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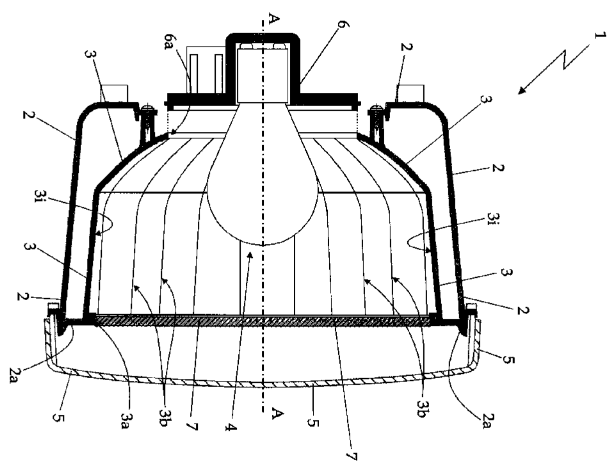
(54) **Title**: AUTOMOTIVE LIGHT

Figure 2



(57) **Abstract**: Automotive light (1) comprising at least one cup-shaped body (3) that has the inner surface (3i) mirror-finished so as to reflect the incident light towards the mouth (3a) of the main cup-shaped body (3) itself, and at least one light source (4) which is located within the main cup-shaped body (3), and is structured so as to emit light when electricity powered, the inner surface <3i) of the main cup-shaped body (3) being provided with a first decorative optical pattern which is cyclically repeated on said inner surface (3i) with a predetermined spatial periodicity; the automotive light (1) being also provided with at least one additional optical filter (7), which is made of a transparent or semi-transparent material, and is arranged so as to be crossed by the light produced by light source (4); said at least one optical filter (7) being provided with an optical surface which is structured so as to present a second decorative optical pattern which is cyclically repeated with a predetermined spatial periodicity; the shape and/or the spatial periodicity of the decorative optical pattern present on the additional optical filter (7) being different from the shape and/or spatial periodicity of the decorative optical pattern present on the main cup-shaped body (3), and such as to cause, in the light exiting from the main cup-shaped body (3), an interferometric effect with Moire deterioration that generates a different virtual pattern from the decorative optical patterns present on the main cup-shaped body (3) and the additional optical filter (7).

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"AUTOMOTIVE LIGHT"

TECHNICAL FIELD

The present invention relates to an automotive light.

More specifically, the present invention relates to a rear light for cars, use to which the following description refers purely by way of example without implying any loss of generality.

BACKGROUND ART

As is known, the car rear lights are usually made of a substantially basin-shaped, rigid rear casing which is structured so as to be permanently recessed into a compartment specifically made in the rear portion of the vehicle body; at least one cup-shaped body of substantially parabolic profile, which is located inside the rear casing with the concave side facing the mouth of the rear casing, and has a mirror-finished inner surface so as to reflect the incident light towards the mouth; a light source which is placed close to the bottom of the cup-shaped body, and is structured so as to emit light when electricity powered; and by a front lenticular half-shell which is at least partially made of a transparent or semi-transparent plastic material, also possibly colored, and is arranged to close the mouth of the casing so as to emerge to the outside of the vehicle body and be crossed by the light emitted from the light source underneath.

More specifically, the front lenticular half-shell is provided with at least one transparent or semi-transparent portion, usually colored, which is located immediately above the reflective cup-shaped body and, according to the characteristics of the light beam that the light must emit, can be shaped so as to have clear surfaces that do not significantly alter the propagation of light, and/or optical surfaces having a function to diffuse or concentrate the light produced by the light source underneath.

In recent years, after integrating the rear light with the external profile of the vehicle body, some car manufacturers have decided to install on new car models, rear lights that have, on the inner face of the lenticular half-shell or the inner surface of the reflective cup-shaped body, relief decorative patterns which are shaped so as to produce, when the light is turned on, certain special light effects having the function of creating a unique and immediately recognizable light beam emitted by the light. In this way, the model of car that adopts this particular type of light can be easily recognized/identified among all vehicles in circulation.

In other words, the light effects produced by the rear light are used to give greater visibility and distinctive capacity to the car having said light installed.

DISCLOSURE OF INVENTION

Aim of the present invention is to make a rear light for cars, motorcycles and the like, which is capable of producing new aesthetically engaging and innovative light effects greater than those currently known.

In compliance with the above aims, according to the present invention there is provided an automotive light comprising at least one main cup-shaped body having the inner surface structured so to direct the incident light towards the mouth of the same main cup-shaped body, and at least one light source which is located within the main cup-shaped body, and is structured so as to emit light when electricity powered; the automotive light being **characterized in that** the inner surface of the main cup-shaped body is provided with a first decorative optical pattern which is cyclically repeated on said inner surface with a predetermined spatial periodicity, **and by** further comprising at least one additional optical filter which is made of a transparent or semitransparent material, and is arranged so to be crossed by the light produced by the light source; said at least one additional optical filter being provided with an optical surface structured so to have a second optical decorative pattern which is cyclically repeated with a predetermined spatial periodicity; the shape and/or spatial periodicity of the decorative optical pattern on the additional optical filter being different from the shape and/or spatial periodicity of the decorative optical pattern on the main cup-shaped body, and such to cause, in the light coming out from the main cup-shaped body, an inferometric effect with Moiré deterioration which generates a virtual decorative optical pattern different from the decorative optical patterns on the main cup-shaped body and on the additional optical filter.

