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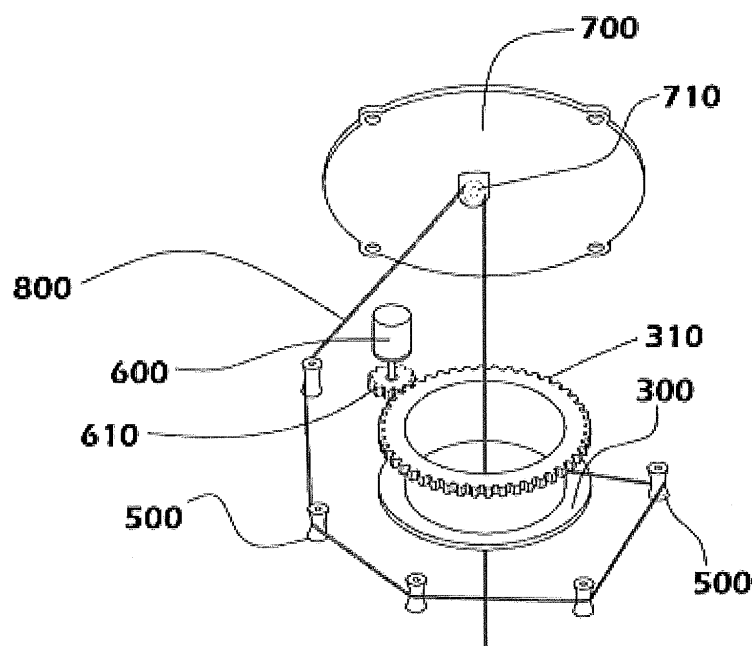
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(54) **Lifting reel having bearing type wire winding drum**

(57) Disclosed herein is a lifting reel having a bearing type wire winding drum, which is installed on the interior ceiling surface of a building to ascend and descend articles, includes: a main body (200) having a vertical direction passage (220) formed in the middle of the inside thereof; a cylindrical hollow drum (300) which is mounted inside the main body (200) in a bearing type to be able

to rotate in the horizontal direction; a wire (800) of which one end is fixed to be wound on the drum (300) and of which the other side extends downwardly through the vertical direction passage (220); and a guide part (500) for guiding the wire (800) wound on the drum (300) toward the lower part.

fig.3



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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a lifting reel, and more particularly, to a lifting reel having a bearing type wire winding drum.

Background Art

[0002] In general, lights are mounted in places which have high ceilings, such as hotel lobbies, gyms, factories, churches, performing places, wedding halls, banquet halls, oil stations or gas stations, restaurants, coffee houses and department stores.

[0003] Such lights must be replaced with new products due to their limited lifespan or trouble, and must be cleaned periodically in order to extend their lifespan. In order to easily replace and clean the lights, a lifting reel for vertically moving the lights is used.

[0004] Now, configuration of the lifting reel will be described simply. As shown in FIGS. 1 and 2, the lifting reel includes a main body 10 which is mounted and fixed on the ceiling surface. A lifting body 30 is connected to the main body 10 through a wire 60, and a light 20 is mounted to be electrically connected to the lifting body 30. The wire 60 is fixed to a drum 70 of which one end is connected to the lifting body 30 and of which the other end is mounted inside the main body 10, such that the lifting body 30 connected to the wire 60 lifts up and down when the wire 60 is released from the drum or is wound on the drum.

[0005] Moreover, the lifting reel includes a wireless remote controller 50 to control ascent and descent of the lifting body 30. For instance, when the wireless remote controller 50 inputs a wireless signal to the main body 10, the drum 70 is rotated to wind or release the wire 60, such that the lifting body 30 and the light 20 mounted on the lifting body 30 are ascended or descended.

[0006] Moreover, the lifting reel includes a forward and backward motor 80 to rotate the drum 70 in the forward and backward directions. In the meantime, connection terminals 90 and 91 are respectively disposed at the lower end of the main body 10 and at the upper end of the lifting body 30 in order to electrically connect the main body 10 and the lifting body 30 with each other when they get in contact with each other.

[0007] The lifting reel keeps a lighting state because electric power is applied to the light 20 when the main body 10 and the lifting body 30 are electrically connected with each other by the connection terminals 90 and 91. In the above state, when a user presses a descent button of the wireless remote controller 50 on the ground in order to replace the light 20 with a new one or clean the light 20, the forward and backward motor 80 is operated, and the drum 70 which receives a driving force of the forward and backward motor 80 rotates to release the wire 60,

such that the lifting body 30 is descended together with the light 20 at the lower end of the main body 10. In this instance, because the connection terminals 90 and 91 are separated from each other to cut off electric power, the light 20 is turned off.

