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Remarks:
Amended claims in accordance with Rule 137(2) EPC.

(54) **Illumination device**

(57) Herein proposed is lighting lamp (1) comprising: a diffuser body (2), lighting means (6) housed in said diffuser body (2), a supporting base (3), circuital components, the lamp being characterised in that the diffuser body (2) is made in form of a tubular diffuser, which has, at least partly on its length, openings (5) for the outgoing of the light produced by said lighting means (6), and that the lighting means (6) are preferably formed by LEDs, which are supported on un supporting element (7) which axially extend in the tubular diffuser body (2), and that provided is a transparent or opaque screening diaphragm (8), which is associated to said diffuser body (2) and covering said openings (5) for the outgoing of the light. The lamp may be obtained as a floor, desk, wall lamp or the like.

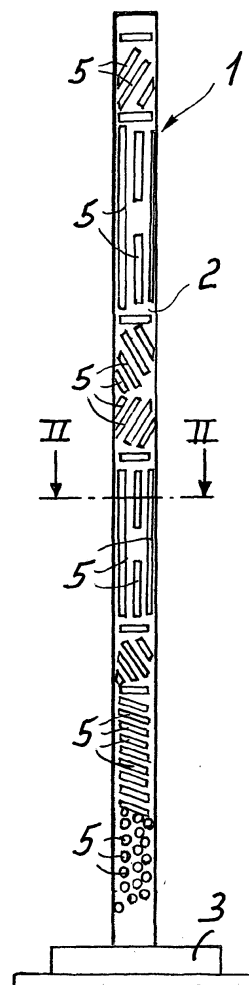


Fig. 1

Description

Technical field of the invention

[0001] The present invention refers to a lighting lamp according to the preamble of claim 1.

Prior art

[0002] As known, lighting lamps are known in various embodiments. Besides the tubular lighting lamps, lamps with incandescence or halogen bulbs have the common characteristic of comprising a diffuser body, lighting means housed in said diffuser body, hanging means or a supporting base, as well as the required circuit components.

[0003] The diffuser body may be provided transparent, or opaque, for example bell-shaped, delimiting the outgoing light beam, wherein the lamp is freely visible.

[0004] Such lamps may have hanging means, for example in form of a chain or tube which can be hooked to a hook fixed onto the ceiling or, for example in case of floor lamps or desk lamps they may have a base, wherein interposed between said base and diffuser body are supporting elements, for example in form of a tube, for example curved (in case of floor lamps or desk lamps) or several rods or tubes articulated to each other like arms, with springs or counterweights interposed, for the desired positioning of the diffuser body (for example in the case of desk lamps).

[0005] A variation of the intensity of the luminous flux may occur, with halogen lamps, generally with two different voltages, for example of 25 and 50 W, using a transformer, generally housed in the base. The intensity of the light flux may also be varied through a converter or trimmer.

[0006] The known and various embodiments of lamps, headlights and downlights with lighting means in form of incandescence, halogen, fluorescent and low consumption lamps reveal practical limits.

[0007] For example lamps with a light dimmer practically absorb the same amount of power regardless of the set variation. A variation of the position of the emitted light beam requires an articulated support for the diffuser body and, as a consequence, higher reproduction costs with respect to a fixed diffuser body.

[0008] The diffuser body generally has only one large opening for the outgoing of the light. Furthermore, providing for a plurality of exposed lamps arranged spaced on a strip-like support - such solution being definitely suitable for industrial lighting, shops, shop-windows and the like, but less suitable for household lighting where less strong and preferably more diffused lighting is required - for the diffusion of light along a relevant length is also known.

Summary of the invention

[0009] Therefore, according to the present invention, there arises the need for providing a lighting lamp capable of allowing overcoming various drawbacks of the prior art lamps.

[0010] The abovementioned task is met, according to the invention, by means of a lighting lamp having the characteristics of claim 1.

