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- (71) Applicant (for all designated States except US): **SPY OPTIC, INC.** [US/US]; 2070 Las Palmas Drive, Carlsbad, California 92009 (US).

- (72) Inventors; and  
(75) Inventors/Applicants (for US only): **POLINELLI, Riccardo** [IT/IT]; Via Gaggio 8, I-21020 Galliate Lombardo (IT). **PAVANELLO, Paolo** [IT/IT]; Via Giacomo Matteotti, 36, I-21040 Carnago (IT).

- (74) Agent: **STETINA BRUNDA GARRED & BRUCKER**; 75 Enterprise, Suite 250, Aliso Viejo, California 92656 (US).

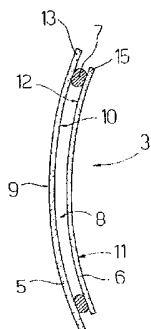
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(54) Title: SCREEN FOR EYE PROTECTION GOGGLES AND A METHOD OF FORMING A SCREEN



(57) Abstract: A screen for eye protection goggles is disclosed having a first and a second lens (5, 6) connected together; the screen (3) being characterized by including a seal (7) that extends along a closed ring-shaped path and is positioned along the rims (13, 15) of the first and the second lenses (5, 6) in such a way as to join the first and the second lens (5, 6) and form an airtight cavity (8) between the first and the second lens (5, 6).

WO 2006/049689 A2

## SCREEN FOR EYE PROTECTION GOGGLES AND A METHOD OF FORMING A SCREEN

### CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application claims priority to pending Italian Patent Application No. MI2004A002082 filed on October 29, 2004, the entire contents of which is incorporated by reference herein.

### BACKGROUND OF THE INVENTION

10 The present invention relates to a screen for eye protection goggles.

In particular, the invention relates to a screen for ski goggles, to which the invention will make specific reference without thereby excluding more general reference.

15 Ski goggles consist of a frame able to fit closely onto a user's face, an elastic strap connected to the frame and a transparent screen fitted onto the frame.

The function of ski goggles is to protect the user's eyes from snowflakes, dust and the flow of air generated by wind and/or the forward movement of the skier himself and at the same time to guarantee good visibility even in bad weather conditions.

20 Ski goggles differ from glasses by the fact that they insulate part of the face around the user's eyes in order to avoid wind, dust and snowflakes coming into contact with the eyes and irritating them or forcing the user to close his eyes while skiing. In other words, goggles, when during use they fit closely to the user's face, form a chamber that is substantially closed and insulated from the external  
25 environment.

When practicing sport, the skier perspires due to the exertion he makes his body undergo and, consequently, vapour generated by perspiration is trapped inside the closed chamber and condenses on the inside face of the screen. So the screen mists up and visibility is considerably reduced, sometimes even to zero.

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### BRIEF SUMMARY OF THE INVENTION

To get round this problem, ski goggles are generally provided with lateral aeration slits. These slits are covered with a spongy material in order to allow the

evacuation of vapour from the said chamber and, at the same time, to prevent the passage of air, dust and snowflakes from the outside. Although these openings prevent the build-up of excess pressure in the closed chamber they have proved inadequate for getting round the problem of the screen misting up.

5 To get round the problem of the screen misting up, a new type of goggles has been produced provided with a screen consisting of an internal lens and an external lens, which are fitted onto the frame so as to form a cavity. In this way, the internal lens is thermally insulated from the external lens and the vapour present in the mask only comes into contact with the warm internal lens, and contact with the cold  
10 external lens, which would bring about immediate condensation of the vapour, is prevented.

The two-lens screen combined with aeration slits has not completely resolved the problem. In fact, in certain exercise conditions condensation forms in the cavity and is deposited on the faces of the internal and external lenses. This fact is particularly troublesome because it is not possible to remove the condensation.  
15

The scope of this invention is to produce a screen for eye protection goggles that is free from the problems of prior art and that, in particular, gets round in a simple and economical way the problem of condensation forming on the screen.

