(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 012 055 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
20.04.2011 Bulletin 2011/16

(51) Int Cl.:
F21S 8/00 *(2006.01)*

(21) Application number: **08159339.4**

(22) Date of filing: **30.06.2008**

(54) **Device for illuminating a liquid jet**

Vorrichtung zur Beleuchtung eines Flüssigkeitsstrahls

Dispositif d'éclairage d'un jet liquide

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR

(30) Priority: **04.07.2007 NL 2000732**

(43) Date of publication of application:
07.01.2009 Bulletin 2009/02

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Description

[0001] The invention relates to a device for illuminating a liquid jet from a liquid supply means, comprising an at least substantially annular body, which annular body comprises a passage, through which the liquid to be illuminated can pass, light sources and means for connecting the liquid supply means thereto.

[0002] Such a device is known from German utility model No. 20 2004 012 070 U1.

[0003] The last few years have witnessed an increasing interest in decorating gardens with fountains, cascades and the like ornaments. Some of these garden ornaments are provided with illumination means so as to meet people's wish to enjoy their garden also in the evening hours, usually in connection with the fact that they have to work in the daytime.

[0004] In the device as referred to in the introduction, the liquid jet flows from a liquid source, for example a garden hose, past the light sources, as a result of which the liquid jet is illuminated, which leads to beautiful light effects, for example in a fountain, especially if such a liquid jet lands in a basin.

[0005] DE 10 2004 001 256 discloses the preamble of claim 1.

[0006] The object of the invention is to improve the prior art, and in particular to provide a simple device for illuminating a liquid flow which can be produced at low cost and/or which is economical in use.

[0007] In order to accomplish that object, a device of the kind referred to in the preamble of claim 1 for illuminating a liquid jet is according to the invention characterised in that the cover body comprises a cylindrical lip at least substantially extending in the direction of the passage, which lip can be received in the passage of the annular body, wherein at least one slot formed in the circumference of the passage and/or the lip is provided for receiving a thickening formed in the circumference of the passage and/or the lip, wherein the lip is provided with external screw thread and the passage of the annular body is provided with internal screw thread. The cover body preferably extends coaxially with the annular body, with the passages defined by the two at least substantially annular bodies connecting to each other so as to allow the liquid flow to pass therethrough. More preferably, the cover body is at least substantially made of a transparent material, even more preferably the cover body is at least substantially made of a coloured material for illuminating the liquid flow with coloured light. The advantage of such a device is that the colour of the liquid jet can be varied in a simple manner by placing differently coloured cover bodies on the annular body, without there being a need to exchange the light sources themselves. Moreover, by using the invention the light sources are protected against damage, for example during transport or storage. Preferably, the external diameter of the cylindrical lip corresponds to the internal diameter of the passage of the annular body, in order that the lip can be clampingly received in the passage. In this way the cover body and the annular body are connected together in a simple manner. Upon connection of the annular body to the cover body, a thickening in the form of a ridge formed in, for example, the passage of the annular body is received in a slot formed in, for example, the lip of the cover body, as a result of which a solid connection between the cover body and the annular body is obtained. The cover body can be screwed to the annular body, thereby providing a rigid connection between the two.

[0008] In a preferred embodiment of a device according to the invention, said light sources comprise LEDs. LEDs, or Light Emitting Diodes, have a low energy consumption and are thus economical in use. In addition, LEDs have a long life, which adds to the service life of the device.

[0009] In another preferred embodiment of a device according to the invention, an end surface of the annular body is provided with holes extending transversely to the passage for receiving the light sources. Preferably, the circumferential shapes of the light sources correspond at least substantially to the circumferential shapes of said holes, so that the light sources can be clampingly received in the annular body. Mounting the light sources in a surface extending transversely to the direction of flow of the liquid jet results in the jet being illuminated in the direction of flow, as a result of which the jet functions as a light guide, analogously to a glass fibre, and thus absorbs and transports the light, resulting in the intended light effects.

[0010] In another preferred embodiment of the device according to the invention, the annular body has an at least substantially U-shaped cross-section. Because of this, the annular body is easy to manufacture and, in addition, sufficient space is available between the legs of the U-shaped section for the provision of electric power supply means for supplying electric power to the light sources, which are preferably mounted in the holes in the base of the U-shaped section.