[0008] When the light 20 is descended completely, the user replaces or cleans the light. After that, when the user finishes work, the user presses the ascent button of the wireless remote controller 50. Then, the forward and backward motor 80 is operated in the opposite direction to wind the wire 60 on the drum. The lifting body 30 is ascended. After the ascending action is completed, the connection terminals 90 and 91 are electrically connected to turn on the light 20.

[0009] Moreover, besides the light, a fire alarm or others may be mounted according to use purposes.

[0010] When such a lifting reel is used, the user can carry out what the user wants to do while lifting and lowering the light. However, the conventional drum used to the lifting reel is erected to rotate in the vertical direction inside the main body and the forward and backward motor is directly connected to the middle of the drum to rotate the drum forwardly or backwardly. However, such a configuration increases the entire size of the lifting reel because the drum is mounted in the erected state. Therefore, the conventional lifting reel has several disadvantages in that manufacturing costs are increased and the lifting reel occupies a wide installation space due to enlargement of the lifting reel in size.

Prior Art Documents

[0011] Patent Document 1: Korean Utility Model Registration No. 20-0356233 entitled "light ascending and descending apparatus having drum rpm sensor"

[0012] Patent Document 2: Korean Patent Publication No. 2009-0004387 entitled "lifting device for fire detector"

SUMMARY OF THE INVENTION

[0013] Accordingly, the present invention has been made to solve the above-mentioned problems occurring in the prior arts, and it is an object of the present invention to provide a lifting reel having a bearing type wire winding drum, which includes a bearing type drum on which a wire is wound and which is mounted inside the lifting reel in a flatly lying state to rotate in the horizontal direction, thereby miniaturizing the lifting reel, reducing manufacturing costs, and securing an installation space to be installed conveniently.

[0014] To accomplish the above object, according to the present invention, there is provided a lifting reel having a bearing type wire winding drum, which is installed on the interior ceiling surface of a building to ascend and descend articles, including: a main body having a vertical direction passage formed in the middle of the inside thereof; a cylindrical hollow drum which is mounted inside the main body in a bearing type to be able to rotate in

the horizontal direction; a wire of which one end is fixed to be wound on the drum and of which the other side extends downwardly through the vertical direction passage; and a guide part for guiding the wire wound on the drum toward the lower part.

[0015] Moreover, the guide part guides the wire wound on the drum in the downward direction through the vertical direction passage of the main body.

[0016] Furthermore, a connection tube which forms the vertical direction passage extends in the vertical direction inside the main body and is mounted to be inserted into a hollow of the drum, such that the drum can rotate in the horizontal direction based on the connection tube.

[0017] Additionally, a rotating roll is mounted on the outer wall of the connection tube, such that the drum rotates in contact with the rotating roll.

[0018] In addition, a gear part is formed on the outer circumference of the drum, and the drum rotates by a driving motor having a driving gear engaging with the gear part.

[0019] Moreover, the guide part includes: a plurality of guide rolls for guiding the wire 800 wound on the drum from the side of the drum 300 toward the upper part of the drum; and a middle roll for guiding the wire 800 guided to the upper part of the drum toward the lower part through the vertical direction passage of the main body.

[0020] Furthermore, the main body includes a casing which forms the upper side of the main body, and the middle roll is formed in the middle of the bottom side of the casing.

[0021] Additionally, the article may be a light, a fire alarm or a CCTV mounted at the end of the wire.

[0022] As described above, according to the present invention, the drum on which the wire is wound is formed in a bearing type. Therefore, the lifting reel having the bearing type wire winding drum can miniaturize the size of the lifting reel and reduce manufacturing costs because the drum is mounted inside the lifting reel in a flatly lying state to rotate in the horizontal direction.

[0023] Additionally, the miniaturized lifting reel can be installed conveniently on the high ceiling surface because it is light and secure an installation space when other facility such as an air conditioning system is installed on the ceiling surface so as to be easily installed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] The above and other objects, features and advantages of the present invention will be apparent from the following detailed description of the preferred embodiments of the invention in conjunction with the accompanying drawings, in which:

FIG. 1 is a configurative diagram of a conventional lifting reel;

FIG. 2 is a configurative diagram showing a state where a light lowers down in the conventional lifting reel;

FIG. 3 is a perspective view showing a connection of a bearing type drum according to an embodiment of the present invention;

FIG. 4 is an exploded perspective view of the bearing type drum;

FIG. 5 is a sectional diagram of the bearing type drum; and

FIG. 6 is a plan view of the bearing type drum.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0025] Reference will be now made in detail to the preferred embodiments of the present invention with reference to the attached drawings.

