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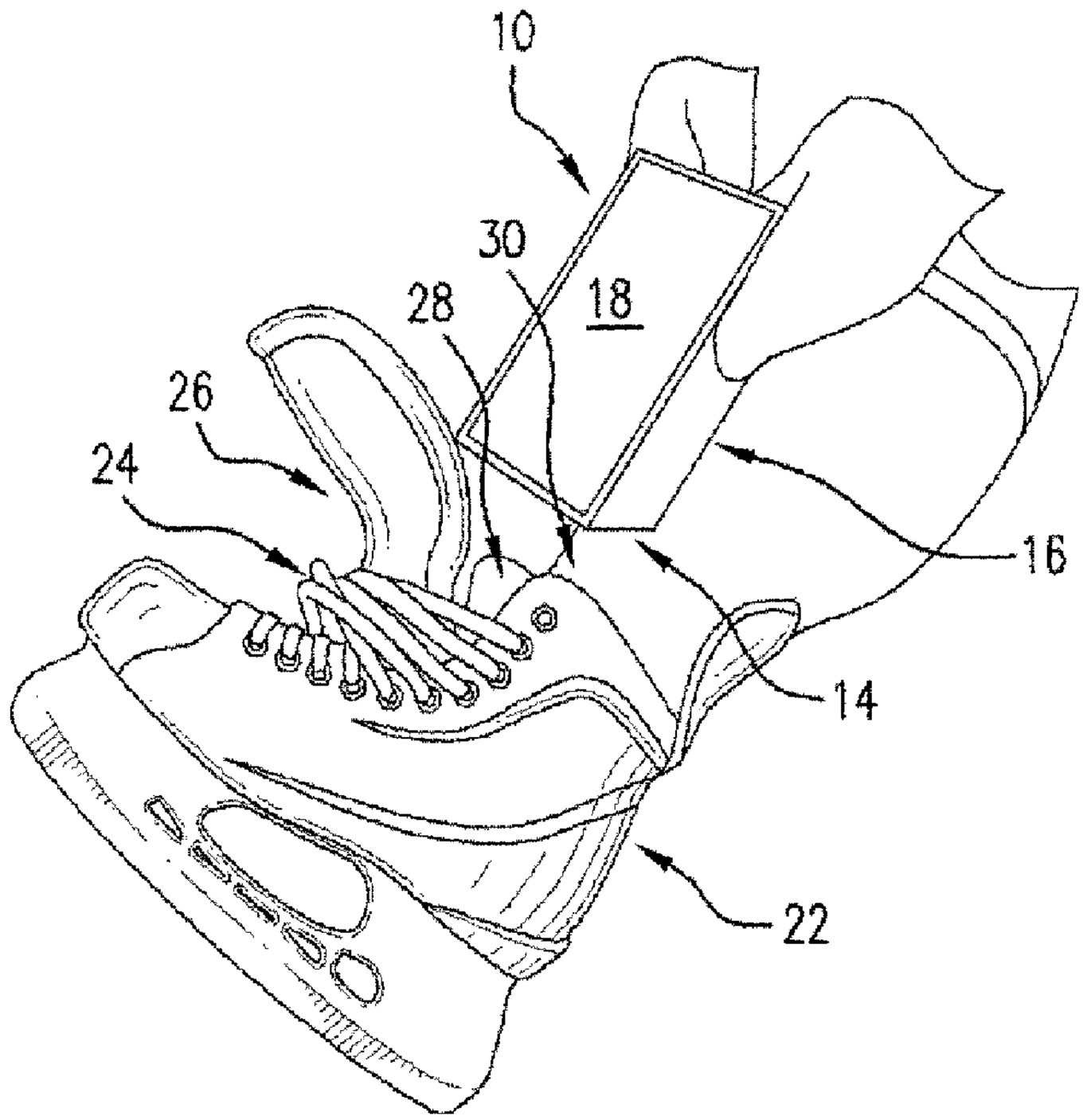
(54) **Titre : INSERT D'ARTICLE CHAUSSANT AMELIORANT LE CONFORT**
(54) **Title: COMFORT-ENHANCING FOOTWEAR INSERT**



(57) **Abrégé/Abstract:**
An insert for use with laced or buckled footwear for enhancing user comfort. The insert comprises polyurethane foam and is sized and configured to be inserted between the footwear tongue and die user's foot, which insert can mold to the user's foot.

Abstract

An insert for use with laced or buckled footwear for enhancing user comfort. The insert comprises polyurethane foam and is sized and configured to be inserted between the footwear tongue and the user's foot, which insert can mold to the user's foot.

COMFORT-ENHANCING FOOTWEAR INSERT

Field of the Invention

The present invention relates to footwear inserts, and specifically to footwear inserts intended to enhance user comfort.