[0011] In another preferred embodiment of a device according to the invention, the cover body has an at least substantially U-shaped cross-section, so that the light sources, which preferably project from the annular body, are received in the U-shaped section. More preferably, the leg on the side of the centre of the cover body comprises the lip-shaped profile and, even more preferably, the other leg of the U-shaped section is arranged for fitting over the annular body, so that the annular body is at least partially received in the cover body.

[0012] In another preferred embodiment of a device according to the invention, the outer circumferences of said bodies are at least substantially polygonal, preferably, the outer circumferences of said bodies are at least substantially octagonal. If the device according to the invention is mounted in a fountain, for example, it can be placed in a fitting profile, so that it can no longer be turned, , which leads to a more solid connection between the device and, for example, the fountain.

[0013] In another preferred embodiment of a device according to the invention, the means for connecting a waters supply means comprise a connecting element which is detachably connected to the annular body. A garden hose, for example, can be connected to such a connecting element, which preferably has a cylindrical configuration, with different connecting elements being available for different garden hose diameters, so that a wide range of liquid supply means can be connected to one and the same annular body.

[0014] The invention also relates to the cover body as described in the above.

[0015] The invention will now be explained in more detail with reference to figures illustrated in a drawing, in which:

- Figure 1 is a schematic view a device for illuminating a liquid jet,
  incorporated in a fountain column;
- Figure 2 is a schematic, perspective view of a device for illuminating a liquid jet;
- Figure 3 is a schematic view of the device of figure 2 in disassembled condition;
- Figure 4 is a schematic, cross-sectional view of the device of figure 2; and
- Figures 5-7 are schematic views of a device analogous to figures 2-4.

[0016] Figure 1 shows a fountain 13, which consists of three columns 16, which are placed on top of a basin 17. Water ornaments 1 according to the invention are placed on the upper side of the columns 16, which water ornaments are provided with illumination means, which illuminate a water jet 100. If the water is illuminated from behind upon flowing from the ornaments 1, as shown in figure 1, the water jet 100 will function as a light guide, with the water holding the light and providing decorative light effects.

[0017] As shown in figures 2 - 4, the water ornament 1 essentially consists of three parts, viz. an illumination ring 2, a cover 3 and a connecting piece 4.

[0018] The illumination ring 2 is an annular body made of plastic, which is provided with a passage 6 on the inner side, through which the water flows. To illuminate the water jet that flows through the passage 6, four LEDs 5 are placed in the ring 2. The LEDs 5 are inserted into holes 14 formed in an upper surface 15 of the ring 2 with a clamping fit, so that a solid connection is obtained. A ridge 12, whose use will become apparent hereinafter, is furthermore provided near the edge of the upper surface 15.

[0019] The cover 3 is made of a transparent, coloured plastic, so that the LEDs are covered when the cover 3 is placed on the ring 2, colouring the light from the LEDs 5, which is preferably white light. To enable the user to adapt the colour of the illumination, the cover is 3 available in various colours, so that the colour can be varied in a simple manner.

[0020] The cover 3 has a substantially U-shaped cross-sectional profile, as is shown more clearly in figure 4, with the LEDs 5 being accommodated between the legs 3a and 3b of the cover 3. The space defined by the inner leg 3b forms a passage 7, which, upon placement of the cover, connects to the passage 6 in the ring 2. The leg 3b is longer, so that a lip 8 is formed, which is received in the passage 6 of the ring 2 when the ring 2 and the cover 3 are connected together. To strengthen said connection, a slot 11 is formed in the lip 8, which slot is capable of receiving an annular thickening 9 formed in the passage 6. In connected condition, as shown in figures 2 and 4, the bottom side of the leg 3a is accommodated in the ridge 12 above the upper surface 15, as a result of which a watertight seal of the upper surface 15 is obtained. In another embodiment, the outer leg 13 is longer as well and oriented more towards the outside, as a result of which it will slide over the outer side of the ring 2, thus sealing the upper surface 15.

