ABSTRACT: The protective helmet has a shell of hard, rigid plastic material, and radially suspended pads that entirely encircle the wearer's head. The front pad and the rear pad are each fastened to the horizontal plastic bands, which encircle the inner circumference of the shell. The pads are affixed to the respective plastic bands by mating tapes, one on the inside surface of the plastic band and the other on the outer surface of the pad, whereby when pushed together the pad is held to the plastic band. Each plastic band is held securely to the shell by spaced rivets. In the front these is one plastic band, and in the rear there are two longitudinal plastic bands, one being higher than the other, the higher band being at approximately the same level as the front plastic band. The rear pad extends slightly below the edge of the helmet to protect the neck better. Because the plastic bands are spaced from the inner surface of the shell, this affords air circulation that keeps the helmet cool—the advantage of this padded helmet over other padded helmets.
ATHLETES' PROTECTIVE HELMET PARTICULARLY FOOTBALL

This invention is a continuation-in-part of patent application of Mike C. Holt identified as Ser. No. 839,585 of filing date July 7, 1969 entitled "Athletic Helmet."

The present invention relates to protective helmets of the type particularly suitable for use by athletes, especially by football players, characterized by pads that completely surround the wearer's head, and which pads are suspended from the interior of the shell of the helmet. The pads that surround the wearer's head completely, namely the forehead, temples, sides and back thereof, including the neck also are attached to horizontal plastic bands that are spaced a distance away from the inside of the hard shell of the helmet. It relates more specifically to football helmets that have a hard shell, to the interior of which shell there is radially attached a plastic band structure that encircles the entire circumference of the wearer's head, and which band structure is spaced an appreciable distance from the inside surface of the hard helmet; and to this band structure there are attached the pads that in turn contact the wearer's head. These pads are secured to the bands respectively in that area of the shell of the helmet by tapes that mate, having permanent mating construction on each tape, one kind on one tape and the other kind on the opposite tape. The purpose is to protect the ultimate the head and neck of the wearer-player, such as the football player, who is subject to great impacts, which can be damaging in vital areas of his body, specifically to his head and neck. Inasmuch as the plastic band to which the pad is attached by the tapes that mate is secured to the shell an appreciable distance from the shell's inside surface, the plastic band will yield or give upon impact upon the shell's rigid surface, absorbing part of the effect of the blow as well as the pad in front of it; the dual effect significantly cushions the impact for the player. This affords greater protection to the player than can be attained by the use of pads alone.

There are suspended padded helmets on the market, whose pads are secured to the inside surface of the helmet's rigid shell by screws or indirectly by sewing to the fabric members in turn attached to the shell, but none have, to the applicant's knowledge, the double protection afforded by pads affixed and plastic band structure that is spaced significant distance from the inside surface of the shell.

It is an object of the present invention to provide a combined head and neck protector or helmet, the shell of which is of rigid type, such as formed from molded plastic, having cushioning pads in the interior thereof arranged to encircle the head of the played and also the neck, wherein the pads are held or affixed to the shell by means of horizontal plastic bands, which bands bear thereon, for holding purposes, tape mating structure. One of the mating tapes is covered by a myriad of firmly woven permanent hooks and the other mating tape covered on the face (opposite to the hook surface) with a myriad of soft loops to mate with the hooks on the opposite surface. One of these mating tapes is affixed to the outer surface of the pad, and the other tape is affixed to the hard plastic band usually of the same width, fastened in turn to another projecting member, explained subsequently, that is secured to the interior surface of the shell of the helmet. This structure just described provides a clear, unobstructed space between the outer surface of the exterior plastic band and opposite interior surface of the shell of the helmet.

It is, without the above details, an additional object of the present invention to provide a protective helmet for athletes or other wearers that has suspended pads encircling the wearer's head, which pads are attached to plastic band structures, in turn affixed to the interior of the rigid shell of the helmet, affording significant clearance between the exterior surface of plastic band and interior surface of the helmet.