According to the present invention, a screen for eye protection goggles is produced that consists of a first and a second lens connected together; the screen  
20 being characterized by the fact that it includes a seal that extends along a ring-shaped path and is positioned along the rims of the first and second lens in such a way as to join the first and the second lens and form an airtight cavity between the first and second lens.

25 According to the invention, infiltration into the cavity of moist air and vapour produced by perspiration is prevented.

According to a special embodiment of this invention, the said cavity contains a dehumidified gas.

In this way condensation of any water vapour present in the air at the time the  
30 screen is being assembled is avoided.

The present invention also concerns a method for producing a screen for eye protection goggles.

According to this invention, a method is provided for producing a screen for eye protection goggles, the method arranging for connecting together a first and a second lens; the method being characterized by the fact that it joins together the first and the second lens with a seal that extends along a ring-shaped path and is positioned along the rims of the first and the second lens in which a way as to join the first and the second lens and form an airtight cavity between the first and the second lens.

### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will not be described with reference to the attached drawings, which illustrate a non-limiting example of how to proceed, as follows:

Figure 1 is a perspective view, with parts taken away for the sake of clarity, of eye protection goggles fitted with a screen made according to the invention;

Figure 2 is a rear elevation view of the goggles screen in figure 1;

Figure 3 is a cross-sectional view of the screen in figure 2, according to the cross-section lines III-III; and

Figure 4 is a partially exploded view of the screen in figure 2.

### DETAILED DESCRIPTION OF THE INVENTION

With reference to figure 1, 1 shows in their entirety some ski goggles suitable for being placed, when in use, on a user's face.

The goggles 1 consist of a ring shaped frame 2, a screen 3 supported by the frame 2, and an elastic strap 4 attached to the frame 2 with fastenings at opposite sides of the frame 2 itself.

With reference to figures 2 and 3, the screen 3 comprises two lenses 5 and 6 joined together and held at the right distance from each other by a seal 7.

The lens 5 and 6 are spherical (alternatively they can be toroidal or cylindrical) and define an airtight cavity 8 completely insulated from the external environment. Lens 5 is defined as external insofar as it presents a face 9 that contributes towards defining the front surface of the goggles 1 and a face 10 that, to a large extent, is turned towards the cavity 8. Lens 6 is defined as internal insofar as it presents a face 11 facing, when in use, the user's face, and a face turned towards the cavity 8. Lens 5 presents a rim 13 protruding beyond the seal 7 with, at certain points, an indented profile, which is incorporated into the frame 2 and bonded to the frame 2

itself by means of slots to the frame 2 (alternatively the rim 13 is bonded to the frame 2 by means of a procedure of pressure fusion of the frame 2 itself). In the upper part of the rim 13 aeration openings 14 are present against which spongy material not illustrated in the attached figures will be positioned. Lens 6 presents a protruding rim 15 along which cuts 16 are made aligned with the openings 14.

According to an alternative embodiment not illustrated the rims 13 and 15 do not protrude from the seal 7. According to a further variant not illustrated, the openings 14 and the cuts 15 are omitted.

The seal 7 extends along a closed ring-shaped path in such a way as to completely close off any access to the cavity 8. The external lens 5 is made from polycarbonate, while the internal lens 6 is made with a material chosen from among polycarbonate, propionate cellulose and cellulose acetate. The seal 7 is made from rubber, preferably from a polyurethane-based or a silicon-based rubber. In both cases, the rubber is added with solvents and reticulating agents. The rubber once it has hardened has the characteristic of being self-sealing. In other words, once the rubber has hardened, if it is perforated by means of a needle or point having a small diameter it has the ability to close up again and restore the hermetic seal.

