

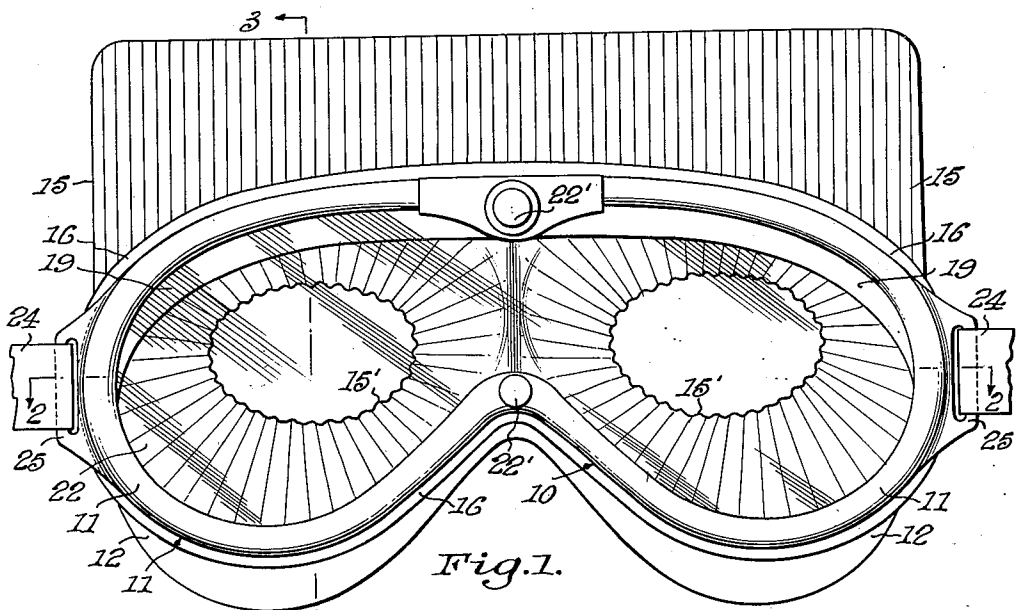
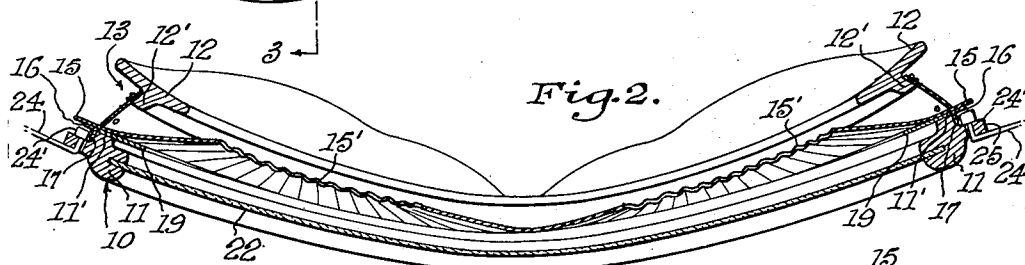
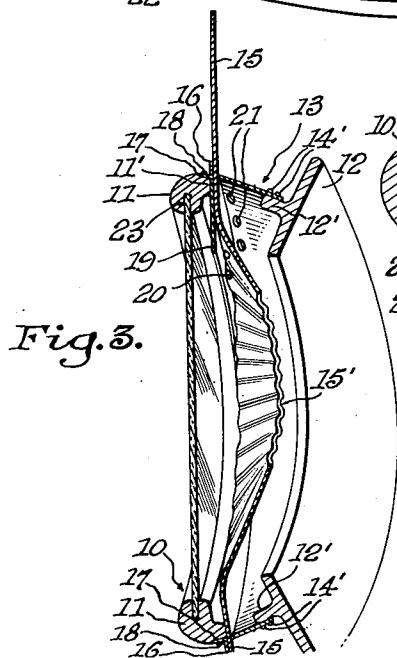
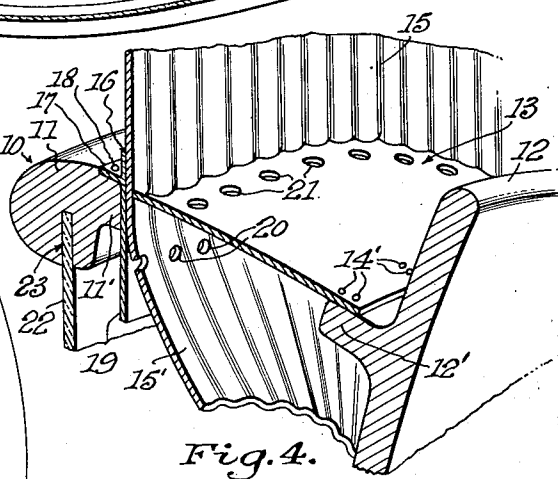
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E. D. PALMES

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ANTIFOGGING AND ANTIFROSTING GOGGLES

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INVENTOR
Edward D. Palmes

By

W. J. Eccleston

ATTORNEY

UNITED STATES PATENT OFFICE

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ANTIFOGGING AND ANTIFROSTING
GOGGLES

Edward D. Palmes, New York, N. Y.

