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(54) **Light assembly with water-proof breather**

Leuchte mit einer wasserdichten Belüftungsöftnung

Armature d'éclairage avec ouverture de ventilation étanche à l'eau

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- **Divulgation d'un feu de signalisation de Toyota Supra en 1986**

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Description

BACKGROUND OF THE INVENTION

a) Field of the Invention:

[0001] 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:

[0002] 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.

[0003] 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.

[0004] 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.

[0005] 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.

[0006] 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.

[0007] From FR-A-21 83 934 a light assembly with a water-proof breather is known. This assembly comprises a housing in which a bulb is disposed and a lens is provided covering front opening of the housing. Said housing and lens forming together a lamp house. A cylindrical member is provided at the rearward end of the housing having an angular opening communicating with a downwardly extending opening to the atmosphere and an opening into the inner of said lamp housing. The air path from the outer atmosphere to the inner of the housing has a mazy form. A cap member is fitted onto said cylindrical member for closing said angular opening in an axial direction of said lamp housing.

[0008] According to the precharacterizing part of claim 1 from TOYOTA SUPRA model of 1986, a lamp display with a water-proof breather is known comprising a housing in which a bulb is disposed and a lens is provided covering the front opening of the housing. Said housing and the lens together form a lamp house. The water-proof breather has an air-path means extending from the back of the housing rearwardly and in which a path communicates said lamp house with the atmosphere. Said air-path means comprises a cylindrical member being a tube member with a vertical partition onto which a cap member is fitted. The outlet of the air path opens to the lower outer circumference of said cylindrical member. The opening into the lamp housing is positioned at the lower portion of the tube member.

SUMMARY OF THE INVENTION

[0009] The present invention seeks to provide a light assembly with an improved water-proof breather.

[0010] The above object can be attained by providing a light assembly with a water-proof breather according to claim 1.

[0011] 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.

[0012] 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

[0013]

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

[0014] 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.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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.

[0022] 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.

[0023] 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.

[0024] 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.

[0025] 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 (20) in which a bulb (5) is disposed and a lens (3) covering the front opening of the housing (20), said housing and lens (3) forming together a lamp house (28), said water-proof breather having an air-path means extending from the back of said housing (20) rearwardly and providing a path communicating said lamp house (28) with the atmosphere, wherein said air-path means (28,30,42,46,50) is composed of a cylindrical member (22) being a tube member and having formed therein a mazy air-path and a cap member (44) fitted onto said cylindrical member (22), the outlet (46) of said air-path being formed so as to open the lower outer circumference of said cylindrical member (22),
characterized in that
said air-path includes at least a second tubular cylinder (26) disposed in said cylindrical member (22) at the upper portion of the inner circumference thereof and formed as a part of the mazy air-path, communicating with said lamp house (28) and having one end (32) thereof opened inside said cylindrical member (22).

2. A light assembly with the water-proof breather according to claim 1, **characterized in that** said second tubular cylinder (26) has the inside diameter increased gradually in the axial direction and towards the free end thereof.

3. A light assembly with a water-proof breather according to claim 1 or 2, **characterized in that** said air-path further comprises a breathing area located below said second tubular cylinder (26) and defined by a horizontal baffle (40) provided as extending in said axial direction.

Patentansprüche

1. Leuchtenanordnung mit einer wasserdichten Belüftungsöffnung, mit einem Gehäuse (20), in dem ein Lampenkolben (5) angeordnet ist und mit einer Streuscheibe (3), die die vordere Öffnung des Gehäuses (20) abdeckt, wobei das Gehäuse (20) und die Streuscheibe (3) zusammen ein Leuchtengehäuse (28) bilden, wobei die wasserdichte Belüftungsöffnung eine Luftwegeinrichtung aufweist, die sich von der Rückseite des Gehäuses (20) nach hinten erstreckt und die einen Weg bereitstellt, der das Lampengehäuse (28) mit der Atmosphäre verbindet, wobei die Luftwegeinrichtung (28, 30, 42, 46, 50) aus einem zylindrischen Element (22), das ein Röhrenelement ist, besteht, in dem ein Labyrinthluftweg ausgebildet ist, und wobei ein Kappen-

