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(54) POST HAVING A MOTOR DRIVEN FRAMEWORK WITH SOLAR LIGHTING UNITS

(57) The present invention proposes a post comprising a base, at least one lighting means and a carrier framework with holder slots for receiving said lighting means or solar units. Said post further comprises at least one longitudinal channel accommodating a movable block (15) displaceable in said longitudinal channel by means of a pulley (18) mechanism which can be driven by an electrical motor (17). Said movable block (15) is fixedly joined to said carrier framework. The lifting mechanism according to the present invention allows easier and faster maintenance of post solar units.

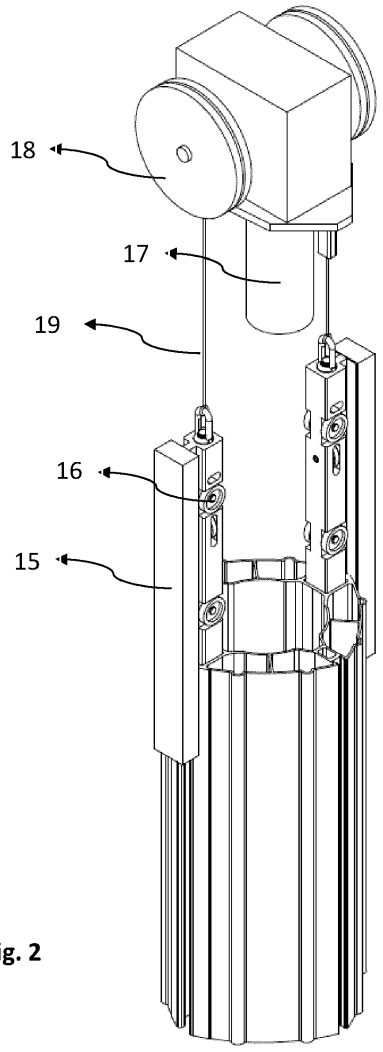

Fig. 2

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Description

Technical Field of the Invention

[0001] The present invention relates to a post solar power illumination means adapted to be mounted on posts erected around an area, e.g. a residential area. In particular, the present invention relates to a post solar unit having solar energy storage means.

Background of the Invention

[0002] A plurality of patents/patent applications are present in the field in relation to posts and to their configuration with regards to fixing of posts and/or s and fittings thereof.

[0003] The present invention on the other hand provides a post solar unit which can easily be adapted to a post to let it function as an illuminating post. The solar unit has a solar panel associated with a battery to store solar energy. The concept of use of solar energy in posts for illumination purposes is known for example from the publication US 2008080174.

[0004] The present invention ensure easier repair of the post solar units by maintenance workers such that maintenance and repair operations are substantially accelerated. Considering quite a large number of posts may require routine maintenance in a large area (for instance a military area), slow maintenance operations prove to be a serious cost item. To this end, the lifting mechanism according to the present invention allows easier and faster maintenance and repair of said post solar units.

[0005] Further, the invention also allows manual control over lowering and raising of all movable elements of the mechanism such that repair and maintenance unit are may perform duties by manually lowering the mechanism first and repositioning it accordingly. The manual control as defined in Claim 2 according to the present invention provides an alternative embodiment of the invention.

Objects of the Invention

[0006] One of the objects of the present invention is to provide a post which allows easier and faster maintenance and repair of post solar units

[0007] One of the objects of the present invention is to provide a post solar unit which incorporates a solar panel in association with a battery.

[0008] Another object of the present invention is to provide a post where an improved performance is imparted to posts such that they are equipped with solar panels and illuminating means.

[0009] Another object of the present invention is to provide a post solar unit where a more efficient use of power accumulated by the solar panel within said solar units is achieved.

Summary of the Invention

[0010] The present invention provides a post with at least one longitudinal channel accommodating a movable block with rollers. Said movable blocks displace in said longitudinal channels in order for raising and lowering said solar units relative to the ground surface on which said posts are erected. This is either achieved manually or by means of an electrical motor whose rotary shaft is conventionally coupled to a pulley mechanism in communication with a wire, the latter carrying said movable block.

[0011] The solar units are provided at both sides of the post. Said carrier framework being in association with said movable blocks provides that said solar units mounted on said framework are lowered by means of said electrical motor, for instance for maintenance purposes.

[0012] The present invention ensuring easier repair of post solar units by maintenance workers is especially advantageous in substantially accelerating maintenance and repair operations.

[0013] Said electrical motor is powered by an electrical battery embedded in the post base. Said motor's power leads are extending to said base of said post through the tubular longitudinal portion. Said motor may also be remotely actuated by signals from a suitable radio transmitter as is conventionally practiced in the available art. Upon termination of routine maintenance or repair, said motor is reactuated to reposition said framework to its initial position. The initial position thereof is detected by microswitches upon which said lighting means are powered by said solar units.

Brief Description of the Figures

[0014] The figures whose brief explanations are herewith provided are solely intended for providing a better understanding of the present invention and are as such not intended to define the scope of protection or the context in which said scope is interpreted in the absence of the present description.

Fig. 1a demonstrates a general perspective view of the post profile according to the present invention.

Fig. 1b demonstrates a cross-sectional view of the post profile according to the present invention.

Fig. 2 and Fig. 8 demonstrate perspective views of the post profile with the illumination means lifting mechanism according to the present invention.

Fig. 3 demonstrates another perspective view of the post profile while the illumination means lifting mechanism rollers are within the profile according to the present invention.

Fig. 4a and 4b respectively demonstrates planar

views of the positions before and after the illumination means framework reaches its operational position according to the present invention. Fig. 10 demonstrates a perspective view of an alternative design of said illumination means framework according to the present invention.

Fig. 5a demonstrates a planar view of the post base according to the present invention. Fig. 5b demonstrates a cross-sectional view taken along the A-A line as indicated in Fig. 5a. Fig. 5c demonstrates a perspective view of the base according to the present invention.

Fig. 6 demonstrates an exploded view of the post solar unit according to the present invention and Fig. 9 demonstrates an alternative embodiment of the solar unit housing.

Fig. 7a demonstrates an perspective view of an erected operable post according to the present invention. Fig. 7b demonstrates a longitudinal cross-sectional view of the post indicating dome-shaped caps according to the present invention.

Fig. 8 demonstrates an perspective view of the pulley mechanism according to the present invention.

Fig. 9 demonstrates perspective views of a solar panel unit according to the present invention.

Fig. 10a demonstrates a perspective view of the post according to the present invention. Fig. 10b demonstrates a perspective view of the post with an advertisement flag according to the present invention.