[0021] As shown, both the cover 3 and the illumination ring 2 are octagonal in shape. This shape leads to a solid connection of the water ornament 1 to, for example, a column 13 as shown in figure 1 when the ornaments 1 are placed in fitting profiles, since the ornaments 1 cannot be turned any more in that case.

[0022] In the bottom side of the passage 6 of the ring 2, the connecting piece 4 is connected via connecting means 9 and 11 similar to those used for connecting the cover 3 to the ring 2. The connecting piece 4 is provided with stepped projections 10 on the outer side, over which a water supply means (not shown), for example a garden hose, can be clampingly fitted. In this device connecting piece 4 has a diameter of thirteen millimetres, for example. As a variant, a water supply means can be clampingly fitted in the inner side of the connecting piece 4.

[0023] Figures 5 - 7 show a device for illumination a liquid jet, in which the same numerals are used for indicating the parts as in figures 2 - 4. In this case a ring 2b is provided with eight LEDs 5, and a connecting piece 4b has a larger diameter, for example of nineteen millimetres, for connecting a thicker water supply means. Because of the various embodiments of the rings 2 and 2b, the connecting pieces 4 and 4b and the differently coloured covers 3, the water ornament can be readily adapted to the user's wishes, since the various connecting pieces 4 and 4b, the rings 2 and 2b and the covers 3 are exchangeable.

Claims

1. A device (1) for illuminating a liquid jet from a liquid supply means, comprising an at least substantially annular body (2), which annular body (2) comprises

a passage (6), through which the liquid to be illuminated can pass, light sources (5) and means (4) for connecting the liquid supply means thereto, wherein the device (1) furthermore comprises an at least substantially annular cover body (3), which is detachably connected to the annular body (2) and which is provided with a passage (7) through which the liquid to be illuminated can pass, said cover body (3) being arranged for covering the light sources (5), **characterized in that** the cover body (3) comprises a cylindrical lip (8) at least substantially extending in the direction of the passage (6), which lip (8) can be received in the passage (6) of the annular body (2), wherein at least one slot (11) formed in the circumference of the passage (6) and/or the lip (8) is provided for receiving a thickening (9) formed in the circumference of the passage (6) and/or the lip (8), wherein the lip (8) is provided with external screw thread and the passage (6) of the annular body (2) is provided with internal screw thread.

2. A device (1) according to claim 1, wherein the cover body (3) is at least substantially made of a transparent material.

3. A device (1) according to claim 2, wherein the cover body (3) is at least substantially made of a coloured material for illuminating the liquid flow with coloured light.

4. A device (1) according to claim 1, 2 or 3, wherein said light sources (5) comprise LEDs.

5. A device (1) according to any of the preceding claims 1-4, wherein the external diameter of the cylindrical lip (8) corresponds to the internal diameter of the passage (6) of the annular body (2), in order that the lip (8) can be clampingly received in the passage (6).

6. A device (1) according to any one of the preceding claims 1-5, wherein an end surface (15) of the annular body (2) is provided with holes (14) extending transversely to the passage (6) for receiving the light sources (5).

7. A device (1) according to claim 6, wherein the circumferential shapes of the light sources (5) correspond at least substantially to the circumferential shapes of said holes (14), so that the light sources (5) can be clampingly received in the annular body (2).

8. A device (1) according to any one of the preceding claims 1-7, wherein the annular body (2) has an at least substantially U-shaped cross-section.

9. A device (1) according to any one of the preceding claims 1-8, wherein the cover body (3) has an at least substantially U-shaped cross-section.

10. A device (1) according to any one of the preceding claims 1-9, wherein the outer circumferences of said bodies (2, 3) are at least substantially polygonal.

11. A device (1) according to claim 10, wherein the outer circumferences of said bodies (2, 3) are at least substantially octagonal.

12. A device (1) according to any one of the preceding claims 1-11, wherein the means (4) for connecting a waters supply means comprise a connecting element which is detachably connected to the annular body (2).

