A wheel which simulates a wide track tire with a decorative hub comprising a tire member which can receive a variety of different "mag wheels" or hubcap members. The tire member is cup shaped, with tapered inner walls for tightly receiving a hubcap member pressed therein. The hubcap member has a tubular portion which receives a protruding hub portion of the tire member as the hubcap member is pressed into place, to prevent tilting of the hubcap member.

7 Claims, 5 Drawing Figures
WHEEL FOR A TOY CAR

BACKGROUND OF THE INVENTION

1. Field of the Invention
This invention relates to toy vehicles and, more particularly, to a wheel assembly for toy vehicles.

2. Description of the Prior Art
One type of toy vehicle which has become popular is constructed for low wheel friction to permit fast movement, and is designed to resemble real or imaginary high performance automobiles. The necessity for low friction requires that the bearing hole through which the axle extends be of small diameter and that it be concentric with the tire rolling surface. The attainment of a realistic racing appearance, makes it desirable that the wheels have a wide tread appearance and that hubcaps of highly decorative appearance be provided. While all tires may be expected to have a common black color suggestive of rubber tires, the hubcaps should be highly decorative. It would be desirable if the hubcaps could be produced separately from the tires and perhaps of different material that could be more easily decorated. In some application, where a child may wish to change the decorations of his vehicles, it would be desirable to enable the child to easily remove a hubcap and replace it with another of different design.

OBJECTS AND SUMMARY OF THE INVENTION

An object of the present invention is to provide a toy vehicle wheel of attractive design and efficient performance. Another object is to provide toy vehicle wheel assemblies with a variety of selectable hub designs, which is economical to produce and entertaining to play with. In accordance with one embodiment of the present invention, a wheel is provided for a toy vehicle which includes a cup-shaped tire member, and a decorative hubcap member which can be inserted into the tire member. The tire member has a central bearing hole for receiving an axle that supports the vehicle frame, and a tire perimeter concentric with the bearing hole for rollably supporting the vehicle. The inner walls of the recess formed by the cup-shaped tire member are tapered, and they receive the hubcap member in an interference fit therewith. In order to prevent tipping or skewing of the hubcap member, it is provided with a tubular extension at its center which receives a hub projection on the tire member in an interference fit. The hubcap member serves as a thrust bearing for the vehicle axle, and it can be removed for replacement with another hubcap member by merely pushing the tire member hard towards the vehicle. Another hubcap member of different design can be installed by merely pushing it into position.

The novel features of the invention are set forth with particularity in the appended claims. The invention will be best understood from the following description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a toy vehicle constructed in accordance with the present invention;

FIG. 2 is a sectional view of a wheel assembly taken on the line 2—2 of FIG. 1;

FIG. 3 is a perspective view of the wheel assembly of FIG. 2;

FIG. 4 is a perspective, partially sectional, exploded view of the wheel assembly of FIG. 3; and

FIG. 5 is a sectional view of a wheel assembly constructed in accordance with another embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 illustrates a toy vehicle which includes a body 10 rollably supported by four wheel assemblies 12. The vehicle body is designed to represent a high speed racing car, and the wheel assemblies are constructed to resemble racing wheels. Each wheel assembly includes a wide track tire member 14 and a highly decorative wheel or hubcap member 16. The visible portion of hubcap member 16 has the appearance of a part often referred to as the "wheel" in automotive nomenclature, but is herein referred to as the hubcap member. This portion 16 of an automobile wheel assembly is the most highly decorative part. The outer portion of the tire member 14, however, is designed for high performance and generally is not highly decorative, although a wide track appearance is generally desirable to suggest racing tires.

As shown in FIG. 2, the tire member 14 is cup-shaped with an outer or tire portion 18, an inner or hub portion 20, and an annular web portion 26 connecting them. The hub portion 20 has a bearing hole 22 for receiving the axle 24 of the vehicle. The axle 24 passes through the inner face I of the tire member, but does not reach the outer face O which faces away from the vehicle. Most of the tire portion 18 extends like an axial flange from the web portion 26, so that it forms a recess in the outer face O of the tire member which receives the hubcap member 16.

The hubcap member 16 has a rim portion 28 with tapered sides for engaging correspondingly tapered walls 30 that form the recess in the tire member. The diameter of the hubcap rim portion 28 is in between the smallest and largest diameter of the tire portion walls 30, so that a snug fit can be achieved. The hubcap member also has an annular or tubular portion 32 that extends towards the inside of the tire member recess and which receives a projecting part 34 of the tire member hub portion 20. Both the inside of the tubular hubcap portion 32 and the projection 34 have tapered walls that engage in a snug or interference fit. However, the tubular hubcap portion can often "bottom" in the recess to abut the outer surface 26S of the web portion of the tire member.

The construction of the wheel assembly 12 is accomplished by first inserting the vehicle axle 24 through the bearing hole 22 in the tire member and cold heading the end 36 of the axle. The hubcap member 16 is then pressed into place. The firm engagement of the rim portion 28 of the hubcap member with the walls 30 of the tire member recess help to assure retention of the hubcap member. The fact that the tubular member 32 fits snugly over the projection 34 of the tire member helps to prevent skewing of the hubcap member. The fact that the tubular member 32 makes a snug fit with the projection 34 provides for additional retention of the hubcap member. The hubcap member serves as a thrust bearing for the cold-headed end 36 of the axle, and also helps to decorate the wheel assembly.

