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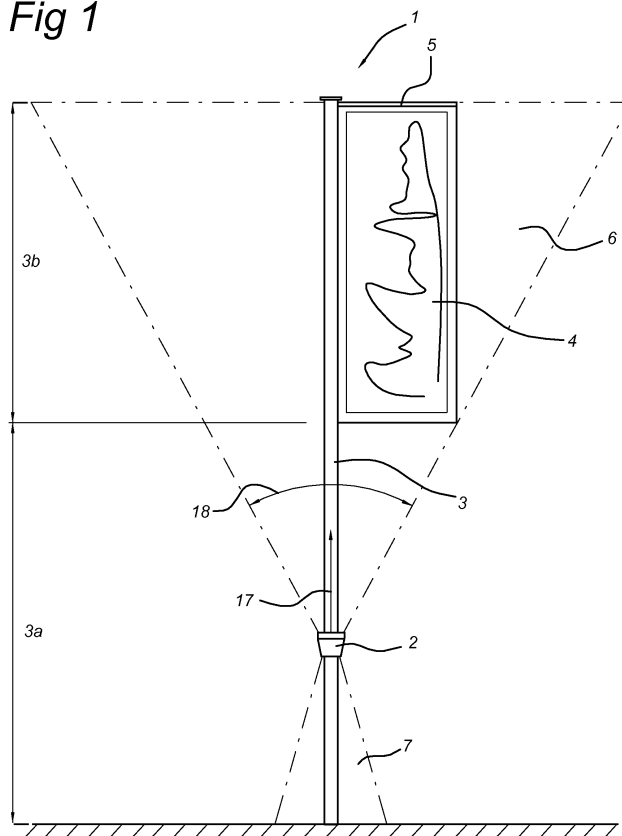
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(54) **Flag pole assembly and lighting unit for pole**

(57) Disclosed is a flag pole assembly (1). The flag pole assembly (1) comprises an elongated support member (3) having a bottom end and a top end, the elongated support member (3) defining a predetermined direction from a bottom part to a top part of the elongated support member, fastening means (5) for fastening a banner (4) to the top part of elongated support member (3), and

illuminating means (2) for generating a beam of light and illuminating said banner (4) from below. The beam of light (6) generated by the illuminating means (2) having an illumination axis (17) and illuminating direction. The illumination axis (17) coincides the elongated support member (3) and the illuminating direction is in said predetermined direction.

Fig 1



Description

Field of the invention

[0001] The present invention generally relates to lighted support poles, and more particularly, but not necessarily entirely, to lighted support poles and devices for illumination flags or banners attached thereto.

Background of the invention

[0002] At present, flag and banners are commonly used to promote a product or business and are placed before the corresponding business, building, shop, store or restaurant. To promote the product or firm at night, the flag or banner has to be illuminated.

[0003] A lighted support pole of the type defined in the opening paragraph is known from U.S. Pat. No. 3,752,975. This document discloses a pole being surrounded by a lamp so to illuminate the flag at night. U.S. Pat. No. 6,227,683 discloses an luminous pole knob to illuminate a flag attached to said pole.

[0004] U.S. Pat. No. 7,217,015 discloses a lighting device including means for illumination, means for attaching the device to a flag pole so as to direct the illumination generally in the direction of a flag.

[0005] U.S. Pat. Appl. 2004/0083633 discloses a flag pole which is partially or wholly translucent and comprises lighting elements placed inside in the flag pole, thereby illuminating the flag pole as well as the banner.

[0006] Furthermore, U.S. Pat. No. 5,988,100 discloses an apparatus for supporting and illuminating display flags. An internally lighted flag mast reflects light externally using reflected surfaces within the flag mast to illuminate a flag hanging therefrom.

[0007] Various solutions to improve the visibility of flags, banners and pennants at night are known in the art. The most widely recognized solution makes use of floodlights to improve the visibility of such flags. However, depending on the voltage range used, floodlights are often difficult to install and the investment of properly illuminating the flag and the subsequent costs of operating floodlights can be very expensive.

Summary of the invention

[0008] The present invention seeks to provide an alternative flag pole assembly to illuminate a flag or banner attached thereto.

[0009] According to the invention, the flag pole assembly comprises:

- an elongated support member having a bottom end and a top end, the elongated support member defining a predetermined direction which is from a bottom part to a top part of the elongated support member;
- fastening means for fastening a banner to the top part of elongated support member; and

- illuminating means positioned at the bottom part arranged for generating a beam of light and illuminating said banner from below, the beam of light having an illumination axis and illuminating direction;

wherein the illumination axis coincides the elongated support member and the illuminating direction is in said predetermined direction.

[0010] The invention is based on the insight that current solutions to illuminate a banner are energy inefficient. When using flood light positioned at the ground, the light source is at a relative long distance which reduces the efficiency and requires a higher light intensity of the light source when located near to the banner. When using a light source in the top of the flag pole, the beam angle of light source must be about 180 degree to illuminate the banner. Only a small portion of the beam illuminates the banner, making this solution energy inefficient. Furthermore, the intensity of the light beam decreases rapidly due to the wide angle of the beam. By having the illuminating means attached below the banner, the distance between the light source is enlarged with respect to the light source in the top and the beam angle can be reduced such that the banner is always fully illuminated.

This enables us to use a less intensive light source to illuminate the banner and provides a better, i.e. more uniform, illumination of the banner under all conditions.

[0011] In an embodiment of the invention, the illuminating means have an upper side and comprises a plurality of first light sources for generating light through the upper side, wherein the first light sources are positioned circularly around the elongated support member and are arranged to generate the beam of light. These features provide to illuminate a banner which can rotated around the flag pole. Furthermore, the flag pole will not generate a shadow on the banner, which will be the case when illuminated with ground based flood light. In a further embodiment of the invention, each of the light sources generates a sub beam of light having a beam angle which is equal to or smaller than the beam angle of the beam of light. Using light source with smaller beam angles provides a more uniform illumination from the bottom to the top of the banner.

[0012] In an embodiment, the plurality of light sources include a first type of light sources for generating first sub beams of light having a first beam angle and a second type of light sources for generating second sub beams of light having a second beam angle, wherein the first beam angle differs from the second beam angle. These features provide to improve the illumination of the banner further.

[0013] In an embodiment of the invention, the first sub beams of light form a first beam of light having a beam axis coinciding the illumination axis and the second sub beams of light form a second beam of light having a beam axis coinciding the illumination axis. In an embodiment of the invention, the first beam of light and second beam of light have a beam angle in the range of 100 - 135

degree and 30 - 60 degree respectively, preferable in the range of 115 - 125 degree and 40 - 50 degree respectively, and more preferable 120 degree and 45 degree respectively.

[0014] In an embodiment of the invention, the illuminating means have a lower side and comprises a plurality of second light sources for generating light through the lower side, wherein the second light sources are positioned circularly around the elongated support member and arranged to generate a further beam of light, said further beam of light having a illuminating axis which coincides the elongated support member and an illuminating direction is opposite to said predetermined direction. These features enable one to illuminate the ground around the flag pole with a light color that could be associated with for example the logo color of a firm or a color associated with the banner.

[0015] In an embodiment of the invention, each of the plurality of first light sources comprises a LED and a lens. These features provide an cheap solution for a light source for generating a beam of light with a defined beam angle, which is durable, light weighted and easy to manufacture.