[0026] A lifting reel 100 according to an embodiment of the present invention is installed on the interior ceiling surface of a building and lowers an article, such as a light, a fire alarm or a CCTV, which is mounted at an end of a wire, down to the ground using the wire wound on a drum when a user replaces the article with a new one or cleans the article. Such a structure of the present invention is not described in detail because it is similar with the conventional lifting reel.

[0027] As the article joined to the end of the wire 800, ordinary bulbs and LED lamps may be joined to the end of the wire 800. Additionally, according to use purposes, the lifting reel 100 may be mounted on a ceiling type air conditioning system to ascend or descend a grill. In addition, a fire alarm or a CCTV may be mounted at the end of the wire 800. Therefore, the lifting reel according to the present invention can be applied in various ways. Because the lifting reel 100 can be ascended or descended by one of methods or devices widely known in the art, a concrete description of the method or device for ascending or descending the lifting reel 100 will be omitted.

[0028] In this embodiment of the present invention, as an example, a light (not shown) is mounted at the end of the wire 800.

[0029] As shown in FIGS. 3 to 6, the lifting reel according to the present invention which is installed on the interior ceiling surface of a building to ascend and descend articles, such as lights, includes: a main body 200 having a vertical direction passage 220 formed in the middle of the inside thereof; a cylindrical hollow drum 300 which is mounted inside the main body 200 in a bearing type to be able to rotate in the horizontal direction; a wire 800 of which one end is fixed to be wound on the drum 300 and of which the other side extends downwardly through the vertical direction passage 220; and a guide part for guiding the wire 800 wound on the drum 300 toward the lower part.

[0030] Here, preferably, the guide part guides the wire 800 wound on the drum 300 in the downward direction through the vertical direction passage 220 of the main body 200.

[0031] In this instance, a connection tube 210 which forms the vertical direction passage 220 extends in the

vertical direction inside the main body 200 and is mounted to be inserted into a hollow of the drum 300, such that the drum 300 can rotate in the horizontal direction based on the connection tube 210.

[0032] In more detail, because the drum 300 is mounted in the bearing type to rotate in the horizontal direction, the hollow of the drum 300 is opened in the vertical direction. Moreover, the connection tube 210 has a diameter smaller than the hollow of the drum 300 and is formed to extend from the central part of the bottom side of the main body 200 toward the upper side. Therefore, when the connection tube 210 is inserted into the opening formed in the vertical direction inside the drum 300, the drum 300 can rotate outside the connection tube 210.

[0033] In this instance, a rotating roll 400 may be mounted on the outer wall of the connection tube 210. When the rotating roll 400 is mounted, the drum 300 rotates in contact with the rotating roll 400, thereby reducing friction when the drum 300 rotates.

[0034] That is, the rotating roll 400 is arranged between the outer circumferential surface of the connection tube 210 of the main body 200 and the inner circumferential surface of the drum 300 so as to promote effective and stable rotation of the drum 300 when the drum 300 rotates in the horizontal direction. In the meantime, the rotating roll 40 is fit on a fixing pin 410 to rotate around the fixing pin 410.

[0035] Meanwhile, in the above, it is described that the wire 800 wound on the drum 300 is guided to the upper part of the drum 300 to extend downwardly through the vertical direction passage 220 of the main body 200, but the present invention is not restricted to the above, and the wire 800 may be disposed to extend downwardly at a predetermined position of the outside of the drum 300.

[0036] Furthermore, moving rolls 320 may be formed at the lower portion of the drum 300. The moving rolls 320 may be formed at four spots of the lower end of the drum 300 at predetermined intervals. The moving rolls 320 serve to make the drum 300 easily rotate without getting in direct contact with the bottom side of the main body 200.

[0037] Additionally, a gear part 310 may be formed on the outer circumference of the drum 300, and the drum 300 can rotate by a driving motor 600 having a driving gear 610 engaging with the gear part 310.

[0038] In this instance, the gear part 310 of the drum 300 rotates in the horizontal direction, and the driving motor 600 is controlled to rotate in the forward direction or in the reverse direction by a control part (not shown).

[0039] In the meantime, the guide part includes: a plurality of guide rolls 500 for guiding the wire 800 wound on the drum 300 from the side of the drum 300 toward the upper part of the drum 300; and a middle roll 710 for guiding the wire 800 guided to the upper part of the drum 300 toward the lower part through the vertical direction passage 220 of the main body 200.

[0040] Through the above structure, the wire 800 is wound on the drum 300 or released from the drum 300

along the guide rolls 500. The number and the mounting positions of the guide rolls 500 may be changed in various ways if they can guide the wire 800 wound on the drum 300 toward the upper part of the drum 300, namely, toward the upper part of the opening of the drum 300.