[0011] Further developments of the proposed lighting lamp form an object of the dependent claims.

[0012] Several important advantages are obtained by means of the proposed lighting lamp. Firstly, by providing for a tubular diffuser body extended length-wise allows providing the openings for the outgoing of the light according to the desired number, arrangement and shape. Production of diffusers as base diffusers may thus be performed in a rational and modular manner, with the ensuing reduction of the costs of production.

[0013] The production of the openings for the outgoing of the light may be provided in a simple, controlled and quick manner through laser beam cutting.

[0014] The lamps may be assembled in a simple, automatable and quick manner given that the lamp is made up of a limited number of components. Preferably, advantageously used as lighting means are LEDs, which currently have good lighting performance, occupy little space and are easily available, for example, on a tape-like support, for example a fabric, which in turn can be easily fixed on a stiff strip-like support, for example made of metal or synthetic material, which can be easily inserted or fixed in the tubular diffuser body. Said stiff support may divide, for example diametrically, the tubular body into two chambers, in which the LEDs are arranged towards the chamber with the openings for the outgoing of the light. This allows improving the lighting performance and providing the possibility of obtaining specific lighting effects, such solution being enhanced by using LEDs emitting light of respectively different colours. The use of LEDs also allows eliminating the prior art transformers and allows power supply by means of conventional AC adapters which can be inserted directly into the power supply sockets.

[0015] The diffuser body may be fixed directly to a base, in which intermediate supports - for floor lamps - and articulated arms, springs and so and so forth - for desk lamps - may be eliminated.

[0016] The provided screening diaphragm protects the diffuser body against penetration of dust, insects and dirt and facilitates the cleaning of the diffuser body. It may also be tubular, for example made of synthetic and transparent material, with a longitudinal slot which allows, when closed, an easy insertion thereof into the diffuser body and, when released, a self-locking positioning thereof into the diffuser body. This also facilitates the assembly of the lamp.

Brief description of the drawings

[0017] Further characteristics, advantages and details of the lighting lamp according to the invention are further observable from the description that follows with reference to the attached drawings, to which reference shall be made for any detail not illustrated in detail in the description and which schematically illustrate, by way of example, two lighting lamps according to the invention.

[0018] The drawings show in:

figure 1, in a front elevational view, a lamp according to the invention, in an embodiment as a floor lamp,
figure 2 a horizontal cross-section through the plane II-II of the lamp of figure 1, and
figure 3 a side elevational view, of a lamp according to the invention in a desk lamp embodiment.

Description of the illustrated embodiments

[0019] In the various figures, provided in scale suitable for better clarity, identical parts have identical reference numbers.

[0020] With reference to figure 1, the lighting lamp according to the invention is indicated in its entirety with 1 and, according to a first aspect of the proposed disclosure, it has a tubular diffuser body 2 which does not require any supporting element but it can be directly fixed to a base 3, shaped at will.

[0021] According to a second aspect of the proposed disclosure the opening for the outgoing of the light is not provided for solely at the opening 4 of the diffuser body opposite to the base 3, such opening 4 possibly being provided for closable by a cover element, for example removable, not illustrated, but it may be divided into a plurality of openings 5, shaped at will, for example rectangular, circular, and so on and so forth, which are distributed along the diffuser body 2 at will.

[0022] In the lamp illustrated in figures 1 and 2, said openings 5 are provided for on and along half of the surface of the diffuser body 2, which may have a circular or polygonal cross section at will. This allows obtaining a stabilised light emission at will, depending on the desired lighting results and effects.

[0023] The openings 5 are easily obtainable through laser cutting in the diffuser body 2, preferably made of metal, for example steel, light alloy and so on and so forth.

