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(71) Applicant: **Yueqing Yewei Electric Co., Ltd**
Yueqing, Zhejiang 325604 (CN)

(72) Inventor: **WANG, Lianghua**
Yueqing, Zhejiang 325604 (CN)

(74) Representative: **Cabinet Chaillot**
16/20, avenue de l'Agent Sarre
B.P. 74
92703 Colombes Cedex (FR)

(54) CONTACT OPERATING MECHANISM OF CIRCUIT BREAKER

(57) Disclosed is a contact operating mechanism of a circuit breaker, wherein a mounting groove (11) is provided on a base (1) and beneath a handle (2), a pressing spring (111) and a sliding block (112) are provided inside the mounting groove (11), one end of the pressing spring (111) abuts against an inner side face of the mounting groove (11) and the other end thereof abuts against the sliding block (112), a pushing rod (113) is provided between the sliding block (112) and a lock catch (5), and a spring (8) applying an elastic force to a movable contact mounting seat (6) is provided between the movable contact mounting seat (6) and a side wall of the base (1).

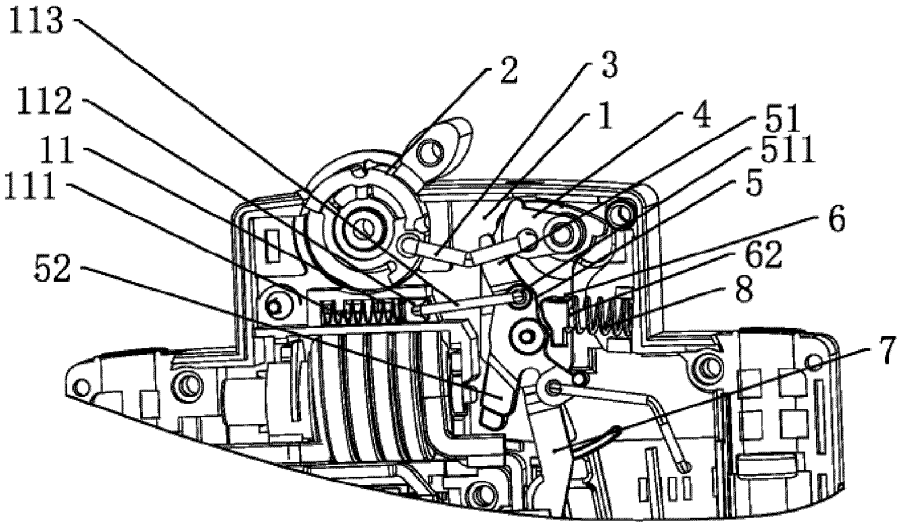

FIG. 1

EP 3 748 665 A1

Description

Field of the Invention

[0001] The present invention relates to a circuit breaker, and especially to a contact operation mechanism inside the circuit breaker.

Background

[0002] A contact operation mechanism of a conventional circuit breaker generates an opening force by pulling a moving contact installation base, which is inconvenient to install; in addition, a small pulling force will affect the opening, and a lock catch generates a restoring force through a torsion spring or a pulling spring, which will affect opening of a moving contact.

Summary of the Invention

[0003] The present invention overcomes defects of the prior art and provides a novel contact operation mechanism of a circuit breaker that is easy to install and has a good opening effect.

[0004] In order to realize the above utility model, a technical solution used in the present invention is: a contact operation mechanism of a circuit breaker, including a base, a handle, a connecting rod, a jump buckle, a lock catch, a moving contact installation base, and a moving contact, where the lock catch and the moving contact installation base are rotatably provided on the base, the jump buckle is rotatably provided on the moving contact installation base, and the moving contact is fixedly provided on the moving contact installation base; the handle and the jump buckle are connected via the connecting rod; an abutment foot and a push foot are provided on the lock catch, where the abutment foot is fit with the jump buckle, and the push foot is provided corresponding to a tripping device of the circuit breaker; an installation groove is provided on the base and below the handle, and an abutment spring and a sliding block are provided in the installation groove; one end of the abutment spring abuts against an inner side of the installation groove, and the other end abuts against the sliding block; a push rod is provided between the sliding block and the lock catch, and a spring that generates resilience to the moving contact installation base is provided between the moving contact installation base and the side wall of the base.

