), the drive head (11) having a drive stud (110), the tool display rack comprising:
 - a main body (21);
 - a mounting portion (211) mounted on the main body (21) to allow passage of the drive stud (110) and having a peripheral wall provided with a plurality of elastic locking portions (212) urged on a peripheral wall of the drive stud (110); and
 - a pressing member (22) pivotally mounted on the main body (21) and urged on the neck portion (12).
2. The tool display rack in accordance with claim 1, wherein the main body (21) is integrally formed with the mounting portion (211).
3. The tool display rack in accordance with claim 1, wherein the mounting portion (211) is integrally formed with the locking portions (212) which are extended radially inward therefrom.
4. The tool display rack in accordance with claim 1, wherein the peripheral wall of the mounting portion (211) is provided with a plurality of recessed retaining portions (213) mounted between the locking portions (212).
5. The tool display rack in accordance with claim 4, wherein the mounting portion (211) is integrally formed with the retaining portions (213).
6. The tool display rack in accordance with claim 1, wherein the pressing member (22) has an inside formed with a passage (220).
7. The tool display rack in accordance with claim 6, wherein the passage (220) of the pressing member (22) has a side having two ends each formed with an oblique limit portion (221).
8. The tool display rack in accordance with claim 1, wherein each of the locking portions (212) has a reduced portion.
9. The tool display rack in accordance with claim 1, wherein the main body (21) has an end formed with a hanging portion (210).
10. The tool display rack in accordance with claim 1, wherein the mounting portion (211) is a through hole.
11. The tool display rack in accordance with claim 1, further comprising an attachment (214) detachably mounted on the main body (21) and integrally formed with the mounting portion (211).
12. The tool display rack in accordance with claim 11, wherein the main body (21) is formed with a positioning hole (216) for mounting the attachment (214).
13. The tool display rack in accordance with claim 12, wherein the main body (21) is formed with at least one locking hole (217), and the attachment (214) has a periphery formed with at least one locking stub (215) locked in the at least one locking hole (217) of the main body (21).

