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(54) **IMPACT DIVERTING HELMET SYSTEM**

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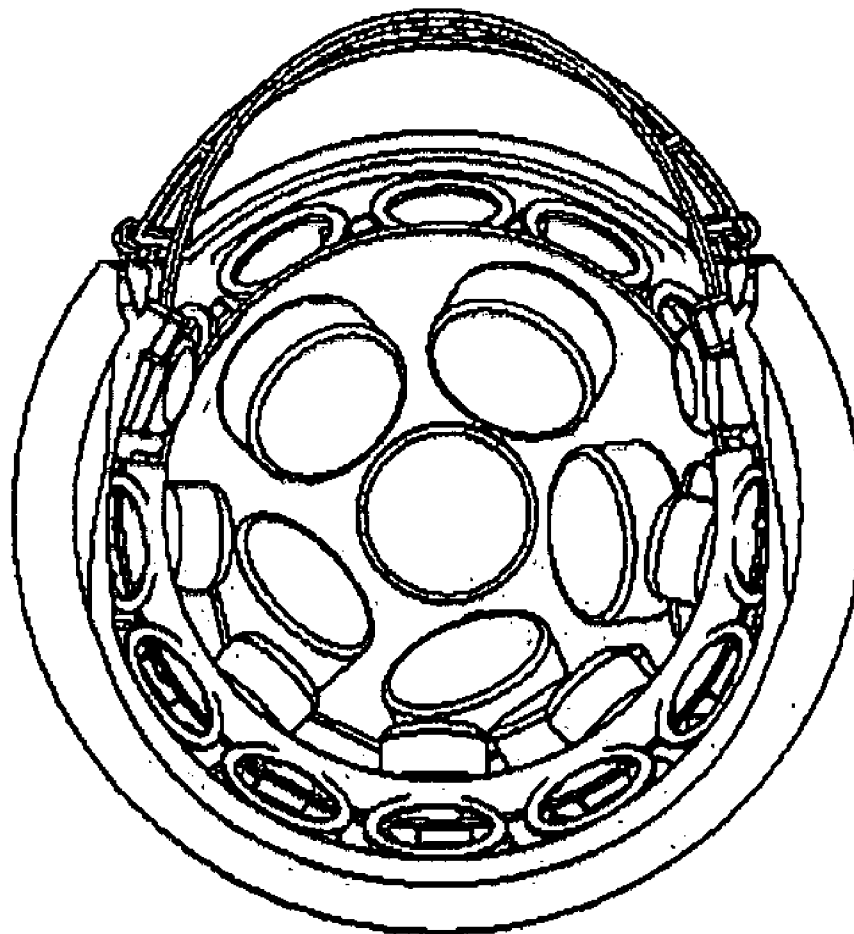
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(57) **ABSTRACT**

The Impact Diverting Helmet System is a redesign of the conventional football helmet that is in use today. It is a protective head covering device that is designed to absorb and divert the majority of force that results from a collision starting at the point of impact. This design offers the wearer eleven levels of protection and it can be easily manufactured with lightweight materials so it can be similar in weight to conventional helmets in use today.



