TANDEM ROLLER HOCKEY SKATE

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ABSTRACT

A roller hockey skate includes a hockey boot, a pair of roller support blades rigidly attached to the bottom of the boot, and a set of four ground-engaging rollers mounted in tandem between the blades. Each roller preferably is made of a stiff material, such as hard rubber or plastic, and is about 2½ inches in diameter with good lateral stiffness, which enables the user of the skate to achieve such maneuverability and high speeds that the skate performs in a manner comparable to ice skates. The front and rear rollers protrude beyond the front and rear, respectively, of the boot, which provides good balance when the user travels at high speeds over rough surfaces. The rollers are releasably attached to the roller support blades, and the front and rear rollers are adjustable vertically so that the degree of ground-engagement by the rollers can be varied in accordance with the user's skating style and experience.

9 Claims, 3 Drawing Figures
TANDEM ROLLER HOCKEY SKATE

CROSS-REFERENCE TO RELATED APPLICATION

This is a continuation-in-part of my application Ser. No. 274,191, filed July 24, 1972, now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to tandem roller skates, i.e., skates in which a single row of rollers are attached to the bottom of the skate. More particularly, the invention relates to a tandem roller hockey skate which achieves the speed, maneuverability, and balance normally associated with ice skates.

In the past, a variety of roller skates have been devised in which a series of rollers are arranged in tandem on the skate. The purpose of such skates generally has been to simulate the performance of ice skates, especially in figure-skating. However, the prior art tandem roller skates have not been designed in such a way that they can simulate the speed, maneuverability, balance, and fast-start capability of ice skates.

SUMMARY OF THE INVENTION

Briefly, this invention provides a tandem roller hockey skate which includes a boot having an elongated foot-supporting base, rigid roller support means extending down from the underside of the foot-supporting base, and a set of four longitudinally spaced apart rollers mounted in tandem on the roller support means. The rollers are arranged to provide a front roller, a pair of intermediate rollers, and a rear roller, all of which are engageable with the ground in unison. Each roller is at least about 2% inches in diameter. The rollers also have ground-engaging portions made of a stiff material, such as hard rubber or plastic, and are adapted to provide good lateral stiffness as well as stiffness in compression.

I have discovered that the use of four hard rollers mounted in tandem and of a size at least about 2% inches in diameter (which is larger than the rollers used in most conventional roller skates having three or more rollers in tandem) makes it possible for the use of the skate to obtain the speed, maneuverability, balance, and fast-start capability normally obtained with ice skates. The small size of prior art rollers, or the use of a resilient material in such rollers, limits the speed, fast-start capability, and maneuverability of the prior art skates to such an extent that the user is unable to simulate the performance of ice skates.

The rollers are arranged so that the front roller protrudes forward of the tip of the foot-supporting base, and the rear roller protrudes rearward of the tail end of the foot-supporting base. This arrangement of rollers aids the user in fast-starting and achieving good balance, especially when travelling at high speeds over rough surfaces.

Since the roller skate is capable of simulating the performance of ice skates, it is especially suitable for use indoors on gymnasium floors, or outdoors on hard surfaces such as streets, playgrounds, and parking lots, by hockey players or those who are learning the game and who do not have a nearby ice skating rink at their disposal.

These and other aspects of the invention will be more fully understood by referring to the following detailed description and the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an elevation view showing a tandem roller hockey skate embodying the present invention.

FIG. 2 is a sectional elevation view taken on line 2—2 of FIG. 1, and

FIG. 3 is a plan elevation view taken on line 3—3 of FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing, a tandem roller hockey skate 10 includes an ankle-supporting boot 12 and a pair of longitudinally aligned rollers 14 mounted in tandem below the underside of the boot. Preferably, boot 12 is a hockey boot, because the skate is especially useful in practicing and playing hockey on hard surfaces.

Preferably, there are four rollers attached to the underside of the boot in a ground-engageable position. The rollers are attached to the boot by a pair of longitudinally extending and parallel roller support means, each of which includes a downwardly projecting elongated blade 16, and a pair of longitudinally spaced apart, horizontally disposed front and rear supports 18, 19 extending at right angles with respect to the blades. The blades are rigidly secured to the foot-supporting base 20 of the boot by bolts 22, and nuts 24 are threaded onto the shank of each bolt and tightened against the underside of base 20. As shown best in FIG. 2, each roller 14 includes a sealed roller bearing 26 having a transverse opening 28 extending through it. A pair of opposed nylon sleeves 20 are inserted in the ends of each opening 28. The sleeves provide a fixed shaft about which the rollers rotate, and also act as spacers between the outer edges of the rollers and the inner edges of the blades. The side of each roller is recessed in its center, and a pair of opposed rigid metal support plates 29 are sealed in the opposite recessed portions of each roller. The metal plates of each roller are held in place by suitable fasteners (not shown) such as screws which extend transversely through the roller from one side thereof and are tightened by nuts on the opposite side of the roller. Metal support plates 29 provide good lateral stiffness for the rollers which is especially necessary when the skater is travelling at high speeds which his skates held on a cant angle relative to the vertical plane.

Sleeves 30 of each roller are aligned with collinear holes 32 in the blades, and an elongated externally threaded bolt 34 extends through sleeves 30 and holes 32. A separate nut 36 is threaded onto the shank of each bolt and is tightened against the outer wall of the blade.