[0024] LEDs - monochrome or coloured at will, which are provided for in a number suitable for the geometric dimensions of the diffuser body 2 and the light to be emitted - are preferably provided for as lighting means 6. Said LEDs 6 may, for example, be fixed to a flexible tape-like support 7, for example consisting of a fabric, in turn fixed to a stiff strip-like supporting element 8 inserted into the diffuser body 2, for example as a diametral diaphragm and forming two internal chambers 9 and 10, as illustrated in figure 2, the chamber 10 in the illustrated example representing a blind chamber.

[0025] In the illustrated example, the LEDs 6 are arranged in the chamber 9, in whose semi-surface of the diffuser body 2 the openings 5 are provided.

[0026] A tubular diaphragm 11, having the same polygonal configuration of the diffuser 2, which has a longitudinal slot 12 such that by tightening said diaphragm 11 it can be easily inserted into the diffuser 2 and, by releasing the diaphragm 11 it is self-locked in the diffuser, is provided for in order to prevent the penetration of dust, insects and dirt into the diffuser body 2. Said diaphragm 11 may be made of stiff transparent synthetic material, for straight diffusers, figure 1, or flexible synthetic material, for curved diffusers, figure 3.

[0027] The LEDs 6 may be divided - in terms of circuit - into two or more groups, inserted through known connection means, like switches or the like, not illustrated, supported in the base 3, or controllable by a remote control, also not illustrated.

[0028] Regarding the desk lamp 1 illustrated in figure 3, and other lamps having a curved diffuser body 2, reference shall be made to the lamp of figures 1 and 2.

[0029] Providing diffuser bodies 2 having a semipolygonal cross section, or having the chamber 9 alone housing the LEDs 6 falls within the scope of the invention.

Thus, besides a new and unique aesthetic aspect, considerable saving in terms of materials and reduction of production costs is obtained.

[0030] From the structural and functional description above, it is observable that the disclosures of the invention allow efficiently meeting the abovementioned task and obtaining the aforementioned advantages.

[0031] In practice, those skilled in the art may introduce modifications and variants, such as for example providing for diodes 6 and openings 5 for the outgoing of the light even in the blind chamber 10, or provide for the tubular diaphragm 11 outside the diffuser body 2, and so on and so forth, without departing from the scope of protection of the invention as claimed.

Claims

1. Lighting lamp (1) comprising:

- a diffuser body (2),
- lighting means (6) housed in said diffuser body (2),
- a supporting base (3),
- circuital components,

characterized in that

- said diffuser body (2) is made in the form of a tubular diffuser which has, at least partly on its length, openings (5) for the outgoing of the light produced by said lighting means (6),
- **in that** said lighting means (6) are preferably formed by LEDs which are supported on at least

a supporting element (7; 8) which axially extends into said tubular diffuser body (2),

- **in that** is provided a transparent or opaque screening diaphragm (11) which is associated to said diffuser body (2) and covers said openings (5) for the light outgoing.

2. Lighting lamp according to claim 1, **characterized in that** said tubular body (2) has a cross section which is circular-polygonal or polygonal at will, wherein a strip-like support (8) for the provided LEDs (6) acts as a partition diaphragm and separates the interior of said diffuser body (2) in a chamber (9) housing said LEDs and in a blind chamber (10).
3. Lighting lamp according to claim 1, **characterized in that** said tubular body (3) has a semipolygonal, a semicircular or a semipolygonal cross section at will, wherein said semipolygonal body defines a chamber (9) housing a strip-like support (8) of the provided LEDs (6).
4. Lighting lamp according to claims 1 to 3, **characterized in that** said LEDs (6) are preferably preliminarily supported on a strip-like support (7) consisting of a fabric, a synthetic film or the like which is preferably flexible and which, in turn, is supported on a stiff strip-like support (8) which in case of diffuser bodies (2) having two chambers (9, 10) forms said partition diaphragm (8) separating said chambers.
5. Lighting lamp according to one or more of claims 2 to 4, **characterized in that** said screening diaphragm (11) is made of synthetic material, for example of polycarbonate, and has a cross section which is similar to the cross section of said diffuser body and has a longitudinal slot such that by clamping said diaphragm (11) the latter may be inserted into said diffuser body (2) and, after the release of said diaphragm, the latter locks itself into said diffuser body (2) and, in case of diffuser bodies (2) having two chambers (9, 10), houses said partition diaphragm (8).
6. Lighting lamp according to one or more of claims 2 to 4, **characterized in that** said screening diaphragm (11) is made of synthetic material, for example of polycarbonate, and has a cross section which is similar to the cross section of said diffuser body and has a longitudinal slot such that by enlarging said diaphragm (11) the latter may be inserted outside onto said diffuser body (2) and, after the release of said diaphragm, the latter locks itself outside onto said diffuser body (2).
7. Lighting lamp, **characterized in that** it comprises a rectilinear or bent tubular diffuser body (2) according to one or more of the preceding claims.

