



(43) International Publication Date
28 October 2010 (28.10.2010)

(10) International Publication Number
WO 2010/124064 A1

- (51) International Patent Classification:
G02B 5/08 (2006.01)
- (21) International Application Number:
PCT/US20 10/0320 17
- (22) International Filing Date:
22 April 2010 (22.04.2010)
- (25) Filing Language:
English
- (26) Publication Language:
English
- (30) Priority Data:
61/172,022 23 April 2009 (23.04.2009) US
61/187,1 12 15 June 2009 (15.06.2009) US
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- (81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
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SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted
a patent (Rule 4.1 7(H))

[Continued on nextpage]

(54) Title: MIRROR ASSEMBLY FOR VEHICLE

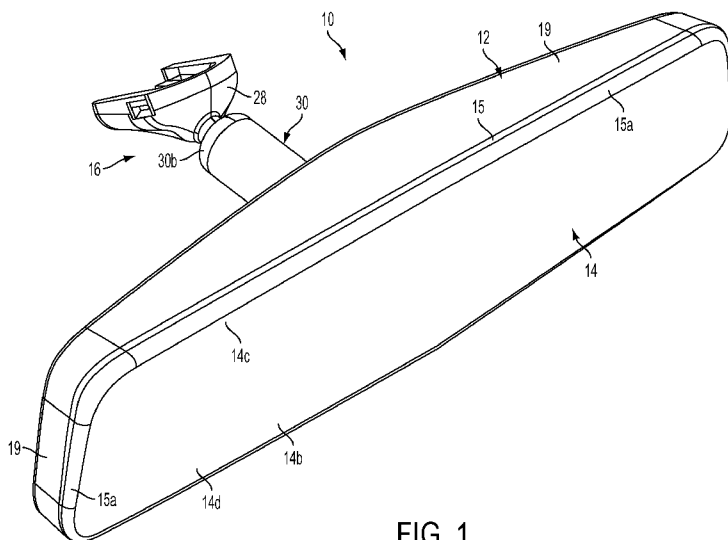


FIG. 1

(57) Abstract: A vehicular rearview mirror assembly includes a mirror casing, a reflective element and a mounting assembly for adjustably mounting the mirror assembly at a portion of the equipped vehicle. The reflective element has a front surface and a rear surface and a perimeter edge about its periphery and extending between the front and rear surfaces. The front surface generally faces a driver of the vehicle when the mirror assembly is normally mounted in the equipped vehicle. The rear surface of the reflective element may be attached to an attachment surface of an attachment plate or of the mirror casing to secure the reflective element relative to the mirror casing. The perimeter edge of the reflective element may be exposed and viewable by the driver of the vehicle when the reflective element is attached to the attachment surface and when the mirror assembly is normally mounted in the equipped vehicle.

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- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(Ui))*
- *of inventorship (Rule 4.17(iv))*
- Published:**
- *with international search report (Art. 21(3))*

MIRROR ASSEMBLY FOR VEHICLE
CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the benefit of U.S. provisional applications, Ser. No. 61/187,112, filed Jun. 15, 2009, and Ser. No. 61/172,022, filed Apr. 23, 2009, which are hereby incorporated herein by reference in their entireties,

FIELD OF THE INVENTION

[0002] The present invention relates generally to the field of rearview mirror assemblies for vehicles and, more particularly, to an interior rearview mirror assembly that is adjustably mounted to an interior portion of a vehicle.

BACKGROUND OF THE INVENTION

[0003] Typically, a prismatic interior rearview mirror assembly includes a mirror reflective element that is attached to an attachment plate and at least partially received in a casing, with a bezel portion snapped to the casing so that the bezel portion and casing overlap or encompass a perimeter edge of the reflective element and a portion or perimeter region of an outer or front surface of the reflective element (the surface facing the driver of the vehicle when the mirror assembly is normally mounted in the vehicle). The reflective element is adjustable by the driver to adjust the rearward field of view provided by the mirror reflective element.

SUMMARY OF THE INVENTION

[0004] The present invention provides a rearview mirror assembly that includes a casing and a reflective element attached to or adhered to a surface or portion of the casing with no bezel portion overlapping or encompassing a perimeter edge or front surface of the reflective element. The reflective element may comprise a prismatic or wedge-shaped reflective element and the perimeter edge of the reflective element maybe rounded or ground or polished so as to provide a rounded profile or curved transition around the perimeter of the reflective element.

[0005] According to an aspect of the present invention, a rearview mirror assembly for a vehicle comprises a casing and a reflective element. The reflective element comprises a front surface (the surface that generally faces the driver of the vehicle when the mirror assembly is normally mounted in the vehicle) and a rear surface opposite the front surface. The rear surface has a reflective mirror reflector coated or established thereat. The rear surface of the reflective element is attached, such as adhered, to a mounting surface or portion of the casing. When the reflective element is attached to the mounting surface of the casing, the perimeter edge of the

reflective element is exposed and the casing does not extend over or encompass the perimeter edge or the front surface of the reflective element.

