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(54) Reflector comprising recovery means of flow

(57) The present invention concerns a lighting apparatus, in particular a lighting apparatus for fixing to the ground or walls, comprising recovery means (19,20-24) of light flow adapted to prevent the presence of shadow areas, on the object or on the area to be illuminated, caused by the support poles of the lighting assembly of said lighting apparatus.

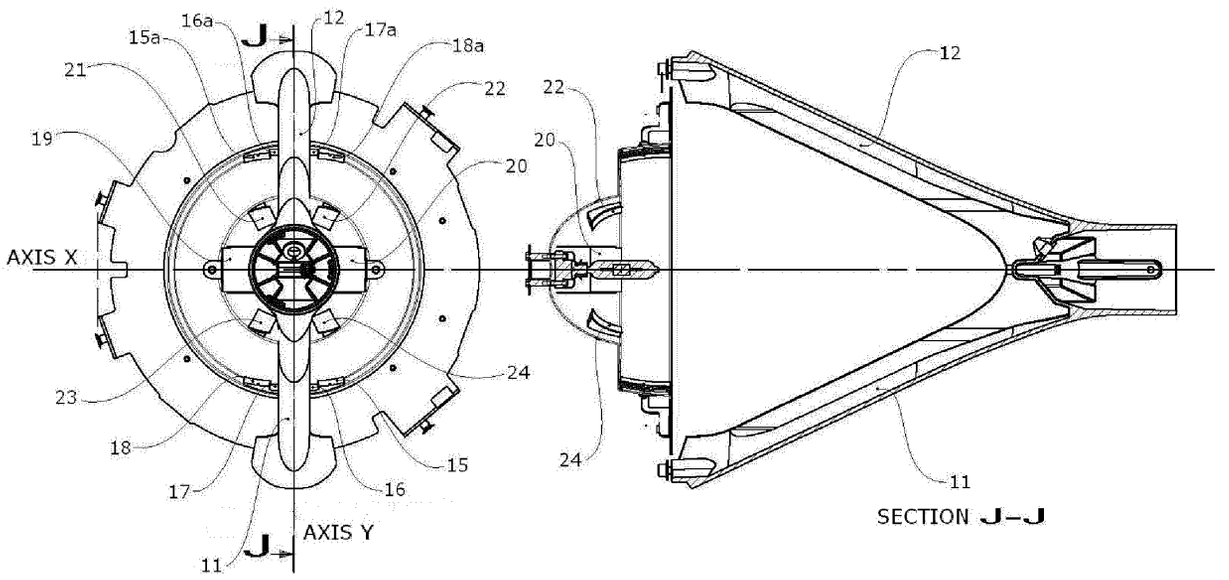

Fig. 4

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Description

Field of the invention

[0001] The present invention relates to the technical field of lighting apparatuses and in particular to the technical field of lighting apparatuses comprising reflectors adapted to optimize the light emission.

State of the art

[0002] It is known how one of the most important parameters relative to lighting apparatuses is constituted by their light emission. Reflectors, diffusers and light emission devices are designed and chosen so as to provide precise lighting conditions, in terms of emission diagram and light intensity emitted.

[0003] In the case of lighting apparatuses of the suspended type, the design of the light emission of the apparatus itself takes place in a relatively simpler manner with respect to the case of lighting apparatus equipped, for example, with support poles for fixing to the ground.

[0004] Indeed, in this case, the emission diagram, and therefore the overall light emission of the lighting apparatus, is strongly influenced by the presence of said supports which are often placed in positions such as to constitute an obstacle for the emission itself and therefore to cast shadow areas on the object or on the area to be illuminated.

[0005] This disadvantage is more important the greater the dimensions of the support poles of the lighting apparatus which are found in intermediate position between the light emission devices and the object or the area to be illuminated, and it is clear the need to obviate the technical problem described so as to recover the lost fraction of light flow and obtain an optimal or almost optimal light emission, even in presence of lighting apparatuses equipped with support poles for fixing to the ground.

