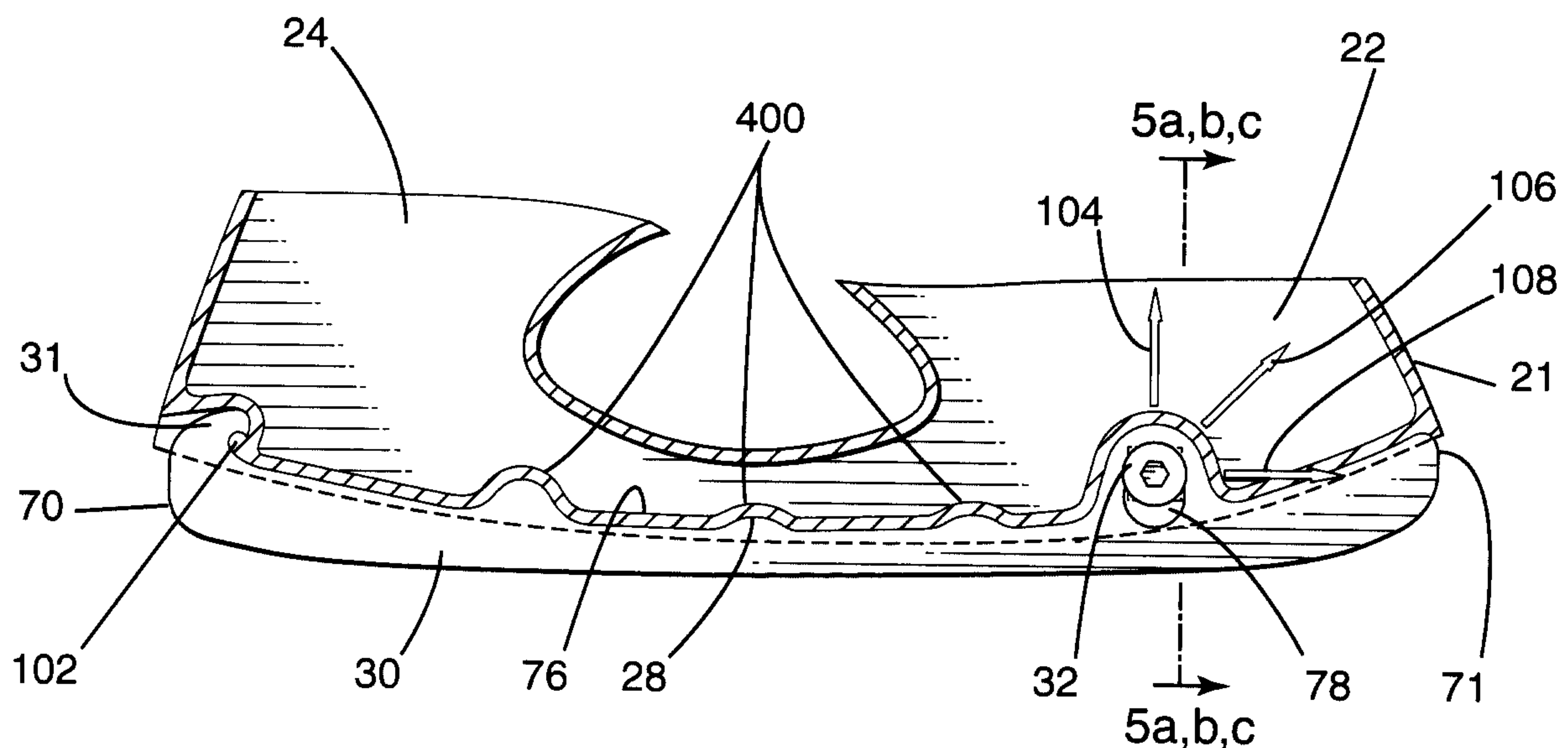




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(72) Inventeur/Inventor:
CHENEVERT, FRANCOIS, CA
(73) Propriétaire/Owner:
BAUER NIKE HOCKEY INC., CA
(74) Agent: SMART & BIGGAR

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(54) Title: ICE SKATE RUNNER



(57) **Abrégé/Abstract:**

An ice skate assembly with a provision for the replacement of ice skate runners. The ice skate assembly includes a moulded runner holder having a pair of side walls, the side walls extending downwards and forming a groove therebetween where a runner is received, a recess and a bore suitable for receiving a fastener. The ice skate runner is fastened to the runner holder by a runner projection suitable to be engaged with the recess on the moulded runner holder and a fastener passing transversely through the runner and through the bore of the moulded runner holder. The fastener is adapted to exert a force on the ice skate runner such that the hooked portion is engaged on the recess and the runner is secured to the runner holder. The force exerted on the ice skate runner comprises a generally longitudinal component, a generally upward component and a generally transversal component.



ABSTRACT

5 An ice skate assembly with a provision for the
replacement of ice skate runners. The ice skate assembly
includes a moulded runner holder having a pair of side
walls, the side walls extending downwards and forming a
groove therebetween where a runner is received, a recess
10 and a bore suitable for receiving a fastener. The ice
skate runner is fastened to the runner holder by a runner
projection suitable to be engaged with the recess on the
moulded runner holder and a fastener passing transversely
through the runner and through the bore of the moulded
15 runner holder. The fastener is adapted to exert a force
on the ice skate runner such that the hooked portion is
engaged on the recess and the runner is secured to the
runner holder. The force exerted on the ice skate runner
comprises a generally longitudinal component, a generally
20 upward component and a generally transversal component.

TITLE: ICE SKATE RUNNER**FIELD OF THE INVENTION**

5 This invention relates to ice skates, and more particularly to an ice skate assembly. The invention is directed to an improved runner holder and replaceable ice skate runner and tightening mechanism therefore.

10 **BACKGROUND**

 It is well known to form ice skate assemblies with a provision for the replacement of the runner, also known as the runner.

15

 Commonly, such assemblies comprise a runner holder commonly moulded from a thermoplastic material, having a groove there along within which the runner is received. In accordance with one proposal, the runner is locked to
20 the runner holder by two or more threaded fastener means that pass transversely through the runner and runner holder at longitudinally spaced apart intervals. This arrangement is advantageous in that it permits the rapid replacement of the runner by the use of two very simple
25 tools.

 In accordance with the second proposal, the runner is locked to the runner holder by two or more threaded fastener means which pass upwardly through the runner
30 holder. This second means of locking the runner to the runner holder is the choice of many persons, as it permits the runner to be strongly bias into contact with the runner holder. A deficiency in the above-described arrangement is that the replacement of the runner usually

necessitates demounting the assembly from the footwear such as to gain access to the threaded fastening means for the release thereof.

Another deficiency in the above-described arrangements is the requirement of using two or more fastener means. The use of two or more fastener means renders the change of a runner cumbersome as well as requiring a longer time to replace a runner.

