COMMONWEALTH OF AUSTRALIA

PATENTS ACT 1952-1973

APPLICATION FOR A PATENT

30951/M

I, Brian J. Littler, of Frankfurter Strasse 84, D-6051 Nieder-Roden, Germany,

hereby apply for the grant of a Patent for an invention entitled:

"CRASH HELMET COLLAR"

which is described in the accompanying complete specification.

The application is a convention application and is based on the application(s) for patent or similar protection made in GERMANY on 29th. November, 1976 under No.
in under No.

My address for service is care of DAVIES & COLLISON, Patent Attorneys, of 1 Little Collins Street, Melbourne, in the State of Victoria, Commonwealth of Australia.

DATED this 23rd. day of November, 1977.

H. M. Dimington

(a member of the firm of DAVIES & COLLISON) for and on behalf of the applicant

BRIAN J. LITTLE

TO: The Commissioner of Patents

WODEN ACT 2606
COMMONWEALTH OF AUSTRALIA
PATENTS ACT 1952-1969
DECLARATION IN SUPPORT OF CONVENTION OR NON-CONVENTION APPLICATION FOR A PATENT OR PATENT OF ADDITION

(The declaration shall be made by the applicant, or, if the applicant is a body corporate, by a person authorized by the body corporate to make the declaration on its behalf).

In support of the Application made for a patent

CRASH HELMET COLLAR 3 0 9 5 1 / / 7

I Brian J. Littler, a citizen of the Republic of South Africa, of D-6051, Nieder-Roden, Frankfurter Strasse 84, Federal Republic of Germany,
do solemnly and sincerely declare as follows:

1. (a) I am the applicant for the patent

2. (a) I am the actual inventor of the invention

(Paragraphs 3 and 4 apply only to Convention applications).

3. The basic application as defined by Section 141 of the Act was made in Germany on the 29th November 1976 by Brian J. Littler

4. The basic application referred to in paragraph 3 of this Declaration was the first application made in a Convention country in respect of the invention the subject of the application.

Declared at London, U.K. this 14th. day of November 1977.
The invention relates to the protection of persons wearing crash helmets, in particular motorcyclists, in the event of an accident, for example a collision with a travelling vehicle.

CLAIM

1. A collar for protection in an accident, the collar being in the form of an inflatable tubular body adapted to substantially surround a human neck.
Application Number:
Lodged:

Complete Specification Lodged:
Accepted:
Published:

Priority:

Related Art:

Name of Applicant: BRIAN J. LITTLET

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Actual Inventor(s): BRIAN J. LITTLET

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Complete specification for the invention entitled:

"CRASH HELMET COLLAR"

The following statement is a full description of this invention,
including the best method of performing it known to me:

- 1 -
The invention relates to the protection of persons wearing crash helmets, in particular motor cyclists, in the event of an accident, for example a collision with a travelling vehicle.

In accidents involving motor cyclists wearing crash helmets there is a danger of injuries in the region of the cervical vertebrae if the head is thrust backwards, as well as in the region of the breast bone or collar bone if the head is wrenched forward or sideways. For example, when the head is turned upwardly and rearwardly the portion of the spine formed by the cervical vertebrae bows rearwardly. At the limit of this bowing movement the vertebrae stop and lock and forces applied to the head are exerted on the vertebrae. If these are too great the vertebrae are displaced or damaged causing injuries which may be serious and even death. Furthermore, there is a danger of the lower rim of the rear of the helmet being forced against the back of the neck. For this reason, a number of crash helmets have an area cut out at the nape of the neck so as to prevent the rear lower rim of the helmet from acting on the region of the cervical vertebrae. The freedom of the head to move backwards is increased by this measure, so that particularly in the event of a crash at high speed, the head with the helmet is displaced backwards. In this case, the risk of the cervical portion of the spine being
bowed excessively and of the cervical vertebrae from being separated and breaking, causing damage to the spinal cord, is increased.

Various proposals have been made for reducing these dangers, for example the use of a neck-engaging pad, but no adequate solution has hitherto been found.

According to the invention there is provided a collar for protection in an accident, the collar being in the form of an inflatable tubular body adapted to substantially surround a human neck.

A collar formed in this way holds the head with respect to the neck and trunk by a shock-absorbing support, and in addition provides direct protection for the neck. The dangerous abrupt jerking movements are substantially avoided. The collar, which is preferably filled with air, is in contact with the underside or lower rim of the helmet in the manner of an air cushion and so restricts the movement of the head in any direction in a progressive manner. This makes it possible for the user to wear a larger and/or heavier helmet, since the collar enables the user to withstand greater force arising from the weight of the helmet and the force arising from the wind resistance of the helmet. This in turn makes it possible to provide a helmet which contains a greater amount of shock-absorbing material.

The inflatable collar may be joined to a crash helmet provided with an inflatable lining or padding. In
this case, it is advantageous for the interior of the collar to communicate directly with the interior of the lining of the crash helmet, for example by means of an insertable connecting piece. It is thus possible for the helmet to sit firmly but sufficiently flexibly on the surface of the head after putting on the collar and the helmet.

The collar may be connected directly with the crash helmet, for example with the lining thereof. This allows the helmet and collar to be put on simply and correctly. Alternatively the collar may be connected to a garment such as a jacket worn by a motor cyclist. In this case it may be unnecessary to provide any means for fastening the ends of the collar together, since if the jacket has a fastener, for example a zipper, the ends of the collar will be brought together automatically when the jacket fastener is done up. The collar may of course, be attached neither to the helmet nor to a garment.

In its deflated state the collar according to the invention needs little room for storage and, where not attached to a garment, may be placed in the interior of the helmet when not in use. The collar is suitable for use both with conventional helmets and with helmets having inflatable linings.

