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(54) RECESSED SPOT

(57) Recessed spot, characterised in that it is provided with a housing (2) which in an axial direction (X-X') tapers essentially upward and is provided with an aperture (3) for a LED or other type of lamp at the top. a lamp holder (4) for the LED or other type of lamp on the level of said aperture (3), whereby the recessed spot (1) further contains a dome-shaped optically clear diffuser (7) which is attached in the housing (2) with its aperture pointing down and with its lower edge (10) at a distance (B) above the lower edge (11) of the housing (2).

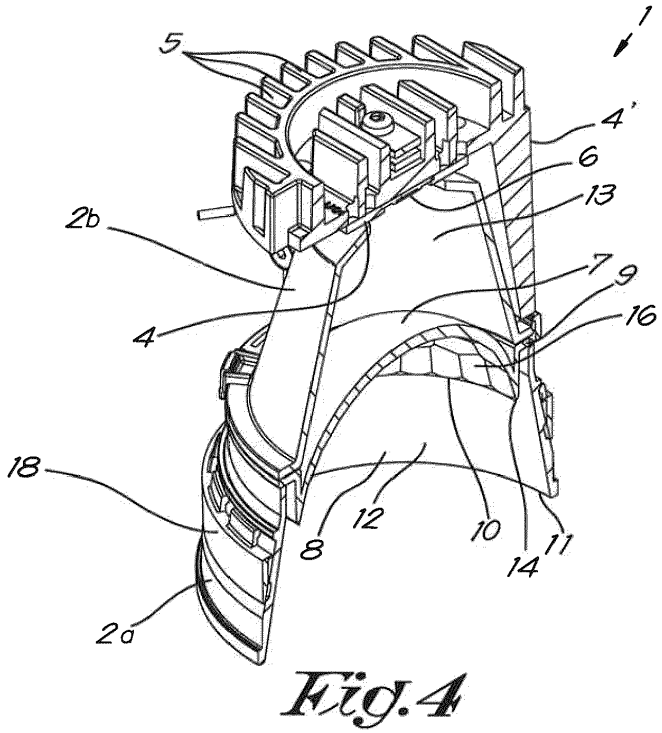

Fig.4

EP 3 865 763 A1

Description

[0001] The present invention relates to a recessed spot, particularly a spot for mounting in ceiling, wall or the like.

[0002] The purpose of the invention is a special spotlight with a good light distribution and artistic and unique look once mounted.

[0003] To this end, the invention relates to a recessed spot which is provided with a housing which in an axial direction tapers essentially upward and is provided with an aperture for a LED or other type of lamp at the top; a lamp holder for the LED or other type of lamp on the level of said aperture, whereby the recessed spot further contains a dome-shaped optically clear diffuser which is attached in the housing with its aperture pointing down and with its lower edge at a distance above the lower edge of the housing.

[0004] The dome-shaped diffuser creates a nice diffusion of the light.

[0005] Preferably, the diffuser has the form of a semi sphere.

[0006] A different effect can be obtained depending on whether the inside of the diffuser is smooth or faceted with contiguous random polygonal facets which create a special effect by a random diffusion of the light.

[0007] Preferably, the diffuser is made completely from a transparent material, for example from PMMA in which the light is nicely diffused and directed toward the lower edge of the diffuser such that it lights up and creates a nice light accent.

[0008] Additionally, the diffuser can be made translucent by applying an opaque transparent coating on its inside.

[0009] The inside of the diffuser can also be provided with a colour by applying an optically clear coloured coating, possibly finished with an opaque transparent coating depending on the desired effect.

[0010] The inside of the diffuser can also be provided with an anti-reflection coating.

[0011] Preferably, the housing is constructed from a lower part or so-called louver and an upper part and the dome-shaped optically clear diffuser is provided with a collar with which the diffuser is attached between the lower and the upper part of the housing with its aperture pointing down.

[0012] Preferably the collar on the dome-shaped diffuser provided on the outside of the diffuser and at a certain distance under the lower edge of the diffuser and at a certain height above the lower edge of the lower part of the housing, such that the luminous lower edge is located opposite the conical inside of the lower part of the housing.

[0013] An extra nice light accent can be obtained by bevelling the lower edge of the diffuser with a chamfer, the normal being oriented toward the inside of the lower part of the housing such that said inside is also lit over at least a certain height when the spot is on.

[0014] Another effect can be obtained depending on whether the conical inside of the lower part of the housing is white or black.

[0015] To obtain a maximum light output, it is preferable that the inside of the upper part of the housing is white or that said upper part is manufactured in a white synthetic material.

[0016] According to a special aspect of the invention, an extra light source with a LED is mounted in the housing in the form of a light tube which is attached to the upper part of the housing and which via a recess in the dome-shaped diffuser is oriented downward through the diffuser.

[0017] Preferably the light tube partially protrudes outward from the housing and a passive cooling block with cooling ribs is attached to said protruding part with which the LED can be effectively cooled.

[0018] What is special is that the light tube can be rotatably mounted around a hinge shaft transverse to a radial plane through the geometric axis of the housing, whereby the hinge shaft is mounted eccentrically at a radial distance from the geometric axis of the housing.

[0019] Thus, the user can rotate the light tube into a desired position, for example between two extreme positions, for example a vertical position parallel with the geometric axis of the housing and a position whereby the light tube is rotated from said vertical position over an angle of 30° toward the geometric axis.

[0020] Preferably, the recessed spot is mounted such that the lower edge of the housing is flush with the plane of the ceiling or wall in which the recessed spot is mounted.

[0021] With the intention of better showing the characteristics of the invention, a few preferred embodiments of a recessed spot according to the invention are described hereinafter by way of an example, without any limiting nature, with reference to the accompanying drawings, wherein:

figure 1 schematically shows a perspective view of a recessed spot according to the invention;
figure 2 shows the recessed spot of figure 1 seen from below;
figure 3 shows the recessed spot of figure 1 in exploded view;
figures 4 and 5 show a cross-section of the recessed spot of figure 1, respectively according to line IV-IV and line V-V in figure 1;
figure 6 shows the part indicated in figure 4 with frame F6 on a larger scale;
figure 7 shows a view from below of the spotlight of figure 1 as mounted in a ceiling;
figure 8 shows an alternative embodiment of a spotlight according to the invention analogue to figure 1;
figure 9 shows the spotlight of figure 8 seen from below;
figure 10 shows a bottom view according to arrow F0 in figure 8;

figure 11 shows a cross-section according to line XI-XI of figure 10;
figure 12 shows a view as that of figure 10, but in a different configuration;
figure 13 shows a cross-section according to line XII-XIII in figure 12;
figures 14 shows the recessed spot of figure 8 in exploded view;
figures 15 shows a view from below of the spotlight of figure 8 as mounted in a ceiling.

