ABSTRACT

A helmet adapted especially for bicyclist wear comprising an outer shell or lamination adhered to an insulative or shock absorbive liner spaced, as worn, from the head of the wearer, the helmet having distributed air intake openings extending through the liner and from which entering air streams are directed rearwardly in cooling contact with the helmet and wearer by baffles formed as inward deflections of the outer shell.

15 Claims, 6 Drawing Figures
AIR COOLED HELMET

BACKGROUND OF THE INVENTION

Protective helmets of the types worn for various safety usages as in group or individual sports events have been known to present heat problems of discomfort to the wearers. Being constructed for safety, such helmets usually have liners which are shock absorptive but also thermally insulative, and even if spaced from the head of the wearer can cause discomfort as a result of either or both high body temperatures reached by the wearer and high ambient or atmospheric temperatures.

Particularly acute can be such discomforts experienced by bicycle riders and racers whose exertions are productive of high body and head temperatures accompanied by excessive perspiration.

Therefore it has been proposed in the general helmet field to provide apertured helmets for air admission to their interiors but without provision for air deflection and direction inside the helmets that has been found to be essential for maximized comfort to the wearer while maintaining superior safety qualities.

SUMMARY OF THE INVENTION

The invention has for its general object to provide a novel helmet structure characterized by having distributed air intake openings in direct association with which are air guides or baffles serving to positively deflect and direct the entering air streams rearwardly within the helmet in cooling contact with the wearer's head.

In keeping with its protective functions the invention contemplates a helmet construction comprising a shock absorptive liner spaced, as worn, from the users head and bonded to an outer shell, the liner and shell both containing the air intake openings with the air guides extending into the liner so that the entering air streams are directed angularly into the heat-liner spacing.

A particularly advantageous feature of the invention is utilization of the outer shell to form the air guides. By forming the shell as a rigid but deformable laminated it may be inwardly deflected at the intended air intake locations and cut to form the inlet openings. In this manner a predetermined shell overall shape or contour may be preserved since the deflections are inwardly of the helmet.

These and additional features, objects and details of the invention will be more fully understood from the following description of an illustrative embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of the helmet with an area broken away to expose a portion of the interior construction;

FIG. 2 is a side elevation of FIG. 1 with front and rear portions appearing in cross section;

FIG. 3 is a fragmentary enlarged section taken on line 3—3 of FIG. 1;

FIG. 4 is a fragmentary sectional enlargement taken on line 4—4 of FIG. 2;

FIG. 5 is an enlarged fragmentary section taken on line 5—5 of FIG. 2; and

FIG. 6 is a fragmentary sectional enlargement taken on line 6—6 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In general reference to the drawing the helmet is shown to comprise an outer essentially rigid but deformable shell 10 which may be made of suitable material such as laminated fiber glass or of molded plastic composition having the properties of protective rigidity and deformability to produce the later described air baffles and scoops. The shell 10 is bonded to a protective shock resistant liner 11 consisting typically of a rigid structural foam such as rigid polystyrene, rigid polyurethane or other semiflexible foams which desirably have open porosity to enhance evaporation of moisture received from the wearer's head.

Extending longitudinally of the helmet, i.e. from front to rear, is a recess or groove 12 formed in the liner 11 to serve as a passage for a portion of the air admitted to the helmet interior. Spacer pads 13 positioned at opposite sides of the open recess 12 are mounted at 14 to the liner in a manner permitting their detachment and replacement by thicker or thinner pads as may be required to best fit the helmet to the head of the wearer.

As illustrated in FIG. 2 the helmet is provided at each side with buckle-like fasteners generally indicated at 15 from which straps 15a diverge to attachments at 16 inside the helmet, the fasteners 15 having extension 17 through which the straps extend adjustably to accommodate the helmet position and angle fore and aft of the wearer. Chin strap 18 adjustably terminates in the fasteners 15.