In many cases, it is desirable to provide a vehicle with a set of at least two hubcap members 16. A child can then remove a hubcap member by pushing inwardly on the wheel assembly until the axle end 36 pushes out, or ejects, the hubcap member which is already installed. The child then presses a hubcap member with a different design into place, using only his fingers. The retention forces of the interference fit is generally sufficient to hold the hubcap member in place, even though during use the hubcap member sometimes applies a slight thrust force against the end of the axle 24. However, the hubcap member 16 generally is not held tightly enough to resist handling contact, so it is made with a depth smaller than the depth of the tire member recess into which it fits. Accordingly, no part of the hubcap member projects substantially from the axial boundary defined by the outer face O of the tire member, and the hubcap member is not subject to blows during normal use that will move it out. Of course, in situations where it is not desired for a child to replace the hubcap members, the hubcap members can be additionally cemented into place or assembled tighter mechanically to prevent removal even during long periods of use.

The provision of a tire member 14 which includes both the axle bearing hole 22 and the tire portion 18 that rollably supports the vehicle on the ground assures concentricity of the bearing hole and tire surface 18S so there is a minimum of wobble at high speed travel of the vehicle (relative to its size). The fact that the entire tire surface is integral with the bearing hole assures concentricity of all portions. Thus, even when the
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edge 18E contacts a rounded, trough-shaped track region, which is sometimes employed at curves, there will be a minimum of friction. No special advantage would be obtained by making the hubcap portion integral with the walls of the bearing hole. In fact, there would be a disadvantage in that many materials which provide low friction for the axle 24 are difficult to elaborately decorate in shape or color. Accordingly, it is desirable that the hubcap portion 16 be separate from the tire member 18.

The hubcap portion 16 does not have to have especially low friction or withstand great abuse, and materials can be used for it which are primarily easy to decorate in shape and color. In fact, materials can be used for the hubcap member which by nature of color and/or texture of the material are decorative, thereby negating further decorative processes. When designing a wide variety of wheel assemblies, only a single type of tire member 14 need be produced and stockt, yet wheels of a variety of appearances can be obtained by using different hubcap members. Larger tire sizes can also use the standard hubcap members.

Thus, the invention provides a wheel assembly suitable for toy racing cars that must move rapidly and which must have a highly attractive racing appearance. This is achieved by utilizing a wheel assembly having an integral tire member that provides a bearing for the vehicle axle and a tire portion representing a wide tread tire, and a separate hubcap member which can be readily installed in a recess in the outer face of the tire member. Various types of tire and wheel members can be employed. For example, FIG. 5 illustrates a wheel assembly wherein the hubcap member 40 has a radially outwardly extending flange 42 that is received within a groove 44 formed on the inner surface of the tire portion 46 of a wheel member 48. It may be noted that even here, the main rolling surface 46S and the outer edge 46E are both integral with the bearing hole 50 to promote minimum rolling friction under a variety of conditions.

Although particular embodiments of the invention have been described and illustrated herein, it is recognized that modifications and variations may readily occur to those skilled in the art and, consequently, it is intended that the claims be interpreted to cover such modifications and equivalents.

What is claimed is:
1. A low friction wheel assembly for a toy vehicle which rolls at high speed relative to its size, comprising:
a tire member having a central bearing hole for receiving a vehicle-supporting axle, and a tire portion with an outer rolling surface integral with the walls of said bearing hole, said tire member having an inner face for facing towards said vehicle and an outer face for facing away from said vehicle, said outer face defining a hubcap-receiving recess; and
a hubcap member for reception in said recess of said tire member, said hubcap member having an axially inwardly protruding annular portion of smaller diameter than the outer hubcap diameter for engaging a region of said tire member about said bearing hole.
2. The wheel assembly described in claim 1 wherein:
said hubcap member includes means for retention in said recess while allowing ejection therefrom under high ejecting forces, and all of said hubcap member lies substantially within the axial boundary defined by said outer face of said tire member.
3. The wheel assembly described in claim 1 wherein:
said recess has sloping walls; and
said hubcap member has correspondingly sloping walls for providing a snug fit with the walls of said recess.
4. A wheel for a toy vehicle which simulates a wide tread tire, comprising:
a tire member having a hub portion having a bearing hole for receiving a vehicle-supporting axle and a radially outer tire surface concentric with said bearing hole for rollably supporting said toy vehicle, said tire member having an inner face for facing towards said vehicle and an outer face for facing away from said vehicle, said outer face defining a hubcap-receiving recess with sloping walls; and
a hubcap member having an outer hubcap diameter between the greatest and smallest diameters of said recess in said outer face of said tire member for reception therein to a predetermined depth, said hubcap member having an axially inwardly protruding annular portion of smaller diameter than said outer hubcap diameter for abutting a region of said tire member about said bearing hole.
5. The wheel described in claim 4 wherein:
said hub portion of said tire member includes a tapered portion protruding axially outwardly into said recess; and
said protruding annular portion of said hubcap member has a central recess with tapered walls for closely receiving said tapered hub portion.
6. The wheel described in claim 4 wherein:
said hubcap member has a tapered outer surface for an interference fit with the walls of said recess, and said hubcap member has an axial length small enough so that no part of said hubcap member protrudes axially past said tire member when installed therein in an interference fit.
7. The wheel described in claim 4 wherein:
said hub portion of said tire member has a tapered portion protruding axially into said recess;
said annular inwardly protruding portion of said hubcap member has a central recess with tapered walls for receiving said tapered hub portion in a substantially interference fit therewith; and
the outer surface of said hubcap member is tapered and is located to form a substantially interference fit with the walls of said recess of said tire member as the tapered walls of said annular hubcap portion form a substantially interference fit with the walls of said hub portion of said tire member.

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