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PATENT REQUEST : PETTY PATENT

I, being the person identified below as the Applicant, request the grant of a Petty Patent to the person identified below as the Nominated Person, for an invention described in the accompanying complete specification.

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Invention Title: PROTECTIVE COLLAR APPARATUS ADAPTED FOR USE
WITH A HELMET

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Drawing number recommended to accompany the abstract: 1

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- (56) Prior Art Documents
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- (57) Claim

1. A protective collar apparatus adapted for use in conjunction with a helmet, such as might be worn by a motorcyclist or cyclist, comprising:-

- an inflatable tubular element adapted generally to surround the wearer's neck, the element being formed such that when inflated, it is generally in contact with the lower edge of the helmet and the upper trunk of the wearer's body, and wherein when inflated, it protects the head, neck and shoulder regions of the wearer's body against forces applied thereto;

- means for securing the inflatable element to the helmet;

- means for detecting the presence of a force likely to be injurious to the head, neck or shoulder regions of the wearer's body; and

- means for activating the inflation of the inflatable element, upon the detection of such a force.

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COMPLETE SPECIFICATION
PETTY PATENT

Applicant: SERGIO TONETTI

Invention Title:

PROTECTIVE COLLAR APPARATUS ADAPTED FOR USE WITH A HELMET

PROTECTIVE COLLAR APPARATUS ADAPTED FOR USE WITH A HELMET

The present invention relates to a protective collar apparatus adapted for use in conjunction with a helmet. It has particular, although not exclusive, application to the helmets worn by motorcyclists, to protect their bodies from injury in the event of an accident.

It is well known that persons travelling in what might be termed "exposed" vehicles (for example, motorcycles and bicycles) are often at risk of injury to their person, in the case of an accident. Particularly in the case of motorcyclists wearing crash helmets, there is inherently a danger of incurring injury in the region of the cervical spine, if upon collision, the motorcyclist's head is thrust rearwardly. If the motorcyclist's head is displaced forward or sideways, injuries to the breast and/or collar bone structures may also be sustained. By way of example, if the head is displaced upwardly and turned rearwardly, the region of the spine formed by the cervical vertebrae bends in a rearward direction. Any forces applied to the head after the cervical vertebrae have reached the limit of their movement, are then exerted on the vertebrae themselves. In this position, excessive forces applied to the vertebrae either cause them to be displaced or damaged. Typically, serious injuries are sustained when this occurs. Such injuries may include damage to ligamentous structures joining the vertebrae, or to the spinal chord itself. Death may even ensue.

Additionally, there is the risk that the lower rim of the rear of the helmet may be forced, in case of a collision or accident, against the back of the wearer's neck. Accordingly, many crash helmets have been designed so as to have an area cut out in the rear rim portion, so

as to prevent that portion of the helmet from injuring the cervical vertebrae, in case of an accident or collision. This design in turn results in the head having increased freedom of movement in case of an accident or collision, so
5 that upon impact, the head is displaced in a backward direction. This in turn results in the possibility of the cervical portion of the spine being bent excessively, and thereby giving rise to an increased risk of separation and breakage of the cervical vertebrae, and consequent damage
10 to the spinal chord.

It would be highly desirable, therefore, to have an apparatus which substantially avoids or minimises the risk of such injuries arising.

The present invention generally provides a
15 protective collar apparatus adapted for use in conjunction with a helmet, such as might be worn by a motorcyclist or cyclist, comprising:-

- an inflatable tubular element adapted generally to surround the wearer's neck, the element being
20 formed such that when inflated, it is generally in contact with the lower edge of the helmet and the upper trunk of the wearer's body, and wherein when inflated, it protects the head, neck and shoulder regions of the wearer's body against forces applied thereto;

25 - means for securing the inflatable element to the helmet;

- means for detecting the presence of a force likely to be injurious to the head, neck or shoulder regions of the wearer's body; and

30 - means for activating the inflation of the inflatable element, upon the detection of such a force.

