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(54) **Outdoor lighting device**

(57) The present invention relates to an outdoor lighting device comprising at least one lighting element (10) and one support element (20) wherein said lighting element (10) comprises a hollow body (11), with at least one portion of surface in a transparent or translucent material and at least one lower opening, and a light source arranged inside said hollow body and configured to emit at least one light beam directed toward said lower opening, and wherein said support element (20) comprises at least one box-shaped portion (21) connected to said lighting element (10) at said lower opening, said box-shaped portion being provided with at least one display surface (22), there being arranged inside said box-shaped portion (21) at least one first plate coated with a reflecting material adapted to reflect and deflect said light beam onto said at least one display surface (22) of said box-shaped portion (21).

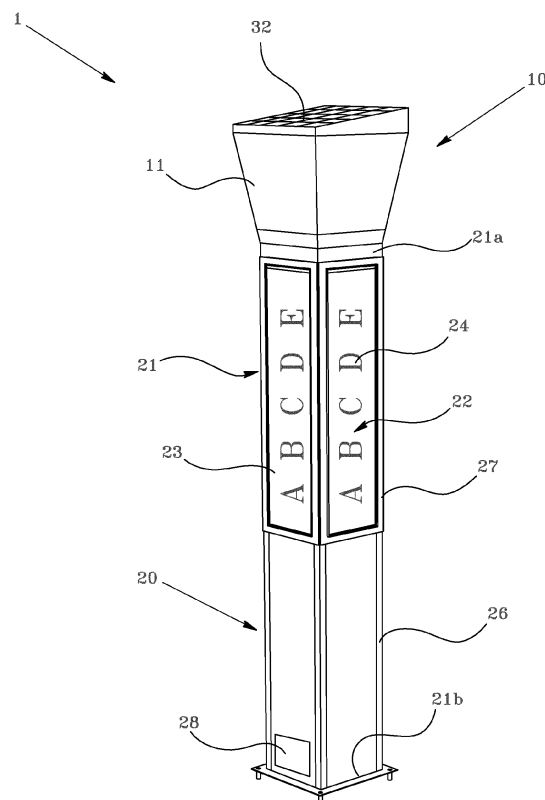


Fig. 1

Description

[0001] The present invention relates to an outdoor lighting device and in particular a lighting device adapted to be placed on roads, cycle lanes, pedestrian walkways (both public and private), car parks, squares or the like.

[0002] Open spaces such as those mentioned above are commonly provided with lighting means to offer good visibility for users even in poor lighting conditions or in the dark.

[0003] In this regard, there are known various types of lamps, street lights or the like for illuminating roads, car parks, squares, etc.

[0004] Places such as these, generally characterized by a large presence or passage of users, are often chosen for the installation of panels for the dissemination of information, promotional or advertising messages.

[0005] In many cases, said panels are constituted by simple support surfaces on which there are produced, according to prior art, images, written messages or the like. However, said panels thus formed are either scarcely visible or are not visible in poor lighting conditions or in the dark.

[0006] In other cases, said panels are provided with lighting systems adapted to enable said information, promotional or advertising messages to be read also in conditions of poor visibility.

[0007] For example, there are known advertising panels provided with lamps or the like, positioned at the perimeter of the panel to illuminate the surface thereof from the outside.

[0008] There are also known backlit advertising panels, wherein the image or the messages are reproduced on a layer of material at least partly transparent to light (generally paper or plastic materials), which is illuminated by a light source arranged behind said layer.

[0009] These lighting devices, such as street lights, lamps or the like have costs for the operator of the space in which they are installed, related both to their installation and maintenance and to their electricity supply.

[0010] Likewise, illuminated advertising panels also have the same costs borne by the operator of the space allocated or by the parties entrusted with management of the advertising space.

[0011] Only in the second case (advertising panels) said costs can be covered by any proceeds deriving from the rental of the advertising space, while this is not possible for the lighting devices.