[0022] The recessed spot 1 of figures 1 to 7 shown by way of an example relates to a recessed spot with a housing 2 with an axial symmetry around a geometric axis X-X'.

[0023] The housing 2 is constructed from bottom to top from a lower part 2a or so-called louver in the form of an upward tapering ring and an upper part 2b in the form of a truncated cone with an aperture 3 for a lamp or LED at the top.

[0024] The terms upper and lower are used here for recessed spot 1 with its axis X-X' in vertical position, for example for mounting in a ceiling. It goes without saying that the recessed spot can also be mounted in a vertical wall with a horizontal axis for example.

[0025] On top of the housing A a lamp holder 4 is provided 2 with a cooling block 4' with cooling ribs 5 for a LED 6 on the level of said aperture 3.

[0026] In the housing 2 at a distance under the LED 6 a dome-shaped optically clear, light permeable diffuser 7 is provided in the form of a semi sphere, the aperture 8 of which is pointing down.

[0027] The diffuser 7 is made for example from optically clear PMMA and on its outside is provided with a collar 9 with which the diffuser 7 is attached in the housing 2 between the lower part 2a and the upper part 2b of the housing 2.

[0028] The collar 9 is provided on the upperside of the diffuser 7 at a certain height A above the lower edge 10 of the diffuser 7 which is located at a certain height B above the lower edge 11 of the lower part 2a of the housing 2, all this such that the lower edge 10 of the diffuser 7 is located opposite the inside 12 of the lower part 2a of the housing.

[0029] Said inside 12 is for example executed in black or white.

[0030] Preferably, the inside 13 of the upper part 2b of the housing 2 is executed in white for a good reflection of the light.

[0031] Preferably, the free lower edge 10 of the diffuser 7 is bevelled straight as shown on a larger scale in figure 6, whereby the chamfer 14 is oriented to the inside 12 of the lower part 2a of the housing 2, all this such that said inside 12 is lit at least over a certain height by the incident light of the LED 6 on the diffuser 7 that via the thickness of the diffuser 7 is directed to the lower edge 10 of the diffuser 7 from which via the chamfer it lights the inside 12 with a beam 15 as shown in figure 6.

[0032] The lit ring on the inside 12 forms a sharp contrast with the diffuse light of the LED 6 which is let through and diffused by the diffuser 7 from below.

[0033] In the example of the figures, the inside 16 of the diffuser 7 is faceted with contiguous random polygonal facets 17.

[0034] Alternatively, the diffuser 7 can also be executed with a smooth even surface on its inside 16.

[0035] The diffuser 7 can be manufactured in different versions, whereby the diffuser 7 is made translucent for example by an opaque transparent coating on its inside 16 or whereby the diffuser 7 is provided on its inside 16 with an optically clear coloured coating finished with an opaque transparent coating.

[0036] The inside 16 of the diffuser 7 can also be finished with an anti-reflection coating if desired.

[0037] For mounting in a ceiling 19, first a plaster kit (not shown) is mounted in a hole in the ceiling 19 in the known way which is finished later, for example, with a layer of plaster.

[0038] The recessed spot 1 is then attached in the finished plaster kit by means of a mounting ring 18 in such a way that the lower edge 11 of the housing 2 is flush with the finished layer of plaster of the ceiling 19.

[0039] The effect thereof is shown in figure 7.

[0040] In figures 8 to 15 an alternative embodiment of a recessed spot 1 according to the invention is shown which differs from the aforementioned embodiment in that an extra light source is provided in the housing 2 in the form of a light tube 20 which is attached to the upper part 2b of the housing 2 and the beam of light of which points down via a recess 21 in the optically clear spherical diffuser 7 through the diffuser 7.

[0041] To this end, a LED 22 or other lamp is mounted in the top of the light tube 20.

[0042] The light tube 20 is extended with a curved section 23 which partially protrudes outward from the housing 2 and is provided with a cooling block 24 which is attached thereon along the outside of the housing 2.

[0043] In this case the light tube 20 is rotatably mounted around a hinge shaft 25 transverse to a radial plane through the geometric axis X-X' of the housing 2, whereby said hinge shaft 25 is applied eccentrically at a radial distance D from the geometric axis X-X' of the housing

[0044] The light tube 20 is thereby hingeable, for example, between two extreme positions, respectively the position of figure 13 parallel with the geometric axis X-X' of the housing 2 and a tilted position whereby the light tube 20 from said position of figure 13 is rotated over an angle C of for example 30° toward the geometric axis X-X' as shown in figure 11.

[0045] The view of a mounted recessed spot according to the second embodiment is shown in figure 15 with the light tube in its vertical position.

[0046] It is not excluded that the housing 2 consists of one single part or is constructed from more than two parts.

[0047] In the same way the diffuser 7 can be applied

in the housing in another way.

[0048] The present invention is by no means limited to the embodiments described as an example and shown in the drawings, but a recessed spot according to the invention can be realised in all kinds of forms and dimensions, without departing from the scope of the invention.

Claims

1. Recessed spot, **characterised in that** it is provided with a housing (2) which in an axial direction (X-X') tapers essentially upward and is provided with an aperture (3) for a LED or other type of lamp at the top. a lamp holder (4) for the LED or other type of lamp on the level of said aperture (3), whereby the recessed spot (1) further contains a dome-shaped optically clear diffuser (7) which is attached in the housing (2) with its aperture pointing down and with its lower edge (10) at a distance (B) above the lower edge (11) of the housing (2).

2. Recessed spot according to claim 1, **characterised in that** the dome-shaped diffuser (7) has the form of a semi sphere.

3. Recessed spot according to claim 1 or 2, **characterised in that** the inside (16) of the dome-shaped diffuser (7) is smooth or is provided with contiguous random polygonal facets (17).

4. Recessed spot according to any one of the previous claims, **characterised in that** the diffuser (7) is manufactured completely of a transparent material, for example PMMA.

5. Recessed spot according to any one of the previous claims, **characterised in that** the diffuser (7) is made translucent by an opaque transparent coating on its inside (16) .

6. Recessed spot according to any one of the previous claims, **characterised in that** the diffuser (7) is provided with an optically clear coloured coating finished with an opaque transparent coating on its inside (16).

7. Recessed spot according to any one of the previous claims, **characterised in that** the diffuser (7) is provided with an anti-reflection coating on its inside (16).

8. Recessed spot according to any one of the previous claims, **characterised in that** the lower edge (10) of the diffuser (7) is bevelled, whereby the normal of the chamfer (14) is oriented toward the inside (12) of the lower part of the housing (2) such that said inside (12) is also lit over at least a certain height when the spot is on.