[0041] Moreover, the main body 200 may include a casing 700 which forms the upper side of the main body 200. The casing 700 is detachably joined to the upper part of the main body 200.

[0042] In this instance, the middle roll 710 may be formed in the middle of the bottom side of the casing 700. The middle of the bottom side of the casing 700 corresponds to the center of the drum 300. Therefore, the wire 800 can ascend and descend at the position corresponding to the central axis of the drum 300, namely, at the central point of the vertical direction passage 220 by the middle roll 710 formed in the middle of the bottom side of the casing 700.

[0043] The lifting reel 100 according to the embodiment of the present invention operates as follows.

[0044] First, the lifting reel 100 is installed on the high ceiling surface of a building, and a light is mounted at the lower end of the wire 800 connected with the lifting reel 100.

[0045] In the above state, the user inputs a descending sign to the lifting reel 100 using a remote controller (not shown) in order to replace or clean the light.

[0046] When the descending signal is inputted, the driving motor 600 is operated, and the driving gear 610 is operated by the driving motor 600. In this instance, because the driving gear 610 and the gear part 310 are gear-coupled with each other, the drum 300 formed integrally with the gear part 310 is rotated. Furthermore, the wire 800 wound on the drum 300 is released according to rotation of the drum 300.

[0047] The wire 800 released from the drum 300 is guided along the guide rolls 500, and the middle roll 710 guides the wire 800 to the center of the drum 300, namely, the center of the vertical direction passage 220 in order to lower the light connected to the end of the wire 800 toward the ground.

[0048] After the user finishes replacement or cleaning of the light descended to the ground, the user inputs an ascending signal to the lifting reel 100 using the remote controller (not shown).

[0049] Then, on the contrary, the driving motor 600 rotates in the reverse direction, and the wire 800 is guided by the middle roll 710 and the guide rolls 500 to be wound onto the drum 300 while ascending.

[0050] The bearing type drum 300 according to the embodiment of the present invention can miniaturize the entire size of the lifting reel 100 because the drum is mounted inside the main body 200 not in the erected state but in the horizontally lying state.

Claims

1. A lifting reel which is installed on the interior ceiling surface of a building to ascend and descend articles, the lifting reel comprising:
 - a main body having a vertical direction passage formed in the middle of the inside thereof;
 - a cylindrical hollow drum which is mounted inside the main body in a bearing type to be able to rotate in the horizontal direction;
 - a wire of which one end is fixed to be wound on the drum and of which the other side extends downwardly through the vertical direction passage; and
 - a guide part for guiding the wire wound on the drum toward the lower part.
2. The lifting reel according to claim 1, wherein the guide part guides the wire wound on the drum in the downward direction through the vertical direction passage of the main body.
3. The lifting reel according to claim 2, wherein a connection tube which forms the vertical direction passage extends in the vertical direction inside the main body and is mounted to be inserted into a hollow of the drum, such that the drum can rotate in the horizontal direction based on the connection tube.
4. The lifting reel according to claim 3, wherein a rotating roll is mounted on the outer wall of the connection tube, such that the drum rotates in contact with the rotating roll.
5. The lifting reel according to claim 1, wherein a gear part is formed on the outer circumference of the drum, and the drum rotates by a driving motor having a driving gear engaging with the gear part.
6. The lifting reel according to claim 1, wherein the guide part comprises:
 - a plurality of guide rolls for guiding the wire wound on the drum from the side of the drum toward the upper part of the drum; and
 - a middle roll for guiding the wire guided to the upper part of the drum toward the lower part through the vertical direction passage of the main body.
7. The lifting reel according to claim 6, wherein the main body includes a casing which forms the upper side of the main body, and the middle roll is formed in the middle of the bottom side of the casing.
8. The lifting reel according to claim 1, wherein the article is a light mounted at the end of the wire.
9. The lifting reel according to claim 1, wherein the article is a fire alarm mounted at the end of the wire.
10. The lifting reel according to claim 1, wherein the article is a CCTV mounted at the end of the wire.