Fig. 11 demonstrates an exploded perspective view of the base unit components according to the present invention.

Fig. 12 demonstrates a general perspective view of the base unit according to the present invention.

Fig. 13a and 13b respectively demonstrates the base unit according to the present invention with and without a central flange portion.

Fig. 14 demonstrates water discharge path of the base unit according to the present invention.

Detailed Description of the Invention

[0015] Referring now to the figures outlined above, the present invention provides a post (11) with a solar panel unit (12), either anchored in the ground or provided with wheels to enable easy displacement.

[0016] Said post (11) is shaped to have a circular-like central portion (29) in the form of an inner profile. Said central portion (29) although being circular-like in the preferred embodiment, it is not necessary to use this form and various other shapes in cross section (e.g. ellipse, triangle, square, pentagonal, hexagonal or other polygonal shapes) may be utilized for providing a post (11).

[0017] The post (11) of the present invention is provided such that it features a double profile post (11) in which an outer profile (30) is connected to said inner profile (29) by means of a plurality of preferably symmetrically arranged bridges (31). To this end, said post (11) features a first closed geometry longitudinally hollow profile (29) interconnected by bridging elements (31) to a second closed geometry longitudinally extending profile (30) enclosed said first profile (29).

[0018] Said solar unit (12) is shaped and dimensioned to be mounted on a carrier framework (13) with holder slots (32) receiving said solar units (12), typically serving to the purpose of supporting the same.

[0019] Said posts (11) have at least one longitudinal channel (14) accommodating a movable block (15) having rollers (16). Said movable blocks (15) displace in said longitudinal channels (14) in order for raising and lowering said solar units (12) relative to the ground surface on which said posts (11) are erected. This is achieved by means of an electrical motor (17) whose rotary shaft is conventionally coupled to a pulley (18) mechanism in communication with a wire (19), the latter carrying said movable block (15). Alternatively, repair and maintenance workers may effect rotation of said pulley (18) mechanism manually by said wire (19) in the absence of an electrical motor (17).

[0020] The solar units (12) are provided at both sides of the post (11) as indicated in Fig. 7. Said carrier framework (13) being in association with said movable blocks (15) therefore provides that said solar units (12) mounted on said framework (13) are lowered by means of said pulley (18) mechanism, for instance for maintenance purposes.

[0021] The present invention ensuring easier repair of post solar units (12) by maintenance workers is especially advantageous in substantially accelerating maintenance and repair operations. Considering quite a large number of posts may require routine maintenance in a large area (for instance a military area), slow maintenance operations prove to be a serious cost item.

[0022] The illumination means according to the invention are LEDs (light emitting diodes) embedded within a central housing (21) above the electrical motor (17). Said illumination means are separately provided on said carrier framework (13).

[0023] The present invention further provides that more efficient power consumption is achieved by making use of LED elements powered on and off appropriately in order for saving power. This arrangement can be realized by means of a PWM module driving the LED elements with an appropriate duty cycle.

[0024] LED- driver circuits can be dimmed by applying a variable duty cycle (pulse- width modulation, or PWM)

to the LED. Applying PWM current to the LED yields an average power comparable to that of dc control. PWM control can be implemented with a simple circuit consisting of a dual comparator producing a desired frequency PWM signal and a duty cycle adjustable from 0% to 100%.

[0025] The comparator's first side can be configured as an oscillator producing a triangular waveform and the other side comparing the triangle waveform with the dc control signal and generates a PWM signal. PWM signal generation and duty cycle control is widely practiced in the art and is extensively known to the person in the art.

[0026] Said electrical motor (17) is powered by a base battery embedded within said base (22). Said motor's (17) power leads extend to the base (22) of said post (11) through its central hollow space, i.e. the longitudinally hollow profile (29). To this end, said motor (17) is continuously connected to said base battery. Said motor (17) may also be remotely actuated by signals from a suitable radio transmitter as is conventionally practiced in the available art. Upon termination of routine maintenance or repair, said motor (17) is reactuated to reposition said framework (13) to its initial position. Said motor's base battery connection is not affected by moving parts of the mechanism, i.e. the displacement of said framework (13). The initial position of the same is easily detected by microswitches (33) upon which said lighting means in said central housing (21) are powered by said solar units (12).

[0027] The present invention provides a compact solar energy station such that said illuminating elements in said central housing (21) are powered by a solar panel (23) as shown in Fig. 6. Said solar panel (23) is in electrical communication with a rechargeable electrical battery (24, symbolically shown in Fig. 6).

[0028] Fig. 6 according to the present invention demonstrates the main components of the post (13) solar unit (12) where said solar panel (23) is maintained within a cage-like housing (25) onto which a sealing element (27) is secured by means of a grooved rim (26). Said cage-like housing (25) is rotatable around its base such that said solar panel's (23) inclined outer surface can be positioned to face a certain desired direction.

[0029] The base (22) according to the present invention provide a further security feature such that the post (11) anchors securing the same to the ground are concealed by a base (22) housing. Said housing comprises a lockable lid (28) which prevents intruders from reaching the anchors. It is to be noted that it is not entirely uncommon that intruders intend to steal posts.

[0030] The present invention's easy repair principle can easily be adapted to be implemented such that lighting means are provided within said holder slots (32) being in association with said carrier framework (13). To that end, said lighting means may also be powered by a battery within said base (22), said battery also powering said electrical motor (17).

[0031] In a nutshell, the present invention proposes a post (11) comprising a base (22), at least one lighting means and a carrier framework (13) with holder slots (32) for receiving said lighting means or solar units (12) having a solar panel (23) and a rechargeable electrical battery (24). Said post (13) further comprises at least one longitudinal channel (14) accommodating a movable block (15) displaceable in said longitudinal channel (14) by means of a pulley mechanism (18). Said movable block (14) is fixedly joined to said carrier framework (13) with holder slots (32) receiving said solar units (12) or said lighting means.

[0032] The figures 11 to 14 demonstrate an alternative base unit (22) embodiment different than that shown in Fig. 10a in terms of physical structure. The base unit (22) embodiment of Fig. 11 comprises a central flange portion (39) annularly encircling said post (11) body above said base unit (22), an inner housing receiving at least one electrical battery (40) and anchoring means for ground fixation. The post (11) of the invention may alternatively comprise a manual drive coupling (43) in said base unit (22) for operating said pulley mechanism (18). Said manual drive coupling (43) may be operated by means of a conventional drilling tool in the possession of maintenance and repair workers such that said pulley mechanism (18) installed within said base (22) instead of being coupled to the shaft of said electrical motor (17) as in the embodiment of Fig. 2 according to the present invention is operated.