9. Recessed spot according to any one of the previous claims, **characterised in that** the diffuser (7) is mounted centrally in the housing (2) with a certain clearance between the lower edge (10) of the diffuser (7) and the inside of the housing (2).

10. Recessed spot according to claim 8 or 9, **characterised in that** the inside (12) of the lower part of the housing (2) is white or black.

11. Recessed spot according to any one of the previous claims, **characterised in that** the inside (12) of the upper part (2b) of the housing is white.

12. Recessed spot according to any one of the previous claims, **characterised in that** the housing (2) is constructed from a lower part (2a) or so-called louver and an upper part (2b) and that the dome-shaped optically clear diffuser (7) is provided with a collar (9) with which the diffuser (7) is attached in the housing (2) between the lower and the upper part (2a and 2b) of the housing (2), with its aperture (8) pointing down.

13. Recessed spot according to claim 12, **characterised in that** the collar (9) on the dome-shaped diffuser (7) is provided on the outside of the diffuser (7) and at a certain distance (A) above the lower edge (10) of the diffuser (7).

14. Recessed spot according to any one of the previous claims, **characterised in that** an extra light source is provided in the housing (2) in the form of a light tube (20) which is attached to the upper part (2b) of the housing (2) and the beam of light of which points down via a recess (21) in the spherical diffuser (7) through the diffuser (7).

15. Recessed spot according to claim 14, **characterised in that** the extra light source is a LED (22) in the top of the light tube (20).

16. Recessed spot according to claim 14 or 15, **characterised in that** the light tube (20) partially protrudes outward from the housing and is provided with a cooling block (24) on this section which is attached thereon.

17. Recessed spot according to one of the claims 14 to 16, **characterised in that** the light tube (20) is mounted rotatably around a hinge shaft (25) transverse to a radial plane through the geometric axis (X-X') of the housing 2.

18. Recessed spot according to claim 17, **characterised in that** the hinge shaft (25) of the light tube (20) is located at a radial distance from the geometrical axis (X-X') of the housing (2).

19. Recessed spot according to claim 17 or 18, **characterised in that** the light tube (20) is hingeable between two extreme positions, respectively a first position parallel with the geometric axis (X-X') of the housing (2) and a second tilted position whereby the light tube (20) is tilted from its first position over an angle (C) of approximately 30° toward the geometric axis (X-X').

20. Recessed spot according to any one of the previous claims, **characterised in that** the housing (2) is provided on its outside with a mounting ring (18) for mounting the recessed spot (1) in a plaster kit which is integrated into the ceiling (19) or a wall.

21. Recessed spot according to any one of the previous claims, **characterised in that** in a mounted condition the lower edge of the housing (2) is flush with the plane of the ceiling (19) or wall in which the recessed spot (1) is mounted.

