Abstract Title: Vehicle wheel rim protector

The protector 1 has an annular body 4 that is dimensioned and configured to fit closely to the rim of a vehicle wheel 2, and a continuous, peripheral lip 5 that overlies the wheel rim. The lip 5 is of increased thickness relative to the annular body 4. The protector 1 is useful for protecting the outer rim of a wheel from damage caused by impact with a kerb or the like. The protector body 4 is adhered to the rim 2 by e.g., double-sided tape adhesive 6.
FIGURE 1
Title – Improvements relating to wheel rim protectors

This invention relates to protective devices for wheels, and in particular to devices for protecting the outer rim of vehicle wheels.

A vehicle wheel can suffer mechanical damage to its exposed surfaces. The wheel rim is particularly easy to damage, for example if it strikes or grazes a kerb, which may typically occur when the vehicle is manoeuvred into a parking space. The wheel rim often protrudes from the wheel, but, in any case, it is often the edge of the wheel rim that is damaged upon contact with an obstruction such as a kerb, because the tyre is deformed so that the wheel rim is exposed.

Many vehicles are fitted with alloy wheels to improve their appearance. Damage to any wheel is clearly undesirable, but damage to alloy wheels particularly so, because they are often considerably more expensive to replace or repair.

Devices that can be fitted to a vehicle wheel to protect the edge of the wheel rim are known.

US-A-5,967,212 describes a wheel rim protector having an annular main portion that fits over the outer lip of the wheel rim, and an annular flange portion that is adapted for positioning between a wheel rim and the bead of a tyre mounted on the wheel rim. The tyre must be removed in order to fit the device to the wheel rim. The tyre is subsequently fitted to the wheel, trapping the annular flange, and thereby securing the device.

The protectors described in GB-A-2393940 and GB-A-2397561 similarly comprise a securing flange for insertion between the wheel rim and the tyre.
WO-A-2005/009761 describes a wheel protector device which is fitted to the wheel rim by engagement with a plurality of connectors that extend radially over the outer surface of the wheel rim. Removal of the tyre is not required in order to fit the device; however, the wheel must be adapted to house connectors that engage between the tyre and the wheel rim.

A common feature of these prior art protectors is that they are held in place by insertion of a flange or other connector between the wheel rim and the tyre.

Other prior art protectors require the wheel rim itself to have a particular shape, e.g. a recess, so that the protective device may be mounted thereon. For example, the wheel trim described in WO-A-2003/106193 is attached by insertion of a projecting portion into a complementary-shaped groove in the wheel rim.

None of these prior art arrangements are entirely satisfactory. In particular, it is undesirable to have to deflate or remove the tyre in order to fit or replace the protector. If fitting or replacement requires professional help, then additional costs may be incurred. A further concern, regarding the insertion of a flange or other connector between the wheel rim and the tyre, is that the sealing between the tyre and the wheel rim may be adversely affected.

It would be most desirable to have one protective device that could fit any wheel. However, vehicle wheels are produced in standard diameters so it is desirable for a protective device to fit any wheel of a given diameter. Devices which only fit to a wheel designed specifically for use with that device clearly have limited application.

There has now been devised an improved vehicle wheel protector, which overcomes or substantially mitigates the above-mentioned and/or other disadvantages associated with the prior art.
According to the first aspect of the invention there is provided a wheel protector having an annular body dimensioned and configured to fit closely to the rim of a vehicle wheel, and a continuous, peripheral lip that overlies said rim, the lip being of increased thickness relative to the annular body.

The vehicle wheel protector of the present invention is advantageous principally in that it resists displacement upon impact with a kerb or the like. The protector is also advantageous because it is easily replaceable. The protector is not fastened via insertion into the contact area between the wheel and the tyre; therefore, the protector can be easily fitted, removed or replaced without special skills, tools, or the need to deflate or refit the tyre. The simplicity of the design means that manufacture is straightforward and thus inexpensive.

The wheel protector is preferably made from a strong, durable and non-brittle material such as a suitable synthetic plastics material. One suitable plastics material is polyethylene terephthalate glycol (PETG), commonly referred to as copolyester.

The protector is preferably non-brittle so that it does not crack or chip upon collision. Preferably, the protector is sufficiently flexible to facilitate fitting of the protector to the rim of the wheel with a close fit.

A particular advantage of the wheel protector of the present invention is that is may be produced easily using conventional plastics moulding techniques, eg injection moulding.

