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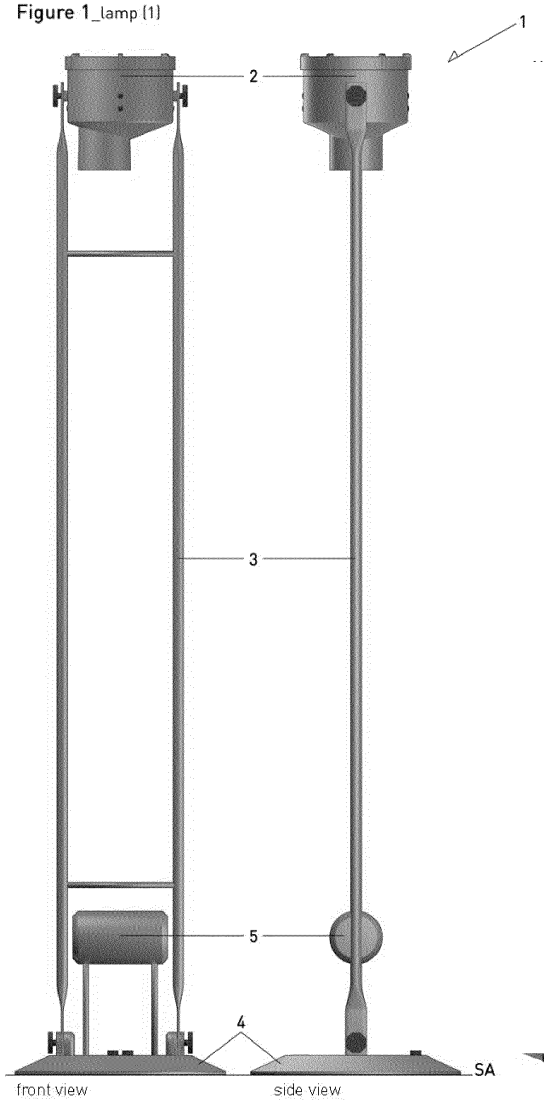
(54) MULTIFUNCTIONAL STEM LAMP

(57) The object of the present invention is a lamp which integrates in a single element two different types of lighting, one of the concentrated type and one of the diffused type so as to be totally flexible in relation to different environments and, therefore, the need for use. Direct light can be used indoors and outdoors to illuminate individual objects such as furnishing elements, public benches, paintings, sculptures, tables for serving food, specific objects, etc., while diffused light can be used, together or not with the direct light, for lighting refreshment rooms, bedrooms, public areas, museum halls, gardens, etc. The lamp is equipped with joints and a counterweight system that allow any orientation in space of both luminous fluxes, thus determining the most total freedom of use.

Another innovative element that characterizes the lamp is that of recovering and reusing waste elements deriving from the building sector and at the same time guaranteeing the reuse and/or recycling of each of its constituent components in the decommissioning phase, with a view not only environmental but also economic and social sustainability.

Figure 1_lamp (1)



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Description

[0001] The present invention relates to a lighting device, and in particular a floor or table, ceiling or wall lamp, for interiors or exteriors.

[0002] In an historical moment in which it is increasingly urgent to reduce the environmental impact of action, in the lighting engineering sector this commitment has almost always manifested itself in the containment of energetic consumption of light sources (led bulbs, led spotlights, etc.). However, if we want to operate fully within the green economy, we cannot fail to take into greater consideration aspects more related to the sustainability of the procedures and processes that lead to the production of a lighting device.

[0003] With this in mind, only a lamp capable of meeting the 3R requirements (Recovery, Reuse and Recycling) both during the production and disposal phases (Cradle to Cradle approach) can be considered truly sustainable and innovative. The purpose of the present invention is to produce a lamp capable, on the one hand, of recovering and reusing as far as possible waste elements deriving from the building sector, i.e. one of the sectors most responsible for the environmental crisis and, on the other hand, to guarantee the reuse and / or recycling of each of its constituent components during the disposal phase, with a view to sustainability not only from the environment but also from the economic and social point of view. The device object of the invention is in fact composed, as better described below and in a preferential but not exclusive measure, of PVC hydraulic fittings and scaffolding elements mutually connected with commonly used elements easily available on the market, so that at least 95% of the lamp it is made with elements not produced specifically for the purpose but simply adapted or re-adapted to it.

[0004] Another object of the present invention is to provide a lamp capable of integrating two different types of lighting in a single element, a concentrated type and a diffused type, in order to significantly reduce the environmental and economic costs that would otherwise be should incurred for the production of two distinct lamps.

[0005] From a functional point of view, the concentrated type of light can be used to illuminate individual objects (furniture elements, benches, artistic objects, tables for serving food, specific objects, etc.) while the diffused type of light can be used, together or not with the first type, for ambient lighting (dining rooms, bedrooms, public areas, gardens, etc.).

[0006] The characteristics and advantages of the lighting device forming the subject of the present invention will be evident in the description given below, given by way of non-limiting example in accordance with the attached figures, in which:

- figure 1 shows a lamp according to the present invention, according to an embodiment;
- figure 2 shows an axonometric view of the lighting body with respect to two different positions;
- figure 3 shows an axonometric view of the optional counterweight;
- figure 4 shows an axonometric view of the base;
- figure 5 shows a vertical section of the lighting body;
- figure 6 shows the different positions of the smaller light source in relation to the rotation of the lighting body with respect to its own axis;
- figure 7 shows the different positions of the lighting body in rotation with respect to its horizontal axis, or with respect to the attachment to the stem;
- figure 8 shows an axonometric exploded view of the lighting body;
- figure 9 shows the axonometric view and two details of the stem, the attachment to the lighting body and the attachment to the base;
- figure 10 shows an axonometric exploded view of the base and the optional counterweight, in view from above and from below;
- figure 11 shows the optional counterweight system in front, side and perspective view;
- figure 12 shows a type of configuration that the lamp can assume in relation to the rotation of the stem and of the lighting body

[0007] With reference to the attached figures, a floor or table lamp, ceiling or wall lamp, for indoor or outdoor, has been indicated as a whole with (1).

[0008] The lamp (1), generally resting on a support surface SA, is mainly composed of three parts plus an optional part: a lighting body (2) equipped, preferably and not exclusively, with two light sources, a concentrated type of lighting (6) and a diffused type of lighting (7), a stem (3), a base (4) and an optional counterweight (5). The lighting body (2) is made, preferentially but not exclusively, with an eccentric hydraulic connection / reduction in pvc (8), with a smaller diameter equal to 100 mm and a larger diameter equal to 200 mm. Inside the fitting / reduction (8), in a concentric position and coinciding with the minor fitting, a PVC cap (44) is welded, specially drilled at the top to ensure the connection of the lamp holder, of the concentrated flow source (6). The fitting / reduction (8) is equipped with 4 pairs of holes (9) spaced at an angle of 90 ° from each other along its entire greater circumference which allow the lighting body (2) to be rotated on its vertical axis and customize the position of the concentrated light source (6), according to a right-left, front-back pattern.

