

[54] **TOE STOP FOR ROLLER SKATES**

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[51] Int. Cl. **A63c 17/14**

[58] Field of Search **280/11.2; 188/251 R, 251 A**

[56] **References Cited**

UNITED STATES PATENTS

2,373,698	4/1945	McGeary et al.	188/251 A
2,485,147	10/1949	Fowlkes	280/11.2

2,595,751	5/1952	Balstead	280/11.2 X
2,631,861	3/1953	Daniska	280/11.2
2,941,812	6/1960	Reynolds	280/11.2
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[57] **ABSTRACT**

A toe stop has a flat floor-engaging surface disposed at such an angle to a mounting stud that it engages flat against the floor when the skate is tipped forwardly. The portion having the floor-engaging surface is molded of relatively soft plastic having a high coefficient of friction, and the portion in which the mounting stud is embedded is formed of relatively hard plastic with a lower coefficient of friction.

5 Claims, 3 Drawing Figures

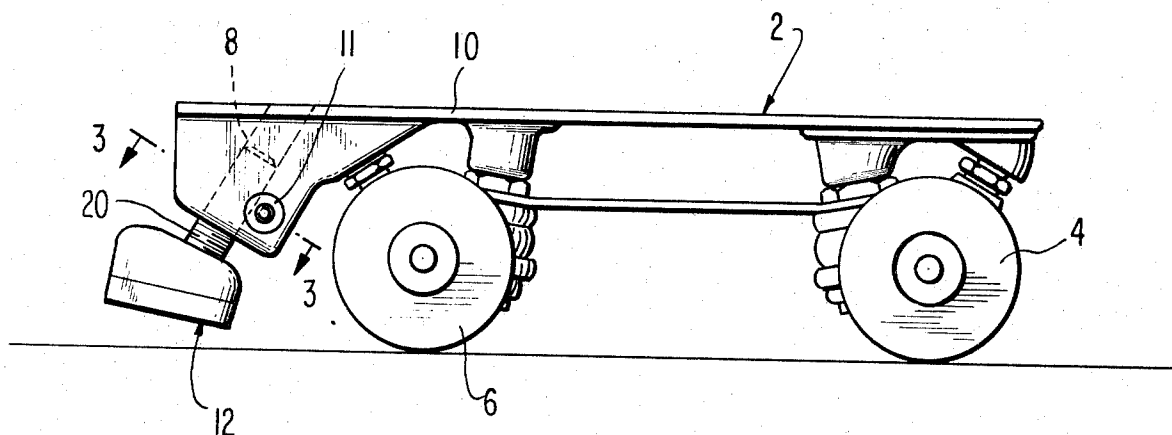


FIG. 1

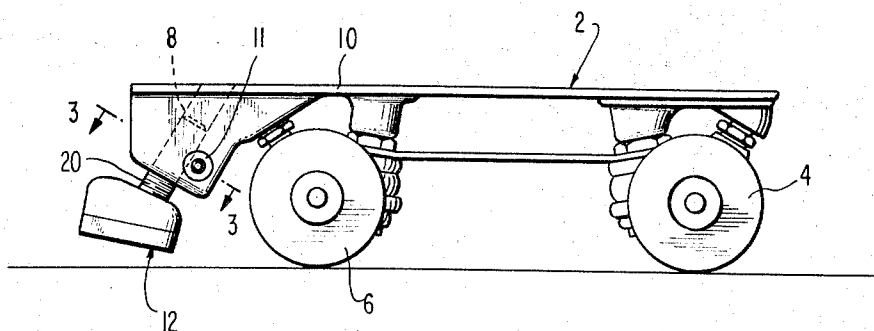


FIG. 2

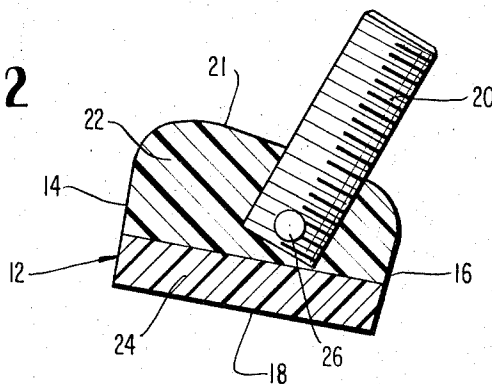
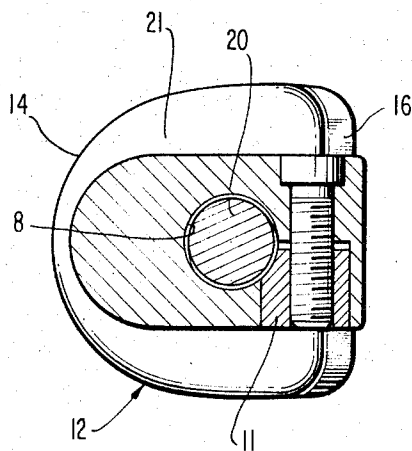


FIG. 3

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TOE STOP FOR ROLLER SKATES

FIELD OF INVENTION

Land Vehicles, Skates, Wheeled, With brake.