Consequently there is a need in the industry to provide a runner that can easily be locked to and removed from the runner holder.

10

SUMMARY OF THE INVENTION

In accordance with a broad aspect, the invention provides an ice skate runner assembly for attachment to a skate boot, the ice skate runner assembly comprising: (a) an ice skate runner comprising a hooked portion at one end, an ice contacting edge extending, and an upper edge opposed to the ice contacting edge, the upper edge comprising a fastener aperture remote from the hooked portion; (b) a runner holder comprising front and rear pedestals with respective top portions for attachment to the skate boot and a bridge portion connecting the front and rear pedestals, the runner holder comprising a bore and a recess remote from the bore, the recess being adapted to receive the hooked portion of the ice skate runner; and (c) an attachment means for attaching and detaching the runner holder and the ice skate runner, the attachment means extending transversely through the fastener aperture and bore and being adapted to apply a force to the ice skate runner in a longitudinal direction and in an upward direction.

Preferably, the bore hole is a sole bore hole, the attachment means is a sole attachment means and the force further comprises a transversal component.

Advantageously, the invention allows attaching and detaching the runner and runner holder with a single attachment means.

In accordance with another aspect, the invention provides an ice skate runner assembly for attachment to a skate boot, the ice skate runner assembly comprising: (a) a runner holder comprising front and rear pedestals with respective top portions for attachment to the skate boot and a bridge portion connecting the front and rear pedestals, the runner holder further comprising a bottom portion having a recess and a bore remote from the recess; (b) an ice skate runner comprising a proximal end, a distal end remote from the proximal end, and an ice contacting edge extending from the proximal end to the distal end, the proximal end having a hooked portion for engaging within the recess of the runner holder, the distal end having a fastener aperture generally aligned with the bore of the runner holder; and (c) a fastener extending transversely through the fastener aperture and bore, the fastener being adapted to exert a force on the ice skate runner such that the projection is engaged within the recess of the runner holder.

In accordance with another aspect, the invention provides an ice skate runner adapted to be fastened to a runner holder having a recess adapted to engage a runner projection and a bore suitable for receiving a fastener. The ice skate runner comprises a runner projection at one end configured to engage the recess of the runner holder and a fastener aperture remote from the runner projection and adapted to align with the bore when in operation. The ice skate runner is adapted to be fastened to the runner holder by a fastener adapted to exert a force on the ice skate runner such that the runner projection is securely engaged on the recess of the runner holder.

Preferably, the ice skate runner is adapted to be fastened to the runner holder by a single fastener.

In accordance with another aspect, the invention provides an ice skate runner assembly for attachment to a skate boot, the ice skate runner assembly comprising: (a) a runner holder comprising: (i) front and rear pedestals with respective top portions for attachment to the skate boot, (ii) a bridge portion connecting the front and rear pedestals, and (iii) a bottom portion defining a longitudinal groove and having a recess and a bore remote from the recess, the bore extending transversely through the

bottom portion; (b) an ice skate runner comprising: (i) a proximal end with a hooked portion adapted to engage within the recess of the runner holder; (ii) a distal end remote from the proximal end; (iii) an ice contacting edge extending from the proximal end to the distal end; and (iv) an upper edge opposed to the ice contacting edge and adapted to be received in the longitudinal groove of the runner holder; wherein the distal end of the ice skate runner has a fastener aperture generally aligned with the bore of the runner holder, the fastener aperture extending transversely through the upper edge of the ice skate runner; and (c) a fastener extending transversely through the fastener aperture and bore, the fastener being adapted to exert a force on the ice skate runner such that the projection is engaged within the recess of the runner holder.

Preferably, the force exerted on the ice skate runner comprises a generally longitudinal component and a generally upward component.

Preferably, the force exerted on the ice skate runner further comprises a transversal component.

Other aspects and features of the present invention will become apparent to those ordinary skilled in the art upon review of the following description of specific embodiments of the invention in conjunction with the accompanying figure.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a side elevation view of a skate comprising an ice skate runner assembly according to the spirit of the invention mounted to a typical skate boot;

Figure 2a is a perspective view of a runner holder according to a specific example of the invention
5 prior to installation on a skate boot;

Figure 2b is a sectional view of the runner holder of figure 2a according to a specific example of the invention;

10 Figure 3 is a side elevation view of an ice skate runner in accordance with a specific example of the invention;

Figure 4 is a sectional view of an ice skate runner assembly according to a specific example of the
15 invention;

Figures 5a, 5b, 5c are sectional views of the runner holder of Figure 4 taken at line 5a, b, c;

Figures 6a, 6b, 6c and 6d are view of variants of fasteners suitable for use in the ice skate runner
20 assembly of figure 4.

DETAILED DESCRIPTION

Figure 1 illustrates an ice skate 19 having a
25 typical skate boot 18 to which is secured an ice skate runner assembly in accordance with a specific example of the invention. Skate boot 18 traditionally features a toe portion 60 at the front of boot 18 to enclose the skater's toes, a heel portion 61 at the rear of boot 18,
30 to support the heel of the skater, side panels 68 on each side of boot 18 to laterally support the foot and an

outsole 62 extending from the heel portion 61 to the toe portion 60 and affixed, usually with glue or fasteners, to the bottom of boot 18. The outsole 62 is usually made of a rigid plastic and serves as an anchoring platform
5 for the runner holder 20.

The upper portion of boot 18 comprises an ankle portion 63, enclosing and supporting the ankle of the skater, and a tendon guard 64 extending upwardly from
10 ankle portion 63 to add support to the ankle and protection to the Achilles tendon of the skater. A tongue 65 is attached to the inner side of toe portion 60 and covers the entire frontal area of the foot, the frontal area of the ankle and lower front portion of the
15 leg. An opening is defined between each side panel 68 and tongue 65 for insertion and removal of the foot. Laces are traditionally attached to lacing apertures 66, which extend along the edge of each side panel 68 and enable the wearer to firmly enclose his foot in boot 18.

20

The ice skate assembly comprises a runner holder 20, an ice skate runner 30 and a fastener 32 adapted to secure the ice skate runner 30 to the runner holder 20.

25 As seen in figure 2a, the runner holder 20 is formed of an elongated plastic moulded frame 21 having a front pedestal 22 adapted to be secured underneath toe portion 60 of skate boot 18, a rear pedestal 24 adapted to be secured underneath heel portion 61 of skate boot 18 and a
30 bridge portion 26 connecting front and rear pedestals 22 and 24 of the runner holder 20. Bridge portion 26

thereby defines an opening 25 in the central area of runner holder 20. Runner holder 20 is rigidly attached to skate boot 18 by fastening front and rear pedestals 22 and 24 to the outsole 62 of skate boot 18 with suitable
5 fasteners. The elongated plastic moulded frame 21 defines a pair of side walls extending downwards and forming a groove 28 therebetween, the groove being adapted to receive the ice skate runner 30.