Amended claims in accordance with Rule 137(2) EPC.

1. Lighting lamp (1) comprising:

- a diffuser body (2),
- lighting means (6) housed in said diffuser body (2),
- a supporting base (3),
- circuital components,

wherein

- said diffuser body (2) is made in the form of a tubular diffuser which has, at least partly on its length, openings (5) for the outgoing of the light produced by said lighting means (6),
- said lighting means (6) are preferably formed by LEDs which are supported on at least a supporting element (7; 8) which axially extends into said tubular diffuser body (2),

characterized in that

- it further comprises a transparent or opaque screening diaphragm (11) which is associated to said diffuser body (2) and covers said openings (5) for the light outgoing.

2. Lighting lamp according to claim 1, **characterized in that** said tubular body (2) has a cross section which is circular-polygonal or polygonal at will, wherein a strip-like support (8) for the provided LEDs (6) acts as a partition diaphragm and separates the interior of said diffuser body (2) in a chamber (9) housing said LEDs and in a blind chamber (10).

3. Lighting lamp according to claim 1, **characterized in that** said tubular body (3) has a semipolygonal, a semicircular or a semipolygonal cross section at will, wherein said semipolygonal body defines a chamber (9) housing a strip-like support (8) of the provided LEDs (6).

4. Lighting lamp according to claims 1 to 3, **characterized in that** said LEDs (6) are preferably preliminarily supported on a strip-like support (7) consisting of a fabric, a synthetic film or the like which is preferably flexible and which, in turn, is supported on a stiff strip-like support (8) which in case of diffuser bodies (2) having two chambers (9, 10) forms said partition diaphragm (8) separating said chambers.

5. Lighting lamp according to claim 1, **characterized in that** said screening diaphragm (11) is made of synthetic material, for example of polycarbonate, and has a cross section which is similar to the cross section of said diffuser body and has a longitudinal

slot such that by clamping said diaphragm (11) the latter may be inserted into said diffuser body (2) and, after the release of said diaphragm, the latter locks itself into said diffuser body (2) and, in case of diffuser bodies (2) having two chambers (9, 10), houses said partition diaphragm (8). 5

6. Lighting lamp according to claim 1, **characterized in that** said screening diaphragm (11) is made of synthetic material, for example of polycarbonate, and has a cross section which is similar to the cross section of said diffuser body and has a longitudinal slot such that by enlarging said diaphragm (11) the latter may be inserted outside onto said diffuser body (2) and, after the release of said diaphragm, the latter locks itself outside onto said diffuser body (2). 10 15

7. Lighting lamp according to claim 1, **characterized in that** it comprises a rectilinear or bent tubular diffuser body (2) according to one or more of the preceding claims. 20