Patentansprüche

1. Vorrichtung (1) zur Beleuchtung eines Flüssigkeitsstrahls von einer Flüssigkeitszuführungseinrichtung, die aufweist: einen zumindest im Wesentlichen ringförmigen Körper (2), wobei der ringförmige Körper (2) einen Durchgang (6), den die Flüssigkeit, die beleuchtet werden soll, durchlaufen kann, Lichtquellen (5) und Einrichtungen (4) zum Verbinden der Flüssigkeitszuführungseinrichtung damit aufweist, wobei die Vorrichtung (1) außerdem aufweist: einen zumindest im Wesentlichen ringförmigen Abdeckungskörper (3), der abnehmbar mit dem ringförmigen Körper (2) verbunden ist und der mit einem Durchgang (7) versehen ist, den die Flüssigkeit, die beleuchtet werden soll, durchlaufen kann, wobei der Abdekkungskörper (3) eingerichtet ist, um die Lichtquellen (5) zu bedecken, **dadurch gekennzeichnet, dass** der Abdekkungskörper (3) eine zylindrische Lippe (8) aufweist, die sich zumindest im Wesentlichen in der Richtung des Durchgangs (6) erstreckt, wobei die Lippe (8) in dem Durchgang (6) des ringförmigen Körpers (2) aufgenommen werden kann, wobei wenigstens ein Schlitz (11), der in dem Umfang des Durchgangs (6) und/oder der Lippe (8) ausgebildet ist, bereitgestellt ist, um eine Verdickung (9) aufzunehmen, die in dem Umfang des Durchgangs (6) und/oder der Lippe (8) ausgebildet ist, wobei die Lippe (8) mit einem Außenschraubgewinde versehen ist und der Durchgang (6) des ringförmigen Körpers (2) mit einem Innenschraubgewinde versehen ist.

2. Vorrichtung (1) nach Anspruch 1, wobei der Abdekkungskörper (3) zumindest im Wesentlichen aus einem transparenten Material gefertigt ist.

3. Vorrichtung (1) nach Anspruch 2, wobei der Abdekkungskörper (3) zumindest im Wesentlichen aus einem farbigen Material gefertigt ist, um den Flüssigkeitsstrom mit farbigem Licht zu beleuchten.

4. Vorrichtung (1) nach Anspruch 1, 2 oder 3, wobei die Lichtquellen (5) LEDs aufweisen.

5. Vorrichtung nach einem der vorhergehenden Ansprüche 1 - 4, wobei der Außendurchmesser der zylindrischen Lippe (8) dem Innendurchmesser des Durchgangs (6) des ringförmigen Körpers (2) entspricht, damit die Lippe (8) klemmend in dem Durchgang (6) aufgenommen werden kann.

6. Vorrichtung (1) nach einem der vorhergehenden Ansprüche 1 - 5, wobei eine Endoberfläche (15) des ringförmigen Körpers (2) mit Löchern (14) versehen ist, die sich quer zu dem Durchgang (6) erstrecken, um die Lichtquellen (5) aufzunehmen.

7. Vorrichtung (1) nach Anspruch 6, wobei die Umfangsformen der Lichtquellen (5) zumindest im Wesentlichen den Umfangsformen der Löcher (14) entsprechen, so dass die Lichtquellen (5) klemmend in dem ringförmigen Körper (2) aufgenommen werden können.

8. Vorrichtung (1) nach einem der vorhergehenden Ansprüche 1 - 7, wobei der ringförmige Körper (2) einen zumindest im Wesentlichen U-förmigen Querschnitt hat.

9. Vorrichtung (1) nach einem der vorhergehenden Ansprüche 1 - 8, wobei der Abdeckungskörper (3) einen zumindest im Wesentlichen U-förmigen Querschnitt hat.

10. Vorrichtung (1) nach einem der vorhergehenden Ansprüche 1 - 9, wobei die Außenumfänge der Körper (2, 3) zumindest im Wesentlichen polygonal sind.

11. Vorrichtung (1) nach Anspruch 10, wobei die Außenumfänge der Körper (2, 3) zumindest im Wesentlichen achteckig sind.

12. Vorrichtung (1) nach einem der vorhergehenden Ansprüche 1 - 11, wobei die Einrichtungen (4) zum Verbinden einer Wasserzuführungseinrichtung ein Verbindungselement aufweisen, das abnehmbar mit dem ringförmigen Körper (2) verbunden ist.