10 In a specific example of the invention, the elongated frame 21 is made up of two longitudinal segments that are glued, welded, fused or otherwise suitably coupled together with a fastener along the central axis of frame 21. However, the elongated frame 21
15 may be made up of a single segment without detracting from the spirit of the invention.

Figure 2a illustrates runner holder 20 prior to attachment to skate boot 18. Front and rear pedestals 22
20 and 24 are of hollow construction for weight reduction and moulding requirements. A plurality of anchoring projections 34 extend from walls 37 of front and rear pedestals 22 and 24. Each anchoring projection 34 features an aperture 35 provided to fasten runner holder
25 20 to outsole 62 of skate boot 18 with suitable fasteners. The elongated frame 21 is provided with a bore 33 suitable for receiving fastener 32, which locks the ice skate runner 30 to frame 21. In a specific example, the elongated frame 21 comprise a sole bore 33.

30

Figure 2b illustrates a sectional view of the elongated frame 21. The elongated frame 21 is further provided with a recess 102 adapted to engage a runner projection. In a specific example, the recess 102 is a
5 pivot member as shown in figure 4 securely mounted on the wall of the elongated frame 21. The pivot member may be an integral part of the elongated frame 21 or a separate component mounted on the elongated frame 21.

10 Figure 3 shows a side elevation view of an ice skate runner 30. In a specific example of the invention, the ice skate runner 30 is a narrow steel strip extending along the length of runner holder 20. The ice skate runner comprises a lower ice contacting edge 75, an upper
15 edge 76 generally opposed to the lower edge 75. The upper edge is adapted to be received by the groove 28 of the moulded runner holder 20. The ice skate runner has a projection 31 at one end configured to engage the recess 102 of the runner holder 20. In a specific example, the
20 projection 31 is a hooked portion 31 suitable to engage the pivot member 102 of the moulded runner holder 20. The ice skate runner has a fastener aperture 78 remote from said runner projection 31 adapted to generally align with the bore 33 of the runner holder 20. The fastener
25 aperture 78 is generally elliptical in configuration and is suitable for receiving the fastener 32 there through.

As shown in figure 4, when the ice skate runner 30 is positioned with the upper edge 76 in the groove 28 of
30 the runner holder 20 and the runner projection 31 is engaged with the recess 102 of the moulded runner holder

20, the fastener aperture 78 is essentially aligned with the bore 33 of the runner holder 20.

5 The ice skate runner is sharpened on its lower ice contacting edge 75 and provided with protrusions 400 on its upper side 76. In a specific example of the invention, the ice skate runner has a curved profile, which is accentuated near its extremities 70 and 71. The ice skate runner 30 is inserted into the longitudinal
10 groove 28 of the runner holder and secured to frame 21 with runner protection 31, which engages onto recess 102 defining pivot point 74 and front fastener 32 (shown in Figure 1), which locks fastener aperture 78 to frame 21.

15 As a variant, the upper edge 76 of the ice skate runner 30 includes a plurality of longitudinally spaced apart protrusions 400, the protrusions 400 being adapted to stabilise the ice skate runner in the groove 28 of the runner holder 20. In a specific example, the walls of
20 the runner holder 20 are provided with a plurality of cavities adapted to engage with the protrusions of the ice skate runner.

In a specific example, fastener 100 passes
25 transversely through the fastener aperture 78 of the ice skate runner 30 and the bore 33 of the moulded runner holder 20. Fastener 100 is adapted to exert a force on the ice skate runner such that the runner projection 31 is engaged on the recess 102 of the runner holder 20.

30

Advantageously, fastener 32 allows the ice skate runner 30 to be secured to the runner holder by a sole attachment means.

Figures 5b and 5c show transversal sectional view of the ice skate runner and runner holder assembly. In a first embodiment shown in figure 5b, the fastener 32 includes a threaded nut 200 and a threaded bolt 100. The threaded nut 200 is imbedded in a wall 206 of the runner holder 20 and the bolt 100 is adapted in operation to pass through the fastener aperture 78 and the bore 33 in the runner holder 20 and be fixedly secured in the nut 200. In this configuration, the nut 200 may be inserted subsequently to the moulding of the runner holder. A variant, the nut 200 is separate from the runner holder and is secured to the runner holder by the action of the bolt 100.

15

In a second embodiment shown in figure 5c, the threaded nut 202 is imbedded in a wall 206 of the runner holder 20 and the bolt 100 is adapted to pass through the fastener aperture 78 and the bore 33 in the runner holder 20 and be fixedly secured in the nut 202.

20

The bolt 100 includes a tapered head. Figures 6a and 6b shows specific examples of a conical bolt suitable for use as a fastener. The conical bolt 100 includes a tapered head portion 600 and a threaded lower portion 602. Figures 6c and 6d show an alternative embodiment of the fastener comprises a conventional bolt 604 and a sleeve 606. In operation, the sleeve 606 is slipped around the bolt 604 such as to provide a tapered head.

25

30

As shown in figure 4 and 5a, the force exerted on the ice skate runner comprises a generally longitudinal component 108, a generally transversal component 210 and a generally upward component 104. For the purpose of illustration, the force exerted on the ice skate runner

35

is drawn in figures 4 and 5a as forces 106 and 208 in the planes defined by components 104 108 and 210 104 respectively. The longitudinal component 108 allows the projection 31 to be securely engaged to recess 102 and
5 puts the ice skate runner under tension. The upward component 104 is operative to secure the upper edge 76 of the ice skate runner 30 within the groove 28 of the runner holder 20. The transverse component 210 is operative to secure the ice skate runner 30 to the wall
10 of the runner holder 20.

Advantageously, when the fastener with a tapered head passes through the fastener aperture 78 and the bore 33 and is secured in the nut, the tapered head produces a
15 force 106 208 on the runner 30 thereby securing the runner 30 to the runner holder 20 under tension by securely engaging the runner projection 31 and the recess 102.

20 Advantageously, the use of a generally elliptical fastener aperture 78 in conjunction with a tapered head allows the tapered head to produce an upward force on the runner 30 thereby securing the runner 30 to the runner holder 20 under tension.

25

The runner holder comprises an inner wall 204 and an outer wall 206 defining an inner side and an outer side of the ice skate runner 30. Preferably, but not essentially, the fastener is positioned such that the
30 head of the bolt is on the inner wall 204 the runner holder when in operation. Advantageously, positioning the fastener on the inner wall 204 of the runner holder allows a person wearing skates having the runner holder assembly to conveniently replace the runner 30 without
35 removing the ice skates.

Although the present invention has been described in considerable detail with reference to certain preferred embodiments thereof, variations and refinements are possible without departing from the spirit of the invention. Therefore, the scope of the invention should be limited only by the appended claims and their equivalents.

