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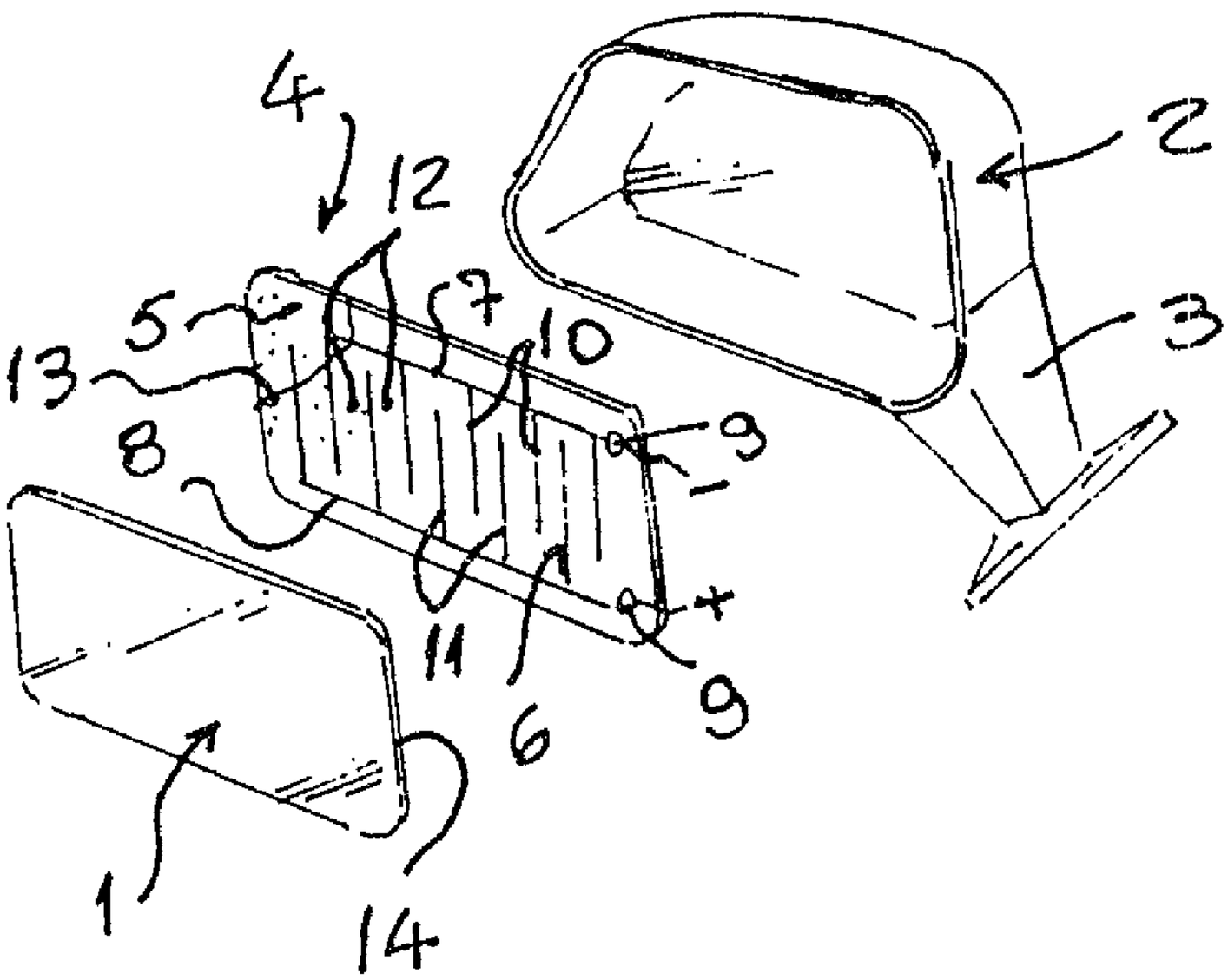
(54) Title: REARVIEW MIRROR WITH HEATER FOR DEFROSTING AND DEFOGGING



(57) Abrégé/Abstract:
A mirror 1, assembled on a structure or frame 2 with a base 3 that can be adjusted on the car body, the present improvement consisting in providing mirror 1 with a defogger and defroster comprising a polymeric semiconductor based on lampblack with silver ink electric conductive tracks and placed on the back side 14 of the mirror.