With reference to figure 4, once the lenses 5 and 6 have been made according to the well-known die-cutting or die-casting technologies, the method for making the screen 3 arranges for carrying out an activating treatment on the face 10 of the lens 5 along the closed ring-shaped path along which the rubber making the seal 7 will be deposited. The activating treatment has the function of modifying the molecular links and facilitating adhesion between the rubber and the polycarbonate. In the case where the internal lens 6 is also made from polycarbonate, the activating treatment is also carried out on the face 12 of the internal lens 6 only on the area intended to come into contact with the seal 7.

Next, the rubber of the seal 7 is deposited in a pasty state along the said closed ring-shaped path on the face 10 of lens 5. Lens 6 is joined to the seal 7 while this is still in a pasty state and joined, in this way, to lens 5.

Depositing the rubber in a pasty state can alternatively take place on the face 12 of lens 6, to which lens 5 will be connected.

The above-mentioned connection is carried out in a controlled environment, in other words, a dehumidified one. Once the connection has been made between lenses

5 and 6 and the seal 7 has solidified, part of the gas contained in the cavity 8 is extracted. With reference to figure 2, the extraction is carried out by using a needle 17 that is inserted through the seal 7, which has the ability, once the needle 17 has been extracted, to close up again hermetically the hole made by the needle 17. The gas is extracted by means of a suction device 18 in a quantity such as will bring about in the cavity 8 an absolute pressure between 700 and 900 millibars. In short, a depression is created in the cavity 8 so as to allow easy use of the goggles 1 even at high altitude. Referring to the average altitude of ski slopes, the preferred pressure in the cavity 8 is between 750 and 800 millibars, which is substantially equal to atmospheric pressure at an altitude of around 2000 meters. Without this expedient the screen 3 would be considerably distorted at high altitudes because of the predominance of pressure in the cavity compared to atmospheric pressure adversely affecting visibility to a considerable extent.

## CLAIMS:

1. Screen for eye protection goggles comprising a first and a second lens (5, 6) connected together; the screen (3) being characterized by the fact that it comprises a seal (7) that extends along a closed ring-shaped path and is positioned along the rims (13, 15) of the first and the second lenses (5, 6) in such a way as to join the first and the second lens (5, 6) and form an airtight cavity (8) between the first and the second lens (5, 6).
2. Screen according to claim 1, characterized by the fact that the said cavity (8) contains a dehumidified gas.
3. Screen according to claim 2, characterized by the fact that the said dehumidified gas is at a low pressure.
4. Screen according to claim 3, characterized by the fact that the absolute pressure of the dehumidified gas is between 700 and 900 millibars.
5. Screen according to claim 4, characterized by the fact that the said absolute pressure is between 750 and 800 millibars.
6. Screen according to claim 5, characterized by the fact that the said seal (7) is made out of rubber.
7. Screen according to claim 6, characterized by the fact that the said rubber is chosen from polyurethane-based or silicon-based rubber and is added using solvents and reticulating agents.
8. Eye protection goggles, characterized by the fact that it consists of a screen (3) according to any of the preceding claims.
9. Method for making a screen (3) for eye protection goggles; the method arranging for connecting together a first and a second lens (5, 6); the method being characterized by the fact that it joins a first and a second lens (5, 6) with a seal (7) that extends along a closed ring-shaped path and is positioned along the rims (13, 15) of the first and the second lenses (5, 6) in such a way as to form an airtight cavity (8) between the first and the second lens (5, 6).
10. Method according to claim 9, characterized by the fact that the said seal (7) is placed onto one or other of the first and the second lenses (5, 6) in a pasty state along the said ring-shaped path.

11. Method according to claim 10, characterized by the fact that it connects the first lens (5) to the second lens (6) with the seal (7) being placed between them when the seal (7) is in a pasty state.

5 12. Method according to claim 11, characterized by the fact that the connection of the first lens (5), the second lens (6) and the seal (7) is carried out in an environment filled with dehumidified gas.

