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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
27 December 2002 (27.12.2002)

PCT

(10) International Publication Number
WO 02/103273 A1

(51) International Patent Classification[7]: F41B 15/04

(21) International Application Number: PCT/KR02/00938

(22) International Filing Date: 18 May 2002 (18.05.2002)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2001-34598 19 June 2001 (19.06.2001) KR

(71) Applicant *(for all designated States except US)*: **SILVERAY CO., LTD** [KR/KR]; 5-6 Bnnkyeri, Munmak-eup, Wonju-city, Kangwon-do, 220-880 (KR).

(71) Applicant and
(72) Inventor: **KIM, Guhn, Tae** [KR/KR]; 376-24, Daebang-dong, Dongjak-gu, Seoul 156-020 (KR).

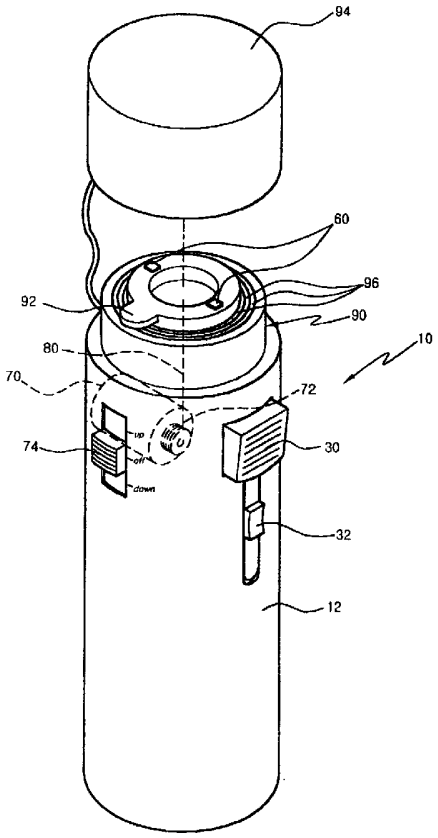
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

[Continued on next page]

(54) **Title:** ELECTRIC SHOCK DEVICE



(57) **Abstract:** Disclosed is an electric shock device for self-defence including a body, a voltage supply section, a DC/AC converter adapted to receive a DC voltage from the voltage supply section in accordance with a manipulation of a switch conducted by a user, and to convert the DC voltage into an AC voltage, thereby generating a high voltage, and an output section including discharge electrodes for externally discharging the high voltage induced by the high voltage generating section, thereby temporarily applying electric shock to an assailant, further including an extension member mounted at one end thereof to one end of the body while carrying the output section at the other end thereof, the extension member including a plurality of hollow rods having different diameters while being connected to one another so that they are slidable in a telescopic fashion to be extended or retracted. Since the output section having the discharge electrodes is forwardly extendable, the user can apply electric shock to an assailant using the device even when he is separated from the assailant by a substantial distance, so that it is possible to efficiently subdue the assailant.

WO 02/103273 A1

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

ELECTRIC SHOCK DEVICE

Technical Field

The present invention relates to an electric shock device, and more particularly to an electric shock device for self-defense in which its output section having discharge electrodes is forwardly extendable, thereby allowing the user to apply electric shock to an assailant using the device even when he is separated from the assailant by a substantial distance, so that it is possible to efficiently subdue the assailant.

Background Art

Generally, an electric shock device is a self-defense appliance which is configured to be conveniently portable, and adapted to subdue an assailant using a high voltage generated therefrom.

Fig. 1 is a perspective view illustrating a conventional electric shock device. As shown in Fig. 1, the conventional electric shock device includes a body 10 which may have diverse shapes. A handle 12 extends downwardly from a lower end of the body 10 so as to allow the user to easily grasp the electric shock device. A switch 30 and a switch lock 32 are provided at one side surface of the handle 12. The switch 30 serves to selectively turn on the electric shock device, whereas the switch lock 32 serves to selectively lock the switch 30.

A voltage supply section 20 is installed in the interior of the handle 12. The voltage supply section 20 includes a battery, and a battery receiving chamber openable to receive the battery. A DC/AC converter (not shown) and a high voltage generator (not shown) are installed in the interior of the body 10. The DC/AC converter receives a DC voltage from the voltage supply section 20, and converts the received DC voltage into an AC voltage under the control of a microprocessor (not shown). The high voltage generator includes a high voltage transformer for transforming the AC voltage outputted from the DC/AC converter into a high voltage, and a capacitor for charging the high voltage outputted from the high voltage transformer.

When the user who carries the electric shock device encounters a threatening situation, he releases the locked state of the switch 30 by manipulating the switch lock 32, and switches on the switch 30. In the ON

state of the switch 30, the DC voltage from the voltage supply section 20 is applied to the DC/AC converter which, in turn, converts the DC voltage into an AC voltage. The AC voltage from the DC/AC converter is transformed into a high voltage by the high voltage generator. The high voltage is discharged from an output section 60 consisting of a pair of discharge electrodes formed at an upper end of the body 10. Accordingly, the user can apply electric shock to the threatening person so as to overcome the threatening situation.