[0009] Once the orientation of the lighting body (2) has been defined, it still maintains a possibility of rotation of 360 ° even in an orthogonal direction with respect to its vertical axis, i.e. with respect to the horizontal axis (23), allowing the 2 light beams to be inverted according to a pattern top-bottom, right-left. Of each pair of holes (9), one of which is above and one is below, the upper hole (9a) is intended to house the screw (11) through which the lighting body (2) connects to the stem (3) while the lower hole (9b) is intended to house the power supply

cable (10) which, through the cavity of each of the two tubes (3a) making up the stem (3), connects each of the two light sources (6 and 7) to the base (4) and from this to the mains or to the battery pack possibly housed inside the base itself.

[0010] The pairs of holes that are not used are closed with buttons (19) made of plastic or other material.

[0011] The two light sources (6 and 7) are positioned opposite each other, preferentially but not exclusively eccentric, inside the lighting body (2). Each of the two lighting sources may or may not be equipped with its own electronic regulator (dimmer) so as to be able to vary the intensity of the light according to different needs (reading, enhancement of an object, lighting of a work of art, room lighting, public lighting, etc.). The commands for switching on/off and adjusting the intensity of the luminous flux can take place via a switch (41), preferentially but not exclusively housed in the base (4) of the lighting device, or in wireless mode.

[0012] The diffuse light source (7) is contained by the two constituent elements a screw cap in PVC, appropriately modified and of such dimensions as to be inserted inside the fitting / reduction (8) in the part that has the largest diameter. An element of the cap, smooth in the lower part and threaded in the upper part, is inserted into the fitting and we will call this element the "lower plug" (12). The other element of the cap screws onto the bottom cap and we will call this element "upper plug" (13). The upper plug (13) has a hole with a diameter slightly smaller than the external diameter of the diffused light body (7).

[0013] The lower cap (12) has a PVC collar (44) internally and in a position contiguous to the thread, functional to support the light source (7). The diffuse light source (7) rests on the collar (44) of the lower plug (12), and is held in place by screwing the upper plug (13) onto the lower plug (12). The lower plug (12) is equipped with 4 pairs of holes (14) spaced at an angle of 90 ° from each other along its entire circumference, completely identical to those present on the fitting / reduction (8) and having same function. The lower plug (12) fits inside the fitting / reduction (8) and each pair of holes (14) present on the lower plug (12) coincides with a pair of holes (9) present on the fitting / reduction (8).

[0014] Considering two opposite pairs of these holes, the fastening system of the lighting body (2) to the stem (3) consists of two not-countersunk head screws (11) which penetrate, in order, the lower cap (12) and the fitting / reduction (8) passing through the high holes of these pairs (9a and 14a) and are tightened by two external self-locking nuts (15). For each of the two attachments, the part of the screw (11) in excess of the nut (15) is inserted into a hole (16) on the head of the respective support tube (3a) which forms the stem (3) and here blocked by a female threaded knob (17). By loosening or tightening the knob (17), then decreasing or increasing the friction force between the nut (15) and the support tube (3a), the rotation of the lighting body (2) on the vertical plane is allowed or blocked. An anti-slip gasket (18) is interposed between each of the two nuts (15) and each of the two tubes (3a) of the stem.

[0015] The stem (3) that supports the lighting body (2) is made preferentially but not exclusively by two scaffolding braces (3a) within which passes the power supply cables (10) which connect to the light sources from the base. These braces (3a) are held together and spaced apart by suitable crosspieces (20) which can be fixed or sliding along the braces themselves. Each of the two braces (3a) originally has holes at both ends for attachment to the scaffolding.

[0016] Inside each hole of each of the two braces (3a) making up the stem (3), a washer (21) with an internal diameter suitable to allow the passage of the not-countersunk head screw (11) is welded. Through the holes (16a) present at one end of each single brace, the attachment of the stem (3) to the lighting body (2) is made: we will conventionally call the ideal line joining this pair of holes "transverse rotation axis of the lighting body" (23). Through the holes (16b) present on the other end, the attachment of the stem to the base (4) is made: we will conventionally call the ideal line joining these holes "transversal rotation axis of the lamp" (24).

[0017] In a concentric position with respect to the transverse rotation axis of the lamp (24) and in an external position to each of the two braces (3a), two toothed wheels (22) are made integral with the stem (3), one for each brace (3a). Each wheel have a hole in the center with a diameter such as to allow the insertion of a male threaded knob (25). The knobs will screw to a special support integral with the base, therefore loosening or tightening the knobs (25), thus decreasing or increasing the friction force between braces (3a) and supports, the rotation of the stem is allowed or blocked (3) with respect to the transverse rotation axis of the lamp (24). The two toothed wheels (22) transmit their mechanical moment to another pair of toothed wheels (26) placed preferentially but not exclusively below each one, in so that the rotation of the upper pair generate the rotation in the opposite direction of the lower pair.

[0018] The lower pair of wheels (26) is made integral with a tubular element (27) parallel to the transverse axis of rotation of the lamp (24) and with freedom of rotation in the opposite direction. One or more brackets (28) which support a counterweight (5) are welded onto this tubular (27) and in a position perpendicular to its longitudinal axis. We will call this tubular element complete with brackets "counterweight shaft" (fig11). The two pairs of toothed wheels (22 and 26) therefore form a gear which allows to counterbalance the moment of inertia of the stem (3) and of the lighting body (2), with respect to the transverse rotation axis of the lamp (24), with the moment of inertia generated in the opposite direction by the counterweight (5) with respect to the same rotation axis, thus generating a state of equilibrium. The base (4) of the lighting device (1) is preferentially but not exclusively conceived of three elements: - a truncated cone steel element (29), hollow in the lower part and equipped in the

upper part with:

a) suitable holes (30) for the passage of one or more brackets (28) to support the counterweight (5)
b) suitable holes (31) for the passage of the power cables (10)
c) suitable holes (32) for the insertion of the toothed wheels (22 and 26)

- a flat steel element (33) equipped with a guide (34) for the coupling of the other element (29).
- an element, preferentially but not exclusively integral with the truncated cone element (29), acting as a thrust bearing (35).

[0019] The upper truncated cone element (29), engaging on the lower (33) maintains the possibility of rotation on its axis with respect to the lower element (33).

[0020] We will call upper base the truncated cone element of the base (5) complete with thrust bearing (35) and the lower base the flat element (33).

[0021] The upper base (29) has two shaped steel elements, placed along the transverse rotation axis of the lamp (24) and duly spaced from each other in such a way as to be able to accommodate the insertion of the stem (3). We will call each of the two elements "pivot" (36) of the lighting device (1). An anti-slip gasket (37) is interposed between each of the two pivots (36) and each of the two braces (3a) of the stem (3).

[0022] Below each of the two pivots (36) there is a removable element of equal section (38) fixed to the first by means of a pair of recessed screws (39). The two elements (36 and 38) are shaped to facilitate the insertion and tightening of a ball bearing (40) inside which houses and rotates the tubular (27) forming part of the counterweight shaft. This system allows the assembly, maintenance and disassembly of the counterweight shaft (fig. 11).