[0033] The base unit (22) of the invention provides a water discharge path A-B within said base (22) as shown by respective arrows in Fig. 14. Water penetrating into said base (22) through annular openings in between the post (11) body and said central flange portion (39) advances parallel to the post (11) body and is discharged from lateral openings on the ground.

Claims

1. A post (11) comprising a base (22), at least one lighting means and a carrier framework (13) with holder slots (32) for receiving said lighting means or solar units (12) having a solar panel (23) and a rechargeable electrical battery (24), said post (13) further comprising at least one longitudinal channel (14) accommodating a movable block (15) displaceable in said longitudinal channel (14) by means of a pulley (18) mechanism, said movable block (14) being fixedly joined to said carrier framework (13) with holder slots (32) receiving said solar units (12).

2. A post (11) as set forth in Claim 1 wherein said pulley (18) mechanism is driven by an electrical motor (17).

3. A post (11) as set forth in Claim 1 wherein said pulley (18) mechanism comprises a manual drive coupling (43) for operating said pulley mechanism (18).

4. A post (11) as set forth in Claim 2 wherein said elec-

trical motor's (17) rotary shaft is coupled to said pulley (18) mechanism in communication with a wire (19), the latter displacing said movable block (15) in said longitudinal channel (14).

5. A post (11) as set forth in Claim 4 wherein said post (11) features a closed geometry longitudinally hollow profile (29) in which said electrical motor (17) is stationarily installed such that a central housing (21) located immediately above said longitudinally hollow profile (29) contains said pulley (18) mechanism.

6. A post (11) as set forth in Claim 3 or 5 wherein said lighting means are LEDs embedded within said central housing (21).

7. A post (11) as set forth in Claim 1, 2, 3 or 6 wherein said solar units (11) installed within said holder slots (32) of said carrier framework (13) comprises a solar panel (23) and a rechargeable electrical battery (24) in electrical communication with said lighting means embedded within said central housing (21).

8. A post (11) as set forth in Claim 7 wherein said movable block (15) has at least one roller (16) rotatable within said longitudinal channel (14).

9. A post (11) as set forth in Claim 2 or 5 wherein said electrical motor's (17) power leads extend to said base (22) of said post (11) through said longitudinally hollow profile (29).

10. A post (11) as set forth in Claim 2 or 9 wherein said electrical motor's (17) is remotely actuatable by a radio transmitter.

11. A post (11) as set forth in Claim 1 or 10 wherein said carrier framework's (13) position is detected by microswitches (33) upon which said lighting means are powered by said solar units (12).