[0012] In this context, the object of the present invention is to provide an outdoor lighting device, which overcomes the problems of the prior art described above.

[0013] In particular, an object of the present invention is to provide an outdoor lighting device configured so as to have surfaces for the dissemination of information, promotional or advertising messages.

[0014] In detail, an object of the present invention is to produce an outdoor lighting device that enables a single light source to be used both for outdoor lighting and to

illuminate surfaces intended for the dissemination of information or advertising messages.

[0015] A further object of the present invention is to produce an outdoor lighting device provided with a simplified and inexpensive structure, which enables installation costs to be reduced to a minimum.

[0016] In particular, an object of the invention is to eliminate the electrical lighting components normally placed behind illuminated advertising surfaces and the related somewhat costly structure (configured to protect said components and to enable the maintenance thereof).

[0017] Another object of the present invention is to produce an outdoor lighting device provided with an autonomous power source, for example photovoltaic, so as to also reduce operating and maintenance costs to a minimum.

[0018] These objects are substantially achieved by an outdoor lighting device comprising at least one lighting element and one support element wherein said lighting element comprises a hollow body, with at least one portion of surface in a transparent or translucent material and at least one lower opening, and a light source arranged inside said hollow body configured to emit at least one light beam directed toward said lower opening, and wherein said support element comprises at least one box-shaped portion connected to said lighting element at said lower opening, said box-shaped portion being provided with at least one display surface, there being arranged inside said box-shaped portion at least one first plate coated with a reflecting material adapted to reflect and deflect said light beam onto said at least one display surface of said box-shaped portion.

[0019] Advantageously, said display surface can be used for arranging an image containing information, promotional or advertising messages.

[0020] The portion of light beam that hits the plate is deflected onto the display surface, illuminating the advertising image from behind and making it also visible in the dark.

[0021] The lighting device according to the invention thus enables a single structure to be used both for outdoor lighting and for the dissemination of advertising messages or infractions.

[0022] Moreover, due to its form, it allows a single light source to be used also to illuminate the display surface.

[0023] Further characteristics and advantages of the present invention will become more apparent from the following indicative, and therefore nonlimiting, description of an example of a preferred but not exclusive embodiment of the auxiliary propulsion system, as illustrated in the accompanying drawings, in which:

- Fig. 1 is a perspective view of a lighting device according to the invention;
- Fig. 2 is a sectional side view of the lighting device of Fig. 1;
- Fig. 3 is a sectional top view of the lighting device of Fig. 1;

- Fig. 4 is a sectional view of a detail of the lighting device of Fig. 1.

[0024] With reference to the accompanying figures, the outdoor lighting device, indicated as a whole with 1, comprises a lighting element 10 and a support element 20 of said lighting element 10.

[0025] Said support element 20 is adapted to maintain the lighting element 10 raised with respect to the ground at a desired height, in general between 1 meter and 3 meters.

[0026] More in detail, the lighting element 10 comprises a hollow body 11 with at least one lower opening 12. The shape and dimension of said hollow body 11 is not binding for operation of the device; therefore, various shapes and dimensions can be adopted also according to aesthetic requirements.

[0027] Said lighting element 10 also comprises a light source, indicated as a whole with 30 (Fig. 2), arranged inside the hollow body 11. In detail, said light source 30 comprises at least one lamp 31 of known type.

[0028] In order to illuminate the surrounding area, according to the invention said hollow body 11 is provided with at least one portion of surface in a transparent or translucent material, for example glass or plastic materials, such as polycarbonate, methacrylate, PVC, PE, PET or the like, to enable at least a part of the light emitted by the light source 30 to pass through.

[0029] According to a preferred variant, said hollow body 11 is produced in a translucent plastic material, such as PVC, PE or PET, which enables the light to pass through in a diffused and uniform way and at the same time enables the components of the light source 30 to be concealed from view.