[0023] In the upper part of each pivot (36), in the direction coinciding with the transverse rotation axis of the lamp (24), there is a threaded seat (36a) for the insertion of the male threaded knob (25) to fixing the stem (3) at the base (4). The upper base houses the on/off and light intensity adjustment switch (41) for each individual lamp and a connector (42) for connection to the main power line.

[0024] A further innovative aspect of the present invention lies in the fact that it can accommodate, inside the upper base (29), a battery body capable of making the lamp independent from the power line.

[0025] Furthermore, the present invention allows the integration of any type of element such as, by way of example but not limited to, light concentrators or diffusers, filters of any type and nature, photovoltaic panels, absorbers or acoustic sound diffusers, audio and / or video recording and transmission equipment, projectors.

[0026] A photovoltaic panel for the eventual recharging of the battery body is particularly useful in case of use in public areas and gardens.

[0027] These innovations have been reached in accordance with the invention by adopting the idea of making a lamp that has the characteristics listed in claim 1.

[0028] Other characteristics are the subject of the dependent claims.

[0029] It is understood that modifications and variations may be made to the lighting device described and illustrated here, even in the exclusive use of individual components, which do not go beyond the scope of the attached claims.

Claims

1. Lamp (1) powered by electricity, battery or photovoltaic energy to be used as a free standing or table, ceiling or wall lamp, for indoors or outdoors, equipped with systems for switching on/off and regulating the luminous flux (dimmer) controlled by switches or wireless and **characterized by** the fact of including:

   - lighting unit (2), consisting preferably but not exclusively of a fitting/reduction (8) in pvc or other material and a screw cap (12 and 13) in pvc or other material, inside which they are housed two light sources, one with concentrated luminous flux (6) and one with diffused luminous flux (7), positioned one opposite the other in a preferentially but not exclusively eccentric position. On the fitting/reduction (8) there are 4 pairs of holes (9) of which an upper hole (9a) and a lower one (9b) as well as on the lower plug (12) there are 4 pairs of holes (14), of which an upper hole (14a) and a lower one (14b). On both elements (8) and (12), each pair of holes is spaced from the previous/subsequent by an angle of 90 degrees with respect to the circumference in such a way that, once the plug (12) is inserted inside the fitting/reduction (8), each pair of holes (9) coincides with a pair of holes (14).
     This system of holes constitutes the hooking/unhooking system of the lighting body (2) to the stem (3) and allows you to personalize:

     a) the position of the concentrated light source (6), by rotating the lighting body (2) with respect to the vertical axis of the lamp [1] as shown in Figure 6;
     b) the position of both light sources (6 and 7), by rotating the lighting body [2] by 360° on its transversal axis (23) as shown in Figure 7;

   - a stem (3) made preferably but not exclusively from two scaffolding rods (3a), each provided with an upper hole (16a) and a lower hole (16b),

preferably but not exclusively parallel, spaced and made integral by suitable crosspieces (20), fixed or sliding along the rods themselves (Figure 9). Each of the two rods is equipped with:

a) a washer (21), with a hole such as to allow the passage of a screw (11) or a male threaded knob (25), welded inside each of the two upper (16a) and lower (16b) holes present on each of the two rods;
b) a toothed wheel (22) with holes such as to allow the passage of a male threaded knob (25) and welded in a concentric position with respect to each of the two lower holes (16b);

- a base (4) made up of an element with a preferably but not exclusively truncated conical shape (29), in steel or other material, hollow in the lower part and equipped with:

- one or more holes (30) on the upper part through which it is possible to insert one or more support brackets (28) of the optional counterweight (5);
- holes (31) for the passage of the electric cables;
- holes (32) for the passage of the gear wheels (22 and 26);
- a pair of pins (36) of the lighting device;
- a connector (42) for connection to the electric line;
- controls (41) for switching on, switching off and adjusting the intensity of the luminous fluxes;

2. Lamp according to claim 1 wherein the light sources (6 and 7):

- they can be of any type (bulbs, spotlights, luminous surfaces, etc.);
- they can have white, colored (RGB) or mixed (RGBW) light, possibly equipped with their own light intensity regulator (Dimmer);
- they may or may not be of the same model and/or **characterized by** the same type of luminous flux;
- are not limited to two elements
- can be arranged inside a lighting body (2) of different shapes, or in any case such as to create any angle between the two luminous fluxes and/or make the rotation of one or more lighting sources independent of the rotation of the other

3. Lamp according to the preceding claims with the addition of a counterweight system (figure 11] such as to allow the controlled rotation of the stem (3) with respect to the rotation axis of the lamp (24) and always guarantee a condition of balance, whatever the support surface of the lamp (1). The counterweight system consists of a tubular (27) engaged in two ball bearings (40), is made integral with one or more support brackets (28) on which a counterweight (5) engages and is controlled by a gear consisting of two pairs of toothed wheels of which one pair (22) integral with the stem (3) transmits its mechanical moment to the other pair (26) integral with the tubular (27). The ball bearings (40) are locked between the clamping elements (38) and the pins (36) of the lighting device. The clamping elements (38) are tightened to the pins (36) by means of screws (39);

4. Lamp according to the preceding claims in which the counterweight system (fig. 11), useful for the rotation of the stem (3) with respect to the rotation axis of the lamp (24), is modified or replaced with other systems, by way of example and not exhaustive with a system of tie rods, belts, pulleys, etc.;

5. Lamp according to the preceding claims with system for switching on, switching off and/or regulating the luminous flux controlled by a switch (41) or in wireless mode and such that it can be managed jointly or autonomously for each individual light source;

6. Lamp according to the preceding claims whose base (4) is integrated by elements that allow a 360° rotation with respect to its vertical axis:

- a lower element (33), made of steel or other material, equipped with a guide (34) for engaging the truncated conical element (29);
- an element having the function of thrust bearing (35) preferentially but not exclusively integral with the upper element (29);