The means for detecting the force likely to be injurious to the wearer of the apparatus may take the form of providing the helmet with an element capable of

detecting a strain produced by such a force, and wherein, upon the detection of such a strain, the detection means cooperate with the means for activating the inflation of the inflatable tubular element, thereby to inflate it.

5 Preferably, the means for detecting the presence of such a force comprise:

- a strain detecting element, such as a lever, fitted to the helmet; and
 - an elongate element, such as a tether, adapted
- 10 to be fitted between the strain detecting element, and the vehicle for carrying the wearer of the apparatus, so that, upon the application of such a force, a strain is exerted upon the elongate element, which is detected by the strain detecting element, which in turn cooperates with the means
- 15 for activating the inflation of the inflatable element, thereby causing its inflation.

The inflatable tubular element may be formed such that it is integral with either the helmet, or other clothing worn by the wearer. Alternatively, the inflatable

20 tubular element may be formed so that it is removably securable to either the helmet or such other clothing.

In order that the invention may be further understood, a preferred embodiment thereof will now be described by way of example only with reference to the

25 accompanying drawings, in which:-

1. Fig 1 represents a perspective view from underneath and one side, of a crash helmet fitted with a protective collar device in accordance with the present invention.
- 30 2. Fig 2 depicts a motorcyclist riding a motorcycle, and wearing the helmet of Fig 1, with the protective device ready for use in case of an accident or collision.
3. Fig 3 depicts the protective device in

operation, with the collar element in the inflated mode.

Referring now the drawings, there is shown a crash helmet generally denoted as 1 fitted with a protective collar apparatus in accordance with the present invention. The protective collar apparatus, generally denoted as 3, is shown in Fig 1 as comprising a generally tubular inflatable sac or pouch 5, fitted to the underside of helmet 1. In the embodiment depicted in the drawings, sac or pouch 5 is formed integrally with, and around the base of helmet 1, although in other embodiments, it could take the form of a separate element, which could be removably attached to the helmet 1. In yet other embodiments of the invention, it could be formed integrally with the clothing of the wearer (for example, it could be formed integrally with a riding suit).

As shown in Fig 1, sac or pouch 5 has an inflation inlet 7, which in turn is coupled to a cylinder of a compressed gas, denoted generally as 9, fitted to an attachment on the side of helmet 1. The release of compressed gas within cylinder 9 is achieved by opening a valve leading to inlet 7, by means of a lever, denoted 11, also fitted to helmet 1. Lever 11 could be made from any suitable material, but tensioned materials, such as sprung steel, are particularly preferred, in that they allow the lever to detect forces applied to the head or neck of the wearer of helmet 1, such as might occur in case of an accident or collision.

Lever 11 detects such forces by means of a tether 13, having a looped portion 15, which is adapted to be received about lever 11, as shown in Fig 1. The other end of the tether 13 is attached to the body of the motorcycle by means of a releasable hook 17, fitted at the other end of the tether. The entire protective device, as exemplified by this embodiment, is shown in readiness for

use in Fig 2. In use, tether 13 is tightened so that the rider is able to travel comfortably, whilst at the same time, in the event of a collision or accident occurring, there being sufficient tension in tether 13, to provide a downward pull on lever 11, as shown more particularly in Fig 3. Hence, tether 13 and lever 11 cooperate so as to provide a means for detecting the application of an adverse force to the head or neck of the motorcyclist. Once, this detection means identifies the application of such an adverse force, lever 11 is pulled downwardly (as shown in Fig 3), to activate the release of the compressed gas in cylinder 9 via inflation inlet 7, into sac 5. This results in the inflation of sac 5 about the neck region of the wearer of the helmet 1, so as to protect the wearer's neck, head and shoulder regions generally, from unwanted movement of the head, as explained previously. Once lever 11 is pulled downwards, this also activates the release of loop 15 from around the lever, which in turn prevents tether 13 from applying a pulling force on the motorcyclist's head.