[0030] More in detail, said light source 30 is configured to emit a light beam also toward said lower opening 12 i.e. downward.

[0031] Said lower opening 12 can be occupied by a panel in transparent material when the hollow body 11 is produced in a translucent material, or said lower opening 12 can comprise a portion of the hollow body 11 when this is produced in a transparent material.

[0032] According to the invention the support element 20 comprises at least one laterally closed box-shaped portion 21, arranged immediately under the lighting element 10.

[0033] In detail, said box-shaped portion 21 is arranged with an upper end 21a at the lower opening 12 of the hollow body 11.

[0034] More in detail, said box-shaped portion 21 at the upper end 21a has a section substantially identical to that of the lower opening 12, so that when the lighting element 10 is connected to the support element 20, the edge of the lower opening 12 coincides with that of the upper end 21a of the box-shaped portion 21.

[0035] The section of said upper end 21a, just as that of the lower opening 12, can have any shape and dimension, providing it is compatible with that of the hollow

body 11, for example polygonal, circular, oval, elliptical, etc.

[0036] According to a preferred embodiment, said upper end 21a and said lower opening 12 have a polygonal shape, preferably triangular or square.

[0037] Preferably, but not necessarily, the box-shaped portion 21 has for the whole of its length a constant section substantially identical to that of the upper end 21. Alternatively, said section of the box-shaped portion 21 can increase or decrease with linear trend from the bottom toward the top, or said section can vary randomly, said box-shaped portion 21 having any fancy shape.

[0038] In turn, also the length of said box-shaped portion 20 is variable, and can even cover the whole length of the support 20; in other words, from the surface on which the device rests until the lighting element 10.

[0039] According to the invention, said box-shaped portion 21 comprises at least one display surface 22, which occupies at least one portion of the outer surface thereof. Said display surface 22 can comprise, for example, a panel 23 in a transparent material, such as glass, polycarbonate, polymethacrylate or other suitable plastic materials. Alternatively, said surface can comprise a panel 23 in a translucent plastic material, such as PVC, PE or PET.

[0040] Advantageously, said display surface 22 can be used for arranging an image 24 containing information, promotional or advertising messages.

[0041] For example, said image can be reproduced on a sheet 25, which can be arranged on the inside face of the panel 23 when this is produced in a transparent material.

[0042] Alternatively, said sheet 25 can be arranged on the outer face of the panel 23 when this is produced in a translucent material and if necessary covered by a further panel in a transparent material.

[0043] Again alternatively, said display surface 22 can comprise a panel 23 in a transparent or translucent material, on which the image 24 is reproduced directly (for example, by printing or similar known techniques).

[0044] To ensure complete visibility of the image 24 even in poor lighting conditions, inside the box-shaped portion 21 there is provided a first plate 40 coated with a reflecting material adapted to reflect and deflect onto the rear face of said display surface 22 a portion of the light beam emitted by the light source 30 that passes through the lower opening 12 of the hollow body 11.

[0045] In fact, by illuminating the image 24 (reproduced on a sheet 25 or directly on the panel 23) from behind, the light beam enables it to be viewed also at night or in poor lighting conditions.

[0046] The plate 40 in particular enables a portion of said light beam to be directed onto the lower part of the display surface 22, which otherwise would not be illuminated correctly, in a direct manner, thereby.

[0047] The lighting device thus configured therefore enables a single light source to be used both for outdoor lighting and to illuminate a display surface for the dis-

semination of information, advertising messages or the like.

[0048] This results in a considerable saving in both the production and the installation costs of the device with respect to prior art devices.

[0049] Preferably, said plate 40 is arranged at the lower edge 22b of said display surface 22 and lies on a plane inclined with respect thereto by an angle β comprised between 45° and 70° .

[0050] The dimension and the shape of the plate 40 can vary as a function of the dimension and of the shape of the display surface 22.