BRIEF DESCRIPTION OF THE DRAWINGS

A non-limiting embodiment of the present invention will now be described with reference to the accompanying drawings, in which:

- Figure 1 shows in a partially exploded isometric view, and with parts removed for clarity, a car rear light realized in accordance with the teachings of the present invention;
- Figure 2 is a sectional view of the rear light shown in Figure 1; while
- Figures 3 to 6 schematically show corresponding variants of the Figure 1 rear light.

BEST MODE FOR CARRYING OUT THE INVENTION

With reference to Figures 1 and 2, referral number 1 indicated as a whole an automotive light specially structured to be fixed on the front or rear part of the vehicle body of a car or other vehicle.

More specifically, in the example shown the automotive light 1 is preferably, though not necessarily, structured to be fixed on the rear part of the car body, and comprises:

- a substantially basin-shaped rigid rear casing 2, which is structured so to be recessed into a compartment specifically realized in the vehicle body (not shown);

- at least one cup-shaped body 3 preferably, though not necessarily, having a parabolic profile and which is located inside the rear casing 2 with the concave side facing the mouth 2a of the rear casing 2, and having the inner surface 3i structured so to direct the incident light towards the mouth 3i of the cup-shaped body 3 and, therefore, towards the mouth 2a of the rear casing 2; and
- at least one light source 4 which is arranged close to the bottom of the cup-shaped body 3, roughly in the center thereof, and is structured so as to emit light when electricity powered.

In the example shown, in particular, the inner surface 3i of cup-shaped body 3 is preferably, though not necessarily, metalized or otherwise mirror-finished, so as to reflect the incident light towards the mouth 3a of cup-shaped body 3 and, therefore, towards the mouth 2a of rear casing 2.

The automotive light 1 is also provided with a front lenticular half-shell 5 which is at least partially made of a transparent or semi-transparent material, and is arranged to close the mouth 2a of rear casing 2, so as to emerge outside of the vehicle body (not shown) and being crossed by the light emitted by light source 4. Cup-shaped body 3 is therefore arranged inside the rear casing 2 with the mouth 3a facing the lenticular half-shell 5.

More specifically, the lenticular half-shell 5 is provided with at least one transparent or semi-transparent, and optionally also colored, portion, and is arranged to close the mouth 2a of rear casing 2, so that its transparent or semi-transparent portion is crossed by at least part of the light that is emitted by the light source 4 and is reflected back towards the mouth 2a of the casing 2a of the cup-shaped body 3.

In the example shown, in particular, the automotive light 1 is preferably, though not necessarily, provided with only one cup-shaped body 3 completely recessed inside the rear casing 2; while the lenticular half-shell 5 is preferably, though not necessarily, made entirely of a transparent or semi-transparent plastic material, optionally also colored, such as polycarbonate or polymethyl methacrylate.

More specifically, in the example shown the cup-shaped body 3 is preferably, though not necessarily, made of an opaque plastic material via an injection molding process, and has the inner surface 3i mirror-metalized so as to reflect the incident light. The bottom of cup-shaped body 3 is furthermore rigidly anchored to the bottom of rear casing 2 by means of pass-through screws that pass in sequence both elements.

Similarly, the rear casing 2 is preferably, though not necessarily, made of an opaque plastic material via an injection molding process, and has a number of protruding fixing appendixes in plastic and/or metal material.

Obviously, in a different embodiment the cup-shaped body 3 can be made in one piece with the rear casing 2 preferably, though not necessarily, via an injection molding process.

With reference to Figure 2, the light source 4 instead preferably, though not necessarily, consists in a incandescent light bulb 4 or similar which is fited in removable manner into a light socket 6 which, in turn, is structured so as to be inserted and then locked in a rigid and stable, though easily releasable, manner within a pass-through hole 6a specifically realized on the bottom of cup-shaped body 3, so as to allow the light bulb 4 to protrude into the cup-shaped body 3 while keeping said bulb substantially coaxial to the longitudinal axis A of the cup-shaped body 3.

In a non-shown and more sophisticated embodiment, the light source 4 may optionally consist in a crown of light-emitting diodes being arranged inside the cup-shaped body 3, coaxial to axis A of the latter, so that the light-emitting diodes lie on a reference plane locally perpendicular to the axis A of cup-shaped body 3, and are radially oriented so as to direct the emitted light directly towards the inner surface 3i of the cup-shaped body 3.

With reference to Figures 1 and 2, unlike the currently known automotive lights, the inner surface 3i of cup-shaped body 3 has a preferably, though not necessarily made, in bas-relief, first decorative optical pattern which, starting from the bottom of the cup-shaped body 3, is cyclically repeated on the inner surface 3i with a predetermined spatial periodicity; and the automotive light 1 is provided with a neutral and substantially lenticular-shaped, additional optical filter 7 which is made of a transparent or semi-transparent material, and is located below the lenticular half-shell 5, in full or partial coverage of the mouth 3a of cup-shaped body 3, so as to be crossed by the light coming out from the latter.

The optical filter 7 is furthermore structured so as to have, on one of the two faces, a preferably, though not necessarily, in bas-relief, second decorative optical pattern made which is cyclically repeated on the surface of the optical filter 7 with a predetermined spatial periodicity, and has a shape/ pattern and/or spatial periodicity slightly different from that of the decorative optical pattern present on the inner surface 3i of cup-shaped body 3, so as to cause, in the light coming out from the main cup-shaped body 3, an interferometric effect with Moiré deterioration that generates a virtual decorative pattern that having a shape/pattern and a spatial periodicity completely different from those of the decorative optical patterns present, respectively, on the inner surface 3i of cup-shaped body 3 and on the optical filter 7 .