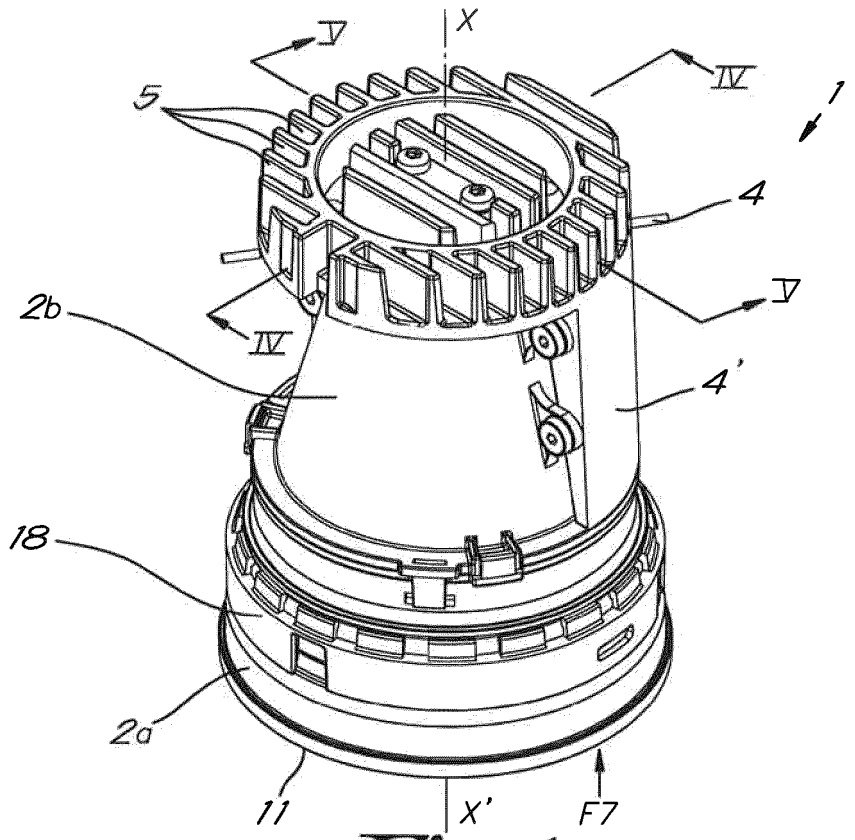

Fig. 1

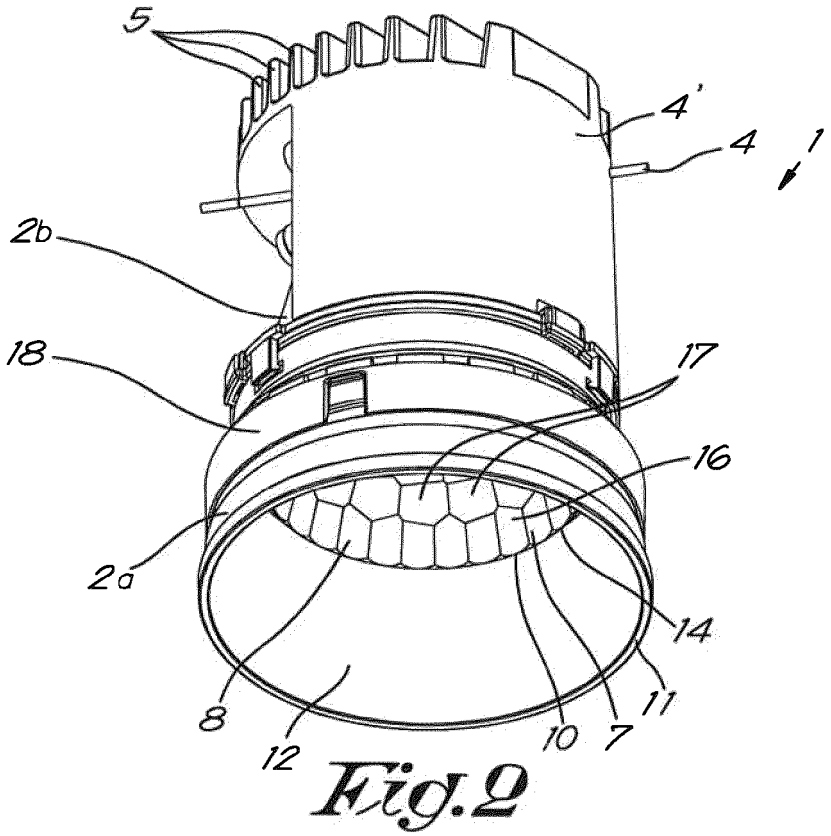

Fig. 2

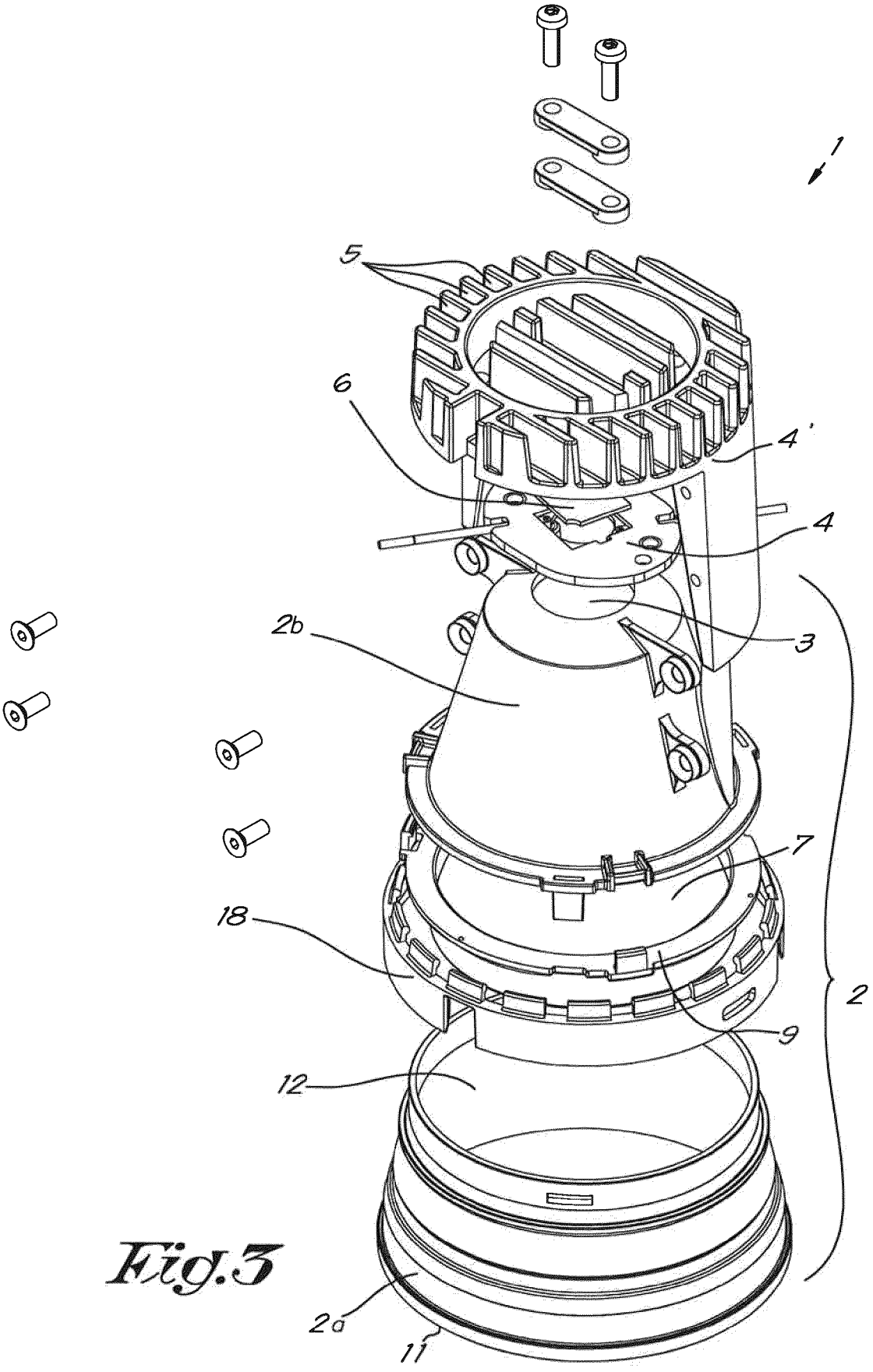

Fig.3

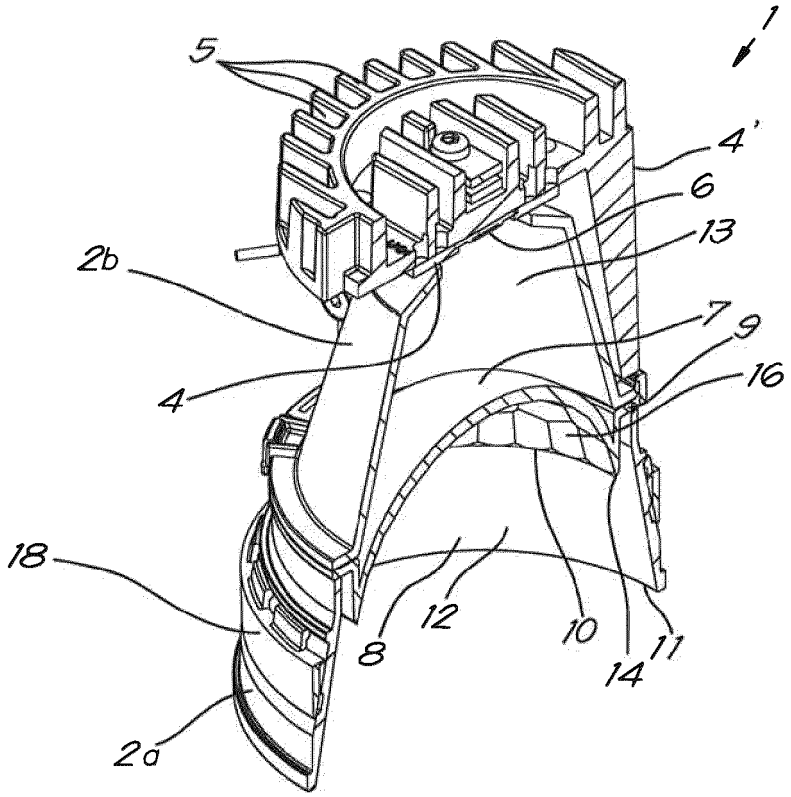
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Fig.4