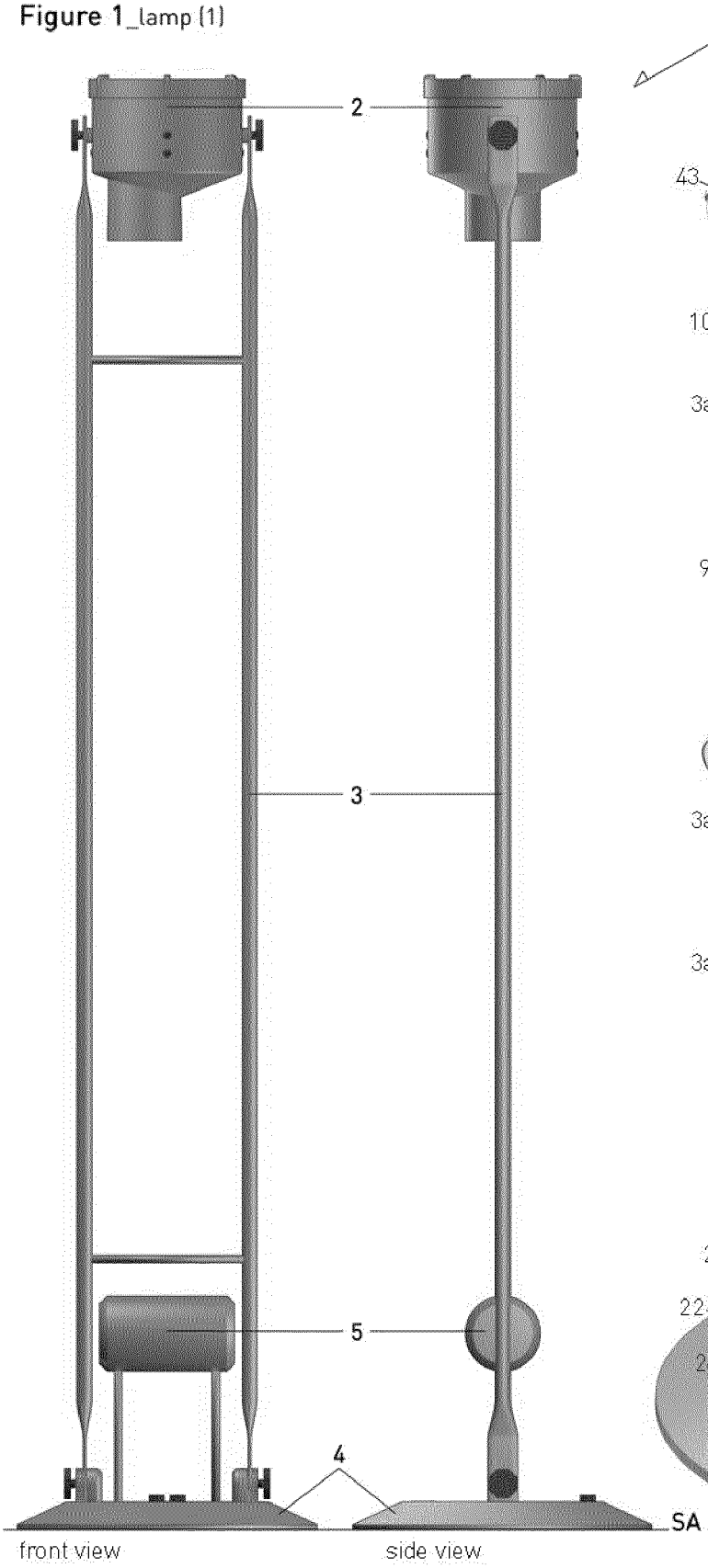
7. Lamp according to the preceding claims made with any type of material and color and/or with a combination of different materials and colors and in which the rods (3a) are made preferably with scaffolding elements but also with any other solid or hollow element, of different shapes and sections, straight or curved;

8. Lamp according to the preceding claims in which the shape and spatial articulation can also be modified by means of a new conformation, addition, subdivision or subtraction of the individual components, where it is decided, by way of example and not exhaustively, to use only the lighting body (2) hanging from the ceiling, or to increase the height of the lamp (1) by connecting two or more stems (3) together or even to modify the size of the components in order to create a different scale version of the same lamp (1);

9. Lamp according to the preceding claims which presents integration of elements such as, by way of non-exhaustive example, light concentrators or diffusers, filters of any type and nature, photovoltaic panels, batteries, absorbers or acoustic and sound diffusers, shooting and transmission devices audio and/or video, projectors.

10. Lamp according to the preceding claims in which the movement of the individual components is controlled by electric motors and in any case is not exclusively of the manual type.

Figure 1_lamp (1)



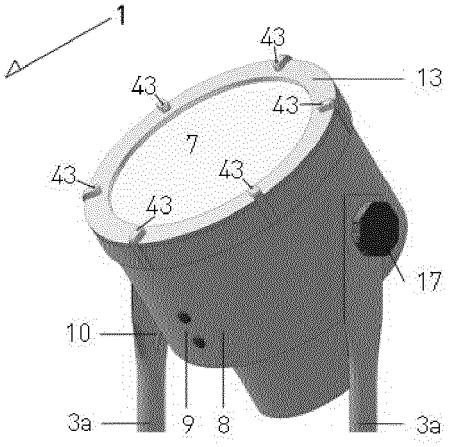


Figure 2_lighting unit (2)

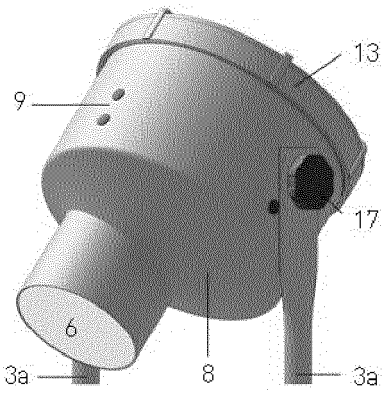
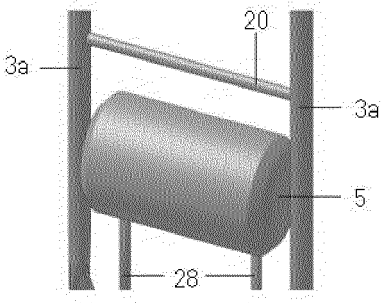


Figure 3_ counterweight (5)



