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

(11) **EP 1 847 354 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
24.10.2007 Bulletin 2007/43

(51) Int Cl.:
B25B 13/46 *(2006.01)* ***B25B 23/143*** *(2006.01)*

(21) Application number: **06008002.5**

(22) Date of filing: **18.04.2006**

(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 LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(71) Applicant: **Wu, Wun-Sin**
Fongyuan City
T'ai chung County (TW)

(72) Inventor: **Wu, Wun-Sin**
Fongyuan City
T'ai chung County (TW)

(74) Representative: **Volpert, Marcus et al**
Zeitler - Volpert - Kandlbinder
Patentanwälte
Herrnstrasse 44
80539 München (DE)

(54) **Torque wrench**

(57) The present invention provides a structure of a torque wrench, which comprises a grip handle (10), a sheathing end (20), a directional braking component (30), an overload dislocating ring (40), a roller post (50) and a resilient component (62); the main feature is that an overload dislocation ring is placed between the braking unit (32) of the directional braking component (30) and the joint slot (21) of the sheathing end (20), and its inner edge is an annular edge for the braking unit (32) of the directional braking component (30) to lock in; and its external edge is designed to have multiple sides (42), and a containment groove (43) is placed between the side surface for the roller post (50), and the roller post (50) protrudes out of the opening of the containment groove (43) and tightly touches the joint slot (21); the side surface of the overload dislocation ring (40) is supported by the movable post (61) of the resilient component (62).

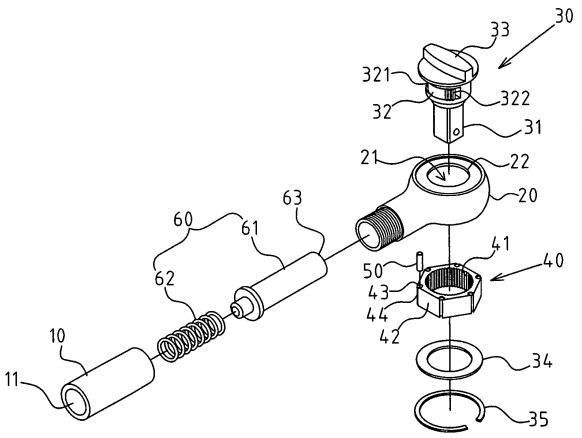

FIG.2

EP 1 847 354 A1

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.

2. Description of Related Art

[0002] 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 predetermined 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.

[0003] 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.

[0004] 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

[0005] 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

[0006]

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

[0007] 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.

[0008] 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 31 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 21, 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.

[0009] 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.

[0010] 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. An improved structure of a torque wrench, which comprising:

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

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

   a directional braking component, which is placed inside the joint slot of the sheathing end, and it includes a column, a braking unit and a controlling unit; among them, the column can be extended from the through hole of the joint slot, and the controlling unit can use it to adjust the direction of the braking unit;

   an overload dislocation ring, which is placed between the braking unit of the directional braking component and the joint slot, and the inner edge of the overload dislocation ring has annular edge for the braking unit; the outside of the overload dislocation ring has multiple sides, and a containment groove that goes through both sides are placed between the side surfaces, and the

outside of the containment groove has joint slot that faces the opening of the small end;
predetermined roller post, which is placed inside the containment groove outside the overload dislocation ring, and the outside of the roller post is protruding out of the opening of the containment groove so that it can touch the wall of the joint slot tightly;
a resilient component, which is inside the hollow hole of the grip handle, which includes a movable post and a resilient component, among them, the first end of the movable post is supported by the resilience of the resilient component, and the resilient component of the embodiment is a spiral spring , and a support unit is placed on the second end of the movable post that goes through the joint slot of the sheathing end, which is pushing against a side surface corresponding to the outside of the overload dislocation ring, and by so doing to create controlling effect for the overload dislocation ring.

2. The improved structure of a torque wrench defined in Claim 1, wherein the side surface of the overload dislocation ring can be flat and straight shape.

3. The improved structure of a torque wrench defined in Claim 1, wherein the resilient component can be a screw spring.

4. The improved structure of a torque wrench defined in Claim 1, wherein the braking unit of the directional braking component can be a double-side swinging block, it has clockwise/ counterclockwise braking edge on the both ends, and the controlling unit of the directional braking component can be placed on the top end and in a button type.