[0016] In an embodiment of the invention, the illuminating means is a lighting unit attachable to the elongated support member. This enables us to apply the invention to existing flag poles.

[0017] In an embodiment of the invention, the assembly further comprises a first and a second sealing member for providing a seal between the lighting unit and the elongated support member. This enables one to have one lighting unit which can be attached to flag poles with different diameter.

[0018] In an embodiment of the invention, the illuminating means comprises extruding paddles and rotation means for providing a wind energy power supply for charging a battery. In another embodiment of the invention, the assembly further comprises at least one solar cell for charging a battery. These features provide solutions to omit to have an electrical connection to a mains supply.

[0019] It is an other aspect of the invention to provide a lighting unit for use in a pole for generating a beam of light, the beam of light having an illumination axis; the lighting unit comprising a plurality of light sources for generation sub beams of light forming together the beam of light; and

a through hole for entering a pole, wherein the through hole has a centre axis which coincides with the illuminating axis of the beam of light and the plurality of light sources are circularly arranged around the through hole.

[0020] The invention enables one to provide an flag pole assemble which is at least one of durable, vandal proof, weather resistant, energy efficient and easy to manufacture. Furthermore, the invention enables one to provide a illumination unit with the same characteristic and which can easily attached to a pole.

Short description of drawings

[0021] The invention will be explained in detail with reference to some drawings that are only intended to show embodiments of the invention and not to limit the scope. The scope of the invention is defined in the annexed claims and by its technical equivalents.

[0022] The present invention will be discussed in more detail below, using a number of exemplary embodiments, with reference to the attached drawings, in which

Figure 1 shows a flag pole assembly provided with a lighting unit according to the invention;

Figure 2 shows an enlarged side view of a lighting unit according to the invention attached to a pole;

Figure 3 shows a schematic top view of a first embodiment of the lighting unit according to the invention;

Figure 4 shows a schematic top view of a second embodiment of the lighting unit according to the invention;

Figure 5 illustrates the effect of using two types of light sources each having a different beam angle.

Figure 6 shows a side view of a third embodiment of the lighting unit according to the invention;

Figure 7 shows an enlarged side view of an embodiment of a lighting unit according to the invention attached to a pole;

Figure 8 shows a schematic side view of the three parts of the lighting unit shown in figure 7;

Figure 9 shows a top view of a lighting unit comprising groups of RGB LED's;

Figure 10 shows an enlarged side view of another embodiment of a lighting unit according to the invention attached to a pole;

Figure 11 shows a schematic side view of the two parts of the lighting unit shown in figure 10;

Figure 12 shows a perspective view of the lower part of an embodiment of a rotating flag pole assembly according to the invention; and

Figure 13 shows a schematic sectional view of the assembly shown in figure 12.

Detailed description of exemplary embodiments

[0023] Figure 1 shows a flag pole assembly 1 provided with a lighting unit 2 according to the invention. The flag pole assembly 1 comprises a flag pole 3, a banner 4, fastening means 5 for fastening the banner 4 to a top part of the flag pole 3 and a lighting unit 2.

[0024] The flag pole 3 is an elongated support member having a bottom end and a top end. The bottom end is located in use at the earth surface. The flag pole 3 further comprises a bottom part 3a and a top part 3b. The top part 3b is the part of the flag pole 3 to which the banner is attached and the part of the flag pole 3 above the banner 4. The bottom part 3a is the part of the flag pole below the banner 4.

[0025] The Banner 4 according to the present description is not limited to a distinctive flag having the form as shown in figure 1, but could be any type of flag, banner or pennant having any type of form. The flag could be squared, rectangular or tapering. The invention is especially advantageous when the banner is attached to a flag pole 1 by means of a support member 5, which comprises a pole having a direction that is perpendicular to the flag pole and that could rotate around the flag pole 3. At the upper side the banner is fastened to the support member 5. At the lower side, the banner could be fastened to the pole 3. Optionally, a second support member (not shown) could be used to attach the banner 4 to the flag pole assembly. The support member 5 could rotate around the pole 3. In this way, the banner 4 could rotate 360 degrees around the flag pole. To illuminate the banner at night, a lighting device is needed that could illuminate at all sides of the flag pole thus not providing at one side of the flag pole 3 a shadow or that at one side of the flag pole the banner is not illuminated due to the flag pole 3.

[0026] The lighting unit 2 forms an illuminating means for generating a beam of light 6 and illuminating the banner 4 from below. The lighting unit 2 could form an integral part of the flag pole assembly 1. In the description below, the invention will be described by means of a lighting unit 2 that could be attached to a flag pole 3.

[0027] The beam of light 6 has an illumination axis 17 which coincides the flag pole 3. Furthermore, the beam of light 6 has an illuminating direction 17 in a predetermined direction which is from the bottom end to the top end of the flag pole. Preferably, the lighting unit 2 is present about 2,45 meters or higher above the earth surface. This has the advantage that humans walking and driving across the street will not see the light sources that illuminate the banner 4.

[0028] At the upper side, the lighting unit 2 comprises light sources to illuminate the banner from below. Figure 3 shows a schematic top view of a first embodiment of the lighting unit according to the invention. At the top side, the lighting unit comprises light sources 10,11 that are positioned around a hole 13 through the lighting unit 3 from the lower side to the upper side 12 of the lighting unit 2. The light sources 10, 11 could be positioned in circles around the hole 13.

[0029] The light sources 10, 11 are preferably LED devices, which are energy efficient light sources with low power consumptions and which have a long product lifetime. An example of LED's that could be used are 15 mm LED devices from Cree. In stead of LED devices any other light source could be used, for example halogen light sources. However, LED devices consumes 100 Watt less energy than comparable halogen light sources.

[0030] The lighting unit 2 is attached to the flag pole 3 below the banner. The distance between the lighting unit 2 and banner 4 depends on the beam angle 18 of the lighting unit 2. The Beam Angle is the angle between the two directions opposed to each other over the beam axis

for which the luminous intensity is half that of the maximum luminous intensity. The luminous intensities are measured in a plane normal to the nominal beam centerline. The distance and beam angle should be chosen such that the lighting unit 2 fully illuminates in use the lower side of the banner 4. Thus, the wider the beam angle 18, the shorter the distance between the lighting unit 2 and banner 4 can be. It should be noted that the beam axes of the respective light sources 10, 11 should not necessarily be parallel to the beam axis or illumination axis 17 of the lighting unit 2. The beam axes may have an angle with respect of the axis of the flag pole. In that case the light sources generates a sub beam of light having a beam angle which is smaller than the beam angle of the beam of light 6.

[0031] In case a banner is at least two times higher than width, as shown in figure 1, the lighting unit 2, comprises a plurality of light sources of a first type 10 and a plurality of light sources of a second type 11. A light source of the first type 10 is arranged to generate a sub beam of light having a first beam angle. A light source of the second type 11 is arranged to generate a sub beam of light having a second beam angle. The first beam angle differs from the second beam angle. The first sub beams of light form a first beam of light having a beam axis coinciding the illumination axis and the second sub beams of light form a second beam of light having a beam axis coinciding the illumination axis. The first and second type of light sources could be obtained by using different lenses with different optical characteristics in the light path of the LED.

