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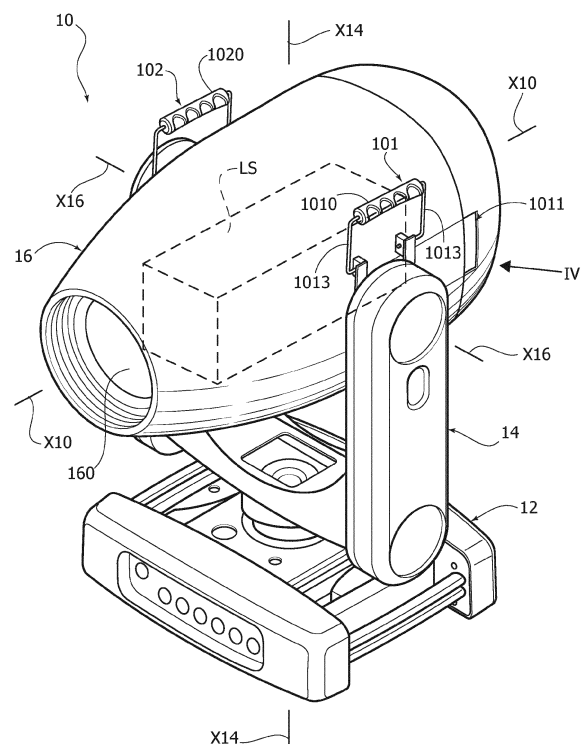
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(54) **LIGHTING DEVICE**

(57) A lighting device (10) that can be used, for example, in the show-business and entertainment sector comprises:

- a mounting structure (12, 14);
- a mobile head (16) with a light source (LS) arranged in the mobile head (16), the mobile head being carried by the mounting structure (12, 14) in a rotatable way about an axis of rotation (X16);
- a pair of handles (101, 102) that are mounted on opposite sides of the mobile head (16) and can swivel about the aforesaid axis of rotation (X16) between:
  - a first position, in which the handles (101) are retracted against the mobile head (16); and
  - a second position, in which the handles (101) project from the mobile head (16), providing formations for gripping the device (10).

FIG. 3



**Description**Technical field

**[0001]** The present disclosure relates to lighting devices.

**[0002]** One or more embodiments may be used, for example, in the show-business and entertainment sector.

Technological background

**[0003]** Lighting devices that are able to emit light radiation of high intensity find application in sectors such as the show-business and entertainment sector.

**[0004]** This may be the case, for example, of the products commercially available from applicant Clay Paky under the brand name AXCOR (see, for example, claypaky.it).

**[0005]** The modalities of use of such lighting devices frequently entail carrying and, in general, handling thereof with the need to take into account various factors.

**[0006]** For instance, the above devices may be used for lighting of stages that are each time set up also for individual events (consider, for example, concerts hosted in stadiums and arenas) and thus involve frequent carrying/handling, in particular by staff operating on ladders, movable scaffolding, or the like.

**[0007]** Also in the case where the device is not particularly cumbersome or heavy, it is thus desirable that it should be possible to hold it firmly and in conditions of substantial equilibrium.

**[0008]** In addition, the above devices present a light-emitting optics that should advantageously be kept free from contamination (e.g., fingerprints) and, even more, from damage (e.g., scratches) such as might occur when the device is gripped, even only momentarily and accidentally, in the area of the light-emission optics.

**[0009]** Finally, since the above devices end up themselves forming part of the scene that is lit up, it may be appreciated that the outer shape of the device at least during use thereof, should be as free as possible from trappings and projecting parts that might produce undesired shadows.

**[0010]** It will on the other hand be appreciated that similar considerations can come into play also in sectors other than the show-business and entertainment sector, mentioned herein purely by way of reference example.

Object and summary

**[0011]** The object of one or more embodiments is to provide a lighting device that will be able to overcome the drawbacks outlined previously.

**[0012]** According to one or more embodiments, the above object can be achieved thanks to a lighting device having the characteristics recalled in the ensuing claims.

**[0013]** The claims form an integral part of the technical

teachings provided herein with reference to the embodiments.

Brief description of the drawings

**[0014]** One or more embodiments will now be described, purely by way of non-limiting example, with reference to the annexed figures, wherein:

10 Figure 1 is an overall view of a lighting device according to some embodiments, presented in a condition of use;

Figure 2 is a broken perspective view of the part of device indicated by the arrow II in Figure 1;

15 Figure 3 is an overall view of a lighting device according to some embodiments, presented in a carrying condition;

Figure 4 is a broken perspective view of the part of device indicated by the arrow IV in Figure 3;

20 Figure 5 is a view in side elevation of a lighting device according to some embodiments, which exemplifies passage between the conditions illustrated in Figure 1 and in Figure 3; and

25 Figure 6 is a corresponding broken perspective view of the part of device indicated by the arrow VI in Figure 5.

**[0015]** It will be appreciated that, for clarity and simplicity of illustration, the various figures may not be reproduced in the same scale.

Detailed description of examples of embodiments

35 **[0016]** In the ensuing description various specific details are illustrated in order to enable an in-depth understanding of various examples of embodiments according to the disclosure. The embodiments may be obtained without one or more of the specific details, or with other methods, components, materials, etc. In other cases, known structures, materials, or operations are not illustrated or described in detail so that the various aspects of the embodiments will not be obscured.

