United States Patent

La Branche

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[54] WHEEL FOR A TOY CAR

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[52] **U.S. Cl.** **46/221,** 301/1

[51] **Int. Cl.** **A63h 17/26**

[58] **Field of Search** 46/201, 202; 301/1, 111; 308/20

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[57] **ABSTRACT**

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

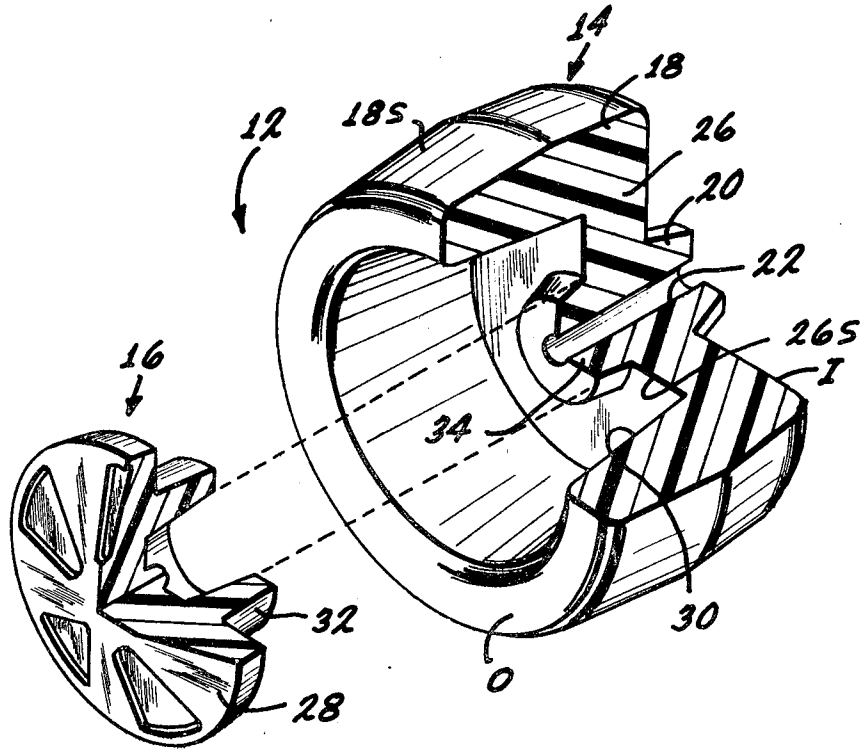


FIG. 1

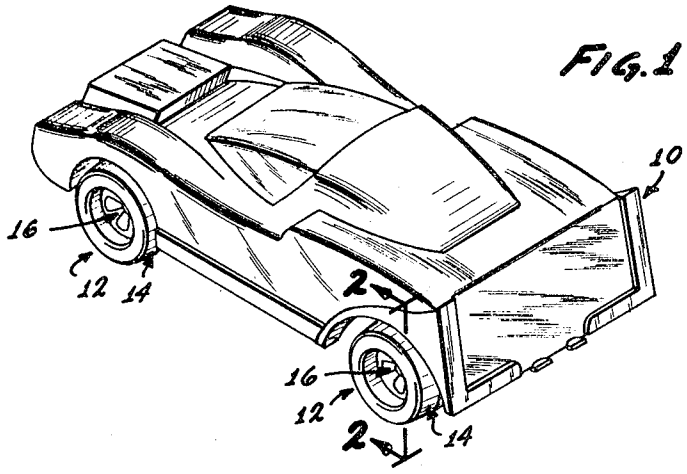


FIG. 2

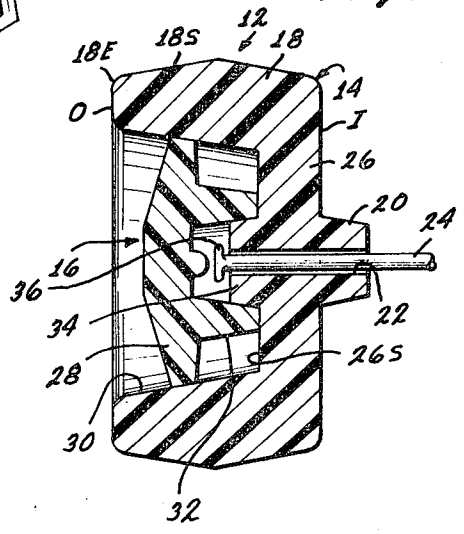


FIG. 3

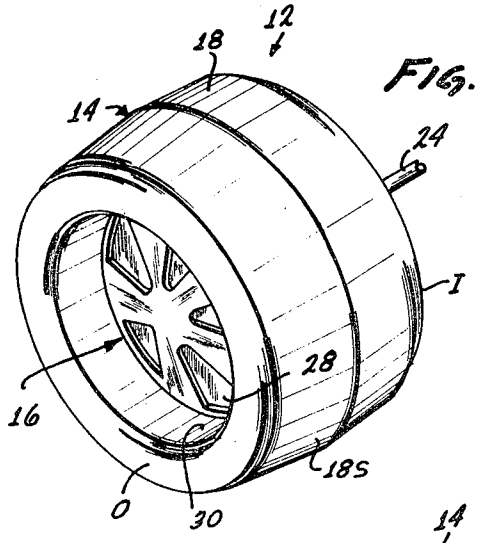


FIG. 5

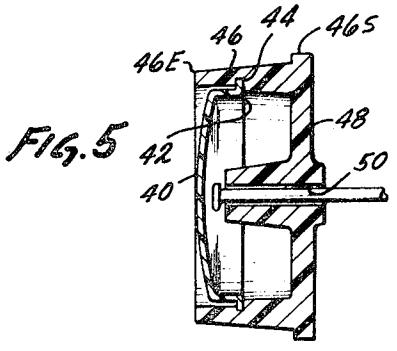
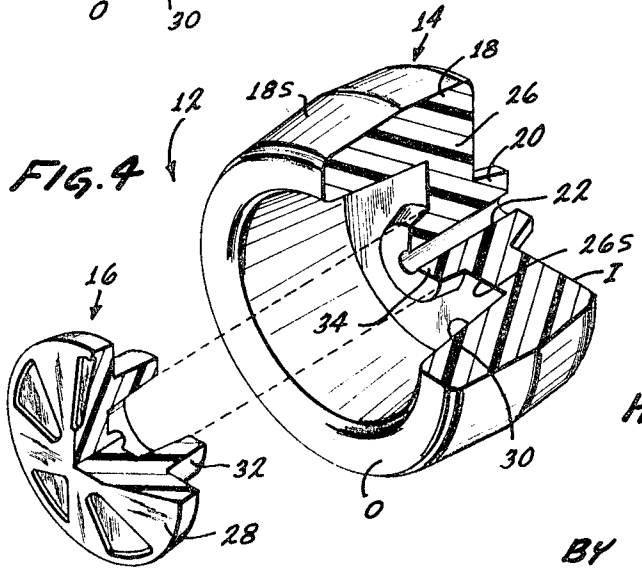


FIG. 4



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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 preset 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 often 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 the 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 **18** 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

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 stocked, 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 with 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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