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(54) AUTOMOTIVE LIGHTING APPLIANCE

(57) An automotive lighting appliance (1) comprising at least one lighting assembly (4) that emits light on command and is arranged inside the rear body (2) so as to be able to selectively backlight a corresponding transparent or semi-transparent sector of the front half-shell (3); the lighting assembly (4) comprising: a radial emission optical fibre (6) having a predetermined length; an electrically-powered collimated light source (5) that is arranged inside the rear body (2), in front of a proximal end (6a) of the optical fibre (6), and is able to selectively direct, towards the same proximal end (6a), a collimated light beam that enters and travels inside the optical fibre (6); at least one proximal photometric sensor (10) which is arranged next to the collimated light source (5) to capture/detect the light reflected/scattered on entering the optical fibre (6); at least one distal photometric sensor (11) that is arranged in front of the distal end (6b) of the optical fibre (6) and is adapted to capture/detect the light coming out of the distal end (6b) of the optical fibre (6); and an electronic control unit (7) which is adapted to command the collimated light source (5) based on the signals coming from said proximal (10) and distal (11) photometric sensors.

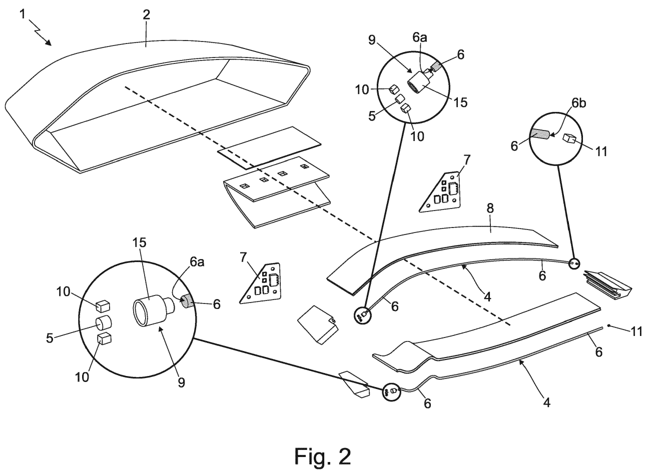


Fig. 2

EP 3 839 329 A1

Description

[0001] The present invention relates to an automotive lighting appliance.

[0002] In more detail, the present invention preferably relates to a taillight for cars and similar vehicles, namely a lighting device designed to be incorporated in a motor vehicle with the function of signalling the position, the sudden deceleration and/or the turning direction of the vehicle, and/or having the function of lighting up the area surrounding the vehicle. Use to which the following disclosure will make explicit reference without however losing its general character.

[0003] As already known, taillights for cars and the like usually comprise: a rigid and substantially basin-shaped rear body which is structured so as to be stably recessed in a compartment specially realized in the rear part of the bodywork of the vehicle; a front half-shell which is arranged to close the mouth of the rear body so as to surface outside of the vehicle bodywork and is generally provided with a number of transparent or semi-transparent sectors, usually having different colour to one another; and a series of lighting assemblies that are arranged inside the body, each immediately beneath a respective transparent or semi-transparent sector of the front half-shell, so as to be able to selectively backlight the overlying transparent or semi-transparent sector of the front half-shell.

[0004] Usually each transparent or semi-transparent sector of the front half-shell is furthermore uniquely associated with a specific light signal designed to signal the position of the vehicle, the sudden deceleration of the vehicle or the turning direction of the vehicle while moving, and each lighting assembly is specifically structured so as to be able to emit, on command, a light beam that, once come out of the lighting appliance through the corresponding transparent or semi-transparent sector of the half-shell, meets the homologation specifications (colour and light distribution) requested for this light signal.

[0005] Over the past few years, some car manufacturers have chosen to provide their new car models with taillights in which the front half-shell is provided with one or more oblong and ribbon-like transparent or semi-transparent sectors, i.e. having a narrow and very elongated shape.

[0006] The lighting assemblies that must backlight the single transparent or semi-transparent ribbon-like sectors of the front half-shell usually comprise: a light-guide bar which is made of polymethyl methacrylate (PMMA) or other photoconductive material and extends within the rear body skimmed over the ribbon-like sector to be backlit, substantially for the whole length of the same sector; and one or more high-power LEDs (acronym for Light Emitting Diode) which are fixed on a small printed circuit which, in turn, is arranged inside the rear body, close to at least one of the two ends of the light-guide bar, so that the LED(s) are in abutment against the end of the light-guide bar and can direct the light directly inside the body of the light-guide bar.

[0007] The light then travels within the body of the light-guide bar due to total internal reflection, and gradually comes out from the lateral side of the light-guide bar that directly faces the front half-shell, so as to be able to backlight the superjacent transparent or semi-transparent sector of the half-shell.

[0008] While operating very well, the backlighting system of the ribbon-like sectors of the front half-shell makes relatively laborious the assembly of the light.

[0009] The light-guide bar, in fact, is notoriously a hard and rigid, but relatively fragile monolithic body, thus it must be inserted inside the rear body with due caution. Moreover, the two ends of the light-guide bar must be perfectly aligned with the LEDs to avoid light loss, and this contributes to lengthening the light assembly time.