In the example shown, in particular, the optical filter 7 is made of transparent or semitransparent plastic material, optionally also colored; lies on a reference plane locally substantially perpendicular to the longitudinal axis A of cup-shaped body 3; and is dimensioned so as to completely cover the mouth 3a of the cup-shaped body 3, so as to be crossed by the whole light that is generated by the light bulb 4 and comes out of the cup-shaped body 3.

More specifically, with reference to Figure 2, in the example shown the optical filter 7 consists of a disc-shaped body made of a transparent or semi-transparent plastic material, optionally also colored, which has a shape complementary to that of the mouth 3a of cup-shaped body 3, and is rigidly fixed to the cup-shaped body 3, so as to lie on a reference plane locally perpendicular to the axis A of the cup-shaped body 3 and be crossed by the whole light coming out of cup-shaped body 3.

As regards instead the two decorative optical patterns realized, respectively, on the inner surface 3i of cup-shaped body 3 and on the optical filter 7, the inner surface 3i of cup-shaped body 3 is preferably, though not necessarily, provided with a number of radially-oriented longitudinal grooves, depressions or indentations 3b which are angularly equally spaced around the axis A of cup-shaped body 3, and extend towards the mouth 3a of cup-shaped body 3 so as to form a spherical crown with a radially-oriented, regular undulated profile.

The outer face of optical filter 7, i.e. the face oriented towards front half-shell 5, instead has a number of transversal grooves, depressions or indentations 7b which are locally tilted with respect to the radial directrix dr of optical filter 7, so as to be locally tilted and misaligned with respect to the longitudinal indentations 3b of the underneath cup-shaped body 3, and are also angularly equally spaced around the reference axis of optical filter 7, i.e. around the axis A of the cup-shaped body 3, so as to form, along the periphery of optical filter 7, a spherical crown with a regular undulated profile which shape differs slightly from that of the spherical crown with regular undulated profile present on the inner surface 3i of cup-shaped body 3.

The functioning of rear light 1 is easily deducible from that written above and needs no further explanation. Except to point out that the interferometric effect with Moiré deterioration occurs when the decorative optical patterns present, respectively, on the inner surface 3i of cup-shaped body 3 and on the optical filter 7, have a well-defined spatial distribution with respect to each other, and that the interferometric effect with Moiré deterioration allows the external observer to visualize a virtual decorative pattern having a shape and a spatial periodicity completely different from those of the two decorative optical patterns present on the cup-shaped body 3 and on the optical filter 7.

The mathematical treatise of the conditions leading to the onset of the interferometric effect with Moiré deterioration has already been exposed in detail in numerous scientific publications, such as the treatise entitled "Analysis of the Superposition of Periodic Layers and Their Moiré Effects through the Algebraic Structure of Their Fourier Spectrum" which was published in 8th Volume of the Journal of Mathematical Imaging and Vision 1998, whose content is incorporated in the present patent application for the sake of completeness.

In addition to the above, experimental tests have shown that the interferometric effect with Moiré deterioration may occur even when the two decorative patterns or optical designs that are superimposed, are of identical shape but are slightly staggered and/or rotated one relative to the other so as to slightly change the spatial periodicity.

The benefits deriving from the particular structure of the automotive light 1 are numerous. First, the use of the interferometric effect with Moiré deterioration allows the automotive light 1 to produce virtual three-dimensional developed light effects, i.e. virtually provided with depth, which are radically different, and much more visually engaging, than those offered by the currently-installed rear lights on cars.

In addition, the considerable distance between the optical filter 7 and the bottom of the cup-shaped body 3 allows exploiting the effects of parallax to make more realistic the "depth" and three-dimensionality of the light effects produced by the light.

And further, this particular structure allows the automotive light 1 to change appearance when the light source 4 is turned on. If lighted from the outside, in fact, the automotive light 1 shows the viewer only the optical filter 7, with its relative ornamental pattern.

Finally, the automotive light 1 has production costs that are only slightly higher than those of a traditional automobile light, with all the commercial advantages that this entails.

Clearly, changes may be made to the car automotive light 1 as described and illustrated above without, however, departing from the scope of the present invention.

For example, in a non-shown and more sophisticated embodiment, the automotive light 1 may be provided with a second lenticular optical filter which can be located immediately above or below the optical filter 7, parallel and facing the optical filter 7, so as to be crossed by the light produced by the light source 4, upstream or downstream of the optical filter 7. This second optical filter has an optical surface structured so as to present a third decorative optical pattern which is cyclically repeated with a predetermined spatial periodicity; the shape and/or spatial periodicity of this third decorative optical pattern is different from the shape and/or spatial periodicity of the decorative optical patterns present, respectively, on the inner surface 3i of cup-shaped body 3 and on the optical filter 7, so that the light coming out of cup-shaped body 3 produces, always by interferometric effects with Moiré deterioration, a virtual decorative optical pattern different from the decorative optical patterns found on the three elements referred above.

The mathematical treatise of the conditions leading to the onset of the interferometric effect with Moiré deterioration in the presence of three or more decorative optical patterns is described in detail in the volume "Periodic Layers" of the treatise entitled "The Theory of the Moiré Phenomenon" written by Isaac AMIDROR and published by SPRINGER publishing house in 2009, whose content is incorporated in this patent application.

With reference to Figure 3, in a first alternative embodiment, moreover, optical filter 7 may consist of a cap 7 in transparent or semi-transparent material, optionally also colored, which has the shape of a substantially cylindrical bell, extends coaxially to the axis A of cup-shaped body 3 within said cup-shaped body 3, and is fitted directly on the light bulb 4 so as to be first crossed by the light emitted by the light bulb 4. The cap 7 in transparent or semi-transparent material is furthermore rigidly fixed on the light socket 6, and has on its inner or outer cylindrical lateral surface a preferably, though not necessarily made, in bas-relief, decorative optical pattern having a predetermined spatial periodicity.

