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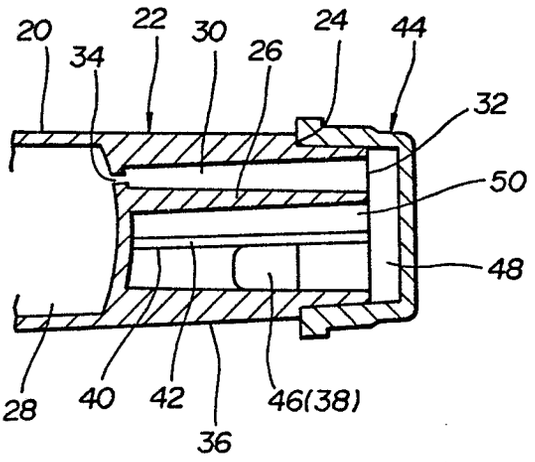
(54) Light assembly with water-proof breather.

(57) The light fitting having a closed lamp house in which a lamp bulb is displayed is provided with a water-proof breather comprising a cylinder extending from the back of the housing rearwardly and having an air-path communicating with a the lamp house and the atmosphere through a mazy passage, and a cap fitted onto the cylinder. The outlet of the air-path is so formed as to open in the lower outer circumference of the cylinder. Therefore, the cylinder provides for both breathing and water-proofing functions. Rain water can be perfectly blocked from entering the light assembly. And since the dimensions of the water-proof breather only depends upon the outside dimensions of the cylinder, the lighting fitting with the water-proof breather can be installed in a minimum space.

FIG. 2



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Light Assembly with Water-proof Breather

BACKGROUND OF THE INVENTION

a) Field of the Invention:

The present invention relates to a light-assembly with water-proof breather by which it is possible to prevent rain water from entering from outside into a closed light assembly through the breather through which a breathing is provided between the inside and outside of the light assembly.

b) Description of the Prior Art:

Fig. 1 schematically shows a conventional light assembly with a water-proof breather. In Figure, the reference numeral 1 indicates the entire light assembly. This light assembly 1 comprises a body 2 formed by a housing or reflector, a lens 3 attached, by an adhesive 13, to a concave portion 12 formed on the circumference of the front opening of the light-assembly body 2, and a bulb 5 disposed in the interior (lamp house) of the light assembly that is defined, as closed, by the light-assembly body 2 and lens 3.

The reference numeral 6 indicates a hollow cylindrical member formed integrally with and as protruded from the body 2. There is formed in the wall of the body 2 a hole 7 which communicates the inside of the lamp house 4 with the inside of the cylindrical member 6, namely, with the outside of the light assembly 1. A step 8 is formed on the outer circumference of the free end of the cylinder 6. The reference numeral 9 indicates a water-stop wall formed integrally with the body 2 and as protruded from a portion lower than the cylinder 6.

The reference numeral 10 indicates a bend as a cap member for the cylinder 6. The bend 10 is made of a rubber tube and curved in U-shape. Also the bend 10 has a step 11 formed on the inner circumference of one end thereof. This bend 10 is fitted at the end thereof onto the free end of the cylinder 6 with the end face of the bend 10 placed as abutting the step 8 at the end of the cylinder 6, the end face of the cylinder 6 placed as abutting the step 11 on the bend 10 and with the other end of the bend 10 directed downwardly and facing the water-stop wall 9.

In the aforementioned breather of the light assembly, the lamp house 4 is communicated with the outside through the hole 7 in the cylinder 6 and the bend 10. Thus, a breathing can be made between the lamp house 4 and the outside of the light assembly 1. Since the bend 10 is curved in U-shape and one end of thereof is fitted onto the end of the cylinder 6 with the other end directed downwardly, any water having entered the lower end opening of the bend 10 and being about to enter the lamp house 4 through the inside of the bend 10 will drop due to its own weight in the middle of the long, curved course inside the bend 10 and be discharged from the lower end opening of the bend 10. Thus, the water is blocked from entering the light assembly 1. Further, the lower end opening of the bend 10 is directed downwardly toward the water-stop wall 9, whereby any rain water is prevented from entering the lower end opening of the bend 10.

However, the water-proof breather of the conventional light assembly employs, for both breathing and water-proofing functions, the U-shaped bend 10 which has one end thereof fitted onto the cylinder 6 and the other end directed downwardly. Therefore, the water-proof breather has a large vertical dimension, needing a large space for installation. In case the water-stop wall 9 opposing the lower end opening of the bend 10 is formed integrally with the light-assembly body 2, the vertical dimension will be still larger.