[0010] To simplify and speed up the assembly of the automotive lighting appliances, some manufacturers of lighting appliances for car and the like have recently replaced the light-guide bar of the lighting assembly with a radial emission optical fibre, which is notoriously much more flexible than a light-guide bar made of polymethyl methacrylate (PMMA).

[0011] In parallel, the high-power LED or LEDs have been replaced by a small laser emitter which is mechanically coupled to one of the two ends of the radial emission optical fibre by means of a fixing ferrule that holds in place the end of the optical fibre in front of the laser emitter.

[0012] Unfortunately, although working very well, the new lighting assembles have proven to be very dangerous in the event of a breaking of the lighting appliance following a car accident.

[0013] Experimental tests in fact have shown that, in case of breaking of the front half-shell of the lighting appliance, the optical fibre can break and move from its seat, thus allowing the laser light to freely escape from the lighting appliance, with all the safety problems that this entails.

[0014] In fact, a broken and free to move optical fibre could direct the laser light outside the lighting appliance, towards the eye of a person standing near the vehicle, and the laser beam emitted by the light laser emitter has such an intensity that can irreparably damage the human eye.

[0015] Aim of the present invention is to increase the active safety of the new lighting assemblies using optical fibres to backlight the front half-shell of the lighting appliance.

[0016] In compliance with these aims, according to the present invention there is provided an automotive lighting appliance as defined in Claim 1 and preferably, though not necessarily, in any of the claims dependent on it.

[0017] The present invention will now be described with reference to the attached drawings showing a non-limiting example of embodiment, in which:

- Figure 1 is a partially exploded perspective view of an automotive lighting appliance realized according to the teachings of the present invention, with parts removed for clarity's sake;

- Figure 2 is an exploded perspective view of the backlighting system of the automotive lighting appliance shown in Figure 1, with parts removed for clarity's sake;
- Figure 3 is a section view of a portion of the automotive light appliance of Figure 1, with parts removed for clarity's sake; whereas
- Figure 4 is a sectioned schematic view of the coupling system between the laser emitter and the optical fibre of one of the lighting assemblies present in the lighting appliance shown in the previous figures, with parts removed for clarity's sake.

[0018] With reference to Figures 1, 2 and 3, the reference number 1 denotes as a whole an automotive lighting appliance, i.e. a lighting device particularly suitable to be arranged on the front or rear part of the bodywork of a motor vehicle, with the function of emitting light signals to signal the position of the vehicle and/or the sudden deceleration of the vehicle and/or the turning direction of the vehicle while moving.

[0019] In other words, the automotive lighting appliance 1 is designed to be fixed on the front or rear part of the bodywork of an car, van, truck, motorcycle or other similar motor vehicle to perform the function of a headlight or taillight.

[0020] In the example shown, in particular, the automotive lighting appliance 1 is preferably structured to be stably recessed into the rear part of the bodywork of a car or any other similar motor vehicle.

[0021] In other words, the automotive lighting appliance 1 is a taillight for car and the like.

[0022] Obviously, in a different embodiment, the automotive lighting appliance 1 could also be structured as to be simply cantilever fixed to the rear part of the vehicle bodywork (not shown).

[0023] With reference to Figures 1, 2 and 3, the automotive lighting appliance 1 firstly comprises: a rear body 2, substantially rigid and preferably made of plastic material, which is substantially basin-shaped and is preferably structured so as to be at least partially recessed into a seat specially realized in the rear part of the vehicle bodywork (not shown); and a front half-shell 3, substantially rigid and preferably made of plastic material, traditionally called a lens, which is arranged to close the mouth of the rear body 2, preferably so as to be able to surface outside of the vehicle bodywork.

[0024] Obviously, in a different embodiment, the rear body 2 could also be structured so as to be simply fixed cantilever on the rear part of the vehicle bodywork (not shown).

[0025] Moreover, the automotive lighting appliance 1 additionally comprises one or more electrically-powered lighting assemblies that emit light on command and are arranged inside the rear body 2 each beneath a respective transparent or semi-transparent sector of front half-shell 3, so as to selectively backlight the superjacent transparent or semi-transparent sector of front half-shell 3.

[0026] More in detail, in the example shown, the rear body 2 is preferably made of an opaque plastic material, preferably via an injection moulding process.

[0027] The front half-shell 3, on the other hand, is preferably made of a transparent or semi-transparent plastic material, such as for example polycarbonate (PC) or polymethyl methacrylate (PMMA), also in this case preferably via an injection moulding process.

[0028] In the example shown, moreover, the automotive lighting appliance 1 is preferably provided with a plurality of electrically-powered lighting assemblies, each of which is arranged inside the rear body 2 in a position such as to be able to backlight only the superjacent and corresponding transparent or semi-transparent sector of front half-shell 3, preferably separately and independently from the other lighting assemblies of the lighting appliance.

[0029] At least one of the lighting assemblies, hereinafter denoted with number 4, moreover comprises: a laser light source 5, which is placed inside the rear body 2 and is capable of emitting, on command, a laser beam r (i.e. an extremely concentrated and collimated, coherent and monochromatic light beam) of a predetermined intensity; and an optical fibre 6 having a predetermined length and preferably a flexible filiform structure, which extends inside the rear body 2 and has one of its two ends, hereinafter called the proximal end, facing and optically coupled to the laser light source 5 so that the laser beam r emitted by the laser light source 5 can freely enter the optical fibre 6 and travel inside it.

