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# United States Patent [19]

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Kondo et al.

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## [54] AUTOMOBILE MIRROR ASSEMBLY

0105103 5/1987 Japan ..... 359/868  
1279158 6/1972 United Kingdom ..... 359/868

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### ABSTRACT

[57] An automobile mirror assembly improves safety during driving of a car by widening the visual field of the driver with little distortion. The mirror is mounted on a car with a support member and a holding member to be adjustable in its position. A gradually changing mirror section is provided on at least one of an upper, lower and side edges of a main mirror section of the mirror. A surface of a gradually changing mirror section is defined by a plurality of intersections between curved surfaces provided in at least one of a vertical and horizontal directions with hyperbolic curves provided in a direction perpendicular to one of the vertical and horizontal directions. Each respective curved surface passes through circular arcs, the radii of curvatures of the circular area being calculated from Equation 1 indicated below. The radii of curvatures of the circular arcs gradually become smaller in an extending direction. The intersection of the hyperbolic curves and the curved surfaces define the surface of the gradually changing mirror. The Equation 1 is as follows:

[21] Appl. No.: **768,671**

[22] Filed: **Dec. 18, 1996**

### Related U.S. Application Data

[63] Continuation of Ser. No. 540,711, Oct. 11, 1995, abandoned.

### [30] Foreign Application Priority Data

Oct. 11, 1994 [JP] Japan ..... 6-272812

[51] Int. Cl.<sup>6</sup> ..... **G02B 5/10; B60R 1/06**

[52] U.S. Cl. .... **359/864; 359/866; 359/868**

[58] Field of Search ..... 359/838, 864, 359/866, 868, 872

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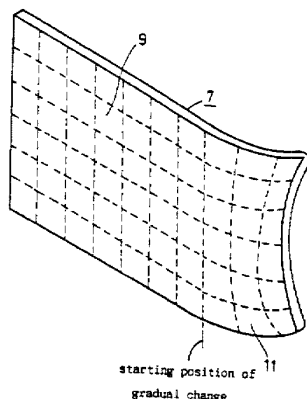
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$$\Sigma f(xn) = 1 + \frac{1}{\sqrt{1 - \{(K+1) \times c^2 \cdot xn^2\} + \{(A1) \times x1^{-1}\} + \{(A2) \times x2^{-2}\} + \{(A3) \times x3^{-3}\} \dots + \{(An-1) \times xn^{-1} - \{(N-1)\} \times \{(An) \times xn^{-n}\}$$

where: A1, A2, . . . An-1. An are asphericity factors representing asphericity at respective portions in the at least one of the horizontal and the vertical directions, n is any integer, K=0, and C=1/r0, and wherein r0 represents a radius of curvature at a starting position of the gradually changing mirror section.

