United States Patent

[11] 3,580,594

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[54] **TOE STOP MOUNTING FOR ROLLER SKATES**
1 Claim, 5 Drawing Figs.

[52] **U.S. Cl.** **280/11.2,** 151/35
[51] **Int. Cl.** **A63c 17/14**
[50] **Field of Search** 280/11.2; 151/35

[56] **References Cited**

UNITED STATES PATENTS

2,179,575	11/1939	Hosking	151/35
2,706,641	4/1955	Van Horn	280/11.2
2,954,984	10/1960	Ware	280/11.2
3,180,651	4/1965	Ware	280/11.2
3,250,544	5/1966	Ware	280/11.2

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ABSTRACT: A toe stop mounting in which a rib or detent projects downwardly from the toe stop support for interlocking engagement with one of a plurality of grooves formed in the upper end of the toe stop member to oppose rotation of the toe stop member in response to offcenter frictional braking forces developed thereby. The bottom of the detent is fractured in an irregular manner to increase its holding power with respect to such rotation of the toe stop member.

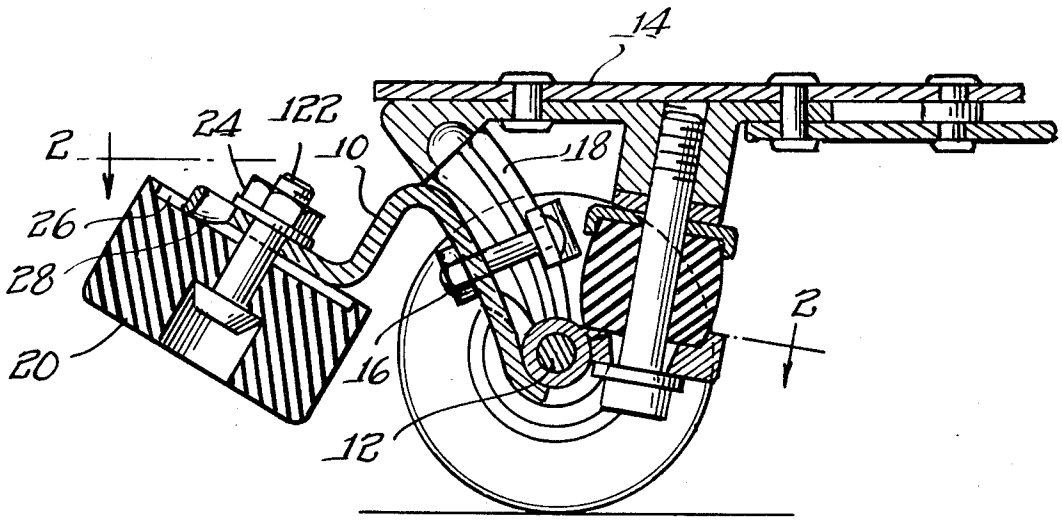


Fig. 1.

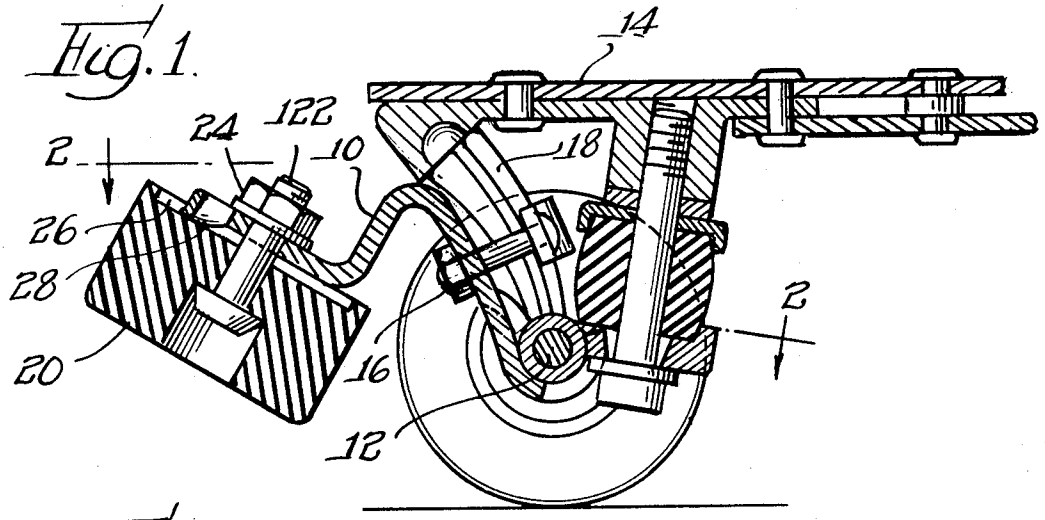


Fig. 2.