Although the present invention has been described above in terms of its usefulness in preventing head, neck and shoulder injuries to motorcyclists and cyclists in particular, it is to be understood that it is by no means limited in its application to such wearers, and that it could also be used in many other situations. For example, a protective apparatus in accordance with the present invention could quite easily be used in connection with other forms of travel and other travel-based sports (eg motor car racing, speed boat racing, etc).

Further, although the invention has been described and depicted in the embodiment herein as taking the form of a collar fitted integrally to a helmet, and having an external means for detecting the application of an adverse force, and for activating the inflation means,

it is to be understood that protective devices made in accordance with the present invention, could take many different forms. For example, and as explained above, the inflatable element could either be a separate element which might removably be attached to the helmet, or alternatively again, it might be formed integrally with other clothing worn by the cyclist or motorcyclist. Further, the means for detecting the application of an adverse force to the wearer's head or neck, and the means for inflating the inflatable element, could be formed integrally either with that element, or with other clothing worn by the wearer. It is therefore to be understood that the invention is in no way limited to the uses described herein, or to the particular constructional details of the embodiment described above, and that many modifications and/or variations will fall within its spirit and scope, which extend to every novel feature and combination of features herein disclosed.

comprise:

- a strain detecting element fitted to the helmet; and

5 - an elongate element adapted to be fitted
between the strain detecting element and a vehicle for
carrying the wearer of the apparatus,
and wherein, upon the application of said force, a strain
is exerted upon the elongate element, which is detected by
the strain detecting element, which in turn cooperates with
10 the means for activating the inflation of the inflatable
element, thereby to inflate it.

DATED THIS 11TH DAY OF DECEMBER

15

SERGIO TONETTI

By his Patent Attorneys:

GRIFFITH HACK & CO

20 Fellows Institute of Patent
Attorneys of Australia

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A protective collar apparatus adapted for use in conjunction with a helmet, such as might be worn by a motorcyclist or cyclist, comprising:-

5 an inflatable tubular element adapted generally to surround the wearer's neck, the element being formed such that when inflated, it is generally in contact with the lower edge of the helmet and the upper trunk of the wearer's body, and wherein when inflated, it protects the head, neck and shoulder regions of the wearer's body against forces applied thereto;

10 - means for securing the inflatable element to the helmet;

15 - means for detecting the presence of a force likely to be injurious to the head, neck or shoulder regions of the wearer's body; and

20 - means for activating the inflation of the inflatable element, upon the detection of such a force.

2. A protective collar apparatus for use in conjunction with a helmet, as claimed in claim 1, wherein the means for detecting a force likely to be injurious to the wearer of the apparatus comprise providing the helmet with an element capable of detecting a strain produced by said injurious force, and wherein, upon the detection of said strain, said detection means cooperate with the means for activating the inflation of the inflatable tubular element, thereby to inflate it.

30 3. A protective collar apparatus for use in conjunction with a helmet, as claimed in claim 1 or claim 2, wherein the means for detecting the presence of a force likely to be injurious to the wearer of the apparatus

ABSTRACT

A protective collar apparatus adapted for use in
5 conjunction with a helmet, such as might be worn by a
motorcyclist or cyclist, comprising:-

- an inflatable tubular element adapted
generally to surround the wearer's neck, the element being
formed such that when inflated, it is generally in contact
10 with the lower edge of the helmet and the upper trunk of
the wearer's body, and wherein when inflated, it protects
the head, neck and shoulder regions of the wearer's body
against forces applied thereto;

- means for securing the inflatable element to
15 the helmet;

- means for detecting the presence of a force
likely to be injurious to the head, neck or shoulder
regions of the wearer's body; and

- means for activating the inflation of the
20 inflatable element, upon the detection of such a force.

