

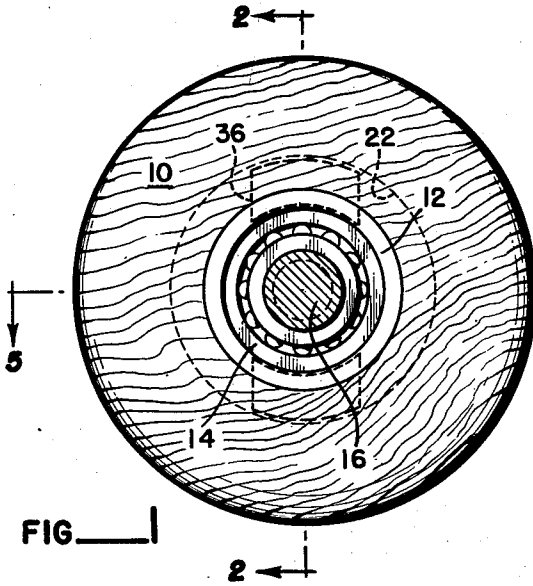
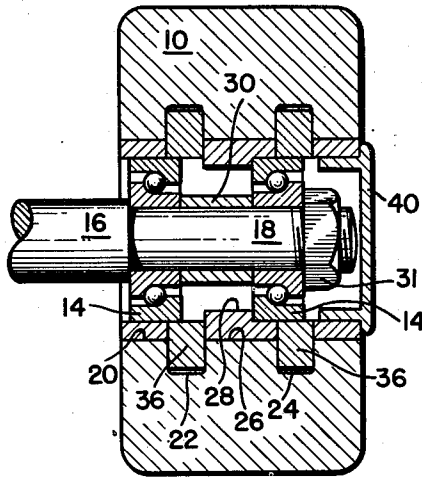
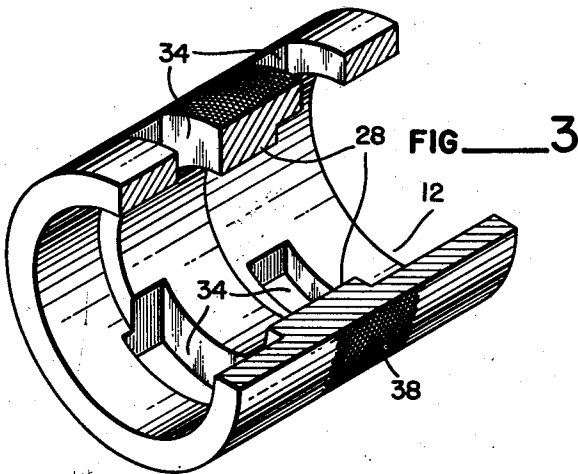
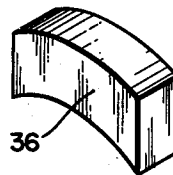
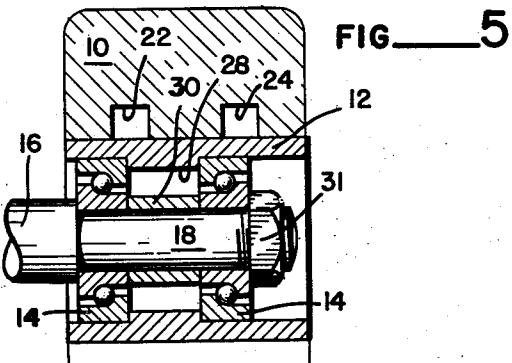
Sept. 30, 1952

V. E. DESCHENES

2,612,410

SKATE WHEEL

Filed July 3, 1951



VERAL E. DESCHENES

Inventor

By *Smith & Tuck*
Attorneys

UNITED STATES PATENT OFFICE

2,612,410

SKATE WHEEL

Veral E. Deschenes, Seattle, Wash.

Application July 3, 1951, Serial No. 235,031

6 Claims. (Cl. 301—5.7)

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This invention relates to improvements in a skate wheel and, more particularly is concerned with wheels having metallic hubs including anti-friction bearings and wooden or similar treads.

Specifically the wheel herein treated is for skates of the type used in roller rinks or other places having wooden floors. Such wheels usually have a tread of non-metallic material of which wood, reconstituted fibers, or plastic materials are typical examples. Within the tread is a hub or sleeve that is rigid, is usually formed of metal and which must be non-rotatably fixed within the tread and also be so positioned that longitudinal movement of the tread relative the hub is precluded.