[0051] According to a preferred embodiment, said plate 40 has a width at the base substantially equal to the width of the display surface 22 and has a shape tapered toward the inside of the box-shaped portion 21.

[0052] In this way, if the box-shaped portion is provided with several adjacent display surfaces, it is possible to arrange a plate 40 at each display surface 22 (Fig. 3). For example, said plate 40 can have a trapezoidal, triangular or semi-circular shape.

[0053] The coating material of the plate 40 can be any material capable of reflecting light, such as a mirror, a polished metal material, or the like.

[0054] According to the invention, the plate 40 can also be entirely produced in said reflecting material (for example metal, glass or mirror finish plastic).

[0055] In the embodiment illustrated, the lighting device comprises a box-shaped portion 21, which acts entirely as support for the lighting element 10, with a section of polygonal shape.

[0056] According to said embodiment, said box-shaped portion 21 comprises a framework 26 provided with specific openings at the display surfaces 22.

[0057] Preferably, said display surfaces 22 comprise a frame 27, which supports the panel 23, hinged on said framework 26 so as to be able to access the inside face of said panel, for example to install or remove the sheet 25 or the panel in translucent material on which an image 24 is reproduced.

[0058] Alternatively, said box-shaped portion 21 can be produced entirely in a transparent or translucent material, so that said display surfaces 22 can occupy substantially the whole of the lateral surface thereof.

[0059] With reference to Fig. 4, there is illustrated in more detail the light source 30 according to a preferred variant of the invention.

[0060] In detail, said light source 30 comprises a photovoltaic panel 32, which enables solar radiation to be transformed into the electricity used to supply the lamp 31 at night or in poor lighting conditions.

[0061] Said photovoltaic panel 32 can be arranged in the upper part of the hollow body 11 and can act as upper cover thereof.

[0062] Advantageously, the photovoltaic panel 32 is mounted along a plane slightly inclined with respect to the ground so as to maximize the receptive capacity of the photovoltaic cells and at the same time promote the

runoff of rain water and reduce deposits of dirt and the like, which over time can deposit on the surface thereof.

[0063] Between the panel photovoltaic 32 and the lamp 31 there is interposed an accumulator 33 adapted to store the electricity produced by the photovoltaic panel during the day and which is then used to supply the lamp 31 during the night.

[0064] Charging of the accumulator 33 and supply of the lamp 31 are managed by a supply and control circuit, indicated as a whole with 34, preferably also arranged inside the hollow body 11 so as to remain isolated and protected from the outside environment.

[0065] According to a preferred embodiment, there is provided a bracket 36 connected to the lower face of the panel 32, on which the accumulator, the lamp and the control and supply circuit are hung.

[0066] Preferably, the lamp 31 is connected to the fixed bracket 36 through a pivoting arm 37 which enables the lamp to be oriented so as to hit the plates 40 and 41 with the light beam as effectively as possible.

[0067] The outdoor lighting device thus configured is extremely simple and inexpensive to produce. In fact, the box-shaped portion 21 contains neither electrical or electronic components, nor electrical connections, and therefore does not require particular measures from the point of view of insulation or of the materials used.

[0068] Alternatively, said light source can be supplied by any independent alternative energy source (not connected to the electricity network), such as fuel cells or rechargeable batteries.

[0069] Preferably, the lamp 31 is an LED lamp of tubular shape provided with LED diodes 35 arranged both on the lateral surface and on the lower end and directed toward the lower opening of the hollow body 11.

[0070] Moreover, around said lamp 31 there can be installed a parabola in a translucent material, which contributes to improved dissemination of light toward the outside of the hollow body 11, while it allows substantially free passage of the light toward the box-shaped portion 21.

[0071] According to a preferred variant, the box-shaped portion 21, in proximity of the lower edge 21b, also has at least one further opening 28 on an outer surface.

[0072] At said opening 28, inside the box-shaped portion 21, there is provided a second plate 41 coated with a reflecting material.