Background of the Invention

It is known in the art of footwear manufacturing that the use of fastening means such as laces or buckles, while providing advantages in terms of tightly securing the footwear to a user's foot, can result in discomfort and even pain due to the fastening means "biting" into the user's skin. This is the case even where a tongue is positioned between the fastening means and the user's foot. The "lace-bite" problem is particularly acute in sports footwear, such as ice hockey skates or ski boots, where the footwear is composed of hard, firm materials and undergoes significant stresses during use, pressing repeatedly and firmly against the top of the user's foot and the ankle region. The resulting pain caused to tendons and other parts of the user's foot and ankle region can not only reduce the pleasure of engaging in the activity but may even block the user's ability to engage in the activity altogether.

Numerous attempts have been made to address the lace-bite problem. The proposed solutions normally entail an insert positionable between the fastening means and the user's foot (or between the footwear tongue and the user's foot). These inserts are commonly composed of gel pads or plastic but can incorporate air-inflated pockets. While such proposed solutions are readily commercially available, it has been found that they fail to fully address the pain and discomfort from lace bite, particularly where pain is already occurring, and they are sometimes cost-prohibitive. Also, gel pads and air-pocket pads can rupture from the extreme conditions encountered during some sports activities, leaking into the footwear and negating any potential benefits of the inserts.

What is needed, therefore, is a barrier that is durable and provides the necessary comfort, that can be positioned between the foot/ankle region and the footwear's tongue.

Summary of the Invention

The present invention therefore seeks to provide such a barrier, in the form of a polyurethane foam or "memory foam" insert.

According to a first aspect of the present invention, there is provided an insert for use with footwear having a tongue, the insert configured for insertion between the tongue and a user's foot, the insert comprising polyurethane foam.

In exemplary embodiments of the first aspect, the footwear may comprise an upper ankle-supporting portion, the insert configured for insertion between the tongue and the user's foot and ankle region. The polyurethane foam is preferably viscoelastic, chlorofluorocarbon-free and made using a soy polyol. The insert preferably comprises a narrowed end for positioning adjacent a user's toes, and most preferably a beveled end. The insert is preferably of sufficient dimensions that, upon compression between the tongue and the user's foot, the insert will cover the top of the user's foot and at least a portion of the sides of the user's foot, and also – where the footwear comprises an upper ankle-supporting portion – the front of the user's ankle region and at least a portion of the sides of the user's ankle region.

According to a second aspect of the present invention, there is provided a method of using a polyurethane foam footwear insert configured for insertion between a footwear tongue and a user's foot, the method comprising the steps of:

a. providing the insert;
b. loosening fastening means of the footwear and inserting the user's foot at least partially into the footwear;
c. inserting the insert between the tongue and the user's foot;
d. inserting the user's foot and the insert fully into the footwear; and
e. tightening the fastening means such that the insert is pressed against the user's foot.

In exemplary embodiments of the second aspect, the insert preferably comprises a narrowed end, and most preferably a beveled end, such that step c comprises positioning the narrowed end adjacent the user's toes. Upon tightening the fastening means such as laces or buckles, the insert is preferably allowed to compress and cover the top of the user's foot and at least a portion of the sides of the user's foot. Where the footwear comprises an upper ankle-supporting portion and the insert is configured for insertion between the tongue and the user's foot and ankle region, upon tightening the fastening means, the insert is preferably allowed to compress and cover the top of the user's foot, at least a portion of the sides of the user's foot, the front of the user's ankle region and at least a portion of the sides of the user's ankle region.

A detailed description of an exemplary embodiment of the present invention is given in the following. It is to be understood, however, that the invention is not to be construed as being limited to this embodiment.

Brief Description of the Drawings

In the accompanying drawings, which illustrate an exemplary embodiment of the present invention:

Figure 1 illustrates side, outer face and end views of an insert according to the present invention;

Figure 2a is a side elevation view of a user loosening the laces of an ice hockey skate;

Figure 2b is a side elevation view of a user pulling the footwear tongue and laces away from the user's foot and ankle region;

Figure 2c is a side elevation view of a user inserting an insert according to the present invention between the tongue and the user's foot and ankle region;

Figure 2d is a side elevation view of a user compressing the insert against the user's foot and ankle region using the tongue; and

Figure 2e is a side elevation view of the footwear laces tightened after insertion of the insert.

An exemplary embodiment of the present invention will now be described with reference to the accompanying drawings.

Detailed Description of Exemplary Embodiment

Turning now to Figure 1, an insert 10 is shown. The insert 10 is made with a polyurethane foam, or "memory foam", which is viscoelastic to enable it to mold to the user's foot and ankle region during use. While various densities of memory foam are commercially available or capable of production, those skilled in the art will be able to determine appropriate material densities for a given application. The polyurethane foam is preferably chlorofluorocarbon-free and manufactured using a soy polyol, although these features address environmental sustainability issues rather than product utility. The polyurethane foam should be cured and off-gassed before shaping into the form of insert 10 illustrated in Figure 1, which shaping is preferably accomplished using machine cutting of a foam block.

