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COMPLETE SPECIFICATION

A Helmet for Accident Prevention

We, OSHIMA DENKI SEISAKUSHO CO. LTD., a joint-stock company organized and existing under the laws of Japan, of No. 42, Fujikura, Ota-shi, Gunmaku, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to improvements in or relating to a protective headgear, and more particularly to a helmet with reflectors.

In order to escape death or a fatal wound caused by accidents, various kinds of helmets are used, as a means for protecting the head against impact at the time of accidents, by those who drive a motorcycle or the like, or by those who are engaged in dangerous work, such as coalminers, stevedores, etc.

There is no doubt that such helmets can be of help to those persons for the prevention of such casualty at the time of accidents. However, it must be noted that conventional helmets function only as a protective headgear at the time when the user meets with an accident, and they are incapable of preventing accidents themselves, such as a traffic accident from occurring.

It is absolutely necessary that all accidents be prevented from occurring in order to completely prevent such casualty. The present invention aims to prevent accidents, especially a night traffic accident, from occurring by providing those persons with a new and useful helmet having reflectors, in view of the fact that accidents, particularly a night traffic accident show an increasing tendency lately.

It is therefore the principal object of the present invention to provide a helmet with reflectors, capable of protecting those who drive a motorcycle or the like from a night

traffic accident, said reflectors being so constructed as to reflect incident rays of light in the direction of the light source.

A further object of the invention is to provide a belt having a number of reflectors which reflect incident rays of light in the direction that they have come from, said belt being adapted to be attached to a safety helmet.

Further objects and additional advantages of the invention will become apparent from the following detailed description and annexed drawings in which:

Figure 1 is a partly sectioned side view of one embodiment of the present invention, composed of a helmet and a belt with a plurality of reflectors, illustrating the state in which the belt carrying the reflectors is attached to the lower peripheral portion of the helmet;

Figure 2 is an enlarged perspective view of the belt shown in Figure 1;

Figure 3 is an enlarged fragmentary perspective view of the belt shown in Figures 1 and 2, illustrating the manner in which a reflector is attached thereto;

Figure 4 is an exploded fragmentary view of the belt shown in Figures 1 to 3, illustrating one form of reflector and an opening formed in said belt for receiving the reflector;

Figure 5 is a perspective view of a combination of another form of reflector and a base member with its rear surface coated with suitable sticking material, said base member being adapted to be stuck at its rear surface on any desired outer portion of a helmet;

Figure 6 is a cross-sectional view of another combination of a reflector and its base member, designed to be attached to any desired outer portion of a helmet with suitable binding agent;

[Price 4s. 6d.]

Figure 7 is a partly broken-away side view of a helmet to which the combinations of the reflectors and the base members, shown in Figures 5 and 6 are attached; and

Figure 8 is a diagram illustrating how an incident ray of light is reflected by elements of a reflector and reaches to man's eyes.

In Figures 1 to 8, like portions or parts are designated with like numerals.

Referring to Figure 1, there is shown one embodiment of the present invention, comprising a conventional helmet 10, a belt 11 encircling the lower peripheral portion thereof, and a plurality of reflectors 12 attached to the belt. The belt 11 is made of flexible material, such as synthetic rubber and is provided with a plurality of openings 13 which are spacedly formed therein for receiving said reflectors. Each reflector 11 is secured to the belt 11 in the manner depicted in Figure 3.

The belt 11 is formed on its inner surface with a longitudinal recess 14 which lengthwise extends along the middle area or portion thereof. The openings 13 for receiving the reflectors 12 are formed in the range of said middle area.

On the outer surface of the belt 11 are formed a plurality of longitudinal convex ribs 15 for decorative purpose.

The belt 11 may be of either a strip of suitable length or a circular strip as shown in Figure 2. In the latter case, the diameter thereof must be properly predetermined so that the belt may be snugly mounted on the periphery of the helmet. However, the belt 11 may, of course, have certain diametrical tolerance as long as it has flexibility. It is preferable that the belt 11 carrying the reflectors 12 is provided with a U-shaped groove 17 formed by inwardly and upwardly turning the lower edge 16 of the belt 11 so that when the belt is attached to the lower peripheral portion 18 of the helmet 10, the U-shaped groove 17 may fit the opening edge 19 of the helmet to thereby protect the edge and at the same time to enable the belt to be securely attached to the helmet. In case the belt 11 is made in the form of a strip, it should be securely fastened at its ends with a suitable fastener when attached to the helmet.