In the example shown, in particular, the outer cylindrical lateral surface of cap 7 has a regular undulated profile, wherein the crests of the waves are parallel to each other and slightly inclined with respect to the longitudinal axis of the cap 7, i.e. slightly inclined with respect to the axis A of the cup-shaped body 3.

The light that crosses the cap 7, is reflected from the inner surface 3i of the cup-shape body 3 and comes out of the mouth 3a of cup-shaped body 3 generating, due to the interferometric effect with Moiré deterioration, a virtual decorative optical pattern which has a shape/design and a spatial periodicity completely different from those of the two decorative optical patterns present, respectively, on the inner surface 3i of the cup-shaped body 3 and on the outer or inner cylindrical lateral surface of the cap 7.

With reference to Figure 4, in a second alternative embodiment, instead, optical filter 7 may consist of a lenticular body 7 in transparent or semi-transparent material, optionally also colored, which is directly fixed to the lenticular half-shell 5, above the mouth 3a of the cup-shaped body 3.

With reference to Figures 5 and 6, the automotive light 1 may also have an electrically-operated, optical-filter moving device 9 which is structured so as to be able to move, on command, the optical filter 7 with respect to the cup-shaped body 3, so as to control the arising of the interferometric effect with Moiré deterioration, and/or adjust/vary on command the intensity of the interferometric effect with Moiré deterioration. By movement of the optical filter 7 with respect to the cup-shaped body 3, it is intended even a temporary elastic deformation of the optical filter 7, for example, a bulging.

In the alternative embodiment shown in Figure 5, in particular, the optical filter 7 consists of a lenticular body 7 in transparent or semi-transparent material, optionally also colored, which is fixed in axially rotating manner on a fifth wheel 10 which, in turn, is rigidly fixed on the mouth 3a of cup-shaped body 3, so as to lie on a reference plane locally perpendicular to the axis A of cup-shaped body 3, and to be coaxial to the axis A of the cup-shaped body 3. Alternatively, the fifth wheel 10 can also be fixed on the rear casing 2 or the front half-shell 5, obviously, always above the mouth 3a of cup-shaped body 3.

The optical filter 7 can then freely rotate around the axis A of cup-shaped body 3, and the optical-filter moving device 9 consists in a small electric motor 9 with permanent magnets or similar, which is preferably, though not necessarily, arranged in the cavity formed by the cup-shaped body 3 inside the rear casing 2, so that its drive shaft protrudes over the mouth 3a of cup-shaped body 3, and can engage a toothed annular crown 9 specifically realized on the periphery of the optical filter 7, so as to be able to rotate the optical filter 7 around the axis A inside the fifth wheel 10, and therefore vary on command the angular position of the optical filter 7 with respect to the cup-shaped body 3.

Obviously, the rotation axis of optical filter 7 can also be parallel to and spaced from the axis A of cup-shaped body 3. Similarly, the electric motor 9 can be replaced by another type of electro-mechanical or piezoelectric actuator capable of varying, on command, the angular position of the optical filter 7.

In this embodiment, the moving device 9 has the function to set, on command, the optical filter 7 in the spatial configuration that causes the onset of the interferometric effect with Moiré deterioration, but may also be structured so as to rotate, on command and in a continuous manner, the optical filter 7 around the axis A of cup-shaped body 3, so as to move in space without interruption and/or change over time the virtual decorative optical pattern generated by the interferometric effect with Moiré deterioration.

In the alternative embodiment shown in Figure 6, instead, the optical filter 7 consists of a cap 7 in a transparent or semi-transparent material, optionally also colored, which has the shape of a substantially cylindrical bell, extends coaxially to the axis A of cup-shaped body 3 within said cup-shaped body 3, and is fitted directly on the light bulb 4 so as to be first crossed by the light emitted from the light bulb 4.

The cap 7 made of a transparent or semi-transparent material has, on its inner or outer cylindrical lateral surface, a preferably, though not necessarily, in bas-relief, decorative optical pattern which has a predetermined spatial periodicity, and is fixed in axially rotating manner on a fifth wheel 11 which, in turn, is rigidly fixed on the light socket 6, coaxial to the axis A of cup-shaped body 3. Thus the cap 7 can rotate around the axis A of cup-shaped body 3, and is crossed by the light emitted from the light bulb 4.

In this fourth embodiment, the optical-filter moving device 9 consists of a small electric motor 9 with permanent magnets or similar, which is fixed to the light socket 6 next to the light bulb 4, so that its drive shaft protrudes inside the cup-shaped body 3, and can engage a toothed annular crown specifically realized on the periphery of cap 7, so to be able to rotate the cap 7 on the fifth wheel 11 around the axis A, and therefore vary, on command, the angular position of the cap 7 with respect to the cup-shaped body 3.

As regards the decorative optical pattern of cap 7, in this embodiment the outer cylindrical lateral surface of cap 7 has a regular undulated profile, wherein the crests of the waves are parallel to each other and slightly inclined with respect to the longitudinal axis of the cap 7, i.e. slightly inclined with respect to the axis A of cup-shaped body 3.

The light that crosses cap 7, is reflected from the inner surface 3i of the cup-shaped body 3 and comes out of the mouth 3a of cup-shaped body 3 generating, due to the interferometric effect with Moiré deterioration, a virtual decorative optical pattern which has a shape/pattern and a spatial periodicity completely different from those of the two decorative optical patterns present, respectively, on the inner surface 3i of the cup-shaped body 3 and on the outer or inner cylindrical side surface of the cap 7.