However, the above mentioned conventional electric shock device has a problem in that it must be used under the condition in which the user is positioned close to an assailant because it is configured to subdue the assailant using a high voltage outputted from the discharge electrodes of the output section 60 as the user manipulates the switch lock 32 and switch 30 while grasping the handle 12 extending from the lower end of the body 10.

In other words, the user may be exposed to attack by an assailant positioned close to him. Furthermore, the assailant may snatch the electric shock device from the user. In this case, the user may face a more dangerous situation.

Disclosure of the Invention

Therefore, the present invention has been made in view of the above mentioned problems involved with the related art, and an object of the invention is to provide an electric shock device in which its output section having discharge electrodes is forwardly extendable, thereby eliminating dangers existing when the user uses the electric shock device at a position close to the assailant, so that it is possible to efficiently subdue the assailant even when the user is separated from the assailant by a substantial distance.

In accordance with one aspect, the present invention provides an electric shock device comprising a body, a voltage supply section, a DC/AC converter adapted to receive a DC voltage from the voltage supply section in accordance with a manipulation of a switch conducted by a user, and to convert the DC voltage into an AC voltage, a high voltage generating section adapted to receive the AC voltage, thereby generating a high voltage, and an output section including discharge electrodes for externally discharging the high voltage induced by the high voltage generating section, thereby

temporarily applying electric shock to an assailant, further comprising: an extension member mounted at one end thereof to one end of the body while carrying the output section at the other end thereof, the extension member including a plurality of hollow rods having different diameters while being connected to one another so that they are slidable in a telescopic fashion to be extended or retracted.

Preferably, the electric shock device further comprises a wire connected at one end thereof to a motor pulley mounted to a motor, and at the other end thereof to a leading one of the hollow rods included in the extension member, so that when the motor rotates normally or reversely in accordance with a manipulation of a motor switch conducted by the user, the wire is extended or retracted, thereby causing the extension member to be extended or retracted.

Preferably, the electric shock device further comprises a knob protruded from an outer surface of a leading one of the hollow rods included in the extension member, and adapted to allow the user to manually manipulate the extension member, and a protective member separably fitted around the one end of the body, and adapted to prevent the extension member and the output section from being damaged by external impact when the electric shock device is not used.

In accordance with another aspect, the present invention provides an electric shock device comprising a body, a voltage supply section, a DC/AC converter adapted to receive a DC voltage from the voltage supply section in accordance with a manipulation of a switch conducted by a user, and to convert the DC voltage into an AC voltage, a high voltage generating section adapted to receive the AC voltage, thereby generating a high voltage, and an output section including discharge electrodes for externally discharging the high voltage induced by the high voltage generating section, thereby temporarily applying electric shock to an assailant, further comprising: a pair of extension members each mounted at one end thereof to one end of the body while carrying, at the other end thereof, an associated one of the discharge electrodes included in the output section, each of the extension members including a plurality of hollow rods connected to one another so that they are slidable in a telescopic fashion to be extended or retracted.

Since the output section having the discharge electrodes is forwardly

extendable, the user can apply electric shock to an assailant using the device even when he is separated from the assailant by a substantial distance, so that it is possible to efficiently subdue the assailant.

Brief Description of the Drawings

The above objects, and other features and advantages of the present invention will become more apparent after a reading of the following detailed description when taken in conjunction with the drawings, in which:

Fig. 1 is a perspective view illustrating a conventional electric shock device;

Fig. 2 is a perspective view illustrating an electric shock device according to a first embodiment of the present invention;

Fig. 3 is a perspective view illustrating use of the electric shock device according to the first embodiment of the present invention;

Fig. 4 is a cross-sectional view taken along the line A – A' of Fig. 3;

Fig. 5 is a block diagram illustrating the constituting elements of the electric shock device according to the first embodiment of the present invention

Fig. 6 is a perspective view illustrating an electric shock device according to a second embodiment of the present invention; and

Fig. 7 is a perspective view illustrating use of the electric shock device according to the second embodiment of the present invention.

Best Mode for Carrying Out the Invention

Now, the present invention will be described in detail with reference to the annexed drawings.

Fig. 2 is a perspective view illustrating an electric shock device according to a first embodiment of the present invention. As shown in Fig. 2, the electric shock device includes a body 10 which may have diverse shapes. The electric shock device also includes a handle 12 extending downwardly from a lower end of the body so as to allow the user to easily grasp the electric shock device, and an output section 60 including a pair of discharge electrodes formed at an upper end of the body 10. The output section 60 discharges a high voltage induced through a voltage supply section, a DC/AC converter, and a high voltage generating section installed in the

body 10. The electric shock device further includes a switch 30 for selectively turning on the electric shock device to supply a DC voltage from a voltage supply section 20 for generation of a high voltage, a switch lock 32 for selectively locking the switch 30, and a microprocessor for controlling the sequential operations of the electric shock device. These configurations are similar to those in the conventional electric shock device. Accordingly, the elements respectively corresponding to those in Fig. 1 are denoted by the same reference numerals. In accordance with the embodiment of Fig. 2, the output section 60, which serves to discharge the high voltage induced in the above described manner at its discharge electrodes, is formed at the front end of an extension member 90 configured to be automatically extendable from the front end of the body 10 in a forward direction (corresponding to an upward direction in Fig. 1) by a desired distance.

