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(54) **LED LIGHTING DEVICE**

LED-BELEUCHTUNGSVORRICHTUNG

DISPOSITIF D'ÉCLAIRAGE À DEL

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Description

[0001] The object of the present invention is an LED (Light Emitting Diode) lighting device.

[0002] More particularly the present invention relates to an LED lighting device, especially suitable for use as luminaire for roads inside and outside towns and cities and motorways, for the lighting of car parks, parks and gardens and/or pedestrian areas, for the lighting of road signs or advertising billboards or another known type of signage positioned along the road. Moreover the same device can be used for lighting elements of street furniture such as, for example, façades of public and/or private buildings or the like with poor visibility and which, consequently, require lighting and enhancement by means of special lamps or spotlights or other known means of lighting or, further, the device can be used for interior applications such as the lighting of trade fair stands and booths, public and/or private venues, etc.

[0003] As is known, traditionally, lighting devices are differentiated on the basis of the methods of attachment and securing with respect to the support structures and of further special features such as, for example, electrical safety, lighting technology performances, modes of use, etc.

[0004] With particular reference to the support structures, the lighting device can be positioned on the top of a support post (post-top connection) or can be connected by suspension to an arm (for example an arched arm) attached to the support post, with the lighting apparatus whose emitting surface is tendentially always parallel to the walking surface.

[0005] These different methods of securing the lighting apparatus with respect to the support post are chosen as a function of the type of space to be illuminated (internal or external), its size, the direction required for the beam of light (direct beam, for example, upwards or downwards with respect to the walking surface) and/or the strictly aesthetic and design features.

[0006] Document US2010/0254134, for example, describes a lighting apparatus, preferably of the type with LED lighting source, comprising a container body provided with a first end portion or upper end and a second end portion or lower end having different sections, with the lower end suitable for a post-top connection with respect to a support structure of the post type by means of a shank and the upper end suitable for accommodating and securing a covering element or cap whose lower portion has mounted at least one lighting source whose beam of light is turned downwards, i.e. away from the lower portion of said cap. A variation of the direction of the beam of light and of the method of support entails the disadvantage of having to modify the structure of the lighting device or replace some constructional components of the same.

[0007] Another known example of lighting apparatus is disclosed in document DE29609772, wherein a wall lamp is suitable for being fixed with respect to

a support arm both in an upright and an hanging position; said lamp comprises a lamp body housing a light source, a lamp head and a closing member, with the lamp body and the lamp head which are provided with means allowing said lamp to be fixed with respect to a support and defined by a carrier piece fixable to the lamp body or to the lamp head and which can support the light source by means of a socket attached to said carrier piece by means of a clamping ring and of an attachment ring.

[0008] However, also this type of lighting apparatus requires structural modifications in order to be fixed with respect a post/pole, as in a post-top configuration instead of a suspension configuration.

[0009] Consequently, for each family of lighting devices it will be necessary to provide different models and specifically suitable for the different methods of securing with respect to the support element and/or to the different modes of orientation of the light beam emitted (for example in the direction of the walking surface or in an opposite direction).

[0010] This entails considerable disadvantages linked to the need to having to provide a number of models corresponding to the different methods of securing and/or of distribution of the light with consequent high costs both of production and of storage.

[0011] A further disadvantage is represented by the fact that, in the case wherein the same lighting apparatus model is to be used for the different methods of connection with respect to the support, it is necessary to make changes with consequent increases in the times of installation and in the costs.

[0012] The object of the present invention is that of avoiding the disadvantages mentioned above.

[0013] More particularly the object of the present invention is that of providing an LED lighting device suitable for being mounted in accordance with different types of support and of distribution of the beam of light, without the need to have to make structural changes to the same device.

[0014] A further object of the present invention is that of providing a lighting device which allows the storage costs to be limited both for the manufacturer/distributor of the device and for the user.

[0015] A further object of the present invention is that of providing a lighting device which is easy and convenient to mount or dismantle in the case of maintenance, inspection or change in configuration.

[0016] A further object of the present invention is that of making available to users an LED lighting device suitable for guaranteeing a high level of efficiency and reliability in time and such, moreover, as to be able to be easily and economically manufactured.

[0017] These and other objects are achieved by the present invention which has the features as claimed in the independent claim 1.

[0018] According to the invention an LED (Light Emitting Diode) lighting device, flexible and modular, is pro-

vided, especially suitable for being used as a luminaire for outdoor and indoor environments and comprising a first body, a second body in contact with said first body and a luminaire coupled with said second body, said bodies being mutually independent and provided with means suitable for a fast and direct connection with respect to a support post for a post-top or suspension mounting and interface means for a quick and easy coupling of said luminaire on the basis of the mounting configuration and the lighting effect required.

[0019] Advantageous embodiments of the invention are disclosed by the dependent claims. The constructional and functional features of the LED lighting device of the present invention will be made clearer by the following detailed description, in which reference is made to the accompanying drawings which represent a preferred and non-limiting embodiment thereof and in which:

Figure 1 represents schematically a front view of the LED lighting device of the invention suitable for a suspension connection;

Figure 2 represents schematically an enlarged and sectioned detail of a portion of the device enclosed in the circle indicated by "X" in Figure 1;

Figure 3 represents schematically a front view of the device of the invention in the configuration suitable for a post-top connection;

Figure 4 represents schematically an enlarged and sectioned detail of a portion of the device enclosed in the circle indicated by "Y" in Figure 3;

Figure 5 represents a sectioned schematic view of a component of the lighting device of the invention; Figure 6 represents schematically an enlarged detail of a portion enclosed in the circle indicated by "Z" in Figure 5;

Figures 7 and 8 represent schematically the lighting device secured to a support post, respectively, in a post-top and suspension configuration.

Figures 9 and 10 represent schematically and in a front view a sequence of phases relating to the packaging of the device of the invention and to the packaged lighting device.

[0020] Referring to the aforementioned drawings, the LED lighting device of the present invention, denoted overall by 10 and 10' in Figures 1 and 3 with reference to the two configurations of installation of the same device, comprises a first body 12 which is defined by a lower portion 12' with truncated cone shape and by an upper portion 12", likewise truncated cone in shape, which develops from an upper base of the lower portion 12' with a lower base surface greater with respect to that of the upper base of said lower portion and with a taper corresponding to that of the same lower portion. The lower portion 12' of said first body 12 has internally an axial hole (not shown in the drawings) suitable for allowing the lighting device to be fitted on a support post 11 and to secure it in accordance with a configuration of the post-

top type as schematised in Figure 7. In this way the lower portion 12' defines a shank.

[0021] The first body 12 is typically made in die-cast aluminium or alloys thereof, coated (for example with polyester powders with high resistance against oxidizing agents and with high heat transmissibility) after a phospho-chromate treatment. The same first body can be made in thermoplastic material or in other known materials suitable for the purpose.