In this variation, the moving device 9 has the function to provide, on command, the cap 7 in the spatial configuration that causes the onset of the interferometric effect with Moiré deterioration, but may also be structured so as to rotate, on command and in a continuative way, the cap 7 around the axis A of cup-shaped body 3, so as to move in space without interruption and/or change over time the virtual decorative optical pattern generated by the interferometric effect with Moiré deterioration.

CLAIMS

1. Automotive light (1) comprising at least one main cup-shaped body (3) having the inner surface (3i) structured so to direct the incident light towards the mouth (3a) of the same main cup-shaped body (3), and at least one light source (4) which is located within the main cup-shaped body (3), and is structured so as to emit light when electricity powered;

the automotive light (1) being characterized in that the inner surface (3i) of the main cup-shaped body (3) is provided with a first decorative optical pattern which is cyclically repeated on said inner surface (3i) with a predetermined spatial periodicity, and by further comprising at least one additional optical filter (7) which is made of a transparent or semitransparent material, and is arranged so to be crossed by the light produced by the light source (4); said at least one additional optical filter (7) being provided with an optical surface structured so to have a second optical decorative pattern which is cyclically repeated with a predetermined spatial periodicity; the shape and/or spatial periodicity of the decorative optical pattern on the additional optical filter (7) being different from the shape and/or spatial periodicity of the decorative optical pattern on the main cup-shaped body (3), and such to cause, in the light coming out from the main cup-shaped body (3), an inferometric effect with Moiré deterioration which generates a virtual decorative optical pattern different from the decorative optical patterns on the main cup-shaped body (3) and on the additional optical filter (7).

2. Automotive light according to Claim 1, characterized in that the inner surface (3i) of the main cup-shaped body (3) is mirror-treated so as to reflect the incident light towards the mouth (3a) of the same main cup-shaped body (3).

3. Automotive light according to Claim 1 or 2, characterized in that said optical filter (7) is substantially lenticular in shape, and is located substantially at the mouth (3a) of the main cup-shaped body (3), so to be crossed by the light which exits therefrom.

4. Automotive light according to Claim 1 or 2, characterized in that said optical filter (7) consists of a cap (7) made of a transparent or semi-transparent material, which is substantially bell-shaped and is fitted onto the light source (4) so to be crossed by the light emitted by the latter.

5. Automotive light according to Claim 4, characterized in that said cap (7) made of a transparent or semi-transparent material is in the shape of a substantially cylindrical bell, and is arranged substantially coaxial to the longitudinal axis (A) of the main cup-shaped body (3)

6. Automotive light according to any one of the foregoing Claims, characterized by further comprising electrically actuated moving means (9) which are structured for moving, on

command, said at least one additional optical filter (7) with respect to the cup-shaped body (3).

7. Automotive light according to Claim 6, characterized in that said at least one optical filter (7) is able to rotate about a predetermined reference axis (A), and in that said moving means (9) are structured so to rotate such optical filter (7) about said reference axis (A).

8. Automotive light according to Claim 7, characterized in that said reference axis (A) is locally substantially coincident with the longitudinal axis (A) of the main cup-shaped body (3).

9. Automotive light according to any one of the foregoing claims, characterized by further comprising:

- a substantially basin-shaped, rigid rear casing (2) which is structured so as to be recessed into a compartment specifically made in the vehicle body; and
- a front lenticular half-shell (5) at least partially made of a transparent or semi-transparent material, and which is placed to close the mouth (2a) of the rigid rear casing (2);

said at least one main cup-shaped body (3) being located inside the rigid rear casing (2), with the mouth (3a) of the main cup-shaped body (3) facing the front lenticular half-shell (5).

10. Automotive light according to Claims 3 and 9, characterized in that said optical filter (7) is fixed to the

front lenticular half-shell (5) immediately over the mouth (3a) of the main cup-shaped body (3).

