

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
1 March 2012 (01.03.2012)

(10) International Publication Number  
**WO 2012/024914 A1**

(51) International Patent Classification:  
*F23Q 2/28* (2006.01)

(21) International Application Number:  
PCT/CN2011/070980

(22) International Filing Date:  
14 February 2011 (14.02.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
201020507984.x 27 August 2010 (27.08.2010) CN

(72) Inventor; and

(71) Applicant : HUANG, Xinhua [CN/CN]; Suite 1803,  
No. 8, Lane 1500, Zhangyang Rd., Pudong New District,  
Shanghai 200135 (CN).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,  
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,  
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,  
HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,

KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,  
ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,  
NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD,  
SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR,  
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,  
ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,  
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,  
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,  
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,  
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

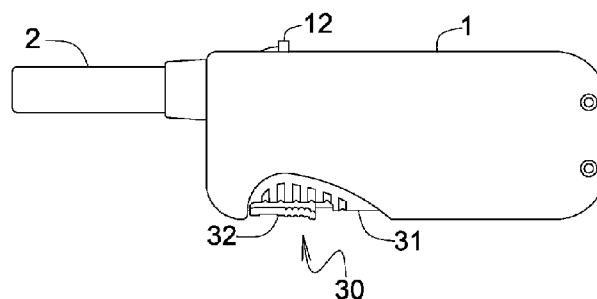
**Declarations under Rule 4.17:**

- as to the identity of the inventor (Rule 4.17(i))
- of inventorship (Rule 4.17(iv))

**Published:**

- with international search report (Art. 21(3))

(54) Title: SKILL REQUIRING TYPE CHILD RESISTANT LIGHTER



**Fig. 1**

(57) Abstract: Disclosed is a skill requiring type child resistant lighter, which includes a handle (1), a barrel (2) mounted in the handle (1) and extending forward, a fuel tank (10) within the handle (1), a gas release nozzle (11) mounted on the fuel tank (10), a piezoelectric unit (20) contained in the handle (1), a fire nozzle (21) contained in the barrel (2), a fuel conveying hose (22) connecting the fire nozzle (21) and the gas release nozzle (11), and an ignition unit (30). The ignition unit (30) has a rotation trigger (31) rotatably mounted to the handle (1), a slidable trigger (32) slidable with respect to the rotation trigger (31), a slidable trigger spring (33) and a rotation trigger spring (35) respectively biasing the slidable trigger (32) and the rotation trigger (31), and a lever (34) mounted on the fuel tank (10). The lighter needs delicate skill to use. The skill is not readily able to be acquired by a child thus lowering a possibility of such unintentional ignitions.



WO 2012/024914 A1

## Description

### Title of Invention: SKILL REQUIRING TYPE CHILD RESISTANT LIGHTER

#### Technical Field

- [1] The invention relates to a skill requiring type (SRT) child resistant utility lighter, and more particularly, to a child resistant electronic gas utility lighter which needs delicate skill to use. The skill is not readily able to be acquired by a child thus lowering a possibility of unintentional ignition by a child.

#### Background Art

- [2] There are two common conventional ways of child resistance of utility lighter. One is deceptive, which usually employs a safe mechanism which has to be first unlocked before a trigger of the lighter is able to be pulled back to ignite or has a different process of ignition from the conventional trigger pressing one. Such lighters are not safe enough since it is very likely that children find the way of ignition. The other is force requiring type lighter. It needs increasingly force to press trigger to ignite compared to conventional lighter without child resistance. Since this kind of lighters is not credible for some mighty children and not user friendly to adult users, they are not commonly used today.

#### Disclosure of Invention

##### Technical Problem

- [3] The main object of the invention is to provide a skill requiring type child resistant utility lighter which needs delicate skill to use. The skill is not readily able to be acquired by a child even when the child knows a way to ignite. However, for an adult user having an ordinary ability of using his finger, it is quite easy to master the way of ignition.

##### Technical Solution

- [4] In order to accomplish the above object, the present invention provides a skill requiring type child resistant utility lighter having a handle, a barrel mounted in the handle and extending forward, a fuel tank within the handle for containing liquefied gaseous fuel, a gas release nozzle mounted on the fuel tank, a piezoelectric unit contained in the handle and having a triggering button which is able to startup the piezoelectric unit to generate sparks for ignition, a fire nozzle contained in the barrel, a fuel conveying hose connecting the fire nozzle and the gas release nozzle, and an ignition unit. The ignition unit has a rotation trigger rotatably mounted to the handle, a slidable trigger slidable with respect to the rotation trigger, a slidable trigger spring biasing the slidable trigger to a forward most spare position, a lever mounted on the

fuel tank, and a rotation trigger spring biasing the rotation trigger to an spare position.

- [5] These and other objectives, features, and advantages of the present invention will become apparent from the following detailed description, the accompanying drawings, and the appended claims.