CLAIMS

1. An ice skate runner assembly for attachment to a skate boot, said ice skate runner assembly comprising:
 - (a) an ice skate runner comprising a hooked portion at one end, an ice contacting edge, and an upper edge opposed to said ice contacting edge, said upper edge comprising a fastener aperture remote from said hooked portion;
 - (b) a runner holder comprising front and rear pedestals with respective top portions for attachment to the skate boot and a bridge portion connecting said front and rear pedestals, said runner holder comprising a bore and a recess remote from said bore, said recess being adapted to receive said hooked portion of said ice skate runner; and
 - (c) an attachment means for attaching and detaching said runner holder and said ice skate runner, said attachment means extending transversely through said fastener aperture and bore and being adapted to apply a force to said ice skate runner in a longitudinal direction and in an upward direction.
2. The ice skate runner assembly as defined in claim 1, wherein said attachment means is further adapted to apply a force to said ice skate runner in a transverse direction.
3. The ice skate runner assembly as defined in claim 1 or 2, wherein said bore is a sole bore and said attachment means is a sole attachment means.
4. The ice skate runner assembly as defined in any one of claims 1 to 3, wherein said attachment means comprises a threaded nut and a threaded bolt; said nut being imbedded in said runner holder and said bolt being adapted in operation

to pass through said fastener aperture and bore and be fixedly secured in said nut.

- 5 5. The ice skate runner assembly as defined in claim 4, wherein said bolt is tapered.
6. The ice skate runner assembly as defined in any one of claims 1 to 5, wherein said fastener aperture is generally elliptical.
- 10 7. The ice skate runner assembly as defined in claim 5, wherein said fastener aperture is generally elliptical and wherein, in operation, when said tapered bolt passes through said generally elliptical fastener aperture and bore and is secured in said nut, said tapered bolt produces an upward force on said ice skate runner thereby securing said ice skate runner to said runner holder under
15 tension.
8. An ice skate runner assembly for attachment to a skate boot, said ice skate runner assembly comprising:
 - 20 (a) a runner holder comprising front and rear pedestals with respective top portions for attachment to the skate boot and a bridge portion connecting said front and rear pedestals, said runner holder further comprising a bottom portion having a recess and a bore remote from said recess;
 - 25 (b) an ice skate runner comprising a proximal end, a distal end remote from said proximal end, and an ice contacting edge extending from said proximal end to said distal end, said proximal end having a hooked portion for engaging within said recess of said runner holder,
30 said distal end having a fastener aperture generally aligned with said bore of said runner holder; and

- (c) a fastener extending transversely through said fastener aperture and bore, said fastener being adapted to exert a force on said ice skate runner such that said projection is engaged within said recess of said runner holder.

5

9. The ice skate runner assembly as defined in claim 8 wherein the force exerted on said ice skate runner has a longitudinal component and an upward component.

10

10. The ice skate runner assembly as defined in claim 8 or 9 wherein said fastener comprises a threaded nut and a threaded bolt, said threaded nut being embedded in said ice skate runner.

15

11. The ice skate runner assembly as defined in claim 10 wherein said bolt is tapered.

12. The ice skate runner assembly as defined in claim 11 wherein said fastener comprises a conical bolt.

20

13. The ice skate runner assembly as defined in any one of claims 8 to 12, wherein said ice skate runner comprises an upper edge opposed to said ice contacting edge and wherein said fastener aperture extends through said upper edge.

25

14. The ice skate runner assembly as defined in any one of claims 8 to 13, wherein said ice skate runner comprises respective inner and outer sides, said fastener being positioned on said inner side.

30

15. The ice skate runner assembly as defined in any one of claims 8 to 12, wherein said bottom portion of said runner holder comprises a longitudinal groove and said ice skate runner comprises an upper edge opposed to said ice contacting edge, said upper edge comprising a plurality of longitudinally spaced apart

protrusions for stabilizing said ice skate runner in said longitudinal groove of said runner holder.

16. An ice skate runner assembly for attachment to a skate boot, said ice skate runner assembly comprising:

(a) a runner holder comprising:

- (i) front and rear pedestals with respective top portions for attachment to the skate boot,
- (ii) a bridge portion connecting said front and rear pedestals, and
- (iii) a bottom portion defining a longitudinal groove and having a recess and a bore remote from said recess, said bore extending transversely through said bottom portion;

(b) an ice skate runner comprising:

- (i) a proximal end with a hooked portion adapted to engage within said recess of said runner holder;
- (ii) a distal end remote from said proximal end;
- (iii) an ice contacting edge extending from said proximal end to said distal end; and
- (iv) an upper edge opposed to said ice contacting edge and adapted to be received in said longitudinal groove of said runner holder; wherein said distal end of said ice skate runner has a fastener aperture generally aligned with said bore of said runner holder, said fastener aperture extending transversely through said upper edge of said ice skate runner; and

(c) a fastener extending transversely through said fastener aperture and bore, said fastener being adapted to exert a force on said ice skate runner such that said projection is engaged within said recess of said runner holder.