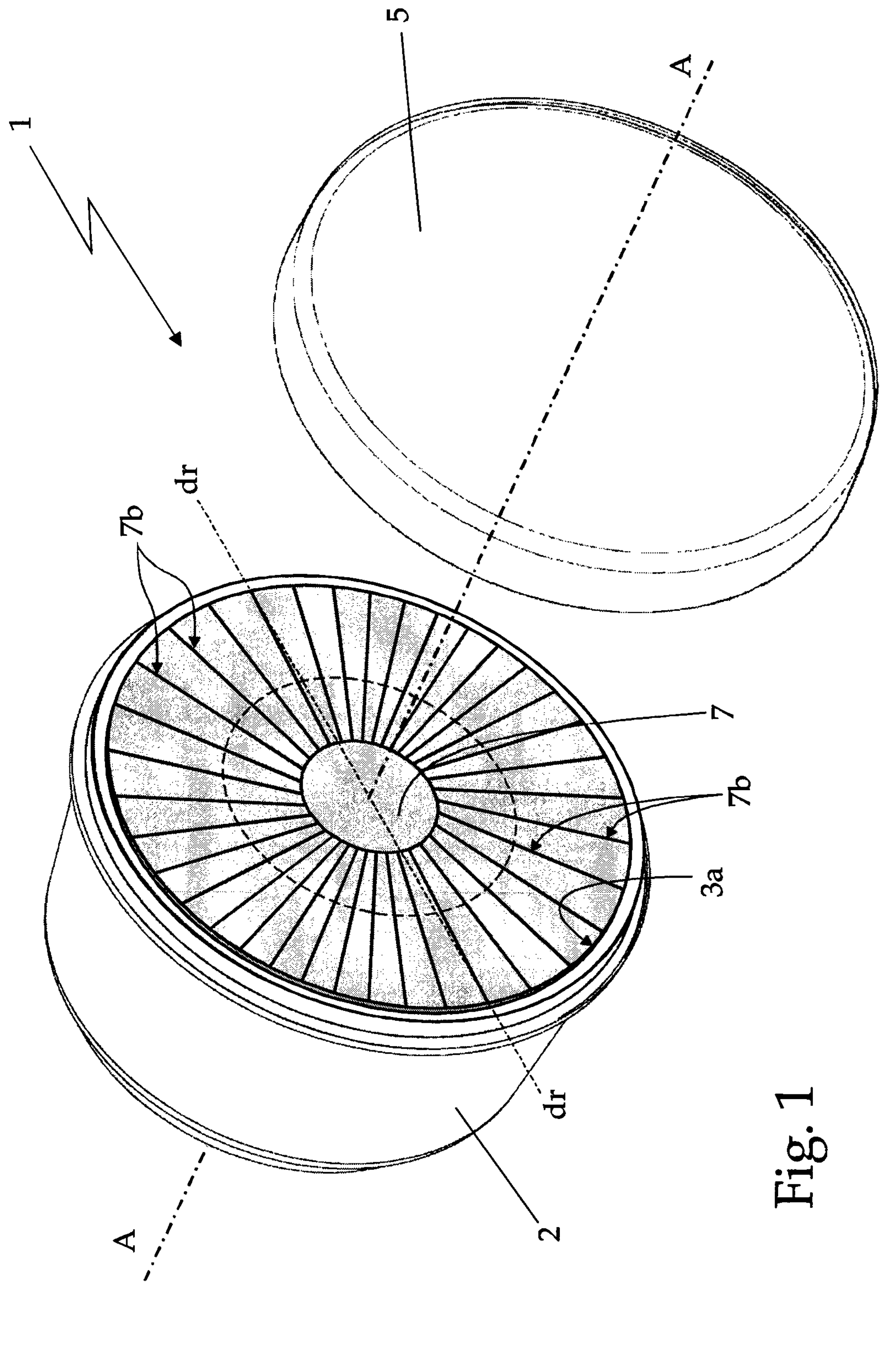

Fig. 1

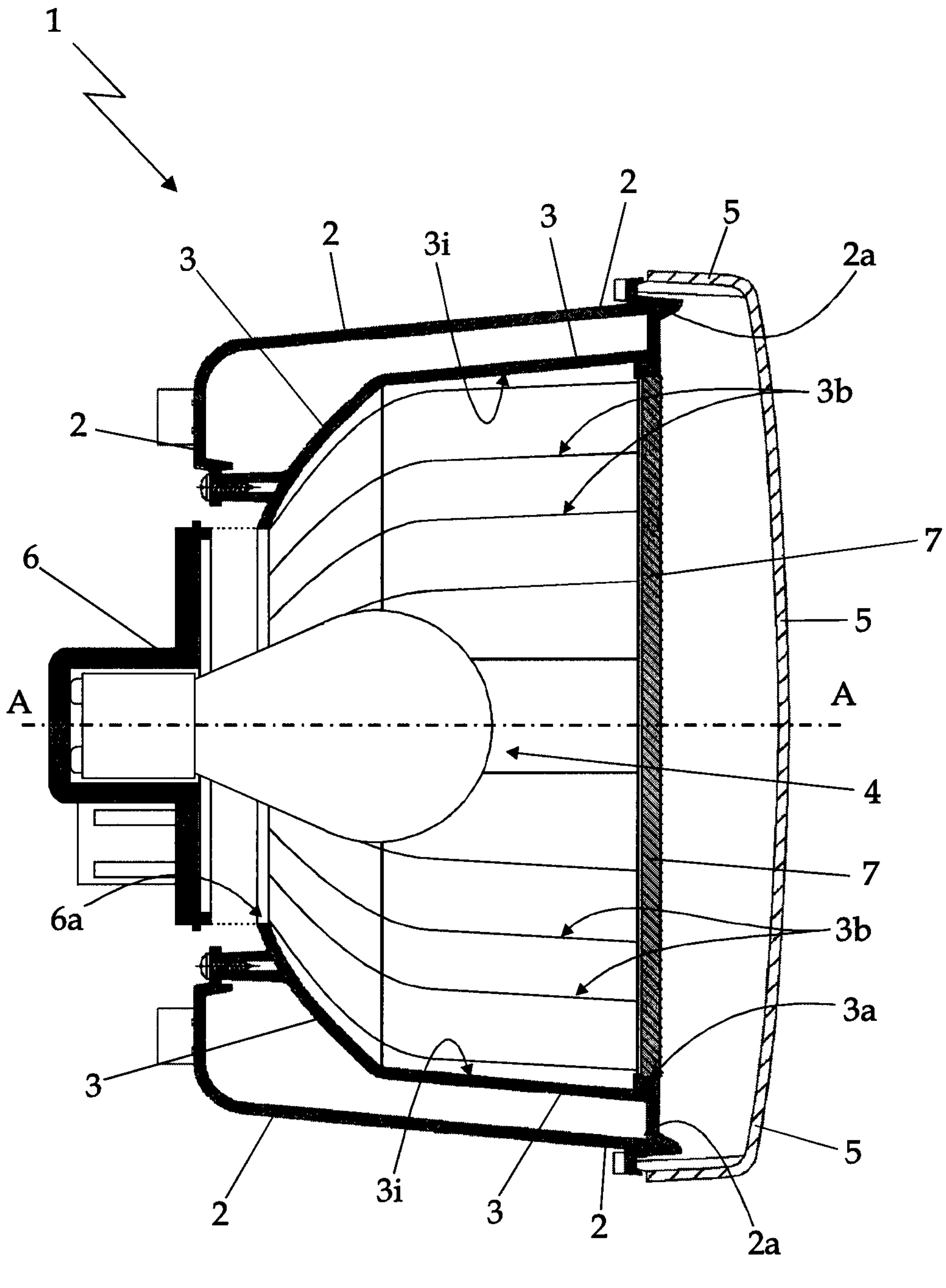

Fig. 2

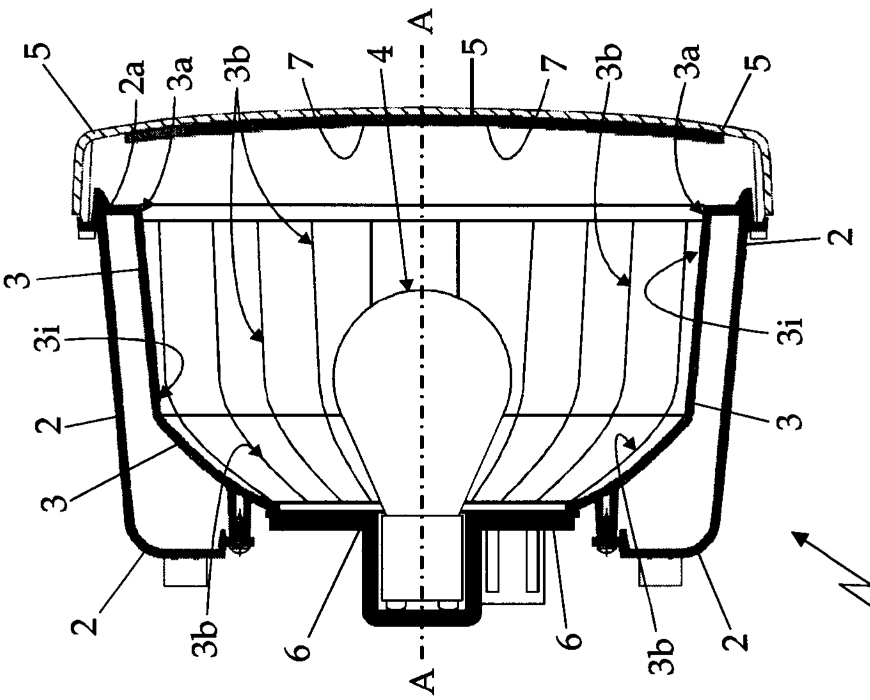
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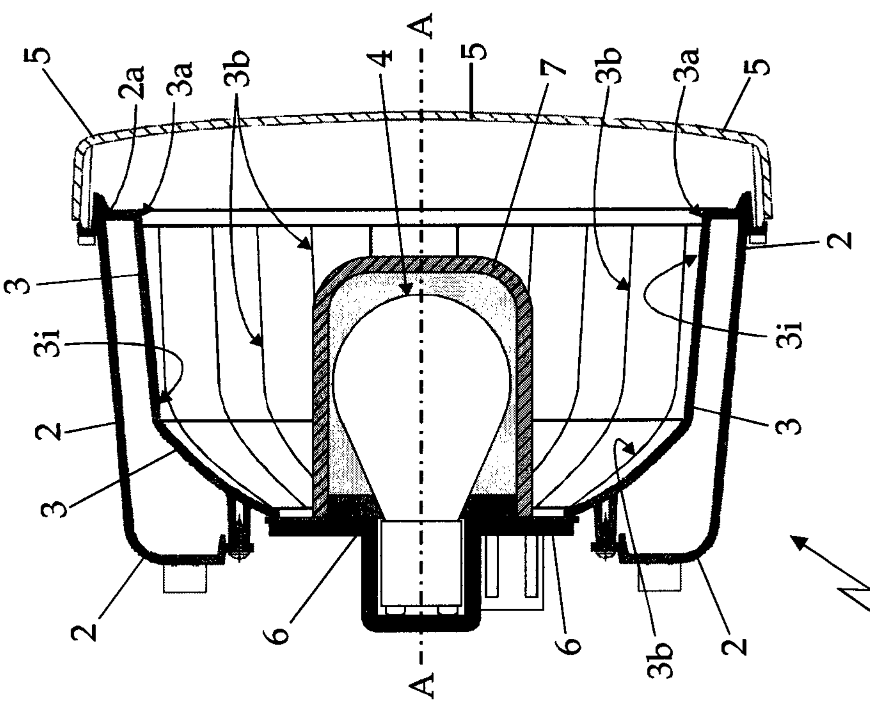
