

May 13, 1941.

R. R. WARE

2,241,684

ROLLER

Filed June 22, 1938

FIG. 1.

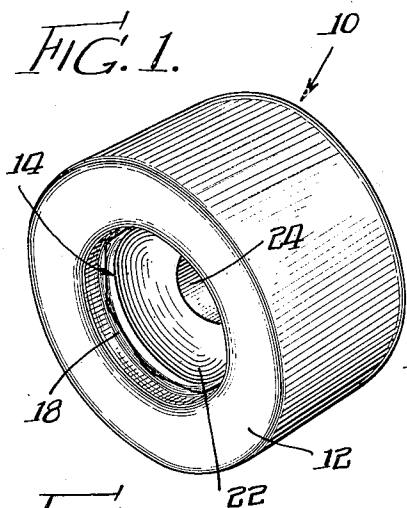


FIG. 2.

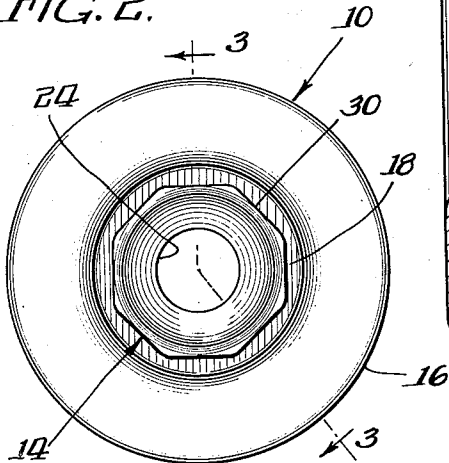


FIG. 4.

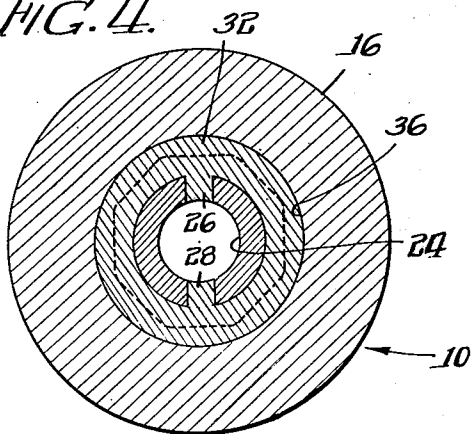


FIG. 3.

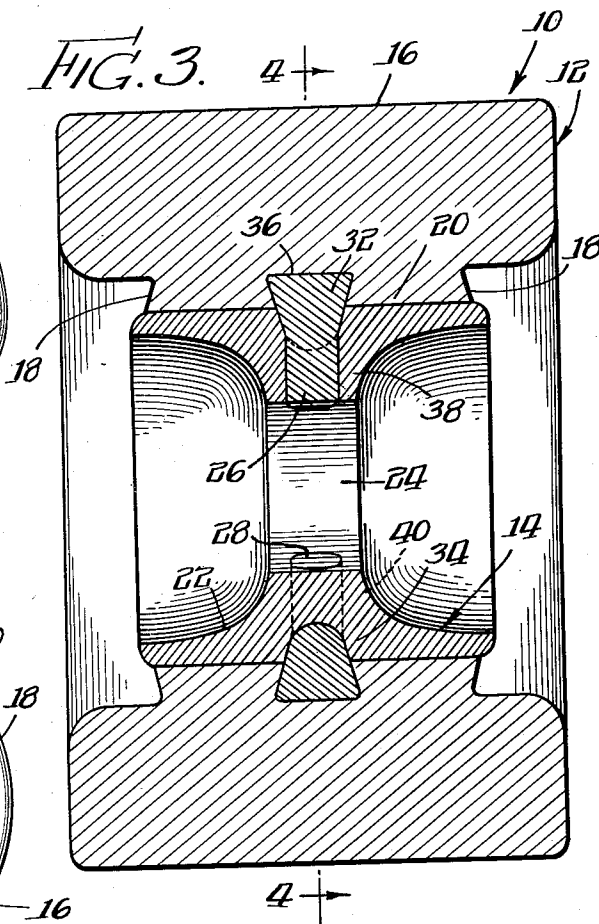
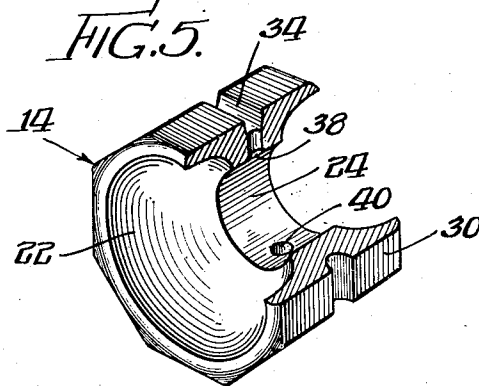


FIG. 5.