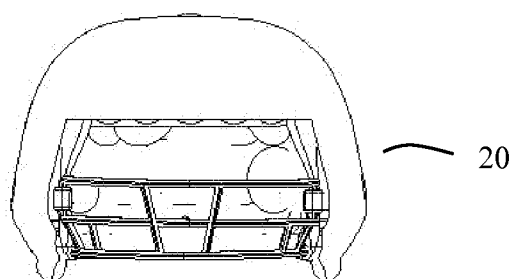


Figure 1

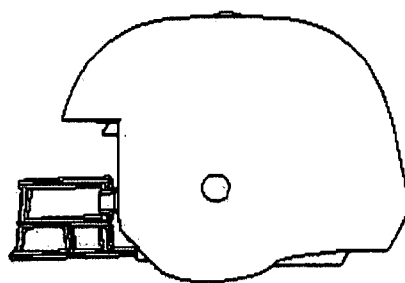


Figure 2

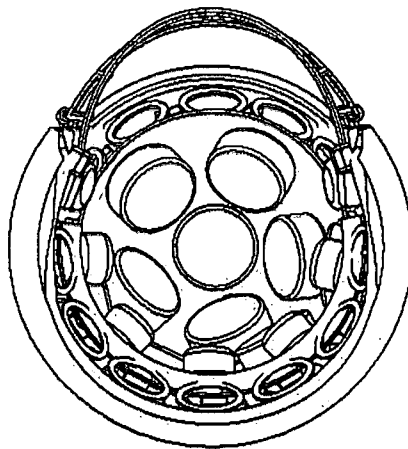


Figure 3

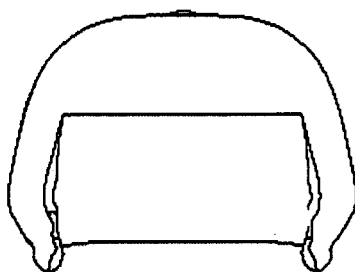


Figure 4

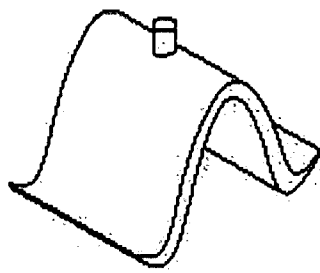


Figure 5

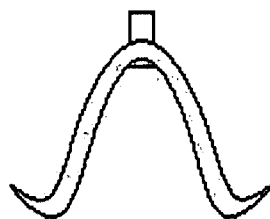


Figure 6

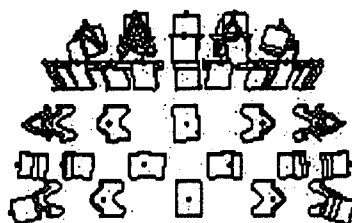


Figure 7

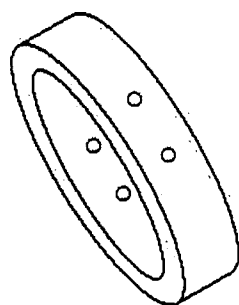


Figure 8

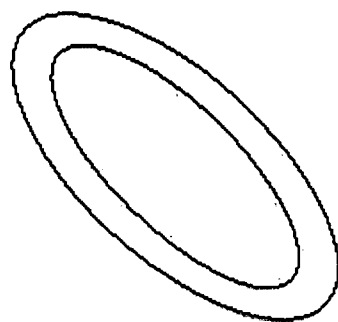


Figure 9

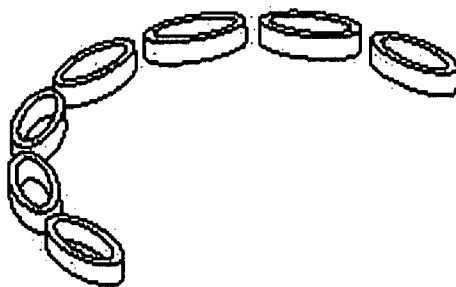


Figure 10

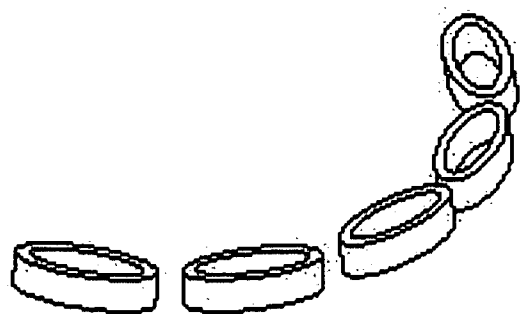


Figure 11

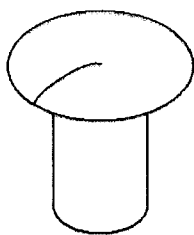


Figure 12

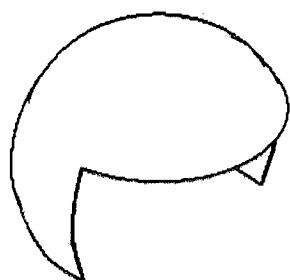


Figure 13

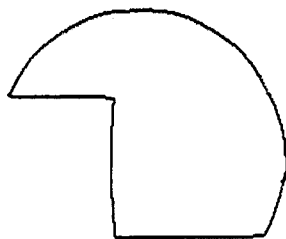


Figure 14

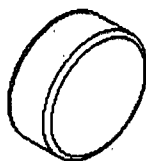


Figure 15

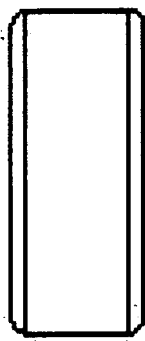


Figure 16

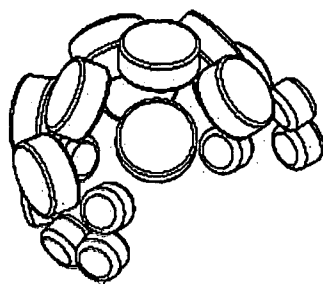


Figure 17

IMPACT DIVERTING HELMET SYSTEM**CROSS REFERENCE TO RELATED APPLICATION**

[0001] Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable

MICROFICHE APPENDIX

[0003] Not Applicable

BACKGROUND OF THE INVENTION

[0004] The present invention is in the classification of helmets. More specifically it is in the sub-classification of head-gear. Several sports involve violent head collisions and these sports require the use of protective head covering devices. The objective of the device is to protect each participant from injury that can occur from any collisions to the head during such activity.

[0005] There have been numerous redesigns of the helmet but none have been able to make a significant reduction in head injury. Generally these helmets include a hard outer shell that is fastened to a person's head with a chin strap with the option of having a facemask.

BRIEF SUMMARY OF THE INVENTION

[0006] The present invention is a protective head covering device that is not limited to football, but it can be applied to any sport or activity that can involve violent collisions to the head. The present invention is engineered to divert and absorb the energy that results from collisions and reduce the resulting force of the collisions at the point of impact instead of after the fact. The design of the present invention incorporates eleven levels of protection that work simultaneously while functioning independently of each other to protect the wearer's head from serious injury.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 shows the embodiment of a front view of a complete assembly of the invention.