[0030] In other words, the laser light source 5 is arranged inside the rear body 2 facing the proximal end 6a of optical fibre 6, and is adapted to emit, on command and towards the same proximal end 6a, a laser beam r that enters and travels inside the optical fibre 6.

[0031] Moreover, the lighting assembly 4 additionally includes an electronic control unit 7 which is adapted to activate and deactivate the laser light source 5 based on an external control signal, and is preferably located inside the rear body 2, optionally close to the bottom of the same rear body 2.

[0032] In more detail, the proximal end 6a of optical fibre 6 is spaced in front of the emitter of laser light source 5, at a distance d from the emitter of laser light source 5 lower than or equal to 0,5 mm (millimetres) and preferably ranging between 0,1 and 0,3 mm (millimetres).

[0033] Moreover, the optical fibre 6 has an external diameter preferably lower than 5 mm (millimetres) and more conveniently lower than 1,2 mm (millimetres), and is specifically structured to channel the laser light towards its distal end 6b opposite the proximal end 6a, while simultaneously and progressively spreading out of the optical fibre 5, substantially in a radial direction, a given percentage of the laser light as the light travel within the optical fibre 6.

[0034] In other words, the optical fibre 6 is a radial emission optical fibre, and it won't be further described since it is a component already known and easily available on the market.

[0035] Preferably, the optical fibre 6 is furthermore sustained/ supported by a rigid supporting structure that is integral with rear body 2 and is preferably made of plastic material.

[0036] More in detail, with reference to Figures 1, 2 and 3, in the example shown the front half-shell 3 is preferably provided with at least one transparent or semi-transparent sector 3a having a narrow and elongated shape (two in the example shown), i.e. substantially ribbon-like.

[0037] The lighting assembly 4 adapted to selectively backlight the/each ribbon-like transparent or semi-transparent sector 3a of front half-shell 3, preferably comprises: a radial emission optical fibre 6 that extends inside the rear body 2 so that at least a portion/segment of the optical fibre is locally substantially skimmed over the ribbon-like sector 3a to be backlit, preferably substantially along the whole length of the same ribbon-like sector 3a; and an electrically -powered laser light source 5 which is able to emit, on command, a laser beam r with a given intensity, and which is arranged inside the rear body 2 directly facing and aligned with the proximal end 6a of optical fibre 6, so that the laser beam coming out of emitter 5 can freely enter the optical fibre 6 through the same proximal end 6a.

[0038] Preferably, the optical fibre 6 is furthermore fixed on the front side of a rigid and preferably made of opaque plastic material, support plate 8 that is arranged inside the rear body 2 with its front sidewall directly facing the front half-shell 3, or rather the corresponding ribbon-like sector 3a preferably substantially for the whole lenght of the ribbon-like sector 3a, and with its rear sidewall facing the bottom of rear body 2.

[0039] With reference to Figures 2 and 4, preferably the lighting assembly 4 furthermore comprises mechanical centring and fixing members 9 which are adapted to rigidly connect the proximal end 6a of optical fibre 6 to the laser light source 5, or rather to the emitter of the laser light source 5, and are structured to keep the proximal end 6a of optical fibre 6 centred and immobile in front of the emitter of laser light source 5.

[0040] More in detail, the centring and fixing members 9 are preferably structured so as to keep the proximal end 6a of optical fibre 6 immobile in front of the emitter of laser light source 5, at a distance d from the emitter lower than 0,5 mm (millimetres) and preferably ranging between 0,1 and 0,3 mm (millimetres).

[0041] In the example shown, in particular, the centring and fixing members 9 are preferably structured so as to stably keep the proximal end 6a of optical fibre 6 at a distance d from the emitter of laser light source 5 ranging between 0,2 and 0,25 mm (millimetres).

[0042] With reference to Figures 1, 2, 3 and 4, moreover the lighting assembly 4 also comprises: at least one proximal photometric sensor 10 which is located next to the emitter of laser light source 5, so as to capture/detect the laser light that is reflected/scattered outside the optical fibre 6 when the laser beam enters into the proximal end 6a of optical fibre 6; and at least one distal photometric sensor 11 which is arranged in front of the distal end 6b of optical fibre 6 and is capable of capturing/detecting the laser light coming out of the distal end 6b of optical fibre 6.

[0043] The electronic control unit 7, in turn, is adapted to drive the laser light source 5 based also on the signals coming from the proximal photometric sensor 10 and from the distal photometric sensor 11.

[0044] More in detail, the electronic control unit 7 is preferably programmed/configured so as to autonomously deactivate the laser light source 5 when the intensity of the laser light detected by any one of proximal photometric sensor 10 and distal photometric sensor 11 deviates from a corresponding predetermined reference value.

[0045] Preferably, this reference value is moreover based on the power/intensity of the laser beam r emitted by the laser light source 5.

[0046] In other words, the electronic control unit 7 is programmed/configured so as to activate and deactivate the laser light source 5 based on the external control signal.

