

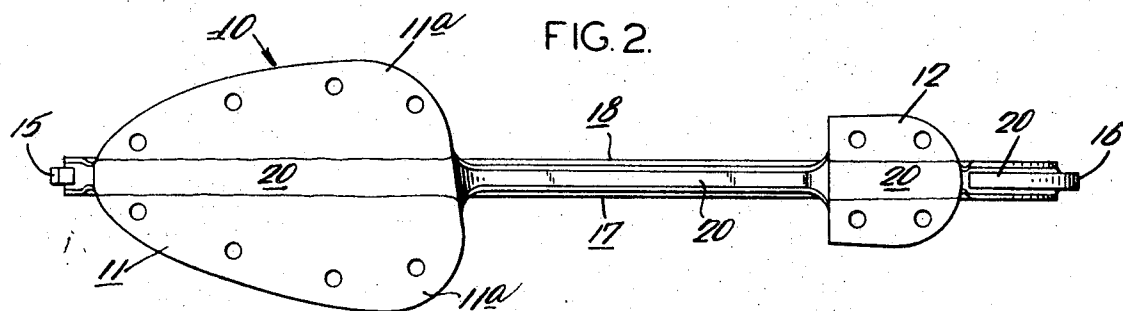
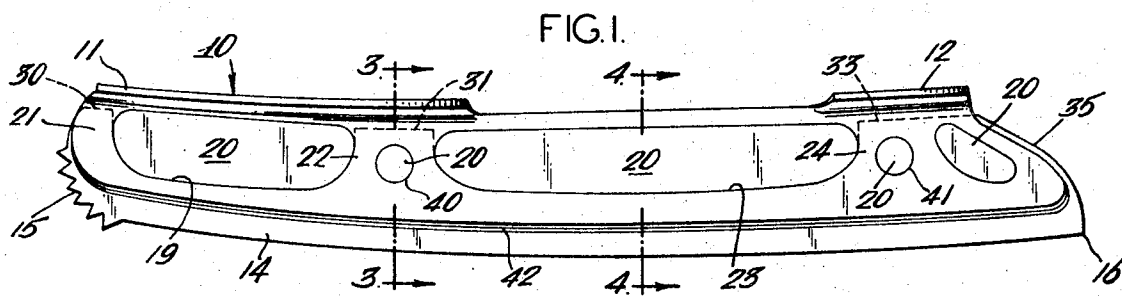
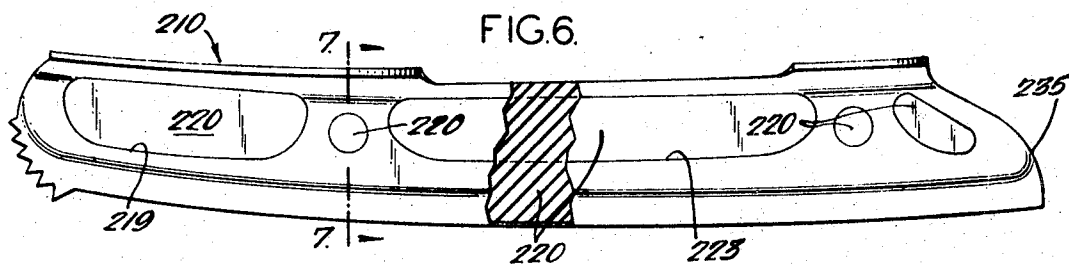
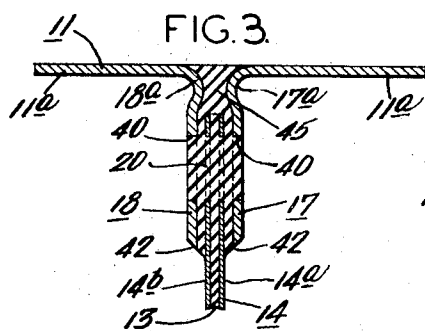
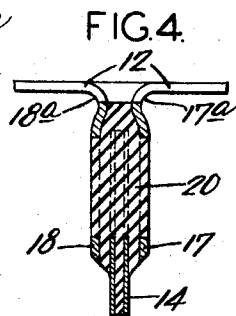
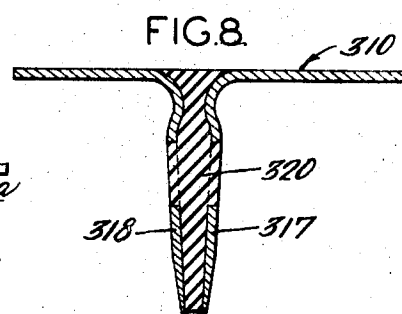
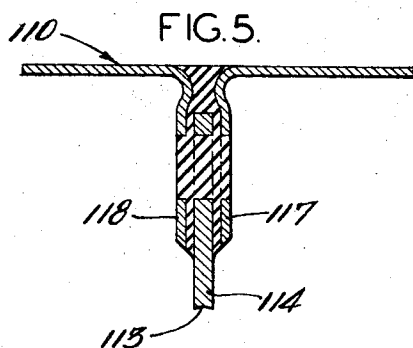
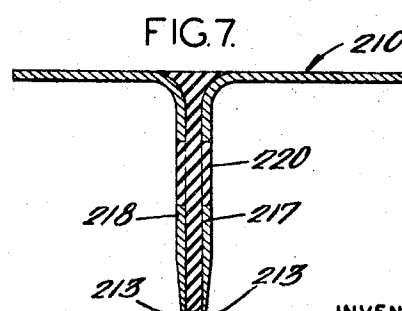
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R. A. WEIDENBACKER