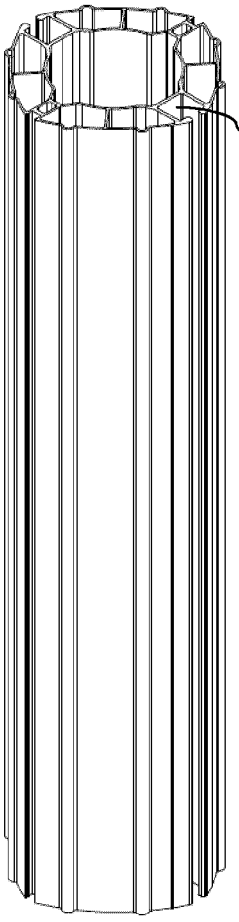


Fig. 1a

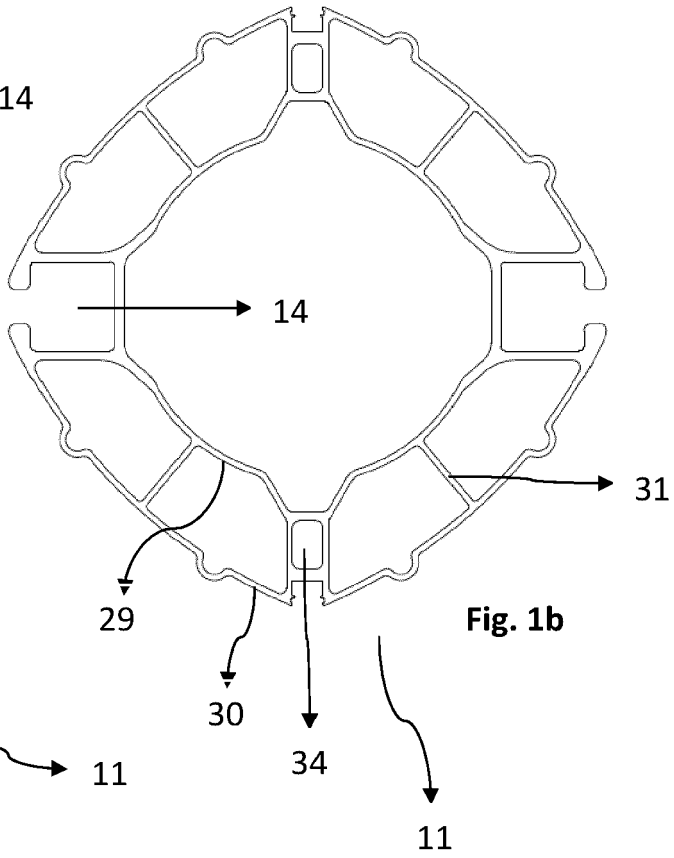


Fig. 1b

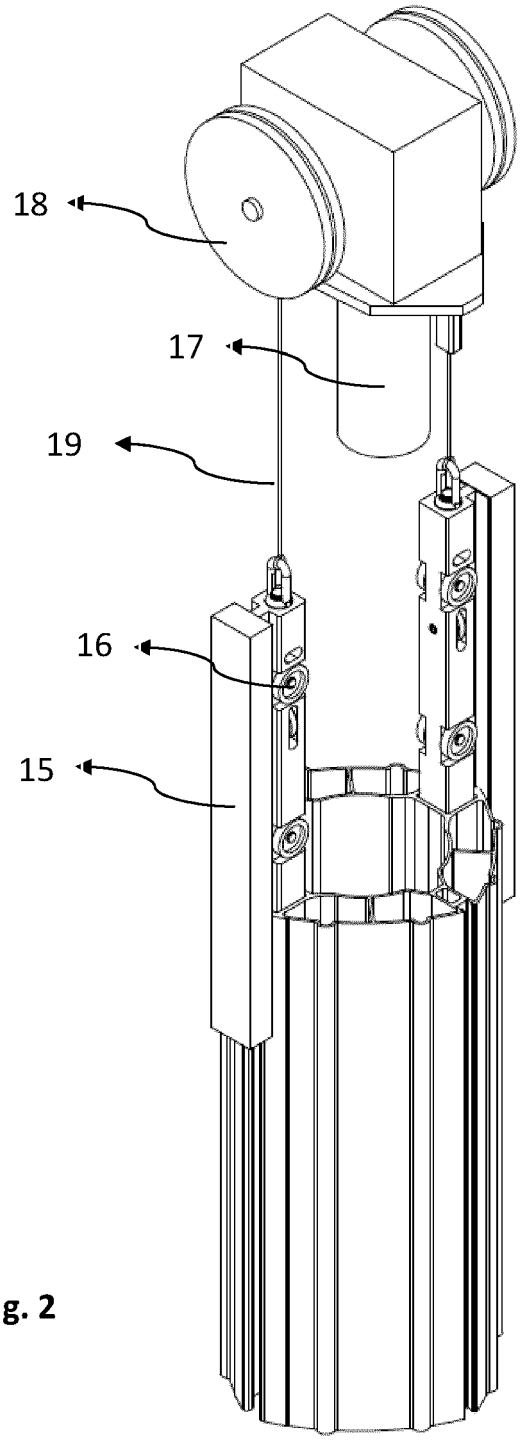


Fig. 2

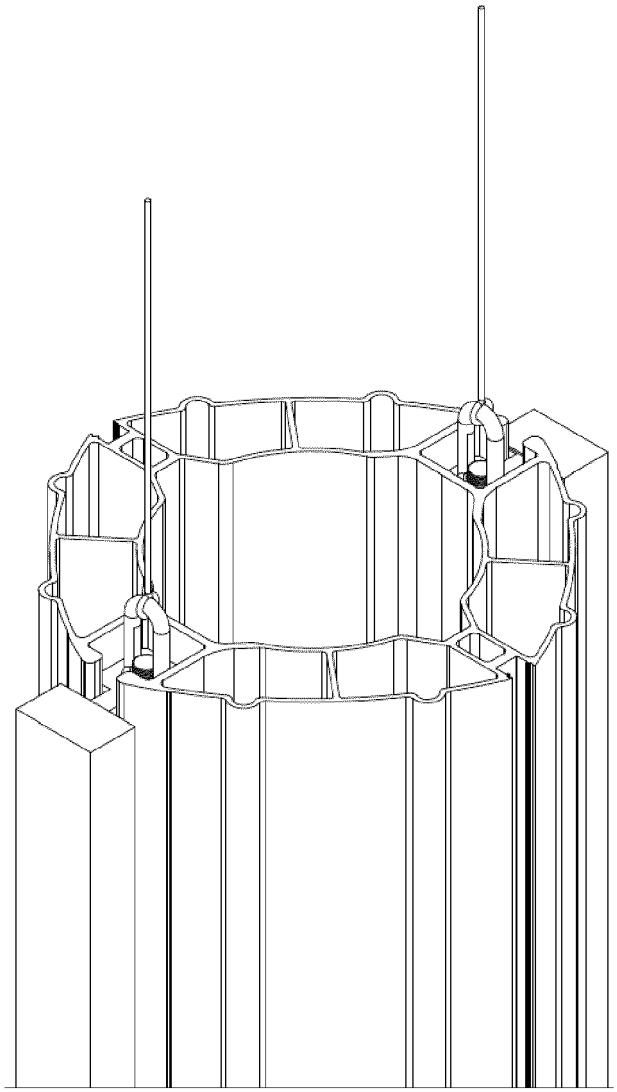


Fig. 3

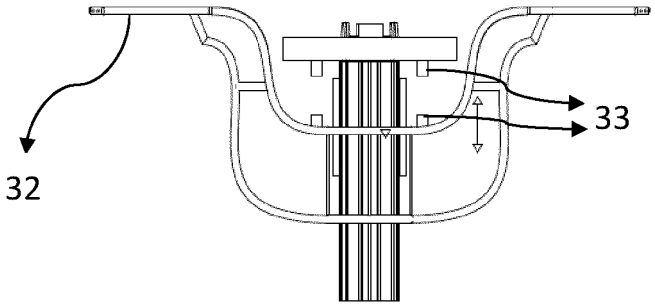


Fig. 4a

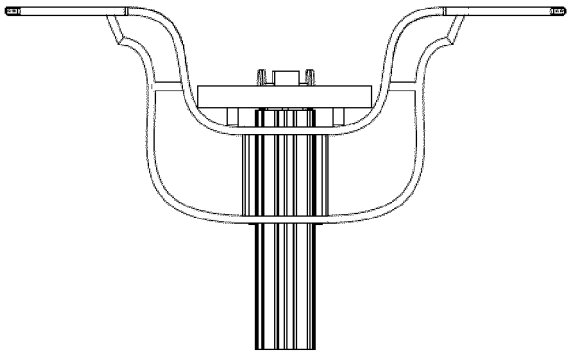


Fig. 4b

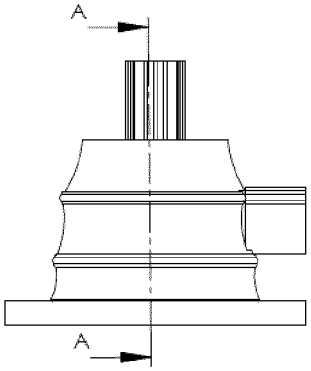


Fig. 5a

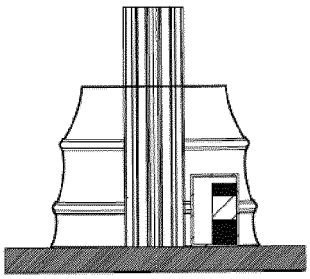


Fig. 5b