[0022] At the lower base of the lower portion 12' of the first body 12 a further shank 14 is secured, by means of a rivet 13, suitable for being inserted in the axial hole of the lower portion 12' in order to enable the connection with respect to an arm 15 secured to the support post 11 so as to realise a configuration of the suspension type, as schematised in Figure 8.

[0023] The lighting device without shank 14 is instead suitable for the connection of the post-top type and is schematised in detail in Figure 3.

[0024] All the electrical and electronic components necessary for the functioning of the lighting device and the optional devices for the regulation of the flow of light (for example smart dimmers, self-learning, etc.), emitted as a function of the features of the environment whereto the device is intended, are housed inside said first body, at the upper portion 12". The upper portion 12" defines therefore a housing compartment or container compartment of the electronic components.

[0025] At the upper base of the upper portion 12" of the same first body 12, on the opposite side with respect to that of connection with respect to the further shank 14, a second body 16 is positioned, defined by a base 18 in contact with the upper surface of the upper portion 12" of the first body 12 and wherefrom two or more arms or claws 20 develop upwards, suitable for supporting a luminaire 22.

[0026] Said arms or claws 20 are made, like the first body 12, in aluminium or alloys thereof or in a thermoplastic material or in another suitable material and can be secured with known retaining means to the base 18 or integrated and obtained in a single part with the same.

[0027] The luminaire 22, with particular reference to the embodiment as per the drawings, has a disc-shaped configuration and is defined by a container element 24 suitable for housing the electronic plates or boards 26 whereon the LED lighting sources 25 are positioned, optionally provided with lenses (primary optics) for the radiation and diffusion of the light emitted and the optics 28 (secondary optics or reflectors), the latter suitable for intercepting the beam of light emitted by the LEDs and for reflecting it in the directions required.

[0028] The container element 24, likewise made in die-cast aluminium or alloys thereof and coated (for example with polyester powders with high resistance against oxidizing agents and with high heat transmissibility) after a phospho-chromate treatment, is closed by means of a screen or covering element 30 in transparent plastic material, optionally coloured and whereon lenses (for exam-

ple Fresnel lenses) are optionally integrated, suitable for increasing the luminosity of the beam of light emitted by the LEDs.

[0029] The luminaire 22 is secured with respect to the arms or claws 20, at their free end opposite that of connection with respect to the base 18, by means of a connection through screws 32 or equivalent retaining means of the removable type (in the preferred embodiment the screws 32 are of the countersunk type).

[0030] Said luminaire can be secured to the arms or claws 20 of the second body 16 at the free ends opposite to those of connection with respect to the base 18, with the covering element 30 turned in the direction of the first body 12 or in the opposite direction as a function of the specific needs of installation and lighting as schematised, respectively, by Figures 3-4 and 1-2.

[0031] For this purpose the perimeter portion or outer edge of the container element 24 of the luminaire has two opposite chamfers or tapers 34, extending continuously or in parts along the perimeter of the same container element.

[0032] At said opposite chamfers or tapers 34 at least two pairs of opposite tapering holes 36 are formed, coaxial one to the other, symmetrical with respect to a horizontal plane, communicating and suitable for allowing the insertion of the screws 32 and the coupling with an appendage 38 formed on the end of each arm or claw 20 opposite that of connection with respect to the base 18 of the second body 16 and provided with an external profile shaped correspondingly to the tapering of the opposite holes 36.

[0033] In order to allow the coupling with the luminaire 22, the end of each arm or claw 20 has a slant 23 corresponding to the slant of the opposite chamfers or tapers 34.

[0034] Each appendage 38 has a blind hole 39 coaxial to the opposite holes 36 and suitable for allowing the insertion of the screw 32.

[0035] This configuration allows the coupling, the centring and the accurate contact between the luminaire 22 and the arms or claws 20 in the two modes of positioning of said luminaire as described above.

[0036] The electrical connection between the first body 12 and the luminaire 22 is guaranteed by a cable (not shown in the drawings) passing in one of the arms 20 and connecting to the luminaire in such a way as to allow the positioning of the same luminaire in accordance with the two positions described above.

[0037] Referring to Figures 9 and 10 a method of packing or packaging of the lighting device of the invention is shown, with said device shown dismantled (Figure 9) and positioned inside a box 40 for containment/storage and transport (Figure 10).

[0038] For this purpose an insert 42 is provided, made in cardboard, polystyrol or another material suitable for the purpose, whose external shape corresponds substantially to that of a compartment 43 defined by the assembly constituted by the second body 16 and by the

luminaire 22 and which internally has an opening or compartment 44 with shaping corresponding to that of the first body 12 and suitable for allowing the containment/insertion of said body.

[0039] In accordance with this packaging configuration the assembly defined by the second body 16 and by the luminaire 22 is positioned outside the insert 42, while the first body 12 is positioned inside the opening 44 of the same insert.

[0040] The assembly obtained in this way is then inserted inside a box 40, inside of which, likewise, the further sleeve 14 is positioned (Fig. 10).

[0041] At assembly, the device of the invention is extracted from the packing box 40, separated from the insert 42, and the second body 16, including the luminaire 22, is secured to the first body 12.

[0042] As can be seen from the above the advantages that the device of the invention achieves are clear.

[0043] The LED lighting device of the invention has the advantage of being very flexible in that it can be secured to a support element or post both in a post-top type configuration and in a suspension type configuration without the need to make structural changes to the same device.

[0044] Further advantageous is the fact that the device is of the modular type and allows advantageously and without structural changes a variation in the configuration of lighting as a function of the specific needs, simply by changing the position of the luminaire 22. Specifically, in one case the beam of light propagates away from the first body 12 and, in a further case, the same beam of light propagates in an opposite direction, i.e. in the direction of the first body 12 allowing, in this way, a change in the features and aesthetic impression generated by the lighting.

[0045] Further advantageous is the fact that the modularity of the lighting device of the invention allows, in a fast and easy manner, a change in the mode of emission of the beam of light also when the device is installed, so as to vary the light effect.

[0046] A further advantage of the device of the invention is represented by the fact that it is fast and easy to assemble/dismantle during repairs and/or maintenance.

[0047] A further advantage is represented by the fact that this device facilitates the management of warehouse stocks, both of the producer and of the distributor/customer, taking account of the flexibility and modularity of installation of the same device and of its packing configuration. In fact the features described in detail above allow a reduction in the number of components stored in the warehouse.

[0048] Further advantageous is the fact that the device of the invention has, when packaged, very reduced overall dimensions which allow easier transport thereof correlated to a reduction in relative costs.

[0049] Although the invention has been described above with particular reference to one of its embodiments given only by way of a non-limiting example, numerous changes and variations will appear clear to a person

skilled in the art in light of the description given above. The present invention therefore intends to embrace all the changes and variations which come within the scope of the following claims.