The reasons for the use of a relatively soft tread should be apparent when it is considered that these wheels are to be used in rinks wherein the floors are of wood and are to be preserved and protected from undue wear as would be the case with metal wheels on wooden surfaces. The reasons for the prevention of rotation of the hub relative to the wheel tread and the preclusion of longitudinal movement of the two reside in the fact that should but the slightest movement take place not very long thereafter the condition rapidly aggravates itself to the result that the parts become completely loosened and unusable.

This problem has been previously treated by other inventors who have cast-in-place various types of interlocks between the hub and tread, or have attempted through the employment of the clamping action of screw threads to join the one to the other, or have attempted to use keys in keyways that are accessible from the ends of the wheels. However these are considered not the final answer to the problem because the casting of metal in a recess, part metal and part wooden, is not particularly practical; because the use of screw elements to obtain clamping has produced wheels which, due to vibration and other attendant factors, unscrew and become loosened; and because those wheels wherein keys have been employed sometimes, and entirely too often, lose their keys and result in no locking at all.

Having these and other criticisms of the prior devices in mind, it has been among the more important objects of this invention to provide an interlocked skate wheel and hub assembly in which the tread and hub have pressing fits and interlocking of the two parts is provided by means readily produced by rotary machining and conventional punching operations; in which relative rotational and longitudinal movement of the parts is precluded; in which the interlocking elements of the assembly is held positively positioned, during use, by the anti-friction means normally employed in skate wheels; and in which hidden keying is employed in obtaining the interlocking of parts to the end that the keys may not become dislodged, loosened or lost.

Other objects and advantages of the inven-

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tion will be more apparent from the following description of a specific form of the skate wheel. For the purpose of this description and of illustrating the invention I have found it convenient to and expedient to specify certain materials to show certain physical embodiments. These however are not to be considered as limitations since it will be obvious to those skilled in the art that variations and modifications in materials and the various embodiments may be resorted to commensurate with the scope and spirit of the invention set forth in the subjoined claims.

In the drawings:

Figure 1 is a face view of a skate wheel according to this invention;

Figure 2 is a diametrical sectional view taken on line 2—2 of Figure 1;

Figure 3 is an enlarged perspective view of the wheel hub, portions having been broken away and omitted for convenience of illustration;

Figure 4 is an enlarged perspective view of a typical key employed in my skate wheel; and

Figure 5 is a diametrical section of the wheel taken on line 5—5 of Figure 1 with portions omitted.

Since it is obvious that the device shown herein may have other uses than upon roller skates, the use of the word "wheel" is for the purpose of covering rotatable members generally and particularly rotatable members such as rollers or the like used in supporting articles for movement or transposition.

The wheel of Figure 1 comprises the tread portion 10, the sleeve or hub 12 having in its interior an anti-friction bearing 14 that journals the axle 16.

The tread 10 is shown formed of wood or similar material and has a cylindrical shape and is provided with an axial bore 20 extending from face to face. Intermediate the ends of this bore, the tread is counterbored to form inwardly open annular grooves 22 and 24. These grooves are spaced apart from each other, preferably so that they are located symmetrically within the wheel tread, and the land 26 therebetween is thus provided.

Sleeve 12 forms the hub of the wheel assembly and is formed of metal, usually aluminum. Each end of the sleeve is counterbored to receive anti-friction bearings and between these counterbores is left sufficient metal to form an annular internal shoulder 28.

Bearings 14 are fitted into the counterbores and are seated, as shown in Figure 5, against opposite sides of shoulder 28. That is the outer races of the bearings are spaced apart by the sleeve shoulder. The inner races of the bearings are likewise spaced apart by spacer sleeve 30.

The wheel is mounted upon axle 16 by having the reduced outer portion 18 of the axle inserted into the inner races of the roller bearings 14 which are separated by spacer sleeve 30 and there secured by the nut 31 which presses the inner races of the bearings together the degree per-

mitted by spacer sleeve 30 and the outer races to the degree determined by shoulder 28. In this arrangement the hub 12 is mounted on the axle in such a way that longitudinal movement of the axle or bearings is prevented and the hub will be free turning due to the rolling action of the balls within the antifriction bearings 14.