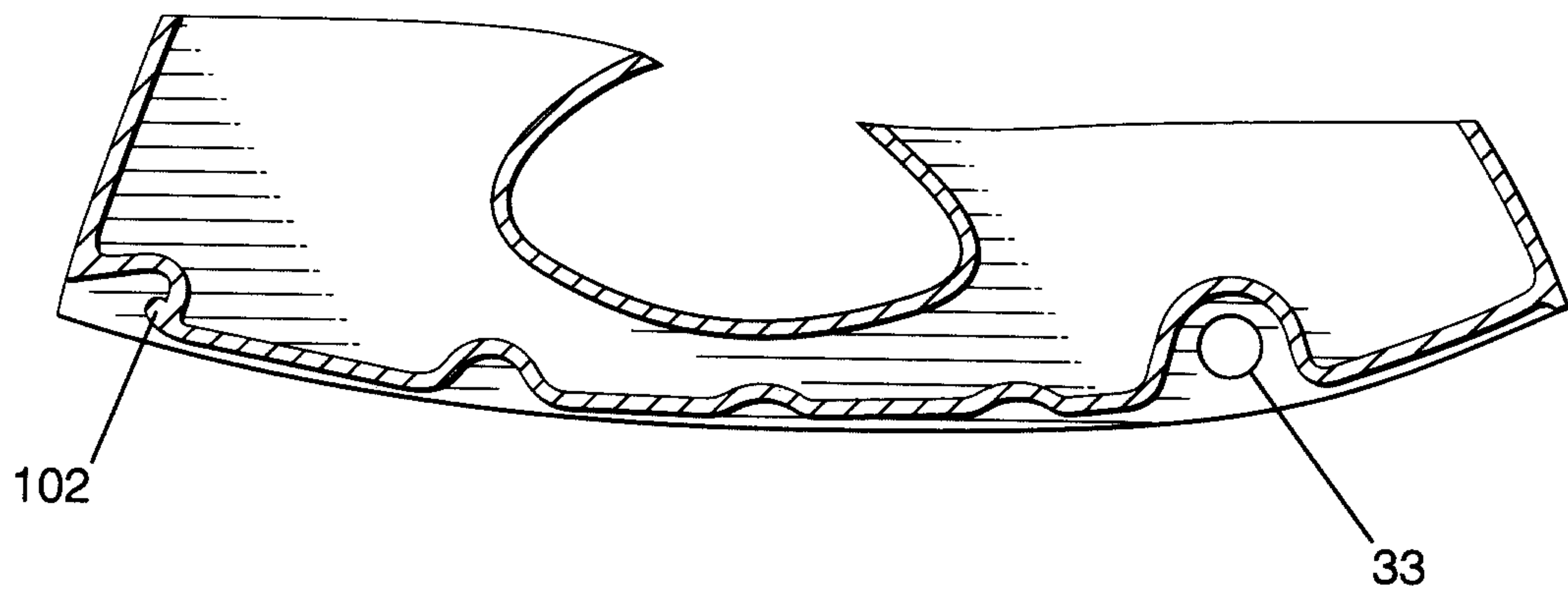


Fig. 2b

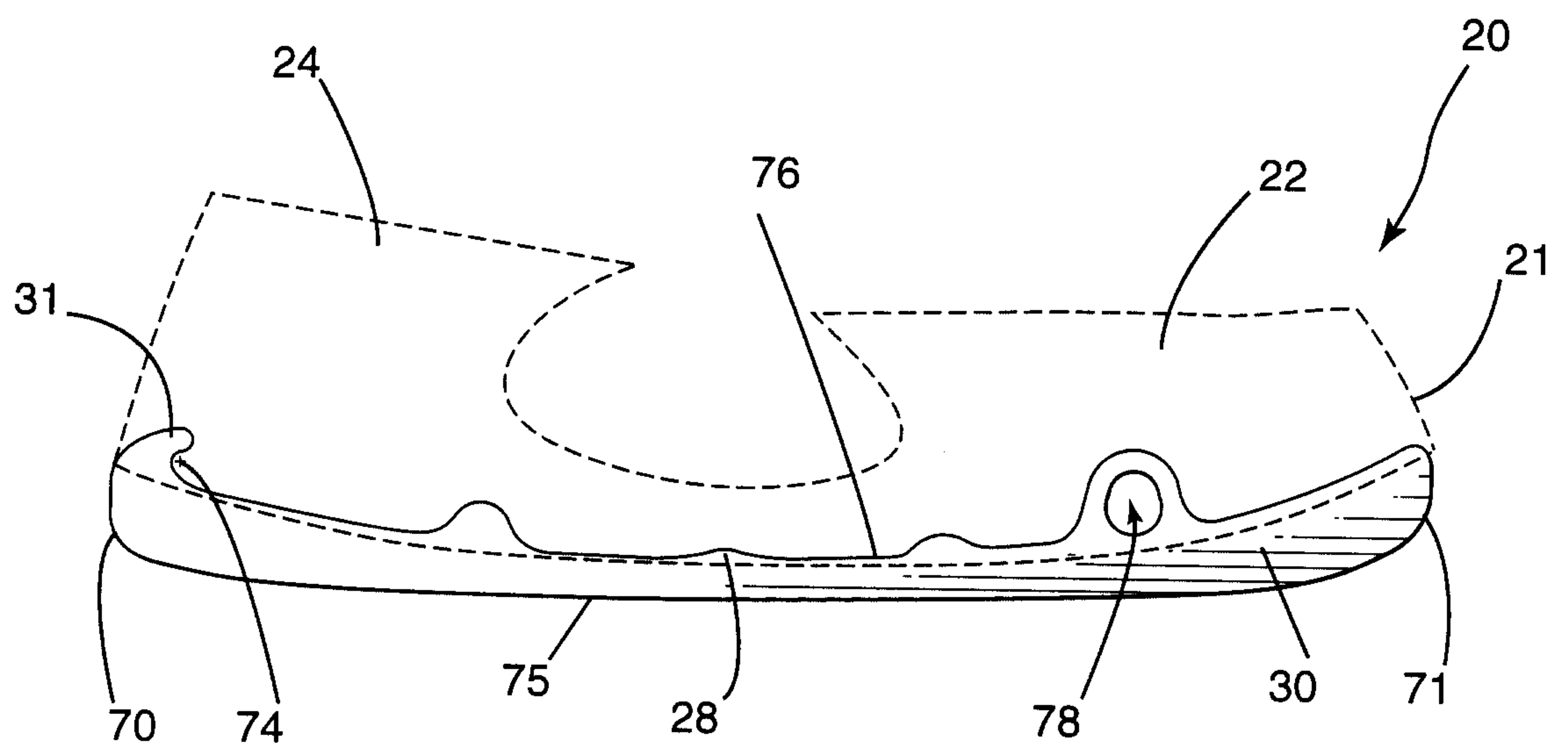


Fig. 3