3,558,149

ELASTOMERIC-BONDED ICE SKATE

Filed March 19, 1970



INVENTOR:
RUSSELL A. WEIDENBACKER
By *Howson & Howson*
ATTYS.

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3,558,149

ELASTOMERIC-BONDED ICE SKATE

Russell A. Weidenbacker, 32 S. Wyoming Ave., Box 153,
Haverford, Pa. 19041

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10 Claims

ABSTRACT OF THE DISCLOSURE

An ice skate is provided with an elastomeric-bonded structure which is economical to manufacture and which possesses safety features. The bonded ice skate comprises a pair of thin side members each having upright portions and laterally extending portions shaped to form complementary sole and heel plates when the upright portions are bonded together in side-by-side relation by means of rubber or another elastomer. In one embodiment, a thin metallic runner element having a hollow-ground edge is bonded by rubber centrally between the upright portions of the metallic side members in a manner which permits it to move vertically relative to the side members thereby to provide a shock-absorbent ice skate. In another embodiment, the central runner element is omitted and the ice-engaging edges are formed on the bottoms of the side members.

The present invention relates to ice skates; and more particularly, the present invention relates to a novel elastomeric-bonded ice skate which is relatively inexpensive to manufacture and which may be made to possess shock-absorbing and other safety features.

At present, a conventional figure-type ice skate comprises a runner having upright toe, sole and heel stanchions to which sole and heel plates are welded for attachment to a shoe. The skate has elongated apertures between the toe and sole stanchions and between the sole and heel stanchions and the shoe and the runner has an extension extending for a short distance beyond the heel stanchion. With this ice skate structure, a rigid connection exists between the runner and the shoe. Thus, when a skater performs some figure skating maneuvers, for example maneuvers in which the skater lands on his feet after a jump, shock forces are imparted to his body through his feet and legs. As a result, the skater may become prematurely fatigued, thereby increasing the possibility of his accidentally falling.

In addition to the foregoing limitations, conventional figure skates are not inexpensive to manufacture. This is because the sole and heel plates are normally secured to their respective stanchions by welding. In addition to the labor required to effect proper weldments, the weldments must be properly ground before a finish is applied to the runners, thereby increasing manufacturing costs.

Other limitations accompany existing figure skates. For instance, there may be a tendency for the skater to catch the runner of one skate on the runner extension of his other skate while performing some intricate figure skating maneuvers. As a result, the skater may lose his balance and fall, possibly injuring himself. A safety cover which eliminates the effects of this tendency is disclosed in my copending patent application Ser. No. 821,883, filed May 5, 1969. Although my safety cover is satisfactory, an ice skate which embodies its safety features and which is also lightweight and economical to manufacture is highly desirable.

With the foregoing in mind, it is a primary object of the present invention to provide a novel, lightweight ice skate which is economical to manufacture.

It is another object of the present invention to provide

an improved ice skate which possesses shock-absorbing features.

As a further object, the present invention provides a new figure-type skate possessing safety features which tend to reduce some of the hazards presently associated with figure skating.