[0006] Therefore, an object of the present invention is to provide a lighting apparatus, for example comprising support poles for fixing to the ground or to walls, adapted to emit an optimized lighting and such to correct the presence of possible shadow areas caused by said support poles and guarantee a correct illuminance of the object or the area to be illuminated.

Brief description of the figures

[0007]

Fig. 1 shows a plan view of a preferred embodiment of the lighting apparatus according to the present invention, comprising recovery means of flow.

Fig. 2 shows a front elevation view of a preferred embodiment of the lighting apparatus according to the present invention, comprising recovery means of flow.

Fig. 3 shows an axonometric view of a preferred embodiment of the lighting apparatus according to the present invention, comprising recovery means of flow.

Fig. 4 shows a section view of a preferred embodiment of the lighting apparatus according to the present invention, comprising recovery means of flow.

Fig. 5 shows a plan view and a side section view of a preferred embodiment of the reflector of the lighting apparatus according to the present invention, comprising recovery means of flow.

Fig. 6 shows an axonometric view of a preferred embodiment of the reflector of the lighting apparatus according to the present invention, comprising recovery means of flow.

Fig. 7 shows the profile of the shadow projected towards the ground from the lighting apparatus according to the present invention, without recovery means of flow.

Summary of the invention

[0008] The present invention concerns a lighting apparatus, in particular a lighting apparatus for fixing to the ground or walls, comprising recovery means of light flow adapted to prevent the presence of shadow areas, on the object or on the area to be illuminated, caused by the support poles of the lighting assembly of said lighting apparatus.

Detailed description of the invention

[0009] With reference to the accompanying drawings 1, 2, 3 and 4, a preferred embodiment of the lighting apparatus according to the present invention comprises an optical assembly 10 equipped with two supports 11, 12 adapted to be associated with a support pole for fixing to the ground.

[0010] Said optical assembly 10 comprises a reflector 13 whose shape has substantially rotational symmetry, in turn comprising a compartment adapted to house a source of lighting associated to suitable power means and possibly associated to suitable heat dissipation means, equipped with recovery means of light flow comprising upper recovery means of light flow and lower recovery means of light flow.

[0011] With reference to the accompanying drawings 4, 5 and 6, said lower recovery means of light flow comprise: at least two chips 14, 14a made with reflective material, preferably made with a thermoplastic resin base (such as, for example, the resin known with the commercial name of ULTEM™), comprising a surface metallizing. Said at least two chips 14, 14a are preferably arranged close to the edge of said reflector 13 and in correspondence of said supports 11, 12. In a preferred embodiment of the present invention, said at least two chips 14, 14a made with reflective material comprise four sec-

tions 15, 15a, 16, 16a, 17, 17a, 18, 18a having approximately the same dimensions. Sections 15, 16 and 15a, 16a positioned on one side of each of said chips 14, 14a have mirroring positioning with respect to the positioning of sections 17, 17a, 18, 18a positioned on the other side of each of said chips 14, 14a, said positionings being partially turned towards said source of lighting and towards the outlet of said reflector 13.

[0012] Preferably, said chips 14, 14a have a satin finish.

[0013] Said upper recovery means of light flow comprise: at least two chips 19, 20 made with reflective material, for example aluminium with satin or rough finish, arranged in adjacent position and on opposite sides with respect to said source of lighting arranged at the top of said reflector 13, with inclination partially turned towards said source of lighting and towards the outlet of said reflector 13 and at least four chips 21, 22, 23, 24 made with reflective material, for example aluminium with mirror surface finish, also arranged in position adjacent and on opposite sides with respect to said source of lighting and having inclinations partially turned towards said source of lighting, towards the outlet of said reflector 13 and towards said chips 19, 20.