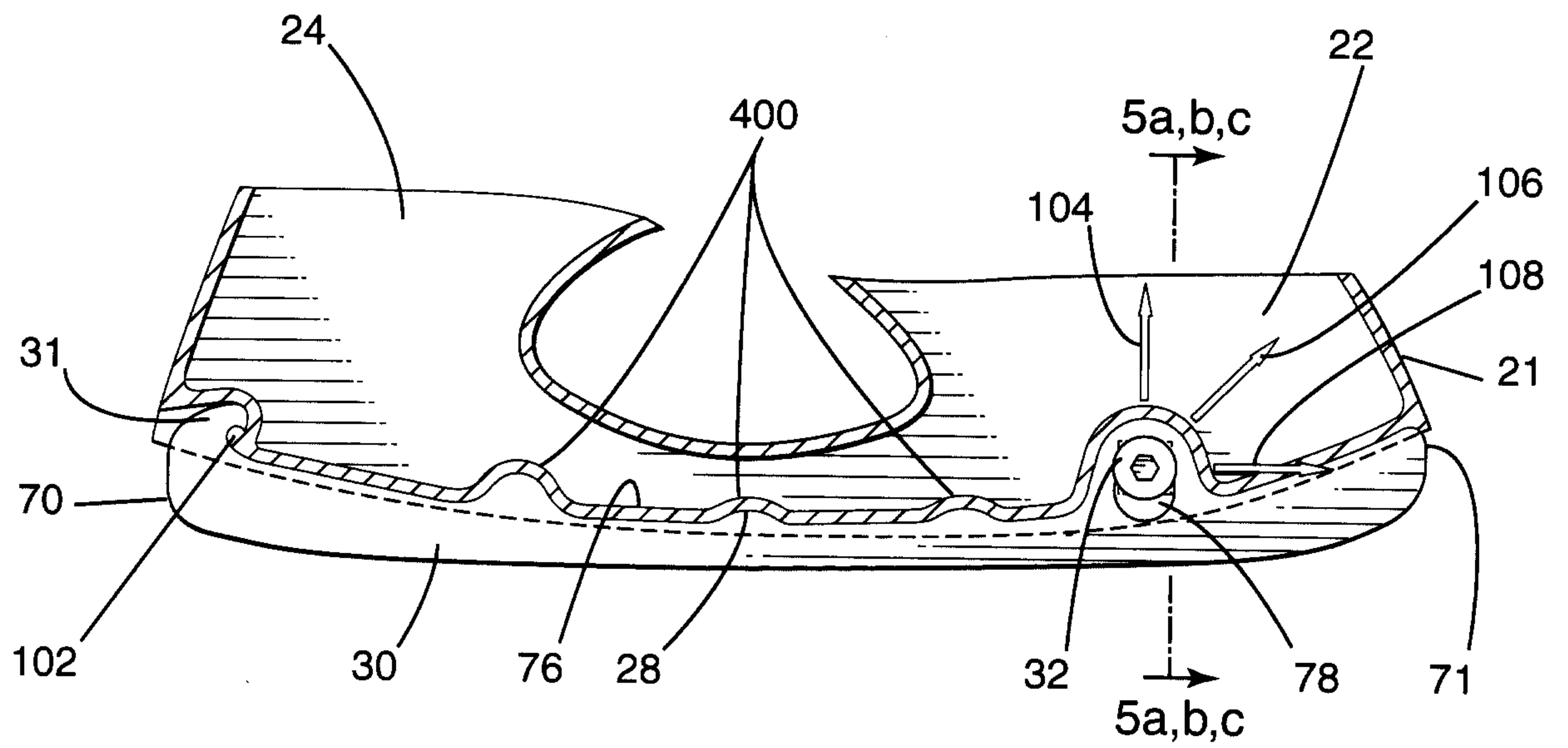


Fig. 4

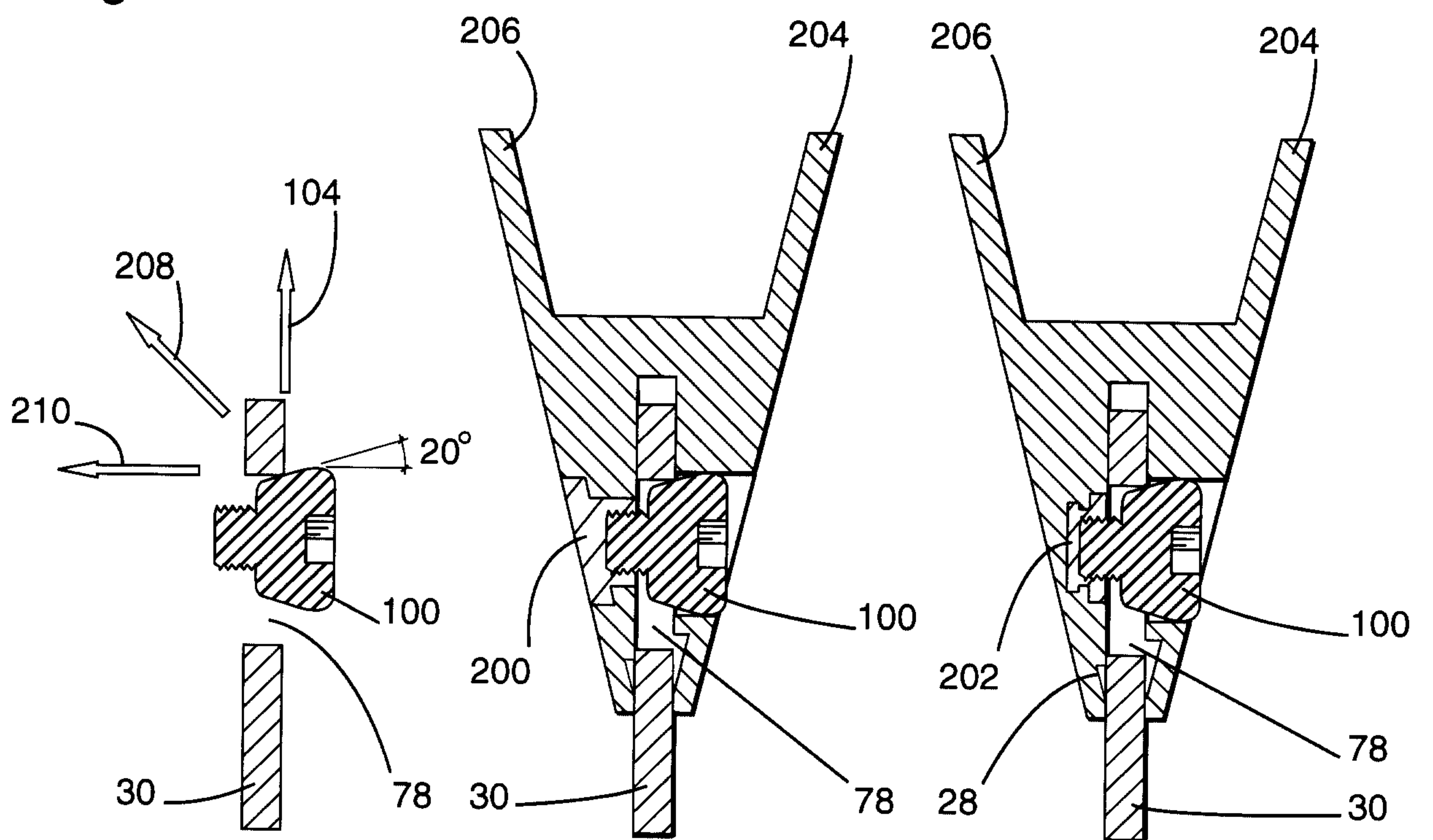


Fig. 5a

Fig. 5b