[0005] By means of the above solution, a structural layout of the product is reasonable, and the above settings are more flexible for a pushing force of the lock catch, and there will be no stuck phenomenon. In addition, spring is easy to install in this way, especially spring can be set to have larger resilience, then the circuit breaker will have a better tripping effect. The resilience generated by the moving contact installation base all acts on the moving contact installation base, and the opening force is not affected by other components.

[0006] A further setting of the present invention is that: the installation groove is a rectangle installation groove, the sliding block can be provided in the installation groove in a sliding manner, a first spring base is provided on one side of the sliding block facing the abutment spring, and a connection hole is provided on an upper end of the sliding block; the lock catch and the moving contact installation base share a rotation shaft which is rotatably provided in the base, an installation hole is provided on the lock catch and located between the rotation shaft and the abutment foot, one end of the push rod is movably inserted on the connection hole and the other end is movably inserted on installation hole.

[0007] By means of the above solution, the push rod may adjust directions when working, thus ensuring resilience generated by the lock catch and stabilizing work of the circuit breaker.

[0008] A further setting of the present invention is that: the lock catch and the moving contact installation base share a rotation shaft which is rotatably provided in the base, a second spring base is provided on one side of the moving contact installation base departing from the handle and located above the rotation shaft, one end of the spring abuts against the second spring base, and the other end abuts against a side wall of the base.

[0009] By means of the above solution, the resilience of the spring can be well acted on the moving contact installation base, thus ensuring opening effects.

[0010] A further setting of the present invention is that: a fan-shaped notch is set on one side of the connection hole of the sliding block facing the lock catch, and the push rod is inserted into the connection hole by means of the fan-shaped notch.

[0011] Change of the push rod force direction is further ensured and work stability of the product is ensured.

[0012] The final setting of the present invention is that: a moving contact resettlement groove is provided on the moving contact installation base, a convex column and a slant hole are provided on the moving contact resettlement groove, a fixing hole and an oblique through hole that are respectively corresponding to the convex column and the slant hole are provided on the moving contact, and the fixing hole of the moving contact is settled in the resettlement groove and then is fixedly provided in resettlement groove after hot riveting by means of the convex column.

[0013] By means of the above solutions, a moving contact is easy to set. In addition, after the moving contact and a static contact are in contact during a closing process, a spring generates pressure on a moving contact installation base, and continues to rotate a handle to move a shaft in a slant hole, resulting in overtravel and final pressure.

[0014] The present invention will be further described below with reference to accompanying drawings.

Drawings of the Description

[0015]

FIG. 1 is a three-dimensional diagram of a contact operation mechanism according to an embodiment of the present invention;
FIG. 2 is a structural diagram of a sliding block according to an embodiment of the present invention; and
FIG. 3 is a structural diagram of a moving contact installation base according to an embodiment of the present invention.