ABSTRACT

A mirror 1, assembled on a structure or frame 2 with a base 3 that can be adjusted on the car body, the present improvement consisting in providing mirror 1 with a defogger and defroster comprising a polymeric semiconductor based on lampblack with silver ink electric conductive tracks and placed on the back side 14 of the mirror.

REARVIEW MIRROR WITH HEATER FOR DEFROSTING AND DEFOGGING

The present invention relates to a rearview mirror for a motor vehicle, which provides a better utilization and efficiency, in particular during cold days and/or fog and/or similar days.

Rearview mirrors for cars are already known, consisting essentially of a mirror plate, mounted so that it can be adjusted or not in a structure or frame, which is mounted so that it can be adjusted or not on its base, which is placed, in the case of an external rearview mirror, on a side of the car body and, in the case of an internal rearview mirror, in the region of the ceiling close to the mid-point of the windscreen.

In spite of the efficiency of said rearview mirrors for the purposes to which they are intended, they have an inconvenience, in particular during cold days and/or days with high levels of humidity and/or mist (fog) and/or other similar days, which diminishes the visibility provided by said mirrors, thus harming the performance of the rearview mirror, in particular when it is of the external type.

According to the present invention, the rearview mirror comprises a reflective mirror plate having defogging and defrosting means consisting of a self-controlled heater mounted on the rear of the mirror plate of the rearview

mirror. This heater is based on a polymeric semiconductor compound, based on lampblack, comprising (in % by weight); low density polyethylene (PEBD) 60%; acetate ethylene copolymer 8.5%; conductive lampblack with selected porous structure 20%; spreading agent consisting of calcium stearate 4.0%; anti-oxidant 3.0%, and calcium titanate coupling agent 0.5%.

The highly efficient defogger and defroster of the present invention solves the problem above-mentioned, without interfering in the efficiency of the rearview mirror or making the rearview mirror too expensive.

Another significant advantage of the present defogger and defroster is that it is easy to incorporate into the rearview mirror and does not require substantial modifications of the assembly line.

In drawings which illustrate preferred embodiments of the present invention:

Figure 1 shows an exploded, perspective view of a rearview mirror according to the invention having a defogger and defroster means; and

Figure 2 shows a partial cutaway perspective view of the assembled mirror of Figure 1.

According to what is shown in the figures above-mentioned, the present improvement in a rearview mirror applies to rearview mirrors, in particular external ones, of motorcars and consists essentially of a mirror plate 1, mounted in a way that can be adjusted or not in a support

structure or frame 2, mounted so that it can be adjusted on a base 3 which is fixed on the body of the car.

The improvement of the rearview mirror with said features consists in providing the mirror plate 1 with a defogger and defroster 4 consisting of a self-controlled heater made from a polymeric semiconductor based on lampblack with silver printed electric conductive tracks.

The above-mentioned self-controlled heater, made from the polymeric semiconductor based on lampblack with silver printed electric conductive tracks, consists essentially of a substrate of semiconductor polymer based on lampblack 5, comprising (in % by weight): low density polyethylene (PEBD) 60%; acetate ethylene copolymer 8.5%; conductive lampblack with selected porous structure 20%; spreading agent consisting of calcium stearate 4.0%; anti-oxidant 3.0%, and calcium titanate coupling agent 0.5%. The lampblack has a high degree of shearing and low degree of orientation. The substrate 5 is printed with a silver ink track 6 consisting of bands building the negative 7 and positive 8 poles linked to the corresponding terminals 9. The negative and positive poles 7, 8 have interpenetrating adjacent parts 10 and 11, having intervals 12 between them. These components 7, 8 are dimensioned and structured to provide the proper heat transfer to the mirror plate 1 itself which is to be defogged and/or defrosted.

Furthermore, a suitable adhesive layer 13 is provided on the electric conductive track 6 for sticking the heater on the back face 14 of the mirror plate 1. The adhesive layer 13 must be made of an adhesive which is not affected by the temperatures and heat of operation. The defogger and defroster means described above may have variable configurations, dimensions and heat transfer capacities which are suitable to meet different configurations and dimensions of current rearview mirrors.