SUMMARY OF THE INVENTION

The present invention seeks to provide a light assembly with a water-proof breather which needs only a small space for installation.

The above object can be attained by providing a light assembly with a water-proof breather comprising, according to the present invention, a cylinder provided as protruded from the light-assembly body, and a cap member fitted on the cylinder, there being provided in the cylinder a hole communicating with the inside of the light assembly and an opening communicating with the outside of the light assembly, the hole and opening being communicated with each other through a communication path.

In the light assembly with a water-proof breathing according to the present invention, the hole and opening formed in the cylinder, and the communication path providing a communication between the breather and opening enable, in cooperation with one another, the breathing between the inside and the outside of the light assembly. Also a mazy air-path formed by the hole, communication path

and opening makes it possible to prevent rain water from entering the light-assembly inside from outside. Thus, the cylinder provided as protruded from the light-assembly body provides for both breathing and water-proofing functions.

These and other objects and advantages of the present invention will be better understood from the ensuing description made, by way of example, of the embodiment of the present invention with reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a schematic drawing for explanation of a conventional light assembly with a water-proof breather;

Figs. 2 thru 7 show one embodiment of the lighting fitting with the water-proof breather according to the present invention, of which:

Fig. 2 is a sectional view showing the essential part of the water-proof breather of the light assembly according to the present invention;

Fig. 3 is a perspective view of the essential part;

Fig. 4 is a view from the direction IV in Fig. 3;

Fig. 5 is a sectional view showing a state of the water-proof breather with the cap member removed;

Fig. 6 is a perspective view showing a state of the water-proof breather with the cap member removed; and

Fig. 7 is a view from the direction VII in Fig. 6.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to Figs. 2 thru 7, one embodiment of the light assembly with the water-proof breather according to the present invention will be described.

In Figures, the reference numeraL 22 indicates a hollow cylindrical member or cylinder formed integrally with and as protruded from a light-assembly body 20. The cylinder 22 has a step 24 formed on the outer circumference at the end thereof. Also the cylinder 22 has formed axially integrally therewith at the upper portion of the inner circumference thereof a small cylinder 26 within which formed axially therewith is a hole 30 to provide a communication between the inside and outside of a lamp house 28.

The hole 30 has the inside diameter reduced as it goes from an opening 32 at the end-face side of the small cylinder 26 (cylinder 22) toward the inside of the lamp house 28, and also has an opening 34 of a further small diameter formed in the wall of the light-assembly body 20 and which is set back from the wall of the small cylinder 26. Thus, a communication is established between the inside and outside of the lamp house 28 through the opening 34 at the side of the lamp house 28 and the opening 32 at the end-face side (outer side) of the small cylinder 26.

The cylinder 22 has formed at each of the lower right and left portions of the circumference 36 thereof a cut 38 extending from the step 24, namely, from the end face of the cylinder 22 in the direction of the lamp house 28.

Also the cylinder 22 has formed horizontally and integrally therewith nearly at the center of the inner circumference thereof a baffle 40 which has a gap 42 formed in the center thereof and axially of the cylinder 22.

The reference numeral 44 indicates a cap member of which the inside diameter is nearly equal to or somewhat smaller than the outside diameter of the portion of the cylinder 22 that is outer than the step 24 and the depth is a little larger than the distance from the end face to the set 24 of the cylinder 22.

The cap member 44 is fitted onto the free end of the cylinder 22 with the opening end of the cap member 44 abutting the step 24 of the cylinder 22. Thus, the opening 32 at the end face (outer side) of the hole 30 in the cylinder 22 and a portion (outer side) on the end-face side that is outer than the step 24 at the cut in the cylinder 22 are closed by the cap member 44. On the other hand, an opening 46 communicating with the outside is formed in a portion inner (toward the lamp house 28) than the step 24 at the cut 38 in the cylinder 22. Also, since the depth of the cap member 44 is larger than the distance from the end face of the cylinder 22 to the step 24, there is defined a space 48 between the end face of the cylinder 22 and inner covering face of the cap member 44. The hole 30 communicating with the inside of the lamp house 28 and the opening communicating with the outside are communicated with each other through a mazy path consisting of a bore 50 of the cylinder 50, gap 42 in the baffle 40 and the aforementioned space 48.