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The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

This invention relates to improved cold weather goggles, and more particularly to an improvement in goggles for preventing fogging and frosting of the goggles lenses at low ambient temperatures.

Fogging on goggles lenses at low ambient temperatures occurs when the temperature of the interior surface of the lens is lower than the dew point of the water vapor contained within the goggles. If the dew point is reached but the freezing temperature of water is not attained, a film or fog will develop on the lens; should the frost point be reached, a frost will develop on the lens, in either case impairing vision.

Accordingly, it is an object of this invention to provide goggles having a new and improved means for preventing fogging and frosting of the goggle lenses at low ambient temperatures.

Another object of this invention is to provide an improved goggles structure wherein condensation of moisture upon the goggles lenses is prevented by means forming moisture condenser surfaces of high heat conductivity positioned intermediate the eyes of a wearer and the lenses.

It is an additional object of this invention to provide an improved goggles in which condensation of moisture on the goggles lens is prevented without unduly chilling the eyes of a wearer.

Further objects, advantages, adaptations and benefits of this improvement in goggles structure will be apparent from the following description and accompanying drawing, wherein:

Figure 1 is a front elevational view of a goggles structure embodying this invention;

Figure 2 is a horizontal sectional view on line 2-2 of Figure 1;

Figure 3 is a cross-sectional view on line 3-3 of Figure 1; and,

Figure 4 is an enlarged fragmentary perspective view of the upper portion of Figure 3.

In order to provide a structure of the character herein described, a frame 10 is provided for the goggles consisting of a flexible lens holding bead 11 and pad-like face contacting body 12 interconnected by structure of relatively high thermal conductivity fixed along opposite longitudinal edges to extended ribs 11' and 12' of bead 11 and face contacting body 12 respectively this structure including a spacing strip 13 and a fin structure 15.

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The spacing strip 13 is formed of a thin sheet brass band or strap approximately one inch wide and eleven thousandths inch thick while fin structure 15 is formed from a fluted brass strip or sheet two thousandths inch thick fixed at right angles to the front edge of spacing strip 13. The upper or top portion of fin forming strip 15 forms an external fin which extends across the top side of the goggles and above the spacing strip 13 a slight distance, for example, on the order of one to three inches to afford an external heat radiating surface. Throughout the balance of its outer perimeter fin structure 15 conforms in contour generally to the lateral and lower edges of frame 10. To the forward side of fin structure 15 is soldered an anchor strip 16 of angle section having an outwardly extending flange 17 to which the rib 11' on lens holding bead 11 is secured by means of brads or rivets 18. From the portions thereof secured to frame 10 the fin structure 15 extends inwardly and backwardly as indicated in Figs. 2 and 3 to form generally frusto-conical shaped baffles 15' so located as to be positioned in front of the eyes of a wearer of the goggles. These baffles have an inner edge defining generally oval shape sight apertures centered before the eyes of the wearer and of sufficient size not unduly to interfere with the vision of the wearer. An additional thin metallic strip or baffle 19, depends from the upper inner edge of frame 10 forward of the baffle or fin structure 15 and is soldered thereto below outwardly extending flange 17 on anchor strip 16. This baffle 19 is adapted to cooperate with the ventilating holes 20 and 21 in fin structure 15 and band 13 respectively, in the manner as hereinafter described. The heat conductor and condenser surfaces 15 and 15' may be independent elements or formed integral with the band 14, as desired.

The spacing strip or band 13 is assembled with goggles frame portions comprising bead 11 and face contacting portion 12 by securing the flange 17 to rib 11' of bead 11 by means of pins or brads, 18, or other suitable securing means, while the rear edge of spacing strip 13 is secured to rib 12' on face contacting part 12 by pins or brads 14', or other suitable securing means. These securing means may extend continuously about the contacting surfaces between flange 17 and rear edge of strip 13 and ribs 11' and 12' respectively, at suitable intervals, and a suitable adhesive or tape, may be used to seal the co-extensive edges between these parts. Optionally the insert may be formed as an integral part of the goggles frame structure or secured by suit-

able fastening or clamping means to the head 11 and face contacting portion 12 which permits easy assembly and disassembly.