[0047] Moreover, the electronic control unit 7 is preferably programmed/configured so as to automatically deactivate the laser light source 5 when the intensity of the laser light detected by the proximal photometric sensor 10 deviates from a first predetermined reference value and/or when the intensity of the laser light detected by the distal photometric sensor 11 deviates from a second predetermined reference value.

[0048] In more detail, the electronic control unit 7 is preferably programmed/configured so as to automatically deactivate the laser light source 5 when the intensity of the laser light detected by the proximal photometric sensor 10 moves out of a predetermined first tolerance range which is arranged astride of said first reference value and is preferably also substantially centred to said first reference value.

[0049] Furthermore, the electronic control unit 7 is preferably programmed/configured so as to automatically deactivate the laser light source 5 when the intensity of the laser light detected by the distal photometric sensor 11 moves out of a predetermined second tolerance range which is arranged astride of said second reference value and is preferably also substantially centred to said second reference value.

[0050] In the example shown, in particular, the electronic control unit 7 is preferably programmed/configured so as to automatically deactivate the laser light source 5 when intensity of the laser light detected by the proximal photometric sensor 10 deviates/varies at least by 3% with respect to said first reference value, and/or when intensity of the laser light detected by the distal photometric sensor 11 deviates/varies by at least 3% with respect to said second reference value.

[0051] With reference to Figures 2, 3 and 4, in the example shown, in particular, the lighting assembly 4 is preferably provided with at least two proximal photometric sensors 10 that are arranged next to the emitter of laser light source 5, on opposite sides of the emitter and preferably in a mirror position with respect to the latter.

[0052] Moreover, the distance between the emitter of laser light source 5 and the two proximal photometric sensors 10 is preferably lower than or equal to 10 mm (millimetres), and more conveniently ranges between 1 and 8 mm (millimetres).

[0053] Preferably, the proximal photometric sensor or sensors 10 and the laser light source 5, or rather the emitter of the laser light source 5, are furthermore arranged/fixed one next to the other, on a small printed circuit board 13 which, in turn, is arranged/fixed inside the rear body 2 of the lighting appliance, close to the proximal end 6a of optical fibre 6.

[0054] The laser light source 5, moreover, preferably includes a known type LASER diode. In more detail, the laser light source 5 preferably includes a known type of RGB LASER diode, which is capable of emitting a laser beam with power and/or colour variable on command.

[0055] Clearly, the first and the second reference values preferably depend on the colour of the laser beam r emitted by the laser light source 5.

[0056] Lastly, in the example shown the photometric sensors 10 and/or 11 are preferably photodiodes.

[0057] With reference to Figure 4, finally in the example shown the mechanical centring and fixing members 9 preferably comprise: a rigid supporting socket 14 preferably made of plastic or metal material, which is firmly fixed on the printed circuit board 13 so as to extend like a bridge above the laser light source 5, or rather above the emitter of laser light source 5, and the proximal photometric sensor or sensors 10; and a ferrule connector 15 preferably made of metal material, which is adapted to be fitted and securely locked on the proximal end 6a of optical fibre 6, locally coaxial to the optical fibre 6.

[0058] The ferrule connector 15 is adapted to be screwed onto a threaded portion of supporting socket 14 locally aligned to the laser light source 5, or rather to the emitter of laser light source 5, so as to arrange the proximal end 6a of optical fibre 6 spaced above the emitter of laser light source 5, locally coaxial to and at the distance d from the emitter of laser light source 5.

[0059] General operation of automotive lighting appliance 1 is easily inferable from what previously described.

[0060] As regards, on the other hand, the operation of lighting assembly 4, due to the air/glass interface, when the laser beam r enters into the optical fibre 6 a very small amount of optical energy cannot enter the optical fibre 6 and is reflected back (Fresnel reflections) towards the laser light source 5 and towards the proximal photometric sensor(s) 10. The laser light reflected towards the laser light source 5 is detected by the proximal photometric sensors (10).

[0061] Clearly, the intensity of the laser light reflected back towards the laser light source 5 is minimal, and remains around a predetermined value as long as the optical fibre 6 is perfectly aligned and coupled to the emitter of the laser light source 5. Any variation in the position of the proximal end 6a of optical fibre 6 with respect to the ideal position causes a variation in the intensity of the laser light detected by the or by any one of the proximal photometric sensors 10.

[0062] Any variation in the light energy detected by the proximal photometric sensor or sensors 10 is therefore indicative of the breaking of optical fibre 6, of the incorrect positioning of optical fibre 6 with respect to the laser light source 5 possibly due to the supervened breaking of the lighting appliance, or of the incorrect assembly/optical coupling of the optical fibre 6 to the laser light source 5.

[0063] The distal photometric sensor 11, on the other hand, detects the intensity of the laser light coming out of the distal end 6b of optical fibre 6. Clearly, if the optical fibre 6 and the laser light source 5 have been correctly dimensioned, the optical energy that reaches the distal end 6b of optical fibre and is scattered outside of the optical fibre is minimal, but nonetheless exists.