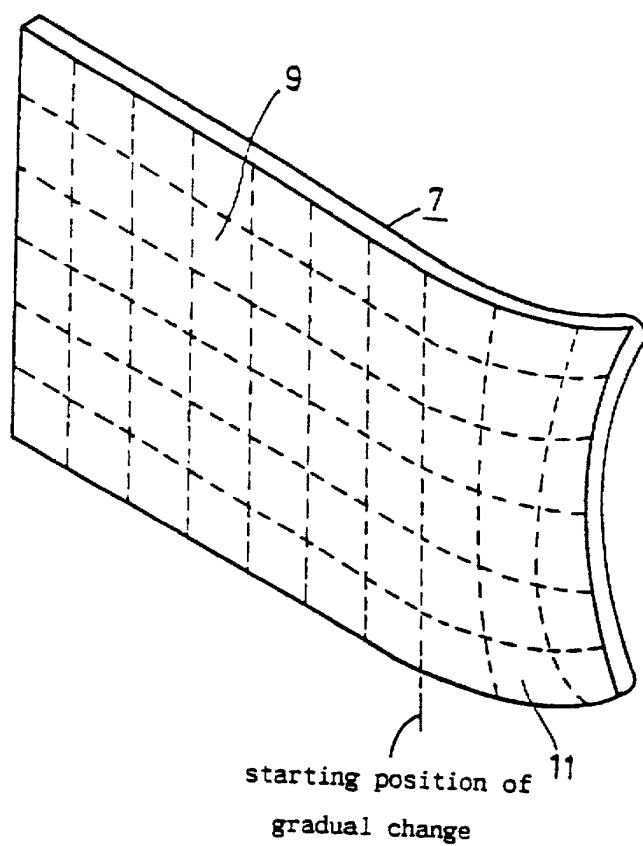
**3 Claims, 8 Drawing Sheets**



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Fig. 1



F i g. 2

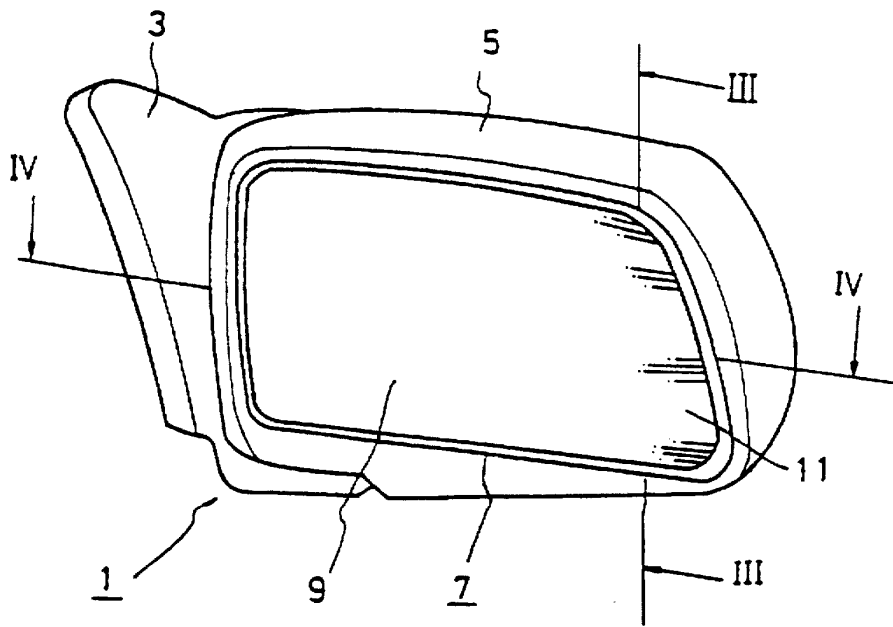


Fig. 3

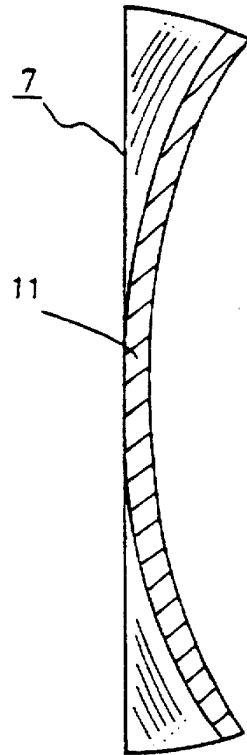
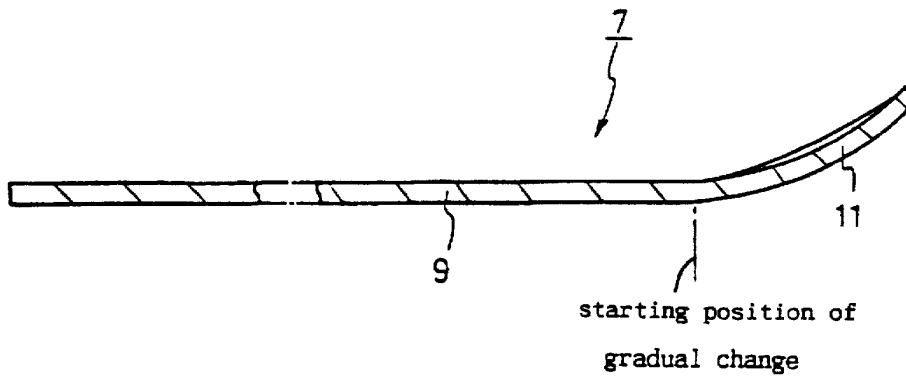


Fig. 4



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