[0014] The central sections 16, 16a, 17, 17a, of said chips 14, 14a made with reflective material of said lower recovery means of light flow are adapted to provide a lighting profile turned deep towards the shadow area of said supports 11, 12; the peripheral sections 15, 15a, 18, 18a, of chips 14, 14a made with reflective material of said lower recovery means of light flow are adapted to provide a lighting profile turned towards the central area of the shadow area of said supports 11, 12; said four chips 21, 22, 23, 24 made with reflective material of said upper recovery means of light flow are adapted to provide a lighting profile turned towards the shadow area, on the ground, of said supports 11, 12; the two chips 19, 20 made with reflective material of said upper recovery means of light flow are adapted to provide a lighting profile turned towards the central area, on the ground, of said supports 11, 12.

[0015] In greater detail and still with reference to the accompanying drawings 1, 2, 3 and 4, an optical assembly 10 equipped with two supports 11, 12 adapted to be associated with a support pole for fixing to the ground is such to project a shadow profile towards the ground. In particular, the shadow profile projected to the ground by a support, for example said support 11, projects a shadow profile to the ground which comprises sectors 1, 2, 3, 4, 7 and 8 shown in figure 7.

[0016] In detail, reflector 13 comprising said recovery means of light flow comprising upper recovery means of light flow and lower recovery means of light flow operates in the following way: said chip 22 made with reflective material is adapted to direct the portion of light flow reflected towards said sector 1, said chip 21 made with reflective material is adapted to direct the portion of light flow reflected towards said sector 2, peripheral section 18a of said chips 14a is adapted to direct the portion of light flow reflected towards said sector 3 creating, however, shadow in said sector 5, peripheral section 15a of said chips 14a is adapted to direct the portion of light flow reflected towards said sector 4 creating, however, shadow in said sector 6, central section 17a of said chips 14a is adapted to direct the portion of light flow reflected towards said sector 5, central section 16a of said chips 14a is adapted to direct the portion of light flow reflected towards said sector 6, said chip 20 made with reflective material is adapted to direct the portion of light flow reflected towards said sector 7 while said chip 19 made with reflective material is adapted to direct the portion of light flow reflected towards said sector 8.

[0017] In the same way, the recovery means of light flow comprising said chips 15, 16, 17, 18, 23 and 24 operate in such a way as to recover the shadow profile projected to the ground by said support 12.

[0018] The overall effect, therefore, will be such to cancel the shadow areas connected to the presence of supports 11 and 12, providing a similar ground lighting to the one which would be provided by a lighting apparatus without said supports.

Claims

1. A lighting apparatus comprising an optical assembly (10) equipped with supports (11, 12) adapted to be associated with a support pole for fixing to the ground, said optical assembly comprising a reflector whose shape has substantially rotational symmetry, in turn comprising a compartment adapted to house a source of lighting and recovery means of light flow comprising a plurality of chips made with reflective material, adapted to reflect part of the light emission of said source of lighting in such a direction to illuminate the shadow areas generated by said supports.

2. The apparatus according to claim 1, wherein said recovery means of light flow comprise: upper recovery means of light flow, in turn comprising a plurality of chips made with reflective material arranged on the inner face of said reflector (13) in substantially intermediate position with respect to the top and to the side of said reflector (13) and about the source of lighting arranged at the top of said reflector (13), and lower recovery means of light flow comprising a plurality of chips made with reflective material arranged close to the edge of said reflector (13) and at said supports (11, 12).

3. The apparatus according to claims 1-2, wherein said upper recovery means of light flow comprise two chips (19, 20) made with reflective material arranged in position next to and on opposite sides to said source of lighting arranged at the top of said reflector

(13), with inclination partially turned towards said source of lighting and towards the outlet of said reflector (13) and four chips (21, 22, 23, 24) made with reflective material also arranged in position next to and on opposite sides to said source of lighting and having inclinations partially turned towards said source of lighting, towards the outlet of said reflector (13) and towards said chips (19, 20).

4. The apparatus according to claims 1-3, wherein said lower recovery means of light flow comprise two chips (14, 14a) arranged close to the edge of said reflector (13) and at said supports (11, 12).

5. The apparatus according to claim 4, wherein said two chips (14, 14a) made with reflective material comprise four sections (15, 15a, 16, 16a, 17, 17a, 18, 18a), of which the sections (15, 16 e 15a, 16a) positioned on one side of each of said chips (14, 14a) have mirroring positioning with respect to the positioning of the sections (17, 17a, 18, 18a) positioned on the other side of each of said chips (14, 14a), said positionings being partially turned towards said source of lighting and towards the outlet of said reflector (13).