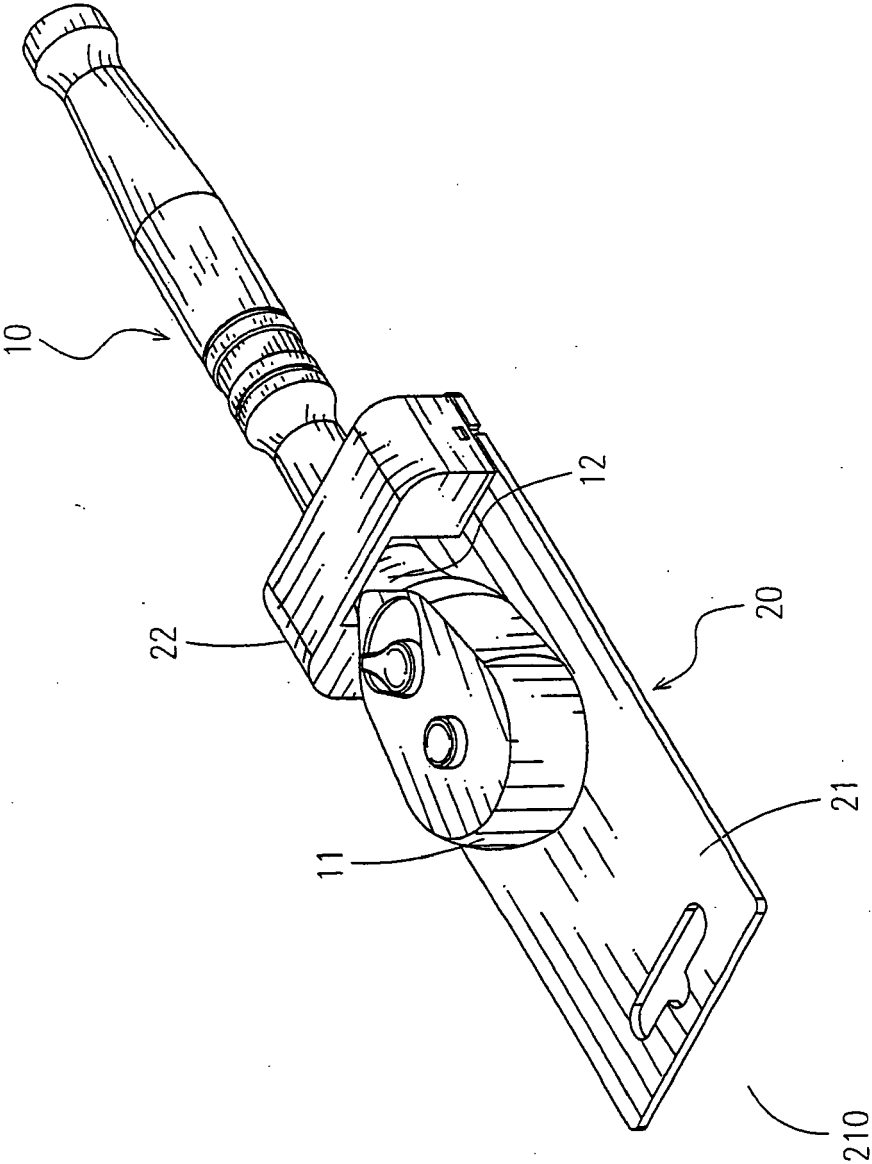


Fig. 1

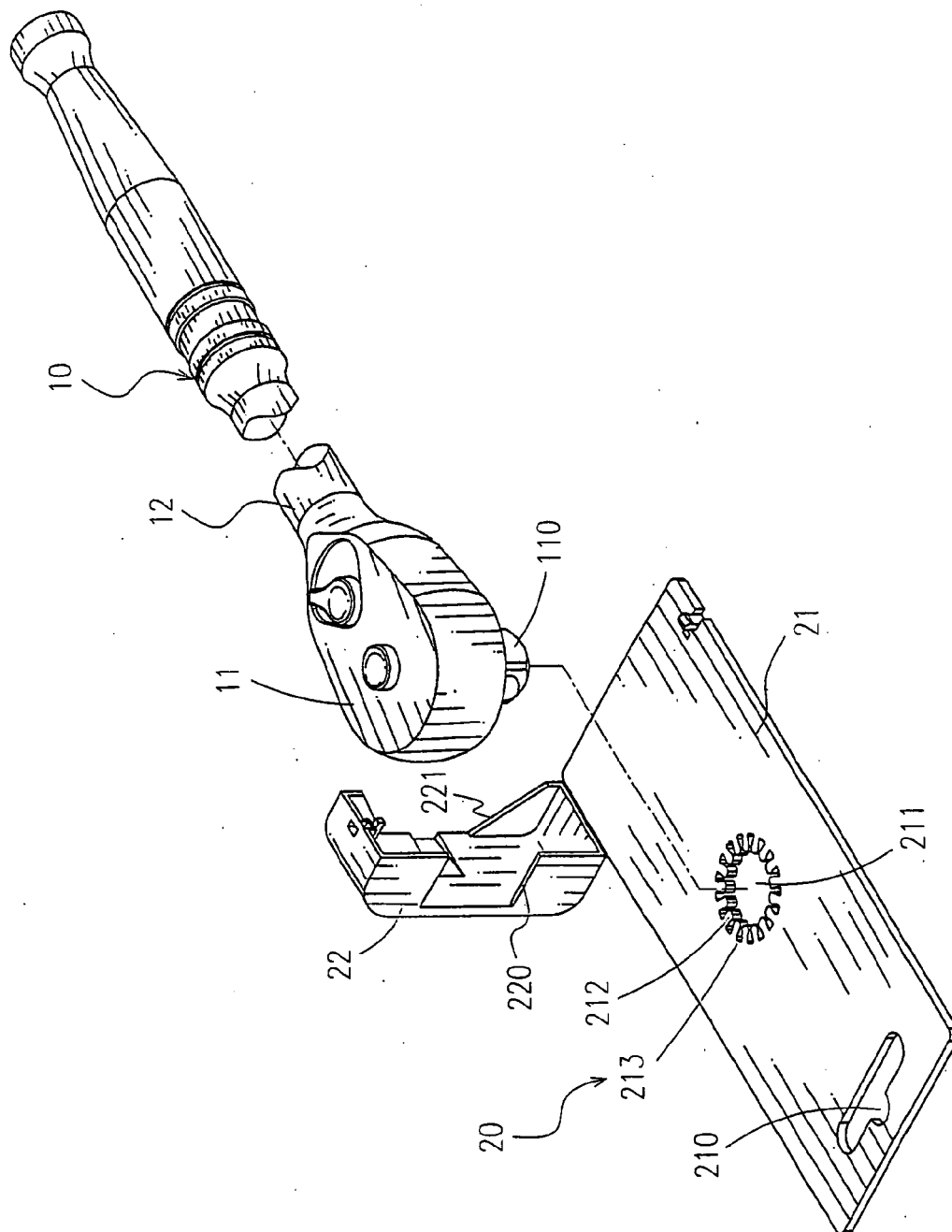


Fig. 2

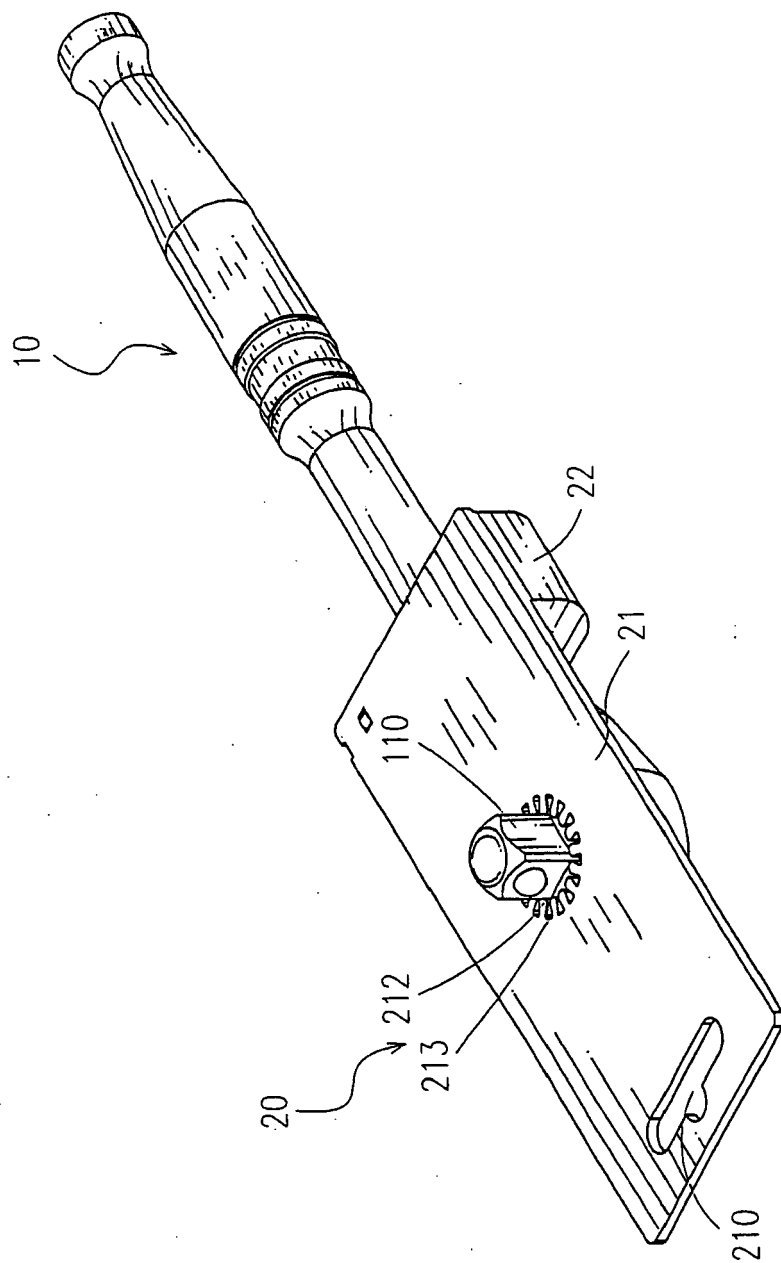


Fig. 3

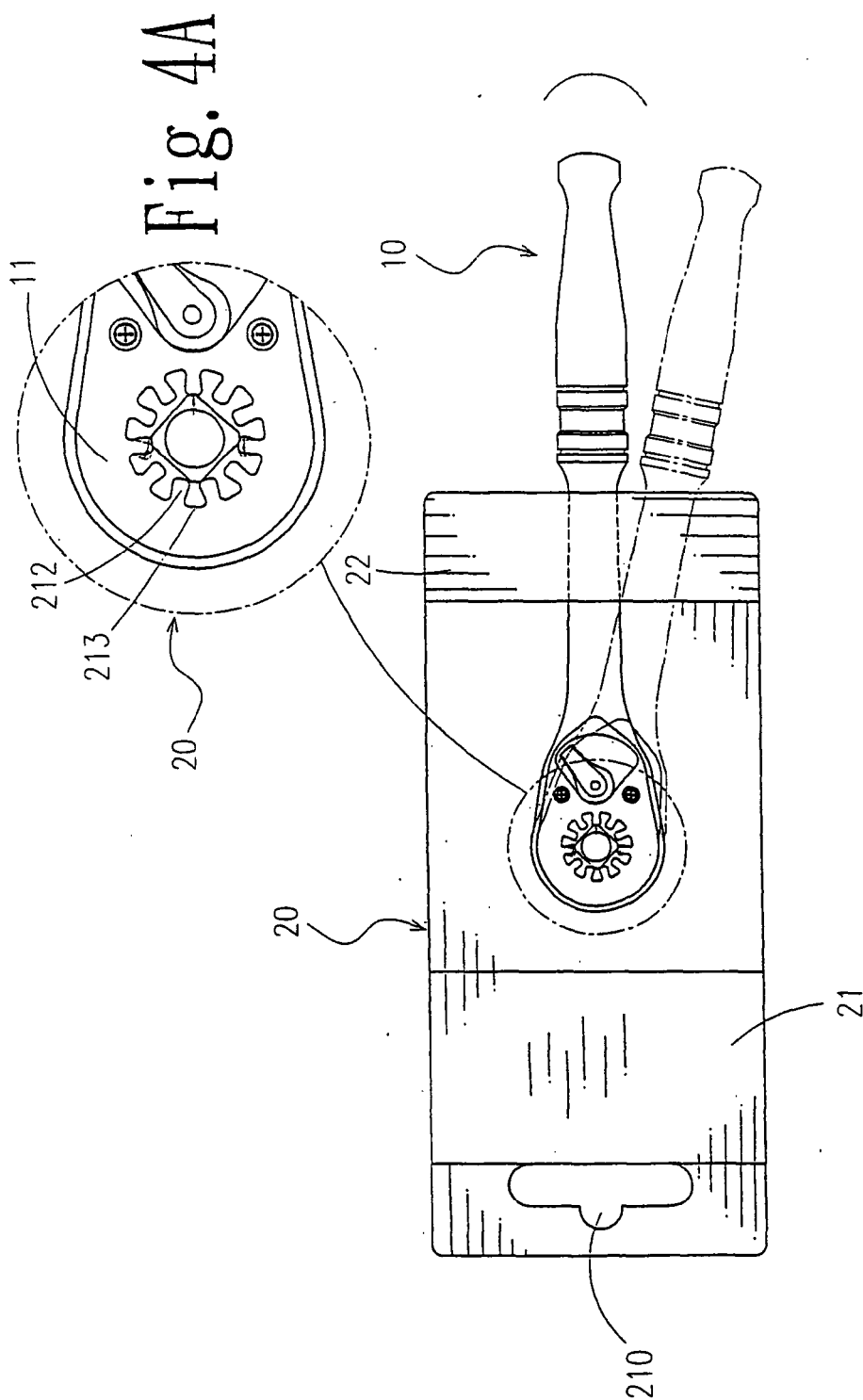


Fig. 4

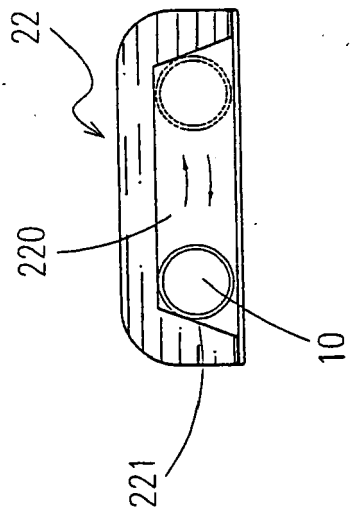


Fig. 5

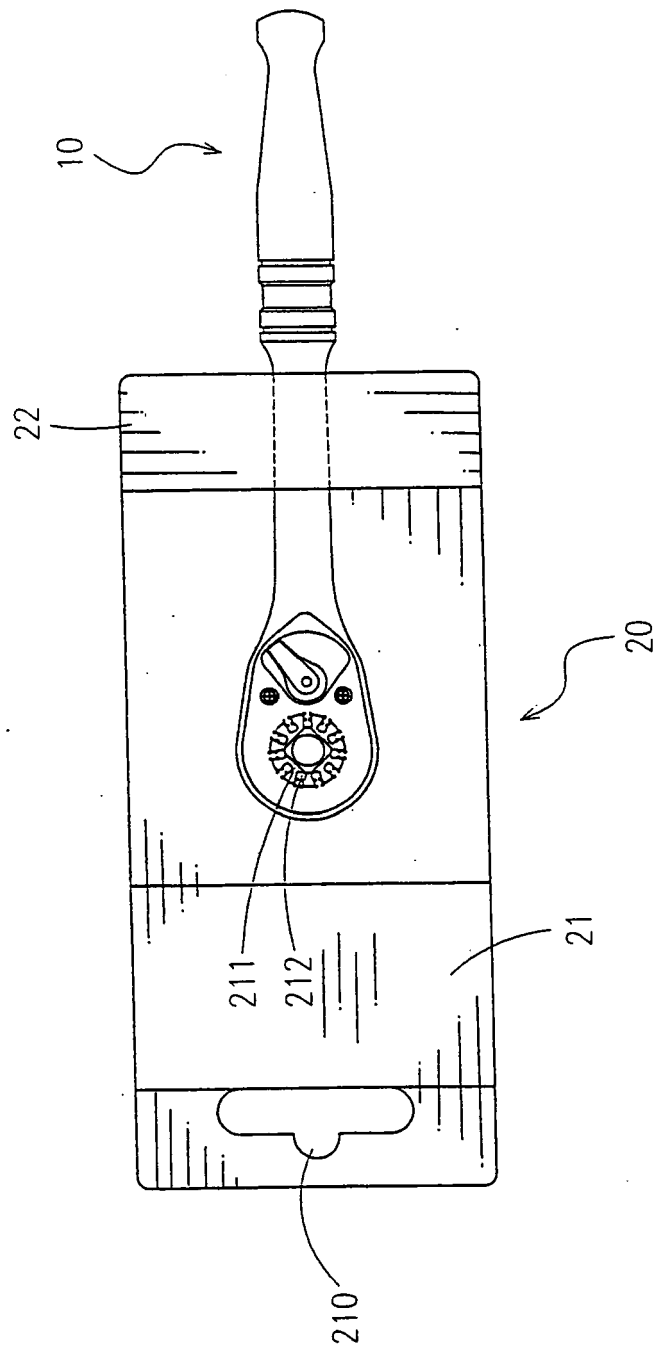


Fig. 6

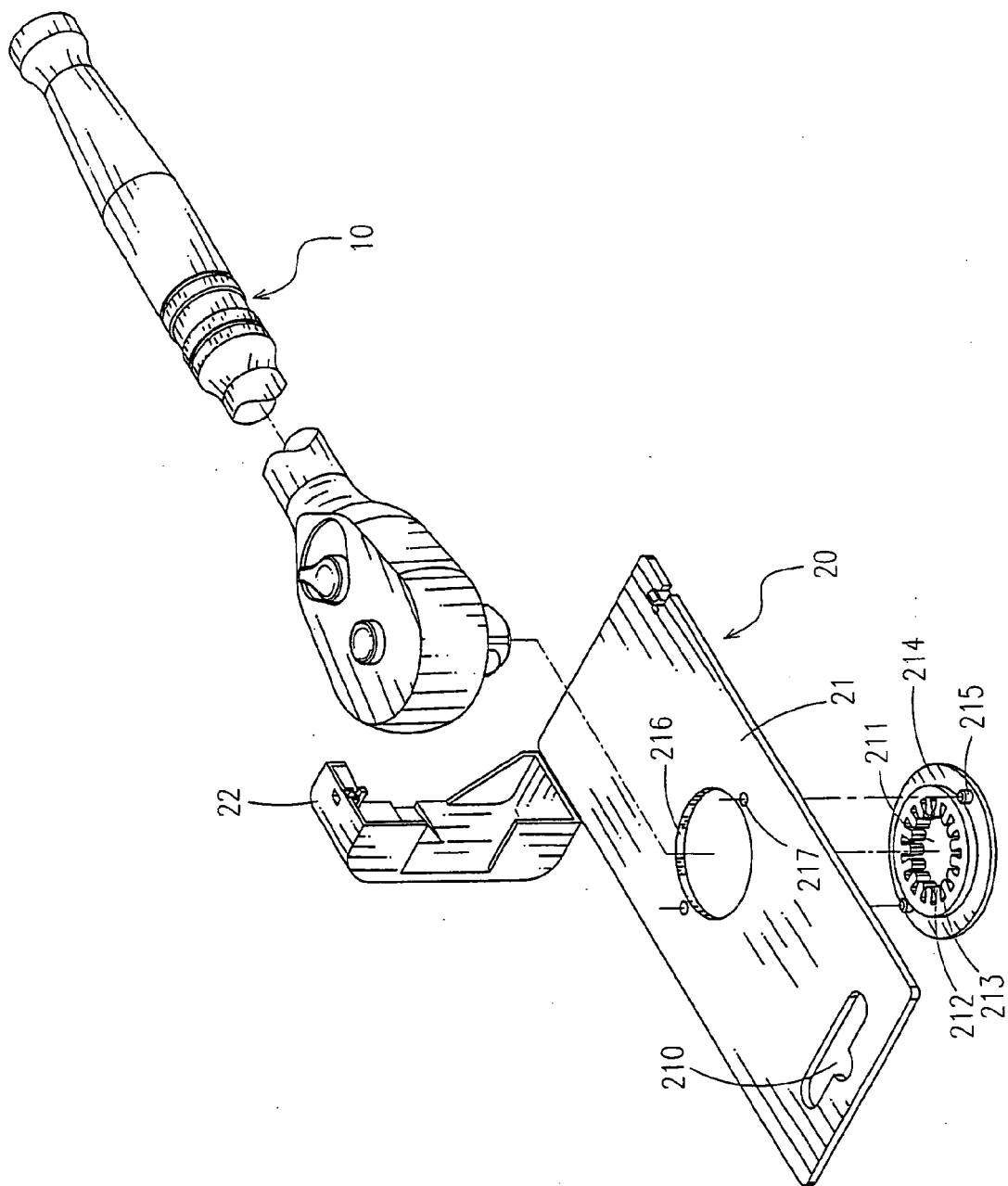


Fig. 7

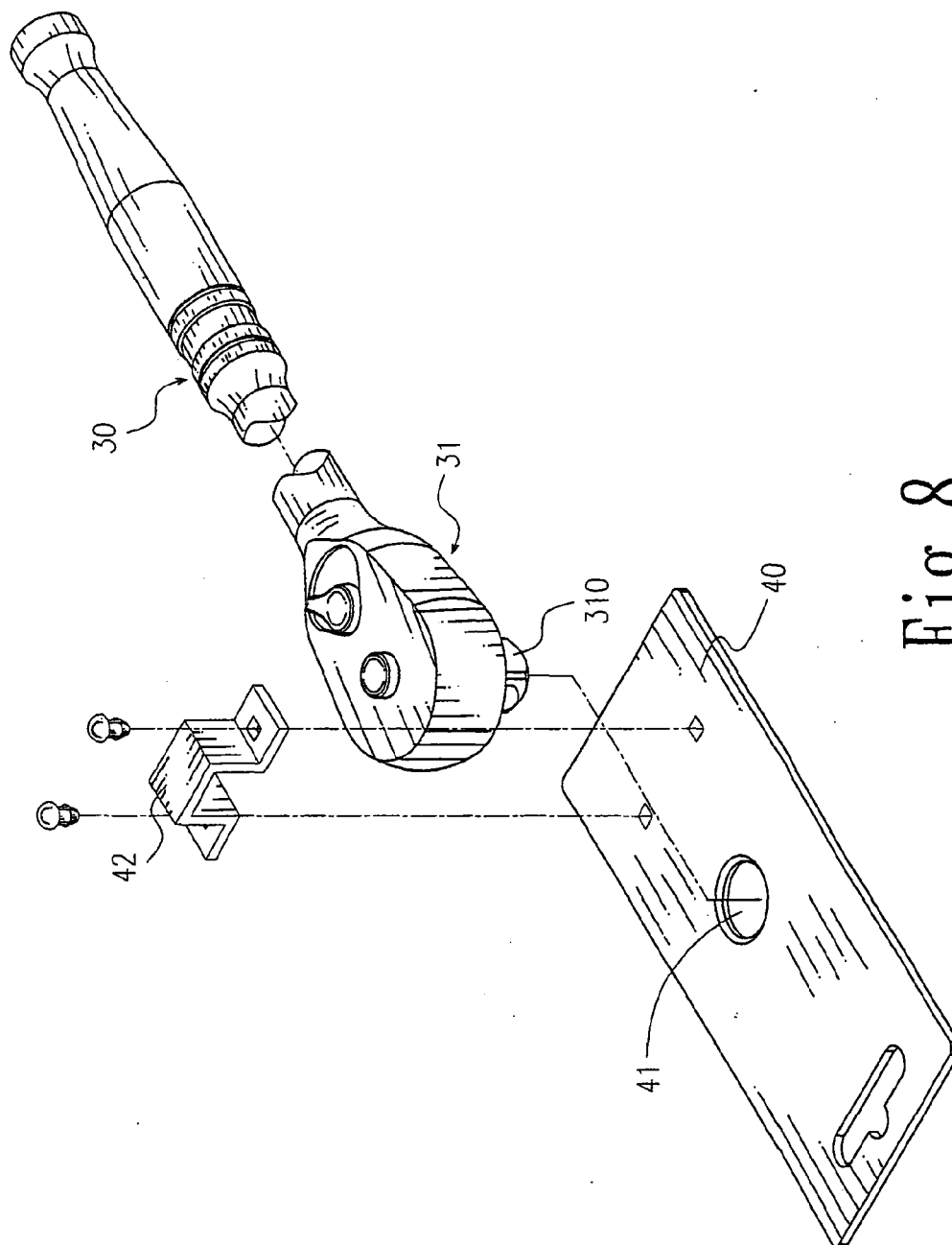


Fig. 8