The extension member 90 includes a plurality of hollow rods 96 connected to one another such that they are slidable in a telescopic fashion. The extension member 90 is selectively extendable in accordance with a user's manipulation. As the extension member 90 extends forwardly, the output section 60 consisting of the discharge electrodes extends forwardly from the body 10 by a desired distance.

In order to allow the output section 60 to be automatically extended from and retracted toward the body 10 of the electric shock device, a motor 70 is installed in the body 10. A motor switch 74 is mounted to the outer surface of the body 10 in order to selectively rotate the motor 70 in a normal or reverse direction. A wire 80 is also provided. The wire 80 is connected at one end thereof to a motor pulley 72 mounted to the motor 70, and at the other end thereof to the foremost or leading one of the hollow rods 96 included in the extension member 90. When the motor 70 rotates normally or reversely in accordance with a manipulation of the motor switch 74 conducted by the user, the wire 80 is raised or lowered, thereby causing the extension member 90 to be upwardly extended or downwardly retracted.

The wire 80, which is connected at opposite ends thereof to the motor pulley 72 and the foremost hollow rod 96 of the extension member 90, respectively, is made of a flexible material having a desired rigidity so that it can push forwardly the extension member 90 when it is upwardly moved in accordance with a normal rotation of the motor 70, while having a desired

elasticity so that it can be easily wrapped around the motor pulley 72 when it is downwardly moved in accordance with a reverse rotation of the motor 70.

The output section 60 consisting of a pair of discharge electrodes is electrically connected to the high voltage generating section via a wire (not shown) of a sufficient length installed in the body 10, so that it is prevented from being disconnected from the high voltage generating section when the extension member 90 is extended.

A knob 92 is protruded from the outer surface of the foremost hollow rod 96 of the extension member 90 in order to allow the user to manually extend the extension member 90 in the forward direction without using the motor 70. A protective member 94, which has a substantially cylindrical shape while being opened at one end thereof, is separably fitted around the front end of the body 10 where the extension member 90 is mounted. The protective member 94 serves to prevent foreign matters from being attached to the output section 60 and extension member 90 when the electric shock device is not used. The protective member 94 also serves to prevent the front end of the body 10 from being damaged by external impact.

Fig. 6 illustrates an electric shock device according to a second embodiment of the present invention. In accordance with this embodiment, the discharge electrodes, which form the output section 60 of the electric shock device, are configured to be forwardly extendable.

In order to allow the discharge electrodes to be forwardly extendable, a pair of extension members 90a and 90b are provided which correspond to respective discharge electrodes.

Similar to the embodiment of Fig. 2, each extension member 90a or 90b includes a plurality of hollow rods 96a or 96b connected to one another such that they are slidable in a telescopic fashion. As the extension member 90a or 90b extends forwardly, the associated discharge electrode extends forwardly from the body 10. A pair of motors 70a and 70b are provided in order to move respective extension members 90a and 90b. Thus, the output section 60 consisting of the discharge electrodes can be extended and retracted.

Now, the operation of the electric shock device having the above described configuration will be described in conjunction with the annexed drawings.

Fig. 3 is a perspective view illustrating use of the electric shock device according to the first embodiment of the present invention. Fig. 4 is a cross-sectional view taken along the line A – A' of Fig. 3. Fig. 5 is a block diagram illustrating the constituting elements of the electric shock device according to the first embodiment of the present invention. In Fig. 5, the reference numeral 20 denotes a voltage supply section, 30 the switch, 40 a DC/AC converter, 50 a high voltage generator, 60 an output section, 70 a motor, 74 the motor switch, 76 a motor drive section, 90 the extension member, and 100 a microprocessor.

Where the user carrying the electric shock device of the present invention desires to use the electric shock device in a threatening situation, he first separates the protective member 94 from the front end of the body 10. As described above, the protective member 94 is fitted around the front end of the body 10 in order to protect the output section 60 consisting of a pair of discharge electrodes, and the extension member 90. In accordance with the separation of the protective member 94, the extension member 90 and output section 60 are externally opened.

In this state, the user manipulates the motor switch 74 mounted to the body 10 so as to switch the motor switch 74 to its "UP" position, thereby causing the extension member 90 to extend forwardly by a desired distance.

That is, when the motor switch 74 is switched to its "UP" position, electric power from the power supply section 20 is applied to the motor drive section 76 which is, in turn, activated. In accordance with the activation of the motor drive section 76, the motor 70 rotates in a normal direction, thereby causing the wire 80 wound around the motor pulley 72 to be forwardly moved while being unwound. That is, the wire 80 is raised.

As a result, the foremost hollow rod 96 of the extension member 90 connected to one end of the wire 80 slides forwardly, and the remaining hollow rods 96 slide sequentially in the forward direction in accordance with the sliding of the foremost hollow rod 96. Thus, the extension member 90 is forwardly extended by a desired distance.