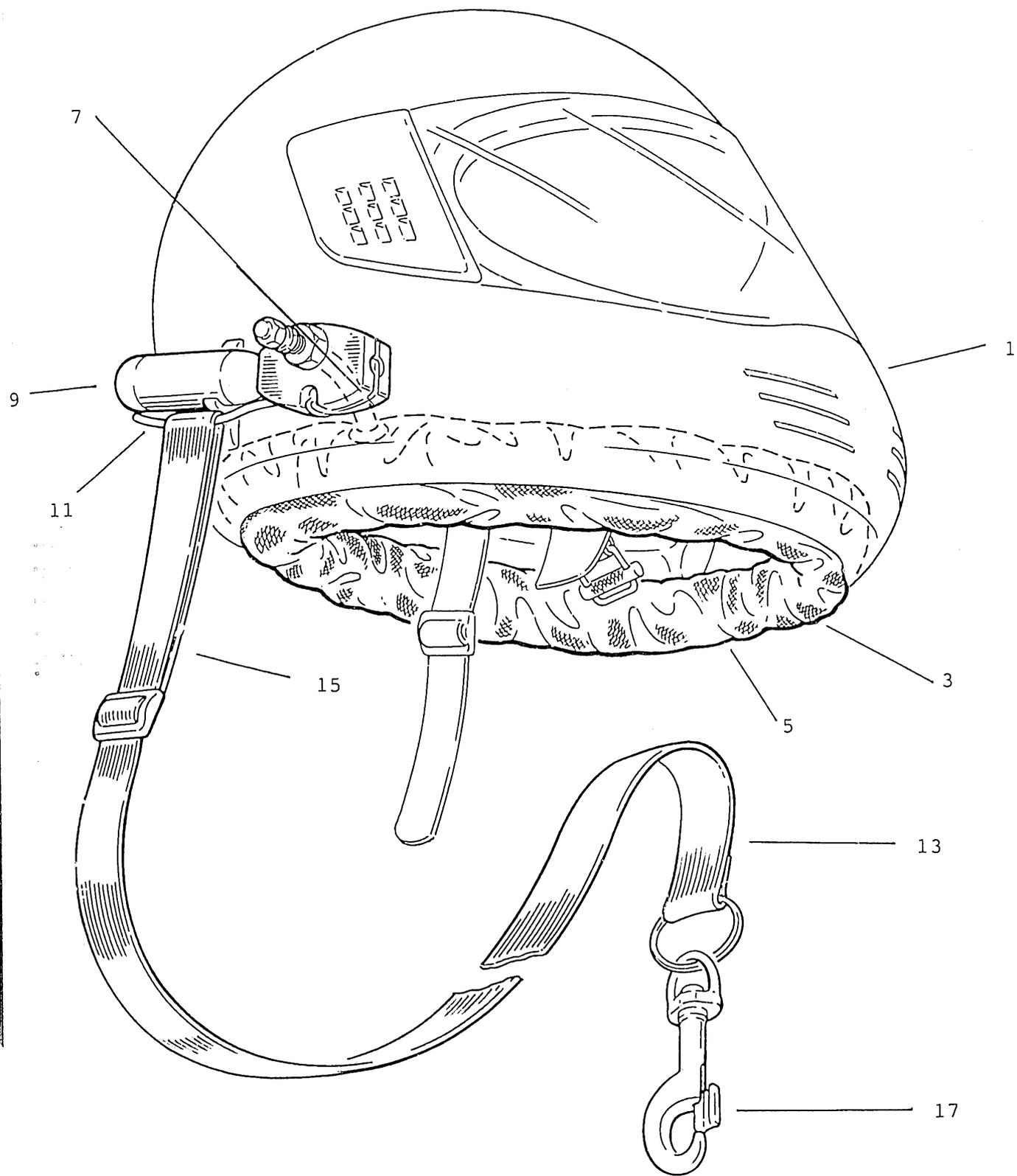


FIG 1