PRIOR ART

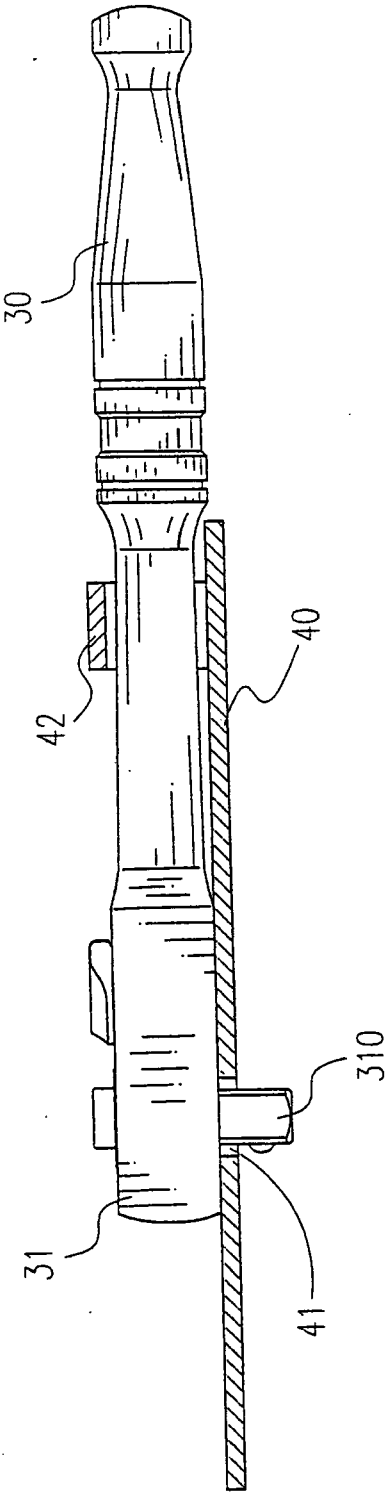


Fig. 9
PRIOR ART

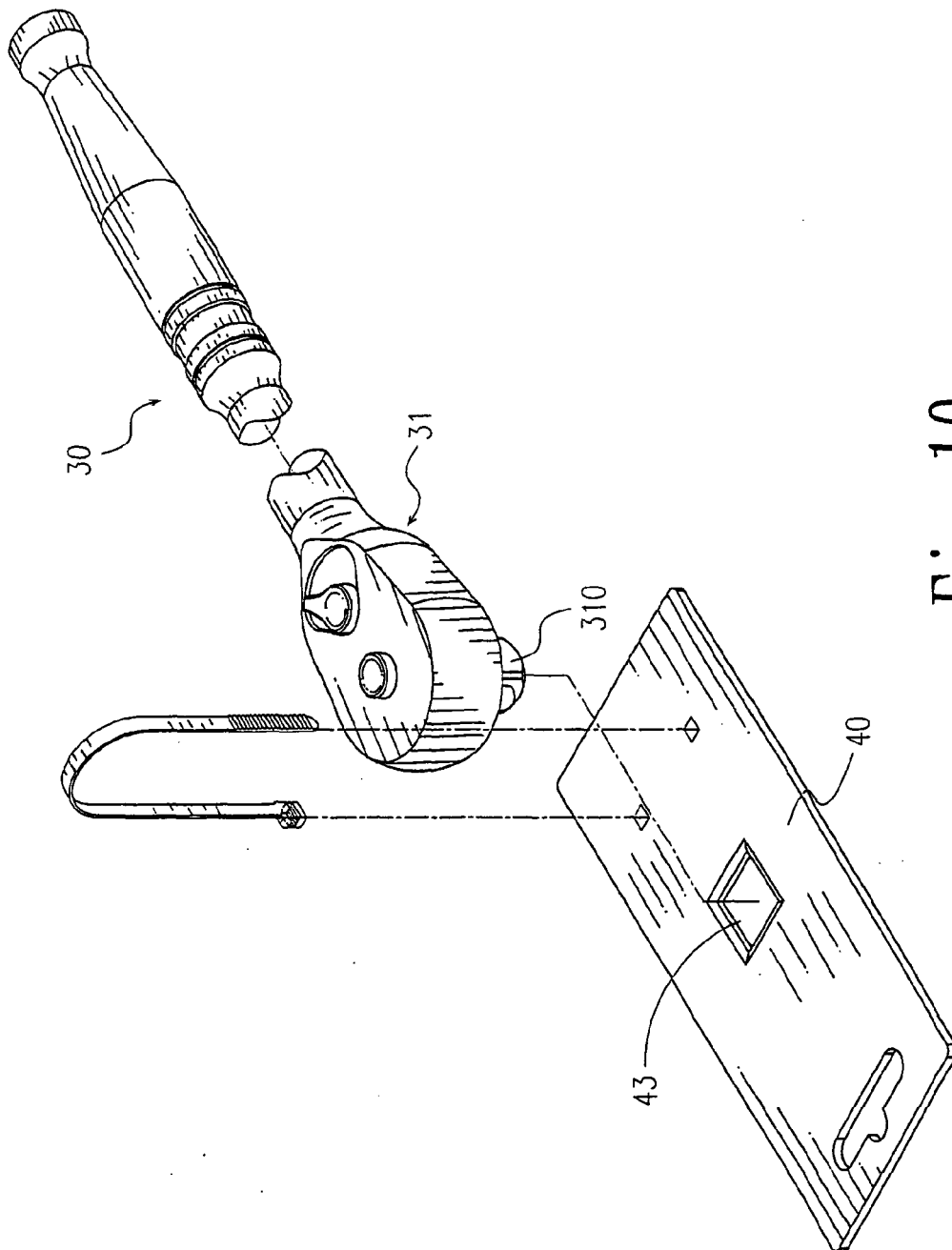


Fig. 10
PRIOR ART

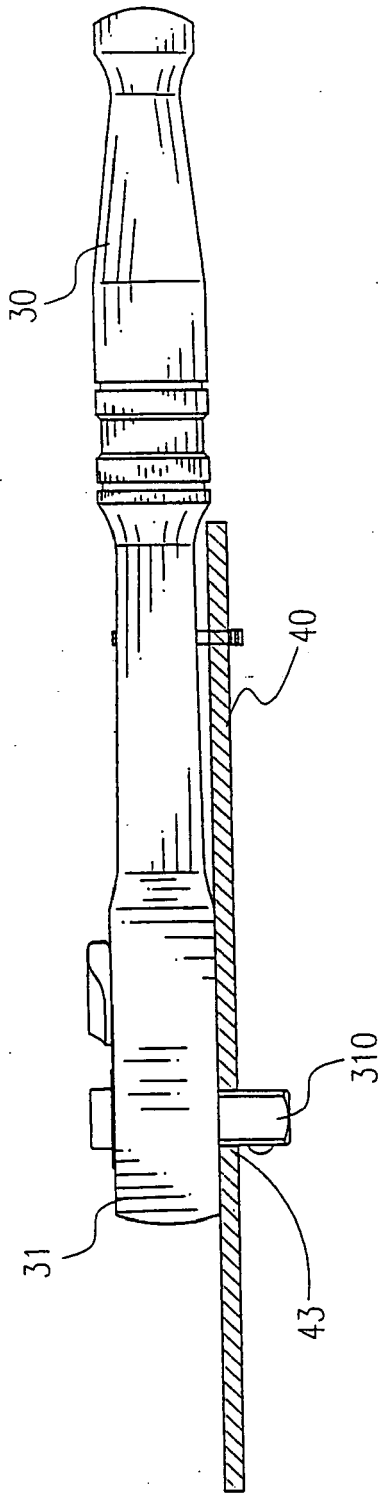


Fig. 11
PRIOR ART

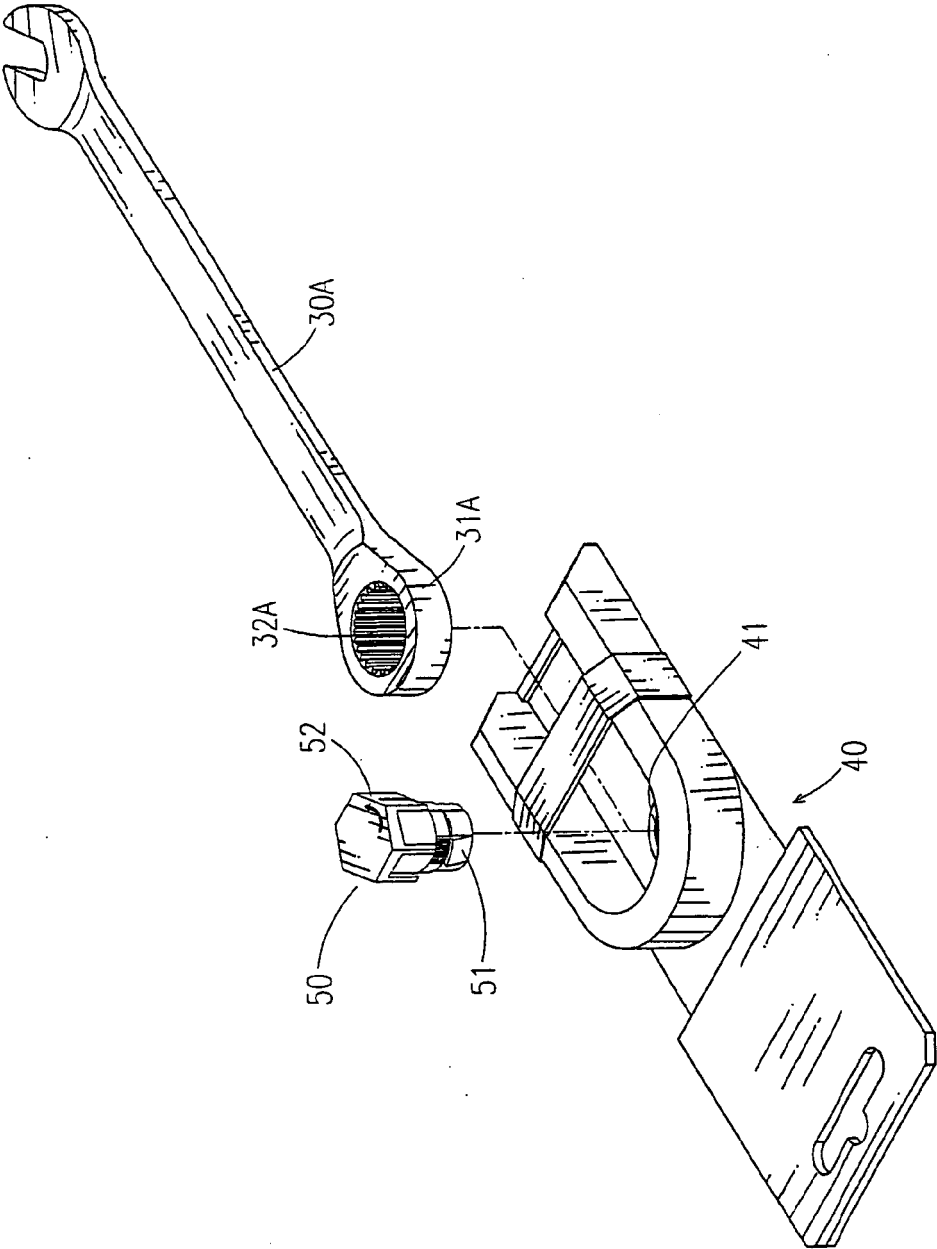


Fig. 12
PRIOR ART

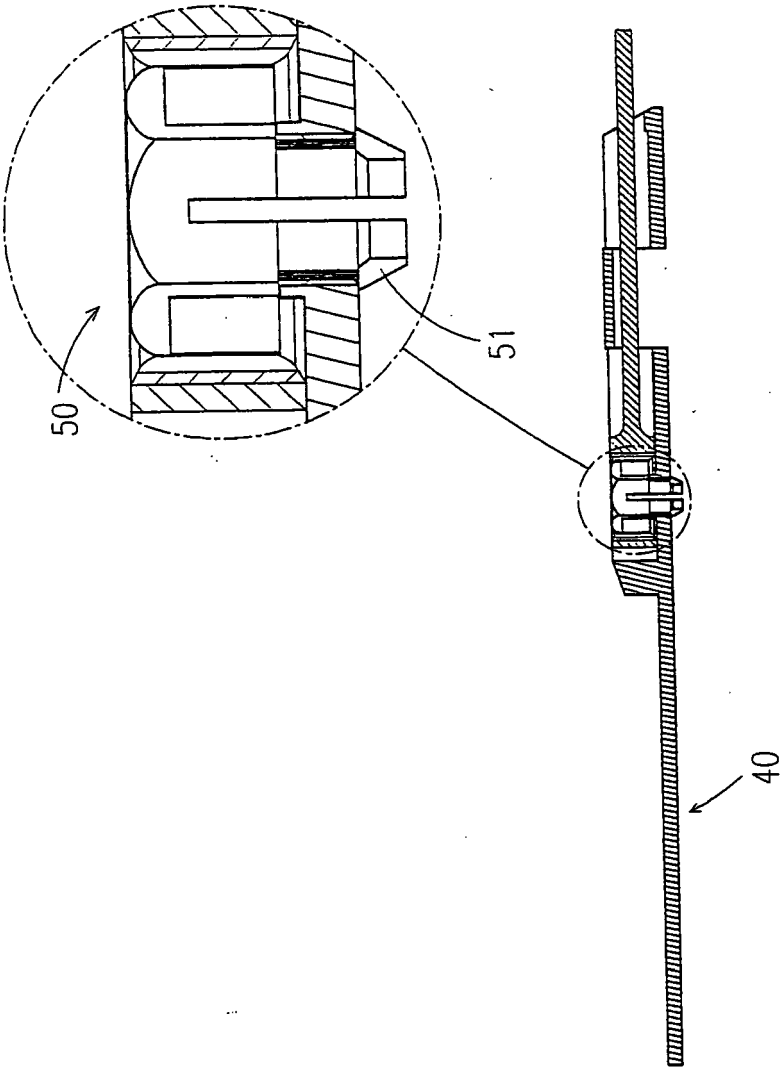


Fig. 13A
PRIOR ART

Fig. 13
PRIOR ART

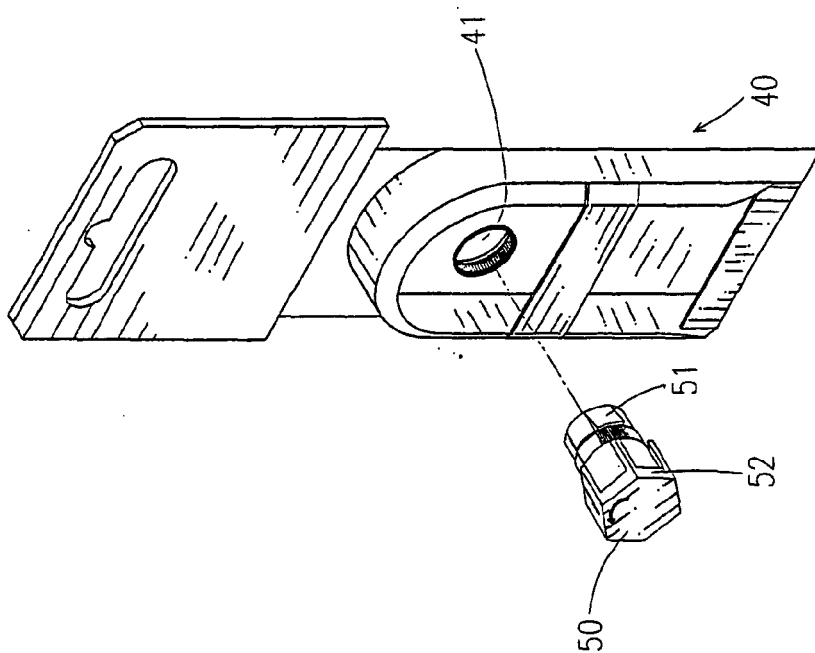


Fig. 14
PRIOR ART