40 **[0017]** Reference to "an embodiment" or "one embodiment" in the framework of the present description is intended to indicate that a particular configuration, structure, or characteristic described in relation to the embodiment is comprised in at least one embodiment. Consequently, phrases such as "in an embodiment" or "in one embodiment" that may be present in various points of the present description do not necessarily refer exactly to one and the same embodiment. Moreover, particular conformations, structures, or characteristics may be combined in any adequate way in one or more embodiments.

45 **[0018]** The references used herein are provided merely for convenience and hence do not define the sphere of protection or the scope of the embodiments.

**[0019]** Once again for brevity and simplicity of treat-

ment, and unless the context were to indicate otherwise, in the annexed figures parts or elements that are similar or identical are designated by the same references, without repeating the corresponding description for each figure.

**[0020]** In Figure 1, the reference 10 designates as a whole a lighting device.

**[0021]** It may, for example, be a lighting device that can be used in the show-business and entertainment sector. As has already been said, this possible sector of use is mentioned herein purely by way of reference and should hence not be understood as in any way limiting the embodiments.

**[0022]** According to a possible configuration (in itself known), the device 10 comprises a base 12 for mounting on a supporting structure (not visible in the figures: it may, for example, be a stage structure in a theatre, in an arena, or on the site of a show), mounted on which is a fork-like support 14.

**[0023]** The fork-like support 14 can be swivelled, for example through 360°, about an axis X14 (vertical in the figures) and supports with its arms or prongs a mobile head 16, which can be oriented by a general movement of slewing about an axis X16 (horizontal in the figures).

**[0024]** Mounted in the head 16 is a source of light radiation LS (for example, an RGB LED source) that is to produce an illuminating beam that exits from the head 16 through a front optics 160, in a direction substantially aligned with a longitudinal axis of the mobile head, designated by X10.

**[0025]** The combined movement about the axes X14 and X16, governed via motor drives (not visible in the figures) arranged, for example, in the base 12 and in the fork-like support 14 (i.e., in the head 16) leads the illuminating beam projected through the front optics 160 to perform a movement of scanning that is able to cover a volume greater than a half-space.

**[0026]** As recalled previously, the overall structure of a device 10 and the modalities of performance of the aforesaid scanning movement are to be deemed known in the art (for example, from the device AXCOR recalled at the outset of the present description), which renders any more detailed indications in the context of the present description superfluous.

**[0027]** This description chiefly regards providing, in such a device 10, a pair of handles 101, 102, which are set on opposite sides of the orientable head 16 and can be selectively located:

in a first position - horizontal, as viewed in the figures - retracted against the body of the mobile head 16, as illustrated in Figures 1 and 2; this position may be adopted, for example, when the device 10 is in its condition of use; and

in a second position - vertical, as viewed in the figures - in which the handles project, for example upwards, with respect to the body of the mobile head 16 as illustrated in Figures 3 and 4; this position may be

adopted, for example, when the device 10 is being carried/handled.

**[0028]** Of course, reference to a "horizontal" position and a "vertical" position is made purely for simplicity of description and does not have any limiting character.

**[0029]** It brings out, however, the fact that, in one or more embodiments:

10 in the first position, illustrated in Figures 1 and 2, the handles are retracted against the body of the mobile head 16 in a condition of at least substantial alignment with the longitudinal axis X10; and

15 in the second position, illustrated in Figures 3 and 4, the handles project from the body of the mobile head 16 in a direction transverse with respect to the longitudinal axis.

20 In one or more embodiments, passage between the first and second positions can lead to a rotation by an angle substantially equal to 90° about an axis, such as the axis X16.

**[0030]** The possible orientation between the two aforesaid positions is exemplified in Figures 5 and 6, where in effect only the handle 101 is visible (represented by a solid line in the position of Figures 1 and 2 and by a dashed line in the position of Figures 3 and 4).

**[0031]** It will be appreciated that, in the position of Figures 1, and 2 the handles 101, 102 are retracted against the body of the head 16, without practically protruding beyond the outline of the head 16 itself, hence without producing undesired shadows.

**[0032]** This occurs also in the case where the handles 101, 102 have distal portions or top portions (gripping portions) having an enlarged cross section 1010, 1020 - possibly with an anatomical shape.

**[0033]** In one or more embodiments, the body of the head 16 may have cavities for receiving said gripping portions with enlarged cross section.

40 **[0034]** Visible in the figures is just one of the aforesaid cavities, designated by 1011, which is to receive the top portion with enlarged cross section 1010 of the handle 101.

**[0035]** A similar cavity, which is not visible in the figures and is to receive the top portion with enlarged cross section 1020 of the handle 102 may be provided in a specularly symmetrical position on the body of the head 16.

**[0036]** In one or more embodiments, the handles 101 and 102 are mounted on the head 16 in such a way that their point of constraint to the head 16 (and to the device 10 as a whole) corresponds to the axis X16. In this way, it is possible to enable the movement of swivelling of the handles 101, 102 between the position of Figures 1 and 2 and the position of Figures 3 and 4 to occur about the axis X16.

**[0037]** The axis X16 is the axis where the fork 14 supports the head 16, and about this axis the movement of slewing of the head 16 with respect to the fork 14 is per-

formed.