Claims

1. An LED (Light Emitting Diode) lighting device (10, 10'), flexible and modular, especially suitable for lighting outdoor and indoor environments comprising a first body (12), a second body (16) having a compartment (43) suitable for housing said first body (12), said first body (12) being provided with connection means for a post-top or suspension mounting on a support post (11), wherein the second body (16) is defined by a base (18) in contact with the surface of the first body (12) opposite said connection means and wherefrom two or more arms or claws (20) develop in a direction away from said base (18) for supporting a luminaire (22) defined by a container element (24) housing LED lighting sources (25) and closed by a screen or covering element (30), **characterised in that** the luminaire (22) is secured to the arms or claws (20) of the second body (16) at the free ends opposite to those of connection with respect to the base (18), with said covering element (30) turned in the direction of the first body (12) or in the opposite direction as a function of the specific needs of installation and lighting, by means of two opposite chamfers or tapers (34) formed along a perimeter portion or outer edge of said container element (24) of the luminaire suitable for being coupled with a corresponding slant (23) of each arm or claw (20) of said second body (16).
2. The lighting device according to claim 1, **characterised in that** it comprises at least two pairs of opposite holes (36) formed at said chamfers or tapers (34) of the luminaire (22), flared, coaxial one with the other, symmetrical with respect to a horizontal plane, communicating one with the other and suitable for coupling with corresponding interface means of the second body (16) defined by an appendage (38) formed on each end of two or more arms or claws (20).
3. The lighting device according to claim 2, **characterised in that** said appendage (38) is provided with an outer profile shaped correspondingly to the tapering of the opposite holes (36).
4. The lighting device according to one or more of the preceding claims, **characterised in that** the luminaire (22) is secured to the arms or claws (20) by means of screws (32) inserted in the opposite holes (36) of the same luminaire and in a coaxial blind hole (39) of the appendage (38) of each arm or claw (20).
5. The lighting device according to claim 1, **characterised in that** the first body (12) comprises a first portion (12') facing said post-top or suspension mounting and having a base opposite said post-top or suspension mounting (11), from which a second portion (12'') having a base surface larger than that of said base of the first portion develops in a direction away from the first portion, with said first portion (12') defining a shank and internally provided with an axial hole suitable for allowing the fitting of the lighting device on the support post (11) securing it in a configuration of the post-top type and with said second portion (12'') which defines a compartment for accommodating electrical and electronic components necessary for the functioning of the lighting device and optional devices for the regulation of the flow of light.
6. The lighting device according to claim 5, **characterised in that** it comprises a shank (14) suitable for being inserted in the axial hole of first portion (12') of the first body (12) in order to enable the connection of the lighting device with respect to an arm (15) secured to the support post (11) so as to realise a configuration of the suspension type.
7. The lighting device according to any one of claims 4-6, **characterised in that** the container element (24) of the luminaire (22) is suitable for housing electronic plates or boards (26) on which are arranged the LED light sources (25) and optics (28) suitable for intercepting the light beam emitted by the LEDs and reflecting it through the screen or covering element (30) made in transparent plastic and possibly coloured material.
8. The lighting device according to one or more of claims 2-7, **characterised in that** the arms or claws (20) of the second body (16) are secured to the base (18) of the same second body or are made in one piece and integrated with said base.
9. A packaging of the lighting device according to one or more of claims 1 to 8, **characterised in that** it comprises an assembly defined by the second body (16), by an insert (42) placed in a compartment (43) of said second body and housing the first body (12) placed inside an opening or compartment (44) of the same insert, with said assembly arranged inside a box (40) together with a shank (14).
10. A method of packing of the lighting device according to one or more of the preceding claims 1 to 8, **characterised in that** it comprises the steps of:
 - pre-arrangement of the first body (12) separated from the second body (16) inclusive of the luminaire (22);

- insertion of said first body (12) in an opening or compartment (44) of an insert (42), with said opening or compartment having a shape tentatively corresponding to that of the first body (12) and with said insert having an external shape corresponding to that of a compartment (43) defined by the assembly constituted by the second body (16) and by the luminaire (22);
- insertion of the insert (42) including the first body (12) in the compartment (43) to define a single block;
- insertion of said block inside a box (40) together with a shank (14).

Patentansprüche

1. LED (Licht emittierende Dioden)-Beleuchtungs-
vorrichtung (10, 10'), flexibel und modular, insbesonde-
re geeignet zur Beleuchtung von Außen- und Inne-
umgebungen, umfassend einen ersten Körper (12),
einen zweiten Körper (16) mit einem Gehäuse (43),
das zur Aufnahme des ersten Körpers (12) geeignet
ist, wobei der erste Körper (12) mit Verbindungsmi-
teln für eine Pfosten-Oberteil- oder Hängemontage
an einem Tragpfosten (11) versehen ist, wobei der
zweite Körper (16) durch eine Basis (18) definiert ist,
die in Kontakt mit der Oberfläche des ersten Körpers
(12) gegenüber den Verbindungsmitteln steht und
von der sich zwei oder mehr Arme oder Klauen (20)
in einer Richtung weg von der Basis (18) entwickeln,
um eine Leuchte (22) zu tragen, die durch ein Ge-
häuseelement (24) definiert ist, das LED-Beleuch-
tungsquellen (25) aufnimmt und durch einen Schirm
oder ein Abdeckelement (30) geschlossen ist, **da-
durch gekennzeichnet, dass** die Leuchte (22) an
den Armen oder Klauen (20) des zweiten Körpers
(16) an den freien Enden befestigt ist, die denjenigen
der Verbindung bezüglich des Sockels (18) gegen-
überliegen, wobei das Abdeckelement (30) in Ab-
hängigkeit von den spezifischen Bedürfnissen der
Installation und der Beleuchtung in Richtung des ers-
ten Körpers (12) oder in die entgegengesetzte Rich-
tung gedreht ist, mittels zweier gegenüberliegender
Abschrägungen oder Verjüngungen (34), die ent-
lang eines Umfangsabschnitts oder einer Außen-
kante des Behälterelements (24) der Leuchte aus-
gebildet sind, die geeignet sind, mit einer entspre-
chenden Schräge (23) jedes Arms oder jeder Klaue
(20) des zweiten Körpers (16) verbunden zu werden.
2. Beleuchtungsanordnung nach Anspruch 1, **da-
durch gekennzeichnet, dass** sie mindestens zwei
Paare von gegenüberliegenden Löchern (36) um-
fasst, die an den Abschrägungen oder Verjüngun-
gen (34) der Leuchte (22) ausgebildet sind, sich er-
weiternd, koaxial zueinander, symmetrisch in Bezug
auf eine horizontale Ebene, miteinander in Verbin-

dung stehend und geeignet, mit entsprechenden
Schnittstellenmitteln des zweiten Körpers (16) ver-
bunden zu werden, die durch einen Fortsatz (38) de-
finiert sind, der an jedem Ende von zwei oder meh-
reren Armen oder Klauen (20) ausgebildet ist.