Detailed Description of the Invention

[0016] As shown in FIGs. 1 to 3, a contact operation mechanism of a circuit breaker, including a base 1, a handle 2, a connecting rod 3, a jump buckle 4, a lock catch 5, moving contact installation base 6, and a moving contact 7, where the lock catch 5 and the moving contact installation base 6 are rotatably provided on the base 1; the jump buckle 4 is rotatably provided on the moving contact installation base 6, and the moving contact 7 is fixedly provided on the moving contact installation base 6; the handle 2 and the jump buckle 4 are connected via the connecting rod 3; an abutment foot 51 and a push foot 52 are provided on the lock catch 5, where the abutment foot 51 is fit with the jump buckle 4, and the push foot 52 is provided corresponding to a tripping device of the circuit breaker. The above technical features are also common in the prior art, and will not be described in detail in this embodiment. In this embodiment, an installation groove 11 is provided on the base 1 and below the handle 2, and an abutment spring 111 and a sliding block 112 are provided in the installation groove 11; one end of the abutment spring 111 abuts against an inner side of the installation groove 11, and the other end abuts against the sliding block 112; a push rod 113 is provided between the sliding block 112 and the lock catch 5, and a spring 8 that generates resilience to the moving contact installation base 6 is provided between the moving contact installation base 6 and the side wall of the base 1. The resilience here includes a force of resetting the moving contact installation base 6 when opening and final pressure to the moving contact installation base 6 when closing. By means of the above solution, a structural layout of the product is reasonable, and the above settings are more flexible for a pushing force of the lock catch 5, and there will be no stuck phenomenon. In addition, the spring 8 is easy to install in this way, especially the spring 8 can be set to have larger resilience, then the circuit breaker will have a better tripping effect. The resilience generated by the moving contact installation base 6 all acts on the moving contact installation base 6, and the opening force is not affected by other components.

[0017] In this embodiment of the present invention, the installation groove 111 is a rectangle installation groove, the sliding block 112 can be provided in the installation groove 111 in a sliding manner, a first spring base 1121 is provided on one side of the sliding block 112 facing the abutment spring 111, and a connection hole 1122 is provided on an upper end of the sliding block 112; the lock catch 5 and the moving contact installation base 6 share a rotation shaft which is rotatably provided in the base 1, an installation hole 511 is provided on the lock catch 5 and located between the rotation shaft and the abutment foot 51, one end of the push rod 113 is movably inserted on the connection hole 1122 and the other end is movably inserted on installation hole 511. By means of the above solution, the push rod 113 may adjust directions when working, thus ensuring resilience generated by the lock catch 5 and stabilizing work of the circuit breaker.

[0018] In this embodiment of the present invention, a second spring base 62 is provided on one side of the moving contact installation base 6 departing from the handle 2 and located above the rotation shaft, one end of the spring 8 abuts against the second spring base 62, and the other end abuts against a side wall of the base 1. Generally, a spring fixing table for fixing an end portion of the spring 8 may be provided on the side wall. By means of the above solution, the resilience of the spring 8 can be well acted on the moving contact installation base 6, thus ensuring opening effects.

[0019] In this embodiment of the present invention, a fan-shaped notch 1123 is set on one side of the connection hole 1122 of the sliding block 112 facing the lock catch 5, and the push rod 113 is inserted into the connection hole 112 by means of the fan-shaped notch 1123, thus further ensuring change of the force direction of the push rod 113 and ensuring work stability of the product. A moving contact resettlement groove 61 is provided on the moving contact installation base 6, a convex column 611 and a slant hole 612 are provided on the moving contact resettlement groove 61, a fixing hole and an oblique through hole that are respectively corresponding to the convex column 611 and the slant hole 612 are provided on the moving contact 7, and the fixing hole of the moving contact 7 is settled in the resettlement groove 61 and then is fixedly provided in resettlement groove 61 after hot riveting by means of the convex column 611, which is easy to set the moving contact 7.

Claims

1. A contact operation mechanism of a circuit breaker, comprising a base, a handle, a connecting rod, a jump buckle, a lock catch, a moving contact installation base, and a moving contact, wherein the lock catch and the moving contact installation base are rotatably provided on the base, the jump buckle is rotatably provided on the moving contact installation base, and the moving contact is fixedly provided on the moving contact installation base; the handle and

the jump buckle are connected via the connecting rod; an abutment foot and a push foot are provided on the lock catch, wherein the abutment foot is fit with the jump buckle, and the push foot is provided corresponding to a tripping device of the circuit breaker; an installation groove is provided on the base and below the handle, and an abutment spring and a sliding block are provided in the installation groove; one end of the abutment spring abuts against an inner side of the installation groove, and the other end abuts against the sliding block; a push rod is provided between the sliding block and the lock catch, and a spring that generates resilience to the moving contact installation base is provided between the moving contact installation base and the side wall of the base.