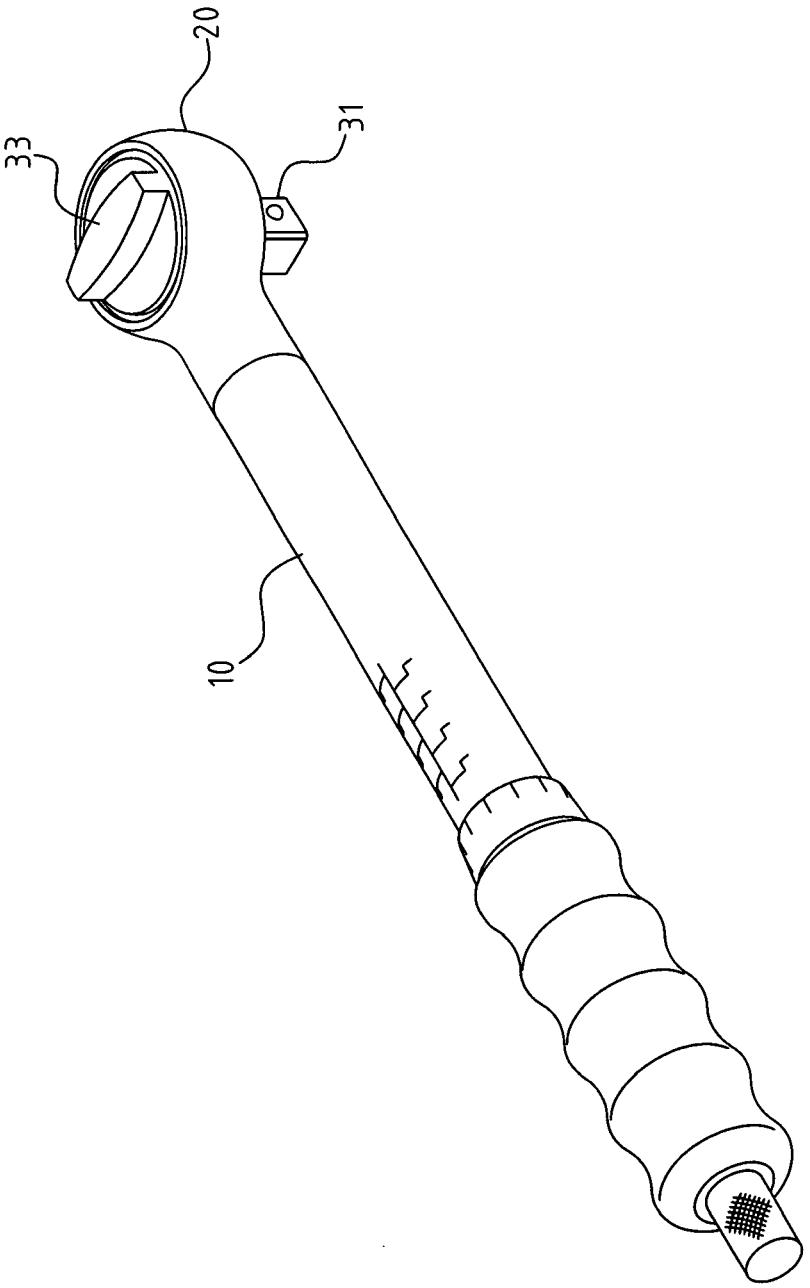

FIG.1

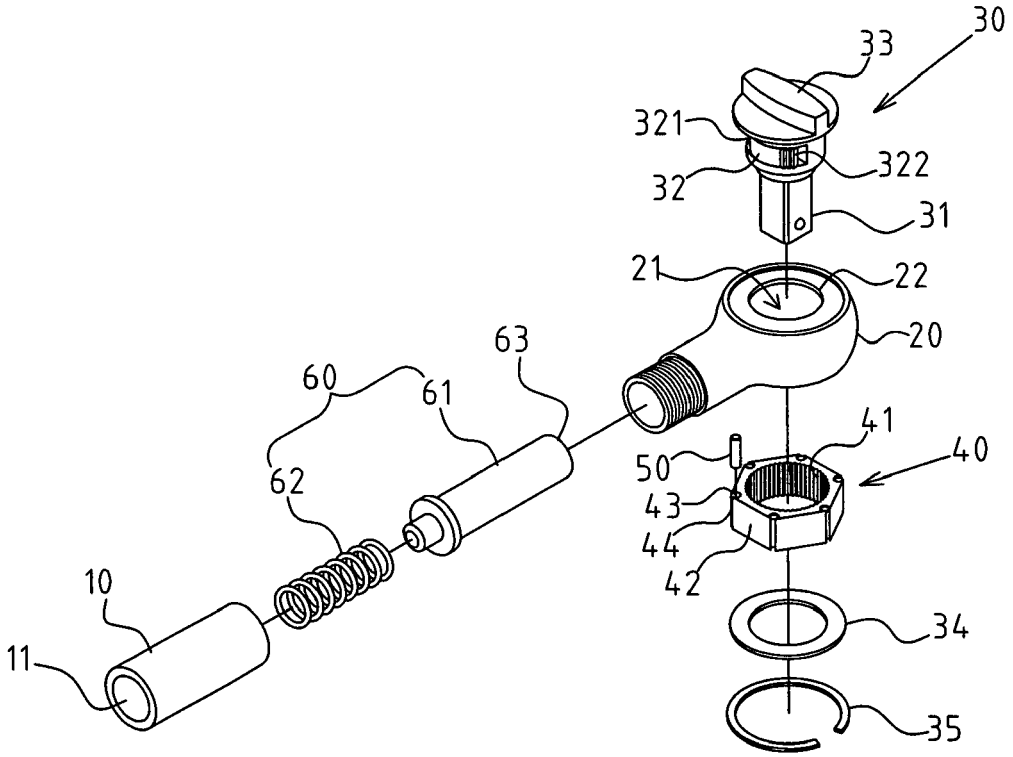

FIG.2

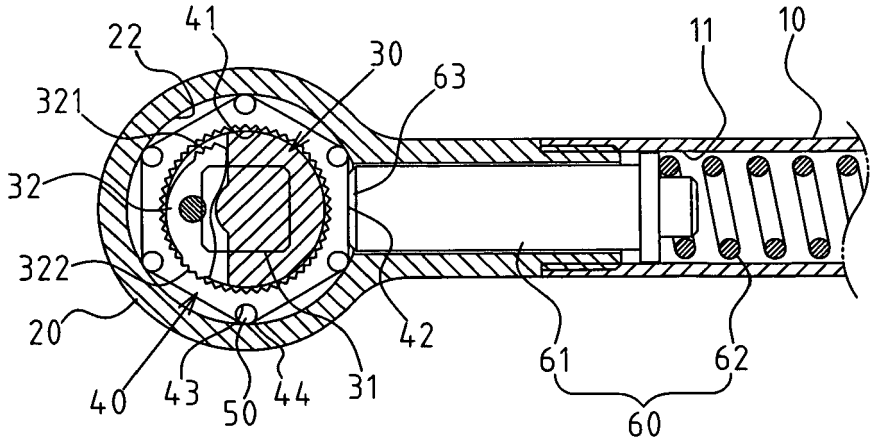
22
41
30
63