It is further object of the present invention to provide a protective helmet for athletes, or other wearers, that has a pad positioned in the skirt portion in the rear of the shell of the helmet thereby to protect the neck as well as the rear portion of the head of the wearer. The pad is affixed by mating tapes as explained to longitudinal positioned plastic bands affixed to the shell through intermediate positioned projecting member, this gives significant clearance of the pad from the interior of the shell.

Because of the significant clearance or space between the outer surface of the outer plastic band and the inside surface of the interior of the rigid shell, the helmet is cool. Circulation of air is provided by this structure just mentioned. This is very important from the demand standpoint of padded helmets. Players become very warm as a result of the violent exercise in the games, and air circulation is needed to keep the helmet cool. Padded helmets have often not met with favor because of the objection of the players that they are hot, a condition due to lack of air circulation in them. Therefore, because there is this significant free space between the interior surface of the shell and the outer surface of the plastic band, and because of the nature of this band, the joist that the head of the wearer receives is greatly lessened, because the plastic band gives or yields, thereby cushioning the blow as does the pad. There is the dual effect as to cushioning. Because the pad is affixed to the plastic band by mating tapes on the outer surface of the pad and the adjacent surface of the plastic band, there can be employed pads of various thicknesses. The trainer or coach or equipment manager can choose the pad to accommodate heads of players of different sizes and shapes of the wearers. This alone and per se is a great advantage of a helmet.

As pointed out supra, the pads in the interior of the rigid shell of the helmet are fastened to it, as previously explained by means of coating, plastic bands, particularly nylon bands; obviously the additional plastic band is the one nearer the surface of the shell; this increases the distance of the pads from the surface of the shell. Referring again to the mating tapes, one of the said tapes is covered with or by a myriad of monofilaments formed of permanent hooks, the other facing it with soft nylon loops. When the two tapes are pressed together they fasten tightly, and hold securely to one another. The mating tapes, is marketed under the trademark, Velcro, produced by Velcro Corp. 681 Fifth Avenue, New York, New York. That fastener type combination of Velcro that the applicant is designated by its manufacturer as “Hook 80” for the hook fastening component and for its mating tape, “Velstrick SR (semirigid)—napped pile.” The first of these, namely “Hook 80” is described in its marketer's literature as having great sheer strength, whose tape is first woven of 80 mil, monofilament nylon is the form of raised and staggered loops with one-sixteenth inch salvage along both edges; these loops are then precision cut in alternate directions and thereby provide a concentration of over 200 hooks per sq. in. The mating napped pile, is a pile tape that has been woven and suitably napped to form a uniform disoriented surface of inverted loops; a one-sixteenth inch salvage is woven along both edges of it to prevent ravelling. The Velstrick SR (semirigid) tape is 1 a wide, semirigid, high impact vinyl extension on which has been permanently attached napped pile tape; there is a protective beading along both edges, offering greater rigidity. The vinyl base is slightly concea scale in order to maintain flat edges after having been applied to the surface.