[0006] Optionally, the perimeter edge may be rounded at a front surface (such as via grinding and/or polishing the edge region of the mirror substrate) so as to provide a rounded front edge portion (that is viewable by the driver of the vehicle). The rounded perimeter edge may be tapered to provide a smooth curved transition between the front surface of the reflective element and a rear portion of the perimeter edge of the reflective element and the outer side walls of the mirror casing. The rounded perimeter edge may be polished or otherwise finished to provide a smooth aesthetically pleasing perimeter edge of the reflective element.

[0007] These and other objects, advantages, purposes and features of the present invention will become apparent upon review of the following specification in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a front perspective view of an interior rearview mirror assembly in accordance with the present invention;

[0009] FIG. 2 is a rear perspective view of the interior rearview mirror assembly of FIG. 1;

[0010] FIG. 3 is a front exploded perspective view of the interior rearview mirror assembly of FIGS. 1 and 2;

[0011] FIG. 4 is a rear exploded perspective view of the interior rearview mirror assembly of FIGS. 1 and 2;

[0012] FIG. 5 is a side elevation and partial sectional view of the interior rearview mirror assembly of FIGS. 1 and 2;

[0013] FIG. 6 is an upper plan view of the interior rearview mirror assembly of FIGS. 1, 2 and 5;

[0014] FIG. 7 is a front perspective view of an interior rearview mirror assembly in accordance with the present invention;

[0015] FIG. 8 is a rear perspective view of the interior rearview mirror assembly of FIG. 7;

[0016] FIG. 9 is a sectional view of the interior rearview mirror assembly of FIG. 7;

[0017] FIG. 10 is a perspective view of the mirror casing of the mirror assembly of FIG. 7, with the reflective element and bezel portion removed therefrom;

[0018] FIGS. 11A-C are rear plan views of the mirror assembly, showing different structural patterned elements at the recesses of the mirror casing;

[0019] FIG. 12 is a side elevation and partial sectional view of another mirror assembly in accordance with the present invention, shown with an electro-optic reflective element attached to a mounting surface or panel of a mirror casing;

[0020] FIG. 13 is an exploded perspective view of another mirror assembly in accordance with the present invention;

[0021] FIG. 14 is a perspective view of the mirror casing of the mirror assembly of FIG. 13;

[0022] FIG. 15 is a side elevation of the mirror assembly of FIG. 13;

[0023] FIG. 16 is a rear elevation of the mirror assembly of FIG. 13;

[0024] FIG. 16A is a sectional view of the mirror assembly taken along the line A-A in FIG. 16;

[0025] FIG. 16B is a sectional view of the mirror assembly taken along the line B-B in FIG. 16;

[0026] FIG. 17 is a lower plan view of the mirror assembly of FIG. 13;

[0027] FIG. 18 is a front elevation of another mirror assembly in accordance with the present invention;

[0028] FIG. 19 is a rear elevation of the mirror assembly of FIG. 18;

[0029] FIG. 20 is a side elevation of the mirror assembly of FIG. 18;

[0030] FIG. 21 is a rear perspective view of a backing plate and toggle element attached at a rear of the reflective element of the mirror assembly of FIG. 18;

[0031] FIG. 22 is a rear perspective view of the mirror assembly of FIG. 18, shown with the mirror casing attached over the backing plate and toggle element of FIG. 21;

[0032] FIG. 23 is another rear perspective view of the mirror assembly of FIG. 18.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0033] Referring now to the drawings and the illustrative embodiments depicted therein, a rearview mirror assembly 10 for a vehicle includes a casing 12 and a reflective element 14 positioned at a front portion of the casing 12 (FIGS. 1-6). In the illustrated embodiment, mirror assembly 10 is configured to be adjustably mounted to an interior portion of a vehicle (such as to an interior or in-cabin surface of a vehicle windshield or a headliner of a vehicle or the like) via a mounting structure or mounting configuration or assembly 16. The mirror casing 12 includes a front mounting surface or panel or substrate 18 (FIGS. 3 and 5) to which a rear surface 14a of the reflective element is attached, such as via an adhesive or adhesive tape 20 (FIGS. 3 and 4) or the like. When so attached or adhered, the perimeter edges of the mirror substrate or reflective element are flush with or generally co-planar with the outer surfaces of the sidewalls of the mirror casing, as discussed below. The reflective element 14 thus is attached to the casing and the mirror assembly does not include a bezel or casing portion that encompasses a front surface 14b and a perimeter edge 15 of the reflective element 14, as also discussed below.

[0034] Reflective element 14 comprises a prismatic or wedge-shaped reflective element having rear surface 14a and front surface 14b (the surface that generally faces the driver of a vehicle when the mirror assembly is normally mounted in the vehicle) with perimeter edge 15 disposed

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