Hub sleeve 12 has its walls pierced or slotted to form openings 34 through the walls for the reception of the solid metal keys 36. The openings 34 are formed in the sleeve, preferably by a punching operation, in such a location that when the sleeve is pressed firmly into the axial bore of the tread 10, they will be aligned with the grooves 22 and 24. In one instance one pair of openings is formed through the wall of the counterbore at one end of the sleeve, as shown to the right in Figure 2. In the other instance the second pair of openings passes through the sleeve wall partly from the counterbore portion to the left in Figure 2 and partly through the shoulder 28.

The keys 28 are shaped and sized to fit snugly into and be insertable through the openings 32 into the grooves 22 and 24. The keys are inserted as shown after the hub and tread have been pressed in assembled relation and extend from the bottom of the inwardly facing grooves to the inner surfaces of the hub counterbores, where they are retained by the outer races of the bearings 14. It will be clear that when the keys are in place the hub and tread portions of the wheel may not move longitudinally of each other except if the tread is totally destroyed by breakage or the like.

The outer surface of the hub 12 is roughed or knurled at 38 so that when it is pressed into the tread the outstanding protuberances of the hub bite into the softer tread in the region of the land 26. In this manner the hub and tread are non-rotatably secured together.

The present arrangement of parts provides a very simple and highly effective and inexpensive means for forming wheels and rollers. The parts are positively secured together because the keys form a positive radial interlock between the tread and the hub and, so long as the bearings are in place no longitudinal movement can take place. In use such a wheel is subjected, particularly in skating, to many and repeated vibrational forces and stresses of a variety of natures. These stresses and forces which normally tend to destroy the wheel are in my invention effectively prevented from acting to the end that the wheel does not become loosened so that self-destruction may start. Also it will be noted that the arrangements provides a skate wheel which is free of peripheral apertures as well as axial openings, other than those provided for the hub as is the case with many of the prior art devices.

The outer face of the wheel is shown provided with a press fit cap 40 that covers the axle end and nut 31. A seal may likewise be applied to the inner bearing if such is desired.

Having thus described my invention, I claim:

1. A skate wheel, comprising: a tread portion having a central bore provided, intermediate its ends, with a pair of spaced apart inwardly facing grooves concentric with the axis of said tread; a rigid sleeve forming a hub for said wheel and having an outer cylindrical surface adapted to fit tightly and non-rotatably into said central bore and the land between said grooves, said sleeve having through the wall thereof slots communicating with and located radially inward of each groove; a pair of longitudinally spaced apart

antifriction bearings disposed within said sleeve, each bearing interiorly closing the slots communicating with a single groove; axle means journaled in said bearings; and a key fitted in each said slot and seated in a portion of the adjacent groove and extending between the bottom of the groove and the outer surface of the interiorly located antifriction bearing.

2. The structure according to claim 1 in which said keys each are a segment of an annulus and are shaped to fit said groove and to fill the adjacent slot.

3. A skate wheel, comprising: a tread portion having a central bore provided with an inwardly facing groove concentric with the axis of the tread; a rigid sleeve forming a hub for said wheel and having an outer cylindrical surface adapted to fit tightly and non-rotatably into said central bore, said sleeve having through the wall thereof a pair of spaced apart slots communicating with and located radially inward of said groove; a pair of longitudinally spaced apart antifriction bearings disposed within said sleeve, one of said bearings closing the slots communicating with said groove; axle means journaled in said bearings; and a key fitted in each said slot and seated in a portion of the adjacent groove and extending between the bottom of the groove and the outer surface of the interiorly located antifriction bearing.

4. The structure according to claim 3 in which said keys are each a segment of an annulus and are shaped to fit said groove and to fill the adjacent slot.

5. A skate wheel, comprising: a tread portion having a central bore provided with a non-rotatably fitted hub, said tread bore having around said hub a pair of inwardly open spaced apart grooves and said hub having an opening there-through in communication with each groove; a key fitting in each said opening and extending outward of said hub in a radial manner into the corresponding groove; and a separate cylindrical member positioned inwardly of each groove within said hub and closing said openings thereby retaining said keys in position.

6. A skate wheel, comprising: a tread portion having a central bore provided with an inwardly facing groove concentric with the axis of the tread; a sleeve forming a hub for said wheel and fitted in said bore in a manner preventing rotation therebetween, said sleeve having through the wall thereof a slot communicating with and located radially inward of said groove; an antifriction bearing disposed within said sleeve and closing said slot communicating with said groove; axle means journaled in said bearing; and a key fitted in said slot and seated in a portion of said groove and extending between the bottom of the groove and the outer surface of said bearing.

VERAL E. DESCHENES.

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