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 01 4267

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	US 6 076 669 A (LING ET AL) 20 June 2000 (2000-06-20) * the whole document *	1-10	B65D73/00
Y	FR 2 481 095 A (SICHO DT 2000) 30 October 1981 (1981-10-30) * the whole document *	1-10	
A	US 3 365 761 A (KALVIG LEANDER E) 30 January 1968 (1968-01-30) * column 1, line 19 - line 26; figures 6-9 *	1,3-5	
A	US 2002/027092 A1 (HU BOBBY) 7 March 2002 (2002-03-07) * paragraph [0045] - paragraph [0048]; figures 13-16 *	1,7	
A	US 4 450 961 A (BIES ET AL) 29 May 1984 (1984-05-29) * column 2, line 22 - line 26 * * column 3, line 64 - column 5, line 6; figures 1-8 *	1,2,9,10	TECHNICAL FIELDS SEARCHED (IPC)
A	US 2003/192844 A1 (WINIG ALAN ET AL) 16 October 2003 (2003-10-16) * paragraph [0053]; figures 20-23 *	1-5,8,10	B65D
A	US 2002/162763 A1 (CHOW JESSIE) 7 November 2002 (2002-11-07) * paragraphs [0017] - [0020]; figures 2-4 *	1	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 January 2006	Examiner Galli, M
CATEGORY OF CITED DOCUMENTS		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	
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			

1

EPO FORM 1503 03.82 (P04C01)

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

EP 05 01 4267

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

26-01-2006

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 6076669	A	20-06-2000	NONE		
FR 2481095	A	30-10-1981	NONE		
US 3365761	A	30-01-1968	NONE		
US 2002027092	A1	07-03-2002	TW	454659 Y	11-09-2001
US 4450961	A	29-05-1984	AU	543495 B2	18-04-1985
			AU	1710683 A	26-01-1984
			CA	1202000 A1	18-03-1986
			DE	3326542 A1	09-02-1984
			FR	2530443 A1	27-01-1984
			GB	2123683 A	08-02-1984
			JP	1764899 C	11-06-1993
			JP	4051165 B	18-08-1992
			JP	59034214 A	24-02-1984
US 2003192844	A1	16-10-2003	CA	2449791 A1	31-07-2003
			CN	1536972 A	13-10-2004
			EP	1478259 A2	24-11-2004
			MX	PA03011920 A	03-06-2004
			WO	03061435 A2	31-07-2003
			US	6581788 B1	24-06-2003
			US	2003192843 A1	16-10-2003
US 2002162763	A1	07-11-2002	NONE		