13. Method according to claim 9, characterized by the fact that it extracts from the said cavity (8) part of the said dehumidified gas in such a way that the said dehumidified gas is at low pressure.

10 14. Method according to claim 13, characterized by the fact that it extracts a quantity of dehumidified gas in such a way as to bring about an absolute pressure between 700 and 900 millibars.

15 15. Method according to claim 13, characterized by the fact that it extracts a quantity of dehumidified gas in such a way as to bring about an absolute pressure between 750 and 800 millibars.

16. Method according to claim 15, characterized by the fact that the extraction of the said dehumidified gas is carried out when the seal (7) is in a solid state by means of a needle (17) and a suction device (18).

20 17. Method according to claim 16, characterized by the fact that the said seal (7) is made out of self-sealing rubber.

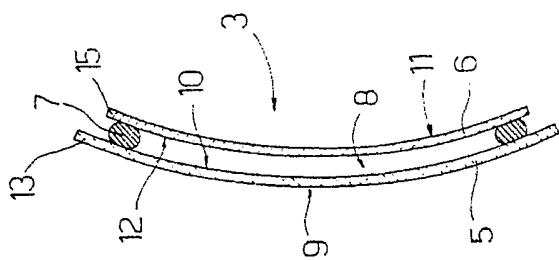


Fig. 3

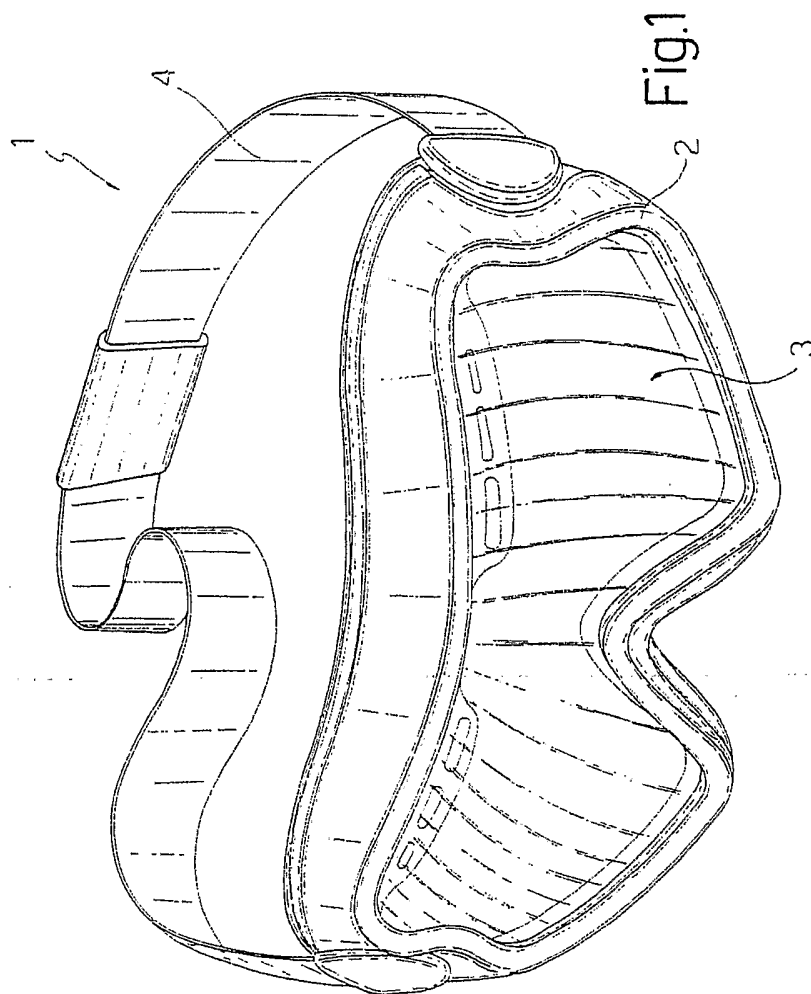


Fig. 1