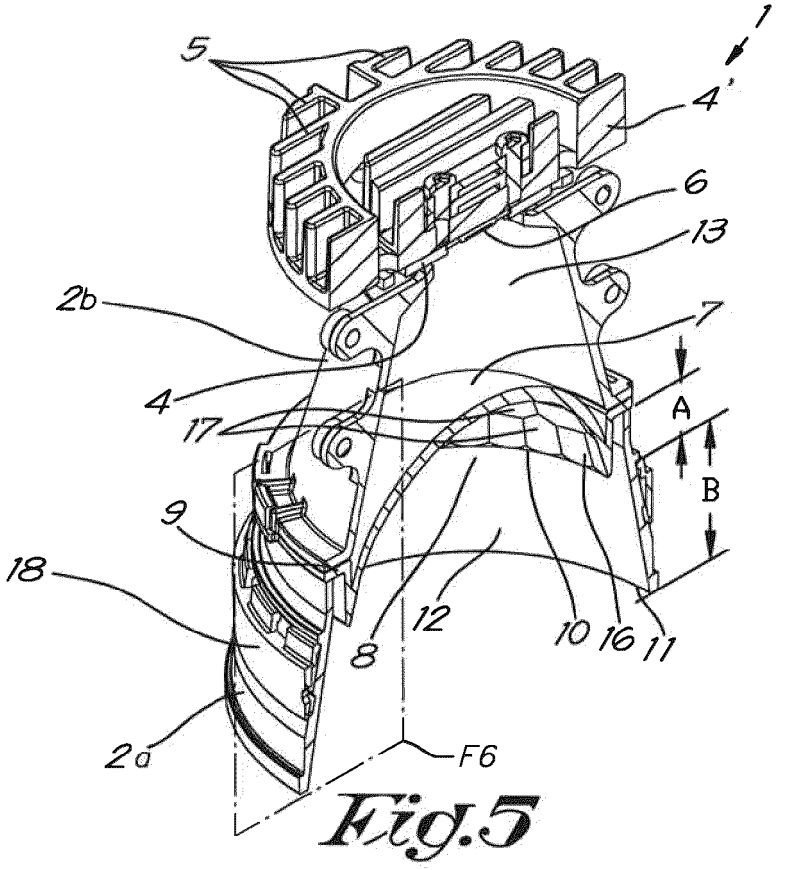
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Fig.5