element (44) auf dem zylindrischen Element (22) angebracht ist, wobei der Auslaß (46) des Luftweges so ausgebildet ist, daß er sich zum unteren Außenumfang des zylindrischen Elementes (22) öffnet, **dadurch gekennzeichnet,** daß der Luftweg zumindest einen zweiten röhrenförmigen Zylinder (26) aufweist, der an dem oberen Bereich des Innenumfangs des zylindrischen Elementes (22) angeordnet ist und als ein Teil des Labyrinthluftweges ausgebildet ist, der mit dem Leuchtengehäuse (28) kommuniziert und dessen eines Ende (32) innerhalb des zylindrischen Elementes (22) geöffnet ist.

2. Leuchtenanordnung mit der wasserdichten Belüftungsöffnung entsprechend Anspruch 1, **dadurch gekennzeichnet,** daß der Innendurchmesser des zweiten röhrenförmigen Zylinders (26) in Axialrichtung und zum freien Ende desselben allmählich zunimmt.

3. Leuchtenanordnung mit einer wasserdichten Belüftungsöffnung entsprechend Anspruch 1 oder 2, **dadurch gekennzeichnet,** daß der Luftweg außerdem einen Belüftungsbereich umfaßt, der unterhalb des zweiten röhrenförmigen Zylinders (26) angeordnet ist und durch eine horizontale Zwischenwand (40) definiert wird, die als sich in Axialrichtung erstreckend vorgesehen ist.

Revendications

1. Armature d'éclairage avec une mise à air libre étanche à l'eau, comprenant un boîtier (20) dans lequel est disposée une lampe (5) et une lentille (3) recouvrant l'ouverture frontale du boîtier (20), ce boîtier (20) et la lentille (3) formant ensemble un logement de lampe (28), cette mise à air libre étanche à l'eau ayant un trajet d'air s'étendant vers l'arrière depuis le dos du boîtier (20) et procurant un trajet faisant communiquer le logement de lampe (28) avec l'atmosphère, dans laquelle ce trajet d'air (28,30,42,46,50) est constitué par un élément cylindrique (22) qui est un élément de tube et à l'intérieur duquel est formé un trajet d'air sinueux et par un chapeau (44) monté sur cet élément cylindrique (22) la sortie (46) de ce trajet d'air étant formée de façon à déboucher sur la circonférence extérieure inférieure de cet élément cylindrique (22),

caractérisée en ce que le trajet d'air comporte au moins un deuxième cylindre tubulaire (26) disposé dans l'élément cylindrique (22) au niveau de la portion supérieure de sa circonférence intérieure et formé en tant que partie du trajet d'air sinueux, communiquant avec le logement de lampe (28) et ayant une extrémité (32) s'ouvrant à l'intérieur de l'élément cylindrique (22).

2. Armature d'éclairage avec la mise à air libre étanche à l'eau selon la revendication 1, caractérisée en ce que ce deuxième cylindre tubulaire (26) a son diamètre intérieur qui augmente progressivement dans la direction axiale en direction de son extrémité libre.

3. Armature d'éclairage avec une mise à air libre étanche & l'eau selon la revendication 1 ou la revendication 2, caractérisée en ce que le trajet d'air comprend en outre une zone de mise à air libre située en dessous du deuxième cylindre tubulaire (26) et délimitée par une chicane horizontale (40) s'étendant dans la direction axiale.