The use of polyurethane foam or memory foam presents numerous advantages over the prior art materials. The primary benefit is that such foam can be compressed against the user's foot and ankle region and, due to its temperature-sensitive open-cell structure, it can mold itself to the user's foot and ankle region and thereby provide a comfortable fitted contact that affords cushioned support. When removed from contact with the user's foot and ankle region, the foam will slowly return to original or near-original form for use in other footwear or by another user. Unlike inserts or pads that have a gel- or air-filled chamber, the insert 10 cannot be ruptured and lose its utility – compressing the foam will simply cause it to mold to the user's foot and ankle region, and stresses will be highly unlikely to be sufficient to cause any tearing of the foam due to its viscoelastic properties.

Figure 1 presents side, outer face and end views of the insert 10. The insert 10 has two opposed sides 12, opposed flat and beveled ends 20, 14, and opposed inner and outer faces 16, 18. In use, the beveled end 20 is inserted adjacent the user's toes, with the inner face 16 against the user's foot and ankle region and the outer face 18 against the tongue. Note that the tongue can be rigid, semi-rigid, or even elasticized, and may take any number of conventional forms, including without limitation tongues that are connected to the footwear at only the tongue's lowermost edge (as in most ice hockey skates; see Figures 2b and 2c) or tongues that are connected to the footwear on all edges of the tongue except for the uppermost edge, and the invention is accordingly not limited to any particular tongue/footwear arrangement. The beveled end 14 can take numerous forms, including chamfered or rounded, as long as the end narrows; this is to provide additional user comfort by helping to avoid bunching of the insert 10 across the user's toes.

The insert can be manufactured according to any desired dimensions. For example, in a "junior" model intended for children and youth, the dimensions can be as follows: inner face 16 length of 4 3/8 inches for positioning against the user's foot and ankle region; outer face 18 length of 5 inches for positioning against the tongue; side 12 height of 1.5 inches; and outer face 18 width of 4 inches. As a further example, in a "senior" model intended for adults, the dimensions can be as follows: inner face 16 length of 6 inches for positioning against the user's foot and ankle region; outer face 18 length of 7 inches for positioning against the tongue; side 12 height of 2 inches; and outer face 18 width of 4 inches. These dimensions are exemplary only, and any desired dimensions can be employed depending on the footwear, user and application. The beveled end is preferably created with an angle of 65 to 70 degrees, but this can also be modified as necessary for different applications.

Turning to Figures 2a through 2e, a method for using the insert 10 is illustrated. Figure 2a shows a user loosening the laces 24 of an ice hockey skate 22, initially pulling the laces 24 away from the tongue 26; it will be recognized, however, that this method can be used with other types of footwear, such as ski boots with buckles. The user then, as shown in Figure 2b, pulls the tongue 26 and laces 24 away from the user's foot 28 and ankle region 30. Once the tongue 26 and laces

24 are sufficiently loosened, the user can then position the insert 10 between the tongue 26 and the user's foot 28 and ankle region 30, as shown in Figure 2c. As can be seen, the beveled end 14 is presented toward the user's toe, and it is preferably positioned approximately half-way down the top of the user's foot, which would position the flat end 20 above the line of the ankle region 30.

Once the insert 10 is in position, Figure 2d illustrates the user compressing the insert 10 against the user's foot 28 and ankle region 30 using the tongue 26. The user can then tighten the laces 24, as shown in Figure 2e, thereby holding the insert 10 in place and allowing it to conform to the shape of the user's foot 28 and ankle region 30. The insert 10 is preferably made in a size sufficient to allow it to mold across the top of the user's foot 28 and the front of the user's ankle region 30, but also extend at least partially around the sides of the foot and ankle region 28, 30 to provide additional comfort and support.

It has been found in actual use that an insert in accordance with the above description provides the desired comfort and support.

As can be readily seen, there are numerous advantages presented by the present invention. The insert can enhance user comfort, even where the user had been experiencing pain and discomfort. It can be made with cost-effective memory foam material using very simple manufacturing processes. There is no rupture risk as with certain prior art inserts. The insert molds to the user's foot and ankle region, but it can rebound to original or near-original form after use, while the beveled end provides additional comfort to the user.

The foregoing is considered as illustrative only of the principles of the invention. The scope of the claims should not be limited by the preferred embodiments set forth in the foregoing examples, but should be given the broadest interpretation consistent with the specification as a whole.

Claims

1. A removable footwear insert for use with an article of footwear having a tongue and means for tightening said footwear, said insert comprising:

a. a continually deformable foam configured for insertion into a position between the tongue of the footwear and the foot of a user;

b. wherein the insert is adapted to be inserted or removed by the user to or from its position between the tongue of the footwear and the foot of the user;

c. the insert is sized such that when the footwear is tightened to the foot of the user with the insert in position, the insert is compressed and covers the top and at least a portion of the sides of the foot of the user; and

d. wherein the insert is adapted to conform to the foot of the user, such that pressure exerted by the tongue and means of securing the footwear on the foot of the user is more evenly distributed over the surface of the foot of the user than would occur in the absence of the insert.

