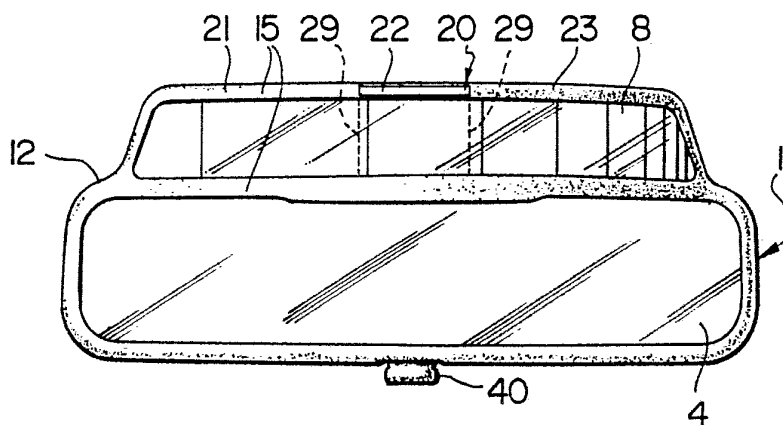


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(54) Title: COMBINATION REARVIEW MIRROR



(57) Abstract

There is described an improved rearview mirror for a vehicle comprising a first planar reflective surface (4), a second longitudinally convex reflective surface (8) providing a wider field of a rearward vision relative to the first reflective surface, a frame (12) surrounding the first and second reflective surfaces for maintaining the same in a fixed position in parallel longitudinal alignment with one another and markings (20) adjacent the second reflective surface providing a visual indication of a safe lane changing zone.

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⁺ Any designation of "SU" has effect in the Russian Federation. It is not yet known whether any such designation has effect in other States of the former Soviet Union.

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COMBINATION REARVIEW MIRROR

DESCRIPTIONTECHNICAL FIELD

5 The present invention relates to a rearview mirror for a vehicle and more particularly to a rearview mirror combining a flat and a convexly curved reflective surface to provide, in combination, an enhanced field of rearward vision.

BACKGROUND ART

10 Conventional rearview mirrors provided on the windshield of virtually every new vehicle sold in North America typically include a single flat rearwardly reflective surface providing an undistorted but limited field of view to the vehicle's rear. This therefore
15 results in the so-called "blind spots" to either side of the vehicle's flanks where the driver checking his mirror cannot see other vehicles. Shoulder checking is the only means of confirming that the blind spots are empty of vehicles, making it safe to change lanes. Shoulder
20 checking requires the driver to take his eyes off the road and is itself therefore somewhat hazardous.

Various mirror constructions have been proposed to overcome the limitation of conventional mirrors but most of these efforts have failed due either to a cumbersome
25 structure, excessive distortion of the field of view, cost, poor ergonomics and poor aesthetics. Perhaps as importantly, mirrors offering an enhanced rearward field of view are not as yet widely offered as original equipment on new vehicles, which, if they were, would lend greater
30 credibility to the use of these devices for enhanced vehicle safety. Moreover, a large part of the reason such mirrors are not offered as original equipment from manufacturers is the lack of a suitable product which overcomes the deficiencies of known after-market products.

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DISCLOSURE OF INVENTION

Accordingly, it is an object of the present invention to provide an improved combination rearview mirror which obviates and mitigates from the disadvantages of the prior art.

According to the present invention, then, there is provided a rearview mirror for a vehicle comprising a first planar reflective surface, a second longitudinally convex reflective surface providing a wider field of rearward vision relative to the first reflective surface, a frame surrounding the first and second reflective surfaces for maintaining the second reflective surface in a fixed position in parallel longitudinal alignment with the first reflective surface, and markings adjacent the second reflective surface providing a visual indication of a safe lane changing zone.