3. Beleuchtungsanordnung nach Anspruch 2, **da-
durch gekennzeichnet, dass** der genannte Fort-
satz (38) mit einem Außenprofil versehen ist, das
entsprechend der Verjüngung der gegenüberliegen-
den Löcher (36) geformt ist.
4. Beleuchtungsanordnung nach einem oder mehre-
ren der vorhergehenden Ansprüche, **dadurch ge-
ennzeichnet, dass** die Leuchte (22) an den Armen
oder Klauen (20) mittels Schrauben (32) befestigt
ist, die in die gegenüberliegenden Löcher (36) der-
selben Leuchte und in ein koaxiales Sackloch (39)
des Fortsatzes (38) jedes Arms oder jeder Klaue (20)
eingesetzt sind.
5. Beleuchtungsanordnung nach Anspruch 1, **da-
durch gekennzeichnet, dass** der erste Körper (12)
einen ersten Abschnitt (12') umfasst, der der Pfo-
sten- oder Hängebefestigung zugewandt ist und eine
der Pfosten- oder Hängebefestigung (11) gegenü-
berliegende Basis aufweist, von der aus sich ein
zweiter Abschnitt (12'') mit einer Basisfläche, die grö-
ßer ist als die der Basis des ersten Abschnitts, in
einer von dem ersten Abschnitt wegführenden Rich-
tung entwickelt, wobei der erste Abschnitt (12') einen
Schaft definiert und innen mit einem axialen Loch
versehen ist, das geeignet ist, die Anbringung der
Beleuchtungsanordnung auf dem Tragpfosten (11)
zu ermöglichen, der sie in einer dafür ausgelegten
Konfiguration des Pfosten-Aufsatz-Typs sichert, und
wobei der zweite Abschnitt (12'') ein Fach zur Auf-
nahme von elektrischen und elektronischen Kompo-
nenten, die für den Betrieb der Beleuchtungsanord-
nung notwendig sind, und von optionalen Vorrichtun-
gen zur Regulierung des Lichtstroms definiert.
6. Beleuchtungsanordnung nach Anspruch 5, **da-
durch gekennzeichnet, dass** sie einen Schaft (14)
umfasst, der geeignet ist, in das axiale Loch eines
ersten Abschnitts (12') des ersten Körpers (12) ein-
geführt zu werden, um die Verbindung der Beleuch-
tungsanordnung in Bezug auf einen Arm (15) zu er-
möglichern, der mit dem Tragpfosten (11) fest ver-
bunden ist, sodass eine Konfiguration des Aufhän-
gungstyps realisiert wird.
7. Beleuchtungsanordnung nach einem der Ansprü-
che 4 bis 6, **dadurch gekennzeichnet, dass** das
Behälterelement (24) der Leuchte (22) zur Aufnah-
me von elektronischen Platten oder Tafeln (26) ge-
eignet ist, auf denen die LED-Lichtquellen (25) und
die Optik (28) angeordnet sind, die geeignet sind,

den von den LEDs emittierten Lichtstrahl abzufangen und ihn durch den Schirm oder das Abdeckelement (30) aus transparentem Kunststoff und gegebenenfalls farbigem Material zu reflektieren.

8. Beleuchtungsanordnung nach einem oder mehreren der Ansprüche 2 bis 7, **dadurch gekennzeichnet, dass** die Arme oder Klauen (20) des zweiten Körpers (16) an der Basis (18) desselben zweiten Körpers befestigt sind oder aus einem Stück bestehen und in diese Basis integriert sind.

9. Verpackung der Beleuchtungsanordnung nach einem oder mehreren der Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** sie eine Anordnung umfasst, die durch den zweiten Körper (16), durch einen Einsatz (42), der in einem Abteil (43) des zweiten Körpers angeordnet ist und den ersten Körper (12) aufnimmt, der in einer Öffnung oder einem Abteil (44) desselben Einsatzes angeordnet ist, definiert ist, wobei die Anordnung zusammen mit einem Schaft (14) in einem Gehäuse (40) angeordnet ist.

10. Verfahren zum Verpacken der Beleuchtungsanordnung nach einem oder mehreren der vorhergehenden Ansprüche 1 bis 8, **dadurch gekennzeichnet, dass** es die folgenden Schritte umfasst:

- Voranordnung des vom zweiten Körper (16) getrennten ersten Körpers (12) einschließlich der Leuchte (22);
- Einsetzen des ersten Körpers (12) in eine Öffnung oder ein Abteil (44) eines Einsatzes (42), wobei die Öffnung oder das Abteil eine Form aufweist, die tendenziell derjenigen des ersten Körpers (12) entspricht, und wobei der Einsatz eine äußere Form aufweist, die derjenigen eines Abteils (43) entspricht, das durch die durch den zweiten Körper (16) und die Leuchte (22) gebildete Anordnung definiert ist;
- Einsetzen des Einsatzes (42), der den ersten Körper (12) umfasst, in das Fach (43), um einen einzelnen Block zu definieren;
- Einsetzen des Blocks in einen Kasten (40) zusammen mit einem Schaft (14).

Revendications

1. Dispositif d'éclairage à LED (diode électroluminescente) (10, 10'), flexible et modulaire, particulièrement adapté pour éclairer des environnements extérieurs et intérieurs comprenant un premier corps (12), un second corps (16) ayant un compartiment (43) adapté pour loger ledit premier corps (12), ledit premier corps (12) étant pourvu de moyens de raccordement pour un montage au haut d'un poteau ou en suspension sur un montant de support (11), dans

lequel le second corps (16) est défini par une base (18) en contact avec la surface du premier corps (12) opposée auxdits moyens de raccordement et à partir de laquelle deux ou plusieurs bras ou griffes (20) se développent dans une direction à distance de ladite base (18) pour supporter un luminaire (22) défini par un élément de conteneur (24) renfermant des sources d'éclairage à LED (25) et fermées par un écran ou élément de recouvrement (30), **caractérisé en ce que** le luminaire (22) est solidaire des bras ou griffes (20) du deuxième corps (16) aux extrémités opposées à celles de raccordement par rapport à la base (18), avec ledit élément de recouvrement (30) tourné dans la direction du premier corps (12) ou dans le sens opposé en fonction des besoins spécifiques d'installation et d'éclairage, au moyen de deux chanfreins ou cônes (34) opposés formés le long d'une partie de périmètre ou bord extérieur dudit élément de conteneur (24) du luminaire apte à être couplé à une inclinaison correspondante (23) de chaque bras ou griffe (20) dudit deuxième corps (16).

2. Dispositif d'éclairage selon la revendication 1, **caractérisé en ce qu'il** comprend au moins deux paires de trous opposés (36) ménagés au niveau desdits chanfreins ou cônes (34) du luminaire (22), évases, coaxiaux l'un avec l'autre, symétriques par rapport à un plan horizontal, communiquant l'un avec l'autre et aptes au couplage avec des moyens d'interface correspondants du deuxième corps (16) définis par un appendice (38) formé à chaque extrémité de deux ou plusieurs bras ou griffes (20).

3. Dispositif d'éclairage selon la revendication 2, **caractérisé en ce que** ledit appendice (38) est pourvu d'un profil extérieur conformé en correspondance avec l'effilement des trous opposés (36).