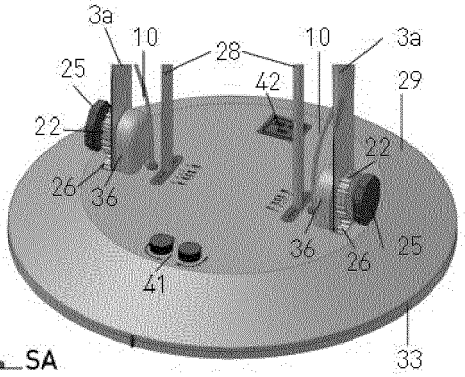
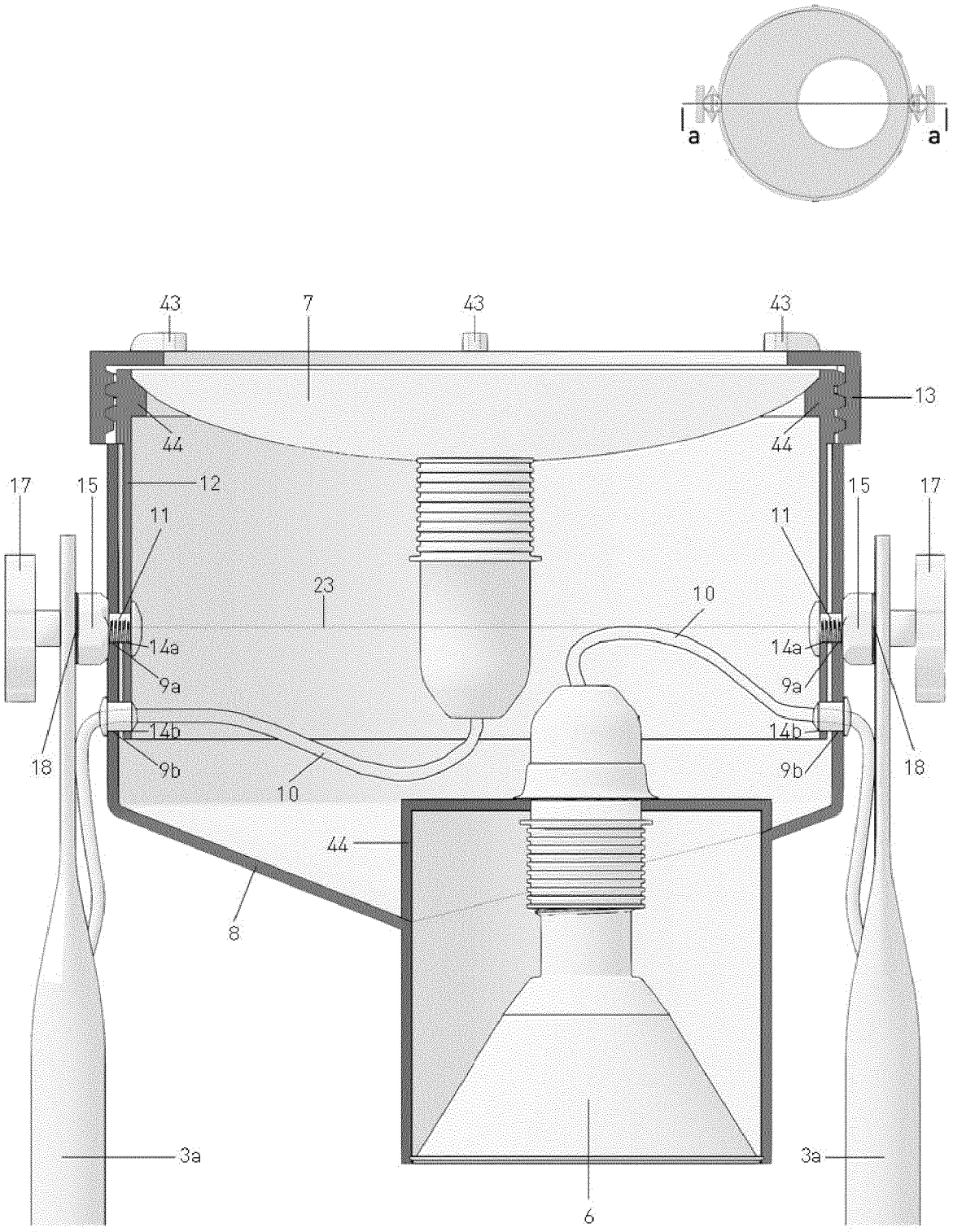


Figure 4_base (4)