The protector may be coloured to provide decoration, or to match the colour of the wheel. More preferably, the protector is made from a transparent or substantially transparent material so that the protector is unobtrusive, and does not significantly impact on the overall appearance of the wheel.
Generally, the annular body will have the form of a generally flat annulus, with a width, ie the dimension measured in the radial direction, that is greater, normally several times greater, than its thickness.

The annular body preferably has a width between 1mm and 30mm, more preferably between 2mm and 10mm. To provide effective protection to the wheel, the width of the protector is most preferably between 4mm and 6mm.

The depth of the lip is preferably less than 10mm, more preferably less than 4mm, and most preferably about 2mm.

The maximum thickness of the annular body is preferably less than 4mm, more preferably less than 3mm, and is preferably between 1.0mm and 1.5mm.

The maximum thickness of the lip is preferably less than 6mm, more preferably less than 4mm, and is preferably between 1.5mm and 2mm.

In presently preferred embodiments the protector is attached to the outwardly-facing surface of the wheel rim using adhesive. Attachment is preferably by means of a layer of adhesive between the annular body and the wheel. Preferred adhesives are flexible bonding adhesives, ie adhesives which create a flexible bond. The adhesive is preferably substantially transparent. Preferably, the layer of adhesive has a thickness of 0.25mm to 0.5mm.

Double-sided adhesive tape is a particularly preferred means of attaching the protector to the wheel rim. The protector may thus be supplied with the layer of adhesive applied, eg as a double-sided adhesive tape, with a release liner that is removed by the user immediately prior to fitting of the protector to the wheel rim.
Preferably, the adhesive is such as to provide a bond strength that is adequate to fasten the protector to the wheel rim and to retain the protector in place during normal usage, but that allows the protector to be removed easily without damage. It is preferable that the adhesive does not damage the surface of the wheel, e.g. if the wheel is painted. In particular, it is preferable that the adhesive does not bind so tightly to the surface of the wheel that removal of the protector damages that surface.

The protector of the present invention may alternatively, or in addition, be attached to a wheel by other suitable means. For instance, the protector and the wheel rim may comprise cooperating male and female connecting portions that releasably engage one another with an interference fit.

It is desirable to select a suitable material for the protector, and a suitable adhesive (if that is the method of attachment), with consideration to the external conditions to which the vehicle and therefore the protector might be exposed. Relevant factors include UV stability, function within a certain temperature range, and stability to chemicals such as salt and detergent.

According to a further aspect of the invention, there is provided a vehicle wheel that is fitted with a wheel protector, wherein the wheel protector comprises an annular body dimensioned and configured to fit closely to the rim of a vehicle wheel, and a continuous, peripheral lip that overlies said rim, the lip being of increased thickness relative to the annular body.

According to a further aspect of the invention, there is provided a vehicle having at least one wheel that is fitted with a wheel protector, wherein the wheel protector comprises an annular body dimensioned and configured to fit closely to the rim of the wheel, and a continuous, peripheral lip that overlies said rim, the lip being of increased thickness relative to the annular body.
According to a yet further aspect of the invention, there is provided a method of protecting a vehicle wheel from damage caused by impact with a kerb or the like, wherein the method comprises fitting the wheel with a wheel protector comprising an annular body dimensioned and configured to fit closely to the rim of a vehicle wheel, and a continuous, peripheral lip that overlies said rim, the lip being of increased thickness relative to the annular body.

In preferred embodiments of the invention, the outwardly-facing surfaces of the annular body and the lip of the protector are curved.

A preferred embodiment of the invention will now be described in greater detail, by way of illustration only, with reference to the accompanying drawings, in which:

Figure 1 shows, schematically, a side view of a wheel and tyre assembly with a wheel rim protector according to the invention fitted thereto;

Figure 2 is a cross-section of the assembly of Figure 1 taken along the diameter of the wheel;

Figure 3 is a fragmentary cross-sectional view of the fitted protector shown in Figure 2, on an enlarged scale;

Figure 4 is a further view, on a greatly enlarged scale, showing a cross-section of the protector fitted to the rim of a wheel; and

Figure 5 is a view similar to Figure 4, but shows a cross-section of the protector when compressed by a kerb.

Figure 1 shows a vehicle wheel to which is fitted a protector according to the invention, which is generally designated 1. The protector 1 is fitted to the rim of the vehicle wheel 2, which is also fitted with a tyre 3.
Figures 2 to 4 are cross-sectional views. The protector 1 comprises an annular body 4 that is dimensioned and configured to fit flush with the rim of the wheel 2, and a lip 5 that overlies the wheel rim, extending inwardly and parallel to the axis of the wheel. The cross-sectional area of the protector 1 is shown most clearly in Figures 3 and 4, particularly Figure 4.