Fig. 5c

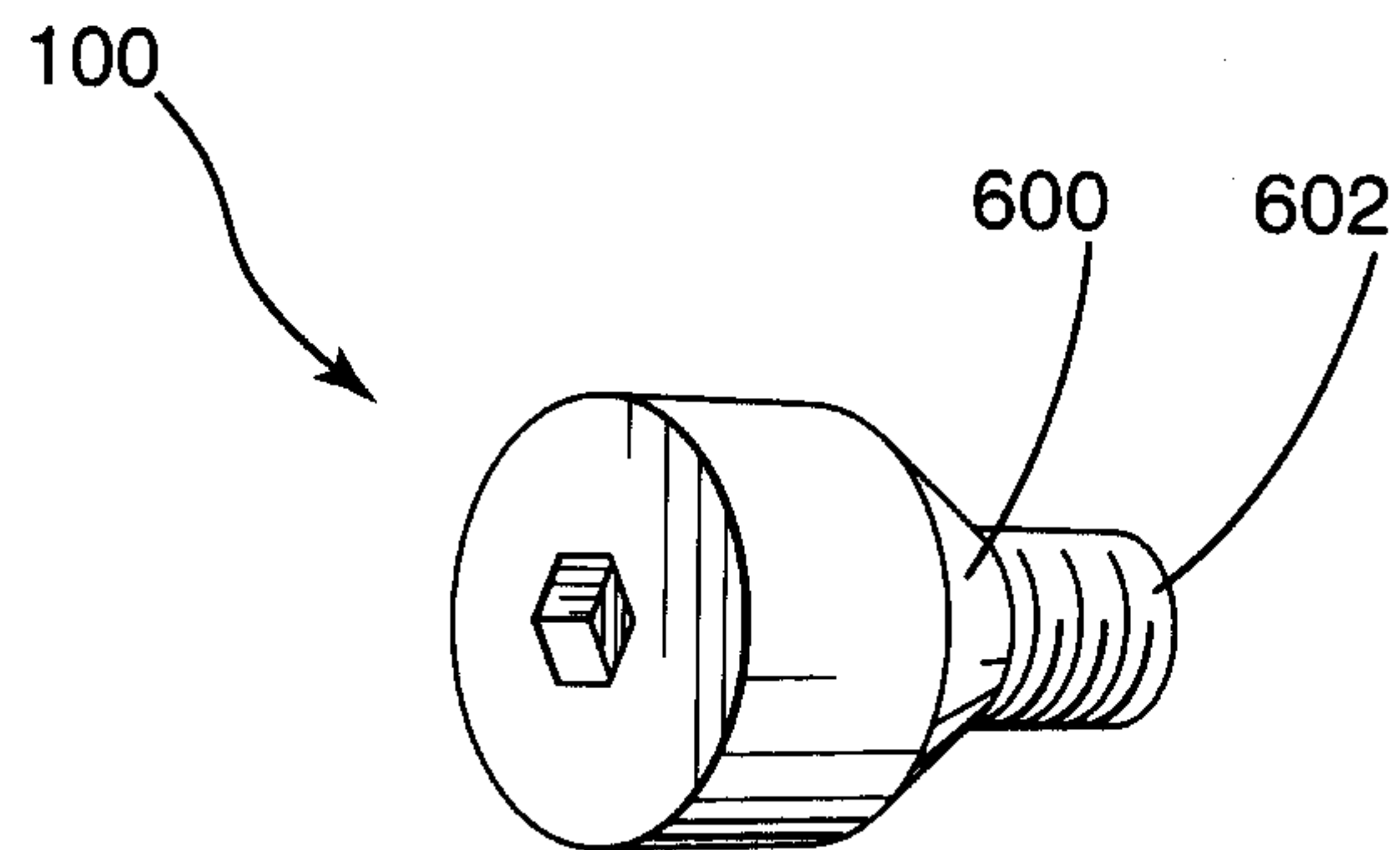


Fig. 6a

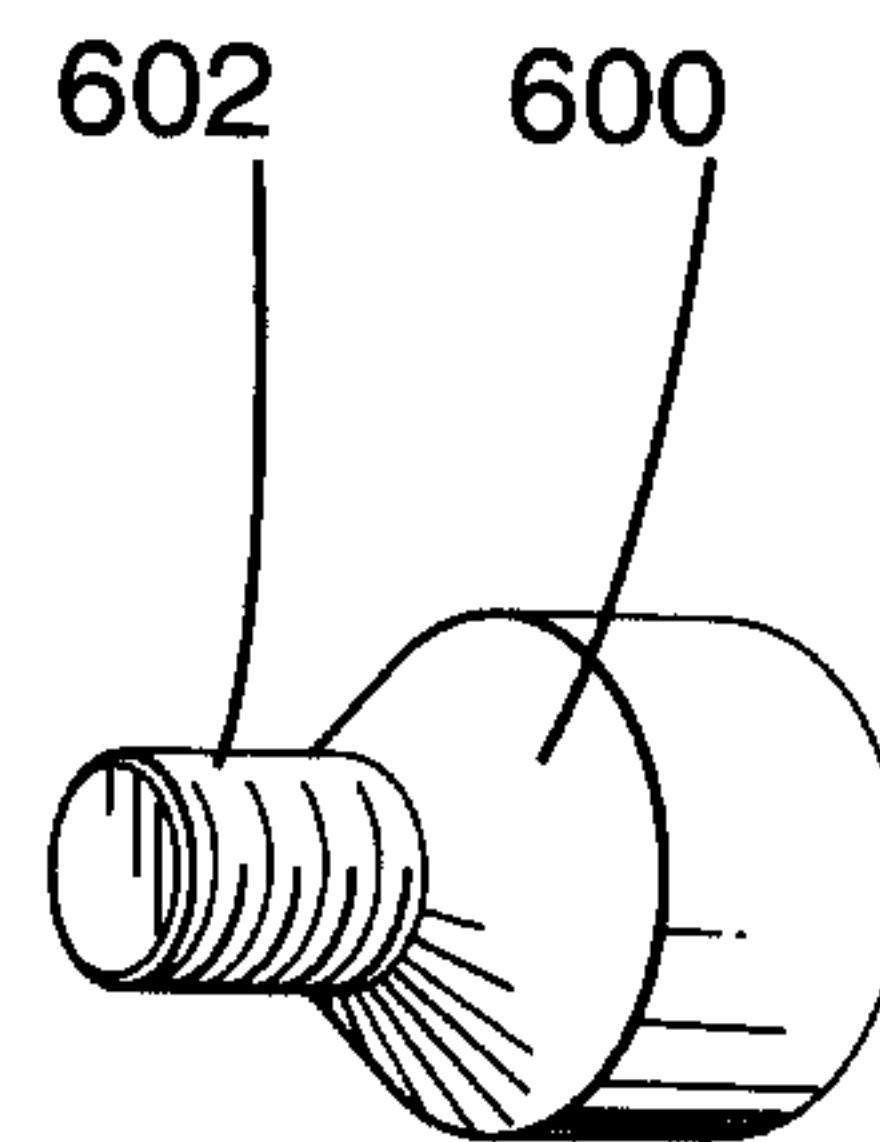


Fig. 6b