Accordingly, the water-proof breather of the light assembly according to the present invention can provide a breathing since the inside and outside of the lamp house 28 are communicated with each other through the opening 32 of the hole 30, hole 30 itself, opening 34 of the hole 30, space 48, bore 50, gap 42, and the opening 46. Also, since the hole 30 communicating with the inside of the lamp house 28, opening 46 communicating with the

outside, hole 30 itself, space 48 as a path communicating the opening 46 with the outside, bore 50 and gap 42 form together a mazy air-path, even if a rain water has entered through the lower lateral opening 46 in the cylinder 22 and is about to enter the lamp house 28 through the hole 30 at the upper portion of the cylinder 22 via the gap 42, bore 50 and space 48, it will drop due to its own weight in the middle of the long, mazy course or air-path and be discharged from the lower lateral opening 46 in the cylinder 22. Thus, the water can be blocked from entering the lamp house 28.

According to this embodiment, the opening 46 communicating with the outside is formed in the lower portion of the cylinder 22, the hole 30 communicating with the inside of the lamp house 28 is formed in the upper portion of the cylinder 22, there is disposed the baffle between these hole 30 and opening 46, the lower portion of the inner circumference of the hole 30 is slanted downwardly from above in a direction of the opening 32 at the end-face side from the opening 34 at the side of the lamp house 28, and the opening 34 at the side of the lamp house 28 communicates with the inside of the lamp house 28 through the hole 30 formed as set back from the inner wall of the aforementioned small cylinder 26. So, any rain water can be perfectly blocked against entering the lamp house 28.

As having been described in the foregoing, the cylinder 22 formed as protruded from the light-assembly body 20 can provide for both breathing and water-proofing functions. So the vertical dimension of the breather may be the outside diameter of the cylinder 22 and it is smaller than that of the breather of the conventional light assembly using a U-shaped bend. Therefore, the light assembly with the water-proof breather according to the present invention needs only a small space for installation.

It should be noted that in the above-mentioned embodiment according to the present invention, the hole 30, cut 38 (opening 46), baffle, gap 42, etc. formed in the cylinder 22 formed as protruded from the light-assembly body 20 are so arranged with a consideration that the releasing direction of the molding dies for the light-assembly body 20 is to coincides with the axial direction of the cylinder 22.

As apparent from the foregoing description, the water-proof breather of the light assembly according to the present invention comprises a cylindrical member formed as protruded from a light-assembly body and a cap member fitted onto the cylindrical member, the cylindrical member or cylinder having formed therein a hole communicating with the inside of the light assembly and an opening communicating with the outside, the hole and opening being communicated with each other through a communication path. So the hole and opening formed in the cylinder and the path communicating the hole with the opening provide for a breathing or air communication between the inside and outside of the light assembly. Also, the mazy air-path formed by the hole, communication path and opening can shut off any rain water about to enter the light assembly from outside. Thus, since the cylinder provided as protruded from the light-assembly body can provide for both the breathing and water-proofing functions, the vertical dimension of the breather may be the outside diameter of the cylinder, and it is small as compared with that of the water-proof breather of the conventional light assembly which adopts a U-shaped bend. Therefore, the breather of the light assembly according to the present invention needs only a small space for installation.

Claims

1. A light assembly with a water-proof breather, comprising a housing in which a bulb is disposed and a lens covering the front opening of the housing, said housing and lens forming together a lamp house, said water-proof breather having an air-path means provided as extending from the back of said housing rearwardly and in which a path communicating said lamp house with the atmosphere, characterized in that said air-path means is composed of a cylindrical member having formed therein a mazy air-path and a cap member fitted onto said cylindrical member, the outlet of said air-path being formed so as to open in the lower outer circumference of said cylindrical member.

2. A light assembly with a water-proof breather according to Claim 1, characterized in that said air-path includes at least a second cylinder disposed in said cylindrical member, communicating with said lamp house and having one end thereof opened inside said cylindrical member.

3. A light assembly with a water-proof breather according to Claim 2, characterized in that said second cylinder has the inside diameter increased gradually in the axial direction thereof.

4. A light assembly with a water-proof breather according to Claim 2 or 3, characterized in that said air-path further comprises a breathing area located below said second cylinder and defined by a horizontal baffle provided as extending in said axial direction.