**[0038]** The axis X16 is located in a position at least approximately centroidal with respect to the head 16 (and to the device 10 as a whole), i.e., at or in the proximity of the centre of gravity thereof.

**[0039]** Consequently, the fact that the point of gripping of the handles 101, 102 on the head 16 (and of the device 10 as a whole) corresponds to the axis X16, which is located in a substantially centroidal position, facilitates gripping of the device 10 firmly and in conditions of substantial equilibrium.

**[0040]** The above is enabled by the provision of gripping formations - such as the handles 101, 102 - that at the very least discourage anybody from attempting to get hold of the device in the region of the light-emission optics 160.

**[0041]** Figures 2, 4, and 6 highlight the fact that one or more embodiments can exploit the presence of articulation pins 160 already provided for mounting the head 16 at the distal ends of the arms or prongs of the fork 14.

**[0042]** In one or more embodiments, the handles 101 and 102 (in the figures, these characteristics are visible only for the handle 101, but altogether similar characteristics may be provided in a specularly symmetrical position on the body of the head 16 for the handle 102) may consequently comprise an annular plate 1012 fitted so that it can rotate about the pin 160.

**[0043]** From the plate 1012 there depart two lateral branches 1013 of the handle coupled to the opposite ends of the top portion 1010 (possibly with enlarged cross section and/or an anatomical shape, with depressions for the fingers).

**[0044]** Advantageously, the aforesaid lateral branches 1013 may be provided as thin filiform branches: this may, in fact, contribute to enabling the handles 101, 102, retracted up against the body of the head 16 in the position illustrated in Figures 1 and 2, not to have parts that protrude beyond the outline of the device 10.

**[0045]** The general ring structure of the handles 101, 102 on the other hand facilitates provision of rather thin lateral branches 1013, without jeopardizing the strength of the handles themselves.

**[0046]** In summary, a lighting device (for example, 10) as illustrated herein may comprise:

a mounting structure (for example, 12, 14),  
 a mobile head (for example, 16) with a light source (for example, LS) arranged in said mobile head, the mobile head being carried by the mounting structure in a rotatable way about an axis of rotation (for example, X16); and  
 a pair of handles (for example, 101, 102) that are mounted on opposite sides of the mobile head (16) and can swivel about said axis of rotation between:

at least one first position (see, for example, Figures 1 and 2), in which the handles are retracted against the mobile head; and

at least one second position (see, for example, Figures 3 and 4), in which the handles projecting from the mobile head provide formations for gripping the device.

**[0047]** Whereas the description of embodiments provided herein by way of example refers for simplicity to a first position "of use" (represented in Figure 1 and with a solid line in Figure 5) and a second, "carrying", position (represented in Figure 3 and with a dashed line in Figure 5), reference to "at least" one first position and/or one second position is intended to highlight the fact that - on the basis of the same criteria described and illustrated herein - in one or more embodiments it is possible to envisage for the handles 101 the possibility of assuming more than one position "of use" and/or more than one "carrying" position.

**[0048]** In a lighting device as illustrated herein, the light source may be configured to emit light along a longitudinal axis (for example, X10) of the mobile head, and:

in the (at least one) first position, the handles may be oriented in the direction of said longitudinal axis; and

in the (at least one) second position, the handles may be oriented in a direction transverse to said longitudinal axis.

**[0049]** In a lighting device as illustrated herein, the handles may be mounted on the mobile head so that they can swivel between said first position and said second position as a result of a rotation of approximately 90° with respect to said axis of rotation.

**[0050]** In a lighting device as illustrated herein, the handles may comprise distal gripping portions (for example, 1010, 1020), and the mobile head may comprise cavities (for example, 1011) for receiving the distal gripping portions of the handles in said first position.

**[0051]** In a lighting device as illustrated herein, the handles may comprise distal gripping portions having an enlarged cross section and/or having an anatomical shape.

**[0052]** In a lighting device as illustrated herein, the handles may have an annular structure with:

a proximal element (for example, 1012) fitted rotatably about said axis of rotation (for example, X16);  
 a pair of lateral branches (for example, 1013) that extend from the proximal element on opposite sides of the proximal element with respect to said axis of rotation; and

a distal gripping portion (for example, 1010, 1020) that spans said pair of lateral branches.

**[0053]** In a lighting device as illustrated herein, said axis of rotation (for example, X16) may be located in a central (centroidal) position of the device, i.e., at or in the proximity of the centre of gravity of the device itself (not necessarily at the very barycentre with reference to the

centre of mass).

**[0054]** In a lighting device as illustrated herein, the mounting structure may comprise a base portion (for example, 12) and a fork-like portion (for example, 14) mounted on the base portion, with:

the fork-like portion that carries (via its arms or prongs) the mobile head rotatably about said axis of rotation; and  
the fork-like portion that is mounted on the base portion rotatably about a further axis of rotation (for example, X14), said axis of rotation being transverse (for example, orthogonal) with respect to said further axis of rotation.

**[0055]** Without prejudice to the underlying principles, the details of construction and the embodiments may vary, even significantly, with respect to what has been described herein purely by way of non-limiting example, without thereby departing from the sphere of protection and scope of the invention, as determined by the annexed claims.