2. The contact operation mechanism of the circuit breaker according to claim 1, wherein the installation groove is a rectangle installation groove, the sliding block can be provided in the installation groove in a sliding manner, a first spring base is provided on one side of the sliding block facing the abutment spring, and a connection hole is provided on an upper end of the sliding block; the lock catch and the moving contact installation base share a rotation shaft which is rotatably provided in the base, an installation hole is provided on the lock catch and located between the rotation shaft and the abutment foot, one end of the push rod is movably inserted on the connection hole and the other end is movably inserted on installation hole.

3. The contact operation mechanism of the circuit breaker according to claim 1 or 2, wherein the lock catch and the moving contact installation base share a rotation shaft which is rotatably provided in the base, a second spring base is provided on one side of the moving contact installation base departing from the handle and located above the rotation shaft, one end of the spring abuts against the second spring base, and the other end abuts against a side wall of the base.

4. The contact operation mechanism of the circuit breaker according to claim 2, wherein a fan-shaped notch is set on one side of the connection hole of the sliding block facing the lock catch, and the push rod is inserted into the connection hole by means of the fan-shaped notch.

5. The contact operation mechanism of the circuit breaker according to claim 1 or 2, wherein a moving contact resettlement groove is provided on the moving contact installation base, a convex column and a slant hole are provided on the moving contact resettlement groove, a fixing hole and an oblique through hole that are respectively corresponding to the convex column and the slant hole are provided on the moving contact, and the fixing hole of the moving contact is settled in the resettlement groove and then is fixedly provided in resettlement groove after hot riveting by means of the convex column.