BRIEF DESCRIPTION OF DRAWINGS

Preferred embodiments of the invention will now be described in greater detail, and will be better understood when read in conjunction with the following drawings in which:

Figure 1 is a front elevational view of the present mirror;

Figure 2 is a rear elevational view of the mirror of Figure 1;

Figure 3 is a top plan view of the mirror of Figure 1;

Figure 4 is a bottom plan view of the mirror of Figure 1; and

Figure 5 is a side elevational view of an end of the mirror of Figure 1.

BEST MODE FOR CARRYING OUT THE INVENTION

With reference now to Figure 1, present mirror 1 combines a conventional first flat reflective surface 4 and a second longitudinally convex reflective surface 8. Mirror 4 provides the usual undistorted but limited field

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of rearward vision whereas mirror 8, being convex, provides a much wider rearward field of vision which overlaps to both sides with most persons natural peripheral vision, thereby all but eliminating the blind spots in the field of view afforded by mirror 4 alone.

Surrounding both of mirrors 4 and 8 is a frame 12 including a backing 13 and relatively thin raised edges 15 which overlap the adjacent edges of mirrors 4 and 8 to retain the mirrors firmly in place in fixed positions relative to each other. As shown, both mirrors as retained by frame 12 are in parallel longitudinal alignment with mirror 8 preferably, but not necessarily, located vertically above mirror 4.

Frame 12 is formed integrally about both mirrors to provide a unitary, seamless, aesthetically pleasing appearance while at the same time making the mirror as a whole compact, unobtrusive, easy to adjust and rigid. As shown, to provide a relatively low profile, the vertical height of mirror 8 is less than that of mirror 4.

As is known, convex mirrors tend to distort distances, making objects appear further away than they really are. It is important therefore that some means be provided to provide a visual indication of which vehicles appearing in the mirror's field of vision are sufficiently distant to permit a safe lane change.

This is accomplished in the present invention by means of calibrated scale 20 marked on frame 12 either above or below mirror 8. Scale 20 is sub-divided into visually distinct zones 21, 22 and 23 distinguished from one another such as by means of colour, texture or some other form of marking. In one embodiment constructed by the applicant, zones 21 and 23 are coloured red, whereas zone 22 is white, both of which colours contrast with the typically dark plastic or resinous material of frame 12. Any vehicle appearing in mirror 8 beneath zones 21 and 23 is too close

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to permit a safe lane change. Any vehicle appearing in mirror 8 beneath white zone 22 is usually sufficiently distant to permit a safe lane change, subject to the usual considerations such as road conditions, weather, the other
5 vehicle's speed of approach and of course the level of traffic.

Scale 20 may be marked on mirror surface 8 itself, or the mirror may be sub-divided by means of thin vertical lines 29 (shown in dotted lines) separating the safe and
10 not-safe lane changing zones in the field of vision. Another alternative is to tint the not-safe zones a different colour relative to the safe zone.

In other respects, mirror 1 is conventional in construction and includes the usual post 30 with a ball
15 joint 31 at one end to provide full adjustability of the mirror's angle relative to the driver's eyes and a foot 32 at the other end for attachment to the car's windshield.

As with most conventional mirrors, the mirror may also include a day/night switch 40.

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CLAIMS:

1. A rearview mirror for a vehicle comprising:
a first planar reflective surface;
5 a second longitudinally convex reflective surface
providing a wider field of rearward vision relative to said
first reflective surface;
a frame surrounding said first and second
reflective surfaces for maintaining the said second
10 reflective surface in a fixed position in parallel
longitudinal alignment with said first reflective surface;
and
markings adjacent said second reflective surface
providing a visual indication of a safe lane changing zone.
15
2. The rearview mirror of claim 1 characterized in
that said second reflective surface is fixed by said frame
above said first reflective surface.
- 20 3. The rearview mirror of claim 2 characterized in
that said frame is formed integrally about said first and
second reflective surfaces.
4. The rearview mirror of claim 3 characterized in
25 that said markings comprise a calibrated scale in
longitudinal alignment with said second reflective surface,
said scale being sub-divided into visually differentiated
zones indicating safe and unsafe lane changing zones.
- 30 5. The rearview mirror of claim 1 characterized in
that the height of said second reflective surface is a
portion of the height of said first reflective surface.