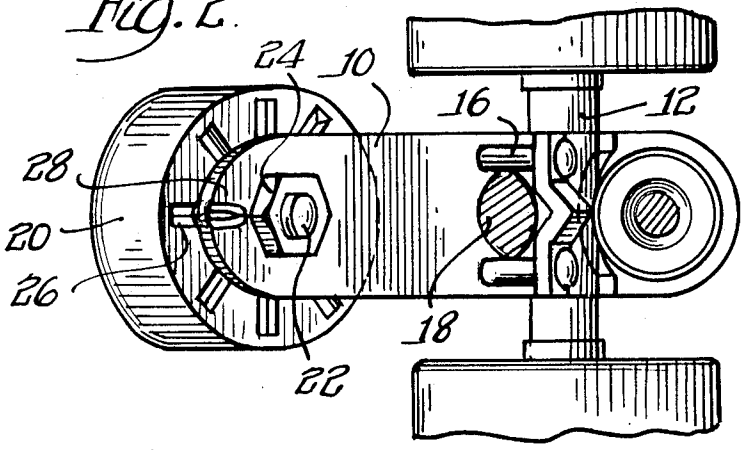


Fig. 3.

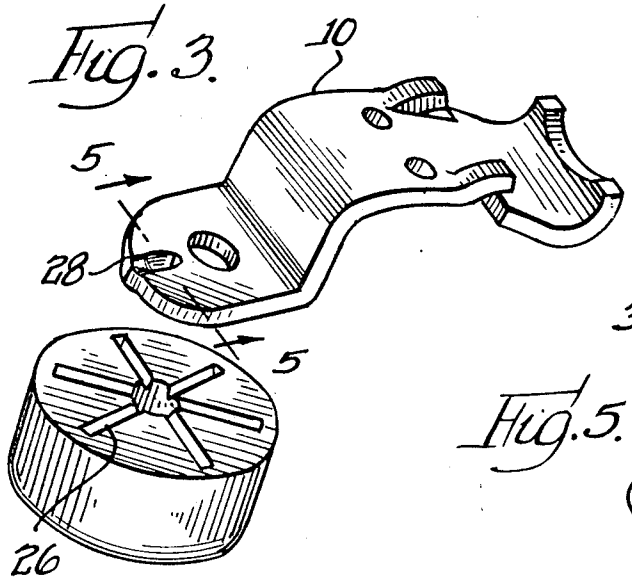


Fig. 4.

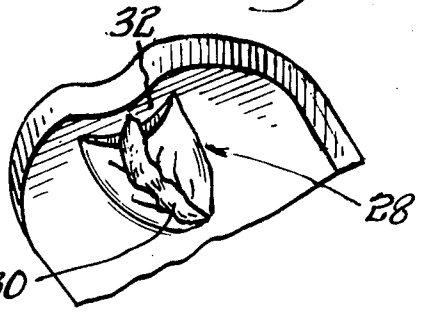
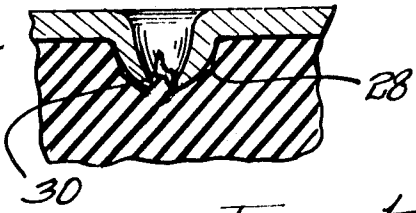


Fig. 5.