2. The removable footwear insert of claim 1, further comprising an upper ankle-supporting portion:

a. wherein the insert is configured for insertion into a position between the tongue of the footwear and the foot and an ankle region of a user:

b. the insert can be inserted or removed by the user to or from its position between the tongue of the footwear and the foot and the ankle region of the user; and

c. the insert is sized such that when the footwear is tightened to the foot of the user with the insert in position, the insert is compressed and covers the top and at least a portion of the sides of the foot as well as the top and at least a portion of the sides of the ankle region of the user.

3. The removable footwear insert of claim 1, further comprising a narrowed end that is adapted for placement adjacent to the toes of the user when the insert is in position in the footwear.

4. The removable footwear insert of claim 3, wherein the narrowed end is beveled.

5. The removable footwear insert of claim 1, wherein the continually deformable foam is viscoelastic.

6. The removable footwear insert of claim 1, wherein the continually deformable foam is chlorofluorocarbon-free.

7. The removable footwear insert of claim 1, wherein the polyurethane foam is made using a soy polyol.

REPLACEMENT SHEET

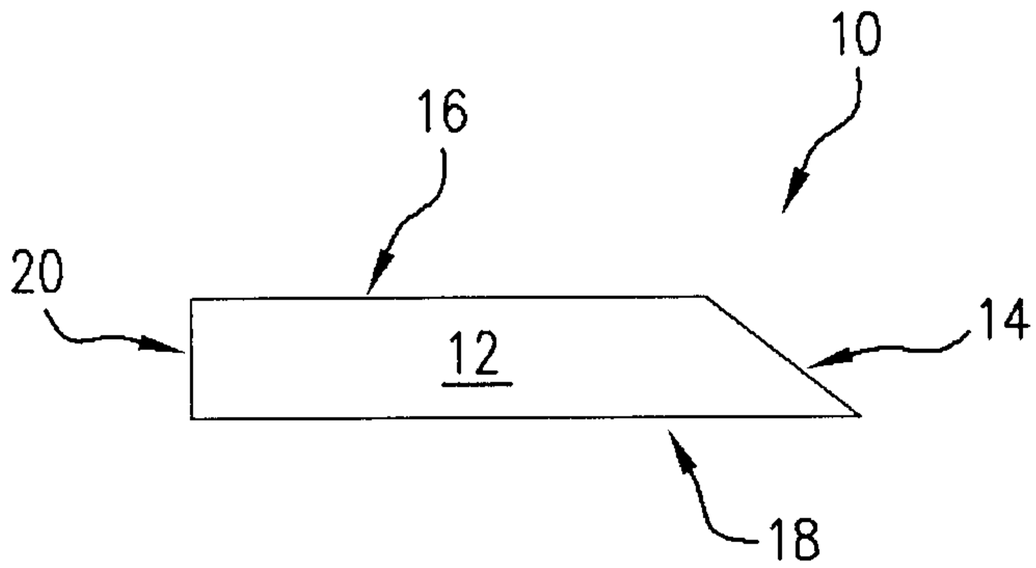


FIG.1A

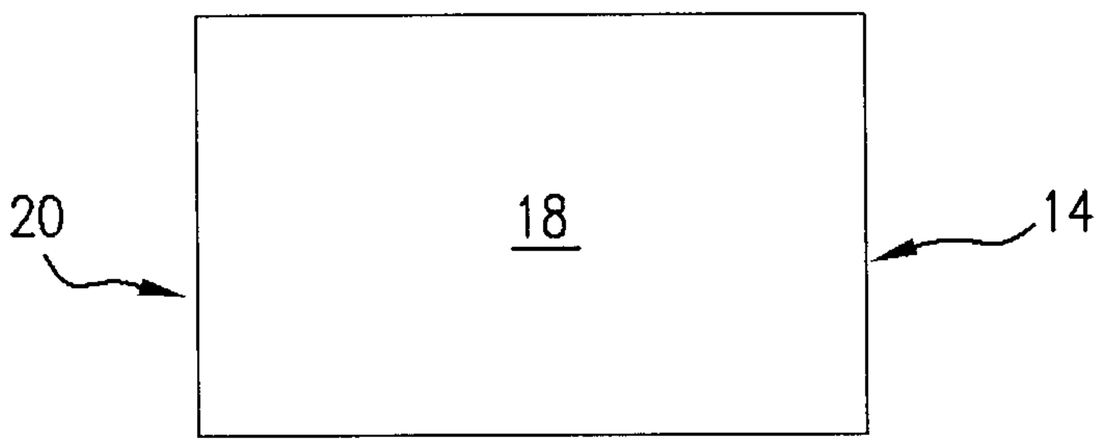


FIG.1B

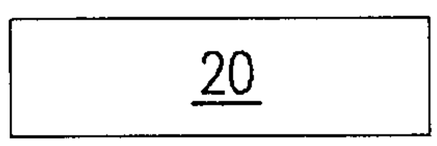


FIG.1C

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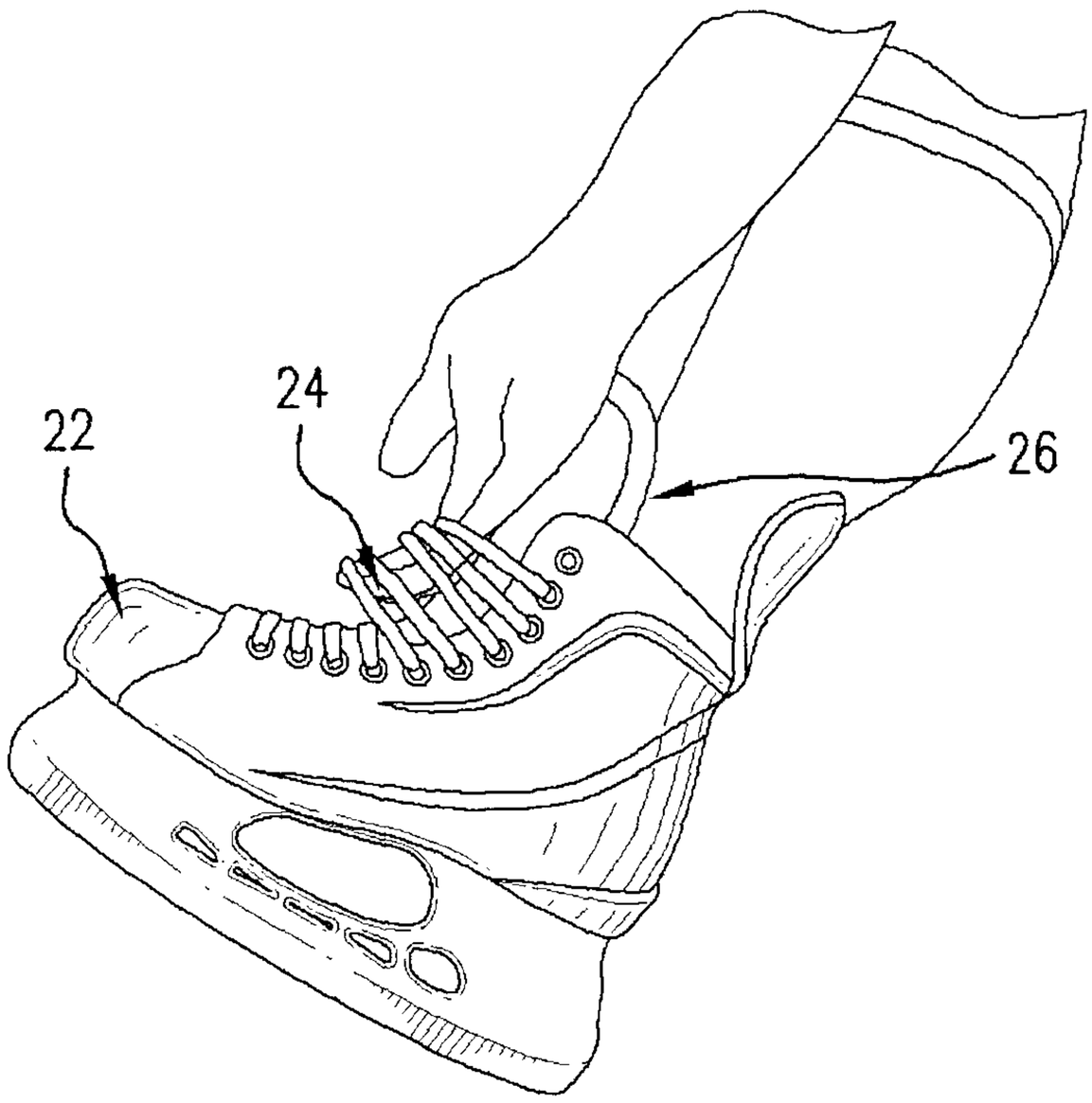