4. Dispositif d'éclairage selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** le luminaire (22) est solidarisé aux bras ou griffes (20) au moyen de vis (32) insérées dans les trous opposés (36) du même luminaire et dans un trou borgne coaxial (39) de l'appendice (38) de chaque bras ou griffe (20).

5. Dispositif d'éclairage selon la revendication 1, **caractérisé en ce que** le premier corps (12) comprend une première partie (12') tournée vers ledit montage au haut d'un poteau ou en suspension et ayant une base opposée audit montage au haut d'un poteau ou en suspension (11), à partir de laquelle une seconde partie (12'') ayant une surface de base plus grande que celle de ladite base de la première partie se développe dans une direction s'éloignant de la première partie, avec ladite première partie (12') définissant une tige et pourvue intérieurement d'un trou axial adapté pour permettre l'installation du dispositif

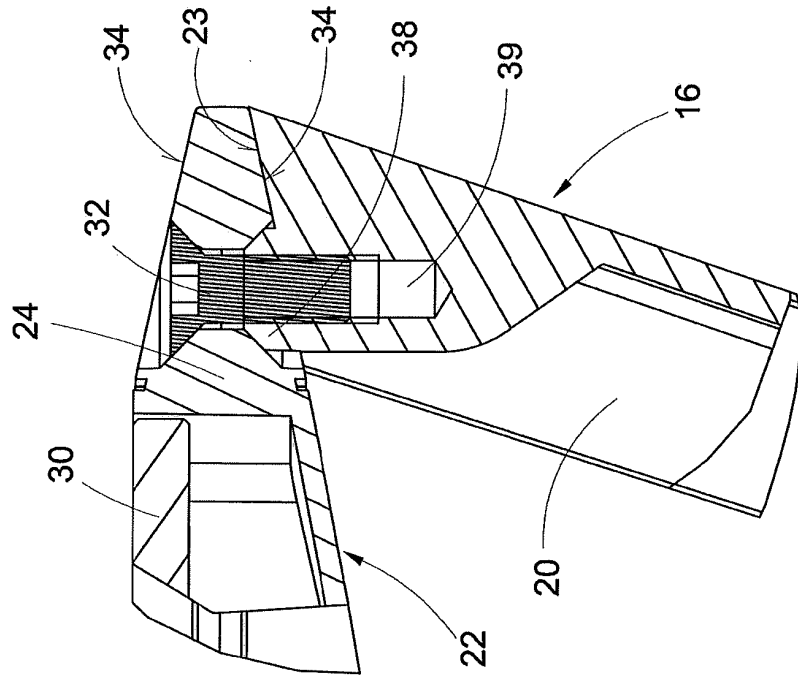
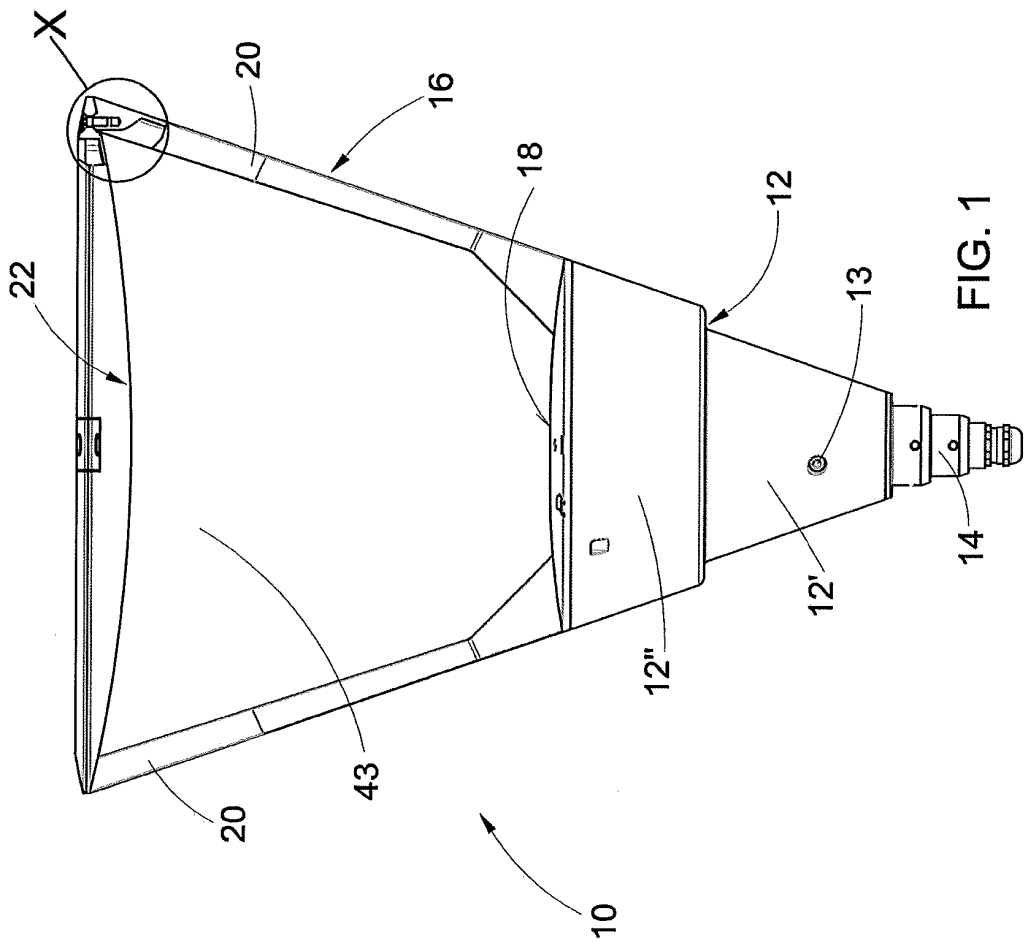
d'éclairage sur le montant de support (11) en le fixant dans une configuration de type en haut d'un poteau et avec ladite seconde partie (12") qui définit un compartiment pour renfermer les composants électriques et électroniques nécessaires au fonctionnement du dispositif d'éclairage et les dispositifs optionnels de régulation du flux lumineux.