WE CLAIM:

1. Rearview mirror for a motor vehicle, said rearview mirror consisting of a base (3); a mirror plate (1); supporting means (2) for holding said mirror plate (1), said supporting means (2) being rigidly attached to said base (3) and holding said mirror plate (1); and defogging and defrosting means for defogging and defrosting said mirror plate (1), said defogging and defrosting means consisting of a self-controlled heater located between said mirror plate (1) and said supporting means (2), wherein said self-controlled heater comprises a polymeric semiconductor substrate (5) including a porous conductive lampblack and an electrical conductor track (6) printed on said semiconductor substrate (5), said electrical conductor track (6) being made from a silver ink;

wherein said polymeric semiconductor substrate consists essentially of about 60% by weight of low density polyethylene, of about 8.5% by weight ethylene vinyl acetate copolymer, of about 4.0% by weight of a spreading agent consisting of calcium stearate, of about 3.0% by weight of an antioxidant of about 0.5% by weight of a coupling agent consisting of calcium titanate and of about 20% by weight of said porous conductive lampblack.

2. Rearview mirror as defined in claim 1 further comprising at least two terminals (9) on said substrate (5), and wherein said conductor track (6) includes at least one positive pole (S) and at least one negative pole(7);

wherein said at least one positive pole is electrically connected to one of the at least two terminals and said at least one negative pole is electrically connected to another of the at least two terminals, and said at least one positive pole (8) and at least one negative pole (7) have interpenetrating and adjacent portions (10,11) spaced at intervals (12) from each other so that in operation a sufficient amount of heat is provided to said mirror plate (1) for defogging and defrosting said mirror plate (1).

3. Rearview mirror as defined in claim 2, further comprising adhesive means (13) for securing said substrate (5) to said mirror plate (1).

4. Rearview mirror as defined in claim 2, having only two of said at least two terminals (9).and wherein said conductor track (6) consists of only one of said at least one positive pole and only one of said at least one negative pole.

5. Rearview mirror for a motor vehicle, said rearview mirror consisting of a base (3) a mirror plate (1); supporting means (2) for holding said mirror plate (1), said supporting means

(2) being rigidly attached to said base (3) and holding said mirror plate (1); and defogging and defrosting means for defogging and defrosting said mirror plate (1), said defogging and defrosting means consisting of a self-controlled heater located between said mirror plate (1) and said supporting means (2), wherein said self-controlled heater consists of an extruded polymeric semiconductor substrate (5) comprising a porous conductive lampblack, low density polyethylene and ethylene vinyl acetate copolymer; an electrical conductor track (6) printed on said semiconductor substrate (5), said conductor track being made from a silver ink, and terminals (9) connected to the electrical conductor track (6).