fig. 1

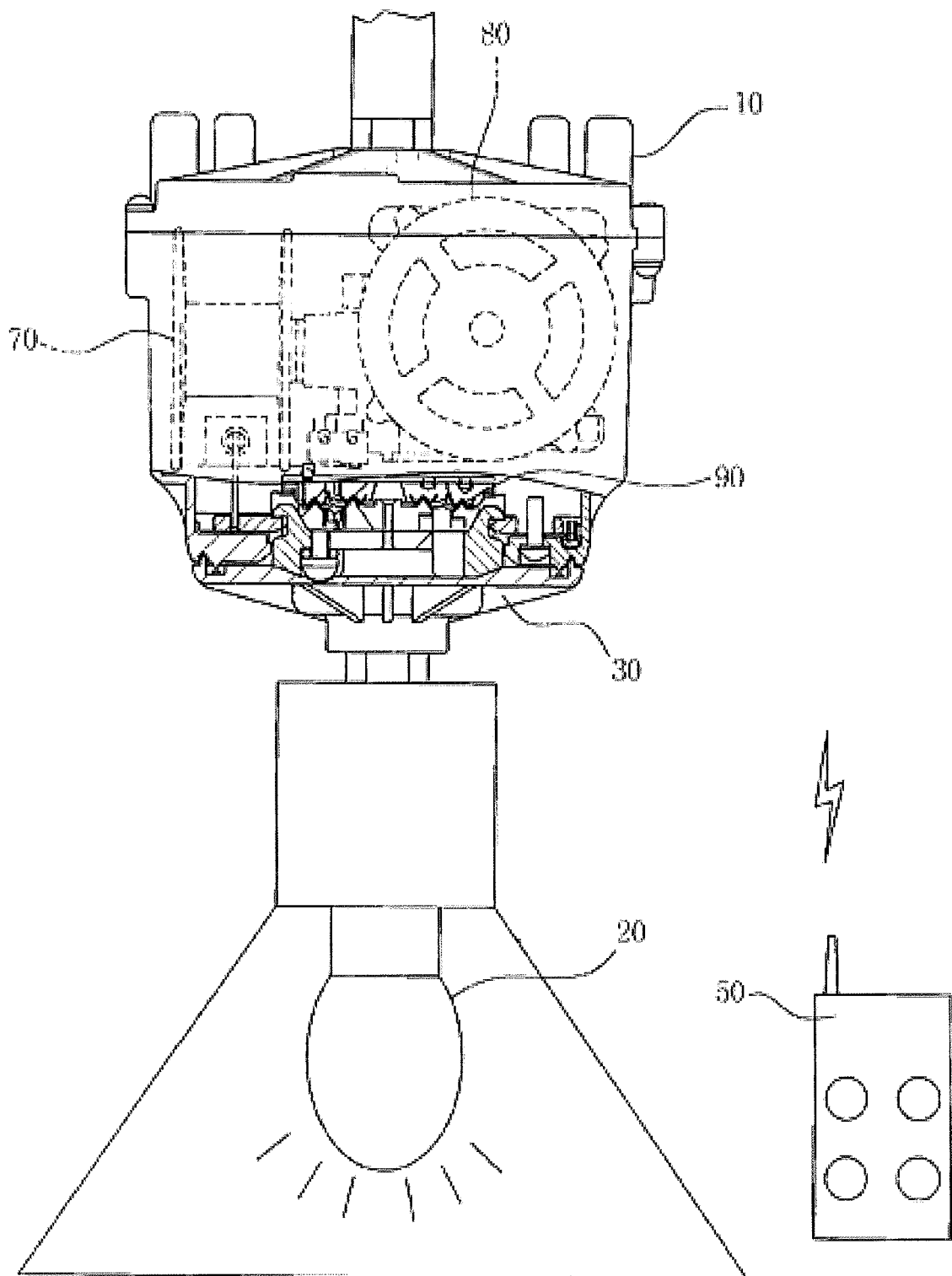


fig.2

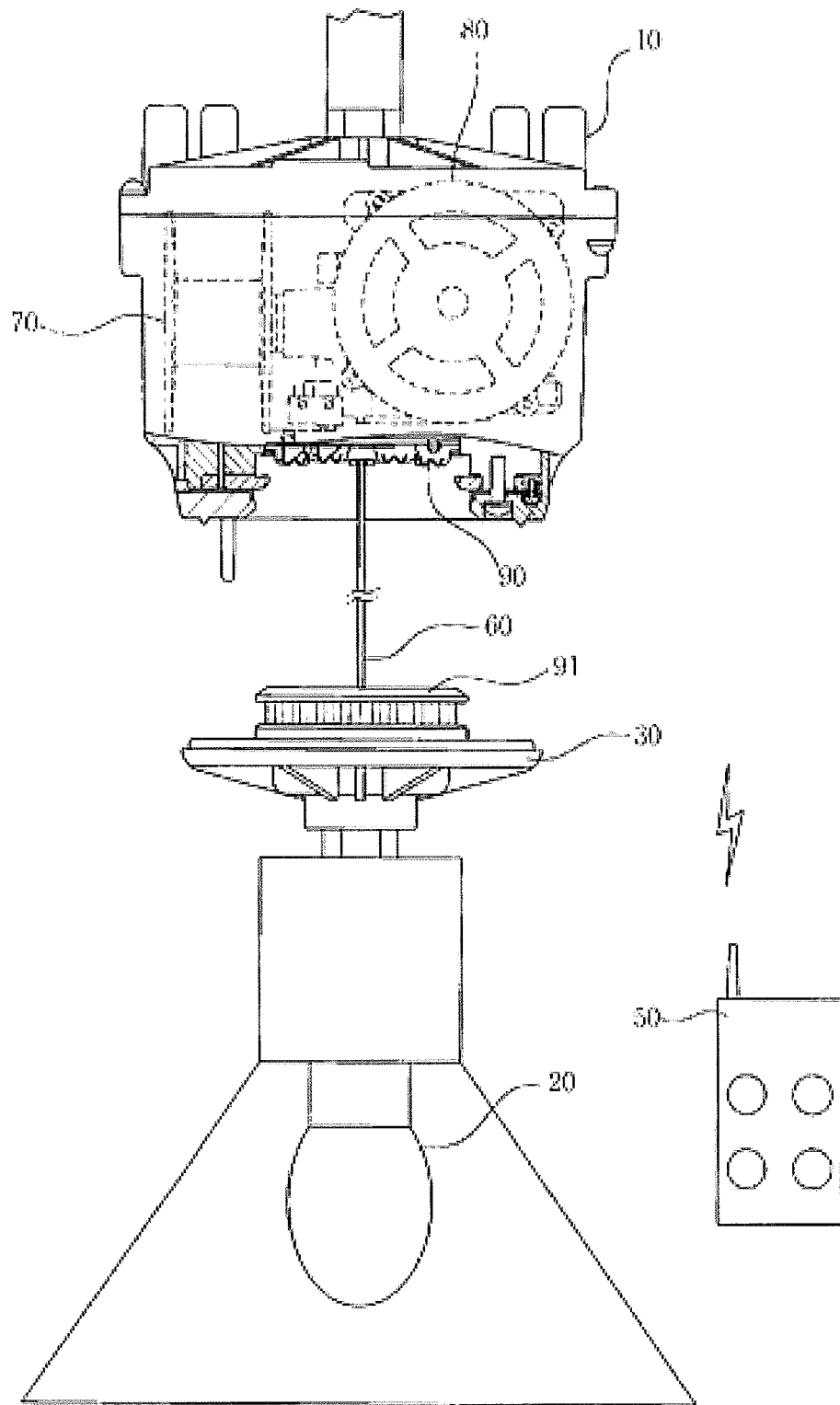


fig.3

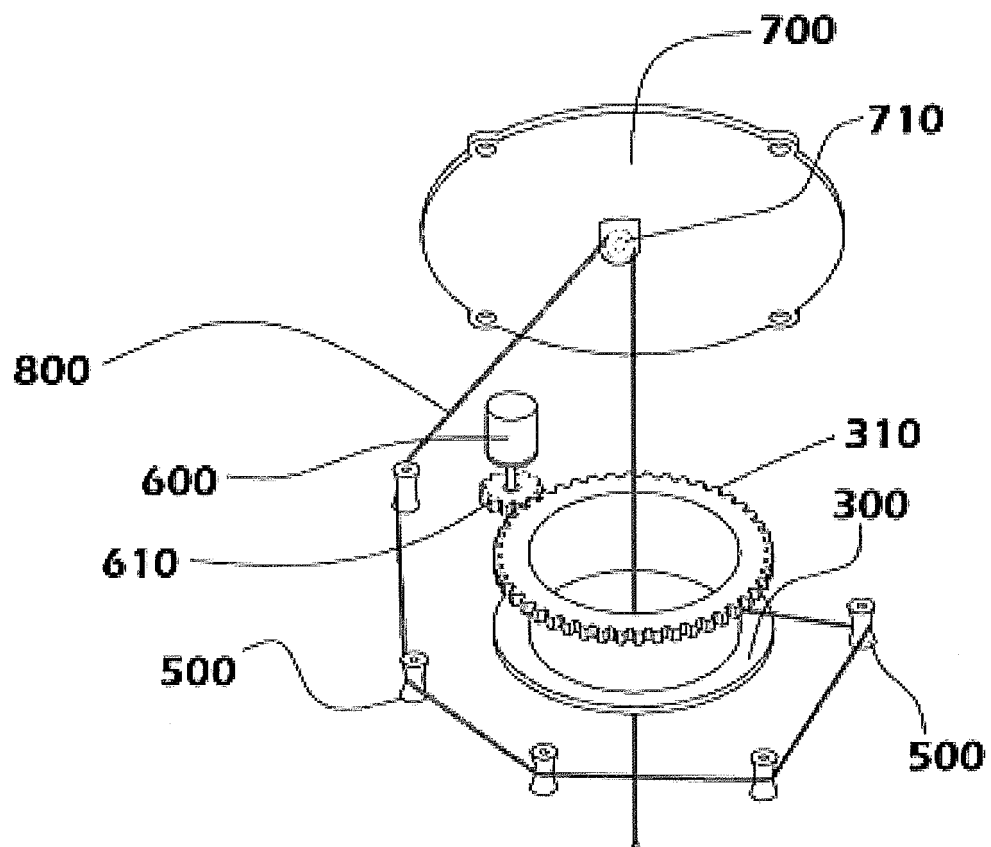


fig.4