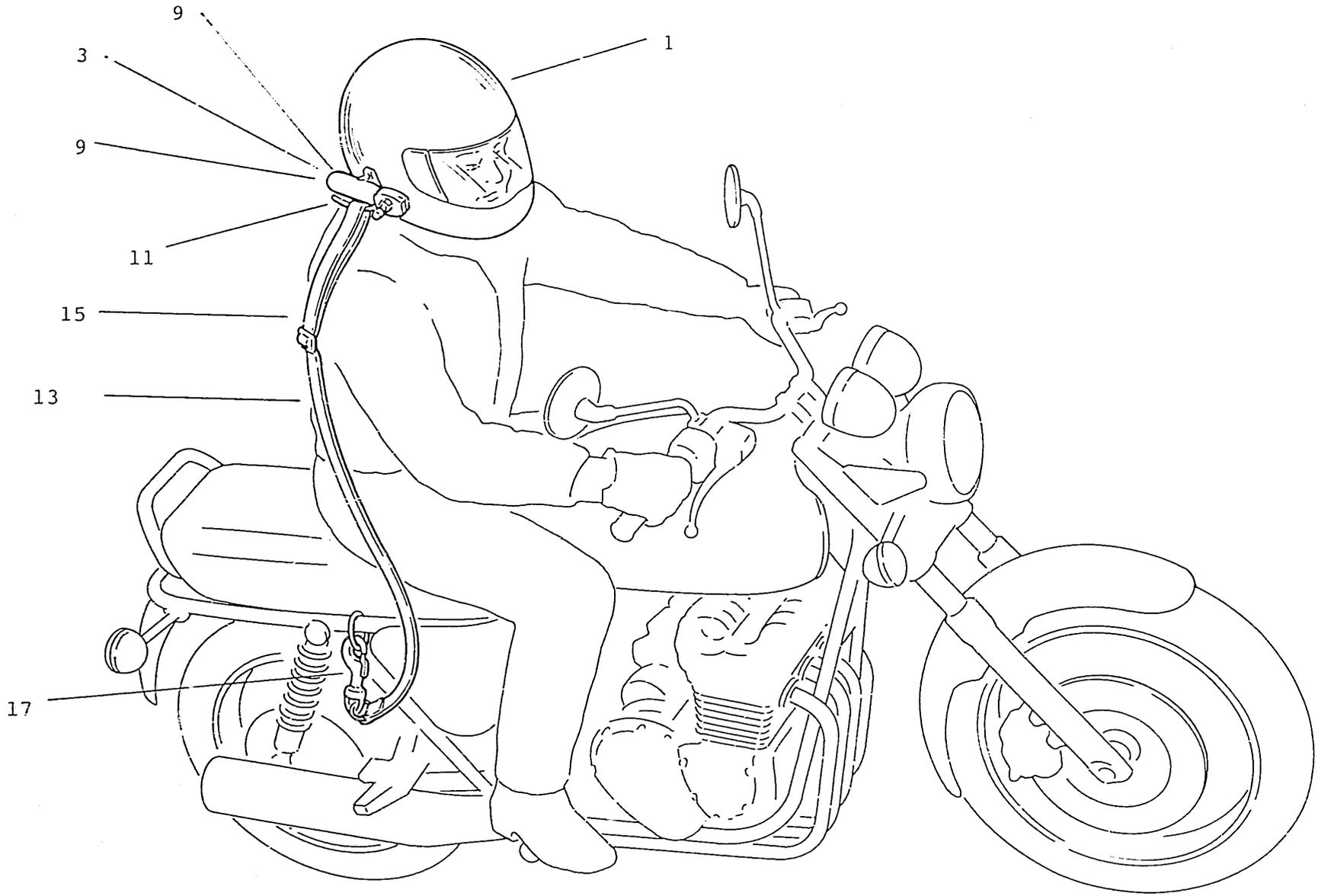


FIG 2

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