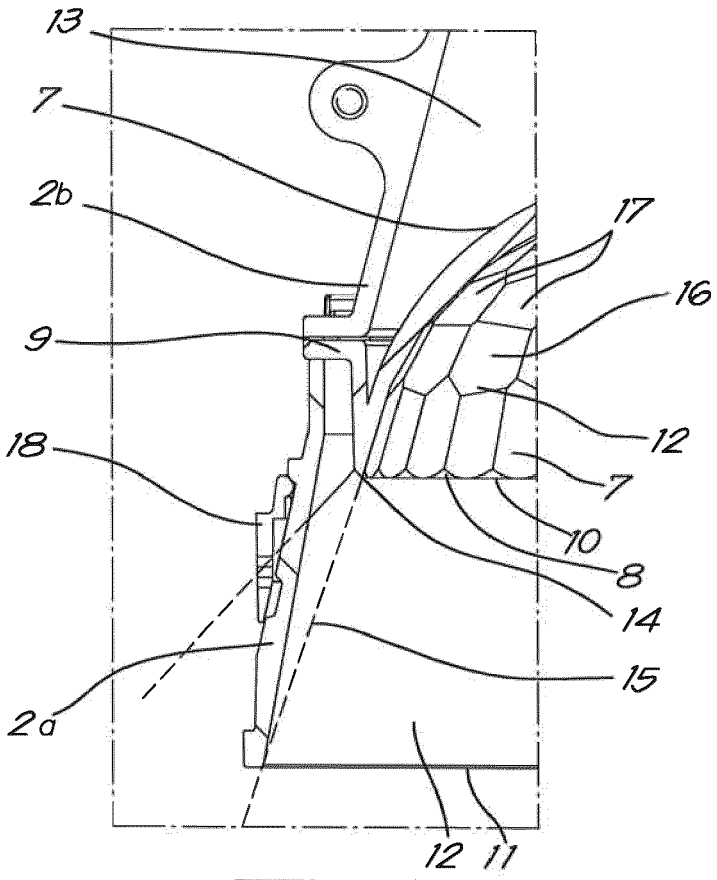

Fig.6

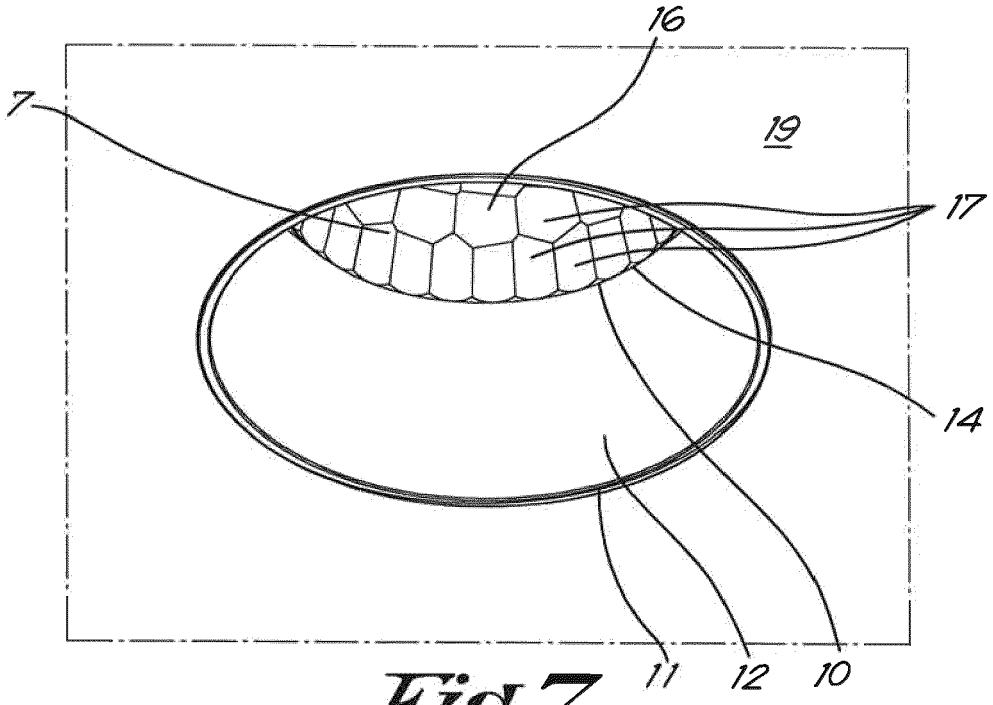

Fig.7

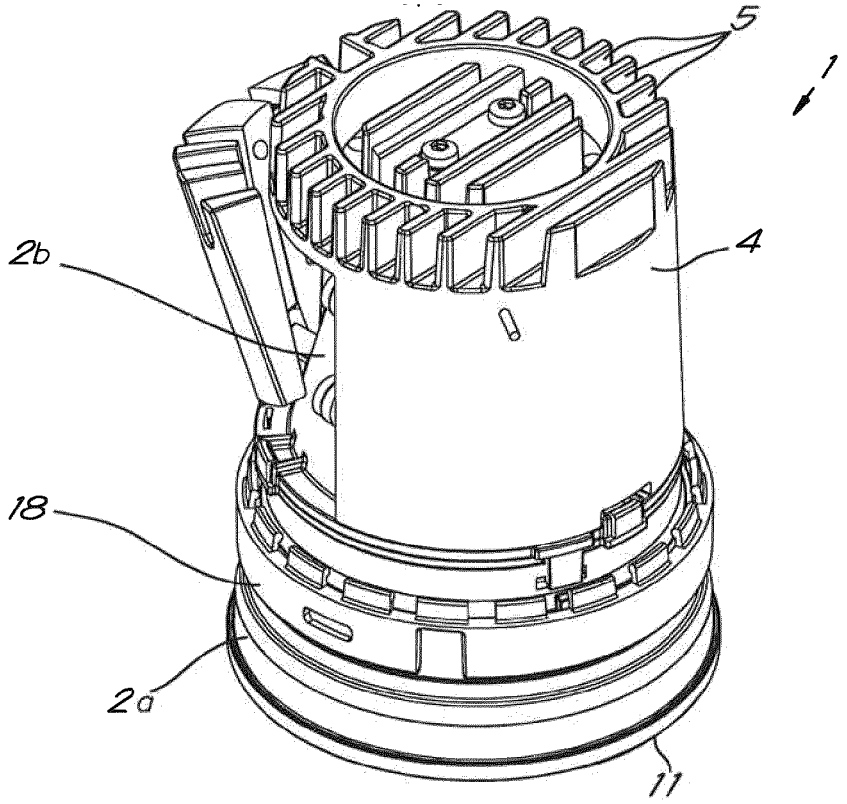

Fig.8

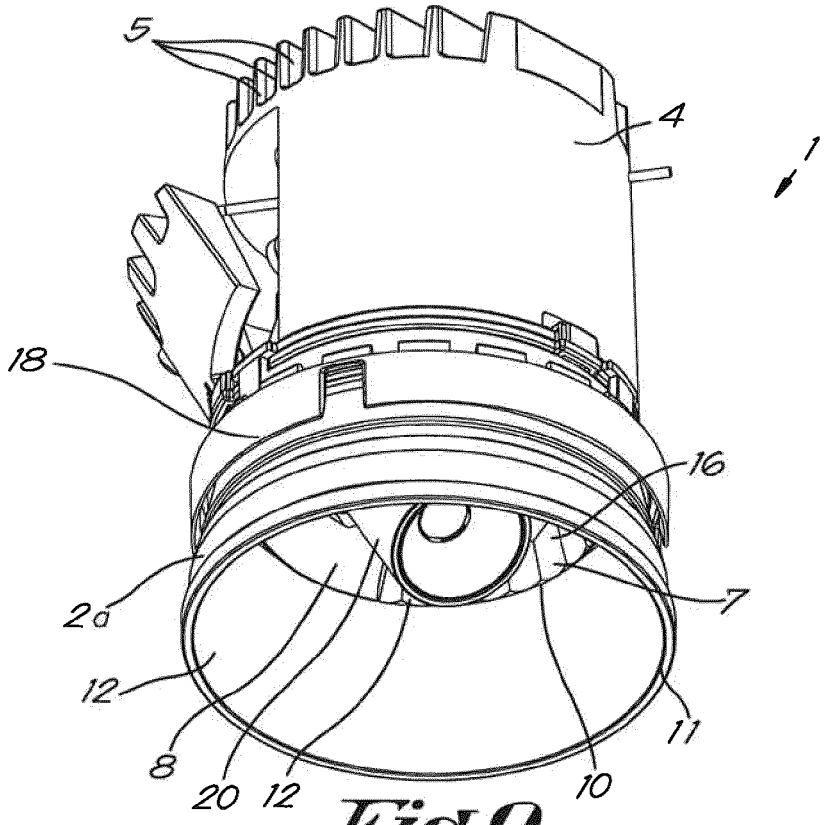

Fig.9

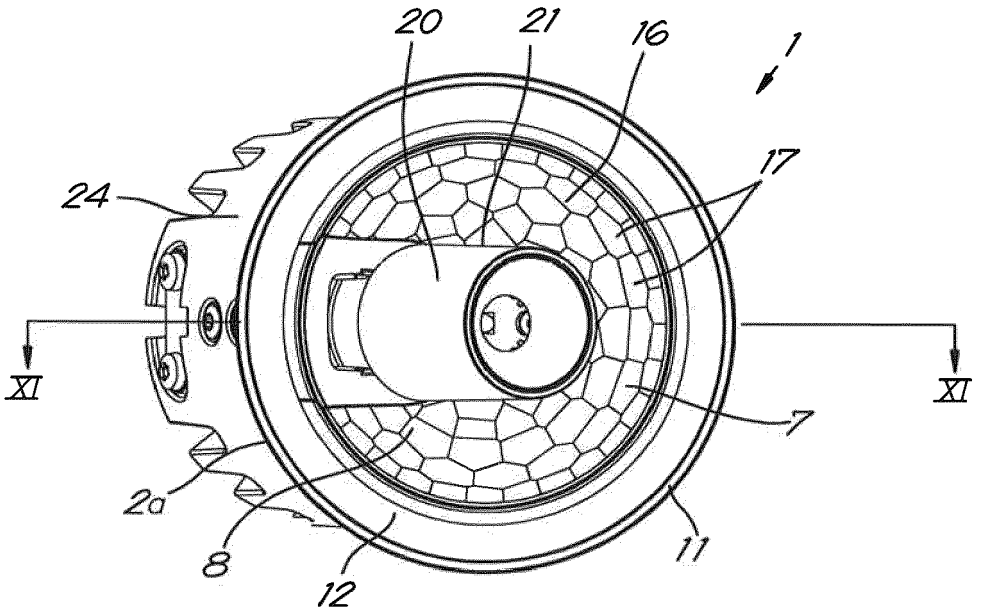
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Fig.10