[0032] Figure 5 illustrates the principle of using to types of light sources. The first type of light sources generates a first beam of light 10b having a wider beam angle than a second beam of light 11b generated by the second type of light sources. It can be seen that the first beam of light 10b illuminates at least the whole lower side of the banner 4 and the upper side of the banner with an intensity that is much lower than the upper side. The first beam of light 10b has such a beam angle that at the level of the lower side of the banner 4, the cross section of the first beam of light 10b approximately corresponds to the area wherein the lower side of the banner can be present. The second beam of light 11b has such a beam angle that at the level of the upper side of the banner 4, the cross section of the beam of light 11b approximately corresponds the area wherein the upper side banner can be present.

[0033] In an embodiment, the first beam of light and second beam of light have an beam angle in the range of 100 - 135 degree and 30 - 60 degree respectively, preferable in the range of 115 - 125 degree and 40 - 50 degree respectively, and more preferable 120 degree and 45 degree respectively. In these embodiments, the beam axis of the respective light sources 10, 11 is assumed to be parallel to the flag pole. The beam angle of the first type of light sources is chosen such that the beam generated illuminates area corresponding to the lower

side of the banner 4 and the beam angle of the second type of light sources is chosen such that the beam generated illuminates the area corresponding to the upper side of the banner. This enables us to illuminate more uniformly the banner.

[0034] As mentioned before, the beam axis of a light source 10, 11 may be angled with respect to the axis 17 of the flag pole 3. The beam axes and beam angles of the first and second type of light sources could be chosen such that the second type of light sources generates a beam of light having a beam angle sufficient wide to illuminate at least the upper side of the banner 4 and the first type of light sources illuminate at least the part of banner that is not illuminated by the second type of light sources. In this case a cross section of the beam of light formed by the second type of light sources perpendicular to the beam axis is a circle and a cross section of the beam of light formed by the first beams is a circular ring.

[0035] The lighting unit 2 could further be provided with a plurality of second light sources for generating light through the lower side, wherein the second light sources are positioned circularly around the elongated support member and arranged to generate a further beam of light 7, said further beam of light having a illuminating axis which coincides the elongated support member and an illuminating direction is opposite to said predetermined direction, i.e. a direction which is to the earth surface. Any suitable type of light source could be used at the lower side of the lighting unit 2. Preferably, the plurality of second light sources comprises RGB-LEDs. This enables us to generate any type of color and to project light to the ground having the colors according to the logo of a company.

[0036] Figure 2 shows an enlarged side view of a lighting unit 2 according to an embodiment of the invention and figures 3 and 4 show schematic top views of two different embodiments that could be used for said lighting unit 2. The upper side 19 of the lighting unit 2 emits a plurality of sub light beams which together form the light beam 6 having a beam axis 17 coinciding the flag pole 3 and a beam angle sufficient to illuminate a banner. The lighting unit 2 comprises a hole from the upper side 19 to the lower side 20 for entering the pole 3 and positioning the lighting unit 2 at the desired height on the pole 3.

[0037] The lighting unit 2 includes attaching means 8 for attaching the unit 2 to the pole 3. Examples of attaching means are screws, bolts, Hex screws, Torx screws, etc. The housing of the lighting unit 2 could be made of aluminum, stainless steel, synthetic material or plastic or any other suitable material. Preferably, light weighted materials, weather resistant materials and materials that could be painted easily are used. A sealing member 9 could be used to provide a watertight seal between the pole 3 and the lighting unit 2. The thickness of the seal depends on difference between the diameter of the hole 13 and the diameter of the pole through the hole 13.

[0038] Figure 3 shows an embodiment wherein the lighting unit 2 comprises one or more components with

a hole 13 for entering a pole. Figure 4 shows an embodiment wherein the lighting unit 2 comprises half circular components 2a, 2b which when coupled together form the unit with the hole. In this embodiment the half circular components comprises means (not shown) to fasten the parts together. Solutions to fasten the parts together are commonly known to a person skilled in the art. The embodiment with half circular components enables us to attach a lighting unit to existing flag poles without the need to lowering the pole.

[0039] In both embodiments the light sources 10, 11 are circularly positioned around the hole. By using two or more types of light sources 10, 11, each generating a light beams having different beam angles, the lighting unit 2 generates a composite light beam having a light distribution suitable to illuminate a banner in a uniform way, wherein each part is illuminated sufficiently by the beam of light. A banner could have for example a size of 1200 x 4000 mm. In an embodiment the light sources 10 are LED's with a beam angle of 45 degrees to provide sufficient light to the upper part of the banner and the light sources 11 are LED's with a beam angle of 120 degrees to provide sufficient light to the lower part of the banner. The light sources of the first type 10 and the light sources of the second type 11 are alternating positioned around the hole 13.

[0040] The lighting units describes above could be main powered. In that case, the lighting unit 2 comprises electrical connections to a mains supply. The wires to the mains supply could be through the flag pole. However, by using LED's it is possible to integrate a power supply in the flag pole assembly or even in the lighting unit itself. In an embodiment, solar cells are provided on the housing of the lighting unit 2. The upper side 19 and side walls of the lighting unit could be used to position the solar cells 24. In another embodiment, the solar cells are positioned on the pole and an electrical connection between the solar cells on the pole and the lighting unit provides the necessary electricity to empower the lighting unit. Preferably, the lighting unit or flag pole assembly 1 comprises a power storage, to store the energy generated by the solar cells.

[0041] Figure 6 shows an embodiment of the invention which uses wind power to generate energy. In this embodiment, the lighting unit 2 comprises a extruding paddles 16 and rotation means for providing a wind energy power supply for charging a battery. The extruding paddles 16 catch the wind and make a rotating part of the lighting unit to rotate around the pole. A person skilled in the art could easily find several solutions to add this functionality to a lighting unit 2. The light sources 10, 11 could be part of the rotating part as the rotation axis, which is the centre axis of the flag pole coincides the beam axis. In stead of in the lighting unit, a wind turbine could be provided in the top of the flag pole assembly.

[0042] In another embodiment, the lighting unit is powered by a fuel cell. In a fuel-cell hydrogen is reacted with oxygen to produce water and electricity, the latter of

which is used to power the light sources.

[0043] Figure 7 shows an embodiment of a flag pole assembly wherein the lighting unit 2 is composed of three parts. A first and second light source parts 21, 22 comprising light sources and a middle part 23 for coupling the first and second light source parts 21, 22. A light source part could comprises only LEDs generating white light, which could for example be Cool White, Neutral White, Warm White, or one color, for example Royal Blue, Blue Green Amber, Red-Orange, Red. A light source part could also comprise a groups of RGB (Red Green Blue) LEDs. When controlled by means of a color mixing unit, this allows us to generate any type of light color with a group of RGB LEDs.

[0044] Figure 8 shows a schematic side view of the three individual parts of lighting unit 2 shown in figure 7 before coupling them together.

[0045] Figure 9 shows a top view of an embodiment of a light source part using groups of RGB LEDs 25. A group of RGB LEDs comprises at least one red LED, at least one green LED and at least one blue LED. The groups of RGB LED's 25 are evenly distributed around the hole 13. It might be clear that the lighting unit in figure 9 could be composed be coupling to half circular lighting units as shown in figure 4.

[0046] Figure 10 shows an embodiment of a flag pole assembly arranged to illuminate only the banner above the lighting unit 2 and not the ground below the lighting unit 2 and around the flag pole. This embodiment of the lighting unit 2 comprises two parts. A light source part 21 and a cover part 26 for covering the lower side of the light source part 21. The light source part 21 could comprise only one type of LED's to generate one color or groups of RGB LEDs enabling to vary the color of the light beam by means of a color mixing unit electrically connected to the RGB LED's.