FIG. 1

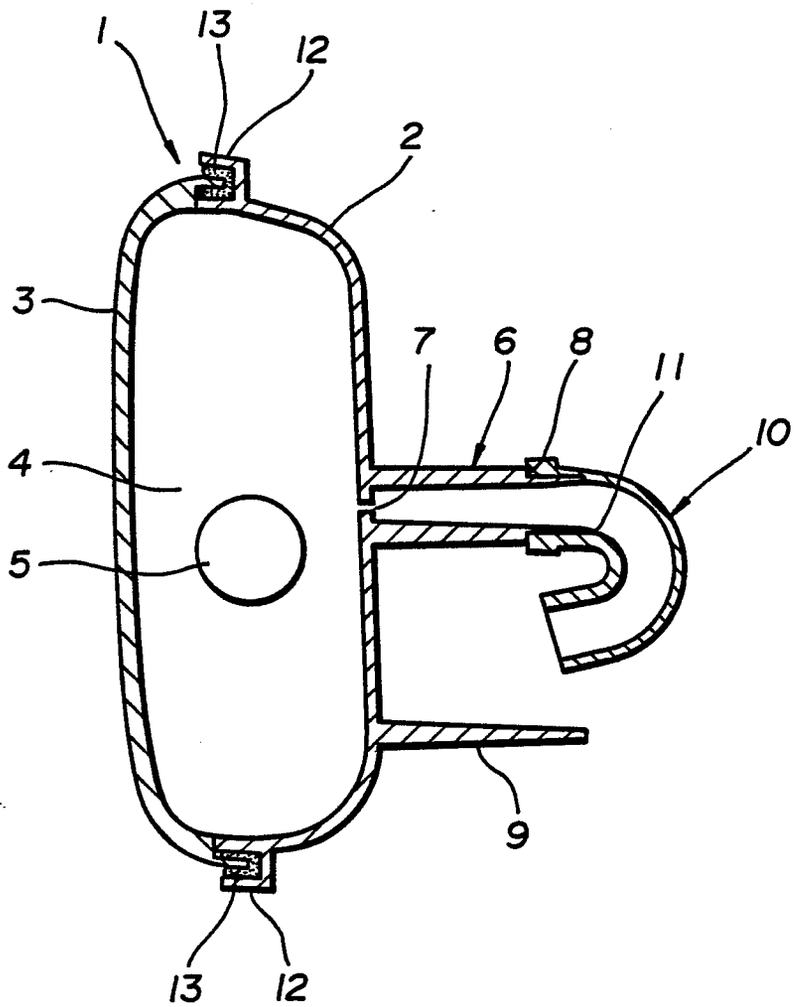

FIG. 2

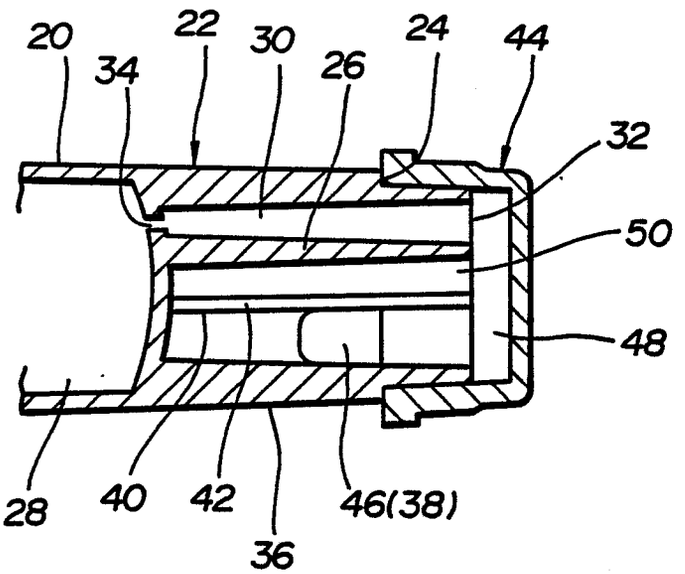

FIG. 3

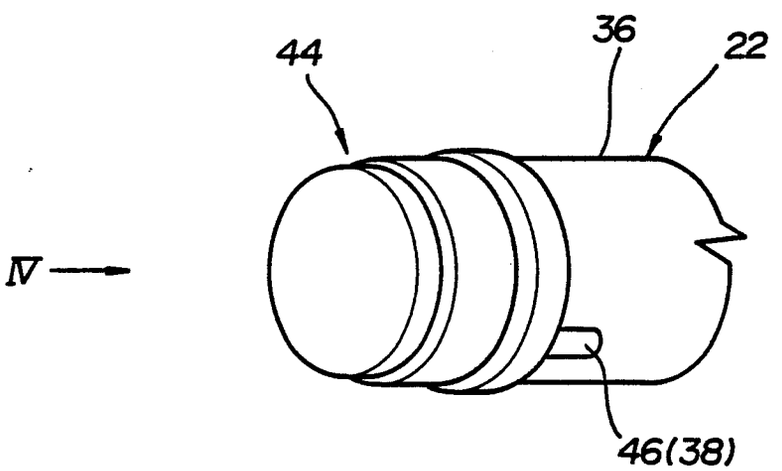

FIG. 4

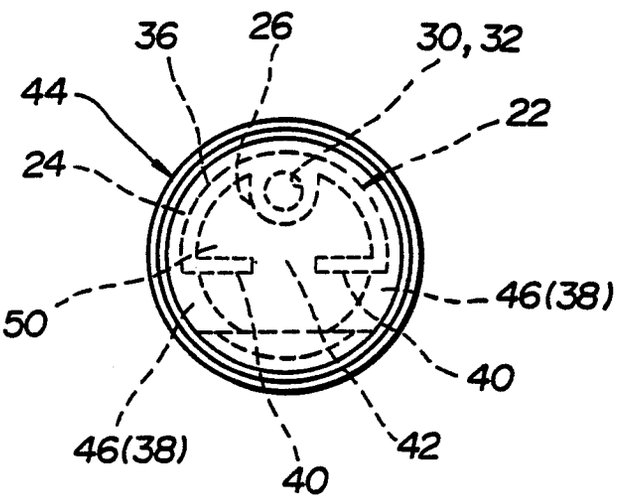