Thereafter, the switch lock 32 mounted to the body 10 is manipulated to release the locked state of the switch 30 under the condition in which the extension member 90 is forwardly extended by a desired distance. In this state, the switch 30 is switched on, thereby causing the DC voltage from the

voltage supply section 20 to be applied to the DC/AC converter 40 under the control of the microprocessor 100. The DC voltage applied to the DC/AC converter 40 is converted into an AC voltage which is, in turn, amplified to a high voltage of 20,000 V while passing though the high voltage generating section 50. The high voltage is induced at the output section 60 which includes a pair of discharge electrodes mounted to the foremost hollow rod 96 of the extension member 90.

Accordingly, the user can temporarily subdue an assailant by bringing the discharge electrodes of the output section 60 into contact with the assailant, thereby applying the high voltage induced at the output section 60 to the assailant. Thus, the user can overcome the threatening situation.

After completion of the use of the electric shock device, the user manipulates the switch lock 32 to lock the switch 30, and then switches the motor switch 74 to its "DOWN" position. At the "DOWN" position of the motor switch 74, the motor 70 rotates reversely under the control of the microprocessor 100. As a result, the wire 80 is wound around the motor pulley 72, so that the hollow rods 96 of the extension member 90 slide sequentially in a rearward direction, starting from the foremost hollow rod 96 of the extension member 90, so that they are completely retracted into the body 10. Accordingly, the user can conveniently carry the electric shock device.

Fig. 7 is a perspective view illustrating use of the electric shock device according to the second embodiment of the present invention.

Where the user manipulates the motor switch 74 mounted to the body 10 of the electric shock device in order to drive the motors 70a and 70b installed in the body 10, the motors 70a and 70b rotate normally, thereby causing the extension members 90a and 90b corresponding to respective discharge electrodes to extend forwardly by a desired distance. Accordingly, the output section 60 is extended from the body 10 by a desired distance.

In this state, the user can bring the discharge electrodes of the output section 60 into contact with an assailant to apply high voltage induced at the output section 60 to the assailant even under the condition in which he is separated from the assailant by a substantial distance. Thus, the user can effectively subdue the assailant.

Industrial Applicability

As apparent from the above description, the present invention provides an electric shock device for self-defense in which its output section having discharge electrodes is forwardly extendable, thereby allowing the user to apply electric shock to an assailant using the device even when he is separated from the assailant by a substantial distance, so that it is possible to efficiently subdue the assailant.

In addition, there is no danger when the user uses the electric shock device at a position close to the assailant, that is, the possibility that the assailant may snatch the electric shock device from the user. Accordingly, the electric shock device can be more securely and efficiently used.

Although the preferred embodiments of the invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

1. An electric shock device comprising a body, a voltage supply section, a DC/AC converter adapted to receive a DC voltage from the voltage supply section in accordance with a manipulation of a switch conducted by a user, and to convert the DC voltage into an AC voltage, a high voltage generating section adapted to receive the AC voltage, thereby generating a high voltage, and an output section including discharge electrodes for externally discharging the high voltage induced by the high voltage generating section, thereby temporarily applying electric shock to an assailant, further comprising:

an extension member mounted at one end thereof to one end of the body while carrying the output section at the other end thereof, the extension member including a plurality of hollow rods having different diameters while being connected to one another so that they are slidable in a telescopic fashion to be extended or retracted.

2. The electric shock device according to claim 1, further comprising:

a wire connected at one end thereof to a motor pulley mounted to a motor, and at the other end thereof to a leading one of the hollow rods included in the extension member, so that when the motor rotates normally or reversely in accordance with a manipulation of a motor switch conducted by the user, the wire is extended or retracted, thereby causing the extension member to be extended or retracted.

3. The electric shock device according to claim 1, further comprising:

a knob protruded from an outer surface of a leading one of the hollow rods included in the extension member, and adapted to allow the user to manually manipulate the extension member.