6. The apparatus according to claim 5, wherein said chips (14, 14a) comprise a satin finish.

7. The apparatus according to claims 3-6, wherein said two chips (19, 20) made with reflective material comprise a surface satin or rough finish.

8. The apparatus according to claims 3-7, wherein said four chips (21, 22, 23, 24) made with reflective material comprise a mirror surface finish.

9. The apparatus according to claims 3-8, wherein said chips (19, 20, 21, 22, 23, 24) made with reflective material are made in aluminium.

10. the apparatus according to claims 4-9, wherein said chips (14, 14a) are made with a thermoplastic resin base comprising a surface metallizing.

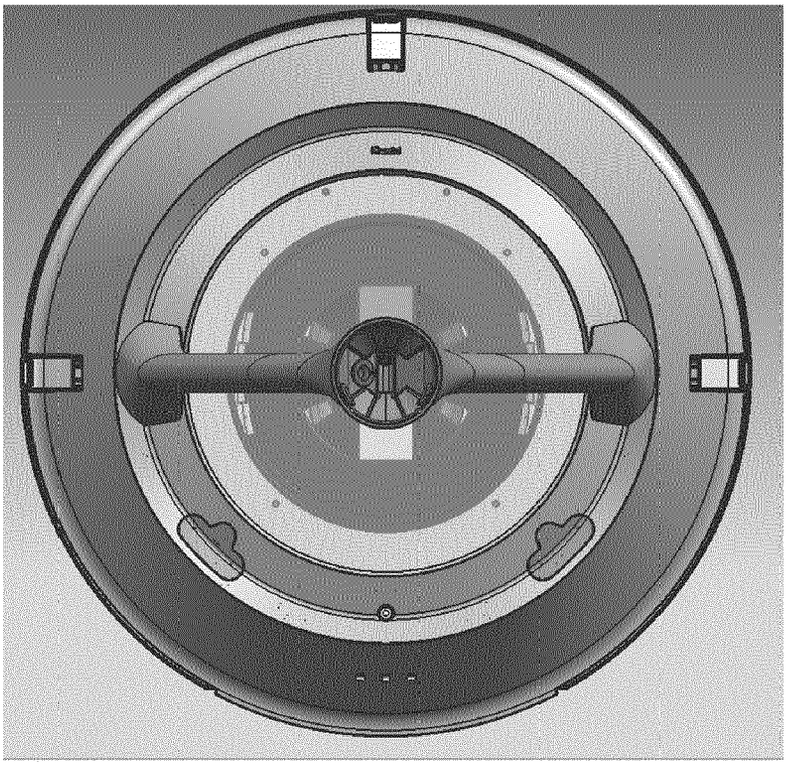


Fig. 1

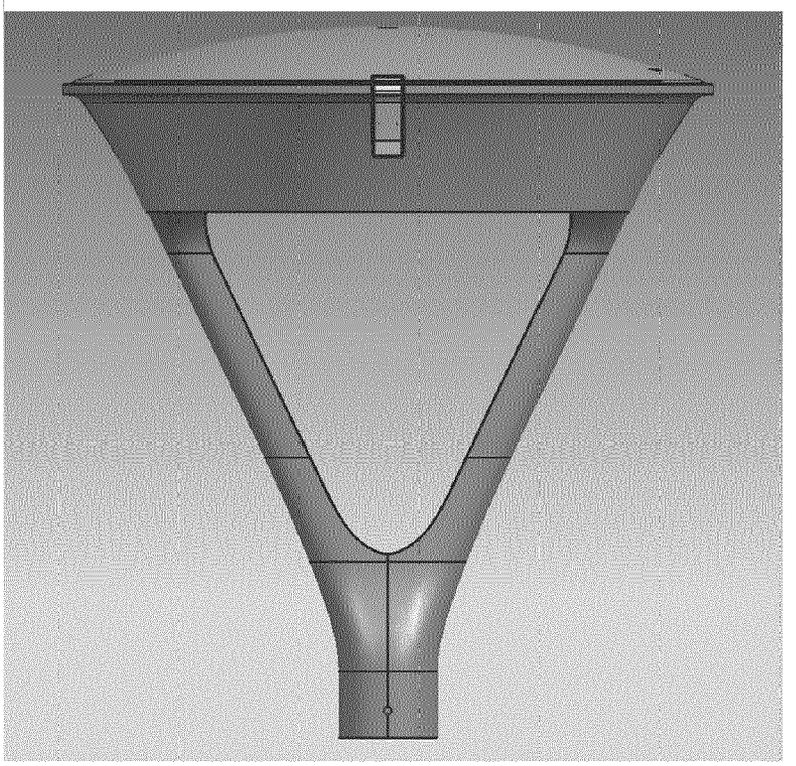


Fig. 2

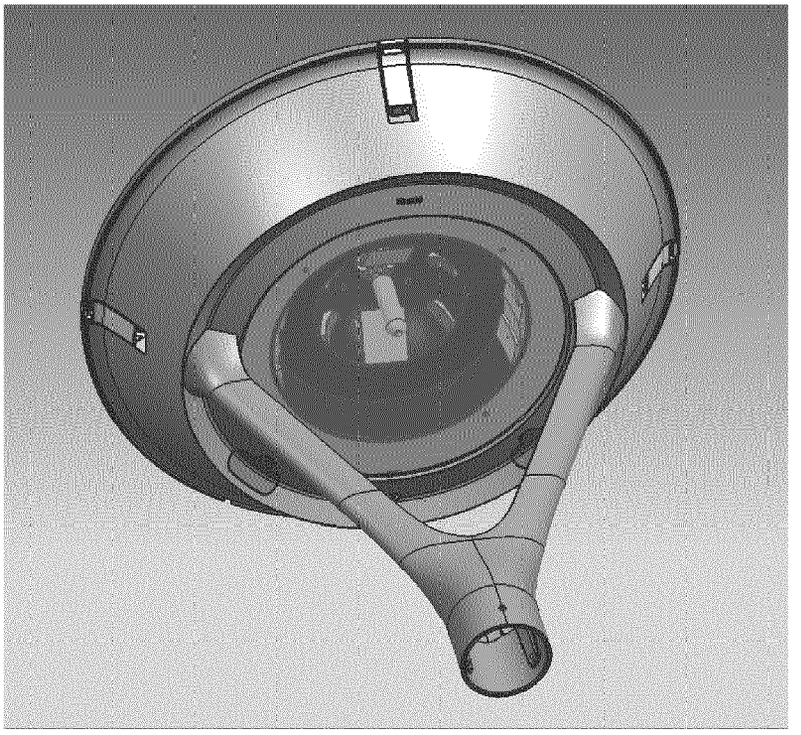


Fig. 3

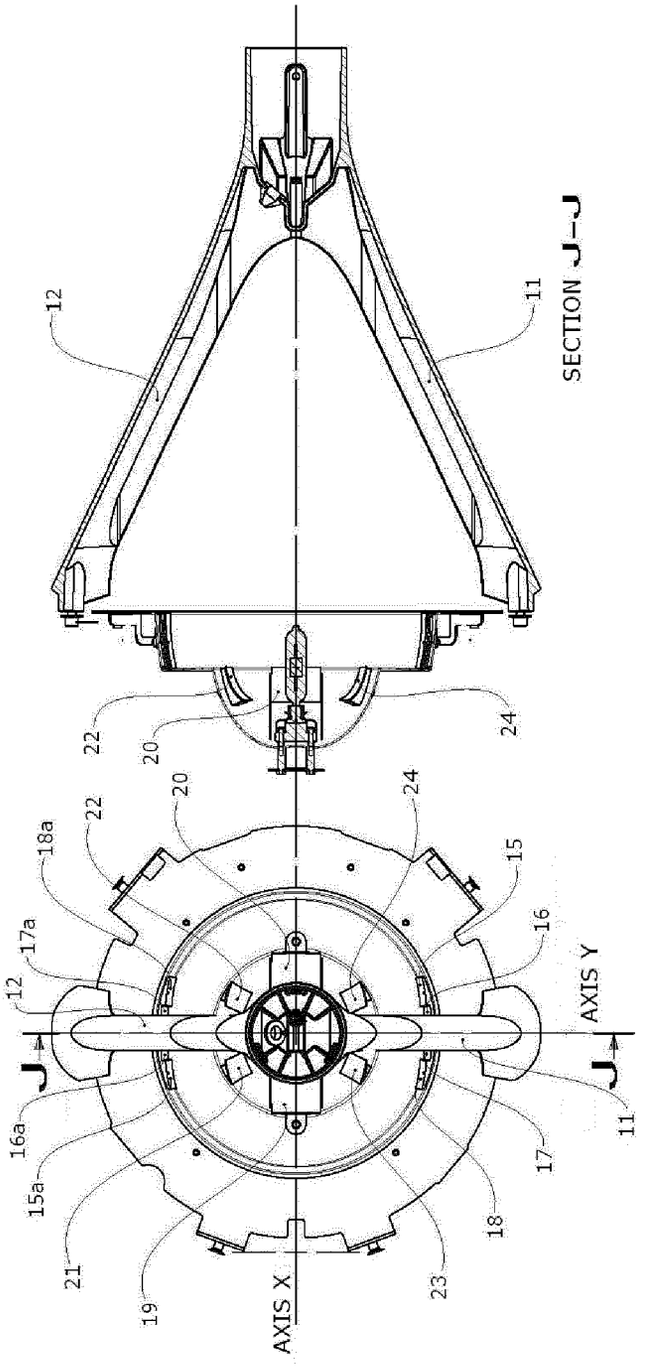
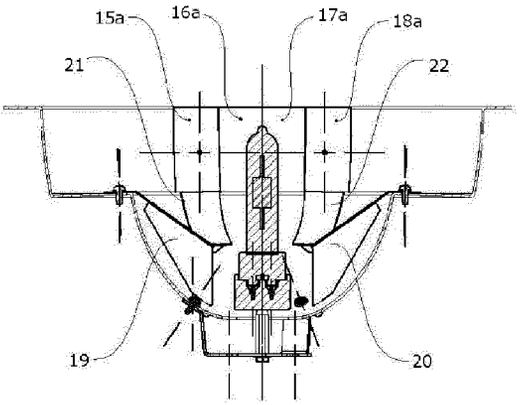
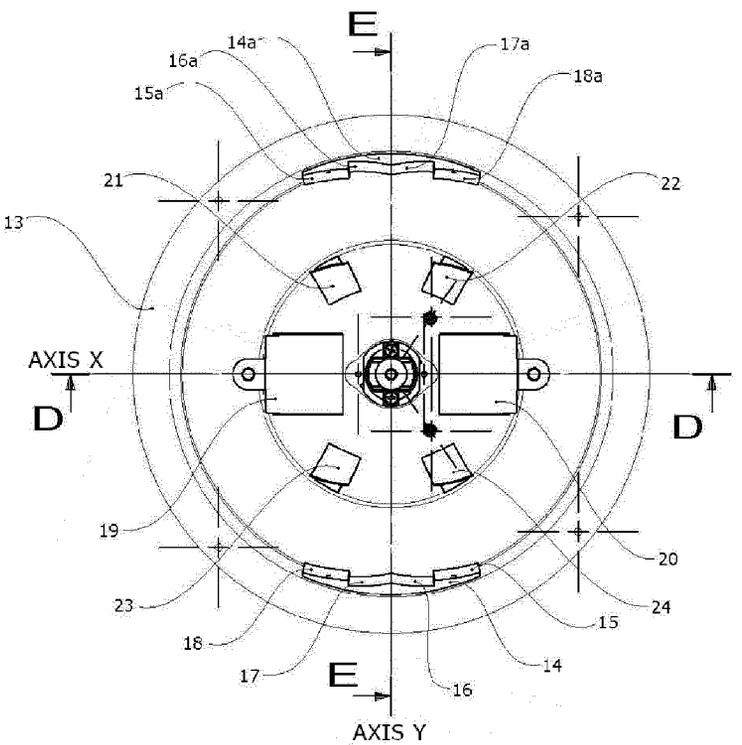
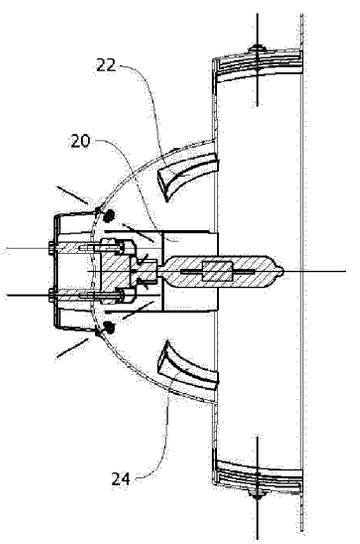