[0008] FIG. 2 shows the embodiment of a side view of a complete assembly of the invention.

[0009] FIG. 3 shows the embodiment of a bottom view of a complete assembly of the invention.

[0010] FIG. 4 shows the embodiment of a front view.

[0011] FIG. 5 shows the embodiment of a perspective view of a specially designed impact diverter.

[0012] FIG. 6 shows the embodiment of a side view of a specially designed impact diverter.

[0013] FIG. 7 shows the embodiment of an array of impact diverters inside the crumple zone around the invention.

[0014] FIG. 8 shows the embodiment of a perspective view of a specially manufactured elliptical compression spring clip.

[0015] FIG. 9 shows the embodiment of a side view of an elliptical compression spring clip.

[0016] FIG. 10 shows the embodiment of a perspective view of the layout of elliptical compression spring clips as they would appear inside the crumple zone at the rear of the invention.

[0017] FIG. 11 shows the embodiment of a perspective view of the layout of elliptical compression spring clips as they would appear inside the crumple zone at the front of the invention.

[0018] FIG. 12 shows the embodiment of a perspective view of a rivet that is used to fasten the elliptical compression spring clips to the larger hard polymer outer shell to the smaller polymer inner shell.

[0019] FIG. 13 shows the embodiment of a perspective view of the inner shell of the invention.

[0020] FIG. 14 shows the embodiment of a side view of the inner shell of the invention.

[0021] FIG. 15 shows the embodiment of a perspective view of a specially designed pillow pad.

[0022] FIG. 16 shows the embodiment of a side view of a pillow pad.

[0023] FIG. 17 shows the embodiment of a perspective view of an array of pillow pads as they would appear inside of the inner core of the invention.

DETAILED DESCRIPTION OF INVENTION AND MODE OF IMPLEMENTATION

[0024] The present invention FIG. 1 represents a method and an apparatus to help protect the wearer's from any force that results from single or repetitive collisions to the head.