[0047] Figure 11 shows a schematic side view of the two individual parts of the lighting unit 2 shown in figure 10 before the parts are coupled together.

[0048] At present rotating flag pole assemblies are available on the market. The pole rotates on bearings around its centre axis. According to the invention a self powered lighting unit could used in such assemblies. The lighting unit could be integrated or fastened to the pole and will rotate with the rotation of the pole. For lighting units which are mains powered, the flag pole assembly should comprise a wiper which conducts current between the rotating flag pole and the stationary base plate. Figures 12 and 13 show an embodiment of the invention wherein the lighting unit 2 is attached to the base plate 27. In this embodiment, the lighting unit 2 comprises a hole 13 for encompassing the rotating pole 3. The hole 13 has a diameter which is larger than the diameter of the pole, allowing the pole to rotate in the hole 13. The pole is rotary mounted on the base plate 27. As shown in figure 13, the lighting unit 2 comprises at the lower side a cavity for encompassing the base plate 27. The upper side of the lighting unit 2 includes a layer of metal, such

as aluminum or steel which is covered with a layer of tempered glass, with for example a thickness of 1 cm. The LED's are provided with different lenses to illuminate the pole and banner in a uniform or smooth manner.

[0049] The lighting unit 2 could comprises a dusk to dawn switch to switch on the light source at night and off in daytime. The lighting unit 2 could further comprise a receiver for receiving commands for controlling the lighting unit 2, for example to switch the light sources on/off, change the intensity of the light, change the color of the beam of light generated by a group of RGB LED's.

[0050] To prevent the lighting unit 2 for pollution, the surfaces passing the beams of light could be covered by a self cleaning layer, such as Self-Cleaning Glass from Pilkington.

[0051] The foregoing detailed description of the invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed, and obviously many modifications and variations are possible in light of the above teaching. The described embodiments were chosen in order to best explain the principles of the invention and its practical application to thereby enable others skilled in the art to best utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the claims appended hereto.

Claims

1. Flag pole assembly comprising:

- an elongated support member having a bottom end and a top end, the elongated support member defining a predetermined direction from a bottom part to a top part of the elongated support member;
- fastening means for fastening a banner to the top part of elongated support member ; and
- illuminating means for generating a beam of light and illuminating said banner from below, the beam of light having an illumination axis and illuminating direction; wherein the illumination axis coincides the elongated support member and the illuminating direction is in said predetermined direction.

2. The assembly of claim 1, wherein the illuminating means have an upper side and comprises a plurality of first light sources for generating light through the upper side, wherein the first light sources are positioned circularly around the elongated support member and are arranged to generate the beam of light.

3. The assembly of claim 2, wherein each of the light sources generates a sub beam of light having a beam

angle which is equal to or smaller than the beam angle of the beam of light.

4. The assembly of claim 3, wherein the plurality of light sources include a first type of light sources for generating first sub beams of light having a first beam angle and a second type of light sources for generating second sub beams of light having a second beam angle, wherein the first beam angle differs from the second beam angle. 10
5. The assembly of claim 4, wherein the first sub beams of light form a first beam of light having a beam axis coinciding the illumination axis and the second sub beams of light form a second beam of light having a beam axis coinciding the illumination axis. 15
6. The assembly of claim 5, wherein the first beam of light and second beam of light have an beam angle in the range of 100 - 135 degree and 30 - 60 degree respectively, preferable in the range of 115 - 125 degree and 40 - 50 degree respectively, and more preferable 120 degree and 45 degree respectively. 20
7. The assembly of claim 2, wherein the illuminating means have a lower side and comprises a plurality of second light sources for generating light through the lower side, wherein the second light sources are positioned circularly around the elongated support member and arranged to generate a further beam of light, said further beam of light having a illuminating axis which coincides the elongated support member and an illuminating direction is opposite to said predetermined direction. 25
30
8. The assembly of any the claims 2 - 7, wherein each of the plurality of first light sources comprises a LED and a lens. 35
9. The assembly of any of the claims 2 - 8, wherein the illuminating means is a lighting unit attachable to the elongated support member. 40
10. The assembly of claim 9, wherein the assembly further comprises a first and a second sealing member for providing a seal between the lighting unit and the elongated support member. 45
11. The assembly of any of the claims 2 - 8, wherein the flag pole is a rotating flag pole rotatory mounted on a base plate, the lighting unit being attached to the base plate. 50
12. The assembly of any of the claims 1 - 11, wherein the illuminating means comprises extruding paddles and rotation means for providing a wind energy power supply for charging a battery. 55

13. The assembly of any of the claims 1 - 11, wherein the assembly further comprises at least one solar cell for charging a battery.

- 5 14. A lighting unit for use in a pole assembly for generating a beam of light, the beam of light having an illumination axis;
the lighting unit comprising a plurality of light sources for generation sub beams of light forming together the beam of light; and
10 a through hole for entering a pole, wherein the through hole has a centre axis which coincides with the illuminating axis of the beam of light and the plurality of light sources are circularly arranged around the through hole.