In this embodiment the annular body 4 is attached to the outwardly-facing surface of the wheel rim by a double-sided adhesive tape 6. The surface of the annular body 4 that is adhered to the wheel 2 is substantially planar to conform with the substantially planar surface of the outwardly-facing surface of the wheel rim. The outwardly-facing surface of the annular body 4 is curved.

The inner surface of the peripheral lip 5 that overlies the wheel rim is substantially planar and flush with the side of the wheel rim. The outer surface is curved. The maximum thickness of the lip 5 (indicated by X in Figure 4) is greater than the maximum thickness of the annular body 4 (indicated by Y in Figure 4).

Figure 5 shows the deformed cross-sectional shape of the protector 1 when it is compressed against a kerb 7. Upon impact with the kerb 7, the annular body 3 of the protector 1 is compressed between the kerb 7 and the wheel 2. Movement of the vehicle wheel 2 against the kerb 7, and thus of the protector 1 against the kerb 7, produces a force acting on the protector 1 that may cause the protector 1 to be displaced relative to the wheel. The compressed annular body 4 is displaced in the direction of that force. However, the increased thickness of the lip 5 relative to the thickness of the annular body 4 means that the lip 5 cannot be forced into the gap between the wheel rim and the kerb. The lip 5 of the protector therefore limits the extent to which the protector 1 can be displaced relative to the wheel, and prevents the protector 1 from being separated from the wheel.
In Figure 5, the annular body is slightly displaced towards the centre of the wheel so that the surface of the lip 5 is lifted away from the side of the wheel rim. Displacement of the protector 1 is stopped when the thickness of the part of the lip 5 that is forced into the gap between the kerb 7 and the wheel 2 exceeds the thickness of the annular body 4.

The extent to which the protector is displaced will not, in most cases, be significant enough to affect the adhesive bond between protector 1 and the rim of the wheel 2. However, if the force applied to the protector is particularly great, then the protector may become loose and it may be necessary to remove the protector 1 and reattach with fresh adhesive 6, or to replace it with a new protector. Similarly, if the protector becomes damaged, then it can easily be replaced.
Claims

1. A wheel protector having an annular body dimensioned and configured to fit closely to the rim of a vehicle wheel, and a continuous, peripheral lip that overlies said rim, the lip being of increased thickness relative to the annular body.

2. A wheel protector as claimed in Claim 1, which is made from a synthetic plastics material.

3. A wheel protector as claimed in Claim 2, wherein the synthetic plastics material is a copolyester.

4. A wheel protector as claimed in any preceding claim, wherein the annular body has a width of less than 10mm.

5. A wheel protector as claimed in any preceding claim, wherein the width of the protector is at least 2mm.

6. A wheel protector as claimed in any preceding claim, wherein the depth of the lip is less than 4mm.

7. A wheel protector as claimed in any preceding claim, wherein the maximum thickness of the annular body is less than 4mm.

8. A wheel protector as claimed in any preceding claim, wherein the maximum thickness of the annular body is less than 3mm.

9. A wheel protector as claimed in any preceding claim, wherein the maximum thickness of the lip is less than 6mm.
10. A wheel protector as claimed in any preceding claim, wherein the maximum thickness of the lip is less than 4mm.

11. A wheel protector as claimed in any preceding claim, wherein the surface of the annular body carries a layer of adhesive.

12. A wheel protector as claimed in Claim 11, wherein the adhesive is flexible bonding adhesive.

13. A wheel protector as claimed in Claim 11, wherein the adhesive has the form of a double-sided adhesive tape.

14. A wheel protector as claimed in any one of claims 11 to 13, wherein the adhesive is substantially transparent.

15. A wheel protector as claimed in any of the preceding claims, wherein the outwardly-facing surfaces of the annular body are curved.

16. A vehicle wheel that is fitted with the wheel protector as claimed in any preceding claim.

17. A vehicle having at least one wheel that is fitted with the protector as claimed in any one of Claims 1 to 15.

18. A method of protecting a vehicle wheel from damage caused by impact with a kerb or the like, wherein the method comprises fitting the wheel with the protector as claimed in any one of Claims 1 to 15.

19. A wheel protector substantially as hereinbefore described, and as illustrated in Figures 1 to 5.
**Application No:** GB0605536.2  
**Examiner:** Roger Binding  
**Claims searched:** 1-19  
**Date of search:** 19 June 2006

**Patents Act 1977: Search Report under Section 17**

**Documents considered to be relevant:**

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