#### LIST OF REFERENCE SIGNS

Device	10
Base	12
Fork-like support	14
Axis of orientation	X14
Mobile head	16
Axis of orientation	X16
Light source	LS
Light-projection optics	160
Longitudinal axis	X10
Handles	101, 102
Handle gripping portions	1010, 1020
Receiving cavity	1011
Handle base plate	1012
Lateral branches of handle	1013

#### Claims

1. A lighting device (10), comprising:

a mounting structure (12, 14),  
a mobile head (16) with a light source (LS) arranged in said mobile head (16), the mobile head being carried by the mounting structure (12, 14) rotatably about an axis of rotation, and  
a pair of handles (101, 102) mounted on opposite sides of the mobile head (16) and swivelable about said axis of rotation (X16) between:

at least one first position, wherein the handles (101, 102) are retracted against the mobile head (16), and

at least one second position, wherein the handles (101, 102) project from the mobile head (16) providing gripping formations for the device (10).

2. The lighting device (10) of claim 1, wherein the light source (LS) is configured to emit light along a longitudinal axis (X10) of the mobile head (16), wherein:

in the first position, the handles (101, 102) are oriented in the direction of said longitudinal axis (X10), and

in the second position, the handles (101, 102) are oriented in a direction transverse to said longitudinal axis (X10).

3. The lighting device (10) of claim 1 or claim 2, wherein the handles (101, 102) are mounted on the mobile head (16) swivelable between said first position and said second position as a result of a rotation of approximately 90° with respect to said axis of rotation (X16).

4. The lighting device (10) of any of claims 1 to 3, wherein the handles (101, 102) comprise distal gripping portions (1010, 1020) and the mobile head (16) comprises cavities (1011) for receiving the distal gripping portions (1010, 1020) of the handles (101, 102) in said first position.

5. The lighting device (10) of any of the preceding claims, wherein the handles (101, 102) comprise distal gripping portions (1010, 1020) having an enlarged crosssection.

6. The lighting device (10) of any of the preceding claims, wherein the handles (101, 102) comprise anatomically shaped distal gripping portions (1010, 1020).

7. The lighting device (10) of any of the preceding claims, wherein the handles (101, 102) have an annular structure with:

a proximal element rotatably fitted about said axis of rotation (X16),

a pair of lateral branches (1013) extending from the proximal element (1012) on opposite sides of the proximal element (1012) with respect to said axis of rotation (X16), and  
a distal gripping portion (1010, 1020) extending bridge-like between said pair of lateral branches (1013).

8. The lighting device (10) of any of the preceding claims, wherein said axis of rotation (X16) is located in a central position of the device (10).

9. The lighting device (10) of any of the preceding claims, wherein the mounting structure (12, 14) comprises a base portion (12) and a fork-like portion (14) mounted on the base portion (12), wherein:

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the fork-like portion (14) carries the mobile head rotatable about said axis or rotation (X16), and the fork-like portion (14) is mounted on the base portion (12) rotatably about a further axis of rotation (X14), said axis of rotation (X16) being transverse with respect to said further axis of rotation (X14).