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UNITED STATES PATENT OFFICE

2,241,684

ROLLER

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Application June 22, 1938, Serial No. 215,081

8 Claims. (Cl. 301-5.3)

The present invention relates to a wheel structure, and more particularly to a wheel of the type employed in roller skates and the like.

The present invention contemplates more particularly the provision of a roller skate wheel having a tread portion formed of wood or similar fibrous or plastic material, in combination with a central bushing of hard material adapted to provide the necessary bearing surfaces. Wheels of wood or similar relatively soft material are employed in relationships wherein metallic treads are unsuitable, as for example in the case of skates adapted to be employed on rinks having wooden or other relatively destructible surfaces. As distinguished from wheels wherein the several parts are all metal, structures comprising treads of wood or other fibrous material, combined with metallic bushings, exhibit a special problem in their permanent assembly. For example, the wooden portions tend to shrink or expand greatly, and to warp under the influence of changes in moisture conditions. It will be apparent that various other conditions may cause the wooden portions to be deformed relative to the metal bushing.

In the relatively severe service normally encountered in the use of a roller skate, the bushing and tread must be at all times rigidly interlocked, since the merest movement of the parts will ultimately result in the complete loosening thereof.

It is therefore an object of the present invention to obviate the above difficulty and to provide a roller, as above, wherein the central bushing is positively and rigidly joined to the tread, the parts being interlocked against relative separation under the influence of shrinkage or any relative strains normally encountered.

Another object of the present invention is to provide a new and improved roller, as above, having a bushing securely interlocked with a fibrous or plastic tread portion, the parts being interengaged to positively prevent relative rotational displacement, and being secured together by a dovetail connecting link for preventing relative expansive or axial separation.

A yet further object of the present invention is to provide a wooden roller skate roller having a rigidly and permanently mounted metallic bushing secured thereto by an interlocking cast metal ring, the cast metal ring having integral portions extending radially into the bushing for positive interengagement therewith.

The invention yet more specifically contemplates the provision of a roller, as above, having

a bushing of polygonal exterior configuration cooperating with a corresponding polygonal aperture in the roller and being interlocked by a ring of cast metal introduced into position through an aperture in the bushing.

Other objects and advantages of the invention will be apparent from the following description, when taken in connection with the accompanying drawing, wherein:

Fig. 1 is a perspective view of a roller constructed in accordance with the present invention;

Fig. 2 is an elevational side view of the roller shown in Fig. 1;

Fig. 3 is a sectional view taken on the line 3-3 in Fig. 2;

Fig. 4 is a sectional view taken on the line 4-4 in Fig. 3; and

Fig. 5 is a perspective view of the bushing employed in the above roller, portions being broken away to show the interior structure.

Referring to the figures of the drawing, wherein the invention is illustrated more in detail, there is shown a roller skate wheel or roller, indicated generally by the reference numeral 10, comprising a body or tread portion 12 and a central bushing 14. The tread or body portion 12 of the wheel, in the illustrated embodiment shown, is formed of wood, such as relatively hard, wear-resistant maple, although it will be obvious from this specification that any suitable wood or equivalent material may be employed in accordance with the service or use desired.

The body portion 12 has an outer annular peripheral surface 16 which normally contacts the floor in service. Each side of the wooden body of the roller is annularly cut away, as at 18, to provide a central web section or bushing supporting portion 20.

The bushing 14 has for its main purpose to cooperate with an axle or shaft for rotatably supporting the roller with respect to a roller skate, for example. To this end the bushing has oppositely curved surfaces 22 which serve to receive and retain suitable metallic ball bearings. Preferably, the surfaces 22 are hardened. It will be understood from the above disclosure that the shaft or axle of the skate will be so configured as to be adapted to cooperate in a known manner with the bushing 14 to provide a complete ball bearing support for the wheel.