Fig 1

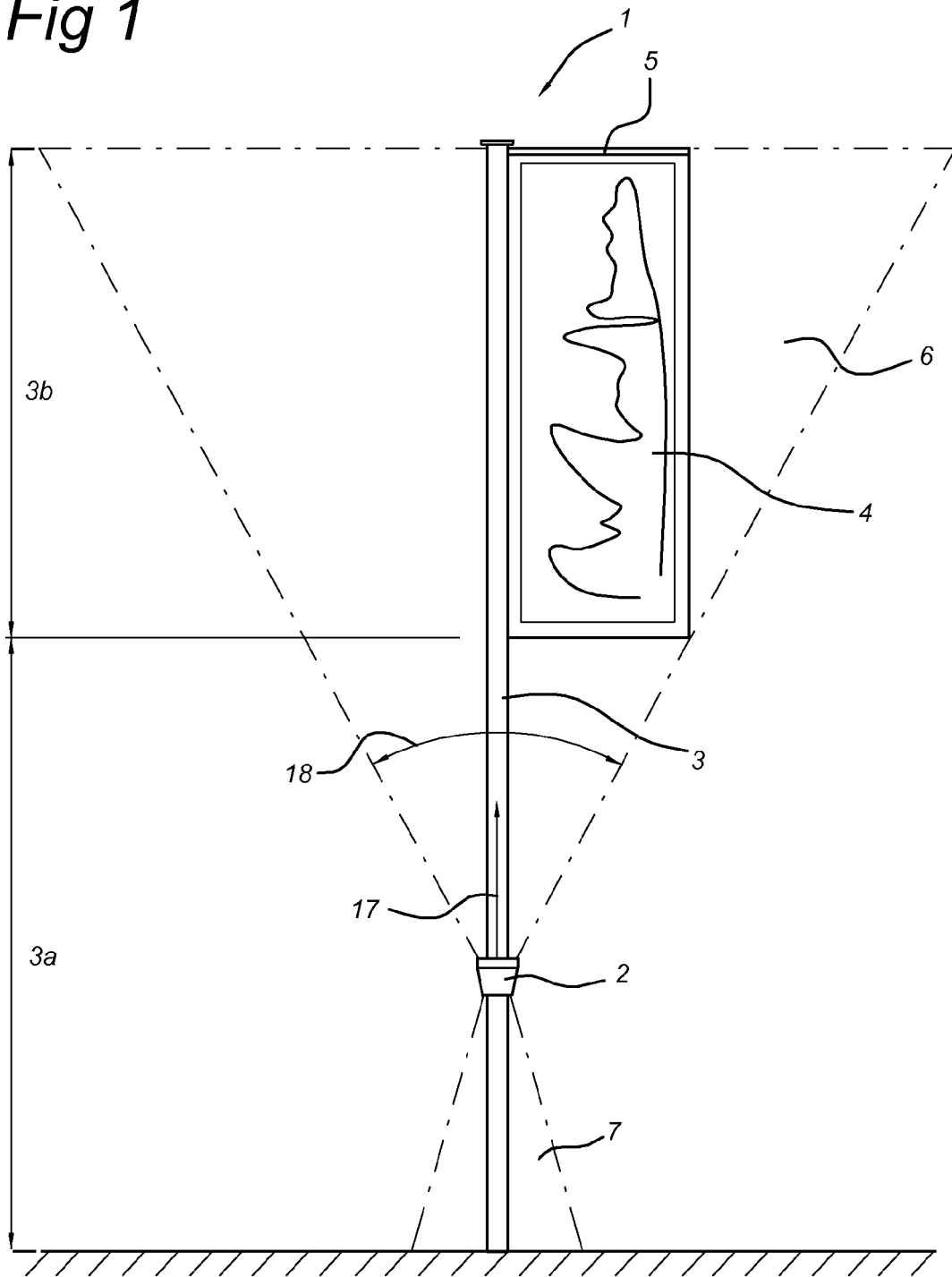


Fig 2

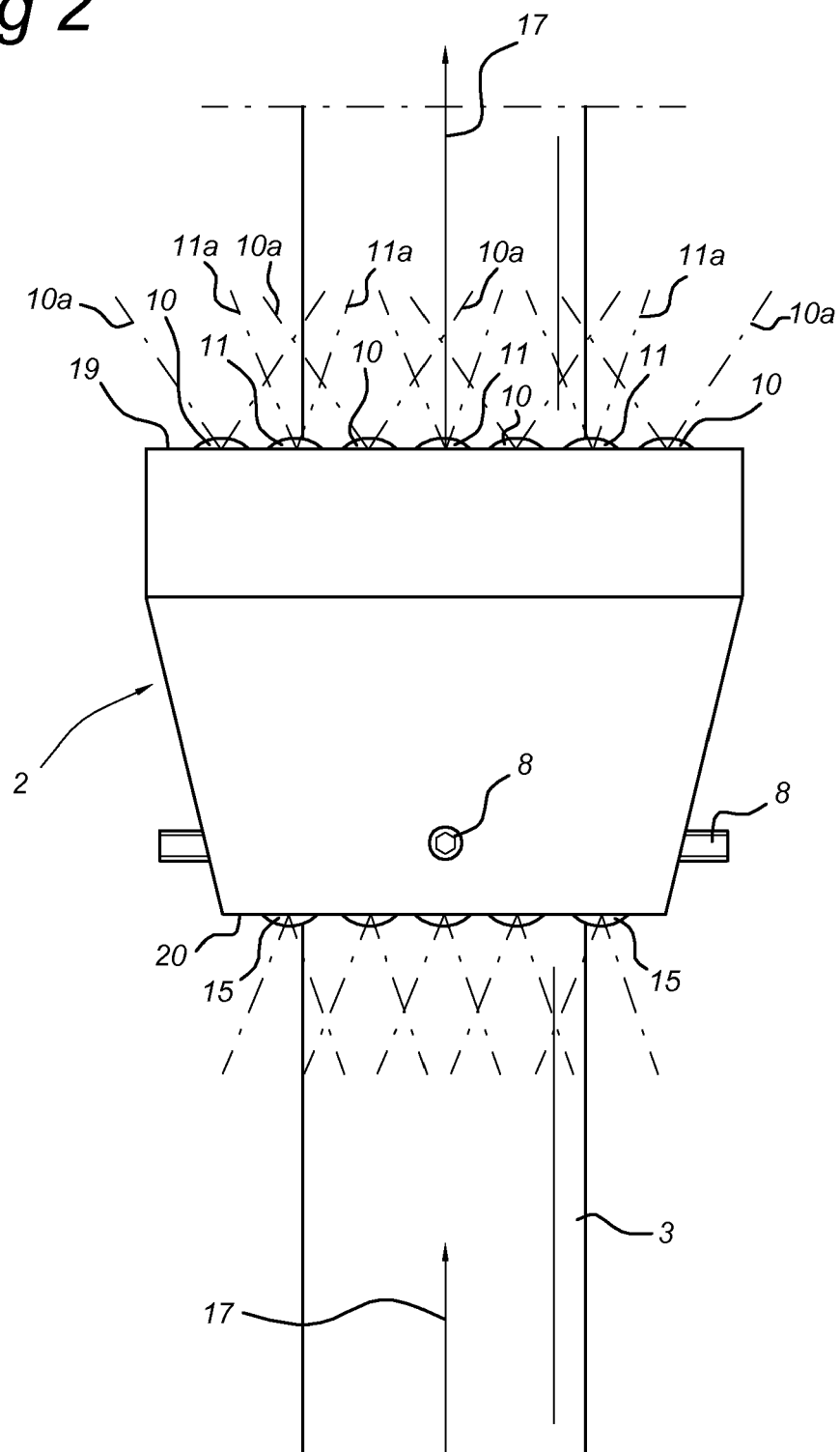


Fig 3

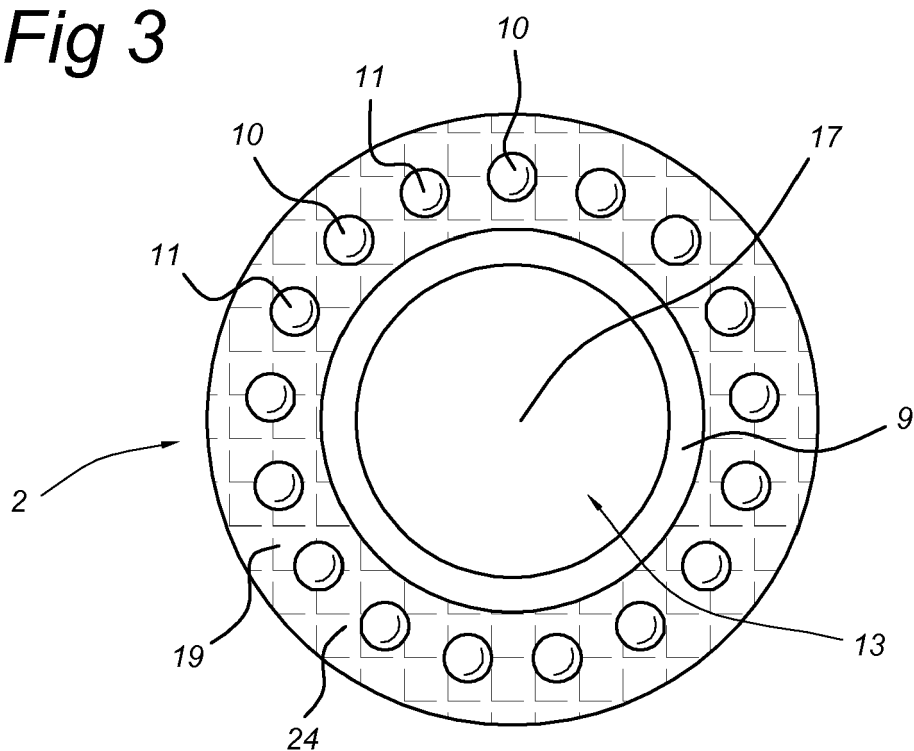


Fig 4

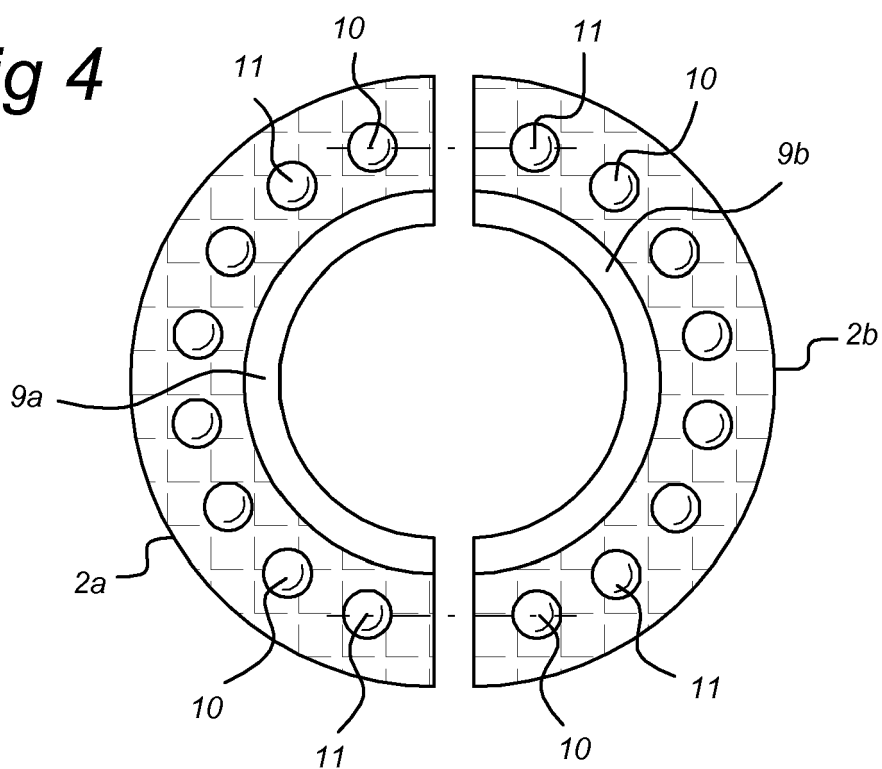


Fig 5

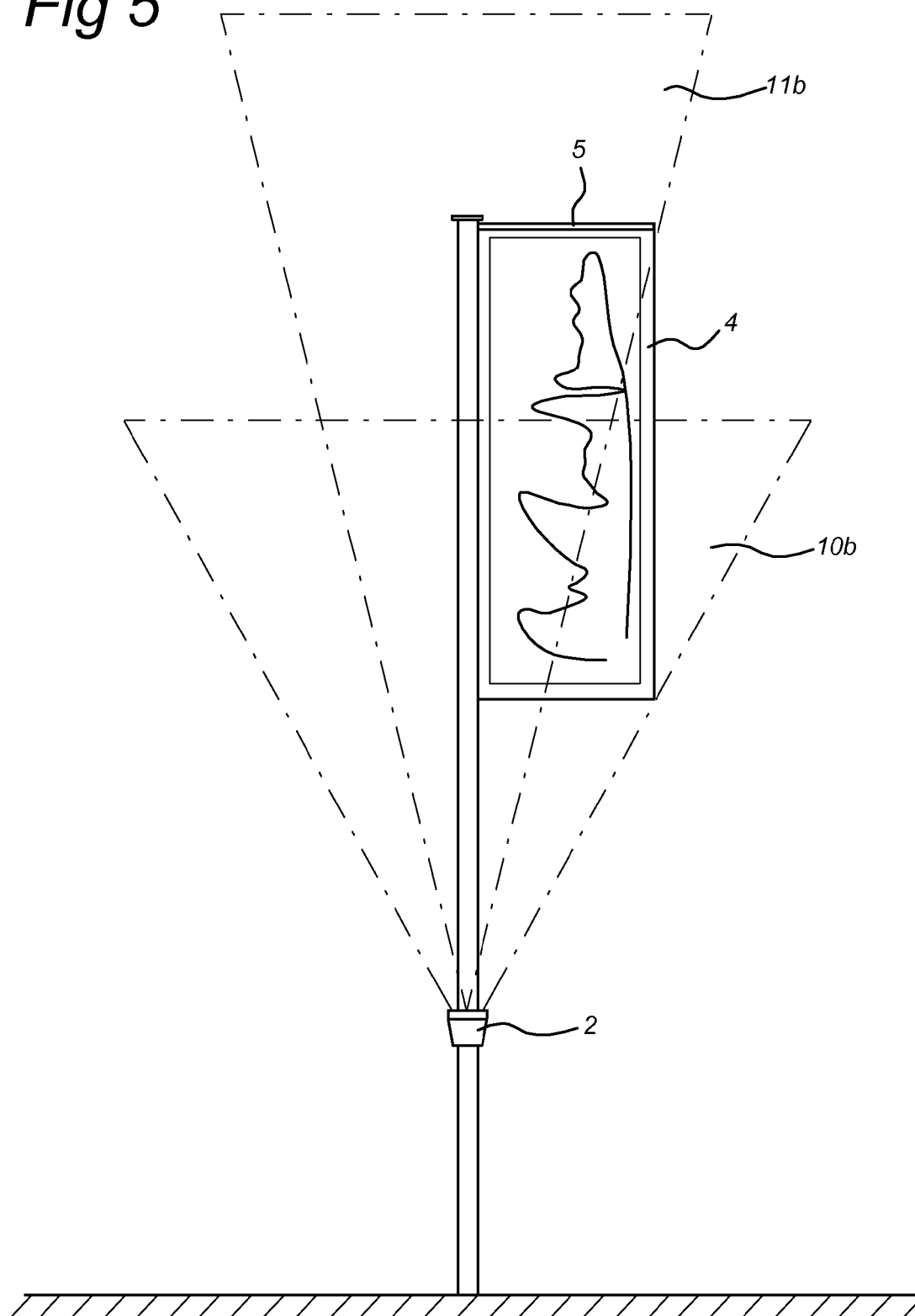


Fig 6

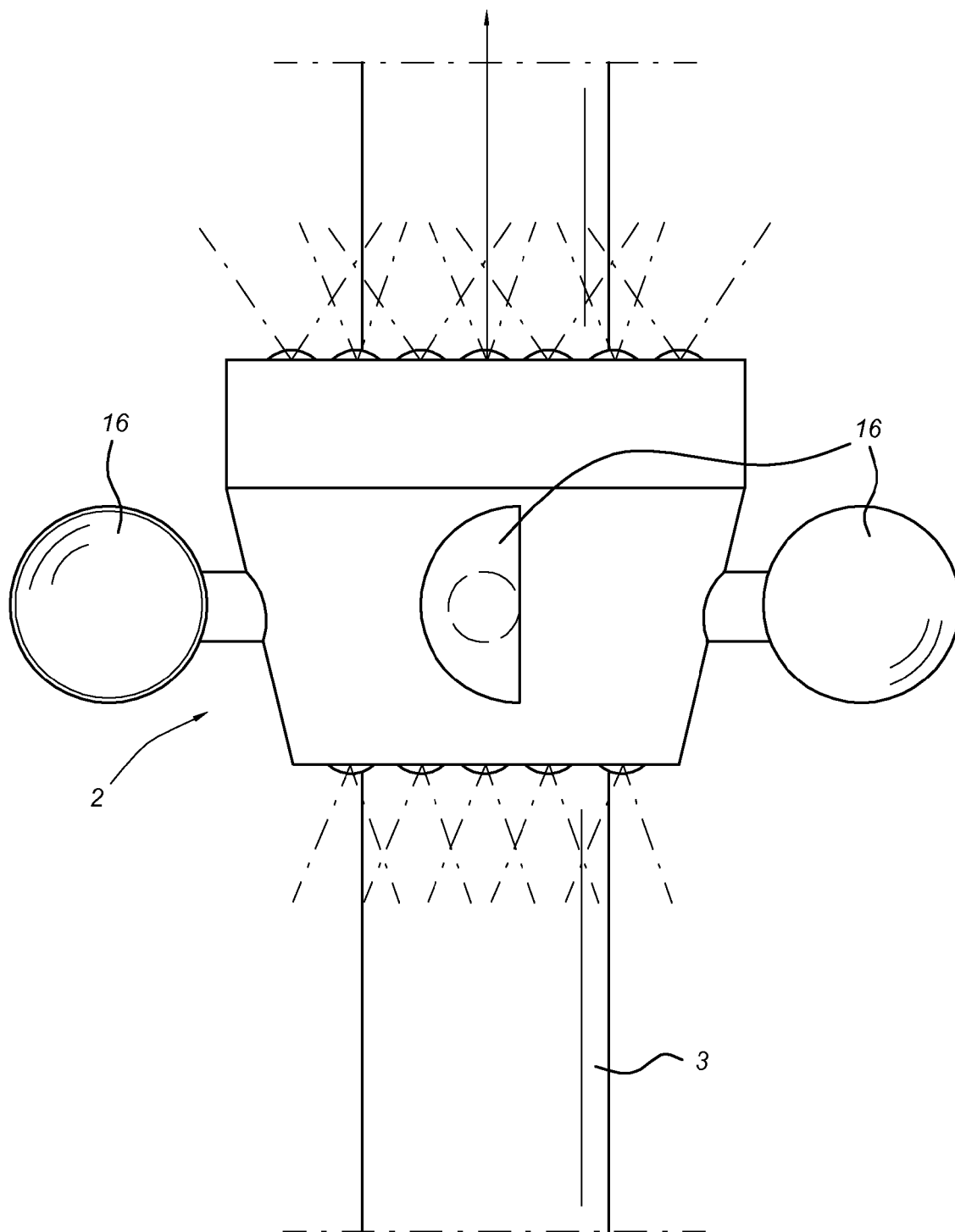