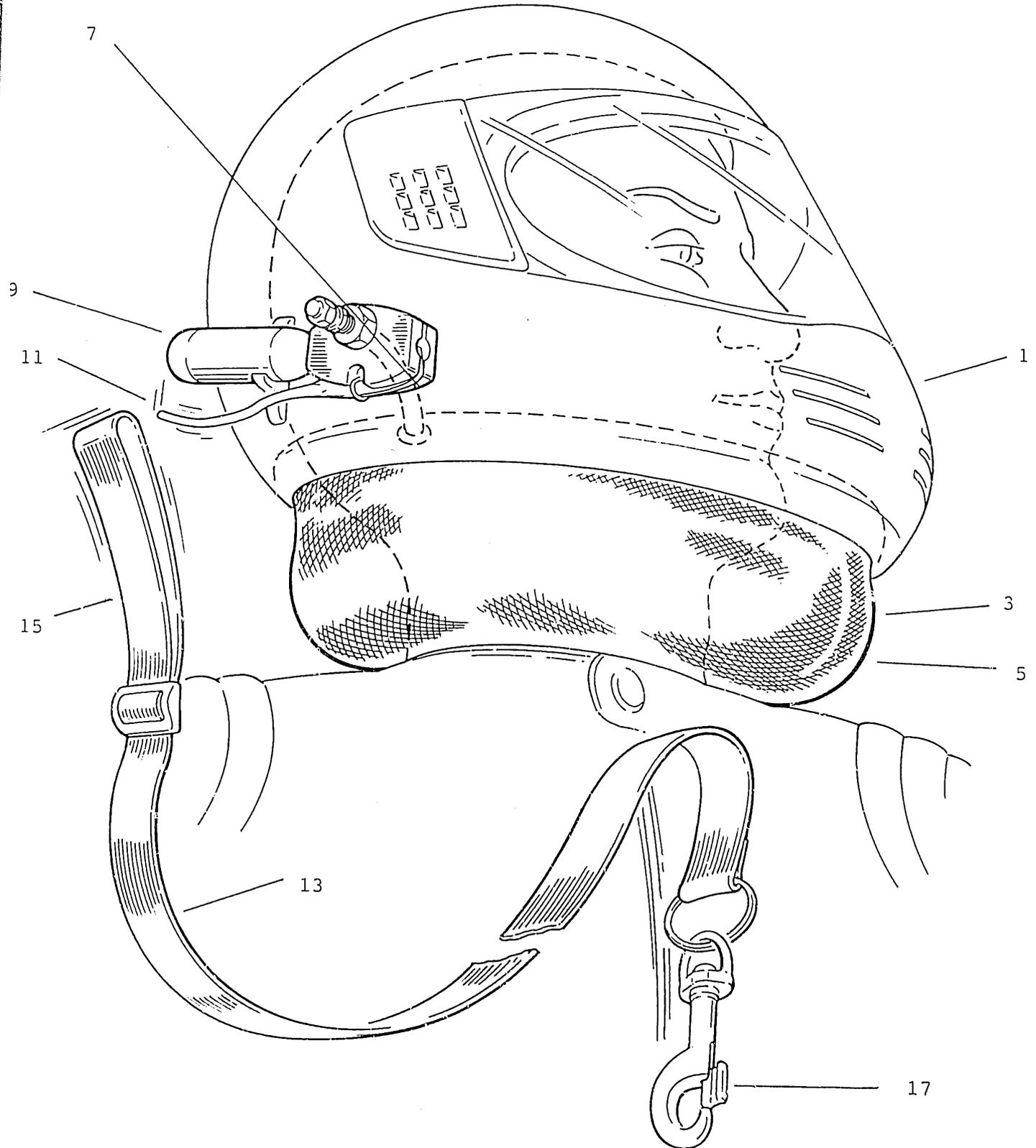


FIG 3