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TOE STOP MOUNTING FOR ROLLER SKATES

BACKGROUND OF THE INVENTION

This invention relates to toe stop mountings for roller skates and more particularly to toe stop mountings in which rotation of the toe stop member due to offcenter frictional braking forces is opposed by means of a rib or detent which projects downwardly from the toe stop support for interlocking engagement with one of a plurality of grooves formed in the top of the toe stop member. Toe stop mountings of this general type have been known in the prior art, as disclosed in my prior U.S. Pat. No. 3,180,651, which was issued on Apr. 27, 1965 for a "Toe Stop Structure" and U.S. Pat. No. 3,250,544, which was issued on May 10, 1966 for a "Roller Skate Structure." Both of these patents disclose ribs or detents which interlock with one of a plurality of grooves in the top of a toe stop member for opposing rotation thereof. In U.S. Pat. No. 3,180,651 the detent is formed by molding or forging a solid projection on the bottom of the toe stop support bracket, and in U.S. Pat. No. 3,250,544 the detent is formed by embossing a flat metal bracket with a punch.

Both of the above-noted prior-art mounting structures usually have been successful in achieving their principal objective of opposing rotation of the toe stop member due to offcenter braking forces. However, it is a principal object of this invention to provide an improved toe stop mounting which is even more effective in opposing the rotation of the toe stop member due to offcenter braking forces than those heretofore known in the art.

SUMMARY OF THE INVENTION

In accordance with this invention, it has been found that the holding power of a detent which interlocks with one of a plurality of grooves in the toe stop member can be substantially improved by deliberately exceeding the structural strength of the mounting bracket when the detent is embossed therein so as to fracture the bottom of the detent in an irregular manner. It has been further found that by suitable adjustment of the punching tool and process, this irregular fracture can be made to assume the form of a pair of spaced apart jagged edges that provide an open space into which the resilient material of the toe stop member will be extruded when the toe stop member tends to rotate, and that the body of the extruded material within such space will present a relatively high shear resistance to the spaced apart jagged edges. Thus, in accordance with this invention, it has been found that the holding power of an embossed detent can be substantially increased by doing a bad job of embossing, i.e. by deliberately exceeding the tolerance levels of the material so as to produce a jagged fracture at the bottom of the detent.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cross-sectional view of one illustrative toe stop mounting assembly of this invention attached to the front wheel truck of a roller skate structure.

FIG. 2 is a plan view taken along the plane 2–2 of FIG. 1.

FIG. 3 is a perspective view of the toe stop mounting bracket shown in FIGS. 1 and 2.

FIG. 4 is an enlarged perspective view of the downwardly projecting detent of the mounting bracket shown in FIG. 3.

FIG 5 is an enlarged cross-sectional view taken along the plane 5–5 of FIG. 3.

DETAILED DESCRIPTION

FIG. 1 shows one illustrative toe stop mounting structure of this invention attached to the front roller truck of a rink-type roller skate. This particular embodiment of the invention utilizes a detachable toe stop bracket **10** which is shaped to engage the underside of an axle **12** which is secured by resilient mounting means to a soleplate **14**. Detachable toe stop bracket **10** is held in place by a U-clamp **16** which is secured to a longitudinal brace **18** that extends between the central

portion of axle **12** and the toe portion of soleplate **14**. The interrelation of toe stop mounting bracket **10**, axle **12**, longitudinal brace **18**, and U-clamp **16** do not, however, constitute a novel feature of this invention. This particular type of detachable toe stop mounting clamp has been known in the past and is disclosed in my prior U.S. Pat No. 2,954,984, which was issued on Oct. 4, 1960 for a "Detachable Toe Stop For A Roller Skate." The novel portions of the structure disclosed in drawings of this application relate to the means on the end of toe stop mounting clamp **10** for preventing rotation of the resilient toe stop member **20** which is attached to the end of clamp **10**.

Referring to FIG. **1**, a resilient toe stop member **20** is secured to the front end of the toe stop mounting bracket **10** by means of a threaded stud **22** which projects from the upper surface of toe stop member **20** and extends through a bore formed in the front end of bracket **10**. Threaded stud **22** is secured to clamp **10** by means of a nut and lock washer **34**. In this particular example, the stud **22** is a threaded bolt which extends through an opening in the toe stop member **20**. It will be understood by those skilled in the art, however, that the threaded stud **22** could also be formed as an integral part of the toe stop member **20** by molding the toe stop member around the head of stud **22**.