Fig. 4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2
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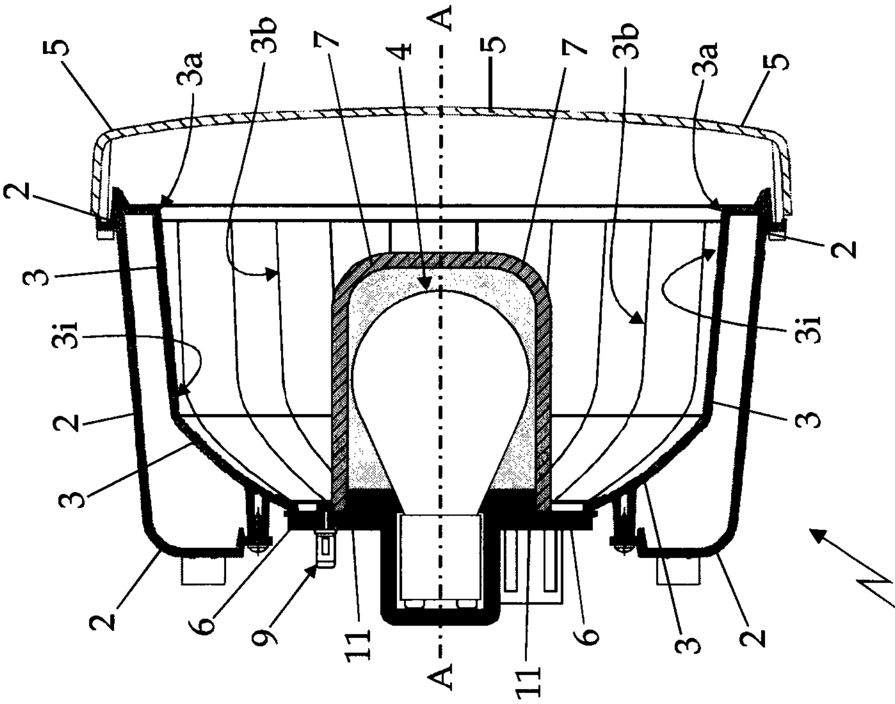
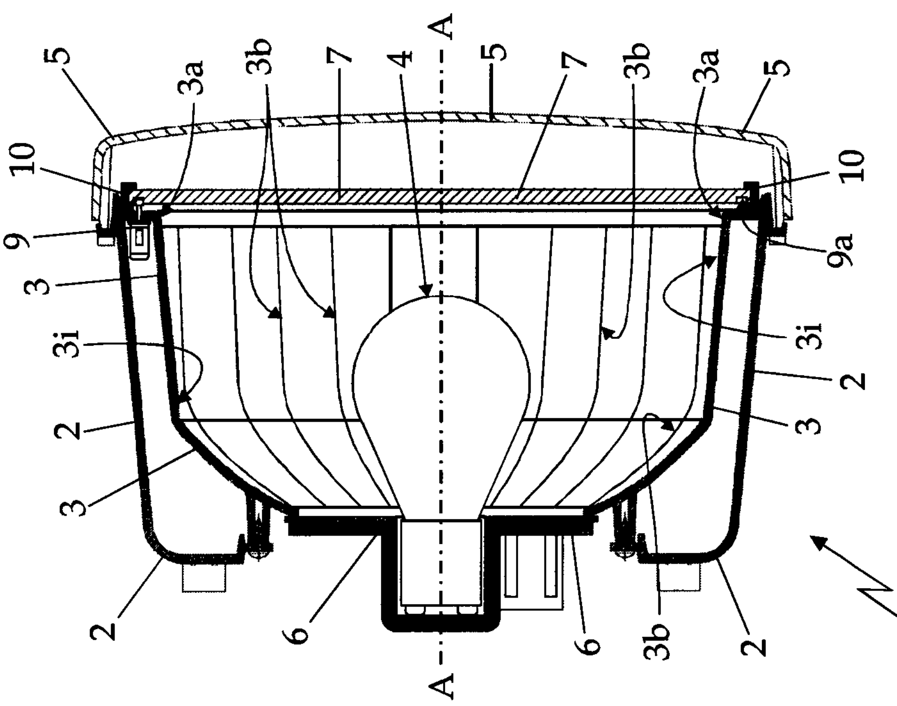
A
6
3b
2
3i
3
1