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FIG. 1

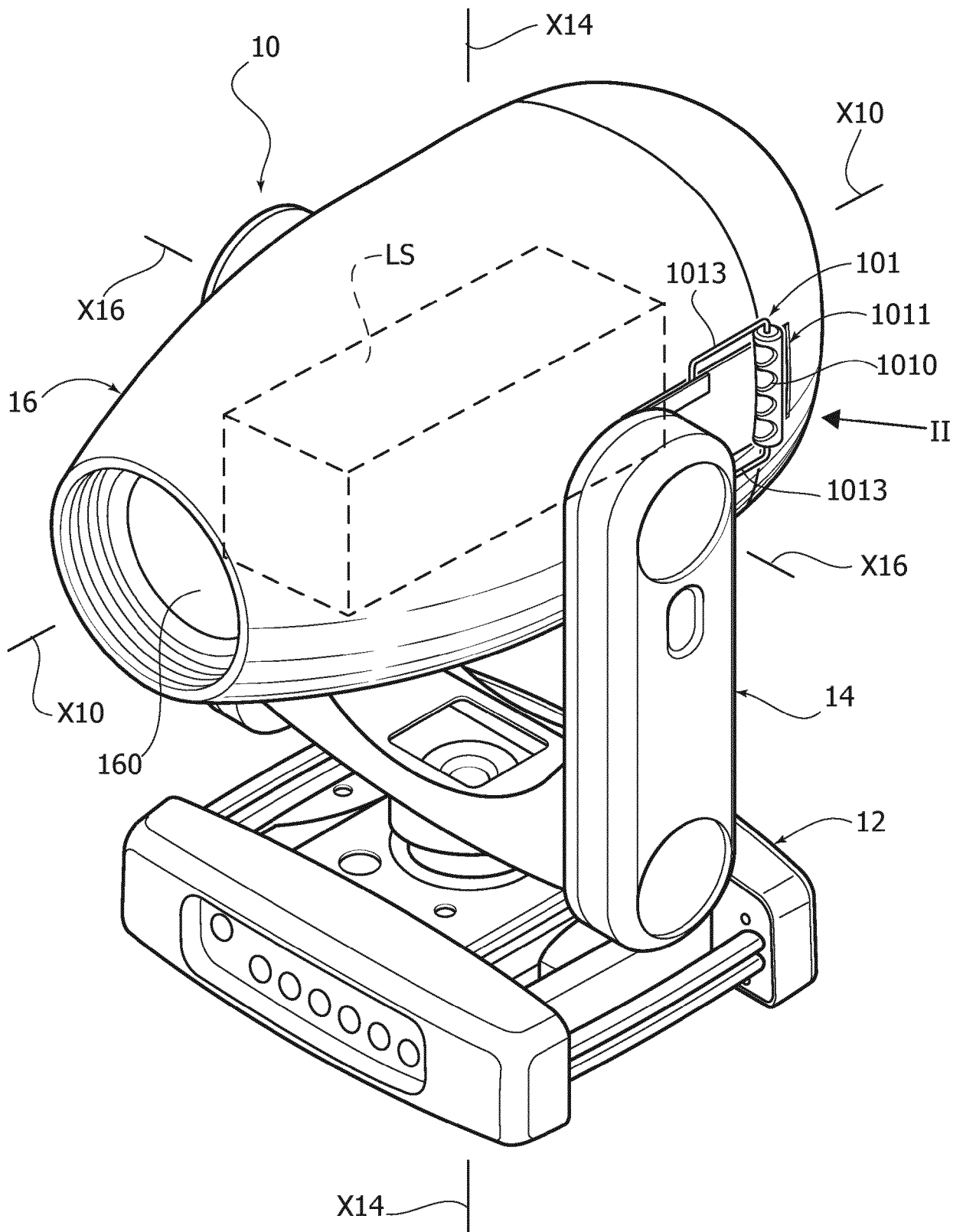


FIG. 2

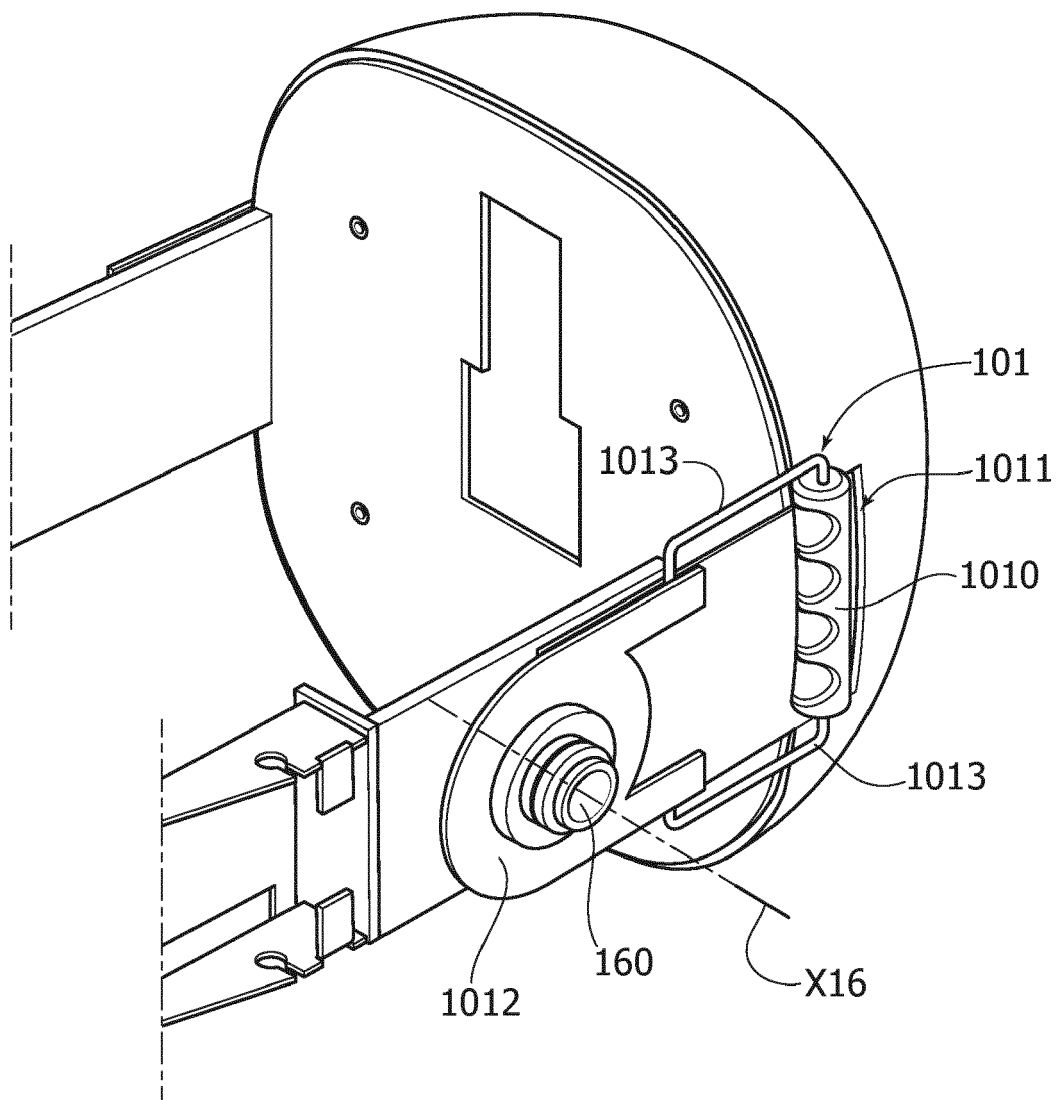


FIG. 3