4. The electric shock device according to claim 1, further comprising:

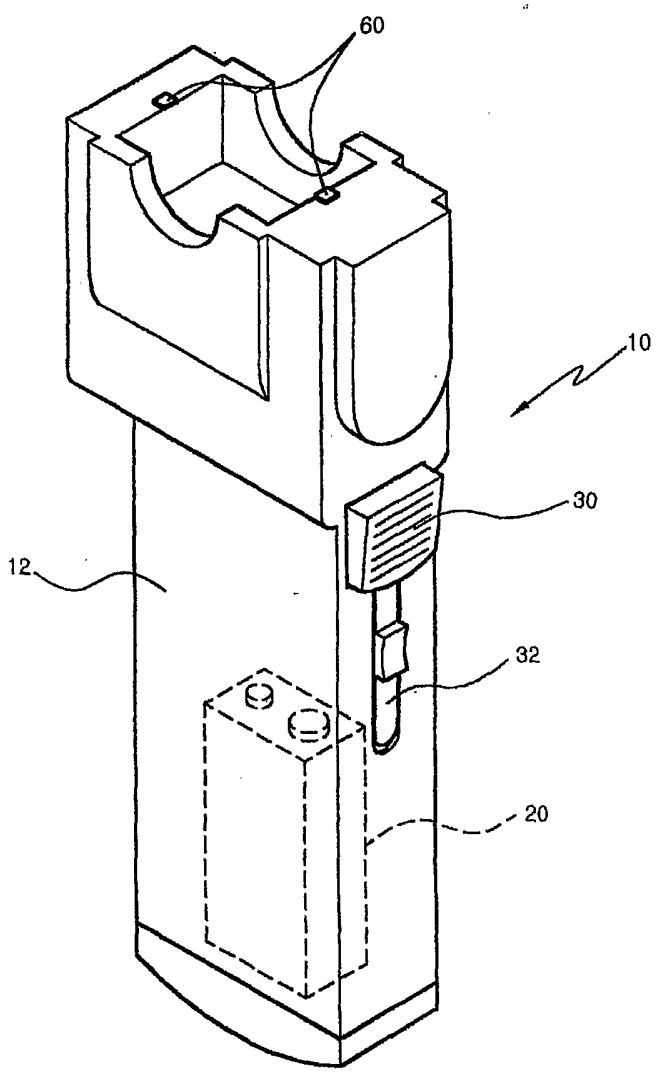
a protective member separably fitted around the one end of the body, and adapted to prevent the extension member and the output section from being damaged by external impact when the electric shock device is not used.

5. An electric shock device comprising a body, a voltage supply section, a DC/AC converter adapted to receive a DC voltage from the voltage supply section in accordance with a manipulation of a switch conducted by a user, and to convert the DC voltage into an AC voltage, a high voltage generating section adapted to receive the AC voltage, thereby generating a high voltage, and an output section including discharge electrodes for externally discharging the high voltage induced by the high voltage generating section, thereby temporarily applying electric shock to an assailant, further comprising:

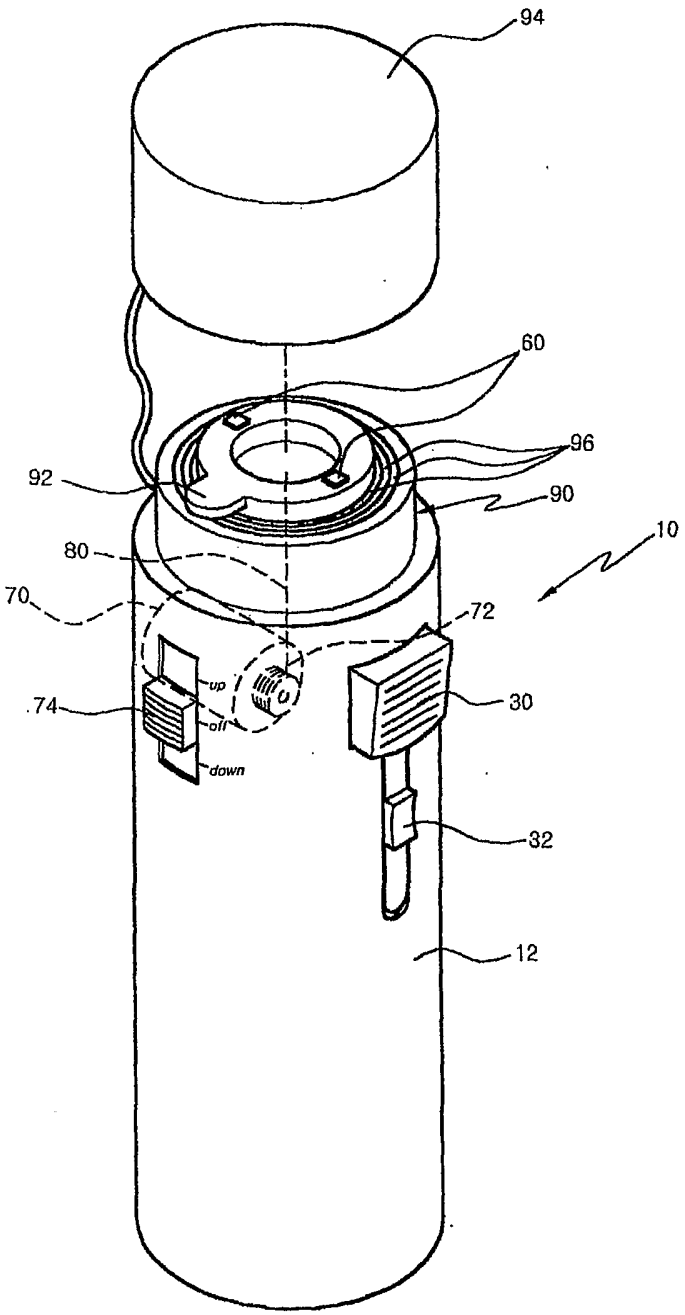
a pair of extension members each mounted at one end thereof to one end of the body while carrying, at the other end thereof, an associated one of the discharge electrodes included in the output section, each of the extension members including a plurality of hollow rods connected to one another so that they are slidable in a telescopic fashion to be extended or retracted.