Revendications

1. Dispositif (1) pour éclairer un jet de liquide provenant de moyens d'alimentation de liquide, comprenant au moins un corps sensiblement annulaire (2), lequel corps annulaire (2) comprend un passage (6) à travers lequel le liquide à éclairer peut passer, des sources de lumière (5) et des moyens (4) pour y raccorder les moyens d'alimentation de liquide, dans lequel le dispositif (1) comprend en outre au moins un corps de couvercle sensiblement annulaire (3), qui est raccordé de manière détachable au corps annulaire (2) et qui est prévu avec un passage (7) à travers lequel le liquide à éclairer peut passer, ledit corps de couvercle (3) étant agencé pour recouvrir les sources de lumière (5), **caractérisé en ce que** le corps de couvercle (3) comprend une lèvre cylindrique (8) s'étendant au moins sensiblement dans la direction du passage (6), laquelle lèvre (8) peut être reçue dans le passage (6) du corps annulaire (2), dans lequel au moins une fente (11) formée dans la circonférence de passage (6) et/ou la lèvre (8) est prévue pour recevoir un épaississement (9) formé dans la circonférence du passage (6) et/ou la lèvre (8), dans lequel la lèvre (8) est prévue avec un filetage de vis externe et le passage (6) du corps annulaire (2) est prévu avec un filetage de vis interne.

2. Dispositif (1) selon la revendication 1, dans lequel le corps de couvercle (3) est au moins sensiblement réalisé avec un matériau transparent.

3. Dispositif (1) selon la revendication 2, dans lequel le corps de couvercle (3) est au moins sensiblement réalisé avec un matériau coloré pour éclairer l'écoulement de liquide avec une lumière colorée.

4. Dispositif (1) selon la revendication 1, 2 ou 3, dans lequel lesdites sources de lumière (5) comprennent des diodes électroluminescentes (LED).

5. Dispositif (1) selon l'une quelconque des revendications 1 à 4 précédentes, dans lequel le diamètre externe de la lèvre cylindrique (8) correspond au diamètre interne du passage (6) du corps annulaire (2), de sorte que la lèvre (8) peut être reçue de manière serrée dans le passage (6).

6. Dispositif (1) selon l'une quelconque des revendications 1 à 5 précédentes, dans lequel une surface d'extrémité (15) du corps annulaire (2) est prévue avec des trous (14) s'étendant transversalement par rapport au passage (6) pour recevoir les sources de lumière (5).

7. Dispositif (1) selon la revendication 6, dans lequel les formes circonférentielles des sources de lumière (5) correspondent au moins sensiblement aux formes circonférentielles desdits trous (14), de sorte que les sources de lumière (5) peuvent être reçues de manière serrée dans le corps annulaire (2).

8. Dispositif (1) selon l'une quelconque des revendications 1 à 7 précédentes, dans lequel le corps annulaire (2) a au moins une section transversale sensiblement en forme de U.

9. Dispositif (1) selon l'une quelconque des revendica-

tions 1 à 8 précédentes, dans lequel le corps de couvercle (3) a au moins une section transversale sensiblement en forme de U.

10. Dispositif (1) selon l'une quelconque des revendications 1 à 9 précédentes, dans lequel les circonférences externes desdits corps (2, 3) sont au moins sensiblement polygonales.

11. Dispositif (1) selon la revendication 10, dans lequel les circonférences externes desdits corps (2, 3) sont au moins sensiblement octogonales.

12. Dispositif (1) selon l'une quelconque des revendications 1 à 11 précédentes, dans lequel les moyens (4) pour raccorder les moyens d'alimentation d'eau comprennent un élément de raccordement qui est raccordé de manière détachable au corps annulaire (2).