More specifically, the present invention provides an elastomeric-bonded ice skate comprising complementary elongated side members each of which has front and rear laterally extending portions forming sole and heel plates adapted to be attached to respective parts of a shoe. The side members are bonded together in side-by-side relation by elastomeric means which spans across elongated apertures in the side members thereby to prevent entanglement of skates presently caused by inadvertent insertion of runner elements through runner-apertures. In addition, the ice skate has a rearwardly and downwardly sloping edge behind its heel plate for camming a misplaced skate rearwardly beyond the terminus of its runner extension. In one embodiment, a thin, elongated runner element having an ice-engaging edge on its bottom is bonded between the side members in a manner which permits limited relative movement therebetween to provide an ice skate having shock-absorbing capabilities. In another embodiment, an ice-engaging edge is formed on the bottom of each side member.

These and other objects, features and advantages of the present invention should become apparent from the following description when taken in conjunction with the accompanying drawing in which:

FIG. 1 is a side elevational view in reduced scale of one preferred embodiment of an ice skate constructed in accordance with the present invention, the skate having a thin runner element bonded between complementary side members by elastomeric means;

FIG. 2 is a plan view of the ice skate illustrated in FIG. 1;

FIGS. 3 and 4 are full-scale cross-sectional views taken along lines 3—3 and 4—4 of FIG. 1;

FIG. 5 is a cross-sectional view similar to FIG. 3 but illustrating a modified runner element;

FIG. 6 is a side elevational view similar to FIG. 1 with a portion broken away of another preferred embodiment of an ice skate constructed according to the present invention, the skate having side members bonded together by elastomeric means and edge means provided on the bottoms of the side members;

FIG. 7 is a full-scale cross-sectional view taken along line 7—7 of FIG. 6; and

FIG. 8 is a view similar to FIG. 7 but illustrating an embodiment of the invention with outwardly-bowed side members.

Referring now to the drawing, there is illustrated in FIGS. 1—4 an ice skate 10 embodying the present invention. The ice skate 10 has an outward appearance substantially similar to a conventional figure-type skate, having a sole plate 11 and a heel plate 12 adapting the skate 10 to be mounted on the underside of the left one of a pair of shoes. A complementary ice skate (not shown) is provided for mounting on the right one of a pair of shoes. As may be seen in FIG. 1, the ice skate 10 has a thin elongated runner element 14 extending from front to rear under the mounting plates 11 and 12. The runner element 14 has teeth 15 ahead of the sole plate 11 and a spur or extension 16 behind the heel plate 12, and the runner element 14 has a hollow-ground ice-engaging edge 13 (FIG. 3) coextensive in length therewith. It is to be noted that the runner element 14 in the illustrated embodiment has a uniform width along its length; however, it is preferable for the width of the runner element 14 to progressively narrow rearwardly from substantially the median of the skate. With the narrowing runner width, the performance of the skate is improved.

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In accordance with the present invention, the ice skate 10 has a structure which is economical to manufacture. For this purpose, the ice skate is fabricated from side members 17 and 18 which are bonded together in side-by-side relation by means of elastomeric material 20. Preferably the material 20 is a hard rubber of either natural or synthetic composition in order to form the sole and heel plates 11 and 12, each side member, for example the member 17, has out-turned portions 11a and 12a which are bent at right angles to the plane of the member 17 and which form complementary portions of the sole and heel plates 11 and 12 respectively when the side members are bonded together. Preferably, the side members are pressed from thin sheets of stainless steel, at which time elongated apertures 19 and 23 are formed therein. The aperture 19 is located in the side members between the toe and sole stanchions 21 and 22, respectively; and the aperture 23 is located in the side member between the sole and heel stanchions 22 and 24, respectively. In this manner, the weight of the assembly is reduced without sacrificing its strength, and the skate may be manufactured by relatively low-cost production techniques, requiring only stamping and bonding machinery.