Fig 7

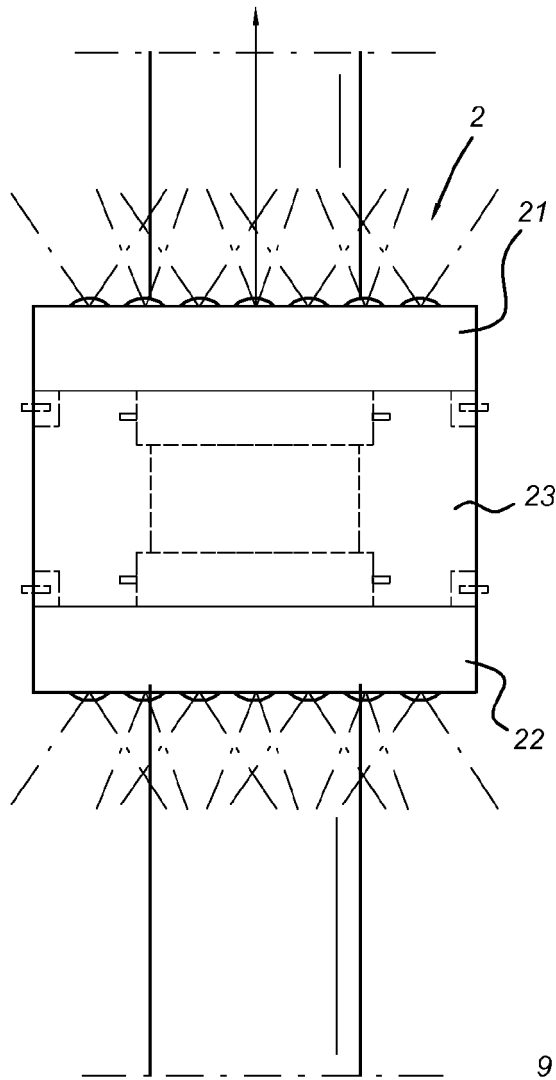


Fig 8

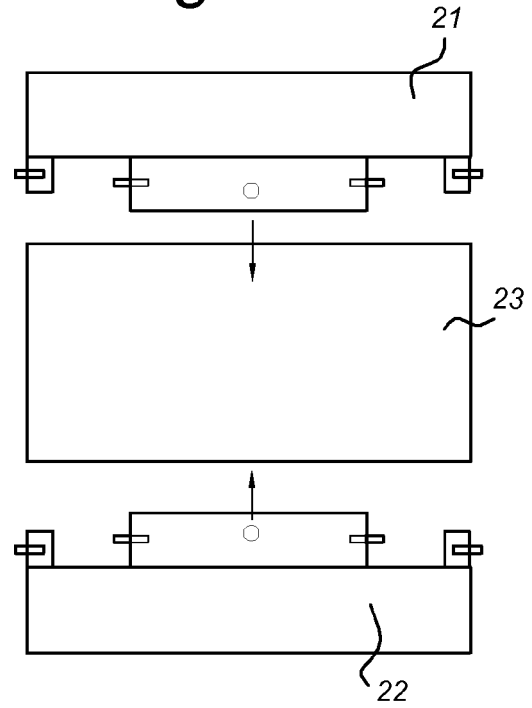


Fig 9

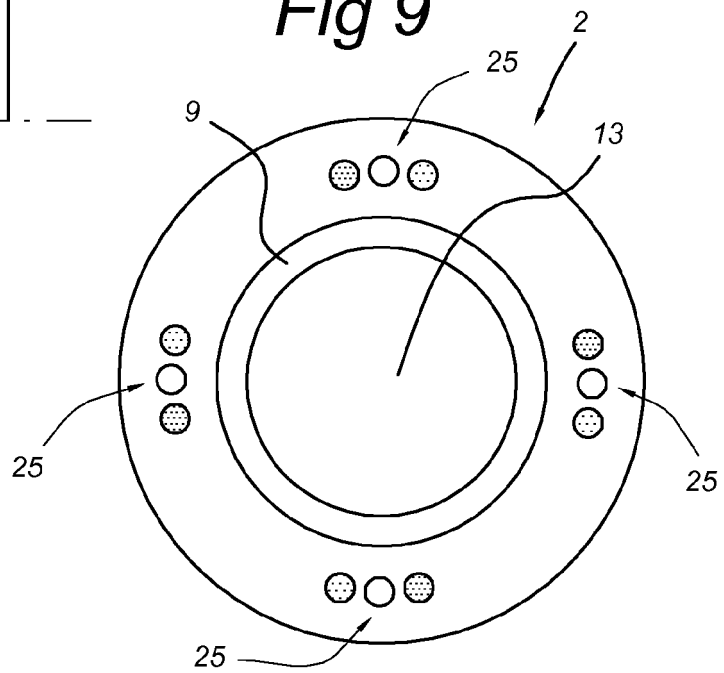


Fig 10

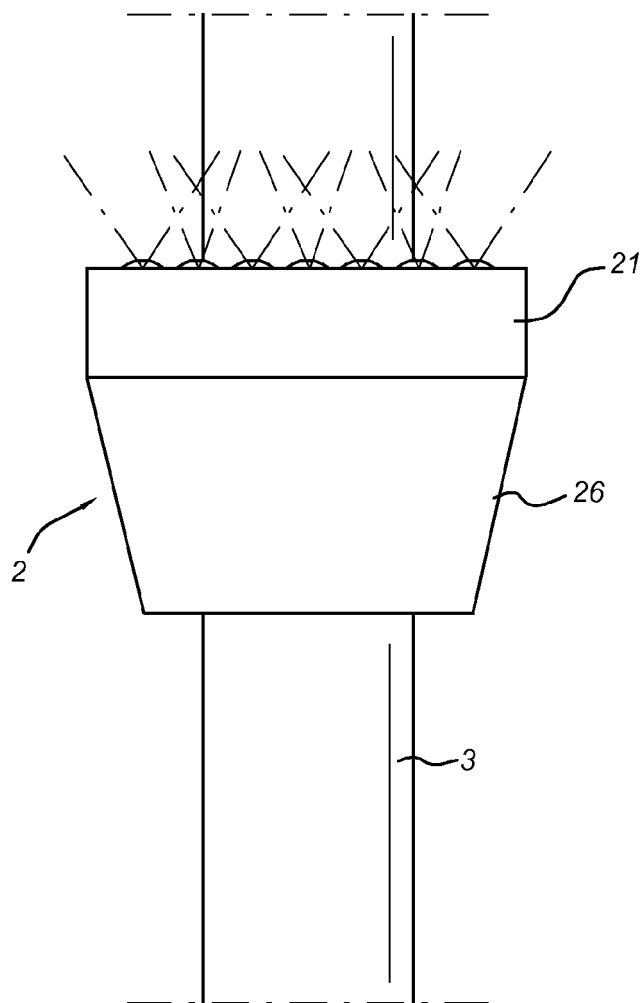


Fig 11

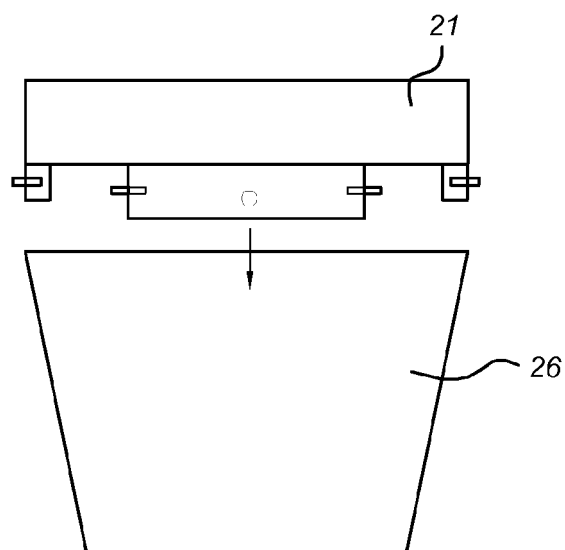


Fig 12

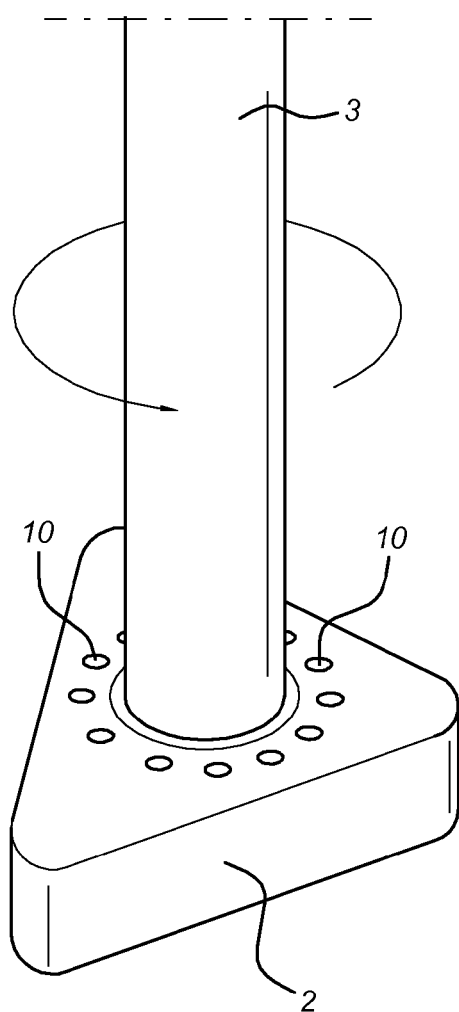