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6. The mirror of claim 3 characterized in that said markings comprise vertical lines on said second reflective surface to sub-divide the same into safe and unsafe lane changing zones.

5

7. A rearview mirror for a vehicle comprising:
a longitudinally convex reflective surface providing a widened field of rearward vision relative to a planar reflective surface; and

10 marking for said reflective surface providing a visual indication of a safe lane changing zone within said rearward field of vision.

8. The rearview mirror of claim 7 characterized in
15 that said markings comprise a calibrated scale in longitudinal alignment with said reflective surface, said scale being sub-divided into visually differentiated zones indicating safe and unsafe lane changing zones.

20 9. The rearview mirror of claim 7 characterized in that said markings comprise vertical lines on said reflective surface to sub-divide the same into safe and unsafe lane changing zones.

25 10. The rearview mirror of claim 7 characterized in that said markings comprise tinting of predetermined portions of said reflective surface to sub-divide the same into safe and unsafe lane changing zones.

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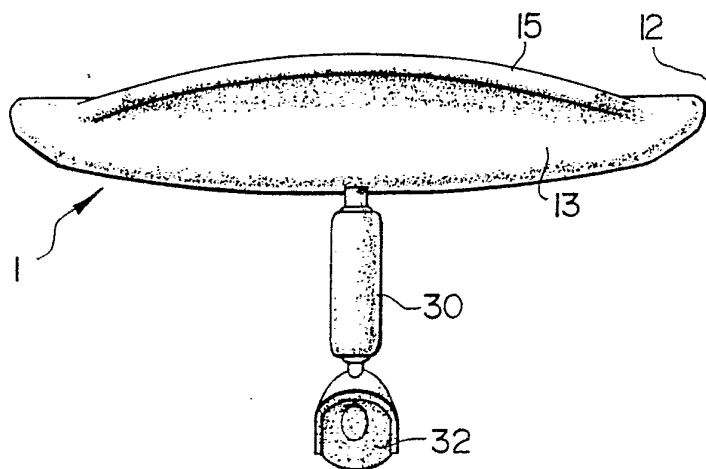
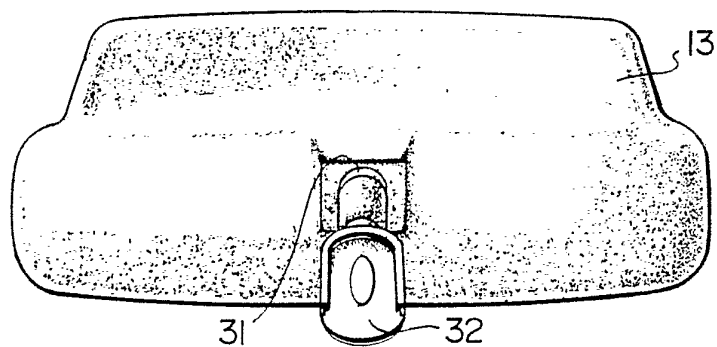
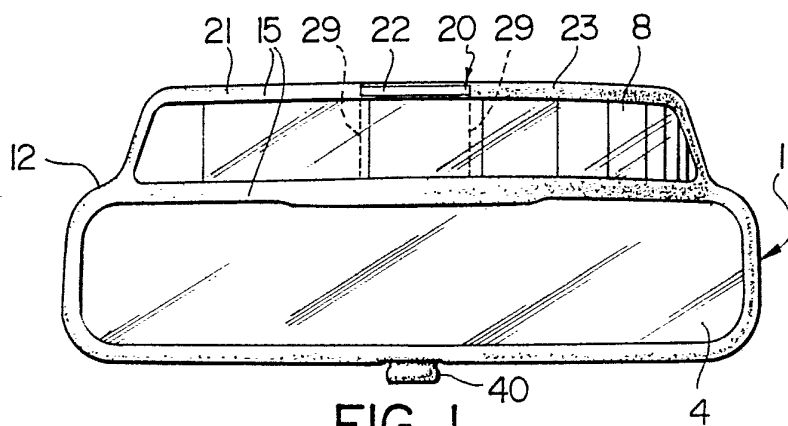
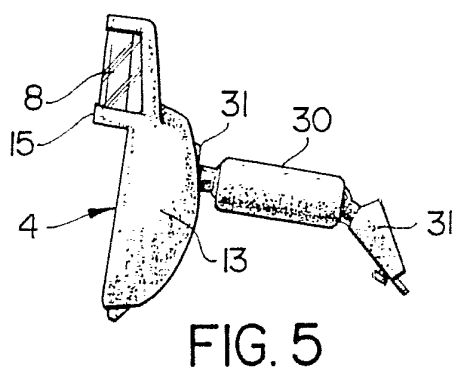
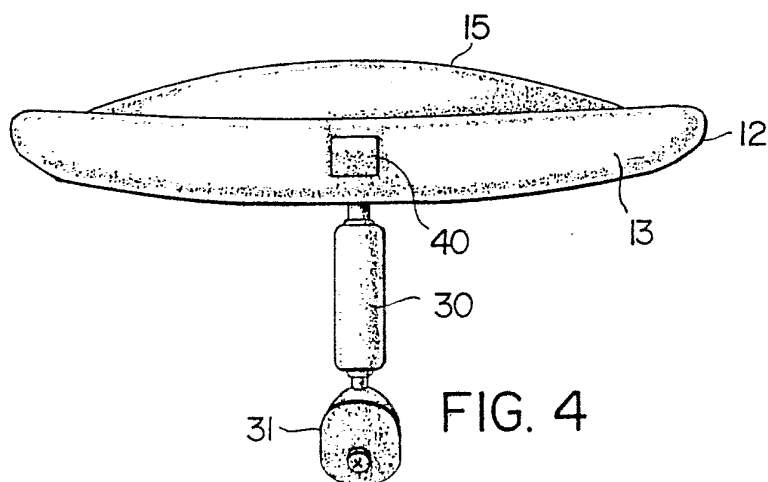