FIG.2A

FIG.2B

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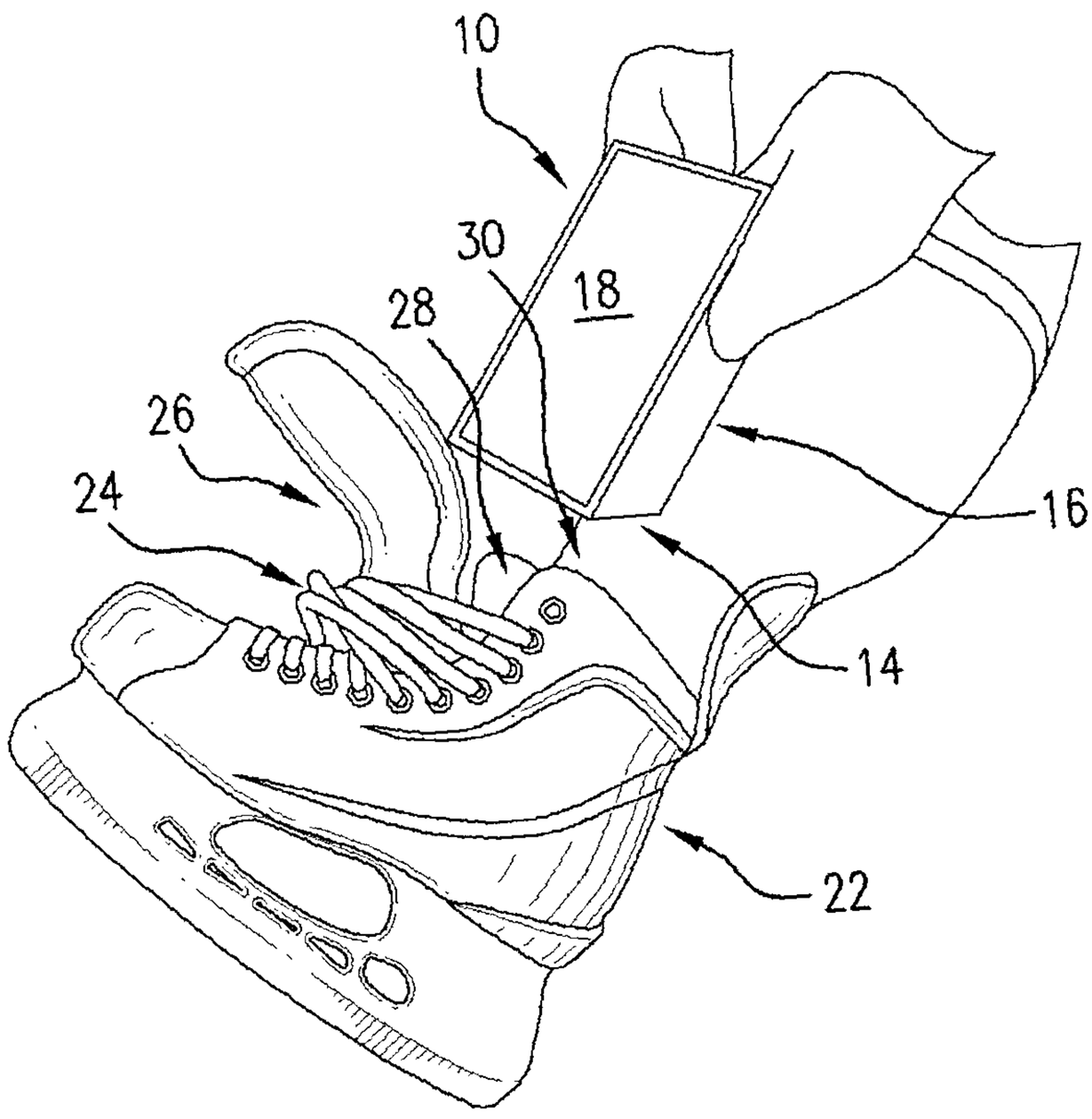