11
10
321
32
322
20
42
61
62
40
43
50
44
31
60

FIG.3

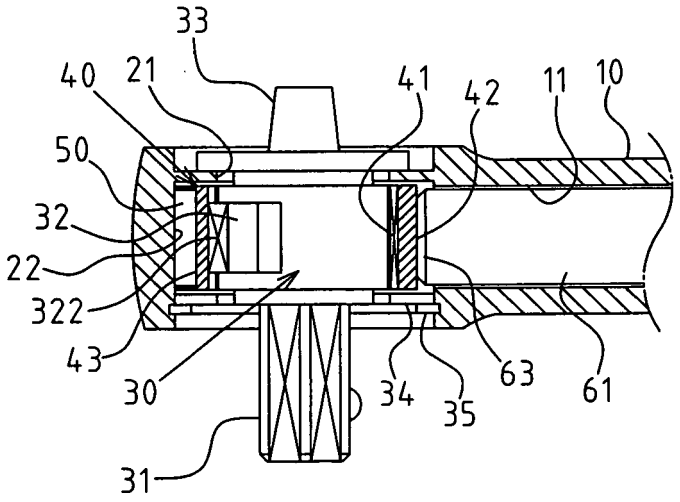
33
40
21
41
42
11
10
50
32
22
322
43
30
34
35
63
61
31