Figure 5



section a-a

Figure 6

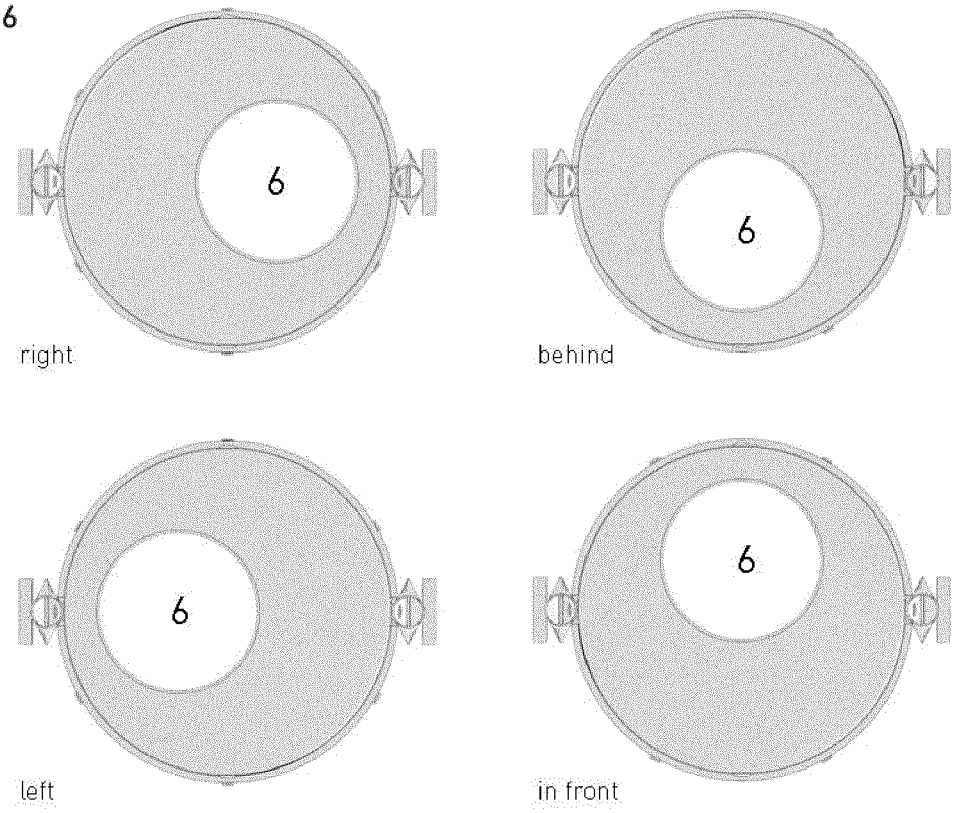


Figure 7

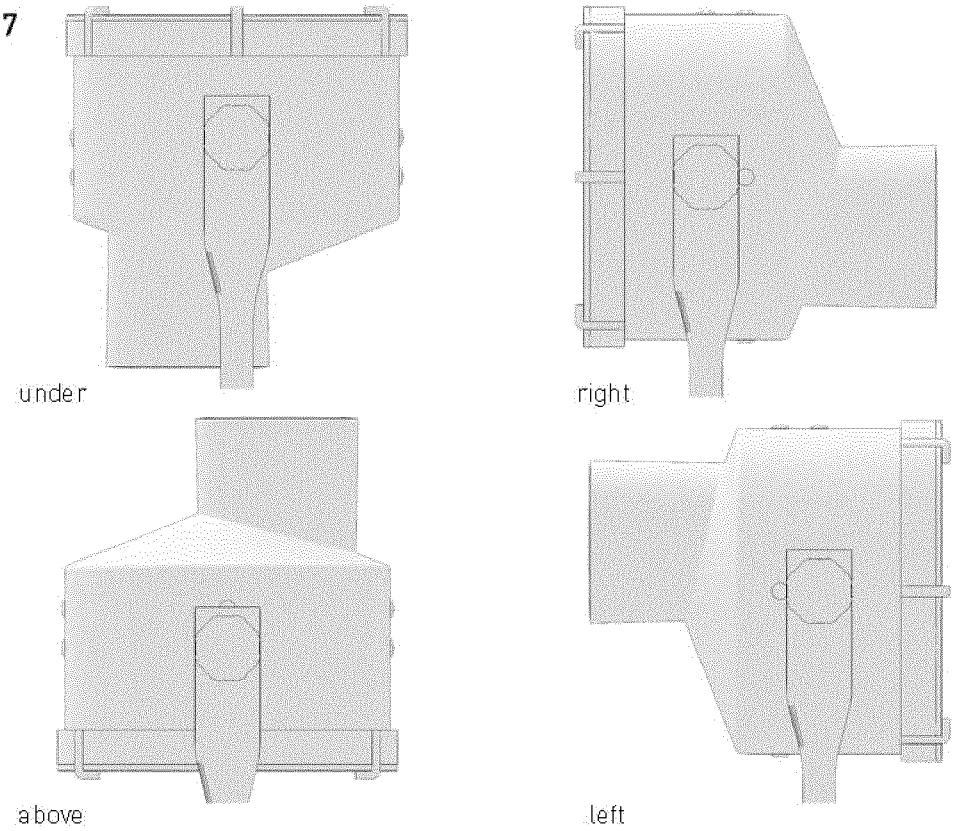


Figure 8

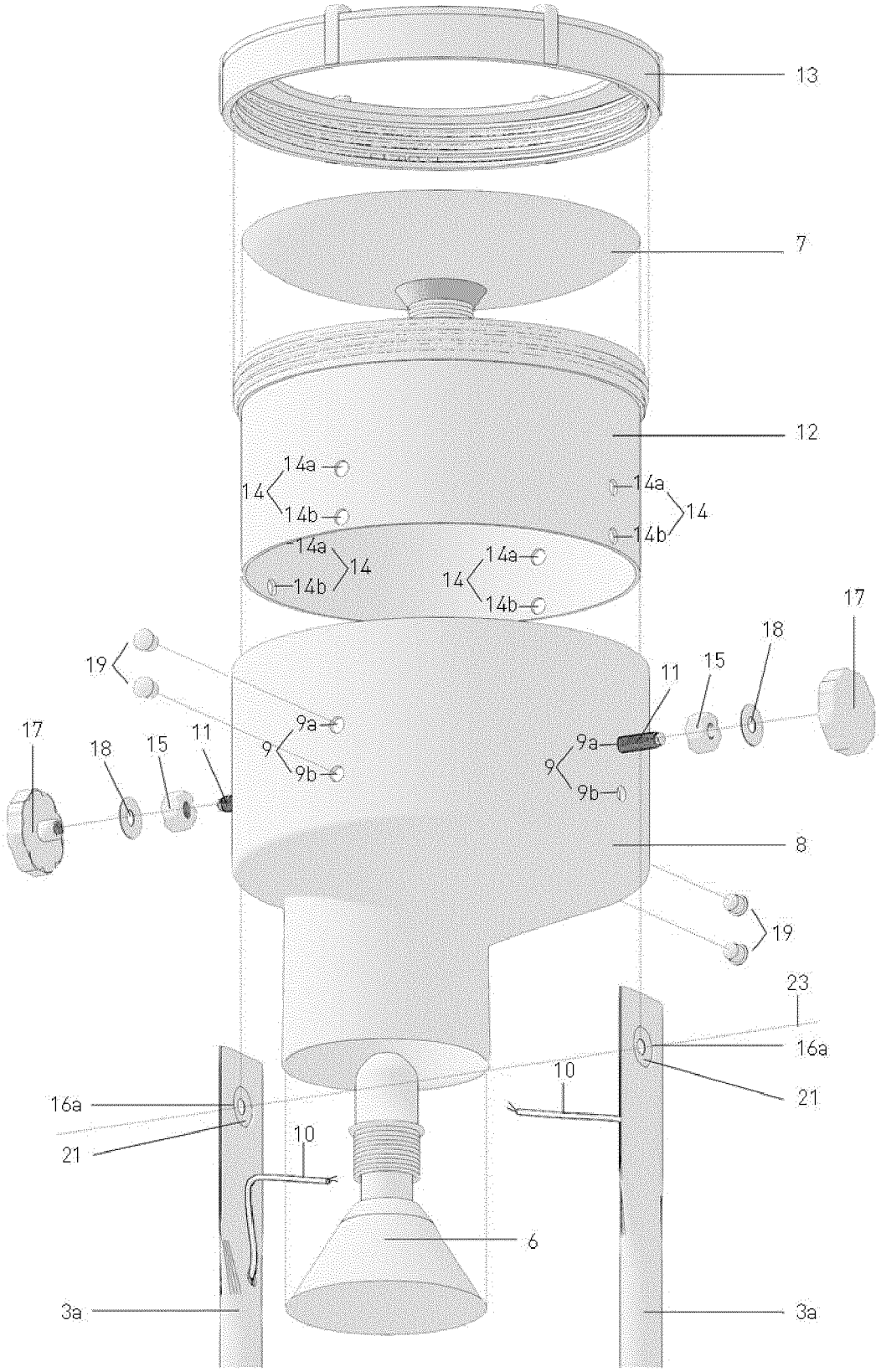


Figure 9

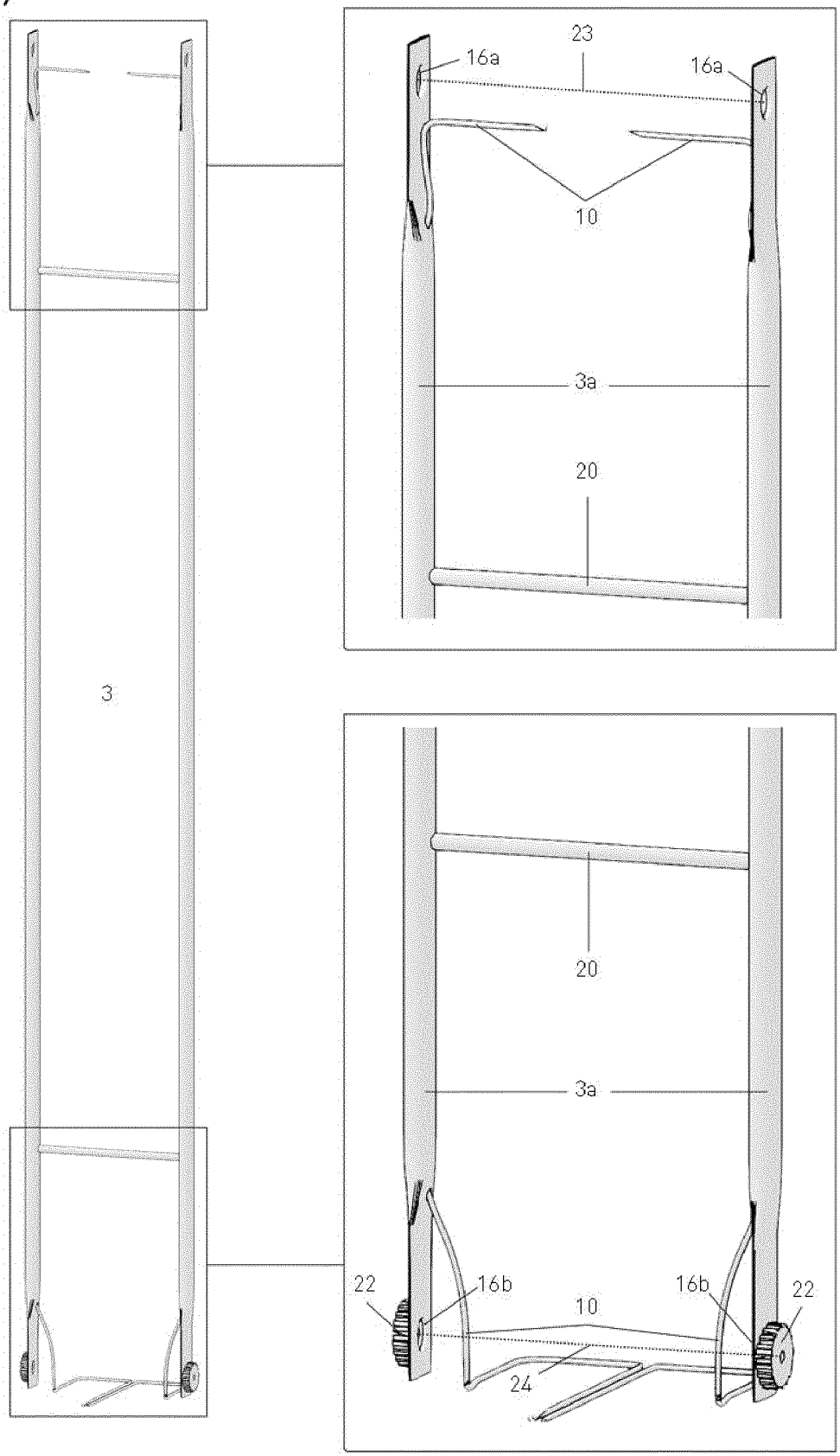


Figure 10

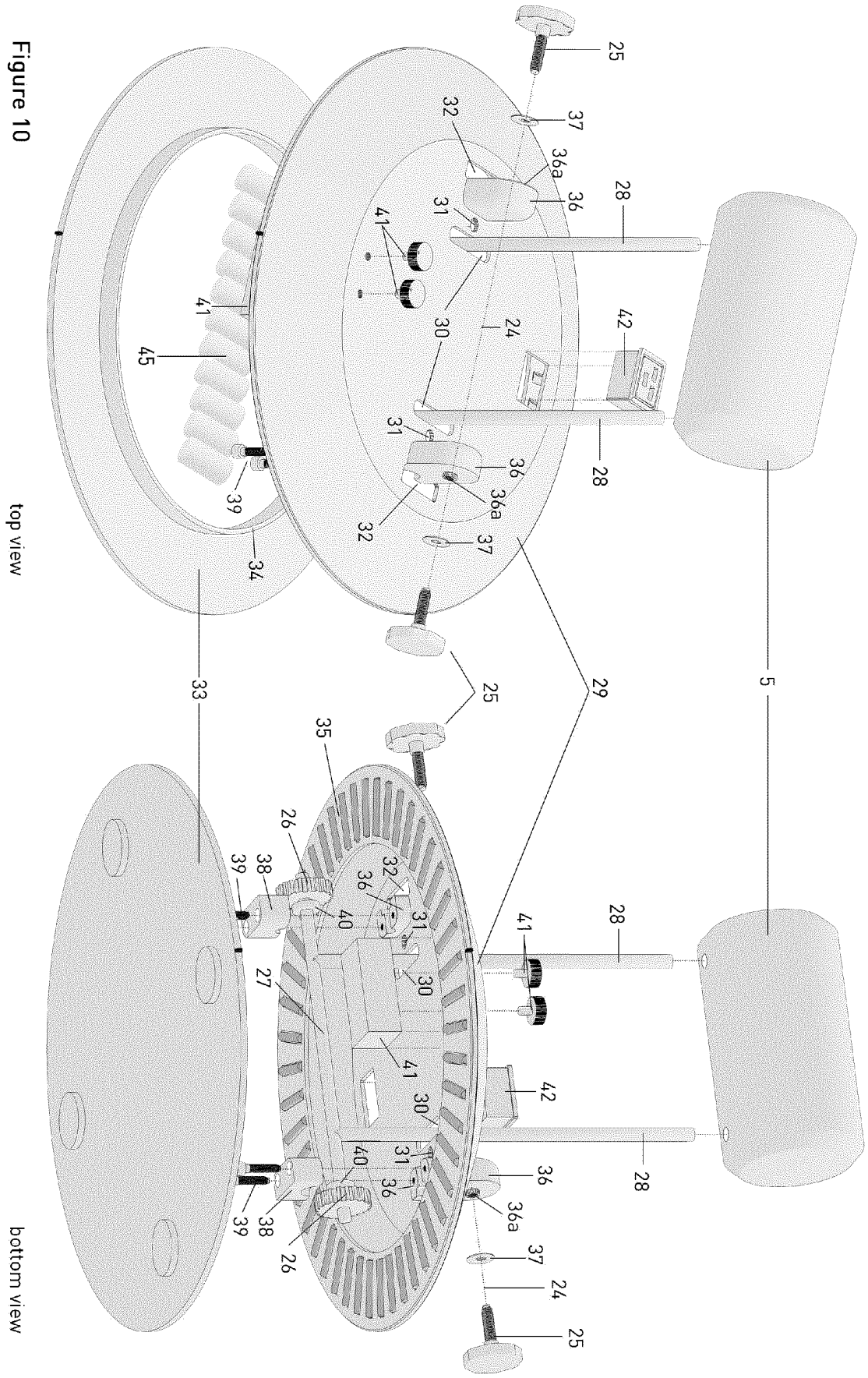

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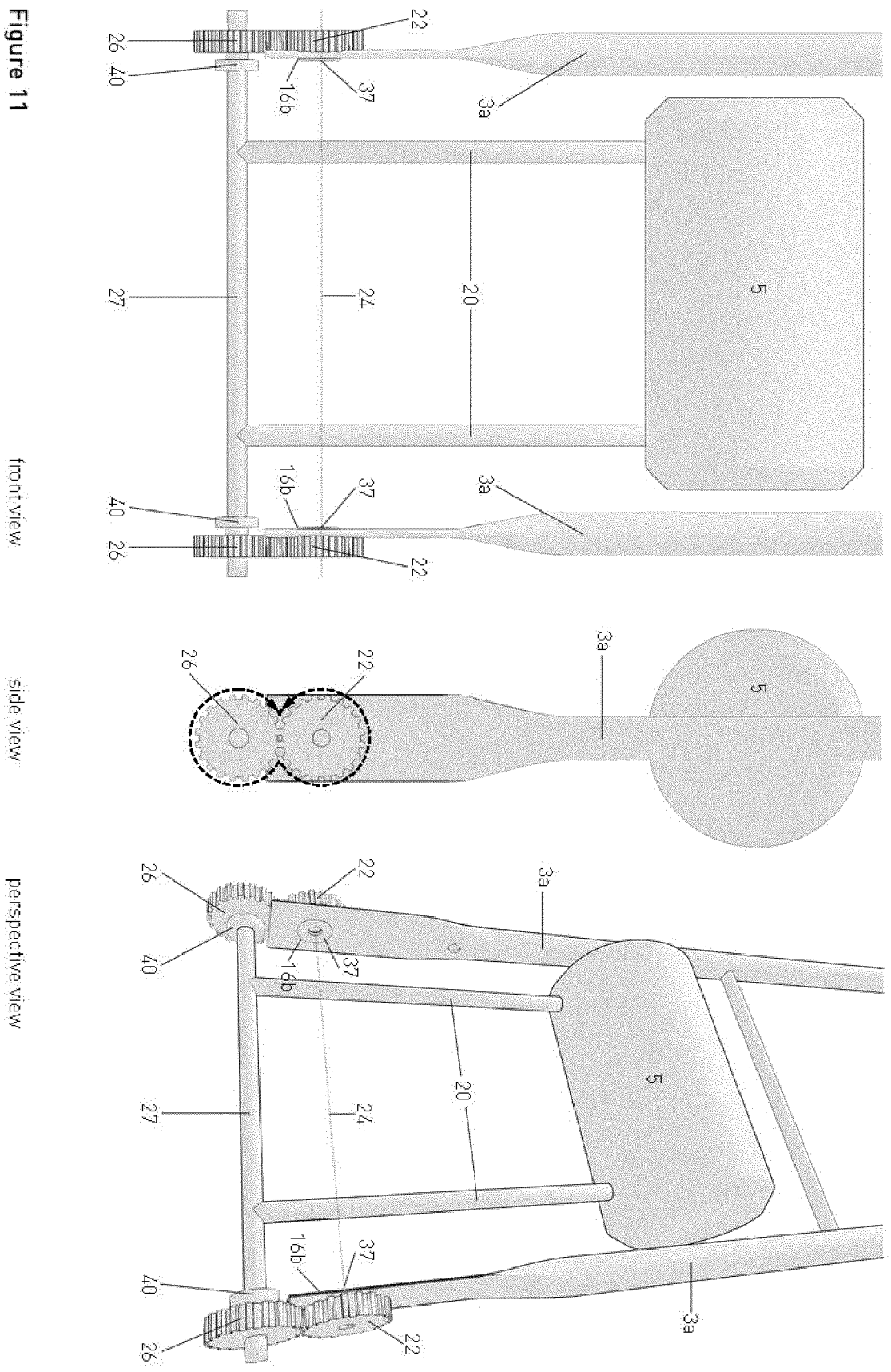
Figure 11


front view
side view
perspective view
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16b