FIG.2C

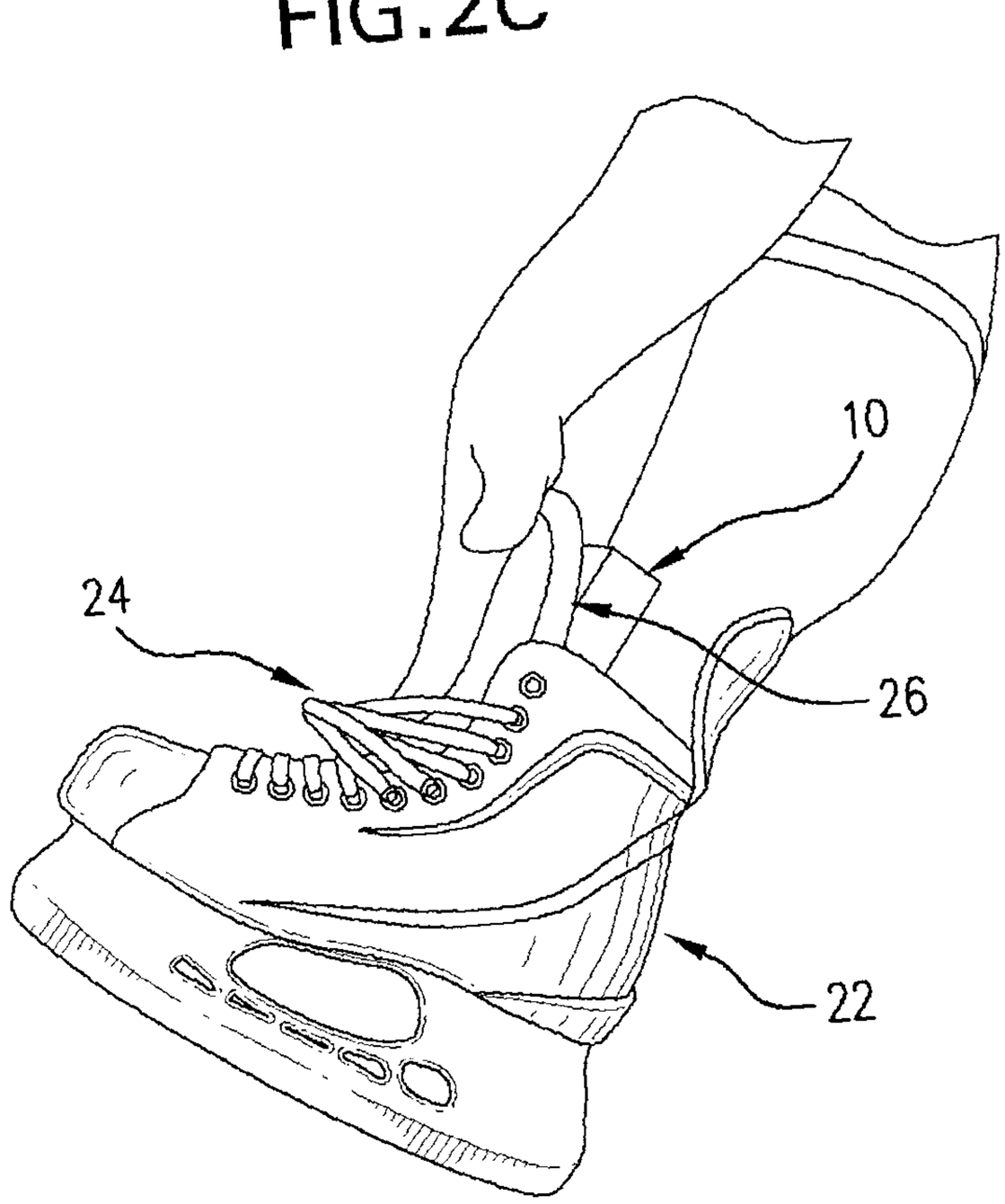

FIG.2D

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