FIG.4

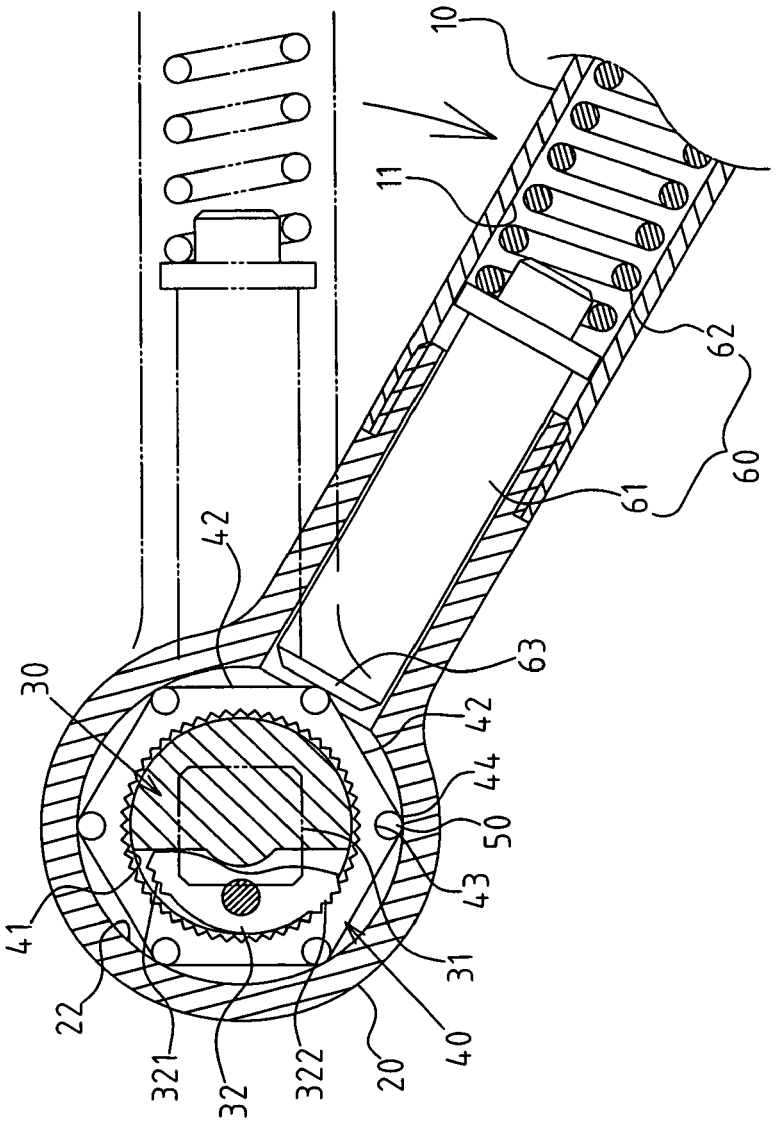

FIG.5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 06 00 8002

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 2 358 461 A (LATIMER CHARLES A) 19 September 1944 (1944-09-19) * page 1, column 2, line 5 - page 2, column 2, line 26 * * figures 1-3 *	1-4	INV. B25B13/46 B25B23/143
Y	US 6 138 532 A (MCCANN ET AL) 31 October 2000 (2000-10-31) * column 2, line 20 - column 3, line 15 * * figure 2 *	1,4	
Y	US 2 972 271 A (GILL MARTIN J) 21 February 1961 (1961-02-21) * column 1, line 60 - column 2, line 61 * * figures 2,3 *	1-4	
A	US 2 826 107 A (WOODS ROBERT GLEN) 11 March 1958 (1958-03-11) * column 1, line 60 - column 3, line 26 * * figures 1,2 *	1	
A	US 2 343 380 A (LARSON KENNETH R ET AL) 7 March 1944 (1944-03-07) * the whole document *	1	TECHNICAL FIELDS SEARCHED (IPC) B25B
A	GB 2 148 767 A (* MHH ENGINEERING COMPANY LIMITED) 5 June 1985 (1985-06-05) * the whole document *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 September 2006	Schultz, 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

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 00 8002

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.

01-09-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2358461 A	19-09-1944	NONE	
US 6138532 A	31-10-2000	NONE	
US 2972271 A	21-02-1961	NONE	
US 2826107 A	11-03-1958	NONE	
US 2343380 A	07-03-1944	NONE	
GB 2148767 A	05-06-1985	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82