Each reflector 12 is formed of suitable transparent synthetic resin, such as acrylic resin and is provided with a lens portion 20 and relatively thin flange-like portions 21, said lens portion being of convex shape and having its rear surface formed with a number of reflector elements 22 adapted to reflect incident rays of light entering through the lens portion 20 from any light source, such as the car headlight. In the illustrated embodiments, the reflector elements 22 are of so-called diamond cut type and adapted to reflect the incident rays substantially in

the direction that they have come from. As illustrated in Figure 8, when the incident ray A entering the lens portion 20 of the reflector 12 from the light source, such as, for example, a car headlight 25, strikes a surface of an element 22 at B, it is bounced from the surface and strikes a surface of another element 22 at C, and then reflected substantially in the direction of the light source 25 and reaches, as a reflected ray D, man's eye 26, such as car driver's in the vicinity of the light source.

To attach a reflector 12 to the belt 11, its lens portion 20 is inserted in an opening 13 of the belt from the inside thereof so that its flange-like portions 21 come into engagement with said recessed portion 14 of the belt to thereby prevent the reflector 12 from coming off.

Illustrated in Figure 5 is a combination of a circular reflector 12' and its base member 23, said reflector being attached to a circular base member 23 to be mounted on any desired outer portion of the helmet. The reflector 12' is formed on its rear surface with a number of reflector elements as in the reflector 12 shown in Figure 3. The base member 23 carrying the reflector has its rear surface coated with suitable sticking material so that it may be stuck on any desired outer portion of a helmet 10' in the manner depicted in Figure 7. Indicated by numeral 24 is a removable protecting film, such as silicon-paper which is normally stuck on the rear surface of the base member 23 where said sticking material is coated, and which is stripped off when the base member is stuck on a desired outer portion of the helmet 10'.

Illustrated in Figure 6 is another combination of a base member 23' and a reflector 12''. The difference between the combination shown in Figure 5 and this consists in that the latter is attached, as shown in Figure 7, to any desired outer portion of the helmet 10' with suitable binding agent 24'. It goes without saying that in these instances, the belt 11 does not need to be employed for carrying the reflectors 12', 12''.

As may be clearly seen from the foregoing, since each reflector 12, 12', 12'' is adapted to bounce back all the incident rays substantially in the direction of the light source, when those who drive a motorcycle etc. at night or in the dark wear the helmet 10 or 10', they can be readily found by other persons who drive car, truck, etc. and a traffic accident may be prevented from occurring.

WHAT WE CLAIM IS:—

1. A helmet for accident prevention comprising in combination a helmet and a plurality of reflectors, said reflectors being



Figure 7 is a partly broken-away side view of a helmet to which the combinations of the reflectors and the base members, shown in Figures 5 and 6 are attached; and

Figure 8 is a diagram illustrating how an incident ray of light is reflected by elements of a reflector and reaches to man's eyes.

In Figures 1 to 8, like portions or parts are designated with like numerals.

Referring to Figure 1, there is shown one embodiment of the present invention, comprising a conventional helmet 10, a belt 11 encircling the lower peripheral portion thereof, and a plurality of reflectors 12 attached to the belt. The belt 11 is made of flexible material, such as synthetic rubber and is provided with a plurality of openings 13 which are spacedly formed therein for receiving said reflectors. Each reflector 11 is secured to the belt 11 in the manner depicted in Figure 3.

The belt 11 is formed on its inner surface with a longitudinal recess 14 which lengthwise extends along the middle area or portion thereof. The openings 13 for receiving the reflectors 12 are formed in the range of said middle area.

On the outer surface of the belt 11 are formed a plurality of longitudinal convex ribs 15, for decorative purpose.