Attention is particularly directed to the fact that the oppositely curved surfaces 22 terminate interiorly of the bushing in a flat, annular surface 24. The surface is apertured to receive

plugs of cast metal 26 and 28, to be hereinafter described more in detail. The bushing, as shown clearly in Figs. 2, 4 and 5, is provided with an octagonal outer periphery 30 and is fitted securely to the wooden body portion 12 by forming a corresponding octagonal aperture therein and forcing the bushing in place. Preferably, the aperture in the wooden member is broached to the desired shape and is of such a dimension that the bushing, when forced therein, is engaged rigidly therewith.

Additional means for rigidly securing the bushing and body portion together, particularly against relative axial movement, comprises an annular ring 32 (see Fig. 3), interposed between the aforementioned parts of the roller. Attention is particularly directed to the fact that the annular ring 32 engages in opposed annular channels cut in the bushing 14 and the body member 12. In other words, it will be noted that the central bushing (see Fig. 5) is provided with an annular channel 34, while an internal annular channel 36 is formed on the inner surface of the wooden member (see Fig. 3). It is very important to note that the ring 32 is dovetailed into the channel 36. In other words, the channel 36 is formed with sides converging together so that the ring 32 is engaged therein and accordingly cannot be relatively displaced in any direction.

In accordance with the present invention it is contemplated that the ring 32 be formed of some relatively low melting point metal which may be cast in place after the parts have been assembled. Among such available casting metals are lead and various alloys thereof, which may be poured at sufficiently low temperature so that they will not adversely affect the materials contacted thereby.

The present invention further provides means for forcing the cast metal into the channels formed for the reception thereof, such means comprising the apertures 38 and 40 which extend radially through the bushing 14 from the flat, central annular surface 24. The apertures or passages 38 and 40 communicate with the channel 34. While the apertures shown are cylindrical in configuration, they may be configured in any desired manner.

It is thought that it will be apparent from the foregoing that the present roller may be assembled by first forming the body portion 12 with an octagonal aperture and then forcing the bushing securely therein until the channel 34 is opposite the channel 36, providing an annular enclosure between the parts. The molten casting metal is then supplied to the apertured channel 40 through the agency of a tube or any other suitable feeding means, and caused to flow throughout the internal passage formed by the channels 34 and 36 until the said passages are completely full of molten metal and the excess of metal has been caused to flow through the passage 38. It will be understood that the passage 38 may, for casting purposes, be provided with a suitable riser to insure homogeneity of the cast metal.

After the metal 32 has solidified, the radially extending portions 26 and 28 are cut off in the plane of the annular surface 24. It will be apparent from the foregoing that the resulting structure comprises not only the metallic ring 32 interlocking the bushing and body portion but having integral therewith radially extending portions 26 and 28 which engage with the bush-

ing. In other words, relative displacement of the ring 32 with respect to the bushing is prevented in any direction.

The present invention provides a very simple, effective and inexpensive means for securing together a roller of the instant type. Separation of the parts due to relative shrinkage thereof no longer occurs, because of the fact that the ring 32 radially interlocks with the annular body portion 12 and retains it securely against the octagonal surfaces 30. The ring 32 is not only retained in the channel 36 by its integral annular structure, but through the agency of the radially extending integral plugs 26 and 28. So, also, the plugs cooperate to lock the ring 32 in the channel 34 against relative rotational displacement, and accordingly cooperate with the octagonal outer surface of the bushing in retaining the tread portion 12 rotationally fixed with respect to the bushing.

The numerous repeated stresses and vibrational forces to which rollers of the present class are subjected are, in accordance with the present invention, positively resisted. Accordingly, where wooden rollers of the present type have normally been characterized by a tendency to become relatively loose upon their central bushing, this difficulty, in accordance with the present invention, is substantially eliminated since the strains which initiate the loosening of the parts are positively resisted.

The present invention, moreover, provides a roller tread surface which is continuous and free from apertures or inserts such as result when intersecuring means are inserted from the region of the exterior surface 16.