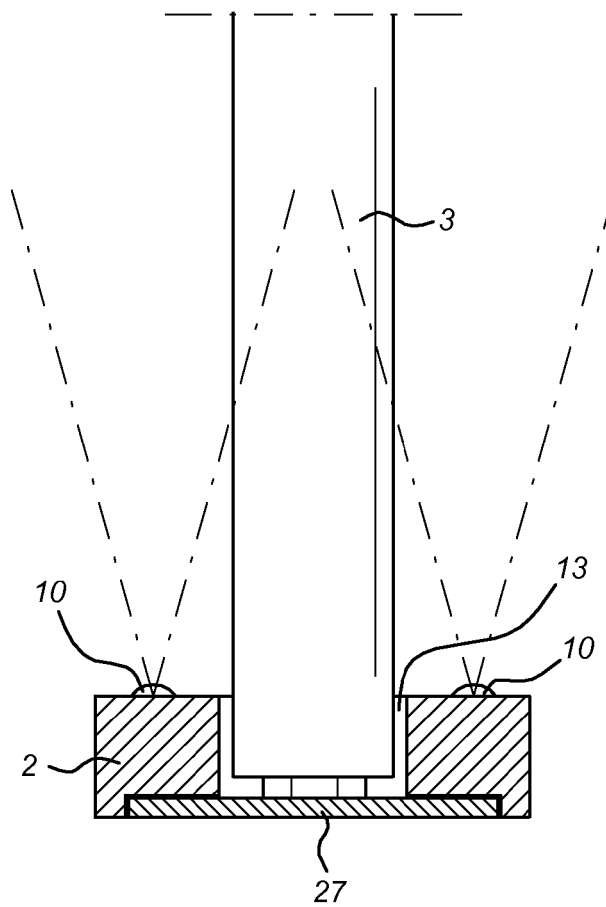


Fig 13





EUROPEAN SEARCH REPORT

Application Number
EP 08 16 6530

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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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			TECHNICAL FIELDS SEARCHED (IPC)
			G09F E04H
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 14 November 2008	Examiner Pantoja Conde, Ana
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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14-11-2008

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