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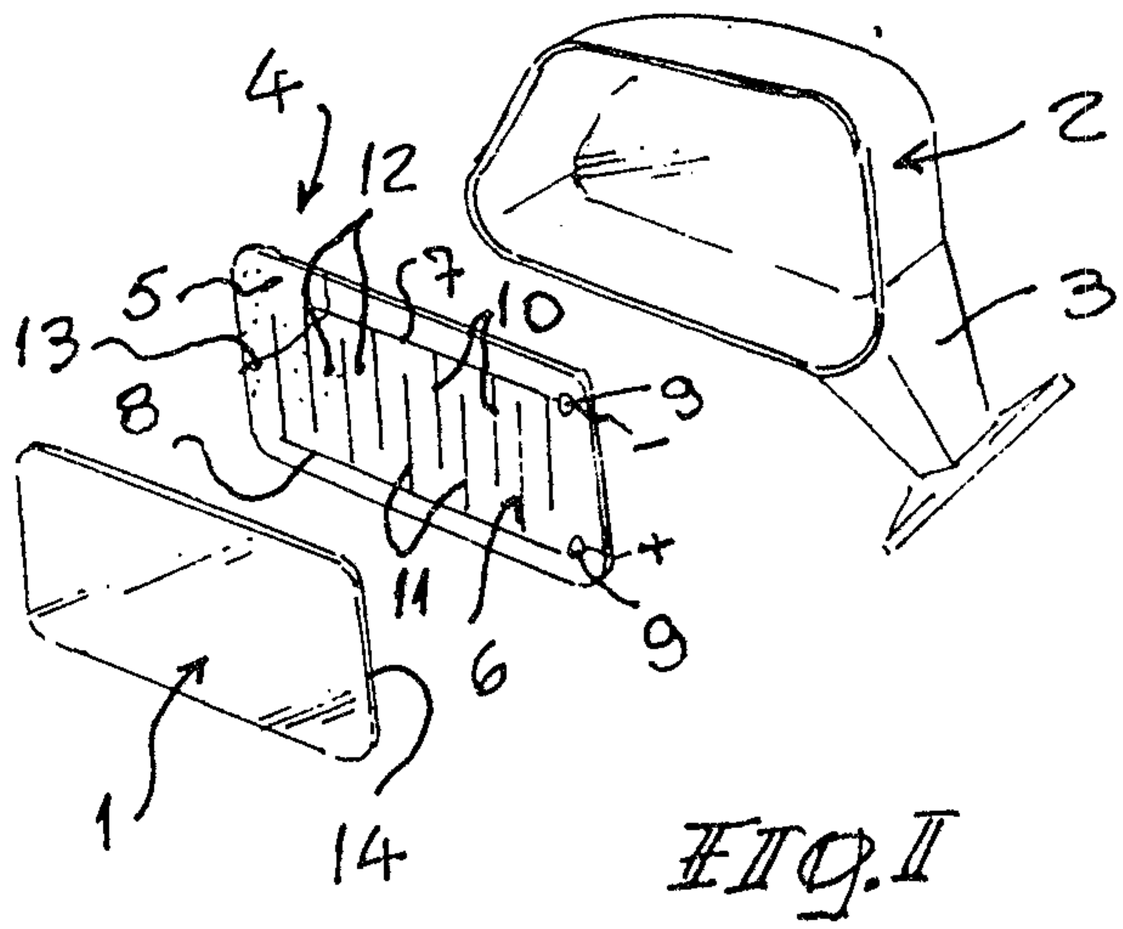

FIG. 1

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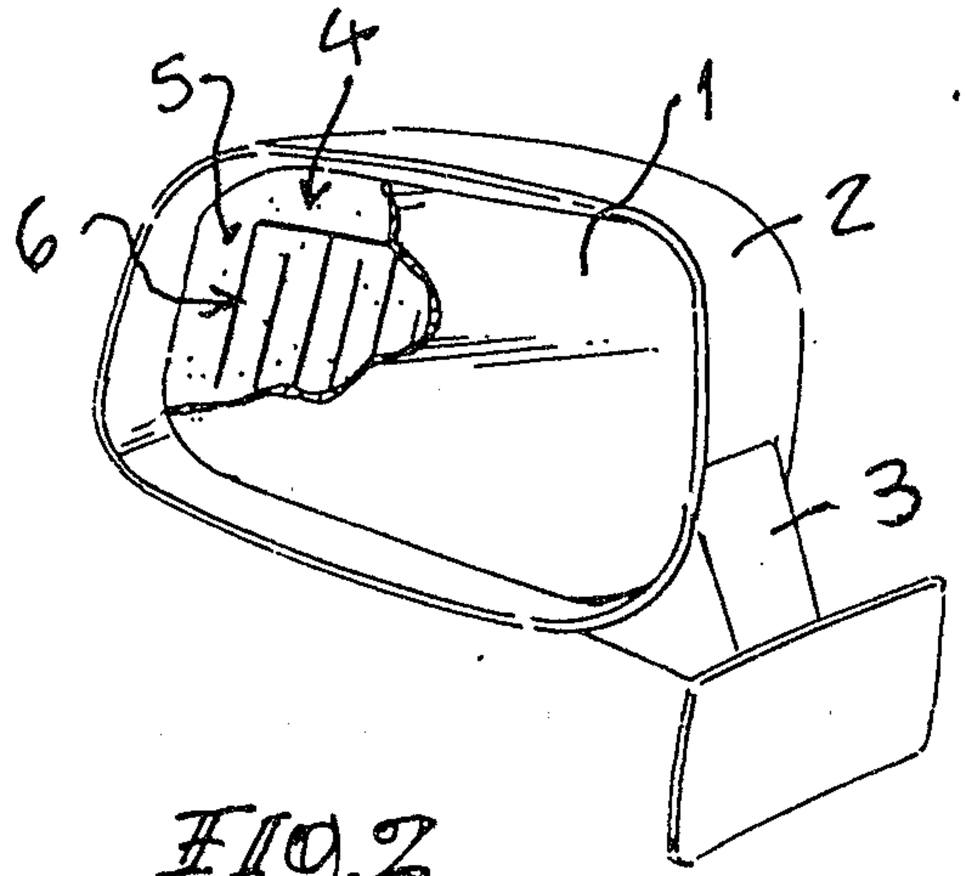