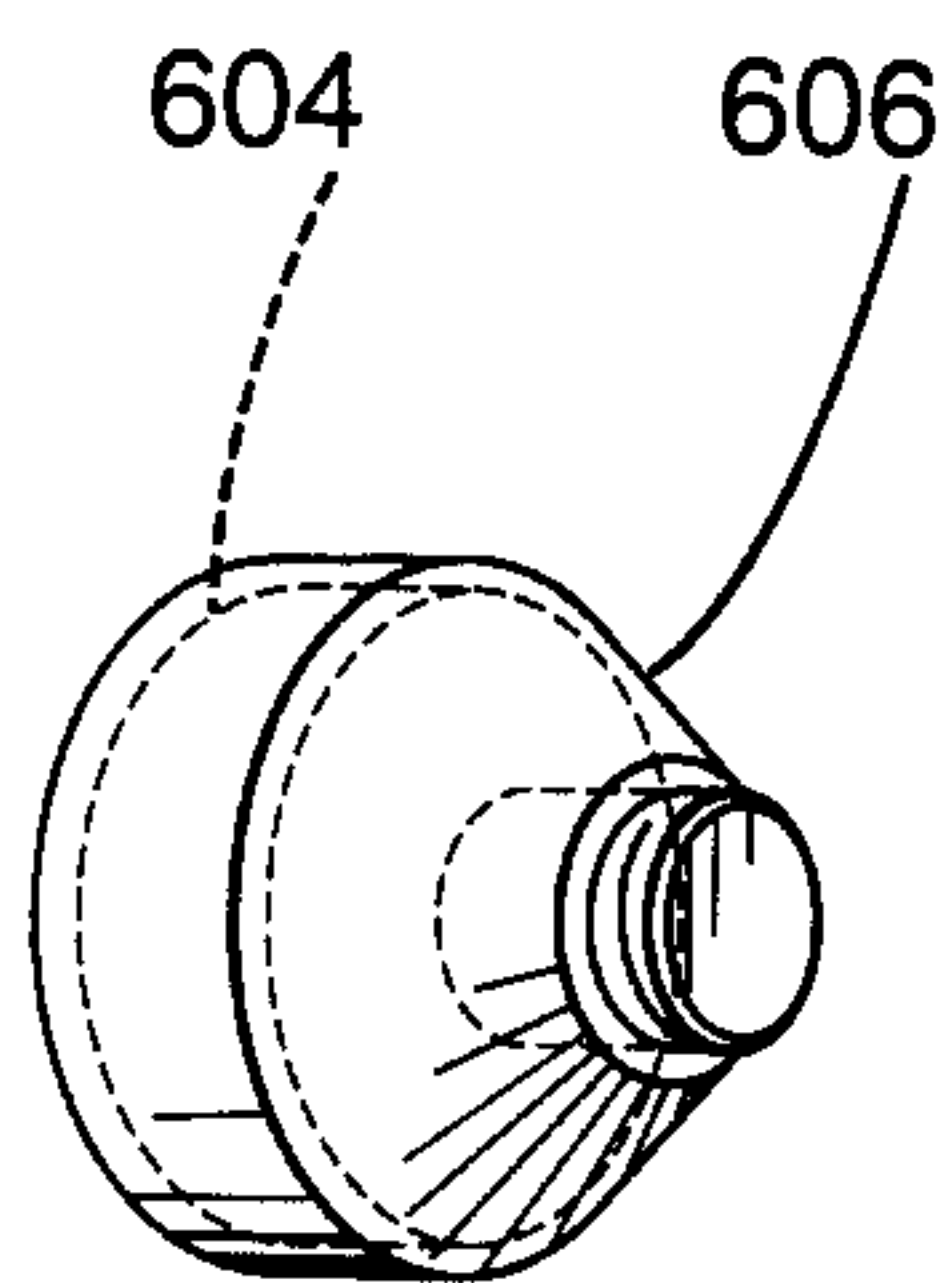


Fig. 6c

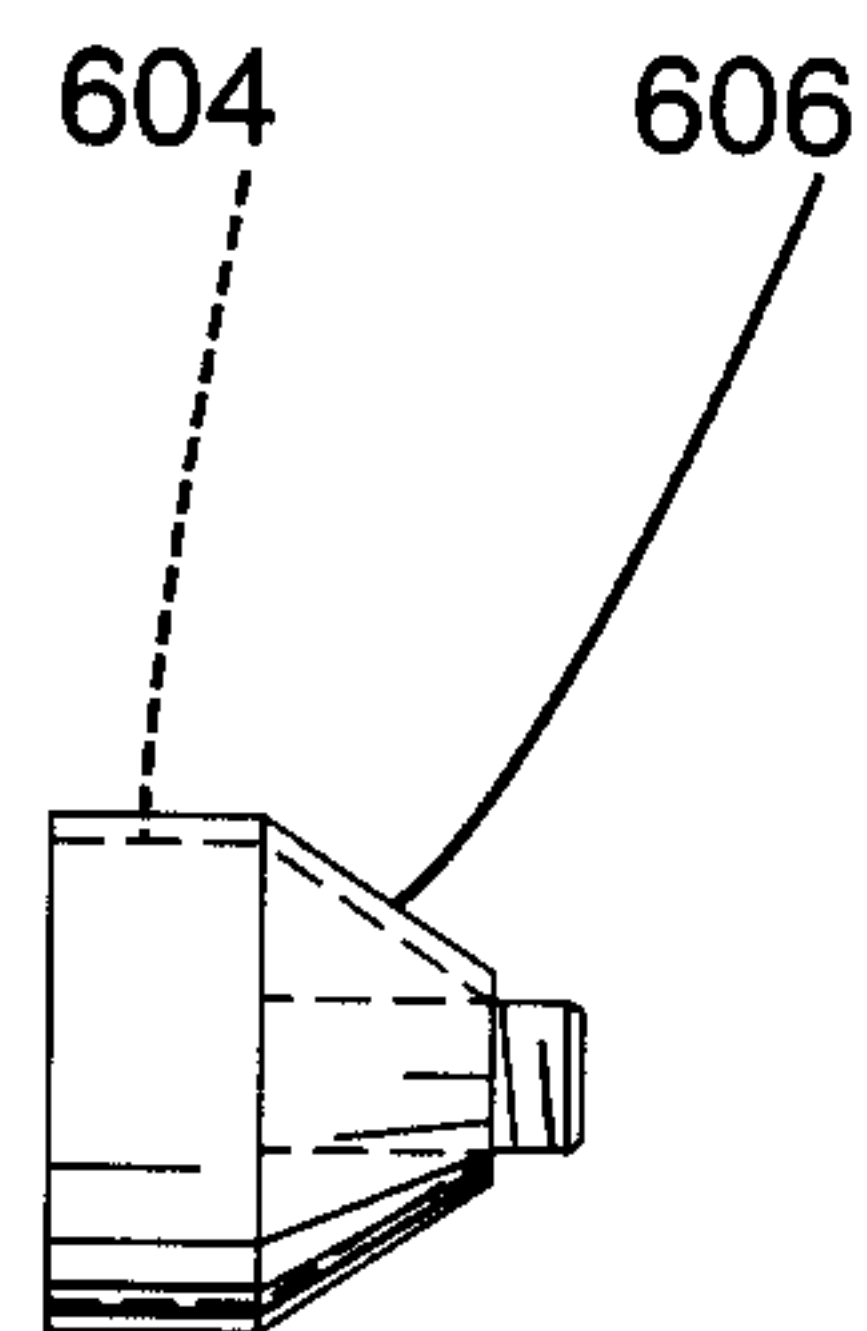


Fig. 6d