[0064] Any variation of the light energy detected by the distal photometric sensor 11 is therefore indicative of the breaking of optical fibre 6 or of the incorrect positioning of optical fibre 6 on the corresponding supporting structure, or rather on the sidewall of support plate 8, maybe due to the breaking of the lighting appliance.

[0065] By automatically deactivating the laser light source 5 when the intensity of the laser light detected by the proximal photometric sensor 10 deviates from the first reference value and/or when the intensity of the laser light detected by the distal photometric sensor 1 deviates from the second reference value, the electronic control unit 7 prevents the laser beam r coming out of the laser light source 5 from causing damage to property and/or people as a consequence of an the unexpected breaking or malfunction of the automotive lighting appliance 1.

[0066] The advantages connected to the simultaneous presence of the proximal photometric sensor 10 and of the distal 11 photometric sensor are remarkable.

[0067] Firstly the use of photometric sensors 10 and 11 increases the active safety of the lighting assembly 4, and therefore of the automotive lighting appliance 1, because it avoids the emission of the laser beam in case of a broken or wrongly-positioned optical fibre 6.

[0068] Moreover, the combined use of the photometric sensors 10 and 11 allows understanding, at the end of or along the production line of the lighting appliance, whether the assembly of the automotive lighting appliance 1, or better of the lighting assembly 4, has been carried out correctly.

[0069] Finally, the combined use of the photometric sensors 10 and 11 allows determining, albeit approximately, the position of a possible breaking/failure/anomaly of the lighting assembly 4.

[0070] It is finally clear that modifications and variations can be made to the automotive lighting appliance 1 and to the lighting assembly 4 described above without however departing from the scope of the present invention.

[0071] For example, the laser light source 5 of lighting assembly 4 may be replaced by a high-power LED and by an optical collimator which is arranged above the LED and is designed to collimate the light rays emitted by the LED in a collimated light beam (i.e. a set of light rays collimated in the same direction) directed towards the proximal end 6a of the radial emission optical fibre 5.

[0072] In other words, in a less sophisticated embodiment, the laser light source 5 is replaced by a collimated LED light source.

Claims

1. An automotive lighting appliance (1) comprising: a substantially basin-shaped, rear body (2); a front half-shell (3) arranged to close the mouth of the rear body (2); and at least one lighting assembly (4) that emits light on command and is arranged inside the rear body (2) so as to be able to selectively backlight a corresponding transparent or semi-transparent sector of the front half-shell (3);
said lighting assembly (4) comprising: a radial emission optical fibre (6) having a predetermined length; and an electrically-powered collimated light source (5) which is place inside the rear body (2), in front of a proximal end (6a) of the optical fibre (6), and is adapted to selectively direct, towards the same proximal end (6a), a collimated light beam that enters into and travels inside the optical fibre (6);
the automotive lighting appliance (1) being **characterized in that** said lighting assembly (4) moreover comprises: at least one proximal photometric sensor (10) that is arranged next to the collimated light source (5) so as to capture/detect the light reflected/scattered on entering into the optical fibre (6); at least one distal photometric sensor (11) that is arranged in front of the distal end (6b) of the optical fibre (6) and is designed to capture/detect the light coming out of the distal end (6b) of the optical fibre (6); and an electronic control unit (7) adapted to command the collimated light source (5) based on the signals coming from said proximal (10) and distal (11) photometric sensors.

2. Automotive lighting appliance according to claim 1, wherein the electronic control unit (7) is programmed/ configured so as to automatically deactivate the collimated light source (5) when the intensity of the light detected by any one of said photometric sensors (10, 11) deviates from a corresponding predetermined reference value.

3. Automotive lighting appliance according to claim 2, wherein said reference value is based on the power/intensity of the collimated light beam emitted by the collimated light source (5).

4. Automotive lighting appliance according to claim 2 or 3, wherein the electronic control unit (7) is programmed/ configured so as to automatically deactivate the collimated light source (5) when the intensity of the light detected by said at least one proximal photometric sensor (10) moves out of a predetermined first tolerance range.

5. Automotive lighting appliance according to claim 2 or 3 or 4, wherein the electronic control unit (7) is programmed/ configured so as to automatically deactivate the collimated light source (5) when the intensity of the light detected by said at least one distal photometric sensor (11) moves out of a predetermined second tolerance range.

6. Automotive lighting appliance according to any of the preceding claims, wherein the lighting assembly (4) is provided with at least two proximal photometric sensors (10) that are arranged on opposite sides of the emitter of the collimated light source (5).

7. Automotive lighting appliance according to claim 6, wherein the distance between the proximal photometric sensors (10) and the emitter of said collimated light source (5) is lower than or equal to 10 mm.

8. Automotive lighting appliance according to any one of the preceding claims, wherein the emitter of said collimated light source (5) and the proximal photometric sensor(s) (10) are arranged/fixed one next to the other, on a printed circuit board (13) that, in turn, is close to the proximal end (6a) of the optical fibre (6).

9. Automotive lighting appliance according to any one of the preceding claims, wherein the proximal end (6a) of the optical fibre (6) is located spaced in front of the emitter of the collimated light source (5) at a distance (d) from said emitter lower than or equal to 0,5 mm.