5

6. Dispositif d'éclairage selon la revendication 5, **caractérisé en ce qu'il** comprend une tige (14) apte à être insérée dans le trou axial de la première partie (12') du premier corps (12) afin de permettre la raccordement du dispositif d'éclairage par rapport à un bras (15) solidaire du montant de support (11) de manière à réaliser une configuration de type en suspension. 10 15
7. Dispositif d'éclairage selon une quelconque des revendications 4 à 6, **caractérisé en ce que** l'élément de conteneur (24) du luminaire (22) est apte à renfermer des plaquettes ou cartes électroniques (26) sur lesquelles sont disposées les sources lumineuses LED (25) et des optiques (28) aptes à intercepter le faisceau lumineux émis par les LED et à le réfléchir à travers l'écran ou l'élément de recouvrement (30) en plastique transparent et éventuellement en matériau coloré. 20 25
8. Dispositif d'éclairage selon une ou plusieurs des revendications 2 à 7, **caractérisé en ce que** les bras ou griffes (20) du deuxième corps (16) sont solidaires de la base (18) du même deuxième corps ou sont réalisés en monobloc et intégrés à ladite base. 30
9. Emballage du dispositif d'éclairage selon une ou plusieurs des revendications 1 à 8, **caractérisé en ce qu'il** comprend un ensemble défini par le deuxième corps (16), par un insert (42) placé dans un compartiment (43) dudit deuxième corps et renfermant le premier corps (12) placé à l'intérieur d'une ouverture ou d'un compartiment (44) du même intérieur, avec ledit ensemble agencé à l'intérieur d'un boîtier (40) avec une tige (14). 35 40
10. Procédé d'emballage du dispositif d'éclairage selon une ou plusieurs des revendications précédentes 1 à 8, **caractérisé en ce qu'il** comprend les étapes de: 45
 - pré-agencement du premier corps (12) séparé du deuxième corps (16) comprenant le luminaire (22); 50
 - insertion dudit premier corps (12) dans une ouverture ou un compartiment (44) d'un insert (42), avec ladite ouverture ou compartiment ayant une forme correspondant tendancielle- 55
 - ment à celle du premier corps (12) et avec ledit insert ayant une forme externe correspondant à celui d'un compartiment (43) défini par l'ensem-

ble constitué par le deuxième corps (16) et par le luminaire (22);

- insertion de l'insert (42) comprenant le premier corps (12) dans le compartiment (43) pour définir un seul bloc;
- insertion dudit bloc à l'intérieur d'une boîte (40) avec une tige (14).