In the accompanying drawings:

Fig. 1 is a partially cut away side view of a crash helmet having an integral mouth and chin protector,
with an associated collar for protection in the event
of an accident, in the inflated state; and

Fig. 2 is a cross-section along line II-II through
the collar of Fig. 1 on an enlarged scale.

Fig. 1 shows a crash helmet 4 with a visor 41 and
a mouth and chin protector 42. The crash helmet 4 has an
inflatable lining 5, and as considered working inwards
from the outside, an air-tight layer 50, a layer 51
with high resistance to penetration and a layer 53 composed
mainly of cotton for direct contact with the surface 6 of
the head of the person wearing the helmet 4. The layer 51
is preferably a felt such as an "Aramid" felt. "Aramid"
is a polyamide product marketed by E. I. du Pont de Nemours
& Co. Inc. and used in several layers under the trade name
"Kevlar" as a fabric for bullet-proof waistcoats. If
desired the felt may be impregnated with a resin to render
it rigid.

A collar 1 is arranged on the underside of the helmet 4
and is in the form of an elongate tubular body shaped to
surround the neck and with its ends joined together by a
button fastener 2 at the front. Instead of a button fastener
any other suitable fastener could be used, for example one
in which pieces of material provided with a large number of
hooks and eyes are secured to the end regions of the collar,
the hooks and eyes being interengageable with one another.
Suitable material is sold under the Trade Mark 'Velcro'. By making the pieces sufficiently large the collar can be adapted to fit a large range of neck sizes. A bulging rim 10 points upwards in the region of the nape of the neck. The rim 10 improves the cushioning effect when the head is thrust backwards. The cross-section of the collar preferably increases from the front to the nape area, when viewed from the side. At least one sealable opening serves for filling the hollow tubular body with air and for emptying it of air. A valve tube 3 which may be sealed, for example, by a check valve, is provided at the front. The collar 1 may be inflated using this valve tube 3 as a mouthpiece. Air blown in through the valve tube may be blown through an air passage 52 between the collar 1 and the inflatable lining 5 of the helmet and thus through the collar 1 into the lining 5 which may be constructed of several interconnected inflatable divisions.

Fig. 2 shows how the wall of the tubular body of the collar 1 is composed of several layers. When considered from the interior outwards, the wall in this specific embodiment consists of the following layers: a layer 11 of air-tight material, a layer 12 of a felt having a high resistance to penetration, a layer 13 of a material having a high resistance to abrasion and great strength, and a layer 14 which is suitable for direct contact with the surface of the neck. The use of such a layer 12 greatly
reduces the risk of damage to the layer 11 by sharp projections on a motor cycle or on objects in the region of an accident, for example kerb stones and road barriers. The layer 13 serves to reduce the risk of damage to the collar from, for example, abrasion on contact with the road surface. The layer 14 is preferably readily removable to enable it to be cleaned or replaced when it is worn or torn. A fabric formed from a polytetrafluorethylene (PTFE) multifilament yarn or a fabric formed from a yarn having a mixture of PTFE and polyamide threads is preferably used for the layer 13, this being a fabric having not only high strength but also a high resistance to abrasion. A cotton fabric or a fabric composed of 90% cotton is preferably used for the layer 14. The above-mentioned "Aramid" felt is preferably used for the layer 12.

In an alternative embodiment the layers 12, 13 and 14 are replaced by a single layer of leather, preferably kangaroo leather.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

1. A collar for protection in an accident, the collar being in the form of an inflatable tubular body adapted to substantially surround a human neck.

2. A collar according to claim 1, wherein the tubular body has a bulging rim in the region of the nape of the neck.

3. A collar according to claim 1 or 2, wherein the tubular body is an elongate body having a fastener for securing its adjacent ends together.

4. A collar according to any preceding claim, wherein the tubular body is inflatable via a check valve.

5. A collar according to claim 4, wherein the valve is in communication with a tube extending from the collar.

6. A collar according to any preceding claim, wherein the wall of the tubular body is composed of a plurality of layers.

7. A collar according to claim 6, wherein the said wall comprises a layer of a felt having a high resistance to penetration surrounding an air-tight inner layer.
8. A collar according to claim 6 or 7, wherein the said wall has an external layer composed of a material including or consisting of polytetrafluoroethylene.

9. A collar according to claim 8, wherein the said external layer is composed of a fabric formed of a polytetrafluoroethylene multifilament yarn.

10. A collar according to claim 8, wherein the said external layer is composed of a fabric formed from a polytetrafluoroethylene polyamide blended yarn.

11. A collar according to any preceding claim, wherein the tubular body is provided with a detachable outer layer.

12. A collar according to claim 11, wherein the said outer layer is composed of a cotton fabric.

13. A collar according to any preceding claim, wherein the collar communicates with an inflatable lining of a crash helmet.

14. A collar according to claim 13, wherein a layer composed of a felt having a high resistance to penetration is joined to the inflatable lining on the side thereof nearer the surface of the head to be received.
15. A collar according to claim 14, wherein a layer composed of a cotton fabric is joined to the felt layer.

16. A collar according to any preceding claim, wherein the collar is fixed to a garment for wearing by a motor cyclist.

17. A collar according to any one of claims 1 to 15, wherein the collar is fixed to a crash helmet.

18. A collar for protection in an accident, substantially as herein described with reference to the accompanying drawings.

19. The parts, elements, steps and features referred to or indicated in the specification and/or claims and/or drawings of this application, individually or collectively, and any and all combinations of any two or more of said parts, elements, steps or features.

Dated this 23rd. day of November, 1977

BRIAN J. LITTLE
by his Patents Attorneys
DAVIES & COLLISON.