While the aforementioned illustrative embodiment comprises a wooden body portion 12, it will be apparent that the invention is not restricted to the use specifically of wood, but comprehends the employment of equivalent fibrous material and plastics which may be substituted for wood in the above relationship. More specifically, I may employ various non-metallic, relatively soft materials. The present invention, moreover, provides a roller which has wide utility and may be employed in combination with various structure other than roller skates, for the purpose of permitting conveyance along a floor.

The term "wheel," as used in the present specification, is intended to cover rotatable members, including rollers, and particularly rotatable members for use in supporting articles for movement or transposition.

Changes may be made in the form, construction and arrangement of the several parts without departing from the spirit or scope of the invention, or sacrificing any of its attendant advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

What I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. In a wheel comprising a body or tread portion having a central bore and a metallic bushing received snugly in said bore, said body portion being formed of material tending to expand and contract with relation to the bushing under atmospheric conditions, means for rigidly securing the body portion and the bushing together, comprising an outwardly facing channel on the bushing, and an opposed inwardly facing channel on the body portion, said inwardly facing channel having side walls converging in an inward direction, and an integral body of cast metal engaging in

both of said channels and engaging said converging walls for securement thereto.

2. In a roller skate, a wheel having a tread portion of wood or the like and a central bushing of metal received slidably within a mating bore in the tread portion, means to secure the tread portion and bushing permanently together, comprising an annular channel formed on the outer surface of the bushing, a complementary annular channel formed on the interior surface of said tread portion, and an integral body of cast metal engaging in said channels and being dovetailed in said second named channel whereby to prevent separation of the members in use.

3. In a roller skate, a wheel having a tread portion of wood or the like and a central bushing of metal, means to secure the tread portion and bushing together, comprising an annular channel formed on the outer surface of the bushing, a second annular channel formed on the interior surface of said tread portion, an integral body of cast metal engaging in said channels and being dovetailed in said second named channel, said bushing having a radially disposed passage extending inwardly from said first-named channel and communicating with the first named channel and having a body of said cast metal therein.

4. In a roller skate wheel comprising a wooden tread and a central, generally annular bushing adapted to receive a shaft or axle to provide a bearing for the roller, means for securing the bushing and tread portion together, comprising opposed channels formed on the bushing and the tread portion, and a cast metal member in said channels, said cast metal being engaged within said channels and having dovetailed interengagement with said body portion, and a channel extending radially inwardly from said first named channels through said bushing containing a portion of said cast metal.

5. In a wheel comprising a body portion having an axial bore and a central bushing received axially within said bore, said body portion being formed of material tending to expand and shrink relative to said bushing under the influence of atmospheric conditions, means for securing said bushing and body portion permanently together against radial loosening as well as axial displacement which comprises a ring of cast material inter-engaging with said bushing and body por-

tion and located at a point spaced from the axial margins of said wheel, the sides of said ring of cast material diverging axially in an outward, radial direction, said axially diverging portion being embraced within a complementary recess in the body portion to radially interlock the bushing and body portion.

6. In a wheel comprising a body portion capable of relatively readily expanding or shrinking and a central bushing for said body portion, means for securing the bushing and body portion together against displacement comprising an annular ring of cast material engaging into said bushing and body portion and having at least one integral portion projecting generally radially through said bushing.

7. In a wheel comprising a body portion capable of relatively readily expanding or shrinking and a central bushing for said body portion, means for securing the bushing and body portion together against displacement comprising an annular ring of cast material engaging into said bushing and body portion and having at least one integral portion projecting generally radially through said bushing, said ring having radial, interlocking engagement with said body portion only for permanently, radially joining said body and bushing.

8. A roller skate wheel comprising a tire mounted on a supporting bushing, said tire comprising an annular body having a central bore, said bushing being received snugly in the bore with the annular body coaxially embracing the bushing, said body being of relatively soft material, means for securing the tire and bushing in permanently assembled relationship comprising an annular, outwardly-facing channel formed on the bushing, annular ring means projecting inwardly from the inner surface of said bore and being radially immovable with respect to said body portion, said ring means engaging into said outwardly formed channel and being complementary therewith for inter-engaging the parts against displacement, said bore comprising multi-sided, inner surfaces extending axially thereof, and said bushing having a complementary, multi-sided outer surface for complementary inter-engagement with the bushing.

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