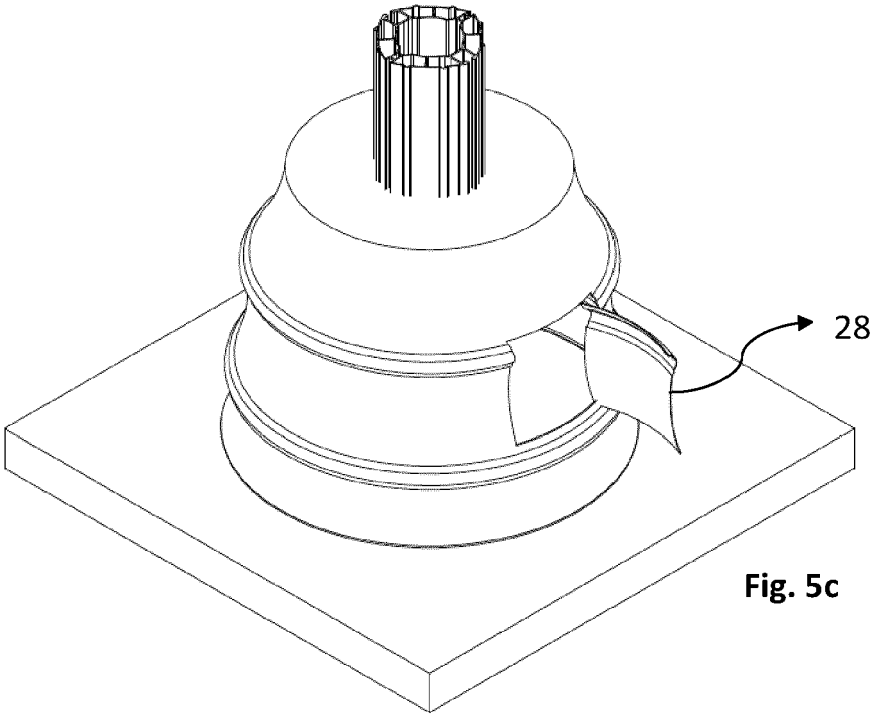


Fig. 5c

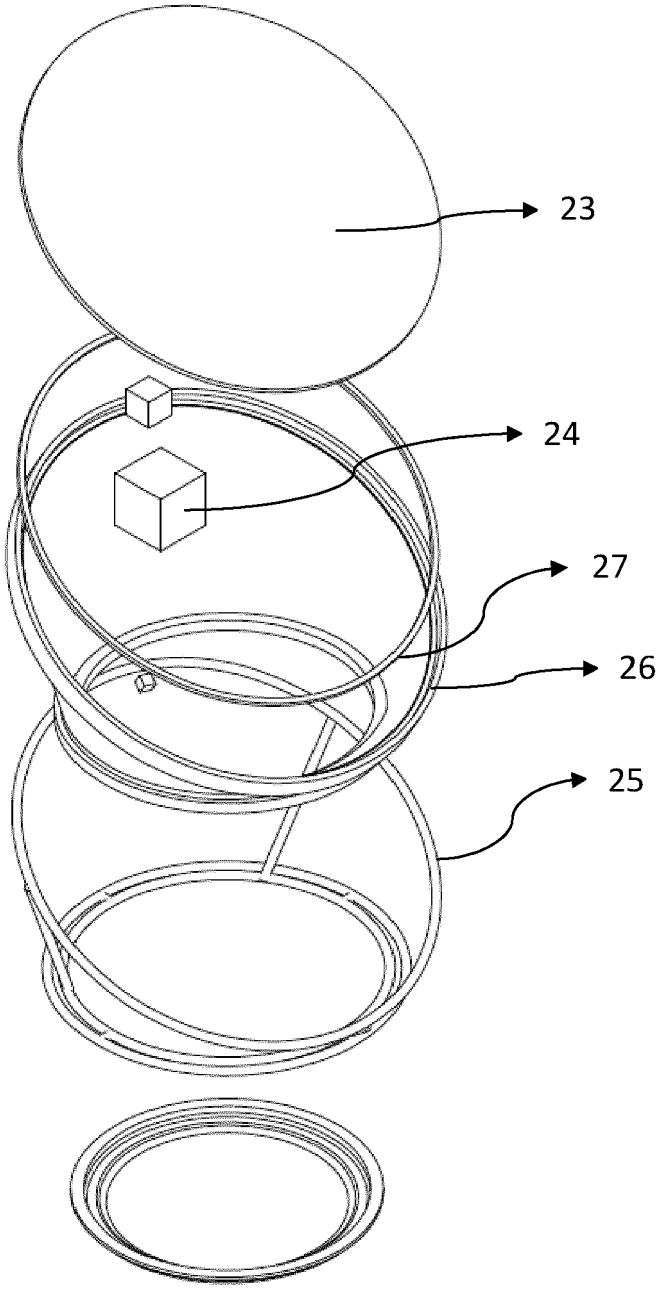


Fig. 6

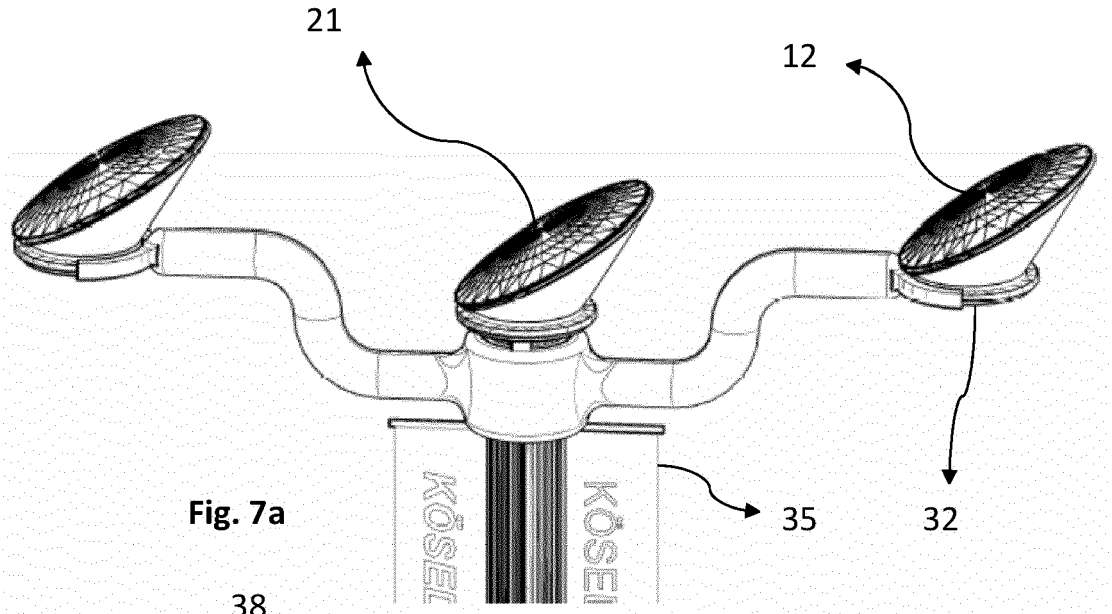


Fig. 7a

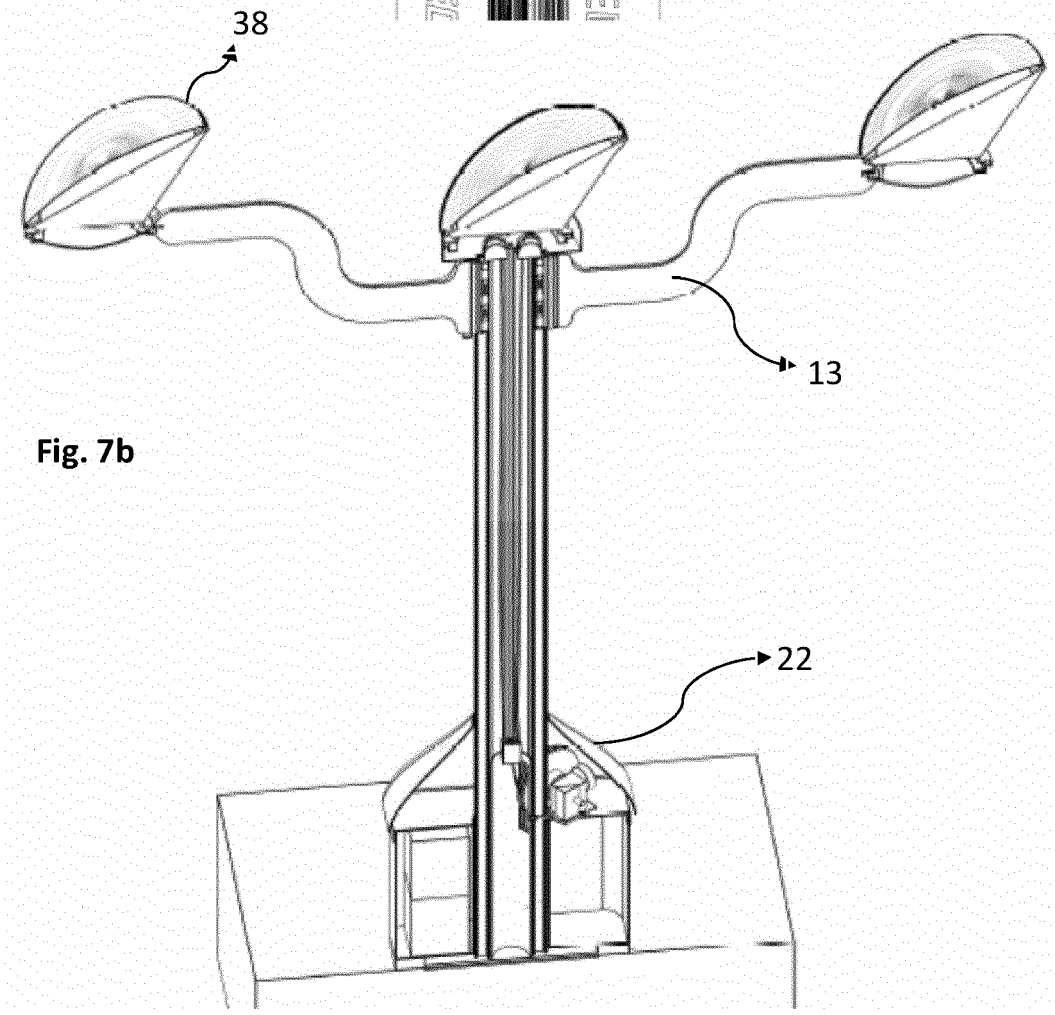


Fig. 7b

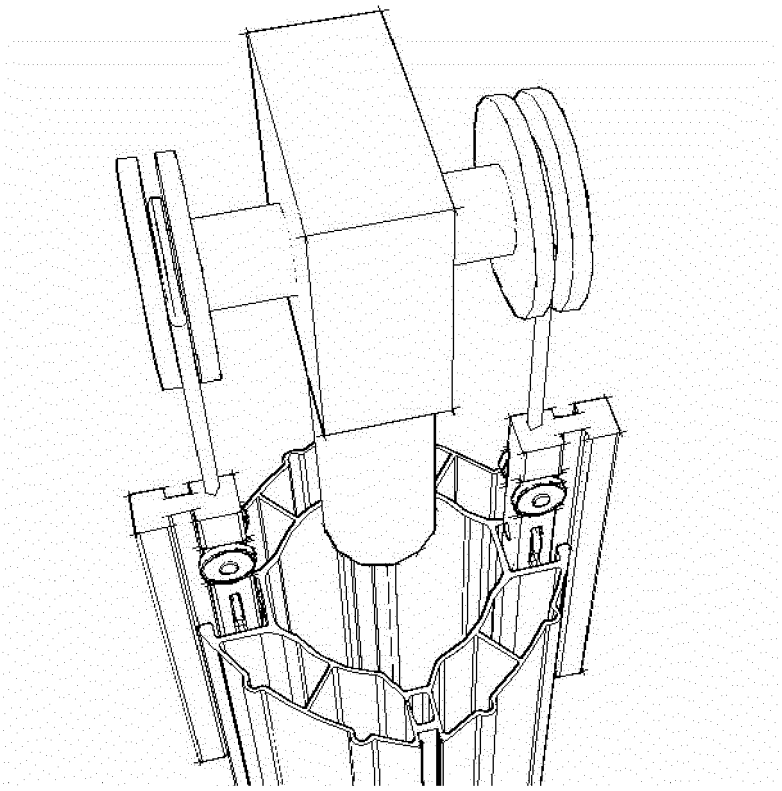


Fig. 8

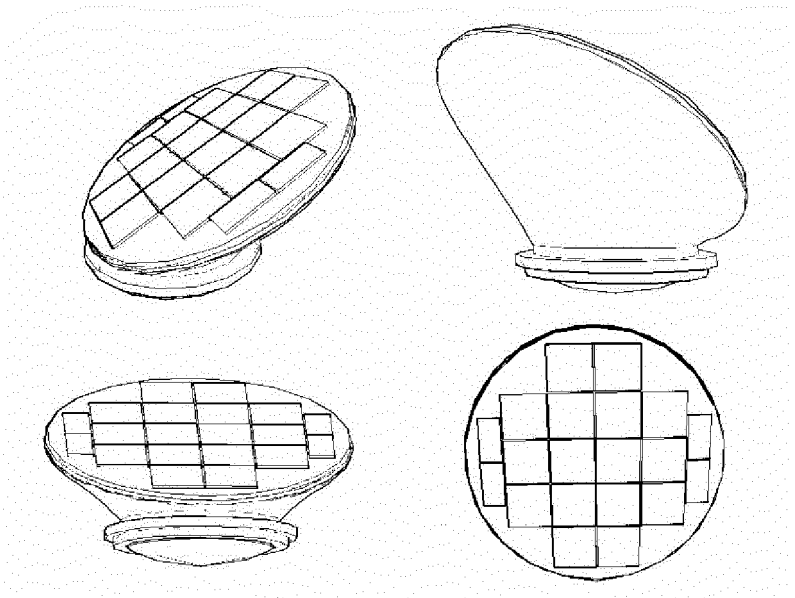


Fig. 9

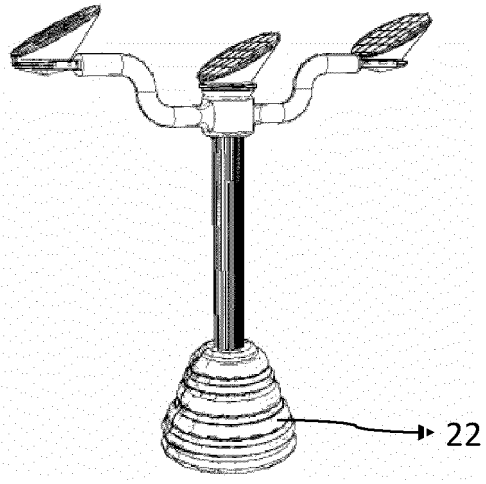


Fig. 10a

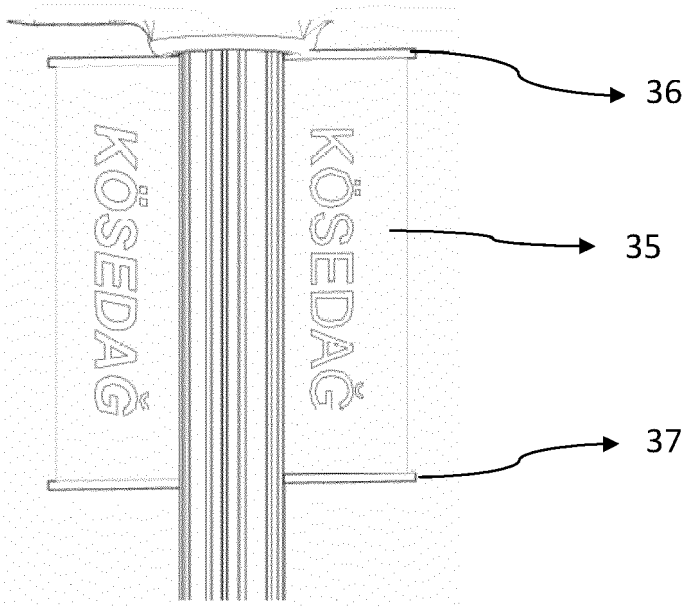


Fig. 10b