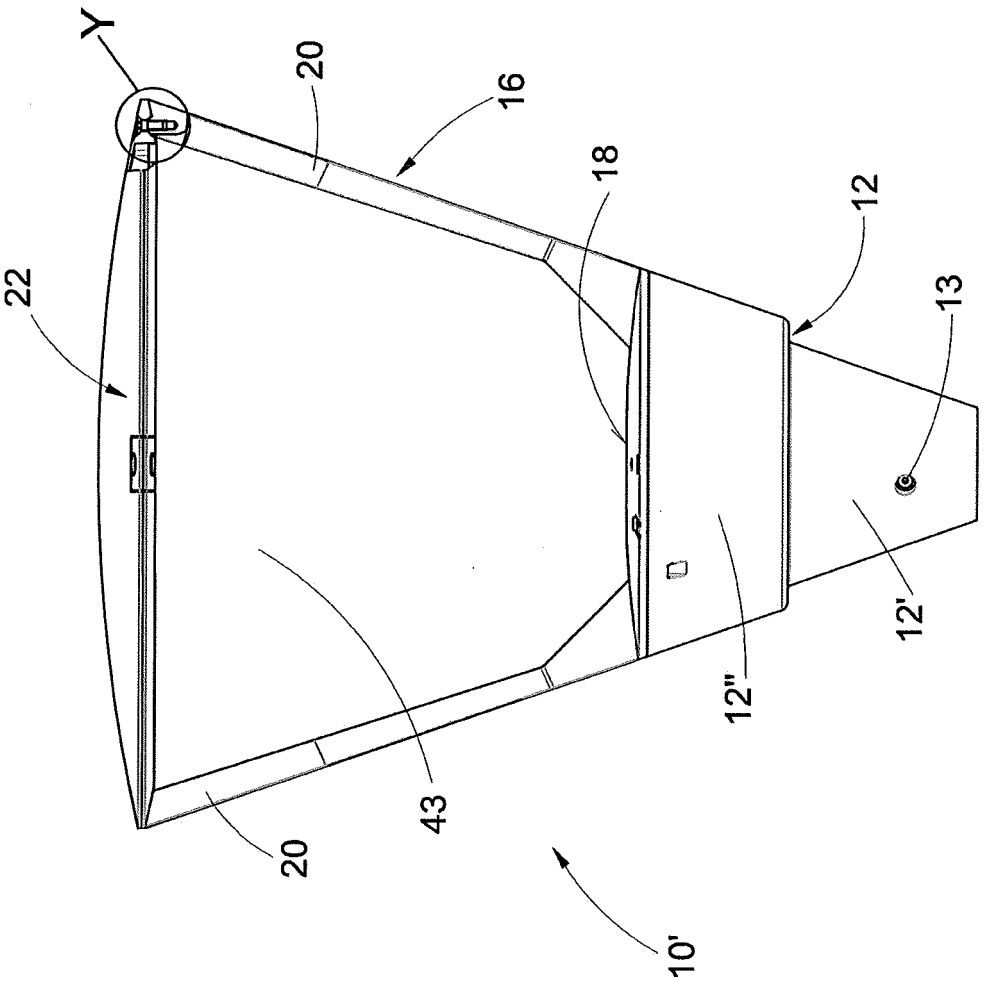


FIG. 3

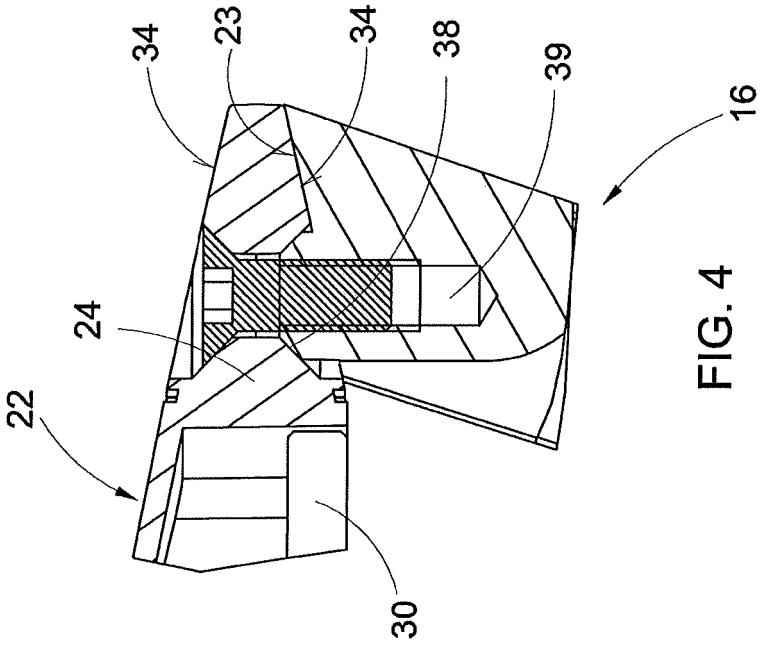


FIG. 4

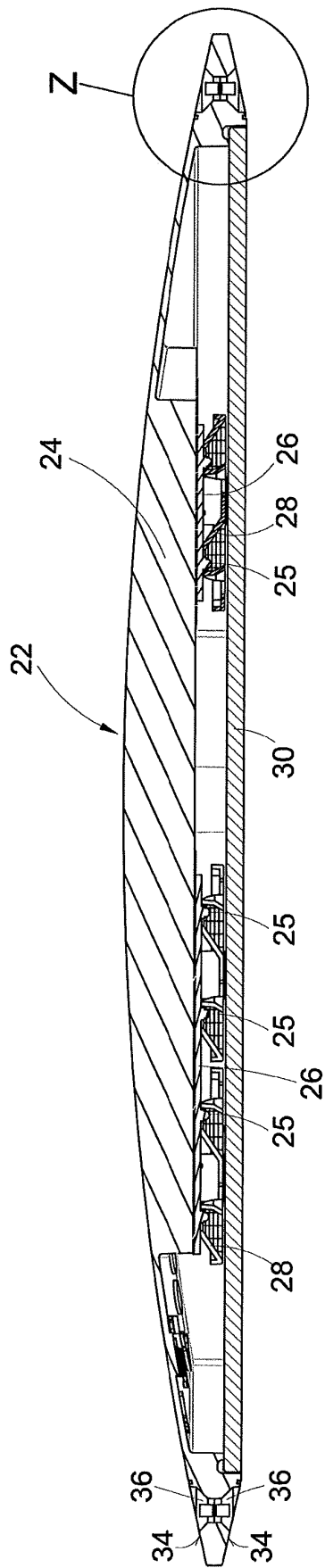


FIG. 5

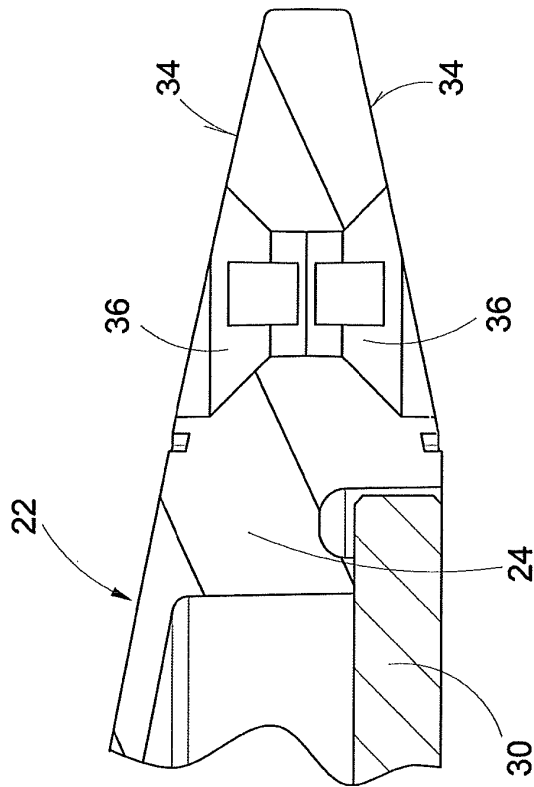


FIG. 6

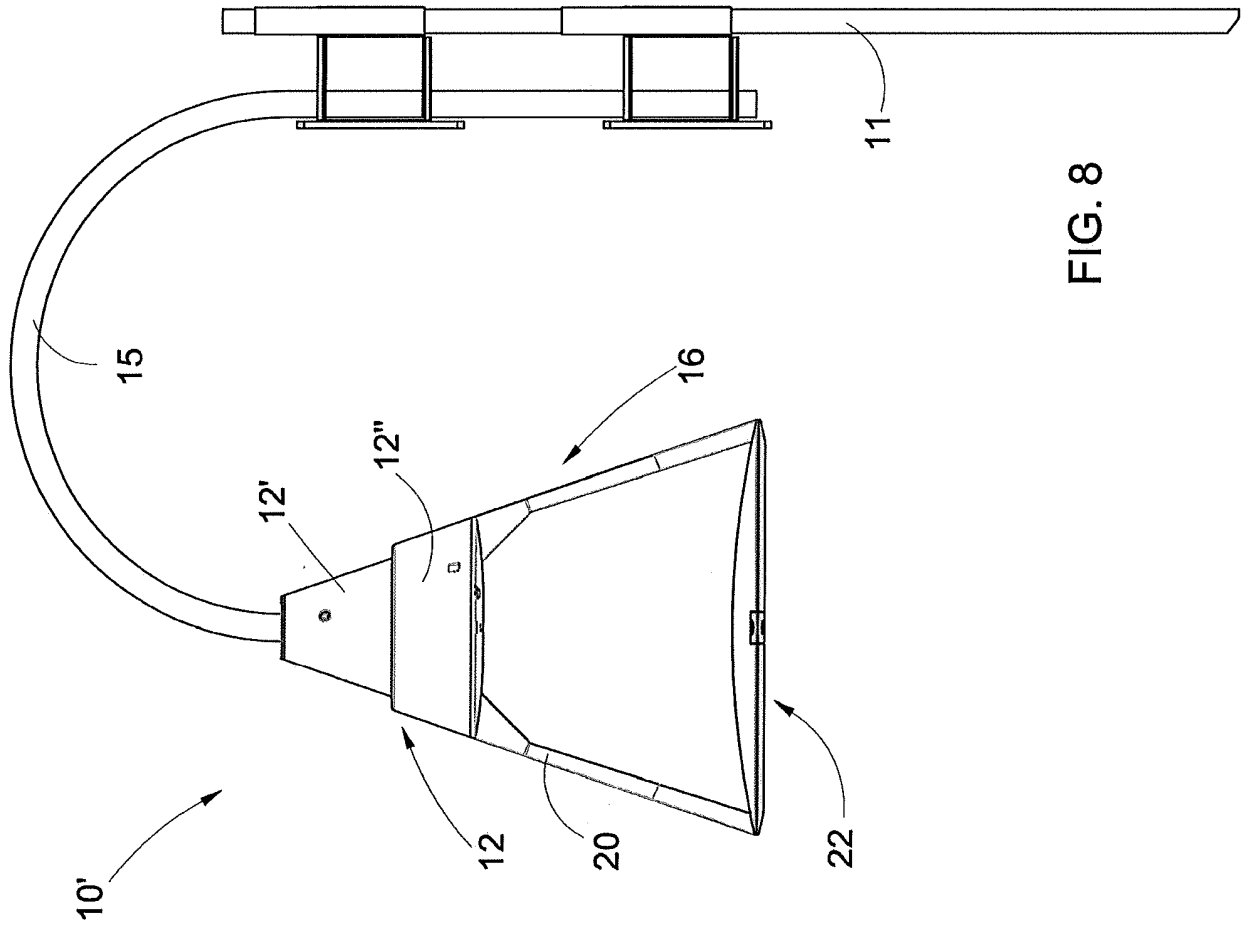