As previously observed a particular feature of the invention is the adaptation of the shell 10 itself to form deflectors for air streams entering the helmet at the location of openings now to be described. Referring to FIGS. 2 and 4 to 6 the shell is cut along edges 20, 21, 22 and 23 to permit inward deflection of the shell to form concave forwardly tapering air baffles or deflectors 24, 25, 26 and rearwardly tapering scoops 27, the deflection inwardly from the edges 20 to 23 resulting in the formation of openings 28, 29, 30 and 31. As illustrated in FIG. 2 the side openings 24, 25 and 26 are progressively smaller toward the rear of the helmet as are the openings formed thereby, the sizes of the frontal baffles and openings being predetermined to prevent accidental penetration by a conventional bicycle handle bar. The rear baffles 27 with their inlets 31 are oppositely oriented to serve as air scoops for receiving the exhausting out of the helmet warm air that has passed over the wearer's head.

At its top the helmet shell has similarly formed baffles 36, 37, 38 and 39, the frontal baffle 36 being relatively enlarged. These baffles direct the air streams entering through openings 40, 41 and 42 into the recess channel 12 rearwardly within the helmet toward the reversely oriented scoops 39 which receive and exhaust the air from the helmet. As shown in FIGS. 5 and 6 the liner is cut at 43, 44 and 45 and 46 at the air inlet and exhaust locations, cuts 45 and 46 being angular, as illustrated, in the directions of the entering and exhaust air streams. Thus the baffles serve as aerodynamic scoops and internal air directors to trap, direct and force air inside the helmet producing a continuous air flow and exhaust at the rear of the helmet.

In further reference to manufacture of the outer shell 10, the latter may be formed as a single piece unit either by injection molding or preferably by die and
cavity molding a resin impregnated fiber glass or equivalent material. Either in the molding operation or prior thereto the material may be cut to form the air inlet and the material preheated to facilitate formation of the baffles which harden as rigid inward deflections of the shell.

1. A protective helmet including an outer shell containing distributed openings through which air streams enter the helmet by virtue of advancing movements of the wearer, and baffles angularly positioned at said openings to direct the entering air streams rearwardly of the helmet in cooling relation with the interior, said baffles being one-piece with the outer shell and projecting inwardly toward and within the helmet interior, the baffles forming edges of the openings offset inwardly into the helmet interior, at least one baffle located at the helmet forward facing portion and having its edge located at the rearwardmost extent of said one baffle.

2. Helmet according to claim 1 including means spacing the helmet from the head of the wearer allowing passage of the directed air.

3. Helmet according to claim 1 having a liner adhered to the shell and in which said baffles project into openings in the liner.

4. Helmet according to claim 3 in which said baffles are concave inwardly of the shell.

5. Helmet according to claim 4 in which the sides of said baffles converge toward the front of the helmet.

6. Helmet according to claim 5 in which said openings are generally aligned in the top and sides of the shell and the side openings progressively reduce in size rearwardly of the shell.

7. Helmet according to claim 3 in which said liner has an open top recess extending longitudinally of the helmet and into which air enters through a series of said baffled openings.

8. Helmet according to claim 1 including means spacing the helmet from the head of the wearer allowing passage of the directed air.

9. Helmet according to claim 1 in which the shell is bonded to a shock resistant liner and the baffles project into openings in the liner.

10. Helmet according to claim 9 in which said shell forms concave baffles as continuations of the shell frontally thereof and discontinuances rearwardly of the shell to allow air entry past the baffles.

11. Helmet according to claim 10 in which the sides of the baffles converge toward the front of the shell.

12. Helmet according to claim 11 in which said openings are generally aligned in the top and sides of the shell and the side opening progressively reduce in size rearwardly of the shell.

13. Helmet according to claim 9 in which said liner has an open top recess extending longitudinally of the helmet and into which air enters through a series of said baffled openings.

14. Helmet according to claim 11 including also air scoops in the rear of the helmet to gather and exhaust air therefrom.

15. Helmet according to claim 14 in which said air scoops also are inward deflections of the shell.