FIG. 2

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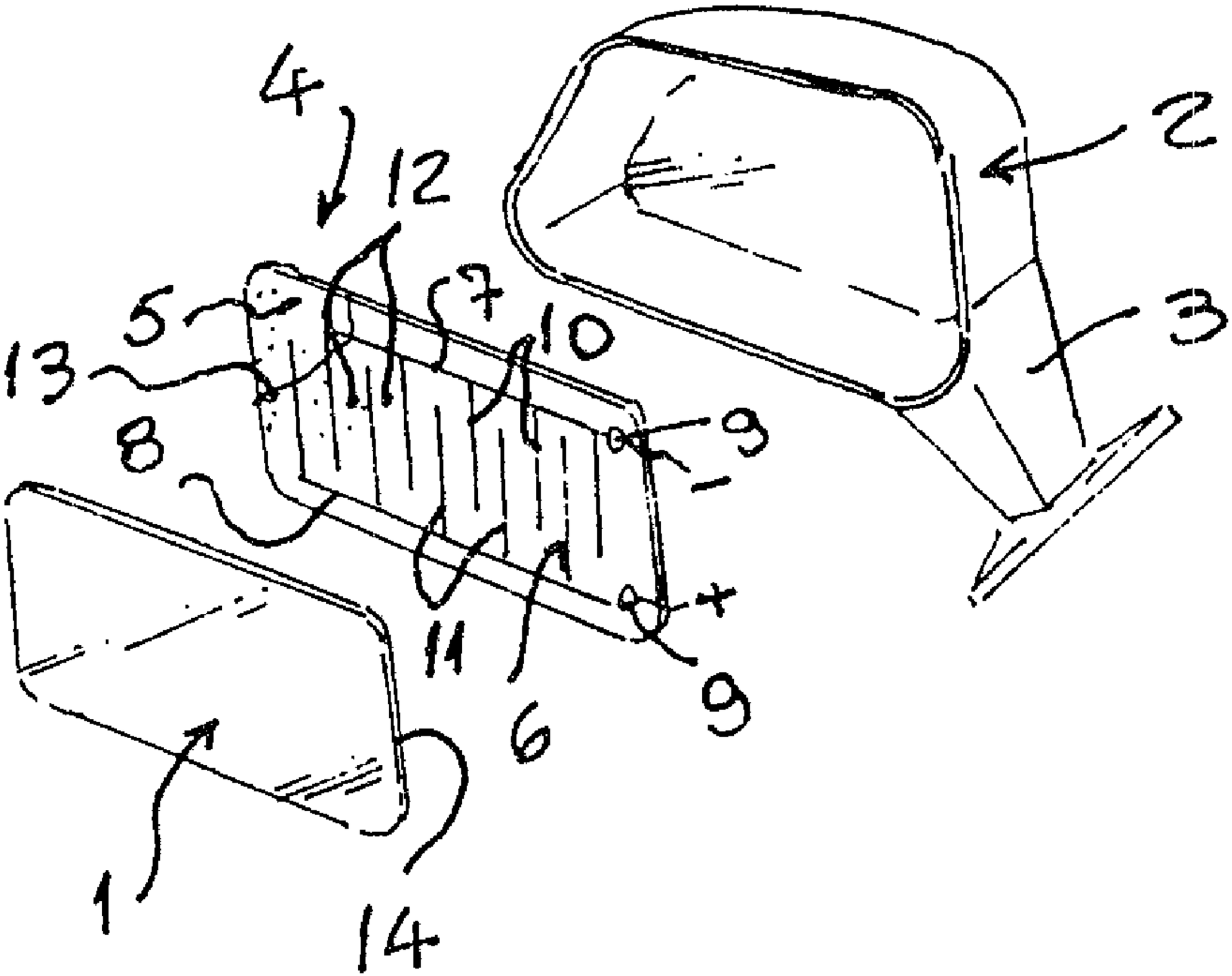
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