FIG. 7

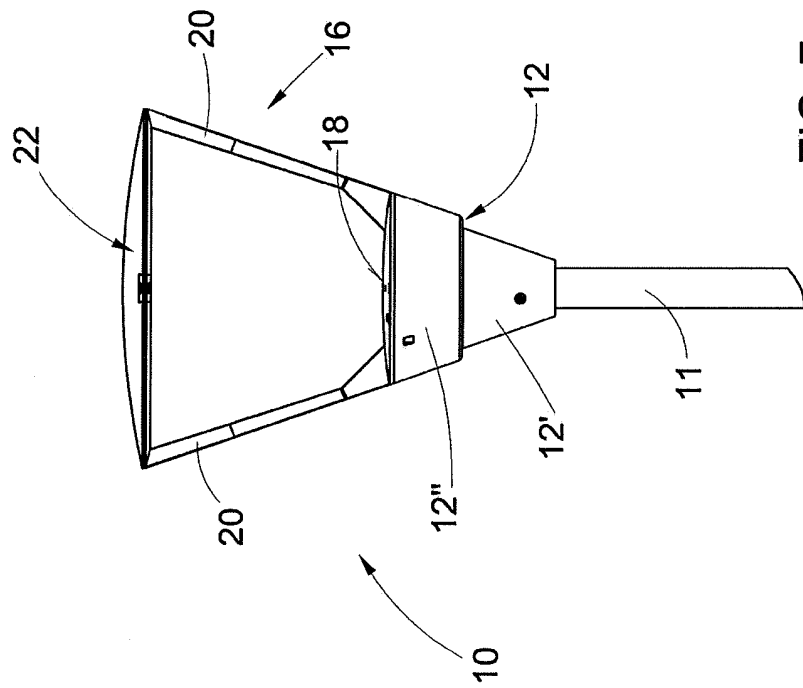


FIG. 8

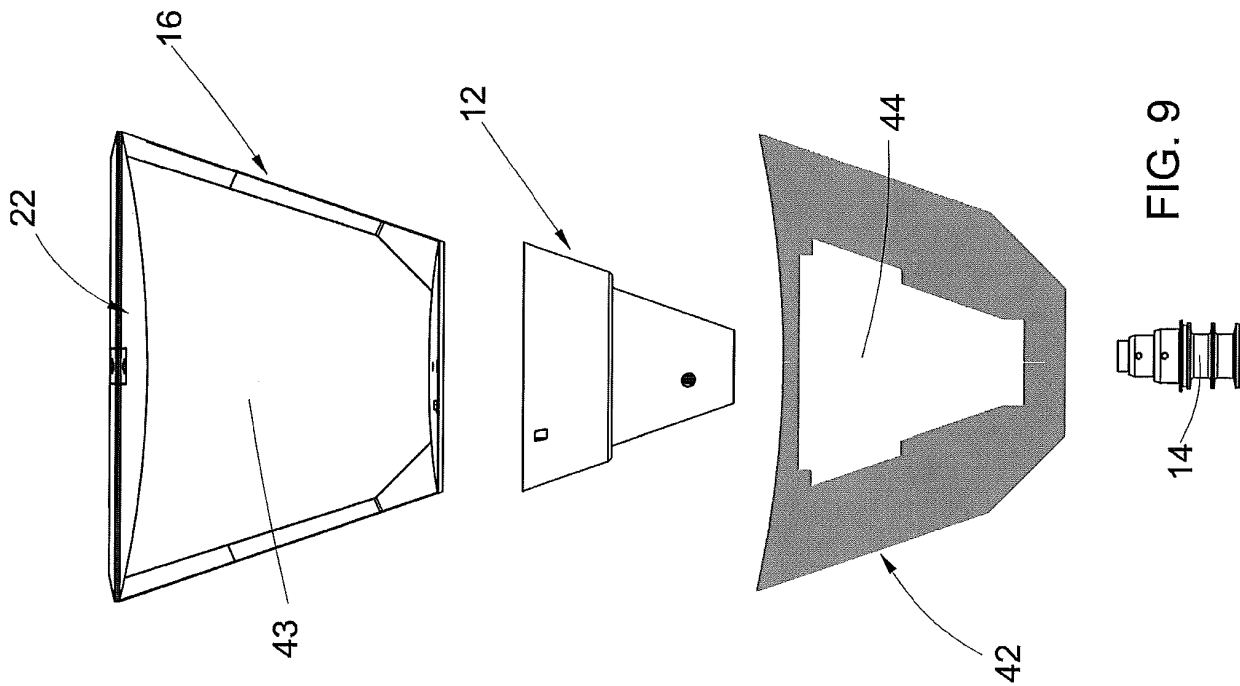


FIG. 9

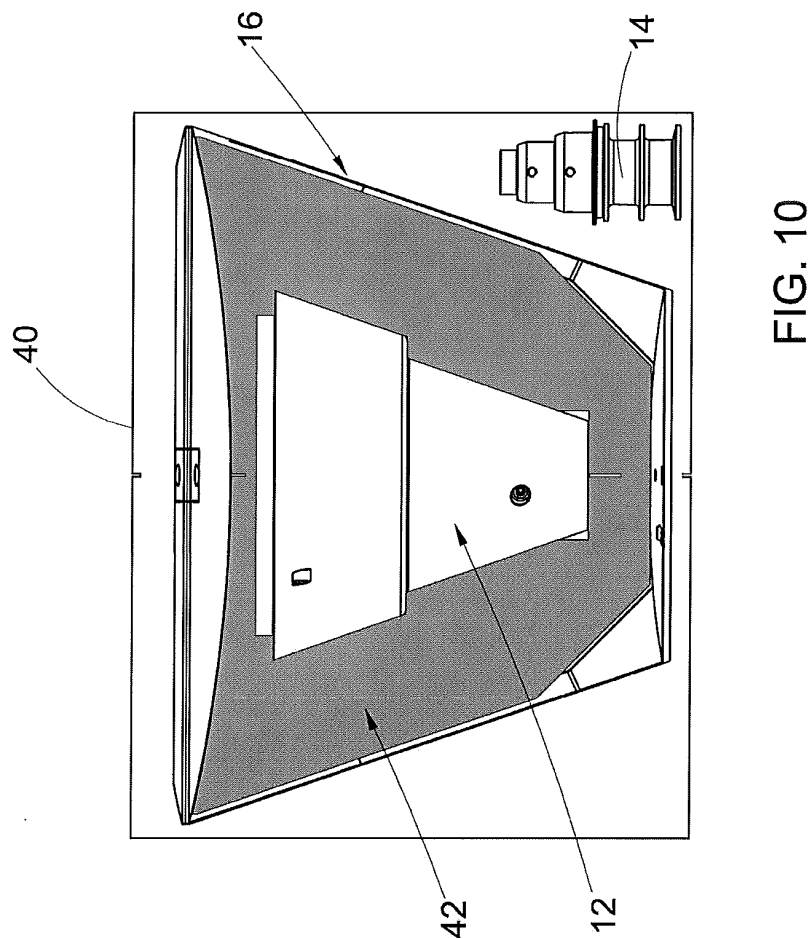


FIG. 10

REFERENCES CITED IN THE DESCRIPTION

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