10. Automotive lighting appliance according to claim 9, wherein the distance (d) between the proximal end (6a) of the optical fibre (6) and the emitter of the collimated light source (5) ranges between 0,1 and 0,3 mm.

11. Automotive lighting appliance according to any one of the preceding claims, wherein said lighting assembly (4) also comprises mechanical centring and fixing members (9) that are adapted to rigidly connect the proximal end (6a) of the optical fibre (6) to the collimated light source (5), and are structured so as to stably keep the proximal end (6a) of the optical fibre (6) centred and immobile in front of the emitter of the collimated light source (5).

12. Automotive lighting appliance according to claim 11, wherein said mechanical centring and fixing members (9) are structured so as to stably keep the proximal end (6a) of the optical fibre (6) at a given distance (d) from the emitter of the collimated light source (5) ranging between 0,2 and 0,25 mm.

13. Automotive lighting appliance according to any one of the preceding claims, wherein the optical fibre (6) has a flexible filiform structure and is sustained/supported by a rigid support structure (8) that is integral with the rear body (2).

14. Automotive lighting appliance according to any one of the preceding claims, wherein the optical fibre (6) extends inside the rear body (2) so that at least one of its portions /segments is locally substantially skimmed over a corresponding transparent or semi-transparent sector (3a) of the front half-shell (3).

15. Automotive lighting appliance according to any one of the preceding claims, wherein the electronic control unit (7) is moreover adapted to activate and deactivate said collimated light source (5) based on an external control signal.

16. Automotive lighting appliance according to any one of the preceding claims, wherein the collimated light source (5) is able to selectively emit a laser beam (r) towards the proximal end (6a) of the optical fibre (6).