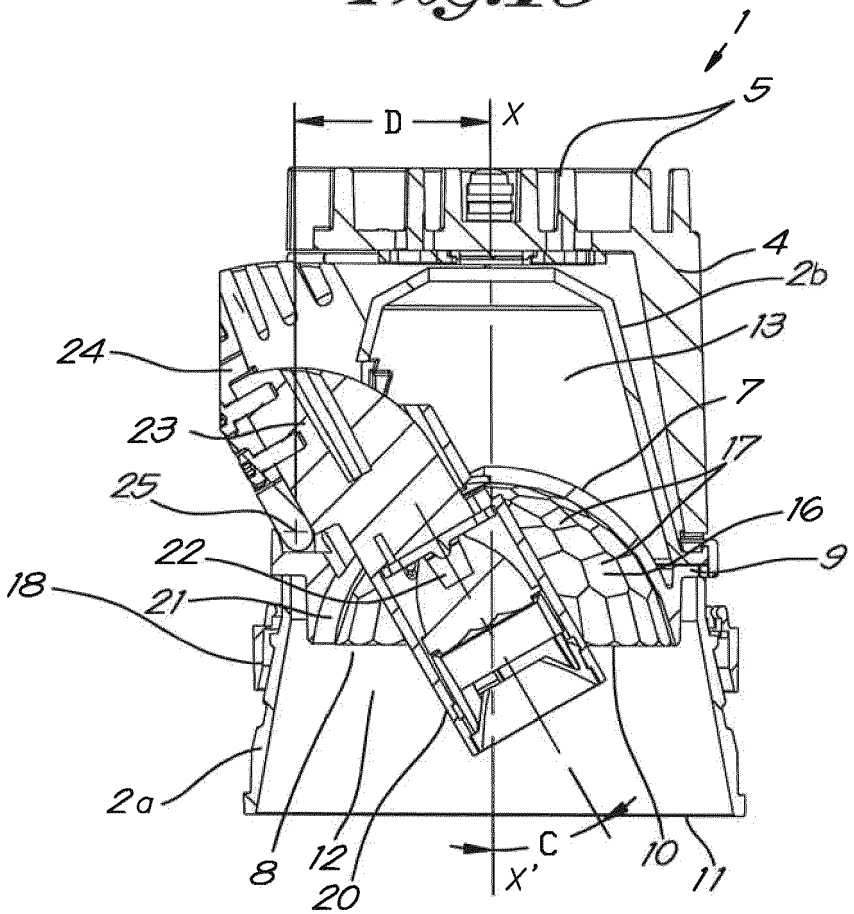
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Fig.11

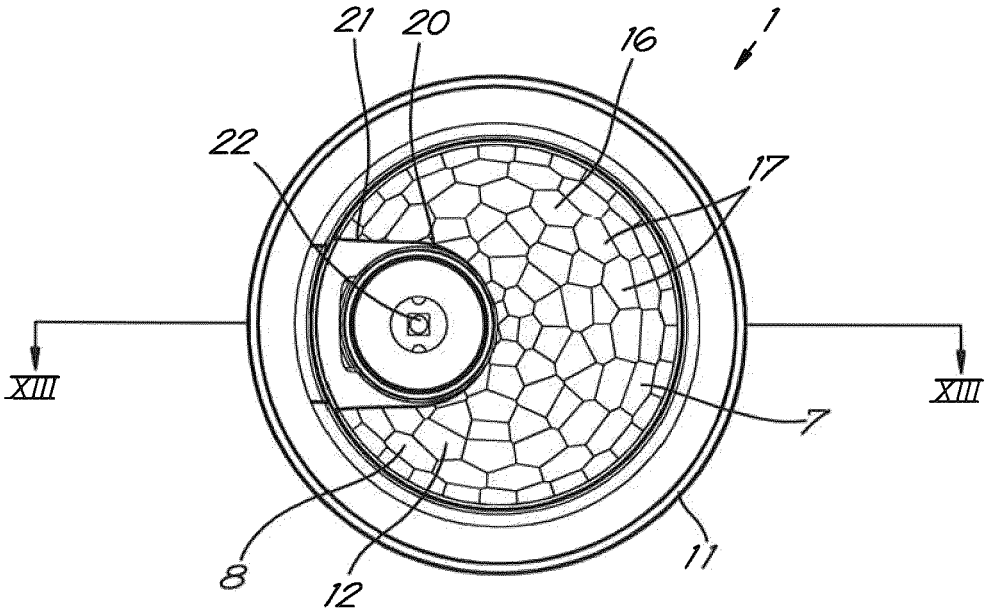
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Fig. 12

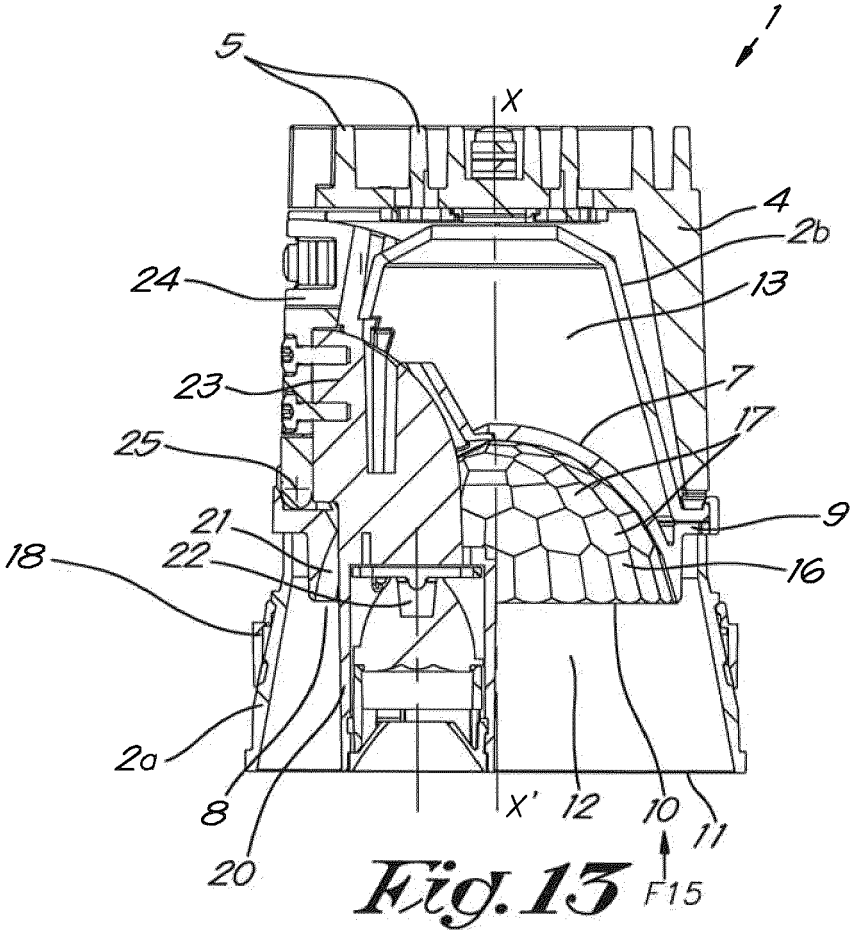
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Fig. 13