【 FIG 】

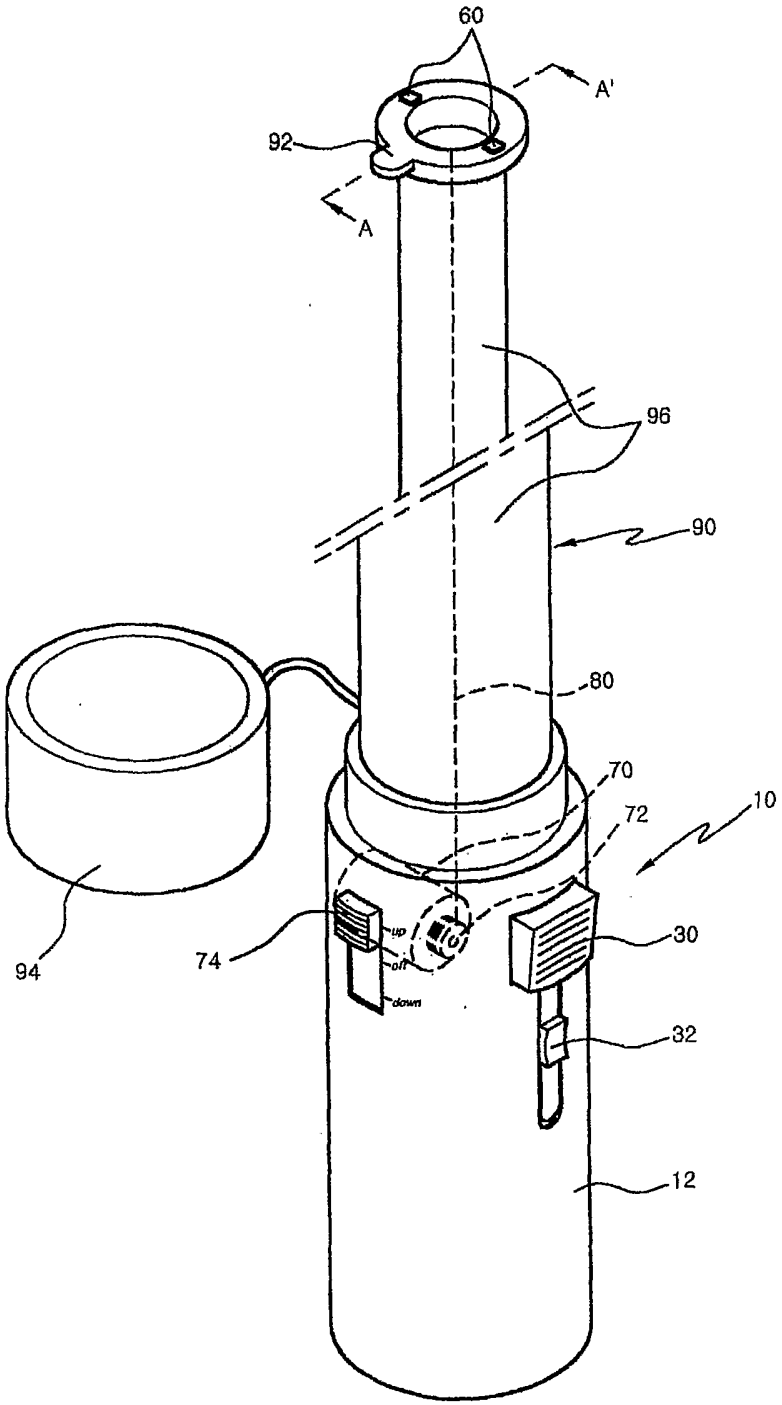
【 FIG 1 】



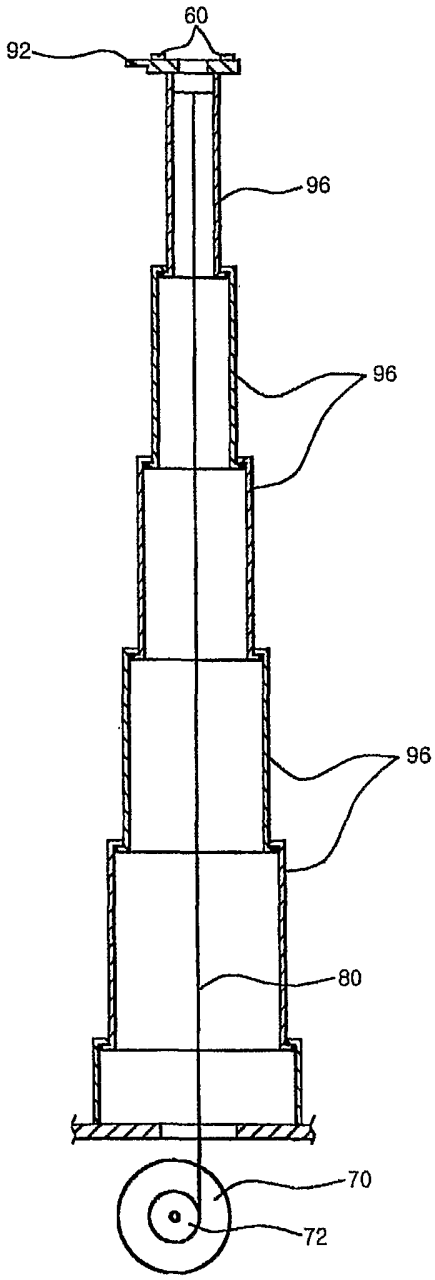
【 FIG 2 】



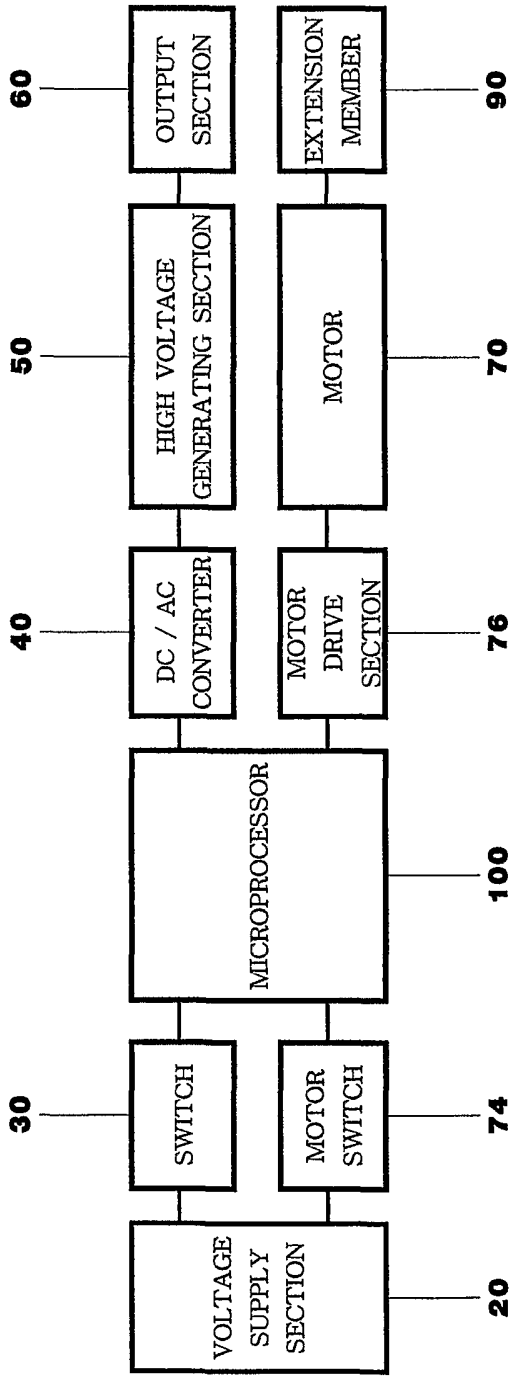
【 FIG 3 】



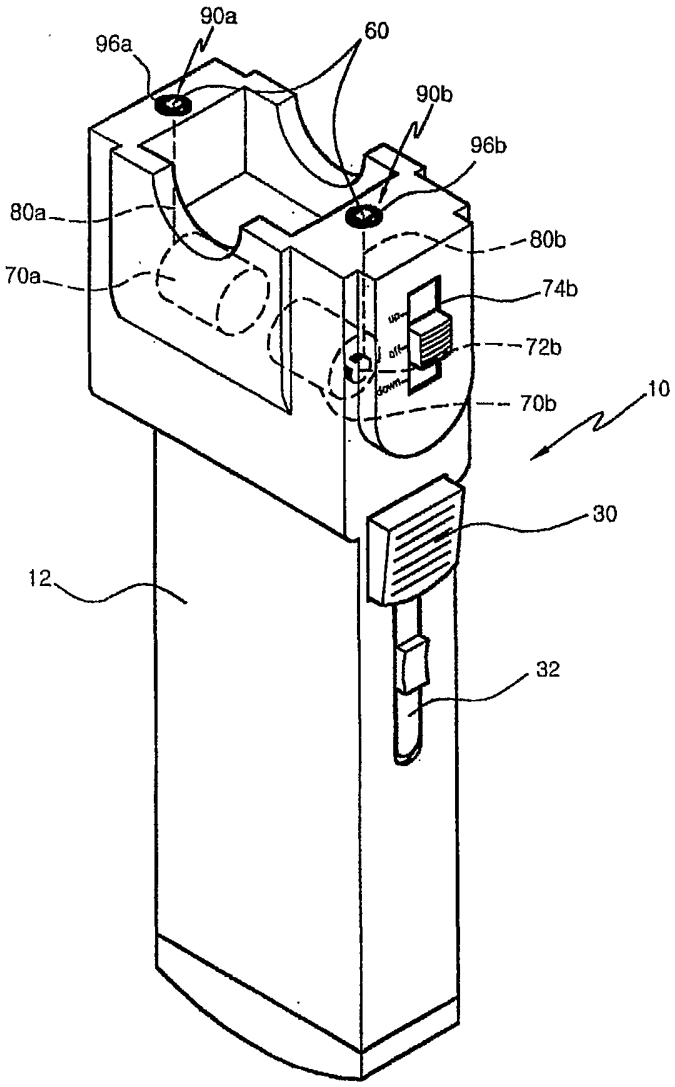
【 FIG 4 】



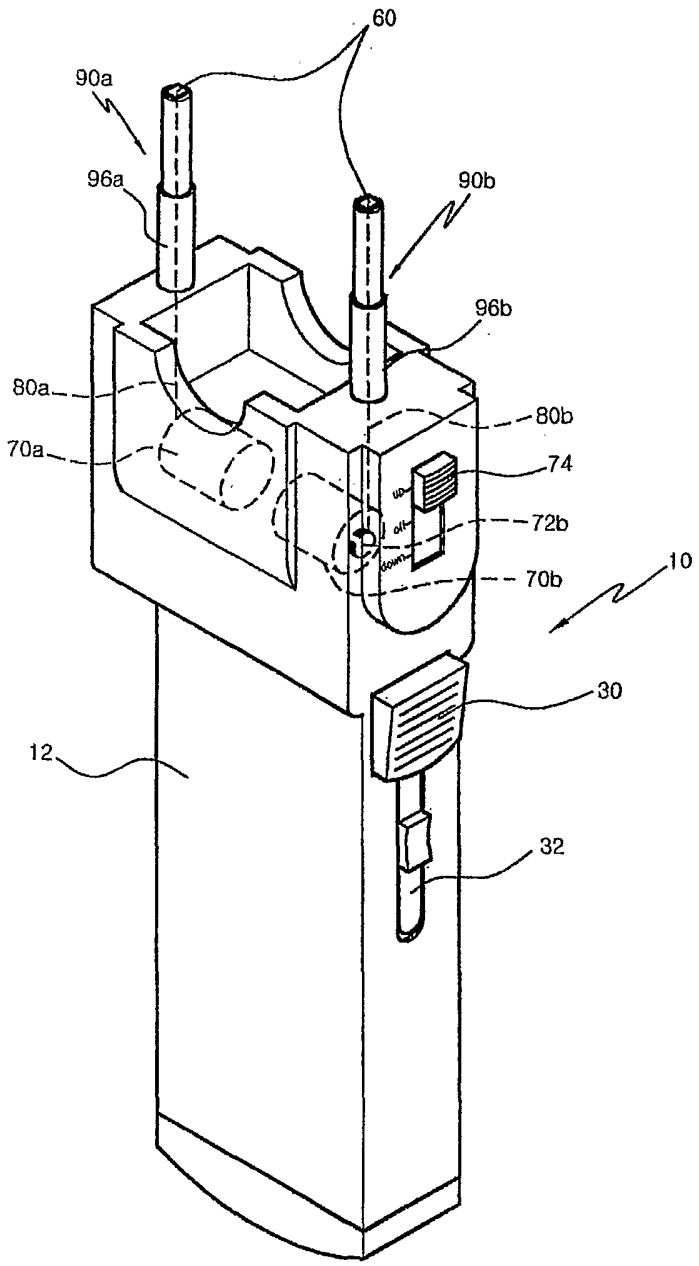
【 FIG 5 】


OUTPUT SECTION
60
EXTENSION MEMBER
90
HIGH VOLTAGE GENERATING SECTION
50
MOTOR
70
DC / AC CONVERTER
40
MOTOR DRIVE SECTION
76
MICROPROCESSOR
100
SWITCH
30
MOTOR SWITCH
74
VOLTAGE SUPPLY SECTION
20

【 FIG 6 】



【 FIG 7 】



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR02/00938

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 F41B 15/04

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)
IPC7 F41, H05C, G08B 13/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
KR,JP IPC as above

Electronic data base consulted during the intertnational search (name of data base and, where practicable, search terms used)
NPS " electric","shock","stun","gun","motor","wire","retract","telescopic"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5467247 A (Richard N. de Anda et al) 14 November 1995 See the whole document	4
A	US 6091597 A (Ming-Chen Lin) 18 July 2000 Column3-column4, Figures	1
A	JP 05-009009 U (JOHNANSEISAKUSHOCO, LTD) 05 February 1993 Abstract, Figure1	1-3
A	KR 20-156259 Y1 (HYUNDAI MOTOR COMPANY) 01 September 1999 Abstract, Figures	1-3

☐ 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 relevence
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)
"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 relevence; 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 relevence; 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
13 SEPTEMBER 2002 (13.09.2002)	14 SEPTEMBER 2002 (14.09.2002)

Name and mailing address of the ISA/KR	Authorized officer
Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	LEE, Dong Kuk Telephone No. 82-42-481-5420

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR02/00938

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5467247 A	14-11-1995	None	
US 6091597 A	18-07-2000	None	
JP 05-009009 U	05-02-1995	None	
KR 20-156259 Y1	01-09-1999	None	