In my aforementioned patent application, separate cam means is mounted behind the heel stanchion of an ice skate to overlie its runner extension for camming the runner of one skate rearwardly beyond the terminus of the runner-extension of the other skate should a skater tend to so entangle his skates while skating. In the present invention, however, cam means is formed integrally with the runner element 14, which is preferably formed of stainless steel. To this end, and as may be seen in broken lines in FIG. 1, the runner element 14 has an upstanding toe stanchion 30, an upstanding sole stanchion 31 spaced rearwardly from the toe stanchion 30, and a heel stanchion 33 spaced rearwardly from the sole stanchion 31, the runner element 14 being recessed downwardly between its respective stanchions. In the illustrated embodiment, the cam means comprises an edge 35 which slopes rearwardly and downwardly from a location adjacent the heel plate 12, and the side members 17 and 18 terminate below the edge 35 to expose it. As a result, the side members 17 and 18 are protected from being damaged by strikes from the ice-engaging edges of the skates, and because the edge 35 is of hard steel, it resists being nicked or otherwise damaged.

In order to securely mount the runner element 14 between the side members 17 and 18, each side member has a bore 40 in the sole stanchion 22 and a bore 41 in the heel stanchion 24. As may be seen in FIG. 3, the runner element 14 also has identically-sized bores in registry with the bores 40 and 41, and the elastomeric means 20 extends through the bores in the runner element 14 and the side plates 17 and 18. Thus, when a downward shock load is applied to the sole and heel plates 11 and 12, the side members 17 and 18 tend to move downwardly with respect to the runner element 14. However, because the elastomeric material 20 in the bores is resilient and somewhat resistant to shearing, the relative movement between the runner element and the side members is limited, thereby reducing stresses on the bond between the elastomeric material 20, the element 14, and the side members 17 and 18. Thus, with this structure, shock absorption is built into the ice skate.

The runner element 14 is preferably of lightweight laminated construction. To this end, the element 14 comprises identical, thin side elements 14a and 14b formed of stainless steel and bonded together by means of elastomeric material 20. The elastomeric material 20 is recessed from ice-engaging edges provided on the bottoms of the elements 14a and 14b to provide the hollow-ground edge effect at 13. In the present instance, it is preferable for the elements 14a and 14b to be bonded together by the elastomeric means 20 before the element 14 is mounted between and bonded to the side members 17 and 18. As a result, a strong, lightweight ice skate which is economical to manufacture is provided.

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In a modified embodiment of the present invention, a skate 110 is provided having runner element 114 (FIG. 5) which is like the runner element 14 except that it is of solid stainless steel. In this embodiment, a hollow-ground ice-engaging edge 113 is ground on the underside of the solid element 114. Thus, where slightly increased weight is not objectionable, the solid runner may be preferred.

Both of the aforementioned embodiments possess additional safety features. For instance, when performing some quite intricate skating maneuvers, a skater may tend to inadvertently catch the runner extension of one skate in one of the apertures of his other skate, possibly causing him to fall. In order to eliminate this possibility, the elastomeric material 20 which bonds the side members together spans across the apertures 19 and 23, and aperture in the heel stanchion 24. Thus webs of material are provided for preventing inadvertent insertion of runner extensions through the apertures, and because the elastomeric means is somewhat resilient, it resists being damaged by misdirected skates.

The ice skate structure of the present invention has a pleasing appearance. For this purpose, the webs of elastomeric material spanning across the apertures in the side members may be brightly colored; or, they may be transparent to give the ice skate an appearance substantially like that of a conventional skate. In addition, it is preferable for the lower margin of each side member 17 and 18 to be chamfered, for example at 42 (FIG. 3) with the elastomeric material 20 being filleted between the side members 17 and 18 and the runner element 14 to thereby enhance the appearance of the skate.

In order to facilitate the mounting of the stanchion plates onto the corresponding parts of their associated shoes, each side member 17 and 18 has an upturned rib 17a and 18a (FIGS. 3 and 4) in its upper margin adjacent the sole and heel plate portions 11a and 12a, respectively. As may be seen in FIG. 3, the ribs 17a and 18a cooperate to form a neck 45 between the side members, the neck 45 overlying the tops of the toe, sole and heel stanchions 21, 22 and 24 of the runner element 14. With this structure not only is a clearance provided for the insertion of mounting screws through the inwardmost apertures in the sole and heel plates 11 and 12; but the runner element stanchions effect a resilient compressive action on the elastomeric means 20 in the neck 45 when downward load is applied on the plates 11 and 12. Thus, an additional zone of shock absorption is provided in the ice skate structure to further reduce stresses on the bond between the side members 17 and 18 and the elastomeric means 20.