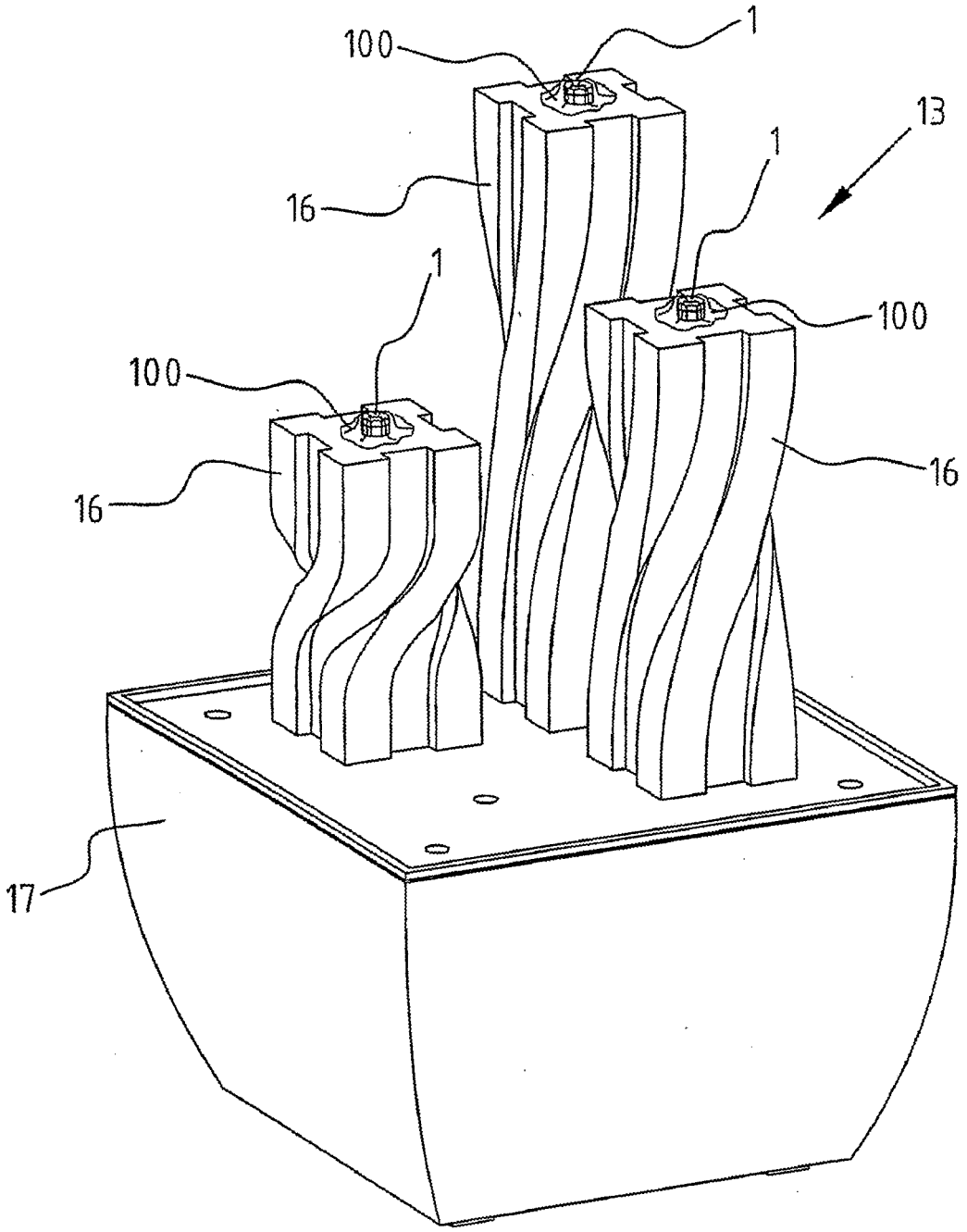

FIG. 1

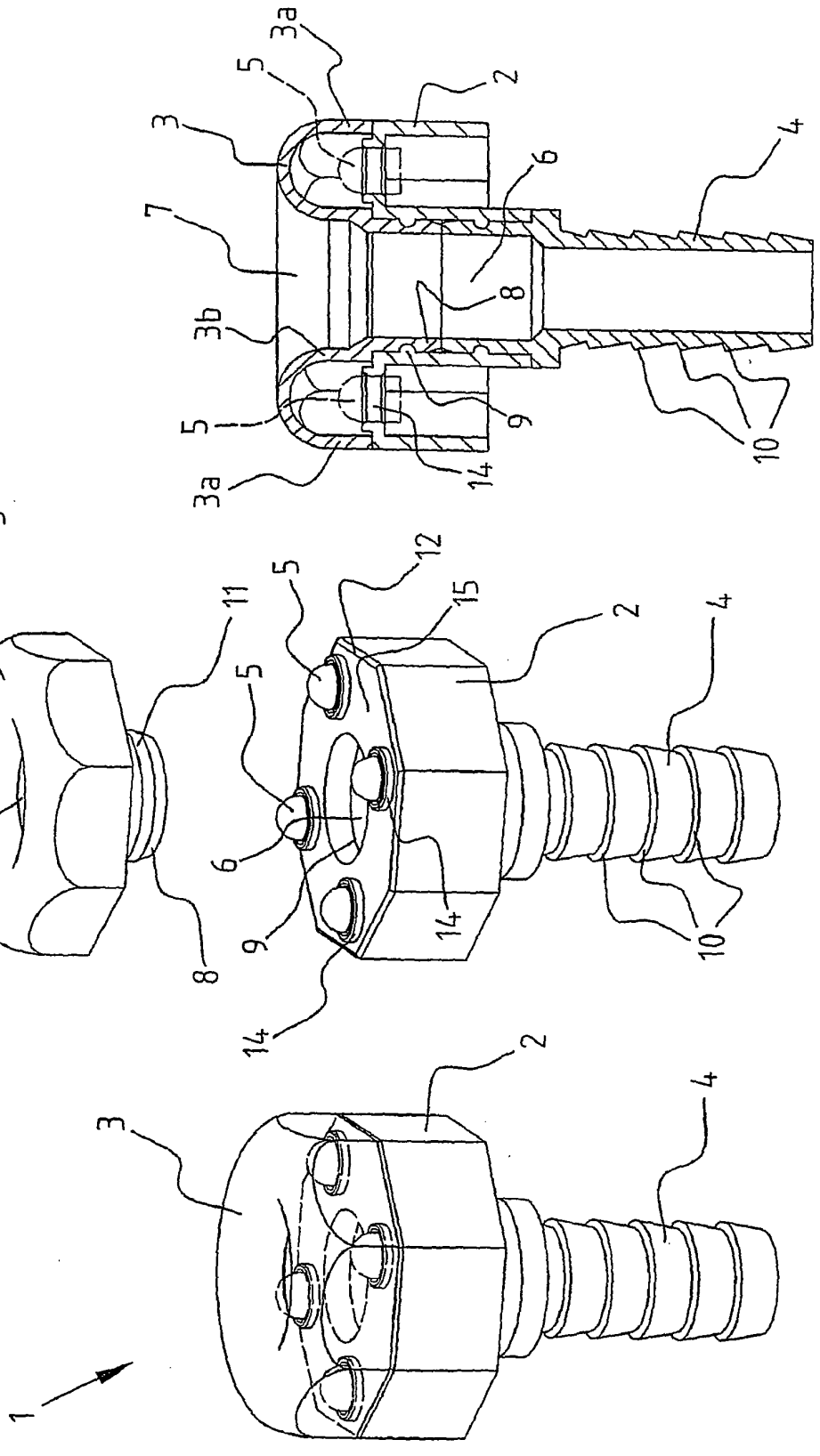

FIG. 2

FIG. 3

FIG. 4