The belt 11 may be of either a strip of suitable length or a circular strip as shown in Figure 2. In the latter case, the diameter thereof must be properly predetermined so that the belt may be snugly mounted on the periphery of the helmet. However, the belt 11 may, of course, have certain diametrical tolerance as long as it has flexibility. It is preferable that the belt 11 carrying the reflectors 12 is provided with a U-shaped groove 17 formed by inwardly and upwardly turning the lower edge 16 of the belt 11 so that when the belt is attached to the lower peripheral portion 18 of the helmet 10, the U-shaped groove 17 may fit the opening edge 19 of the helmet to thereby protect the edge and at the same time to enable the belt to be securely attached to the helmet. In case the belt 11 is made in the form of a strip, it should be securely fastened at its ends with a suitable fastener when attached to the helmet.

Each reflector 12 is formed of suitable transparent synthetic resin, such as acrylic resin and is provided with a lens portion 20 and relatively thin flange-like portions 21, 21, said lens portion being of convex shape and having its rear surface formed with a number of reflector elements 22 adapted to reflect incident rays of light entering through the lens portion 20 from any light source, such as the car headlight. In the illustrated embodiments, the reflector elements 22 are of so-called diamond cut type and adapted to reflect the incident rays substantially in

the direction that they have come from. As illustrated in Figure 8, when the incident ray A entering the lens portion 20 of the reflector 12 from the light source, such as, for example, a car headlight 25, strikes a surface of an element 22 at B, it is bounced from the surface and strikes a surface of another element 22 at C, and then reflected substantially in the direction of the light source 25 and reaches, as a reflected ray D, man's eye 26, such as car driver's in the vicinity of the light source.

To attach a reflector 12 to the belt 11, its lens portion 20 is inserted in an opening 13 of the belt from the inside thereof so that its flange-like portions 21 come into engagement with said recessed portion 14 of the belt to thereby prevent the reflector 12 from coming off.

Illustrated in Figure 5 is a combination of a circular reflector 12' and its base member 23, said reflector being attached to a circular base member 23 to be mounted on any desired outer portion of the helmet. The reflector 12' is formed on its rear surface with a number of reflector elements as in the reflector 12 shown in Figure 3. The base member 23 carrying the reflector has its rear surface coated with suitable sticking material so that it may be stuck on any desired outer portion of a helmet 10' in the manner depicted in Figure 7. Indicated by numeral 24 is a removable protecting film, such as silicon-paper which is normally stuck on the rear surface of the base member 23 where said sticking material is coated, and which is stripped off when the base member is stuck on a desired outer portion of the helmet 10'.

Illustrated in Figure 6 is another combination of a base member 23' and a reflector 12''. The difference between the combination shown in Figure 5 and this consists in that the latter is attached, as shown in Figure 7, to any desired outer portion of the helmet 10' with suitable binding agent 24'. It goes without saying that in these instances, the belt 11 does not need to be employed for carrying the reflectors 12', 12''.

As may be clearly seen from the foregoing, since each reflector 12, 12', 12'' is adapted to bounce back all the incident rays substantially in the direction of the light source, when those who drive a motorcycle etc. at night or in the dark wear the helmet 10 or 10', they can be readily found by other persons who drive car, truck, etc. and a traffic accident may be prevented from occurring.

WHAT WE CLAIM IS:—

1. A helmet for accident prevention comprising in combination a helmet and a plurality of reflectors, said reflectors being

attached to outer portions of the helmet, each of said reflectors having a number of reflector elements adapted to reflect an incident ray of light substantially in the direction of the light source.

2. A helmet for accident prevention as claimed in Claim 1, wherein said reflectors are attached to the helmet through the medium of a flexible annular belt having a plurality of spacedly arranged openings into which said reflectors are disposed.

3. A helmet for accident prevention as claimed in Claim 1, wherein said reflectors are attached to the helmet through the medium of a flexible belt in the form of a strip, said belt having a plurality of spacedly arranged openings into which said reflectors are disposed, and fastened at its ends with suitable fastener when secured to the helmet.

4. A helmet for accident prevention as claimed in Claim 1, wherein each of said

reflectors is attached to the helmet through the medium of an individual base member which is coated on its rear surface with suitable sticking material.

5. A helmet for accident prevention as claimed in Claim 1, wherein each of said reflectors is attached to the helmet through the medium of an individual base member which is stuck on an outer portion of the helmet with suitable binding agent.

6. A helmet for accident prevention substantially as hereinbefore described with reference to the accompanying drawings.

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