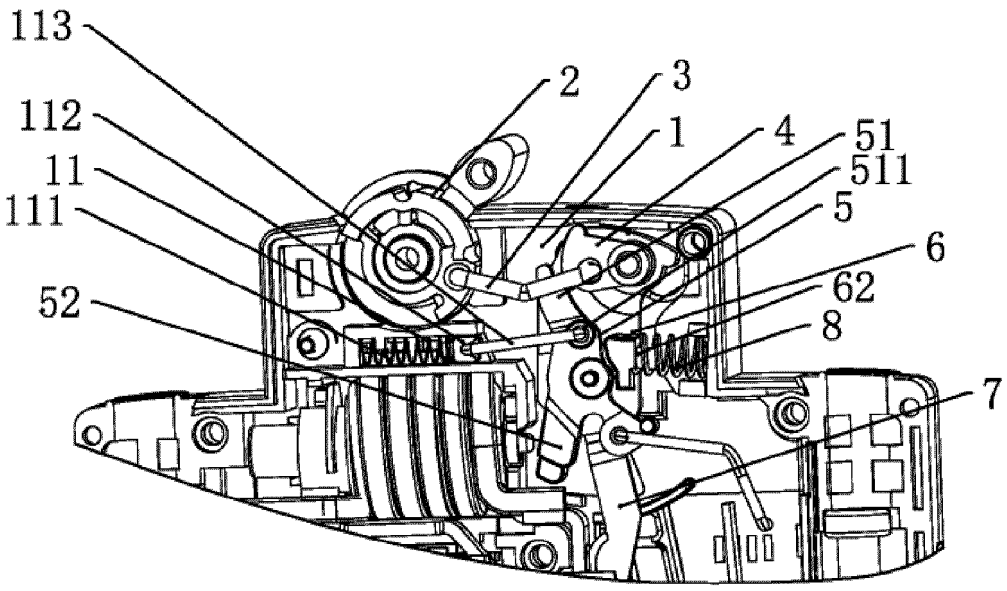

FIG. 1

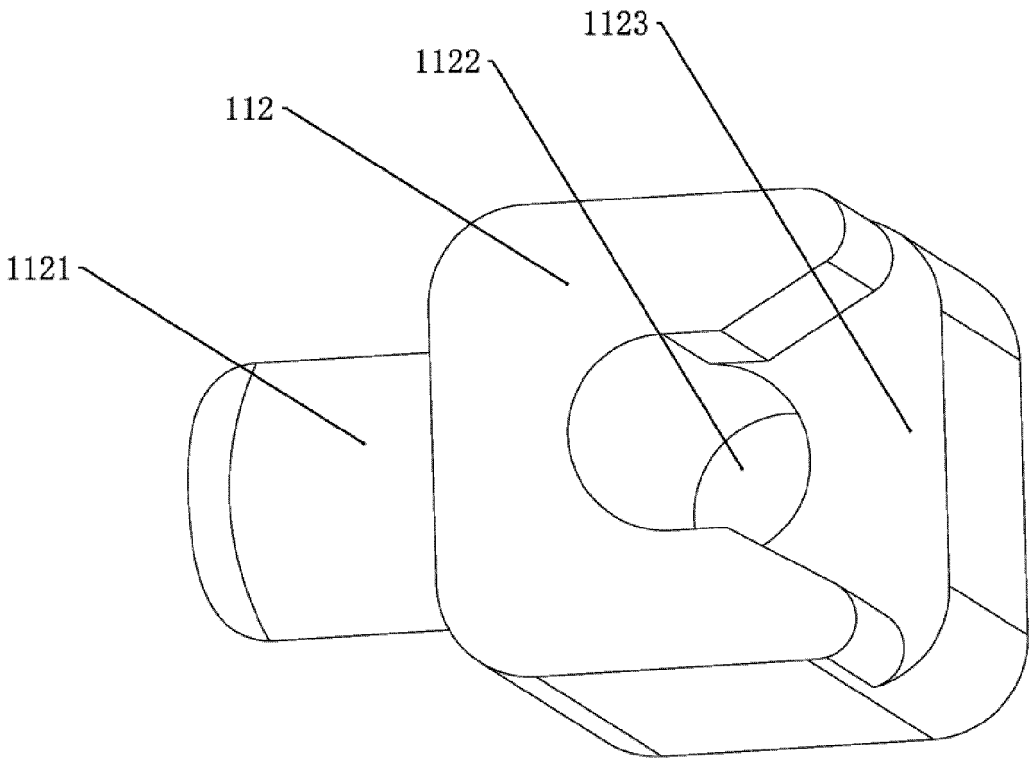

FIG. 2

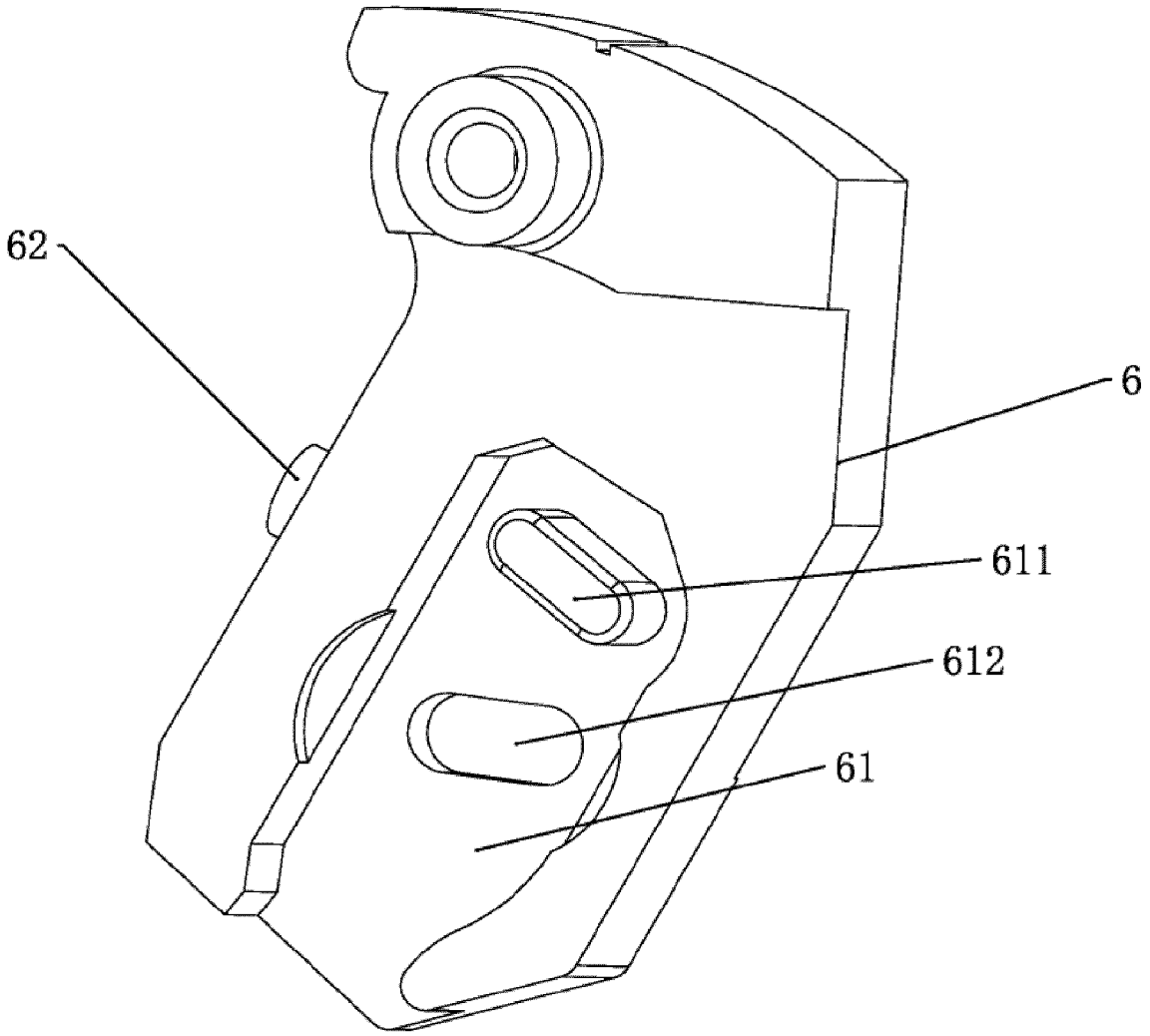

FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2019/070875

A. CLASSIFICATION OF SUBJECT MATTER

H01H 71/10(2006.01)i; H01H 73/04(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H01H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS; VEN; CNTXT; USTXT; EPTXT; WOTXT; CNKI: 也为, 跳扣, 脱扣, 锁扣, 簧, 分闸, 储能, 贮能, 锁, 滑, 槽, 支架, 座, 杆, trip+, latch+, spring? , energy, stor+, slid+, groove, frame, support+, lever, rod, handle

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 108198736 A (YUEQING YEWEI ELECTRICAL CO., LTD.) 22 June 2018 (2018-06-22) claims 1-5	1-5
A	CN 104241038 A (SASSIN INTERNATIONAL ELECTRIC (SHANGHAI) CO., LTD.) 24 December 2014 (2014-12-24) description, paragraphs [0063]-[0074], and figures 2-5	1-5
A	CN 201007977 Y (XIAMEN SHIHLIN ELECTRIC CO., LTD.) 16 January 2008 (2008-01-16) entire document	1-5
A	US 4459572 A (EATON CORP.) 10 July 1984 (1984-07-10) entire document	1-5

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
04 March 2019	**13 March 2019**
Name and mailing address of the ISA/CN **National Intellectual Property Administration, PRC** **No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088** **China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2019/070875

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	108198736	A	22 June 2018	CN	207765387	U	24 August 2018
CN	104241038	A	24 December 2014	CN	104241038	B	01 June 2016
CN	201007977	Y	16 January 2008		None		
US	4459572	A	10 July 1984		None		

Form PCT/ISA/210 (patent family annex) (January 2015)