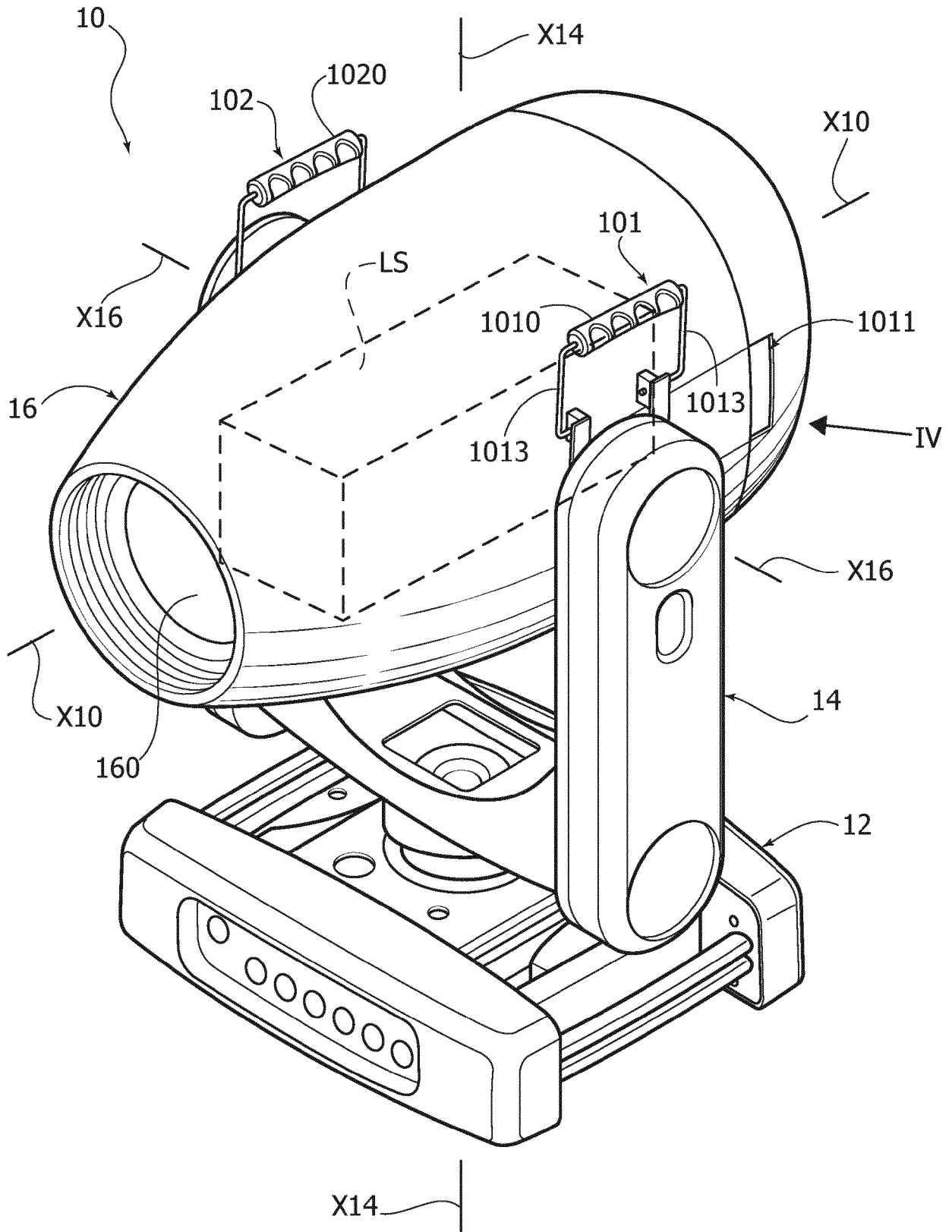


FIG. 4

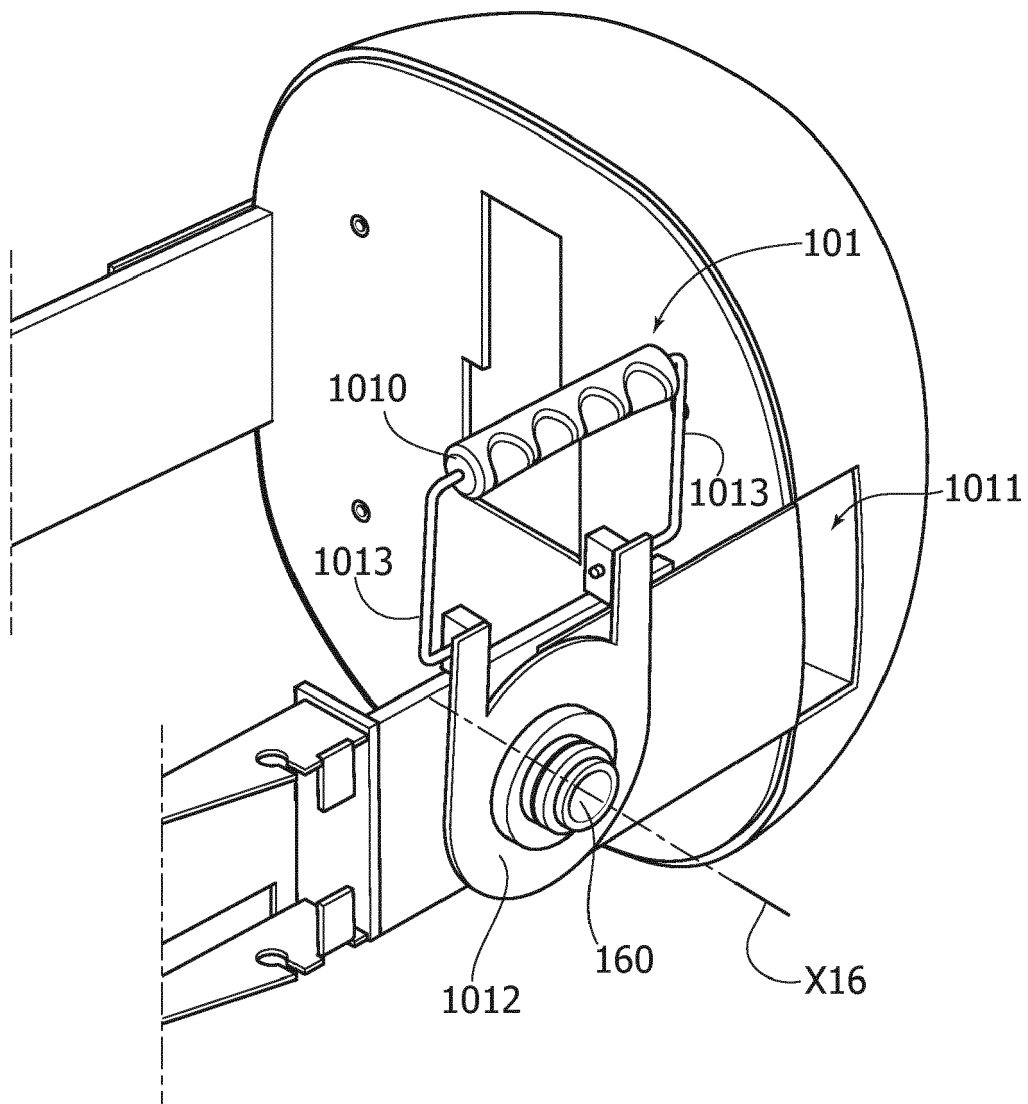


FIG. 5

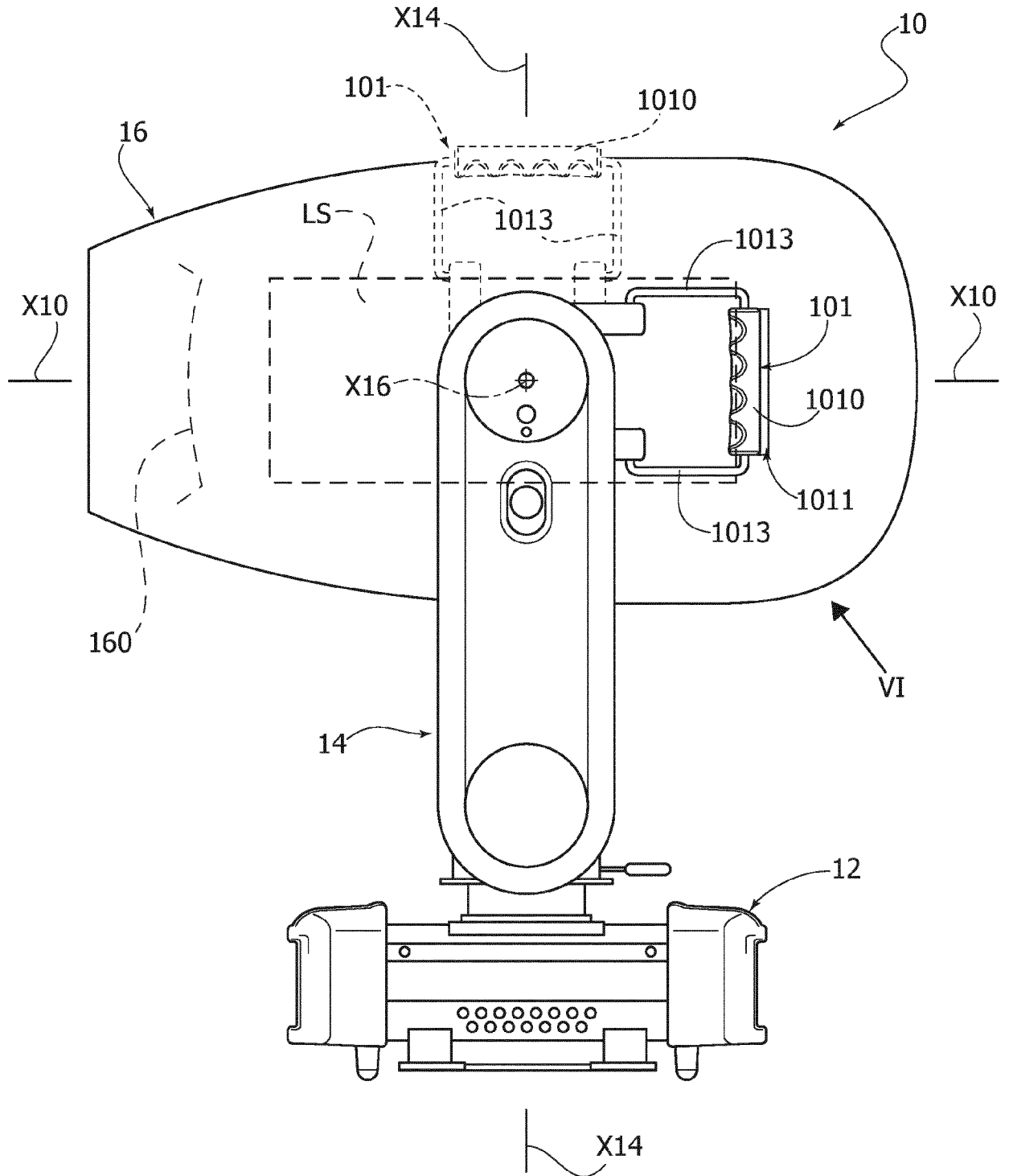
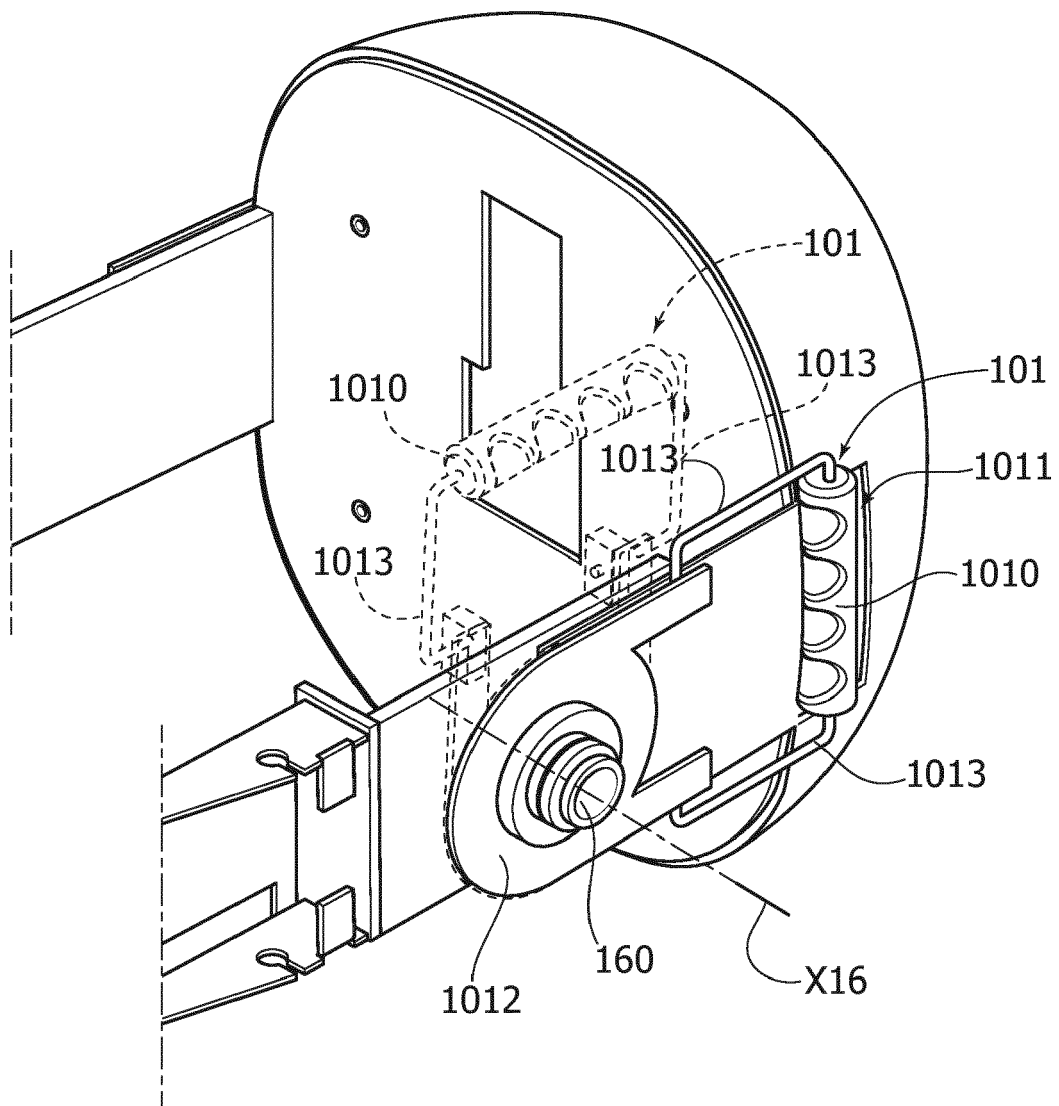


FIG. 6





EUROPEAN SEARCH REPORT

Application Number  
EP 22 15 6794

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			TECHNICAL FIELDS SEARCHED (IPC)
			F21V F21W
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>12 August 2022</b>	Examiner <b>Soto Salvador, Jesús</b>
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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