SUMMARY OF INVENTION

Heretofore, toe stops shaped generally like the heel of a shoe, as is the present one, have been molded of rubber or the like plastic friction material. Conventionally, these toe stops are mounted by means of a stud in a socket at the front of a skate, the stud having one end embedded in the friction material. Usually, there is some sort of anchor, such as a washer, on the inner end of the stud.

Such toe stops are used as brakes, and also as traction devices for fast starts. The skate is tipped forwardly until the stop engages the floor, and in starting, considerable forces which tend to twist, tilt or distort the stop are applied. Heretofore, when conventional rubber or rubber-like plastics were used, such materials with sufficiently high coefficient of friction for traction could be selected, but these were characterized by tendencies to "give," with resultant infirmities in footing.

The object now is to provide a toe stop molded of polyurethane, in which two parts are bonded together during the molding process, one of the parts, i.e., the part which holds the stud, being relatively hard, and the other part, i.e., the part which engages the floor, being relatively soft, with a relatively high coefficient of friction.

These and other objects will be apparent from the following specification and drawings, in which:

FIG. 1 is a side elevation of the toe stop in typical position on a skate;

FIG. 2 is a cross-section through the toe stop; and,

FIG. 3 is a cross-section along the line 3—3 of FIG. 1.

Referring now to the drawing, the subject toe stop 12 is shown in FIG. 1 in its typical use location on the front end of a skate 2, for example, as shown in the U.S. Pat. to Reynolds, No. 2,941,812, although it is usable on many other skate mountings. Typically, a roller skate 2 has rear wheels 4, front wheels 6, a female threaded stud socket 8 extending downwardly and forwardly beneath the skate toe plate 10. Usually, the stud socket has some sort of clamp 11 to keep the stud from turning, once it is threaded into place.

This invention is concerned with toe stop 12, which is in the general form of a shoe heel, having a rounded front side 14, flat back side 16, flat bottom 18 and a stud 20 projecting from the top 21. The angle of stud 20 with respect to the flat bottom 18 is about 69°, so that when the skate is tipped forwardly about front wheels 6 enough to raise rear wheels 4 about one inch off the floor, the flat bottom 18 of the stop engages flat against the floor. Stop 18 is divided into two portions, an upper portion 22 formed of relatively hard elastomer, and a lower portion 24 formed of softer elastomer having a higher coefficient of friction than the upper portion. Through a hole through the inner end of stud 20 engages a cross pin 26 to keep the stud from turning in the material of the upper portion 22 in which it is embedded.

The toe stop, save for the stud and cross pin, is molded of two types of polyurethane. Stud 20 with its cross-pin up is supported in an open top mold and the

elastomer for the upper portion of the stop is poured into the mold around the stud. The material for this upper portion is duPont's L-315 Urethane, sold under the trademark "Adiprene." Its significant characteristic is that it, like the elastomer for the lower portion, is water-resistant and when cured under standard procedures, it has a hardness of 74 on the Shore D scale. The "Adiprene," heated to 212° F and mixed with a suitable cross-linker, such as duPont's "Moca," and a catalyst, such as azelaic acid (both the latter heated to about 235° F) is first poured into the mold and allowed to set sufficiently so that it will not mix appreciably with the material for the bottom part of the stop. Then the material for the bottom part is poured into the mold on top of the then partly set "Adiprene." The material used for the bottom part is American Cyanide's CA9 "Cyanaprene." When set, this has a hardness of 90 on the Shore A scale, and has a considerably higher coefficient of friction than the "Adiprene." This, like the "Adiprene," is mixed with pigment, heated to 212° F, the cross-linker and catalyst are mixed and heated to about 235° F and poured in on top of the "Adiprene." The mold is then moved through a 212° F oven until both the plastics are set. The urethanes, cross linker, pigment and catalyst, mold, oven and mixing procedures are all well known in the urethane art so that further specification is unnecessary.

When the stop is ejected from the mold, stud 20 is firmly embedded in the hard plastic material of the top, and cannot be unscrewed outwardly because of cross-pin 26. When the bottom of the stop is pressed against the floor, a firm, unyielding engagement is achieved, despite the relative softness of the lower part 24.

I claim:

1. A toe stop for roller skates comprising a solid body having

an upper portion bounded on its top side by an upper surface, and a stud embedded in said upper portion and projecting generally upwardly from said upper surface, and

a lower portion contiguous to the upper portion and bounded on its bottom side by a flat surface, said upper and lower portions being bonded to one another,

said upper portion being formed of relatively hard elastomer material,

said lower portion being formed of relatively soft elastomer material characterized by having a relative high coefficient of friction.

2. A toe stop as claimed in claim 1, said upper and lower portions being of molded water-resistant polyurethane material, the material of the upper portion being characterized by a hardness of about 74 on the Shore D scale, the material of the lower portion being characterized by a hardness of about 90 on the Shore A scale.

3. A toe stop as claimed in claim 2, and a cross-pin extending through the inner end of said stud for preventing rotation thereof in said upper portion.

4. A toe stop as claimed in claim 3, said body having a rounded front side and a flat rear side, said stud being disposed at an angle to the flat bottom side of said lower portion so that the free end thereof projects towards the rear of the stop body.

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5. A toe stop as claimed in claim 4, the included angle between the stud and the flat bottom being about 69°.

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