Fig. 3


5
3a
3b
7
4
A
5
7
3b
3a
5
2
3
3i
2
3
2
6
9
11
A
11
6
3
2
1
2
3i
3
Fig. 6


5
10
9
3a
3b
7
4
A
5
7
3b
3a
5
10
9a
3
3i
2
3
2
6
A
6
3b
2
1
3i
2
3
Fig. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2011/001728

A. CLASSIFICATION OF SUBJECT MATTER
INV. F21S10/00 F21V7/00 F21V7/22 F21V14/08
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F21V F21S B60Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2005/225998 A1 (KOMORI SHIGERU [JP]) 13 October 2005 (2005-10-13) paragraphs [0036], [0041], [0042], [0047] figure 3 -----	1-3
A	US 5 258 895 A (BOSSE THOMAS W [US]) 2 November 1993 (1993-11-02) column 3, line 13 - line 21 column 4, line 3 - line 17 figure 2 -----	1,6
A	EP 0 460 913 A2 (TOSHIBA LIGHTING & TECHNOLOGY [JP]) 11 December 1991 (1991-12-11) column 3, line 35 - line 51 figure 1 ----- -/--	1,2

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search

4 November 2011

Date of mailing of the international search report

16/12/2011

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1 556 593 A (BERGKVIST LARS A) 28 November 1979 (1979-11-28) page 3, line 76 - line 91 figures 2-4	1,6-8
A	FR 2 530 781 A1 (CIBIE PROJECTEURS [FR]) 27 January 1984 (1984-01-27) page 8, line 1 - line 27 page 12, line 35 - page 13, line 14 figures 1-3	1,3-5

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2011/001728

Patent document cited in search report		Publication date	Patent family member(s)			Publication date
US 2005225998	A1	13-10-2005	NONE			
US 5258895	A	02-11-1993	NONE			
EP 0460913	A2	11-12-1991	JP	4039854	A	10-02-1992
GB 1556593	A	28-11-1979	DE	2746366	A1	18-05-1978
			FR	2368076	A1	12-05-1978
			IT	1090514	B	26-06-1985
			JP	53089142	A	05-08-1978
			SE	402644	B	10-07-1978
			SE	7611514	A	16-04-1978
			US	4217631	A	12-08-1980
FR 2530781	A1	27-01-1984	DE	3326199	A1	26-01-1984
			ES	8404035	A1	01-07-1984
			IT	1206506	B	27-04-1989
			JP	59033701	A	23-02-1984
			SE	8303820	A	24-01-1984