To further improve the protective performance of the present invention, it is preferred to attach a rubber, U-shaped nose snubber at the front of the shell along the edge or rim of the shell where the wearer's nose would come when the wearer adjusts the helmet for wearing it. The inner lip of the rubber, nose snubber is affixed to the shell by the same metal
band that attaches the plastic band, being positioned between the plastic band and the inside surface of the shell. This nose guard preferably has a plurality of longitudinal holes to decrease its rigidity, were it solid. Also to further improve the protective performance of the present invention, it is also preferred to provide a soft plastic, longitudinal strip at the base of the back pad where the neck of the wearer would contact it, and another strip made of soft plastic on the outer surface of this pad. It is preferred in the interest of protecting the wearer that this larger rear pad extend a short distance below the edge or rim in the rear of the shell. Although the pads affixed to plastic bands via mating tapes, which bands are attached to the interior of the shell, providing by this arrangement pads encompassing the head entirely, i.e. front, sides, rear and neck, which pads are a significant distance from the solid shell, and likewise there is a space between the plastic bands and the shell, are the important structural features of this present invention, this is not to be construed as meaning that other features assisting in the protection of the wearer and his comfort can not be included to make the protector more completely acceptable to the wearer. One such auxiliary means is shown in the drawing of this invention, and is the combination of a circular centerpiece with a plurality of downwardly radiating bands of soft, resilient material to absorb shocks stemming from the upper portion of the shell; this material is preferably close woven cell vinyl, and the radiating bands extending to spaced points in one plane; this protection is further supplemented by circular pieces of the same, soft resilient material just mentioned, one piece being above the center piece from which radiate the bands, and the other piece being below this same center piece. This structure just described is important in protecting the upper region of the wearer's head from impacts in these regions. The combination of this with the suspended pads described above is the extention points, numbered 7, and the upper circular portion, numbered 8, The aforesaid crown pliable member with radiating suspension pieces before being riveted in the shell. Each rivet referred to, number 5, extends through also the lower end of the radiating, crown suspension straps or bands, numbered 6, and in the case of the front rivet also through a side of the rubber nose snubber, numbered 7. As to the rear pad, numbered 3, it is attached to the shell in an analogous but not an identical manner. There is a lower, double plastic band, numbered 8, that is almost horizontal but slightly concave in shape, that is fastened to the shell by three spaced rivets, numbered 9; the lower rivet of this group is in the middle. There is a hard, plastic tab, numbered 10, between the exterior surface of the outer plastic band, 8, and the interior surface of the shell of helmet. Above this plastic band, numbered 8, previously referred to, there is a horizontal, plastic band, designated by the numeral 11. It is fastened to the shell by three spaced rivets, numbered 12, all in the same plane. These respective rivets project through the respective ends of the radiating, crown suspension straps, numbered 6, mentioned previously. The ends of these six radiating crown suspension straps are not only fastened at their respective lower ends by six rivets as explained, but the ends of these radiating bands serve to hold the plastic bands 4 and 11 respectively away from the interior surface of the hard shell's interior surface. Due to this arrangement of mounting the double plastic bands, numbered 4, 8 and 11, through which the spaced rivets extend as explained above, these plastic bands are spaced throughout their length a significant distance from the inside surface of the shell, as the drawing clearly reveals; that is a significant thing. On the inner surface of the double plastic bands there is a beaded edge, numbered 13, of woven napped pile forming a uniform, disoriented surface of uneven loops. This is more clearly shown in FIGS. 4 and 5. Facing this surface just described there is a nylon tape numbered 14. For this tape is always attached pendants described above, which is a device of finely woven nylon monofilaments formed into permanent hooks; this surface of filaments is numbered 14. When the tapes, one on the exterior surface of the pads 2 or 3, and the other on the surface (inside) of the plastic band (numbered 4 or 8 or 11) are pushed together by pushing the former toward the latter, they fasten tightly and hold securely. This results in holding securely the pad to the double plastic band, hence to the interior of the shell. Impacts on the exterior of the shell from contacts with opposing players, their equipment or the ground will not dislodge the pads. And to emphasize what has been pointed out as to structure above, because the double plastic bands are spaced a good distance from the inner surface of the hard shell, this structure diminishes the force of the impact on the player's head. It is only the padding surrounding the head cushion the force of each blow. Pads of various thicknesses are available, the choice depending mainly upon the size of the player's head. The surface of the pads that contact the wearer's head should be smooth, that is a practical aspect to avoid abrasion of the wearer. The front pad not only obviates abrasion or skimming of the forehead but it also protects the nose of the wearer in the event the helmet is rolled forward due to impact. The pads are preferably made of closed cell vinyl to absorb the blow and is covered with a coated fabric sold under the brand name, DOE-LON DM 684 (marketer is Uniroyal Inc., of Stoughton, Wisconsin), to give a smooth surface against the forehead and sides and the rear of the wearer's head. The web suspension straps and the centerpiece that is circular, as clearly seen in FIGS. 2 and 3, are likewise made of close cell vinyl just described. As seen from this drawing, in the dome there is the pliable, plastic crown protecting element having a circular portion, numbered 15, from which radiate, like spokes from the hub of a wheel, several straps, numbered 6, referred to in the early part of the description of the drawing. In the center of this crown's circular portion, there is a circular hole, numbered 16. Through this hole there projects the neck of a dual, crown, head cushioning member, the lower round section of it, numbered 17, and the upper circular portion, numbered 18. The aforesaid crown pliable member with radiating suspension
straps protect the head of the wearer from impacts from the upper region of the helmet.