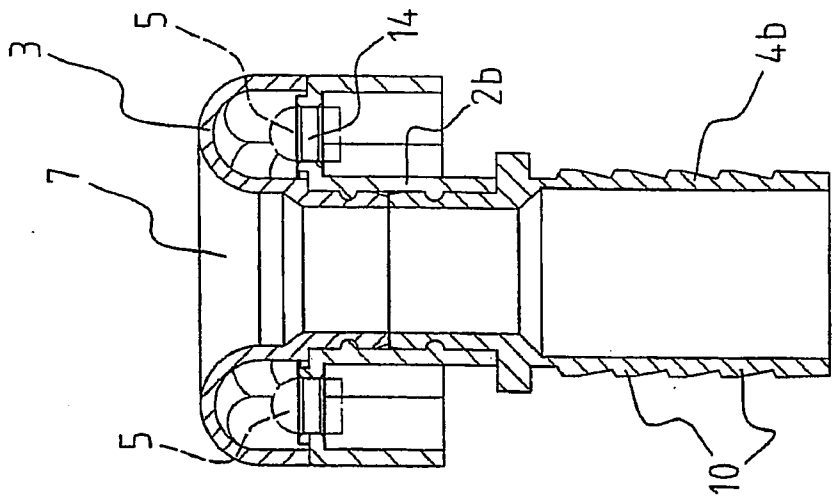

FIG. 7

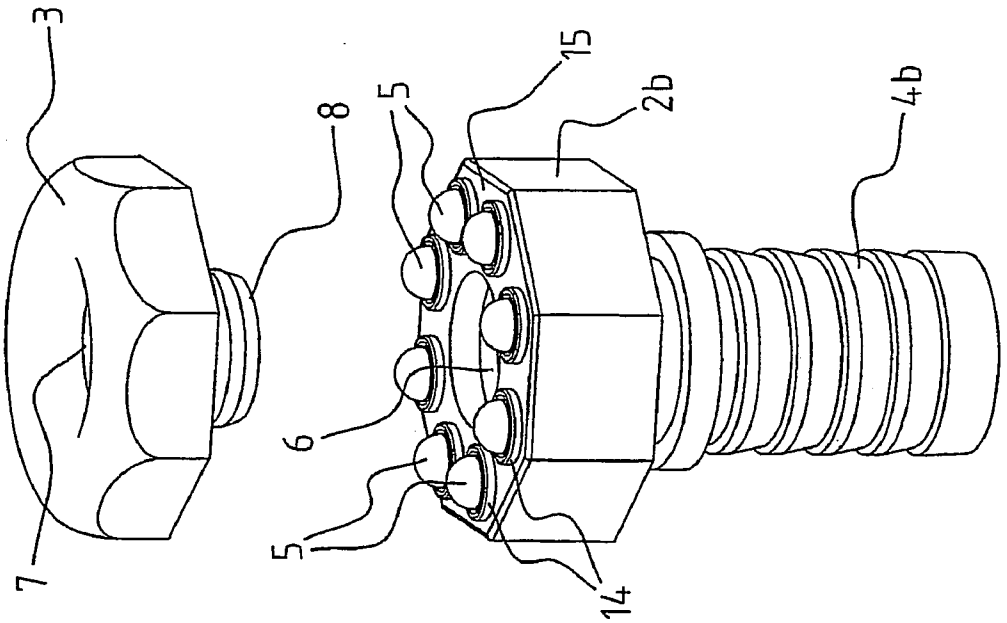

FIG. 6

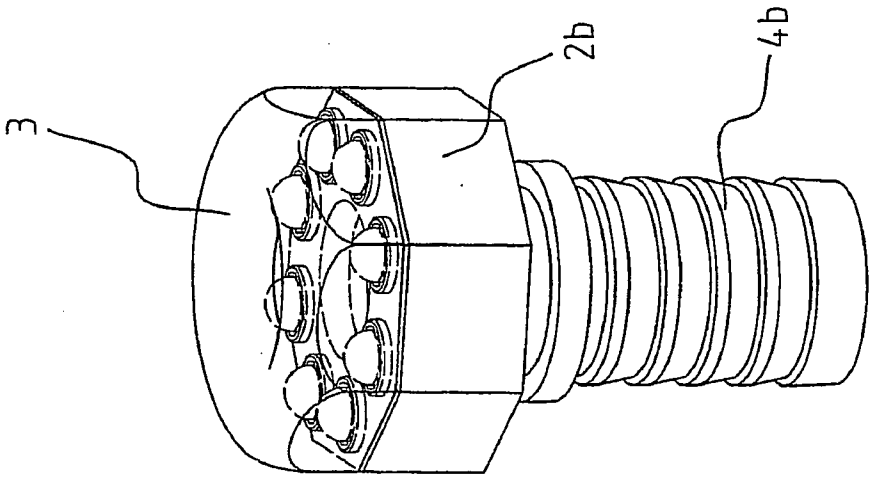

FIG. 5

REFERENCES CITED IN THE DESCRIPTION

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- DE 102004001256 **[0005]**