Some skaters may prefer lightweight skates which do not possess the shock-absorbing features of the aforementioned embodiments. To this end, an ice skate 210 (FIG. 6) is provided having a modified structure which is also economical to manufacture. As may be seen in FIG. 7, the skate 210 comprises side members 217 and 218 which are shaped like the side members 17 and 18 but which, unlike the members 17 and 18, have ice-skating edges 213 ground on their bottoms and are therefore integral therewith. Like the aforementioned preferred embodiments, the side members 217 and 218 are bonded together in side-by-side relation by elastomeric means 220 and have webs spanning across elongated apertures 219 and 223. This modified embodiment also has a rearwardly and downwardly sloping camming edge 235 (FIG. 6) provided behind its heel plate for the aforescribed safety purposes. Unlike the aforementioned embodiments, however, the camming edges 235 are formed on the side members 217 and 218. Thus, with this structure, a lightweight skate is provided which is economical to manufacture and which possesses safety features.

If desired, a skate 310 (FIG. 8) may be provided having side members 317 and 318 which are bowed outwardly and bonded together by elastomeric means 320. With this structure, the webs of elastomeric material spanning across apertures in the side members are thicker in cross-section than in the embodiment of FIGS. 6 and 7. Thus, the

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strength of the webs is increased, thereby preventing the possibility of their being pierced by unusually large strikes from misdirected skates.

In view of the foregoing, it should be apparent that a novel ice skate which possesses safety features and which is economical to manufacture has now been provided. Although the reference has been made herein to figure-type ice skates, it should be apparent that the structure of the present invention has applicability to other types of ice skates, for example, hockey and racing skates.

While preferred embodiments of the present invention have been described in detail, various modifications, alterations or changes may be made without departing from the spirit and scope of the present invention as defined in the appended claims.

I claim:

1. An elastomeric-bonded ice skate, comprising:

a pair of elongated side members each having an upstanding portion and sole and heel plate portions extending laterally-outward to form sole and heel plates for mounting the members on corresponding parts of a shoe, said members being disposed with their upstanding portions in side-by-side relation to form said sole and heel plates with a T-shaped transverse cross-sectional configuration,

edge means carried by said members to provide an ice-engaging runner edge extending along the length of said members below said sole and heel plates, and elastomeric means disposed between the upstanding portions of said members and bonding said members together.

2. An ice skate according to claim 1 wherein said edge means comprise integral portions of said side members remote from said sole and heel plates, and said elastomeric means is recessed from said edge means.

3. An ice skate according to claim 1 wherein the edge means is coextensive in length with said side members and the upright portions of said side members extend rearwardly beyond said heel plate and slope downwardly toward said edge means therebeyond.

4. An ice skate according to claim 1 wherein the upstanding portions of said side members are bowed outwardly intermediate said plates and said edge means.

5. An ice skate according to claim 1 wherein the upstanding portions of said side members have elongated

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apertures in registry with one another, and said elastomeric means spans across said apertures.

6. An ice skate according to claim 1 wherein said elastomeric means is rubber.

7. An ice skate according to claim 1 including a thin elongated runner element disposed centrally between the upstanding portions of said side members and bonded thereto by said elastomeric means, said edge means being integral with the bottom of said runner element.

8. An ice skate according to claim 7 wherein the upright portion of each of said side members has a transverse bore underlying said sole plate and a like bore underlying said heel plate, said runner element having bores in registry with the bores in said side members, said elastomeric means extending into said bores to effect positive mounting of the runner element to the side members.

9. An ice skate according to claim 7 wherein the upright portions of each side member has an inwardly formed rib adjacent said sole and heel plates cooperating to form a neck overlying said runner element and said runner element having an upper edge terminating below said neck, and said elastomeric means extending across said neck and engaging the upper edge of said runner element to enable the upper edge to compress the elastomeric means in the neck when a downward load is applied on the plates, thereby to provide shock absorption.

10. An ice skate according to claim 7 wherein said runner element has a camming edge sloping rearwardly and downwardly beyond said heel plate and side members have similarly sloping portions spaced inwardly of said edge to expose said edge and enable said edge to accept strikes from misplaced skates.

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LEO FRIAGLIA, Primary Examiner

M. L. SMITH, Assistant Examiner