With the structure assembled, as above described, including a conventional lens 22 inserted within the flexible groove 23 of bead 11 and secured by conventional snap fasteners 22' the goggles may be fitted about a wearer's eyes by conventional head straps 24 secured to bead 11 with enlarged ends 24' held by loops 25 of conventional design or a T groove in the lens as is likewise conventional. In the assembled goggles the ends of band or strip 13 overlap and suitable ventilating openings may be provided therein or between strip 13 and the rib 12' on face contacting part 12. In either event the baffles 15' in the baffle or fin structure 15 forms a shield and heat conductor surface circumferentially about the eyes which alleviates temperature differential between the inner and outer surfaces of the lens and prevents transfer of facial moisture to the lenses inner surface by its immediate condensation thereon or transmittal from the goggles frame through outlet passageways 21. The flange or baffle 19 is provided to prevent moisture laden air passing through the sight openings in baffle 15' to the forward side thereof from contacting the lens as it rises and furthermore causes such air to pass from the eye cup cavities through outlets 20 and thence to outlet apertures 21. The lower edge portion of flange 19 may depend downwardly as shown or be curved slightly in a direction opposite to the curvature of baffles 15'.

With the structure as described fitted to a subject under working conditions at temperatures of from -10° F. to -40° F. it was found that the goggles lenses remained clear at the higher temperatures for indefinite times and at the extremely low temperature for a period of practical usefulness varying from approximately one quarter hour to one hour and longer.

By slight modification, as with the provision of air passageways through the lower portion of spacing strip 13, which encircles the area below the eyes, and with or without aligned passageways in the baffles 15', better results are secured and even lower temperatures may be reached, by the more positive inflow of fresh air and outflow of moisture laden semi-heated air from within the eyecup areas of the goggles frame. Care should be taken that the subject wearer is not exposed to freezing by the incoming air. Optionally air vent openings in the rib portion 12' at its lower base portion may be provided.

If desired, or if the goggles structure is to be used with additional glasses, the body portion 12 may be built up or padded with extra layers of rubber, felt or wool, or the like, secured by a suitable rubber cement or adhesive.

Having thus described the insert and its adaptation to a goggles frame, it will be apparent that a like or somewhat modified, molded or otherwise assembled structure in the nature of that described and formed from suitable metal, rubber, resin or other flexible or semi-flexible materials, transparent or otherwise may be provided and utilized under proper conditions. Therefore, while the improvement has been described in more or less detail, it is preferred not to be limited thereby, as changes may be made in the form, arrangement, and construction of parts, and equivalents may be substituted, without departing from the spirit and scope of the

structure as claimed, the forms hereinbefore described being merely the preferred structural embodiments thereof.

I claim:

1. A goggles frame for holding a lens comprising a body member including a part on the forward side thereof for holding a lens in substantially sealed relation thereto and a flexible part on the rear side thereof to contact and form a seal with the face of a wearer so that a confined space is isolated behind the lens when the goggles are being worn, and structure for dissipating heat from the confined space including means forming frusto-conical baffles of sheet material on each side of the bridge of said frame behind the lens and located to center the same before the eyes of a wearer, said baffles having sight openings similarly centered, and a fin extending outwardly of the frame along at least the top side thereof, said fin being in thermal conducting relation with the baffle forming means.

2. The combination as defined in claim 1 wherein the structure for dissipating heat is of relatively thin sheet metal of high thermal conductivity.

3. A goggles frame for holding a lens comprising a body member including a part for holding the lens in substantially sealed relation thereto and a face contacting part interconnected in spaced relation by structure including a web of relatively high thermal conductivity, at least the face contacting part of said frame being sufficiently flexible substantially to conform to and form a seal with the face of a wearer so that a confined space is isolated behind the lens when the goggles are being worn, heat dissipating structure of relatively high thermal conductivity including a fin along at least the upper portion of said frame extending outwardly from the outer side thereof and baffles of sheet material behind the lens extending convergently and backwardly from the inner side of the frame, said baffles terminating forward of the plane at which the eyes of a wearer are located and radially outwardly of the center of the eyes so as not unduly to interfere with vision, and means including apertures in the web to promote convectional flow of air heated by contact with the wearer's face from the space confined by said goggles.