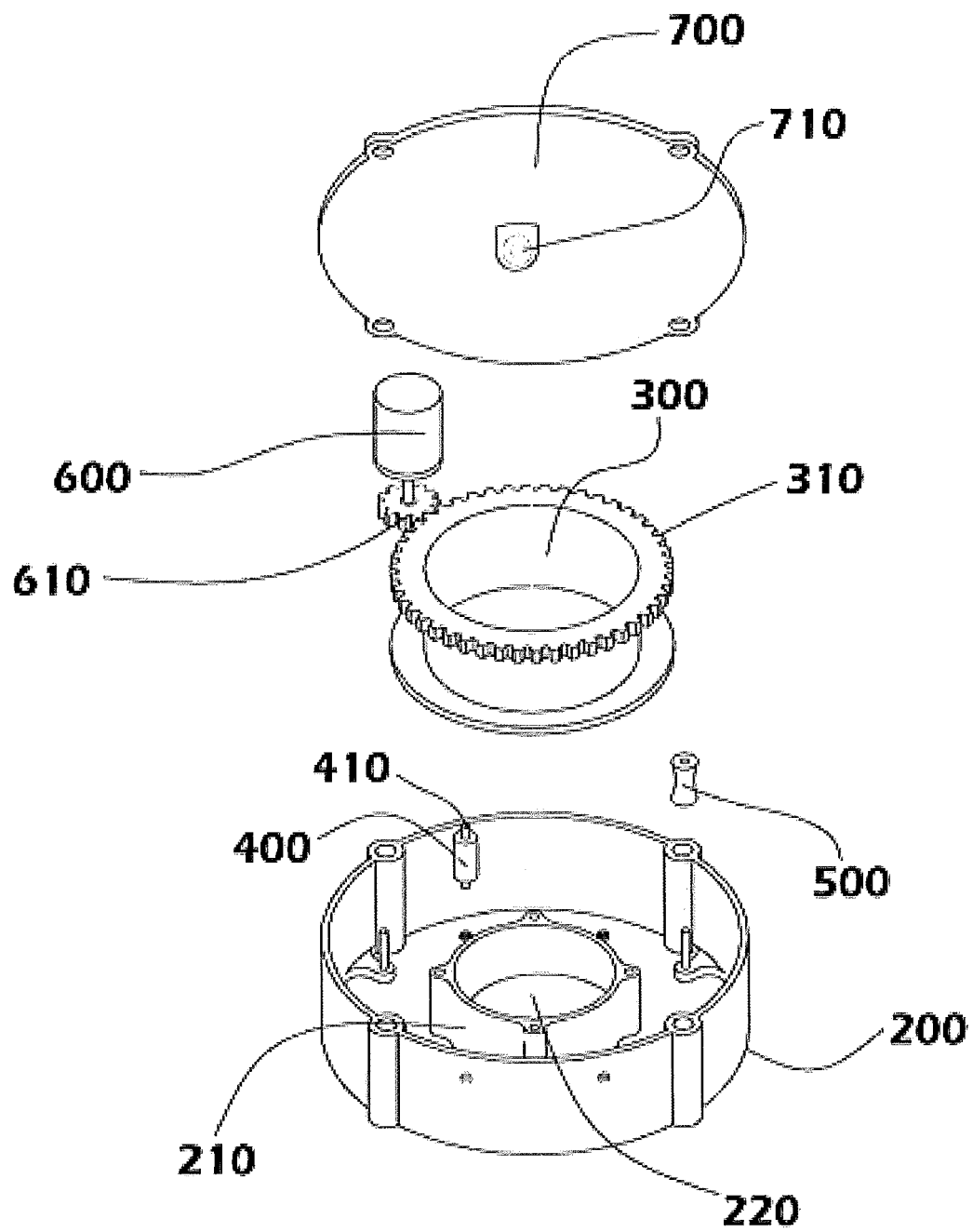


fig.5

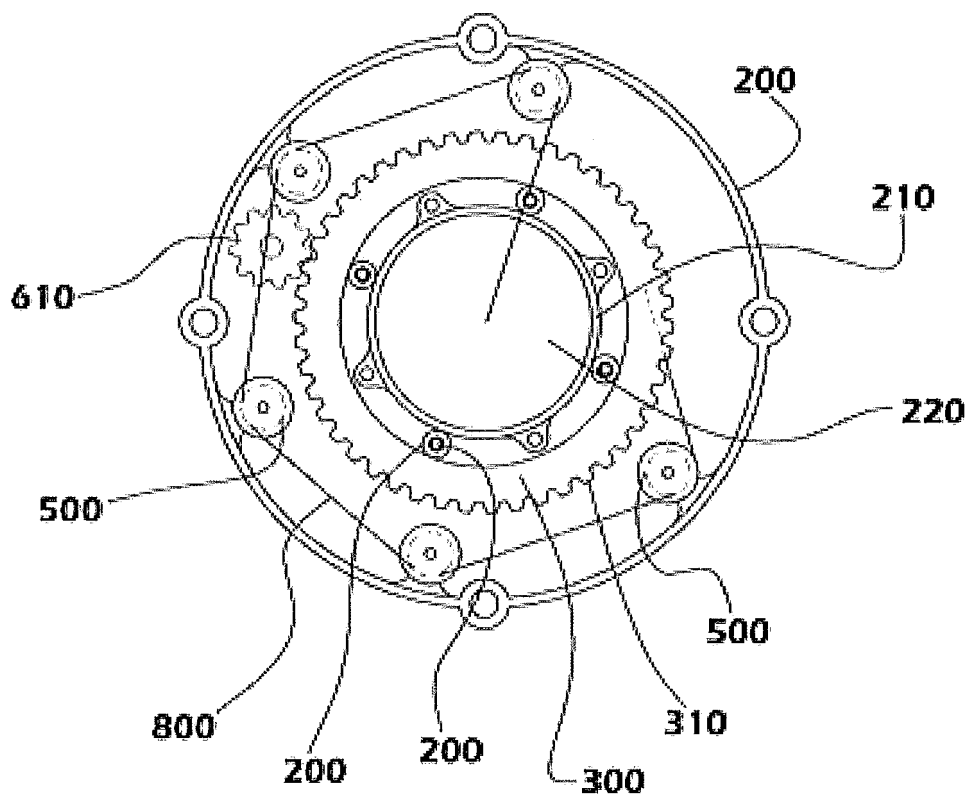
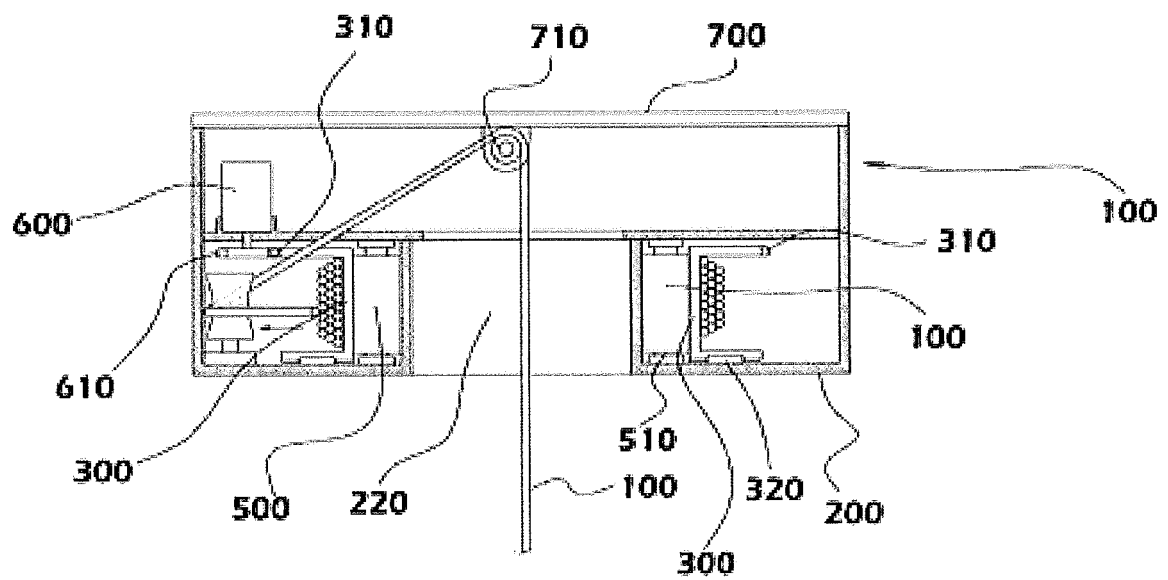


fig.6





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Application Number
EP 14 19 8118

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Place of search The Hague		Date of completion of the search 20 May 2015	Examiner Dinkla, Remko
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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