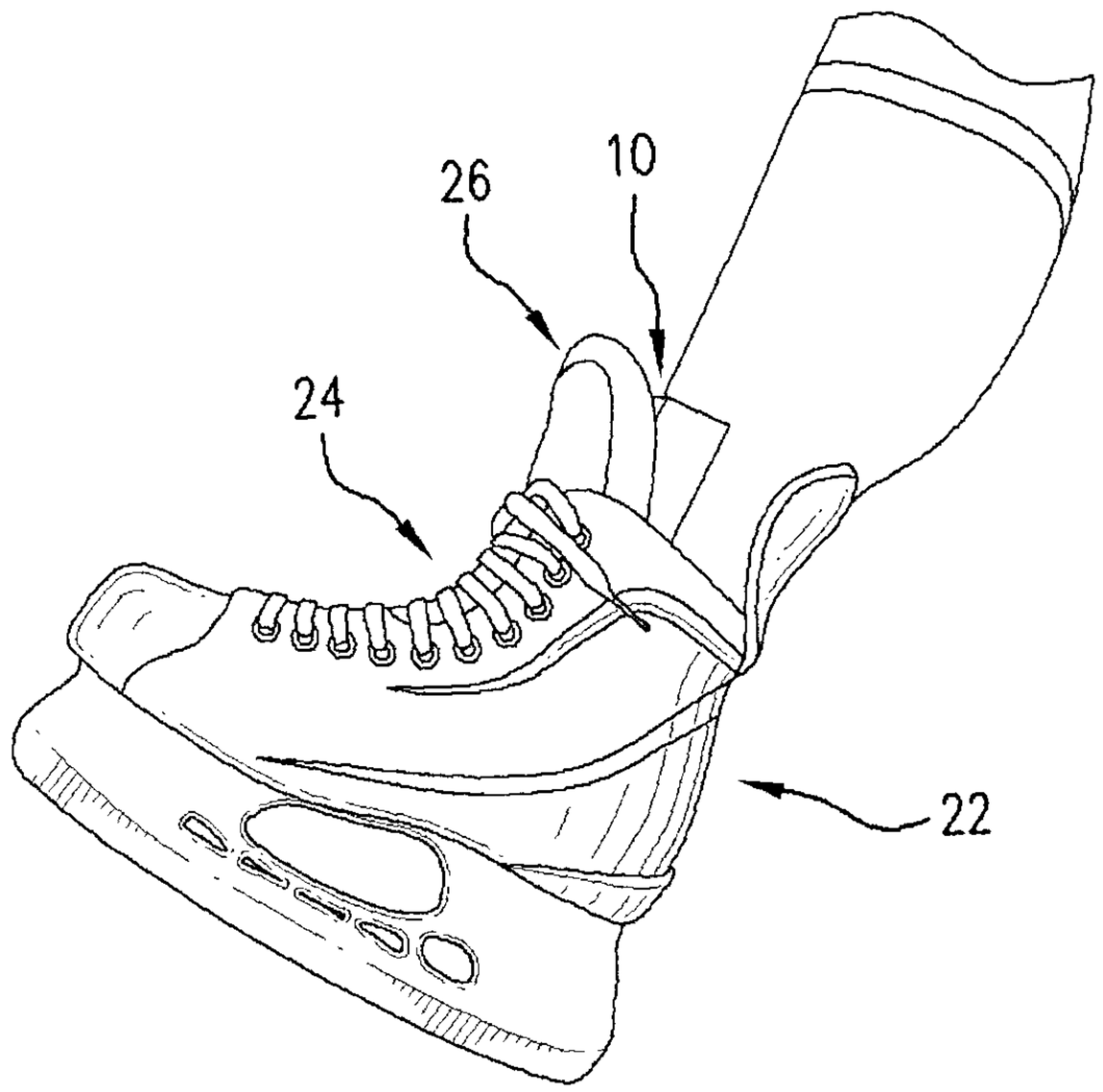
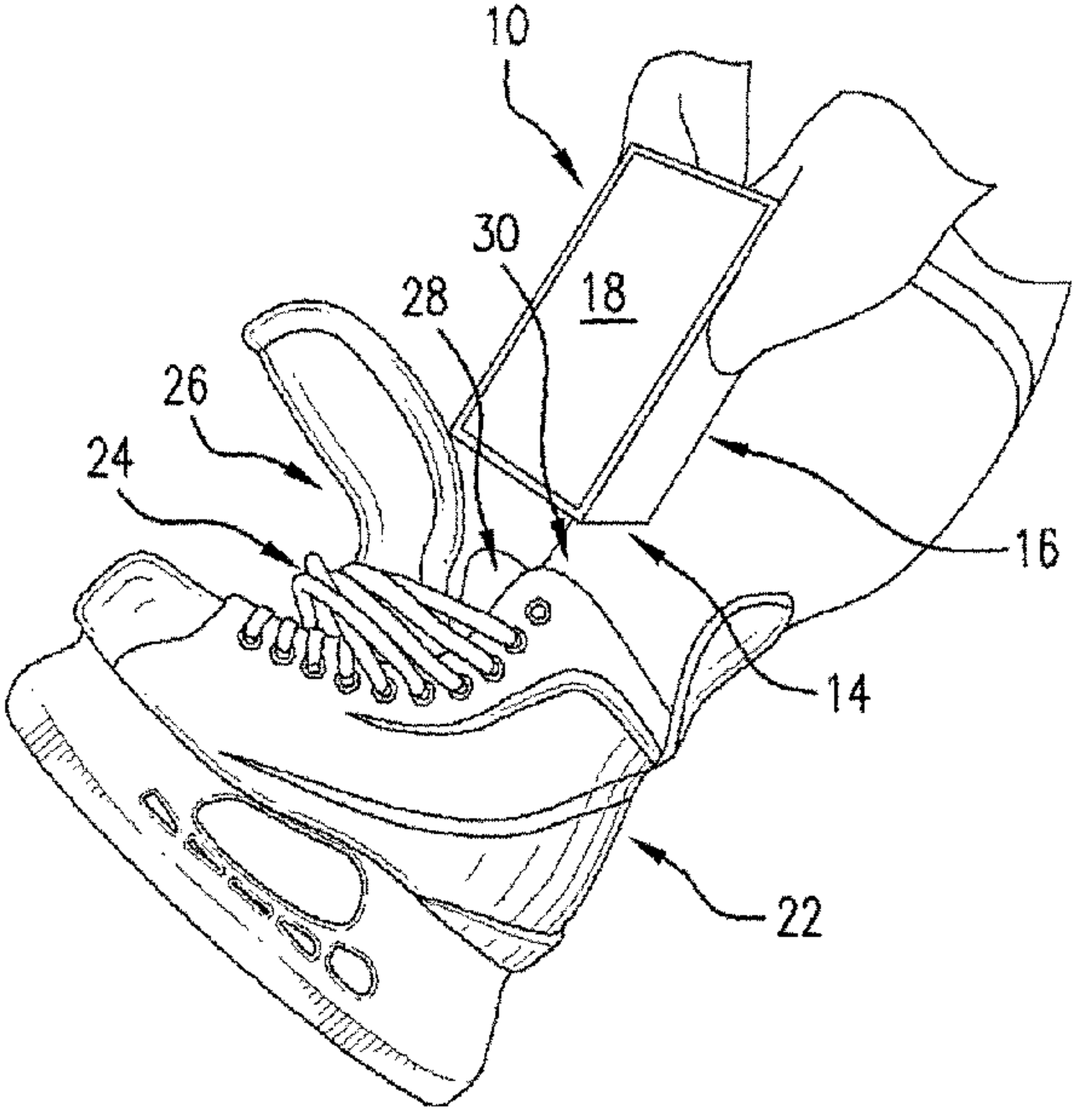


FIG.2E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