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3a
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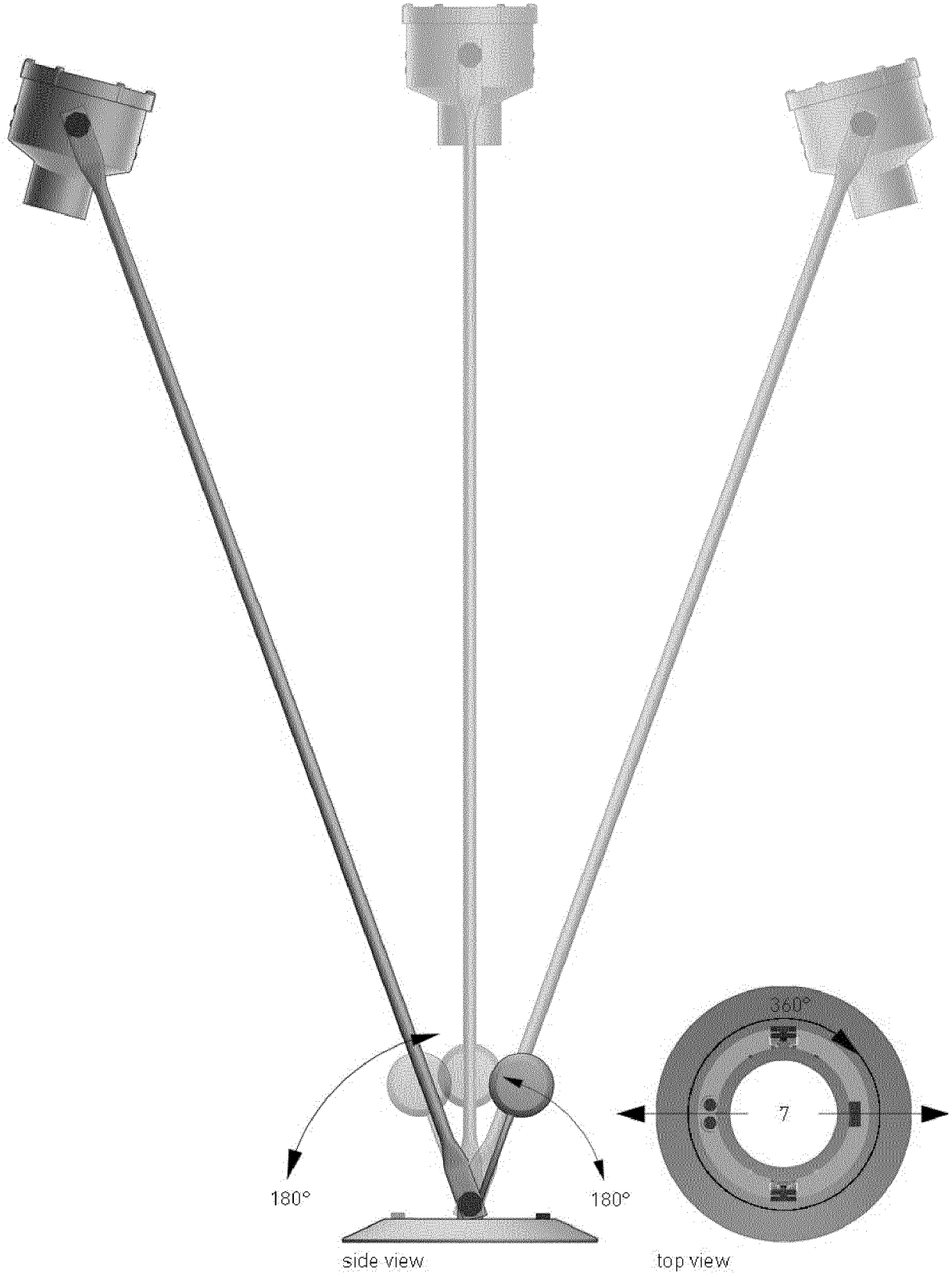
Figure 12



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EUROPEAN SEARCH REPORT

Application Number
EP 23 02 0177

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 203 17 978 U1 (LIN JACK [TW]) 12 February 2004 (2004-02-12) * figures 2-9 *	1-10	INV. F21S6/00 F21V15/01 F21V21/26 F21V21/30
A	FR 2 625 292 A1 (DROUIN JEAN MARIE [FR]) 30 June 1989 (1989-06-30) * figures 1-14 *	1-10	
A	CN 212 361 712 U (ZHEJIANG YANGGUANGMEIJIA LIGHTING CO LTD ET AL.) 15 January 2021 (2021-01-15) * figure 8 *	1-10	
A	KR 2011 0002994 U (FINE TECHNIX CO LTD) 23 March 2011 (2011-03-23) * figure 2 *	1-10	
			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
The Hague	28 September 2023	Dinkla, Remko

CATEGORY OF CITED DOCUMENTS

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