[0073] Also said second plate 41, just as the first plates 40, has the purpose of reflecting and deflecting laterally a portion of the light beam emitted downward from the lamp 31.

[0074] Through the opening 28, said reflected beam is directed onto the ground in the area surrounding the support element 20 of the lighting device.

[0075] This is useful, for example, to illuminate and mark a pedestrian or cycle path, in the absence of natural light.

[0076] For this purpose, the second plate 41 is ar-

ranged along a plane inclined with respect to the ground by an angle α comprised between 30° and 60° .

[0077] The materials usable are instead the same as the first plate 40.

[0078] Preferably, the opening 28 is closed with a panel 29 in transparent material, which enables passage of the light and at the same time prevents water or moisture from entering the box-shaped portion.

[0079] Through the present invention, it is therefore possible to produce an outdoor lighting device that also enables the dissemination of information, promotional or advertising messages.

[0080] In particular, the device according to the invention enables a single light source to be used both for outdoor lighting and to illuminate surfaces intended for the dissemination of information or advertising messages.

[0081] The device as illustrated also has a simplified and inexpensive structure, which enables production and installation costs to be reduced to a minimum.

[0082] The present invention, as described and illustrated, may be subject to various modifications and variants, all of which fall within the scope of the invention; furthermore, all the details may be replaced with other technically equivalent elements.

Claims

1. An outdoor lighting device comprising at least one lighting element (10) and one support element (20) wherein said lighting element (10) comprises a hollow body (11), with at least one portion of surface in transparent or translucent material and at least one lower opening (12), and a light source (30) arranged inside said hollow body and configured to emit at least one light beam directed toward said lower opening (12), and wherein said support element (20) comprises at least one box-shaped portion (21) connected to said lighting element (10) at said lower opening (12), said box-shaped portion being provided with at least one display surface (22), there being arranged inside said box-shaped portion (21) at least one first plate (40) coated with a reflecting material adapted to reflect and deflect said light beam onto said at least one display surface (22) of said box-shaped portion (21).
2. The outdoor lighting device according to claim 1, **characterized in that** said display surface (22) comprises a panel (23) in transparent or translucent material.
3. The outdoor lighting device according to claim 1 or 2, **characterized in that** said first plate (40) is arranged at a lower edge (22b) of said display surface (22).

4. The outdoor lighting device according to any one of the preceding claims, **characterized in that** said first plate (40) is inclined with respect to said display surface (22) by an angle (β) between 45° and 70° .
5. The outdoor lighting device according to any one of the preceding claims, **characterized in that** said plate (40) has a width at the base substantially identical to the width of the display surface (22) and a section tapered toward the inside of the box-shaped portion (21).
6. The outdoor lighting device according to any one of the preceding claims, **characterized in that** said light source (30) comprises at least one lamp (31), at least one photovoltaic panel (32) arranged in the upper part of said hollow body (11), an accumulator (33) the input of which is connected to the photovoltaic panel (32) and the output of which is connected to said lamp (31) and a power supply and control circuit (34).
7. The outdoor lighting device according to any one of the preceding claims, **characterized in that** said box-shaped portion (21) has a polygonal section.
8. The outdoor lighting device according to any one of the preceding claims, **characterized in that** said box-shaped portion (21) extends for the whole of the length of the support element (20).
9. The outdoor lighting device according to claim 8, **characterized in that** in proximity of a lower edge 21b said box-shaped portion (21) has at least one opening (28) on an outer surface, there being provided at said opening (28), inside the box-shaped portion (21), a second plate (41) coated with a reflecting material adapted to reflect and laterally deflect a portion of the light beam emitted by the light source (30).
10. The outdoor lighting device according to claim 9, **characterized in that** said second plate is inclined with respect to the ground by an angle (γ) between 30° and 60° .