4. The improved structure defined in claim 3 wherein the baffles are fluted upon center lines extending substantially radially from centers aligned approximately with the center of the eyes of the wearer.

5. In a goggles having a flexible lens of appreciably larger area than the area of the eye sockets of a wearer, a frame including a part for holding the lens and a face contacting part interconnected in spaced relation by structure including a web of relatively high thermal conductivity, at least the face contacting part of said frame being flexible so that the latter part substantially conforms to and forms a seal with the face of the wearer, and unitary heat dissipating means for the space isolated behind the lens in the frame when the goggles are being worn including a fin extending outwardly from the top side of the frame and a continuous baffle in the frame behind the lens including backwardly extending frusto-conical portions terminating forward of the plane at which a wearer's eyes would be located when the goggles are

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being worn and radially outwardly thereof to define sight openings shaped and proportioned not unduly to interfere with vision, and means including apertures in the web to promote a flow of air heated by contact with a wearer's face from the space confined by said goggles.

6. In a goggles having a flexible lens, a frame including a part for holding a lens and a face contacting part interconnected in spaced relation by structure including a web of relatively high thermal conductivity, at least the face contacting part of said frame being sufficiently flexible substantially to conform to and form a seal with the face of a wearer so that a confined space is isolated behind the lens when the goggles are being worn, heat dissipating structure of relatively high thermal conductivity for said confined space including a fin along at least the upper portion of said frame extending outwardly from the outer side thereof and baffles behind the plane of the lens extending convergently and backwardly from the inner side of the frame, said baffles terminating forward of the plane at which a wearer's eyes would be located when the goggles are being worn and radially outwardly of the centerline of the eyes so as not unduly to interfere with vision, and means for directing a flow of air heated by contact with a wearer's face from the space adjacent the upper inner side of the lens including a plurality of apertures in the web and the inner part of the baffle along the upper portion of the frame, and a second baffle between the lens and the apertured inner part of the first-mentioned baffles for directing away from the inner side of the lens supported in the frame the air entering the space between the said lens and said first-mentioned baffles from the space in the goggles to the rear of the first-mentioned baffles.

7. In a goggles having a lens of appreciably larger area than the eye sockets of a wearer, a frame including a part for holding the lens and a face contacting part sufficiently flexible substantially to conform to and form a seal with the face of the wearer so that a confined space is isolated behind the lens when the goggles are being worn, said lens holding part and face contacting part having substantially symmetrical opposed ribs adjacent their peripheries, structure of relatively high thermal conductivity fixed adjacent opposite edges respectively to the said opposed ribs for holding the forward and rear parts of the frame in spaced relation including a spacing web of relatively thin sheet material and heat dissipating fin structure, said fin structure including a part extending outwardly from the frame along the topside thereof and parts in thermal conducting relation thereto behind the plane at which a lens is supported in said frame

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extending backwardly from the inner side of the frame to form generally frusto-conical baffles directed toward the position at which the eyes of a wearer would be located, said baffles having sight openings located to assume a centered position before the eyes of a wearer of the goggles, and means including apertures in the web and the fin structure to promote a flow of air heated by contact with the wearer's face from the space confined behind the lens when the goggles are being worn.

8. In a goggles having a lens of appreciably larger area than the area of the eye sockets of a wearer, a frame including a part for holding a lens and a face contacting part sufficiently flexible substantially to conform to and form a seal with the face of the wearer so that a confined space is isolated behind the lens when the goggles are being worn, said lens holding part and face contacting part having substantially symmetrical opposed ribs adjacent their peripheries, structure of relatively high thermal conductivity fixed adjacent opposite edges respectively to the opposed ribs for holding the forward and rear parts of the frame in spaced relation including a spacing web of relatively thin sheet material and heat dissipating fin structure, said fin structure including a part extending outwardly from the frame along the top side thereof and parts in thermal conducting relation thereto behind the plane at which the lens is supported in said frame extending backwardly from the inner side of the frame to form generally frusto-conical baffles directed toward the position at which the eyes of a wearer would be located, said baffles having sight openings located at a position to center the same before the eyes of a wearer, and means for directing a flow of air heated by contact with a wearer's face from the space adjacent the upper inner side of the lens including a plurality of apertures in the web and the inner part of the baffle along the upper portion of the frame, and a second baffle between the lens and the apertured inner part of the first-mentioned baffles for directing away from the inner side of the lens the air entering the space between the lens and said first-mentioned baffles from the space in the frame to the rear of the first-mentioned baffles.

EDWARD D. PALMES.

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