SECTION J–J
12
11
22
20
24
18a
17a
15
16
AXIS Y
J
16a
15a
21
19
AXIS X
23
18
17

Fig. 4



SECTION D-D





SECTION E-E

Fig. 5

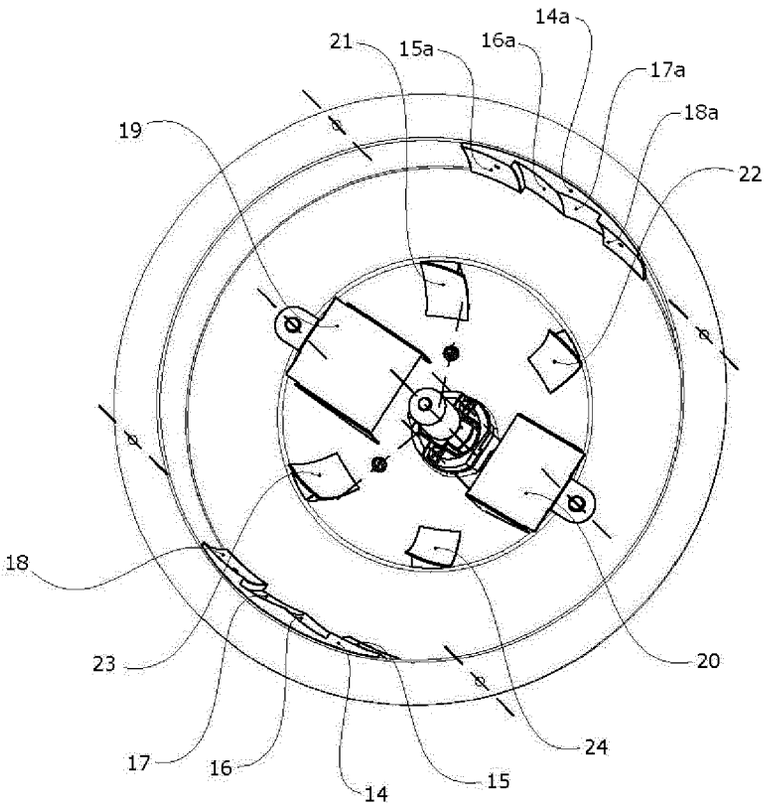


Fig. 6

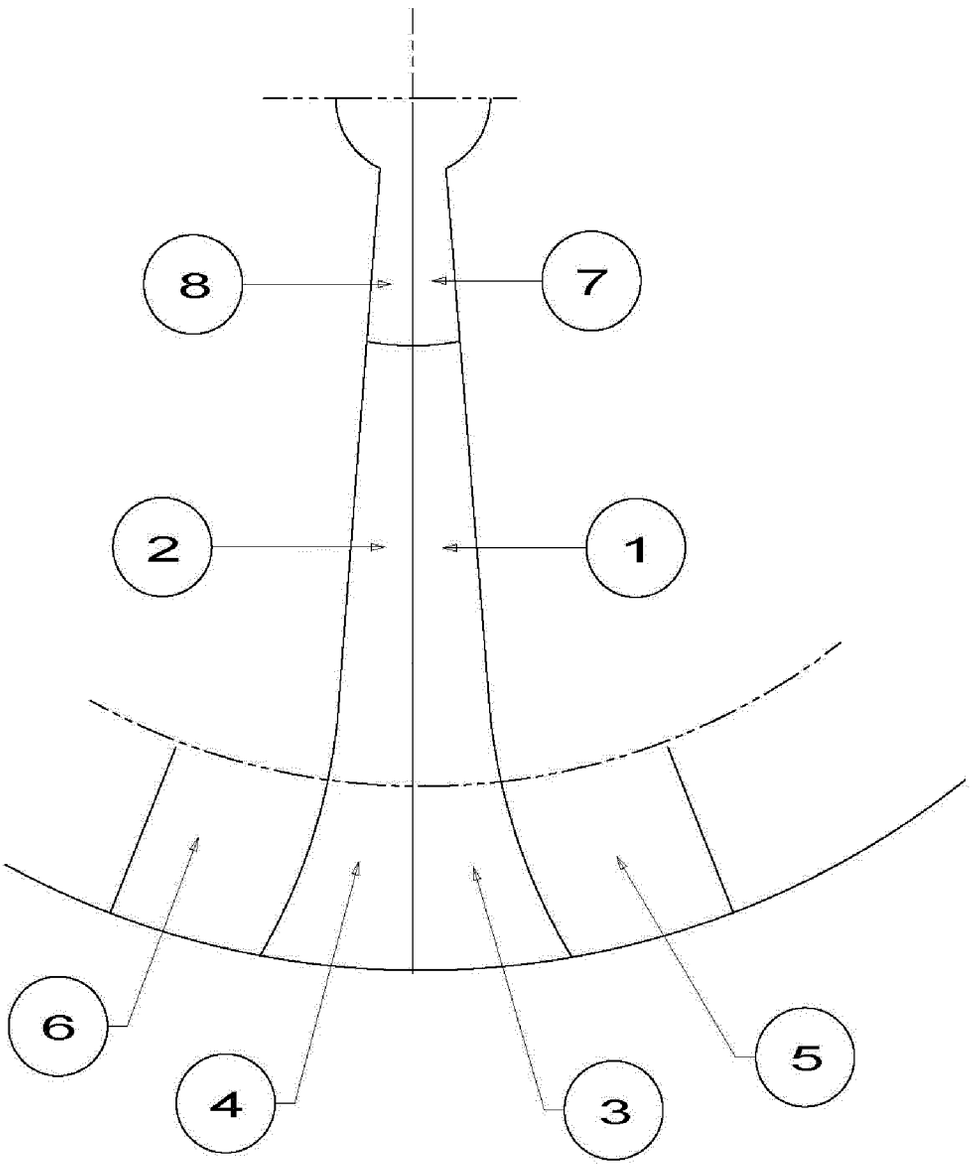


Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 12 16 3870

DOCUMENTS CONSIDERED TO BE RELEVANT

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X	US 6 190 023 B1 (LEADFORD KEVIN F [US] ET AL) 20 February 2001 (2001-02-20)	1	INV. F21S8/00
A	* column 4, line 20 - column 10, line 22; figures 1-18 *	2-10	F21S8/08
A	US 6 502 965 B1 (BRADFORD REED A [US]) 7 January 2003 (2003-01-07) * column 2, line 13 - column 4, line 10; figures 1-5 *	1-10	
A	WO 2009/145883 A1 (RUUD LIGHTING INC [US]; WILCOX KURT S [US]) 3 December 2009 (2009-12-03) * page 7, line 5 - page 9, line 12; figures 1-9 *	1-10	

TECHNICAL FIELDS SEARCHED (IPC)

F21S

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	2 July 2012	Arboreanu, Antoniu

CATEGORY OF CITED DOCUMENTS

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1 EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 12 16 3870

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