### **Advantageous Effects**

- [6] Though this operation has a certain level of difficulty even for adult users, it still acquirable after several practices. However, for children, since they have not already acquired enough flexibility of using their fingers, the above skill is hard to master even if they know how to ignite, which significantly increases a credibility of child resistance.

### **Description of Drawings**

- [7] Fig. 1 is a flat view of the preferred embodiment of the utility lighter of the invention.
- [8] Fig. 2 is a cross-sectional view thereof.
- [9] Fig. 3 is an exploded perspective view thereof. And,
- [10] Fig. 4 is another cross-sectional view thereof showing an operation of using.

### **Best Mode**

- [11] As shown in Figs. 1, 2 and 3, a preferred embodiment of a skill requiring type (SRT) child resistant utility lighter of the invention is shown. The lighter has a handle 1, a barrel 2 mounted in the handle 1 and extending forward, a fuel tank 10 within the handle 1 for containing liquefied gaseous fuel, a gas release nozzle 11 mounted on the fuel tank 10, a piezoelectric unit 20 contained in the handle 1 and having a triggering button 23 which when pressed down, is able to startup the piezoelectric unit 20 to generate sparks for ignition, a fire nozzle 21 contained in the barrel 2, a fuel conveying hose 22 connecting the fire nozzle 21 and the gas release nozzle 11, and an ignition unit 30.
- [12] The ignition unit 30 has a rotation trigger 31 rotatably mounted to the handle 1, a slidable trigger 32 slidable with respect to the rotation trigger 31, a slidable trigger spring 33 biasing the slidable trigger 32 to a forward most spare position, a lever 34 mounted on the fuel tank 10, and a rotation trigger spring 35 biasing the rotation trigger 31 to an spare position.
- [13] In use, if the user presses the rotation trigger 31 with respect to the handle 1 as operating a conventional utility lighter, the slidable trigger 32 will be blocked and stopped by the lever 34, as particularly shown in Fig. 2. In order to ignite, the user has to grasp the handle 1 of the utility lighter of the invention and first move the slidable trigger 32 backward with his forefinger until the slidable trigger 32 leaves the lever 34, as shown in Fig. 4. At this time, as holding the slidable trigger 32 stable with respect to

the rotation trigger 31, the user will be able to depress the rotation trigger 31. The rotation trigger 31 will be able to rotate round a pin 36 fixed to the handle 1. As the rotation trigger 31 rotates, it will depress the rotation trigger spring 35 and the slidable trigger 32 will depress the lever 34. Keep depressing the rotation trigger 31, the rotation trigger spring 35 depresses the triggering button 23 of the piezoelectric unit 20 to generate sparks and the lever 34 lifts the gas release nozzle 11 at the same time. The utility lighter of the invention is thus ignited.

[14] When the user release the rotation trigger 31 after ignition, the rotation trigger 31 and the slidable trigger 32 resume to their spare positions respectively under restoring forces from the rotation trigger spring 35 and the slidable trigger spring 33. A flame adjustment ring 12 may be provided.

[15] In using the utility lighter of the invention, a user has to grasp the handle 1 with his hand and move the slidable trigger 32 backward first. The user must simultaneously press his thumb on the handle 1 in opposite to the forefinger to counteract an upward force thus given by forefinger and grasp the handle 1 with his rest three fingers to counteract a backward force thus given by forefinger. After the slidable trigger 32 leaves the lever 34, the user must hold the slidable trigger 32 stable with respect to the rotation trigger 31, or the rotation trigger 31 and the slidable trigger 32 will restore under the slidable trigger spring 33 and the rotation trigger spring 35 and the ignition will fail.

[16] From above description, it is seen that the objects of the present invention have been fully and effectively accomplished. Embodiment of the invention has been shown and described for the purposes of illustrating the functional and structural principles of the present invention and is subject to change without departure from the invention's principles. Therefore, this invention includes all modifications encompassed within the spirit and scope of the following claims.

#### **Mode for Invention**

[17]

#### **Industrial Applicability**

[18]

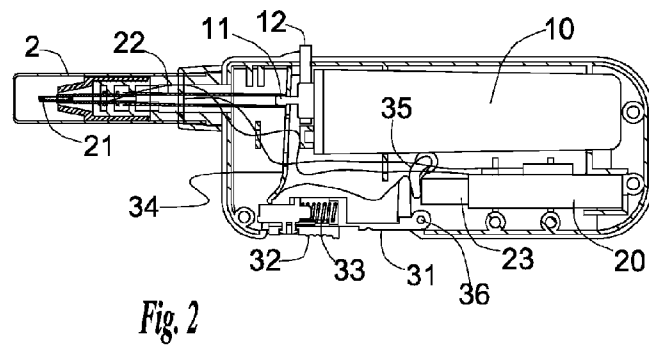
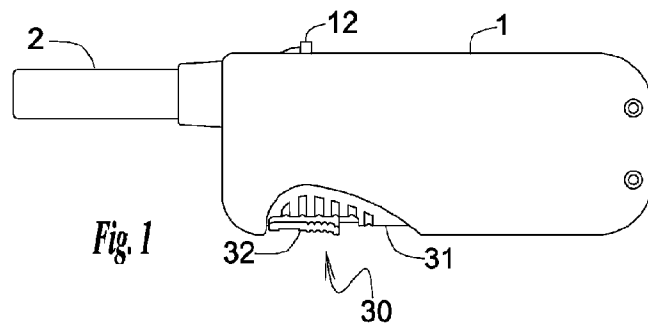
#### **Sequence List Text**