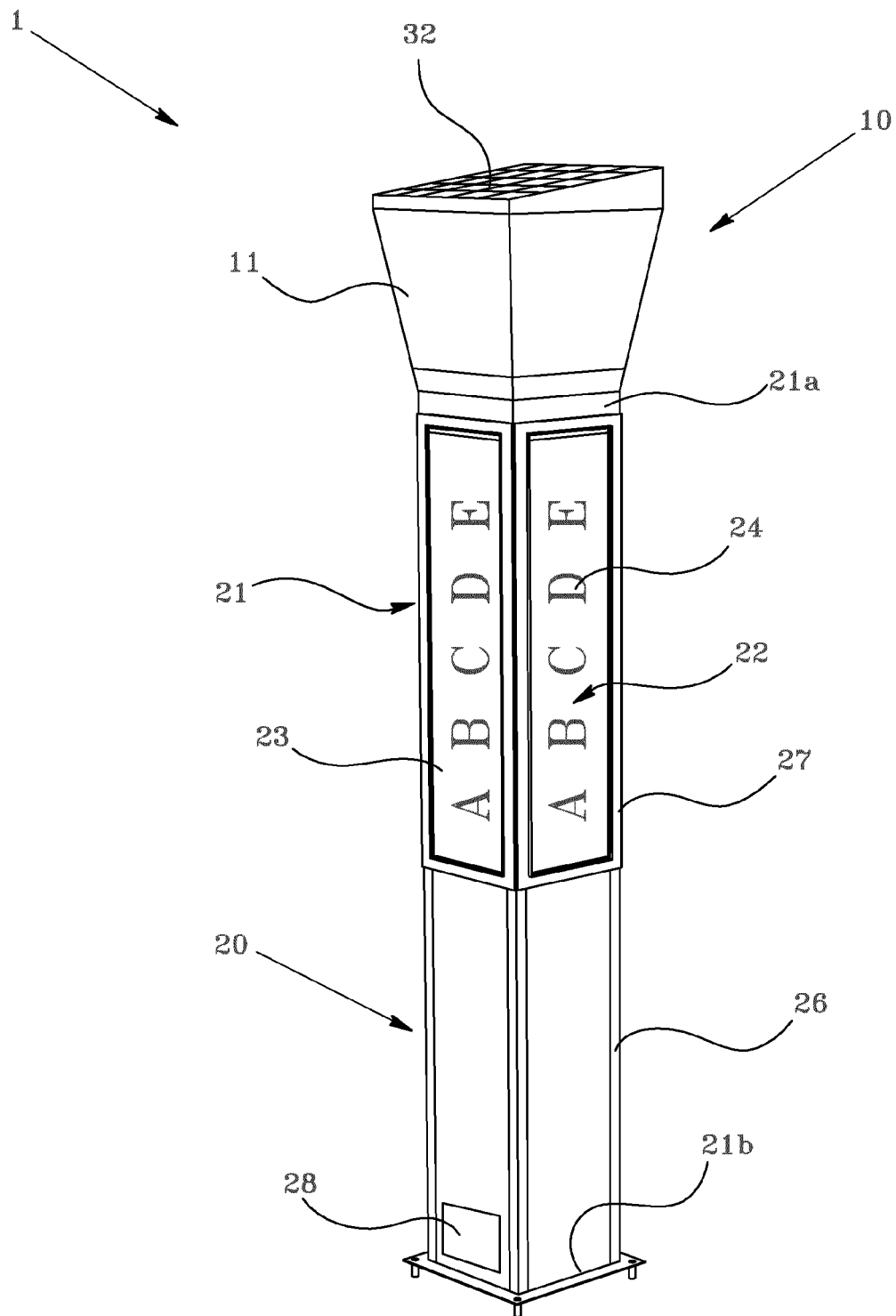


Fig. 1

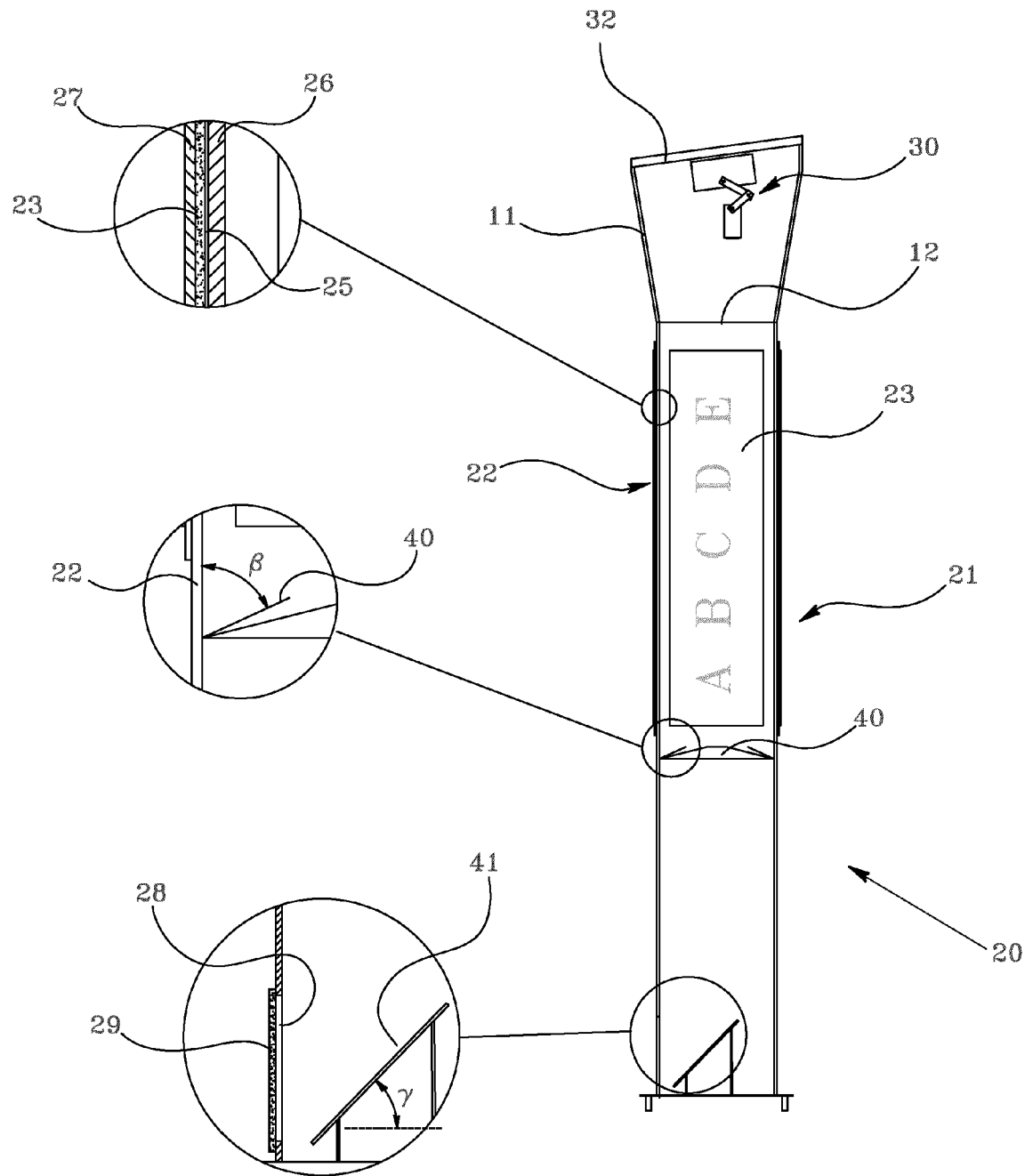


Fig. 2

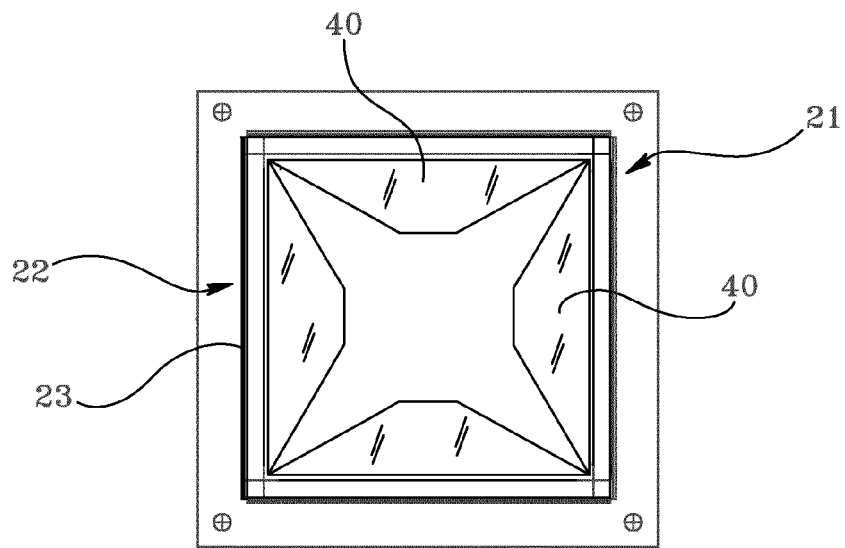


Fig. 3

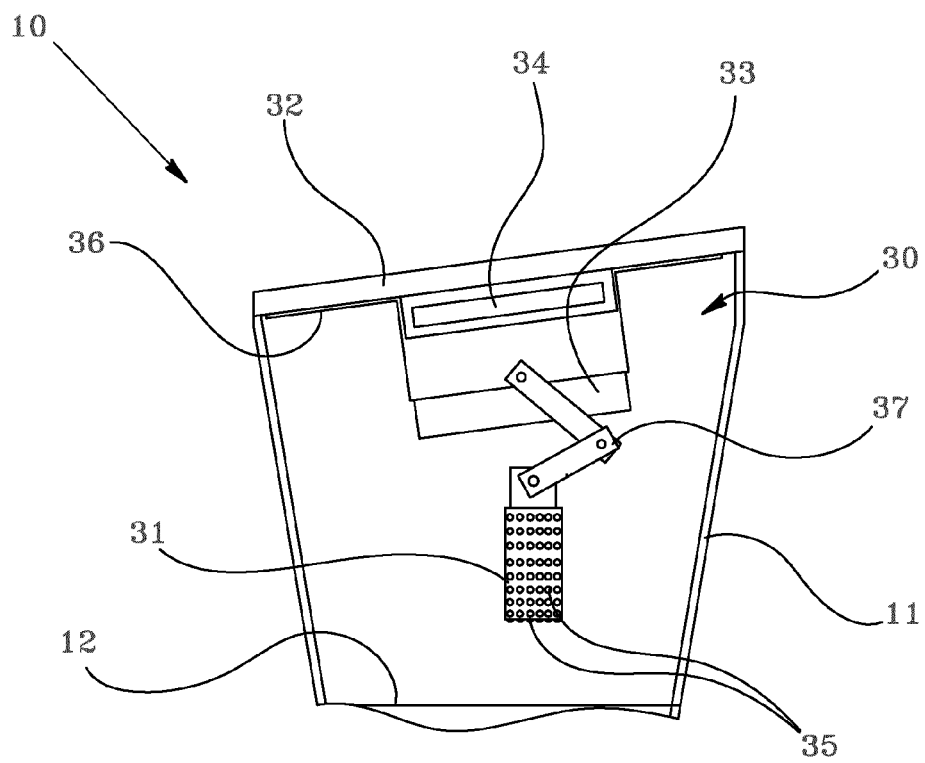


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 13 17 8962

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 4 October 2013	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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EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 13 17 8962

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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