FIG. 1

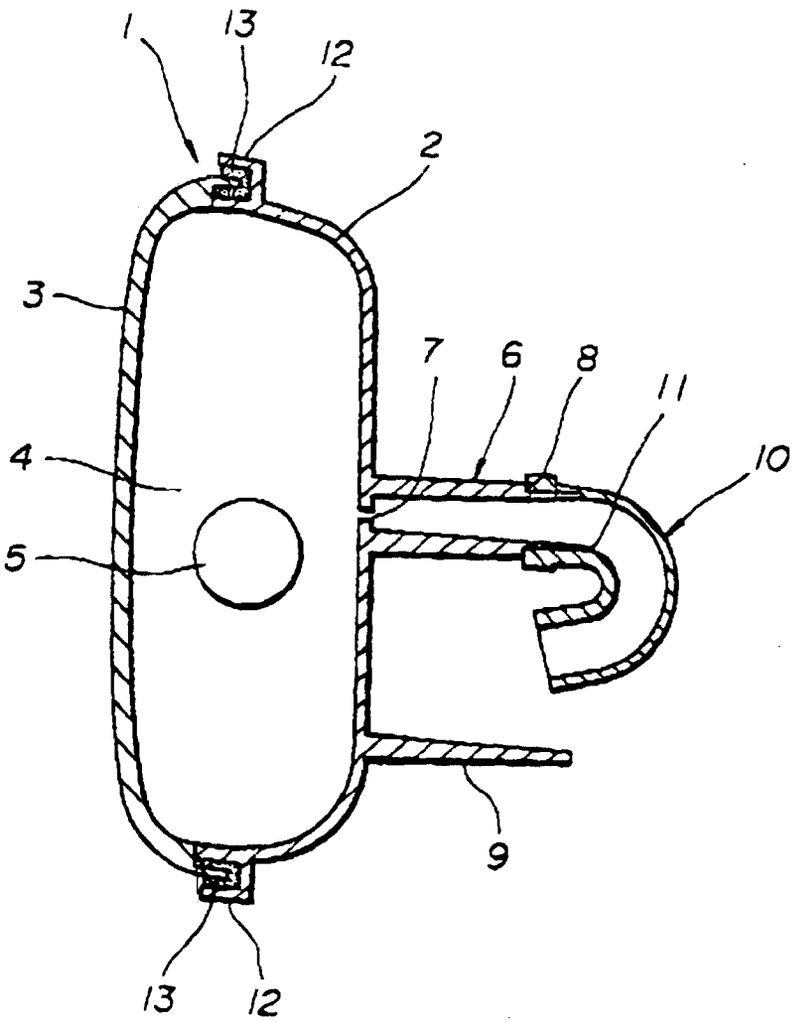


FIG. 2

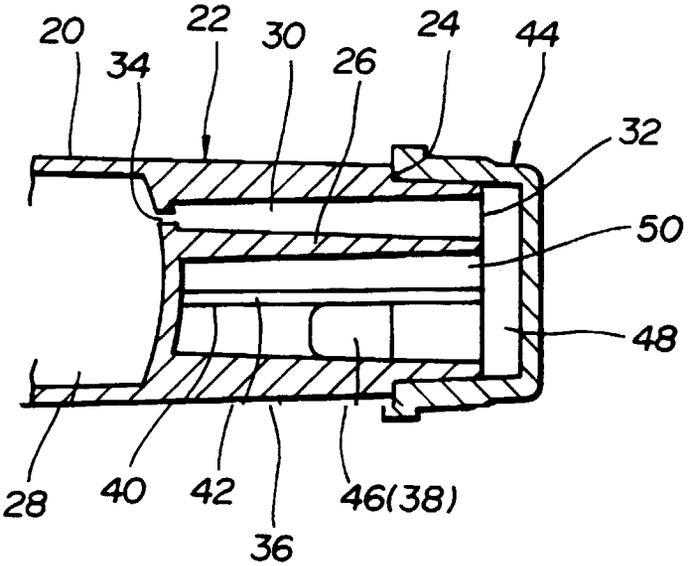


FIG. 3

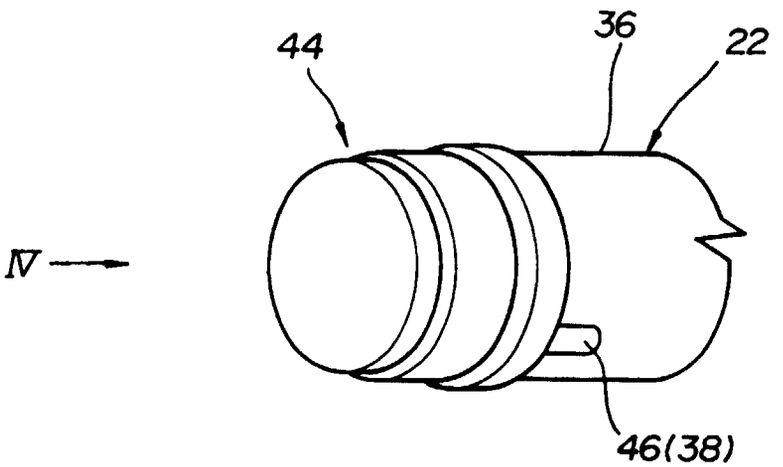
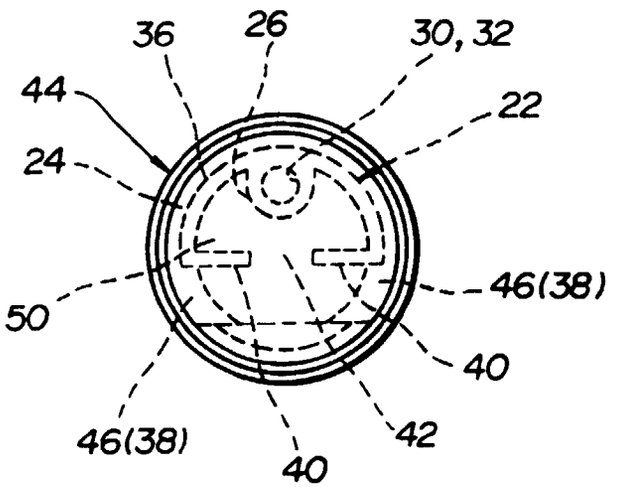


FIG. 4


36
26
30, 32
44
22
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46(38)