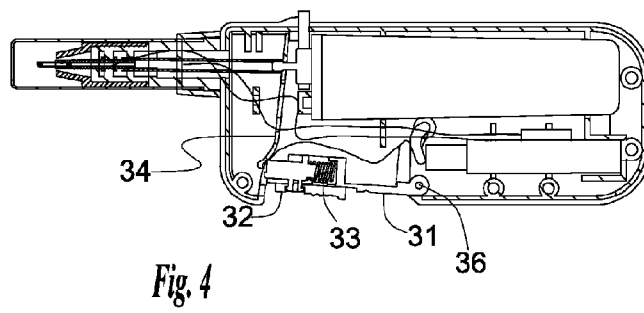
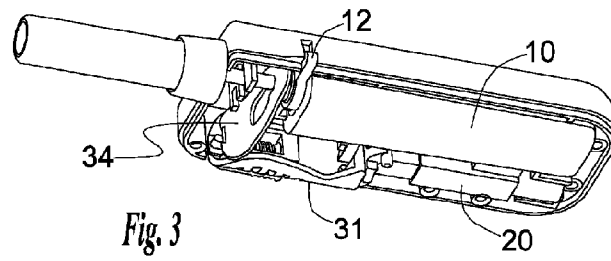
[19]

## Claims

[Claim 1]

1. A skill requiring type child resistant utility lighter comprising a handle, a barrel mounted in said handle and extending forward, a fuel tank within said handle for containing liquefied gaseous fuel, a gas release nozzle mounted on said fuel tank, a piezoelectric unit contained in said handle and having a triggering button which is able to startup said piezoelectric unit to generate sparks for ignition, a fire nozzle contained in said barrel, a fuel conveying hose connecting said fire nozzle and said gas release nozzle, and an ignition unit, wherein said ignition unit has a rotation trigger rotatably mounted to said handle, a slidable trigger slidable with respect to said rotation trigger, a slidable trigger spring biasing said slidable trigger to a forward most spare position, a lever mounted on said fuel tank, and a rotation trigger spring biasing said rotation trigger to an spare position.





# INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2011/070980

## A. CLASSIFICATION OF SUBJECT MATTER

F23Q 2/28(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)

IPC: F23Q 2

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)

CNPAT, CNKI, EPODOC, WPI: safety, child, children, lock, spring, pivot+, rotat+, handle, gun

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CA2293109A1(POLYCITY ENTERPRISE LTD)23 Jun. 2001(23.06.2001) description page 5 line 1 to page 7 line 2, figures 1-6	1
Y	CN2624071Y(NINGBO FEIXIANG ELECTRIC APPLI) 07 Jul. 2004(07.07.2004) description page 3 line 7 to the last line of page 4, figures 1-6	1
A	CN2705719Y(HUANG, Xinhua) 22 Jun. 2005(22.06.2005) the whole document	1
A	CN2816617Y(XINHAI ELECTRIC CO LTD NINGBO) 13 Sep. 2006(13.09.2006) the whole document	1
A	CN2556501Y(FEIXIANG ELECTRICAL EQUIPMENT) 18 Jun. 2003(18.06.2003) the whole document	1
A	US5980242A(MAN A C K) 09 Nov. 1999(09.11.1999) the whole document	1
A	US6468070B1(CALICO BRANDS INC) 22 Oct. 2002(22.10.2002) the whole document	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"document member of the same patent family
"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	

Date of the actual completion of the international search 20 May 2011(20.05.2011)	Date of mailing of the international search report <b>09 Jun. 2011 (09.06.2011)</b>
--	--

Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer <b>GUO, Yunzhi</b> Telephone No. (86-10)62085033
--	---



**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
PCT/CN2011/070980

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CA2293109A1	23.06.2001	CA2293109C	23.03.2004
CN2624071Y	07.07.2004	None	
CN2705719Y	22.06.2005	None	
CN2816617Y	13.09.2006	None	
CN2556501Y	18.06.2003	None	
US5980242A	09.11.1999	US6168423B	02.01.2001
US6468070B1	22.10.2002	WO9960309A2	25.11.1999
		CA2335961A1	25.11.1999
		CN1309755A	22.08.2001
		CN1157561C	14.07.2004
		CA2335961C	17.02.2009