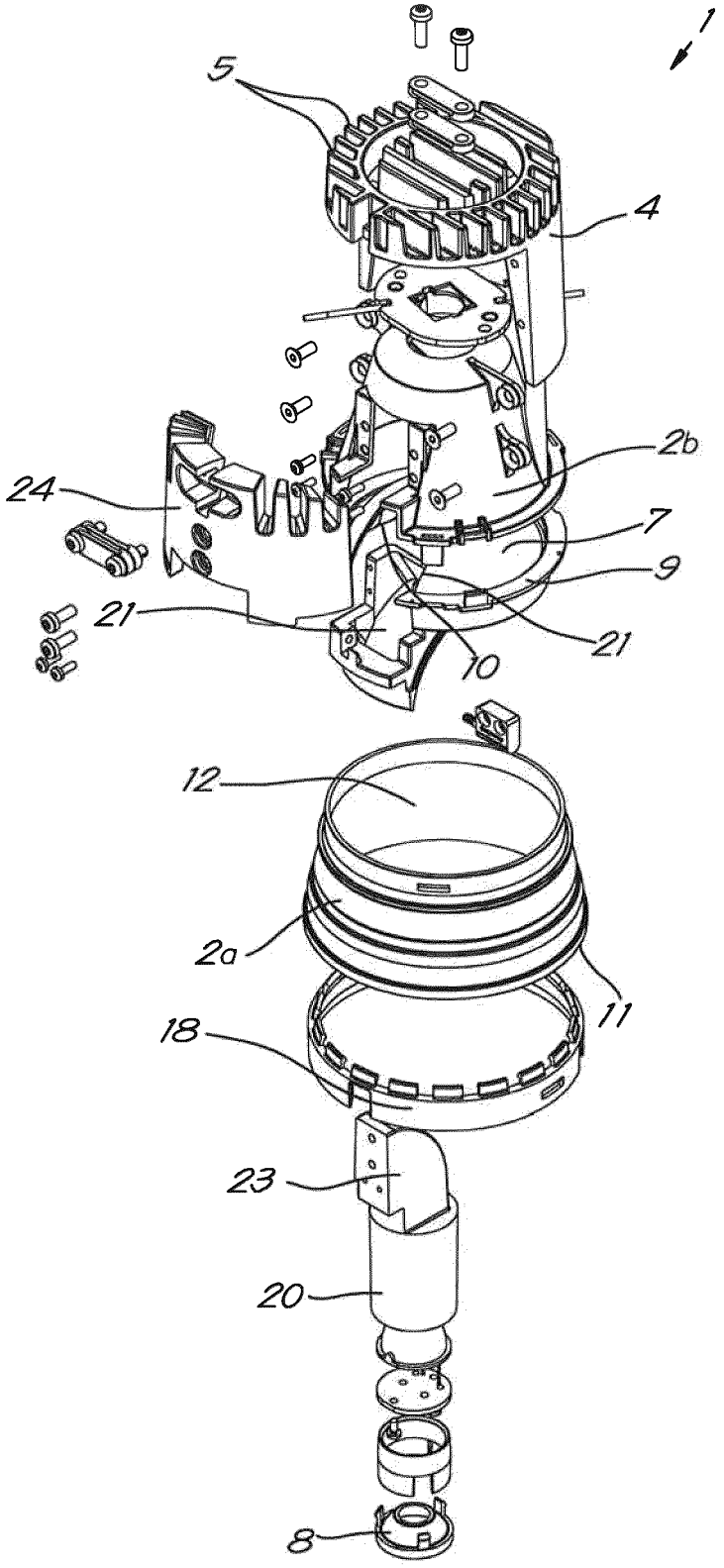

Fig. 14

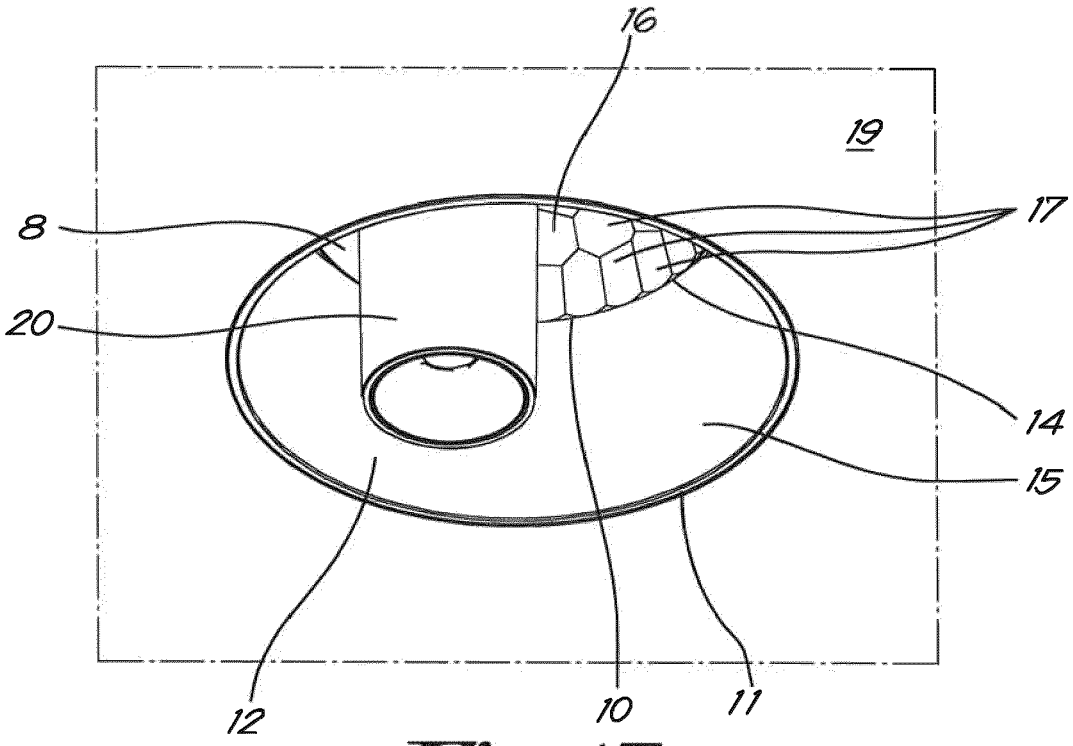

Fig. 15

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EUROPEAN SEARCH REPORT

Application Number
EP 21 15 6086

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 May 2021	Thibaut, Arthur

CATEGORY OF CITED DOCUMENTS

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