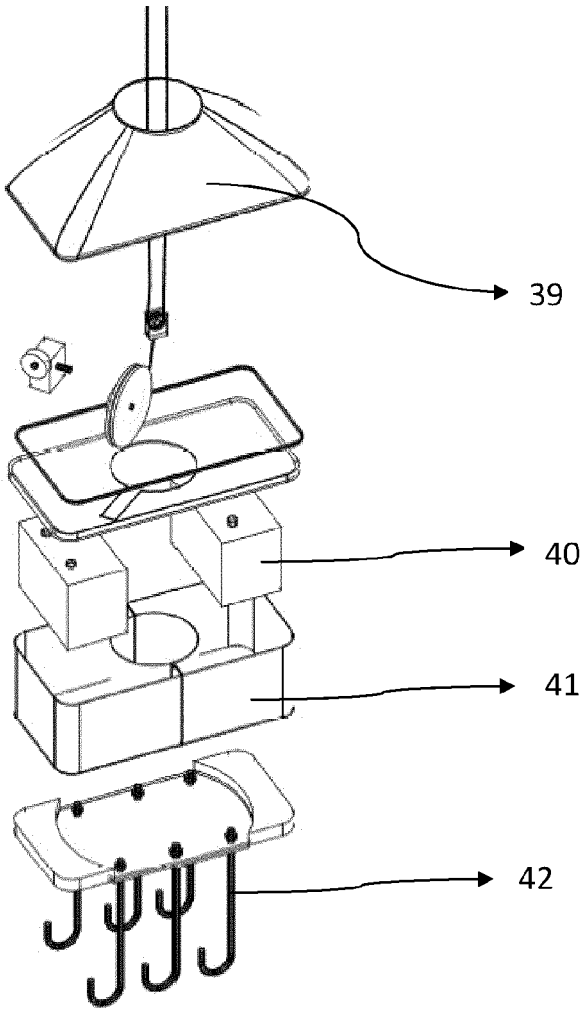


Fig. 11

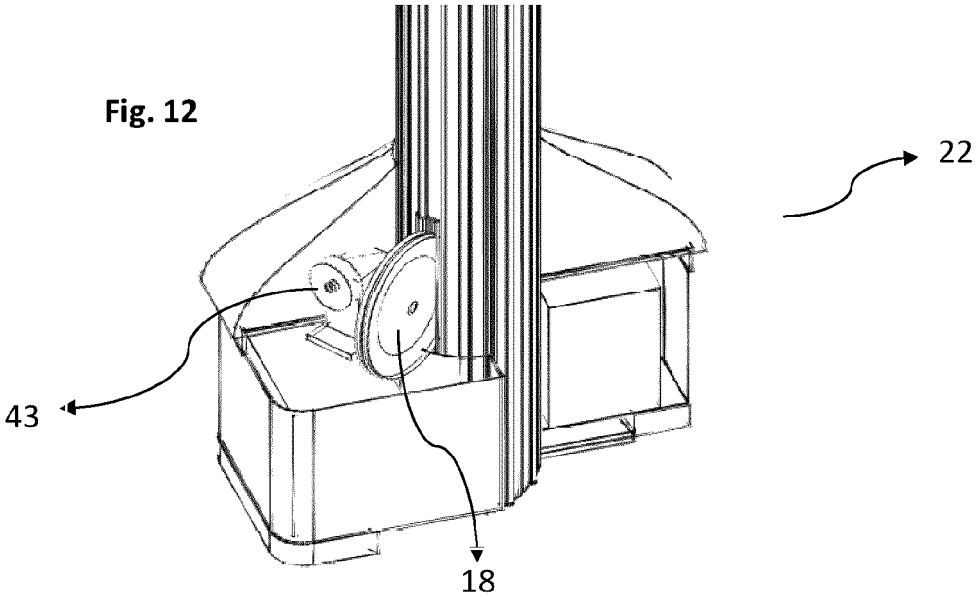


Fig. 12

Fig. 13a

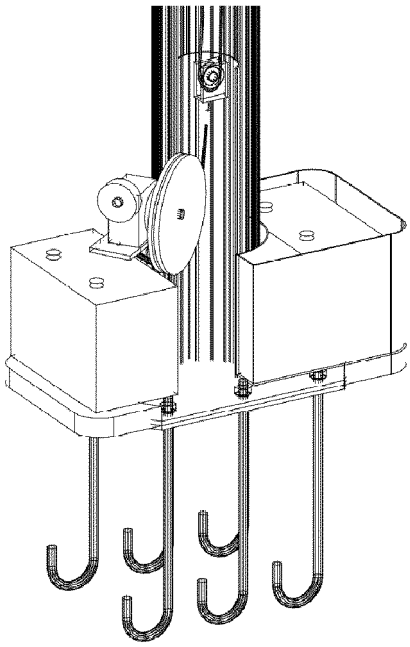
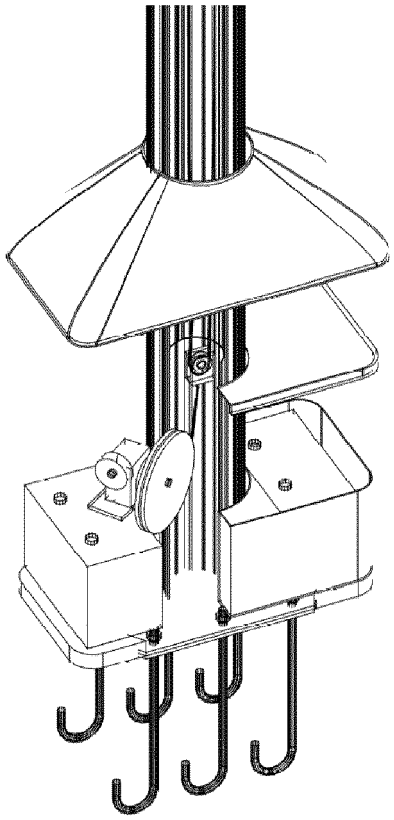


Fig. 13b



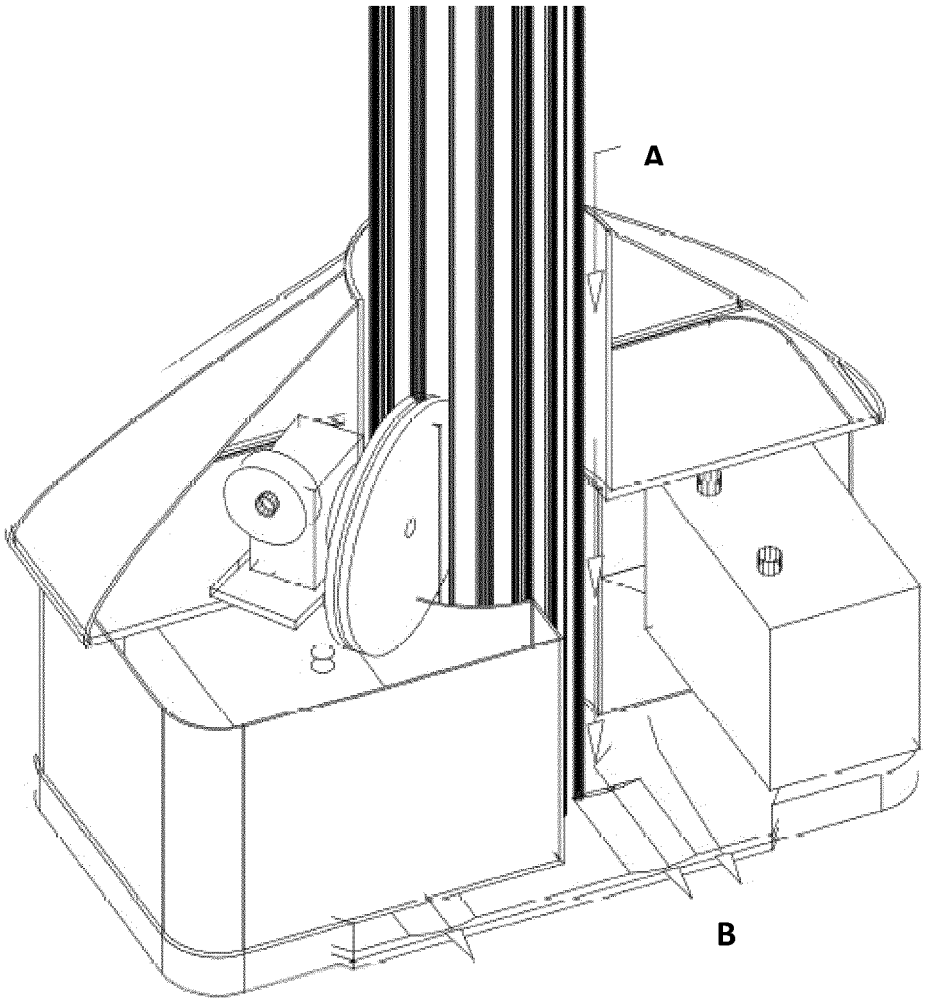


Fig. 14

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EUROPEAN SEARCH REPORT

Application Number
EP 12 16 0870

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	TW 201 104 147 A (WENEEDS ENTPR CO LTD [TW]; LIN JUN-TING [TW]) 1 February 2011 (2011-02-01)	1,2,4	INV. F21S8/08 F21S9/03
Y	* figures 2-6 *	10	F21V21/34 F21V21/38
X	CN 202 056 709 U (JINQIANG NING) 30 November 2011 (2011-11-30) * figure 1 *	1,3	ADD. F21V21/15
Y	JP 2011 210483 A (CHUGOKU ELECTRIC POWER) 20 October 2011 (2011-10-20)	10	
A	* figures 1-9 *	1,2,8	
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A	US 2010/296267 A1 (YU CHING-HUI [TW] ET AL) 25 November 2010 (2010-11-25) * the whole document *	1,2	
A	US 2010/220467 A1 (DAIDONE PAUL D [US] ET AL) 2 September 2010 (2010-09-02) * the whole document *	1	TECHNICAL FIELDS SEARCHED (IPC) F21S F21V

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 September 2012	von der Hardt, M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

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