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FIG. 5

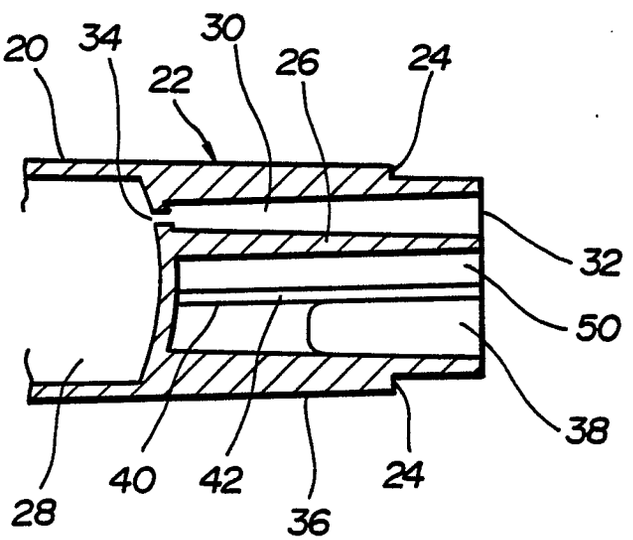
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FIG. 6

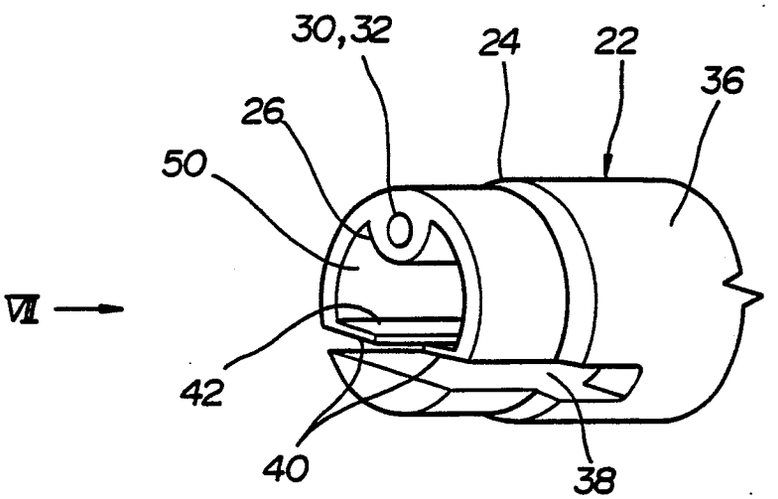

FIG. 7