As best shown in FIGS. **2** and **3**, a plurality of radially spaced indentations **26** are formed in the upper surface of the toe stop member **20** extending radially outward from the center of threaded stud **22**. A downwardly projecting detent **28** formed on the end of bracket **10** engages one of the radial indentations to oppose rotation of the toe stop member **20** in response to offcenter braking forces developed when the toe stop member is pressed against the floor. It will be understood by those skilled in the art that toe stop member **20** will almost never be exactly aligned in a vertical plane when it contacts the floor, and therefore that a rotary moment of force will be developed which tends to rotate toe stop **20** about the axis of stud **22** when the toe stop is pressed against the floor.

In accordance with this invention, it has been found that the holding power of detent **28** with respect to opposing such rotation of toe stop member **20** can be substantially increased by deliberately performing a defective embossing operation when the detent **28** is embossed in bracket **10**. It has been found that by deliberately exceeding the tolerance level of the material of bracket **10** when the detent **28** is embossed, a fracture can be formed on the bottom of detent **28**, as best shown in FIGS. **4** and **5**, and the jagged edges of this fracture substantially increases the holding power of the detent. By suitably adjusting the parameters involved in the embossing operation, i.e. the dimensions of the embossing punch and the amount of force applied thereto, the fracture can be opened to expose spaced apart jagged edges such as indicated in FIGS. **4** and **5**. The spaced apart jagged edges are preferably separated far enough to define an opening **30** that extends completely through the material of bracket **10** to permit the relatively soft plastic material of toe stop member **20** to be extruded into the opening when rotary pressure is applied thereto. This further enhances the holding power of the detent **28**. As is best illustrated in FIG. **4**, by appropriate dimensioning of the embossing punch and appropriate positioning thereof, a relatively solid bridge of material **32** will join together and close off the front of the opening **30** defined by the spaced apart jagged edges. This bridge of solid material is not essential to the invention but it is helpful in most applications. As best shown in FIG. **4**, when a solid bridge of material **32** remains in front of the open space **30**, the front end of the jagged edges will depend downwardly from the bridge of material **32** and present a more jagged and irregular aspect than would be presented if the open space **30** continued to the front edge of the bracket **10**.

From the foregoing description it will be apparent that this invention provides a toe stop mounting bracket in which the toe stop member is more securely locked against rotation due to offcenter braking forces. And although this invention has

been illustrated with reference to one specific embodiment thereof, it should be understood that many modifications can be made in the disclosed structures without departing from the basic principles of this invention. For example, it will be apparent to those skilled in the art that many variations can be made in the particular mounting bracket disclosed herein and in the means for securing the bracket to the roller skate structure without in any way altering the essential features of the detent at the end of the mounting bracket. In addition, it is possible to form several detents instead of the single detent disclosed in this particular example of the invention. Many similar modifications will be apparent to those skilled in the art and it should be understood that this invention includes all modifications falling within the scope of the following claims.

I claim:

1. In a roller skate structure, the combination comprising a resilient toe stop member for generating a frictional braking force when pressed against a surface over which it is moving, an elongate, threaded stud attached to said toe stop member and projecting therefrom for supporting the toe stop member, a plurality of indentations in the surface of said toe stop member adjacent to the projecting portion of said threaded stud, and indentations being radially spaced from one another with respect to the axis of said threaded stud, means on said roller skate structure for receiving said threaded stud to secure said toe stop member to said roller skate structure, said means including a substantially flat metallic plate having a bore formed therein for receiving said stud and at least one detent projecting downwardly therefrom and positioned to engage in one of said indentations to oppose rotation of said toe stop member about the axis of said stud, and the surface of said flat metallic plate being fractured at the bottom of said detent to divide the bottom of said detent into two spaced apart jagged edges, each of which extends substantially radially with respect to the axis of said bore, said fracture extending completely through said flat metallic plate with the radially outermost ends of said spaced apart jagged edges being supported by a substantially solid bridge of material extending circumferentially therebetween, thereby to increase the holding power of said detent with respect to opposing the rotation of said toe stop member about the axis of said stud.