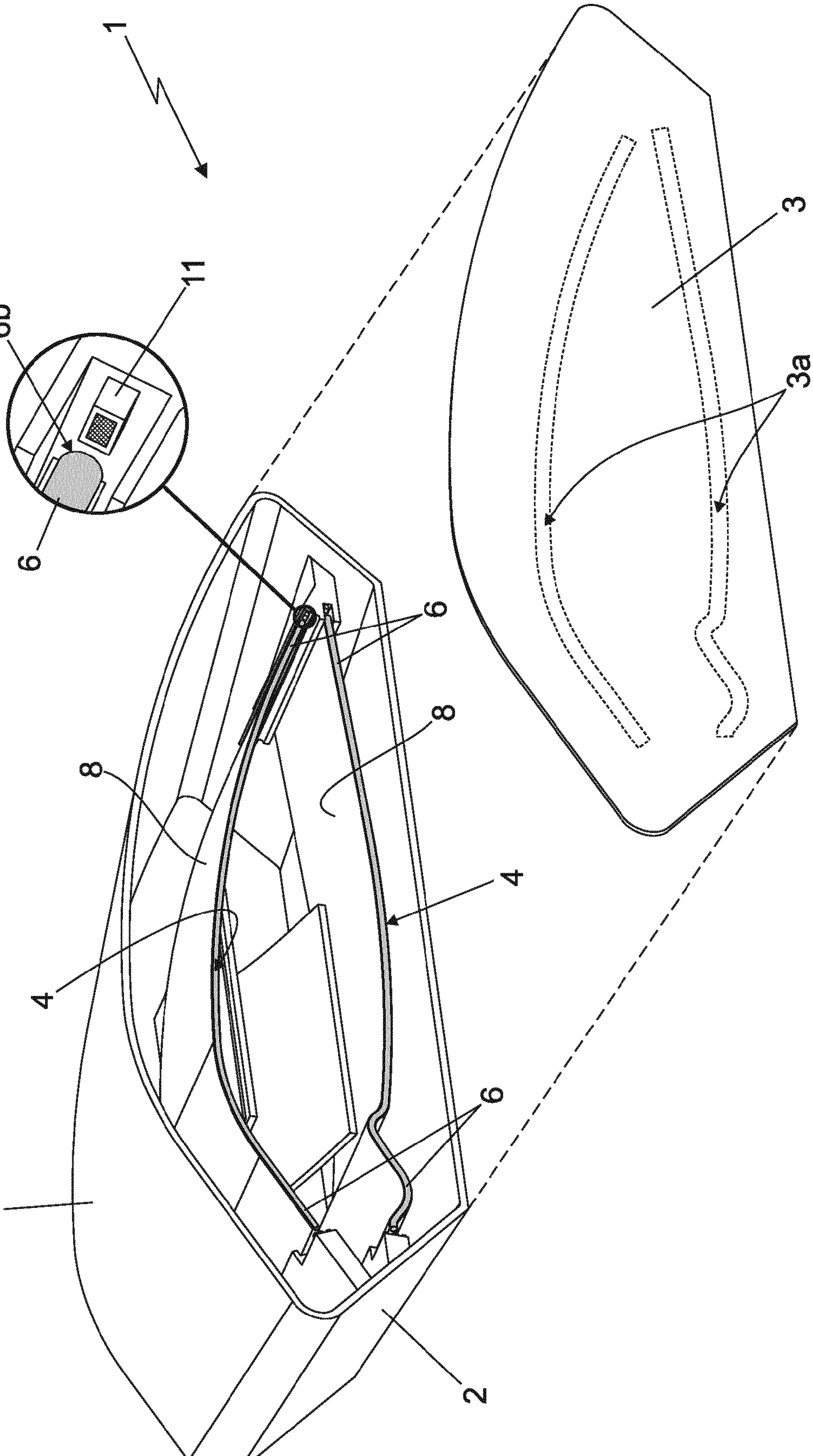


Fig. 1

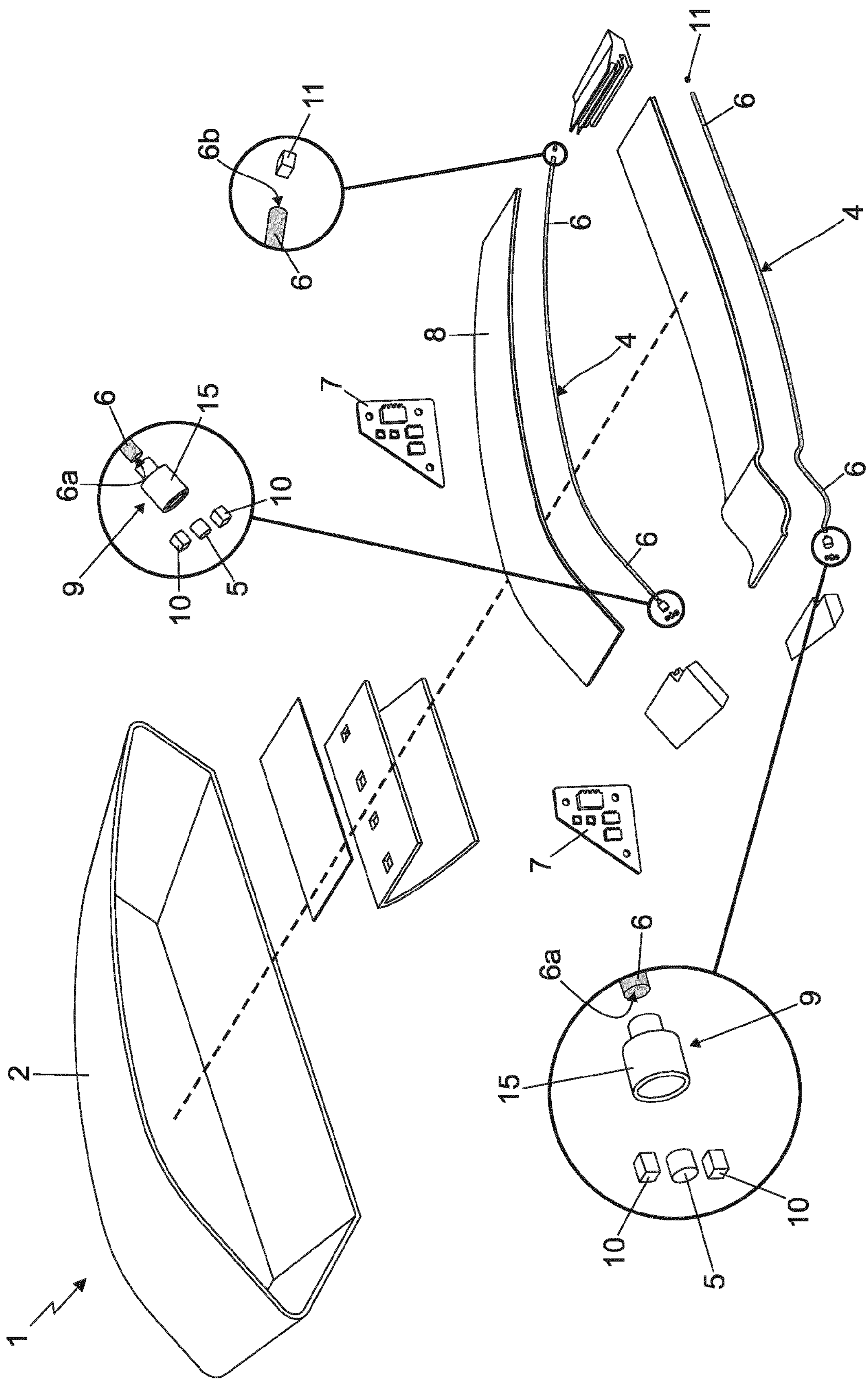


Fig. 2

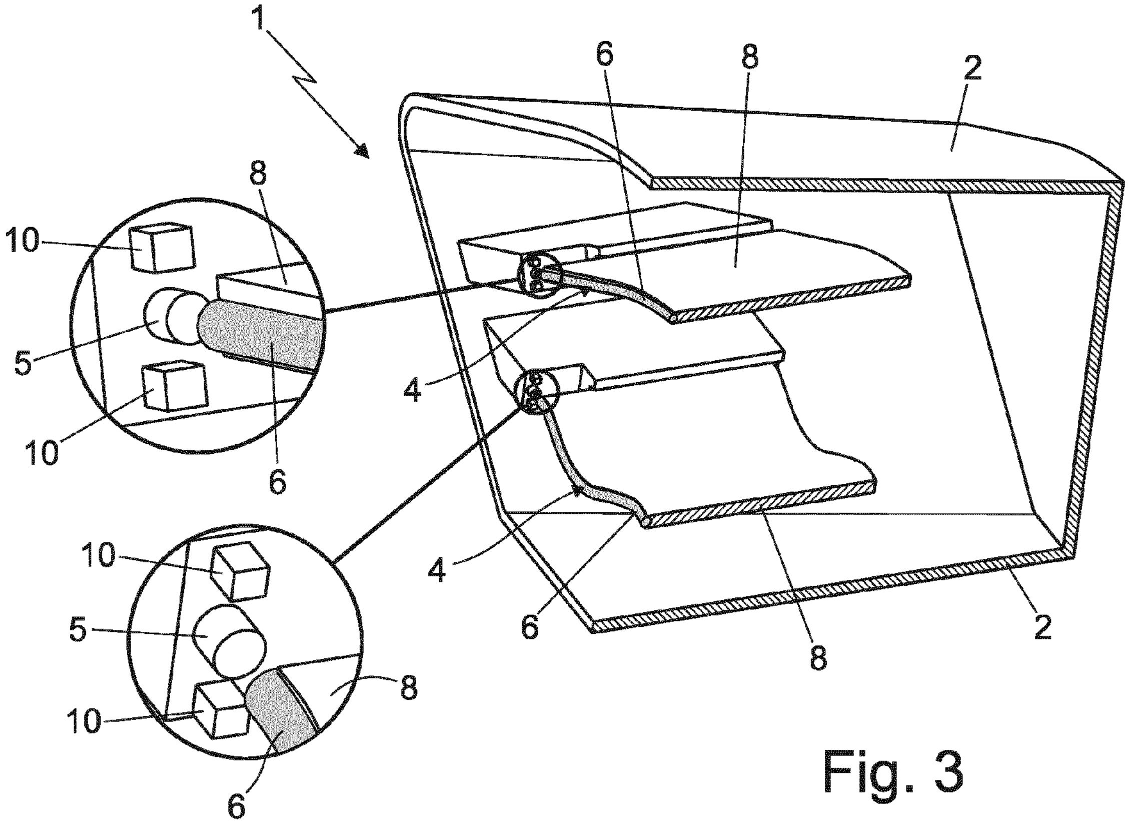
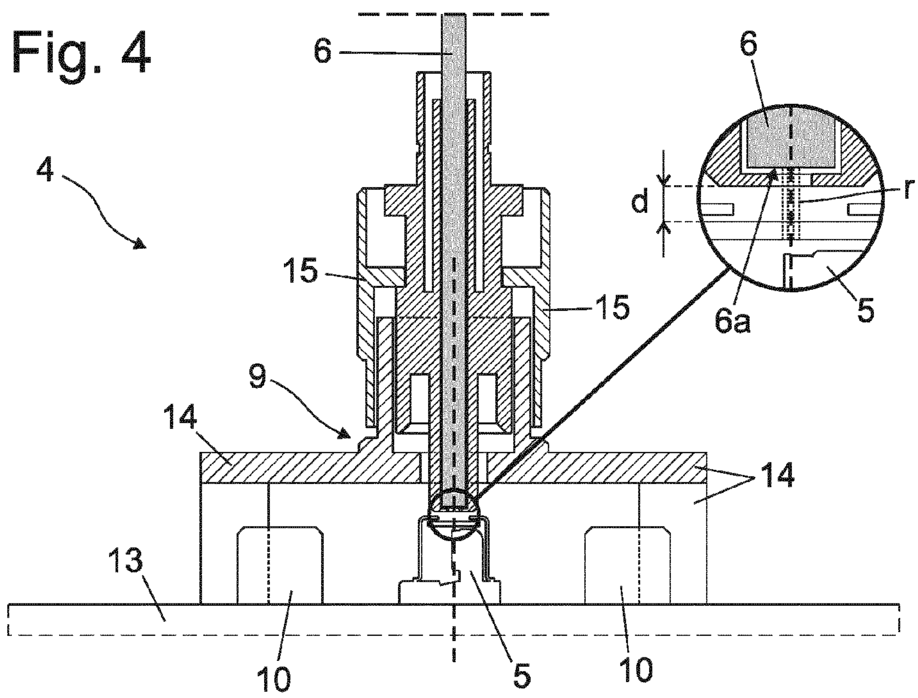


Fig. 3

Fig. 4



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 19 21 9036

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 10 2016 210363 A1 (AUDI AG [DE]) 14 December 2017 (2017-12-14) * paragraph [0026] - paragraph [0034] * * figure 1 * -----	1-16	INV. F21S43/237 F21S43/245 F21S43/14 F21S45/70
A	DE 10 2011 015161 A1 (SCHOTT AG [DE]) 24 May 2012 (2012-05-24) * paragraph [0032] * * paragraph [0058] - paragraph [0059] * * figure 2 * -----	1	
A	DE 10 2015 205353 A1 (OSRAM GMBH [DE]) 29 September 2016 (2016-09-29) * paragraph [0031] - paragraph [0039] * -----	1	

TECHNICAL FIELDS SEARCHED (IPC)
F21S

The present search report has been drawn up for all claims

1

Place of search	Date of completion of the search	Examiner
Munich	25 May 2020	Schulz, Andreas

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