[0025] The first level of protection is a hard polymer shell that can be formed by using injection molding to manufacture the helmet's outer shell. The outer shell is used as the base for the helmet.

[0026] The outer shell is molded wider to the left and right sides 20 close to 22 the ear holes. The wider design adds more distance between the wearer's head and any side impact collisions. The wider helmet design adds a second level of protection.

[0027] The outer shell is molded with added space towards the back of the helmet, 23 extending it rearward and downward to add more distance between the wearer's head and the ground to protect the wearer from any collision that can occur from falling backwards. The extended shape of the helmet adds a third level of protection that can help to protect the wearer from any possible head to ground collisions.

[0028] A specialty design impact diverter FIG. 6 is molded out of sheet metal and having a spring like embodiment with one fixed end 24 that is attached to the inner core of the outer shell by inserting 24 into a predrilled hole and then glued in place.

[0029] The two free moving ends 26 of the impact diverter moves freely outwardly or horizontally across the outer surface of the inner core when any vertical force acts upon the fixed end 24 of the impact diverter

[0030] A fourth level of protection is added when a series of strategically placed impact diverters FIG. 7 are attached to the inner core of the outer shell by inserting 24 into a predrilled hole and then glued in place.

[0031] This array is used to help support the larger hard polymer outer shell 27. The unattached free ends of the impact diverters 26 moves freely across the outer surface of smaller inner shell 36 when any external force collides with the helmet. This movement helps to change the direct force from the impact to a more glancing blow.

[0032] A specially manufactured elliptical compression spring clip FIG. 8 is molded out of sheet metal and having a spring like embodiment with four predrilled holes 30, that are

used to join the inside of the larger hard polymer outer shell 27 to the outside perimeter of the smaller hard polymer inner shell 31.

[0033] One side 29 of the elliptical compression spring clip is fastened to the inside perimeter of the hard polymer outer shell 27 with two rivets FIG. 12. The elliptical compression spring clip compresses downward when any vertical force is exerted on it, and moves laterally when a shearing force is exerted on it.

[0034] A fifth level of protection is created by adding a smaller hard polymer inner shell FIG. 13 whose embodiment can be manufactured using injection molding methods.

[0035] The perimeter of smaller hard polymer inner shell is attached to the larger polymer outer shell by fastening it with rivets FIG. 12 through the opposite rivet holes 32 in the elliptical compression spring clip.

[0036] By fastening the larger hard polymer outer and smaller hard polymer inner shells together, the gap between the larger and smaller hard polymer shells creates a crumple zone 33. The added distance between the wearer's head and the point of impact creates a sixth level of protection.

[0037] The crumple zone 33 houses the array impact diverters FIG. 7 thereby adding a seventh level of protection.

[0038] A specially manufactured soft pillow pad FIG. 15 is made having the embodiment of a soft rubbery exterior and semi-filled non-rechargeable air sac. The air sac is partially filled to keep the pillow pad soft and the air is not released nor is it expelled from the pillow pad on impact.

[0039] One-side of the pillow pads 36 is glued inside the inner core of the helmet. When any external force acts upon the helmet. The pillow pad reacts like a balloon and expands laterally from the compression to absorb the energy from the impact. After the force of the impact dissipates the pillow padding returns to its original shape.

[0040] An array of pillow pads surrounds and cushions the wearer's head FIG. 17 thereby adding an eight level of protection.

[0041] A layer of soft shock absorbing foam 34 is permanently affixed over the hard polymer outer shell of the helmet for added cushioning and shock absorbing at the point of impact. This adds a ninth level of protection to the helmet.

[0042] A tenth level of protection is added by permanently affixing a soft shock absorbing rubbery padding 35 over the foam layer 34 to add more shock absorption padding to reduce the transfer of any force that results from collisions at the point of impact.

[0043] After assembled, an eleventh layer of protection is created as the outer perimeter of the helmet moves on impact to divert the energy that results from a collision. This movement creates a more glancing blow instead of a direct blow to the head.

1. The outer core of the helmet is designed to move on impact.

2. When the outer core of the helmet moves on impact, it will cause the energy from the collision to become more of a glancing blow instead of a more direct blow.

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