50
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46(38)
40
42

FIG. 5

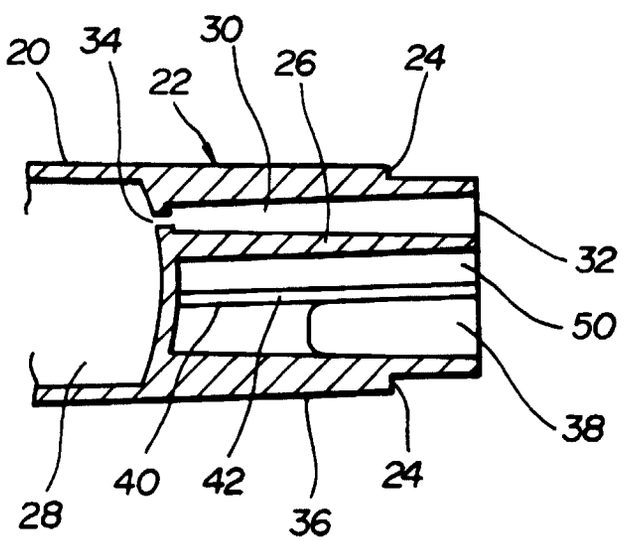
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FIG. 6

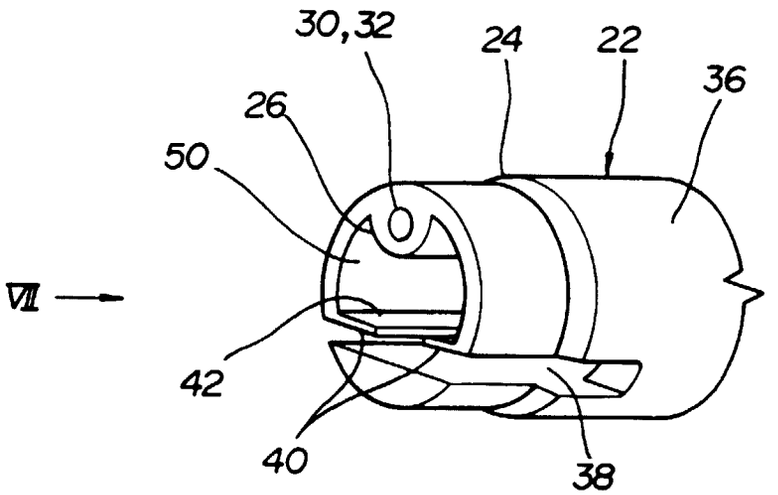

FIG. 7