In the front of the shell at the rim or edge thereof in the middle, there is a pliable, U-shaped nose snubby, numbered 7. It fits around the rim, the longer side extending into the interior of the shell. It is attached to the shell by the same rivet that fastens the radiating suspension strap 6, projecting to this locus, and the plastic band 4 to the shell.

Near the lower edge of the rear pad, numbered 3, there are attached two pliable, longitudinal pads, one identified by the numeral 20, to the inside of the large pad, and the other identified by the numeral 21, to the outside of the same pad.

In the embodiment shown in FIGS. 1 and 2 of the drawing, the helmet's shell is provided with cheek extensions, numbered 22 respectively, one on each side of it. They are each provided with protective pads, numbered 23, for the cheek and car areas of the face; these pads are made of sponge rubber covered by soft leather to prevent chaffing of the cheeks and ears.

This invention may be developed within the scope of the following claims. Accordingly, the above specification is to be interpreted as illustrative of only a single embodiment of this invention, rather than a strictly limited sense.

I claim:
1. A helmet for protecting the head and neck of the wearer, comprising a hard, stiff shell, to the inside there is attached a plastic band spaced from the shell throughout said band's length extending about one-half the inner circumference of the shell, another plastic band also spaced from the shell throughout its length extending about the remaining half of the inner circumference of the shell, the said two bands being about in the same horizontal plane, another plastic band and which is approximately horizontal throughout its length and likewise spaced from the shell and positioned below the last recited plastic band, these said plastic bands being fastened at spaced intervals to the said shell, a pad of soft material with a smooth surface of soft material for the first mentioned plastic band, and a larger pad of soft material with a smooth surface also for the last two mentioned plastic bands at least three pairs of contacting mating tapes having permanently woven locks on one tape of each pair and permanently woven hooks on the other tape, one of the mating tapes of the front pair being fastened to the outer side of the front pad, and the other tape of this front pair being fastened to the inner side of the plastic band, and one each of the mating tapes of the rear pair being fastened to the outer side of the rear pad and the other each of the mating tapes of these pairs being fastened to the inner side of the respective plastic bands, whereby the pads are indirectly fastened to the shell, there being a clear space between the outside of the plastic bands and the inner surface of the shell, to afford a yielding movement of both the pads and the plastic bands upon impact.
2. A helmet as set out in claim 1, wherein there is a crown protecting device consisting of a centerpiece that is pliable and a hole therein through which there project a neck, connected above this centerpiece to a pliable circular piece and below this centerpiece to another.
3. A helmet as set out in claim 1, wherein the center of the rim of the shell where the wearer's face protrudes, there is a rubber, U-shaped snubby having longitudinal holes wherein, the inner side of the same nose snubby being positioned between the end of the radiating suspension strap and the interior surface of the shell.
4. A helmet as set out in claim 1, wherein on the rear, larger pad at its base there is positioned below the lower edge of the shell, a longitudinal, soft plastic strip to protect the neck of the wearer, the position being on the inside surface of the larger pad.
5. A helmet as set out in claim 1, wherein on the rear, larger pad at its base there is positioned below the lower edge of the shell, a longitudinal soft plastic strip to protect the neck, the position being on the exterior surface of the larger pad.