As shown best in FIG. 1, the roller support blades 16 comprise a pair of opposed, vertically extending, elongated slotted openings 38 for mounting the axle shaft of the front roller, and a second pair of opposed vertically extending elongated slotted openings 40 for mounting the axle shaft of the rear roller. These slotted openings provide means for adjusting the type of contact between the ground and the rollers. For example, all four rollers may be mounted to the support blades so that they contact the ground in unison. This provides good ice skate-simulating performance, because of the large amount of rolling contact between the four large rollers and the ground. Alternatively, the four and rear rollers can be moved to a position slightly
3 higher than the intermediate rollers, so the user of the skate can obtain a "rocker effect" from the rollers, which is desirable to some skaters. A horizontally extending, elongated slotted opening 42 allows longitudinal adjustment in the position of an intermediate roller so the spacing on both sides of it can be varied. Thus, the skater is allowed to adjust the type of ground contact of his skate to suit his particular skating style and experience.

Moreover, since the rollers are releasably attached to the roller mounting blades, each of the rollers can be removed and reversed to obtain an even amount of wear on each side of each roller.

Preferably, rollers 14 are at least about 2 3/4 inches in diameter and are made of a stiff, substantially non-resilient material, such as hard rubber or plastic. The traction surfaces of the rollers are rounded (when the roller is viewed on end as in FIG. 2) which improves the maneuverability of the skate when compared with a skate having rollers with flat traction surfaces.

In use, roller skate 10 performs in a manner akin to ice skates because of a combination of factors. The rollers are larger than those of known conventional roller skates having four rollers in tandem. For example, rollers 16 provide a relatively long stroke length (since they protrude beyond and behind the tip and tail end, respectively, of the skate), and because of the large size of the rollers (the combined spacing between the rollers is not greater than the diameter of any one roller) combined with the long stroke length, the skate provides a large amount of rolling contact with the ground which enables the skater to simulate the performance of ice skates. Tests conducted with my skate have shown that it is possible to travel at substantially higher speeds, and with better fast-start capability and high-speed maneuverability than on tandem skates having smaller rollers or rollers made of a resilient material such as soft rubber. If the rollers are made of soft rubber, or if the rollers have lateral flexibility, for example, the fast-starting capability and maximum speed of the skate is too limited to simulate the behavior of ice skates. Moreover, the rollers are carried on roller support blades which are rigidly attached to the ankle-supporting boot worm by the user. This provides better performance than skates which are releasably attached to the user's shoe, because the rigid connection between the support blades and the boot avoids lost motion which tends to be present with skates which are releasably clamped to the user's shoe.

The front and rear rollers protrude in front of and to the rear of the tip and tail ends, respectively, of the boot base member 20. The two intermediate rollers support and properly balance the weight of the user. The rotational axes of the front and rear rollers preferably are in front of and to the rear of the top and tail ends, respectively, of base member 20. This long stroke provided by the roller arrangement gives the skate good stability and adds to its fast-start action during use. The stability of the skate is improved by the rollers protruding beyond the front of and rear of the skate, because in instances where the front roller, or maybe another roller, comes into contact with an impediment, such as a crack in a playground surface, the long track provided by the remaining three rollers helps the skater to maintain good balance until he recovers from contact with the impediment.

Thus, my skate is especially suitable for use by hockey players either in practice or in games played on hard surfaces other than ice. This is especially useful, because the skate can be used on gymnasium floors, other suitable hard surfaces, such as streets and playgrounds, which are generally more available to such athletes than ice skating rinks.

1. A tandem roller hockey skate comprising a boot for receiving a foot of a user and adapted to provide support for the ankle of the user's foot, the boot also having a foot-supporting base, rigid roller supporting means extending down from the underside of the foot-support base, means for rigidly attaching the roller support means to the foot-support base, a set of four longitudinally spaced apart rollers mounted in tandem on the roller support means, the roller including a front roller, two intermediate rollers, and a rear roller, each roller being at least about 2 3/4 inches in diameter and having a ground-engaging portion made of a relatively stiff material adapted to provide substantial lateral rigidity during use, the rollers being mounted to the roller support means so they are engageable with the ground in unison, the front roller being mounted to the roller support means so its axis of rotation is forward of the tip of the foot-support base, and in which the rear roller is mounted to the roller support means so its axis of rotation is behind the tail end of the foot-support base.

2. A tandem roller hockey skate according to claim 1 in which the means for mounting the forward and rear rollers to the roller support are adjustable vertically closer to the boot than the intermediate rollers so that the bottoms of the rollers can be aligned along a substantially arcuate path.

3. A tandem roller hockey skate according to claim 1 in which the ground-engaging portions of the rollers are made of hard rubber or hard plastic.

4. A tandem roller hockey skate according to claim 1 in which a portion of each roller has a major portion thereof comprised of a relatively stiff material, and including a separate rigid metal plate on each side of the stiff material which comprises the central portion of the roller and in direct contact therewith to provide good lateral support for the roller during use.

5. A tandem roller hockey skate according to claim 4 in which each plate extends at least about one-half the diameter of the roller.

6. A tandem roller hockey skate according to claim 1 in which each roller is releasably attached to the roller support means.

7. A tandem roller hockey skate according to claim 1 in which the means for mounting the forward and rear rollers to the roller support are adjustable vertically closer to the boot than the intermediate rollers so that the bottoms of the rollers can be aligned along a substantially arcuate path, and in which a separate rigid metal plate is mounted on each side of each roller to provide lateral support for the rollers during use.

8. A tandem roller hockey skate according to claim 7 in which each rigid plate extends at least about one-half the diameter of the roller.

9. A tandem roller hockey skate according to claim 8 in which each roller is releasably attached to the roller support means.

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