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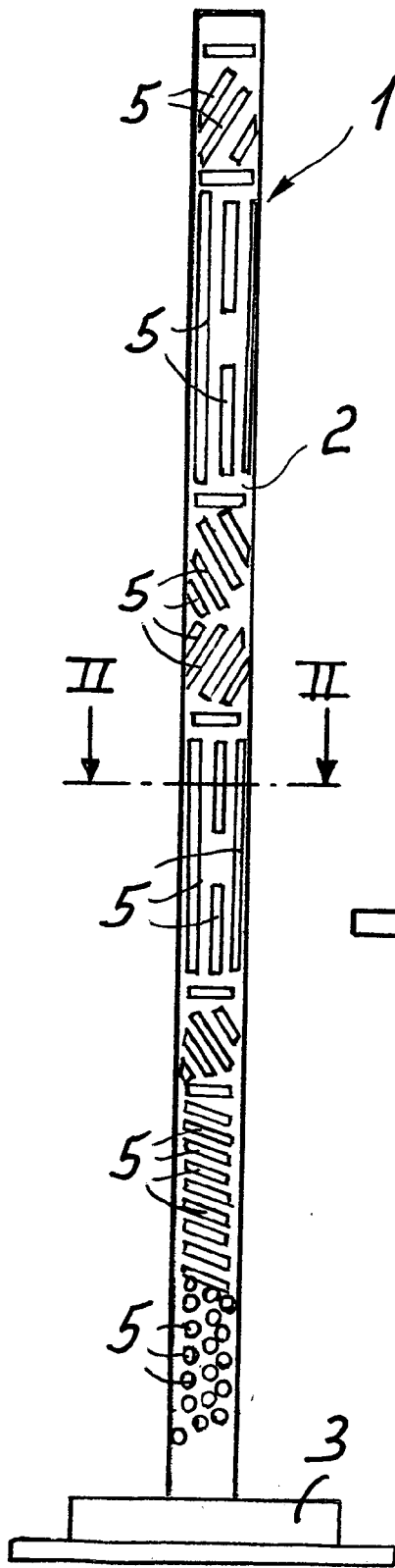


Fig. 1

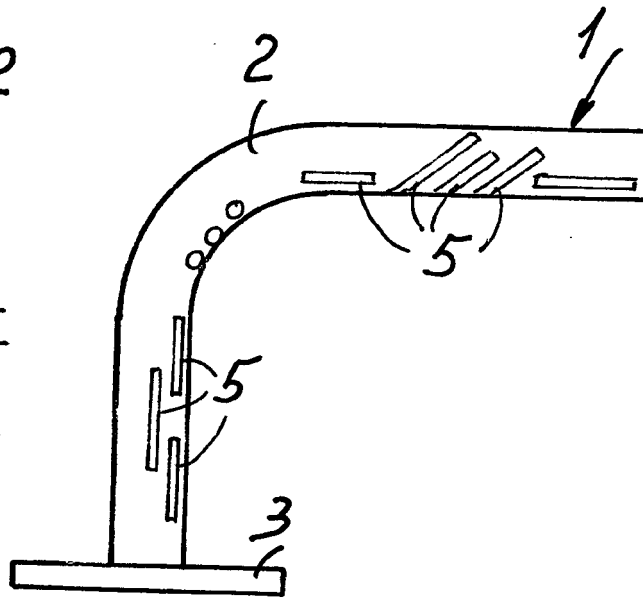


Fig. 3

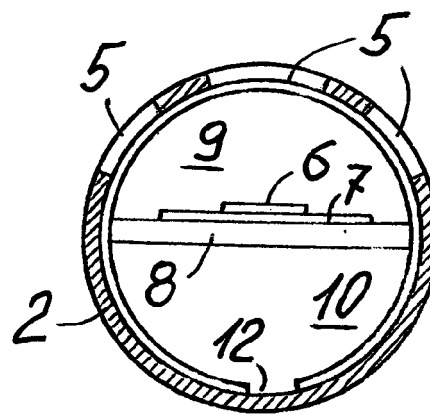


Fig. 2



EUROPEAN SEARCH REPORT

Application Number
EP 10 01 3759

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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 7 December 2010	Examiner Lange, Christian
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 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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The members are as contained in the European Patent Office EDP file on
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