FIG. 3

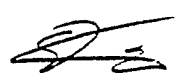
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INTERNATIONAL SEARCH REPORT

PCT/CA 91/00313

International Applica No

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 B60R1/08		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int.Cl. 5	B60R	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	US,A,3 667 833 (W.K. BALDWIN) 6 June 1972 see column 2, line 11 - line 17; figures 4-6 ---	1-3,5,6
Y	DE,U,8 613 766 (EGLEDER, HEINRICH) 12 February 1987 see the whole document ---	1-3,5-7,9,10
Y	EP,A,0 005 437 (HAGUS C. LUCHTENBERG GMBH & CO. KG) 28 November 1979 see the whole document ---	7,9,10
A	FR,A,1 339 632 (RAYMOND, J.-B. LAFONT) 11 October 1963 see figure; résumé ---	1,6,7,9,10
A	US,A,2 514 989 (NEWTON J. BUREN) 11 July 1950 see the whole document ---	1,7,10
-/-		
¹⁰ Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "&" document member of the same patent family		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
11 DECEMBER 1991	13 JAN 1992	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	DUBOIS B.F.J. 	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category °	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
A	GB,A,1 180 930 (HUGH STEPHENS) 11 February 1970 see claims 1,2,7,8; figures 1,2 ---	4,7,8,10
A	FR,A,2 286 728 (COMBINED OPTICAL INDUSTRIES LIMITED) 30 April 1976 see page 2, line 28 - page 3, line 10; figures ---	6,7,9

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

CA 9100313
SA 50902

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on 11/02/92
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US-A- 3667833	06-06-72	None	
DE-U- 8613766	12-02-87	None	
EP-A- 0005437	28-11-79	US-A- 4245894	20-01-81
FR-A- 1339632		None	
US-A- 2514989		None	
GB-A- 1180930	11-02-70	None	
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