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(54) **EXPANDABLE TONGUE FOR  
ARTICULATED BOOTS**

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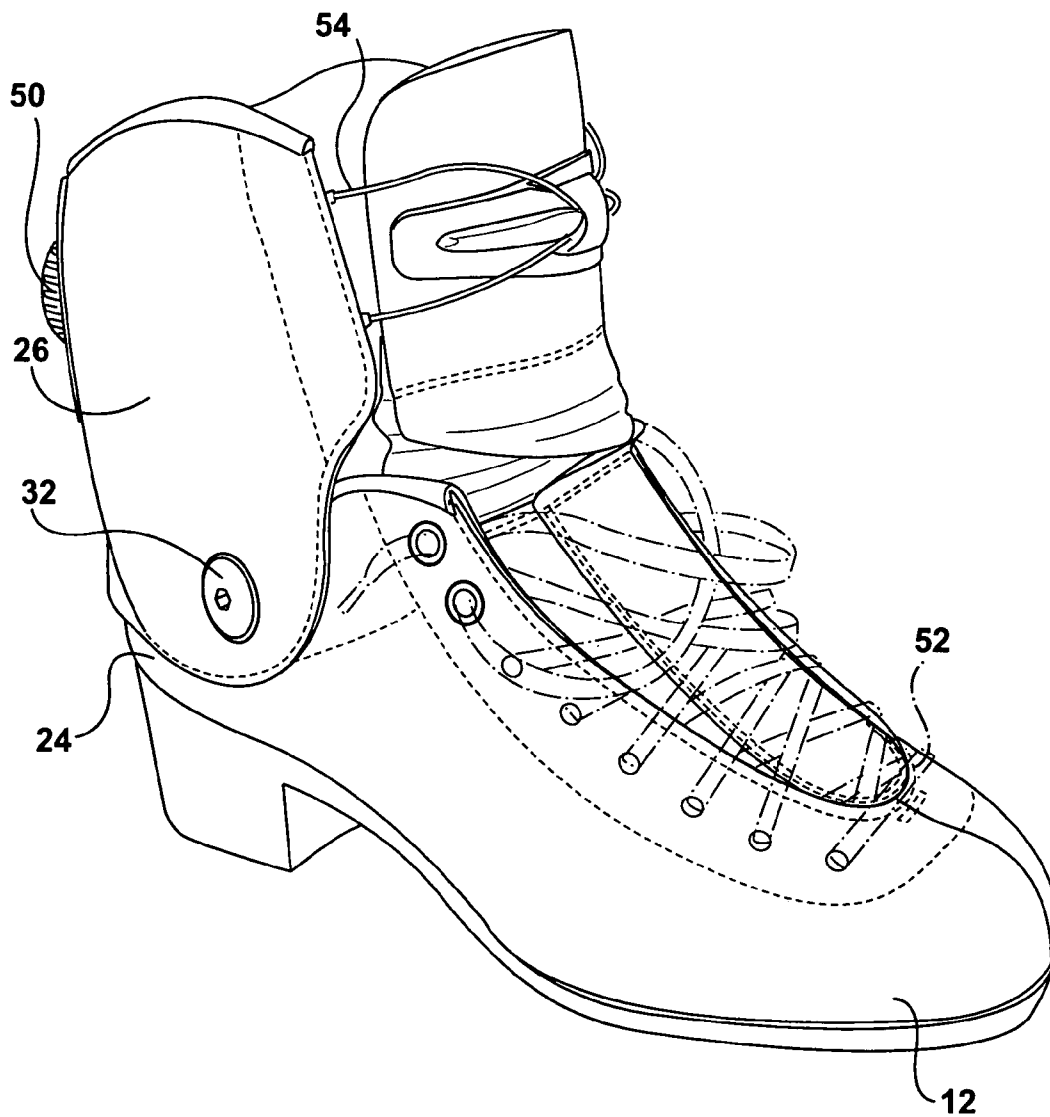
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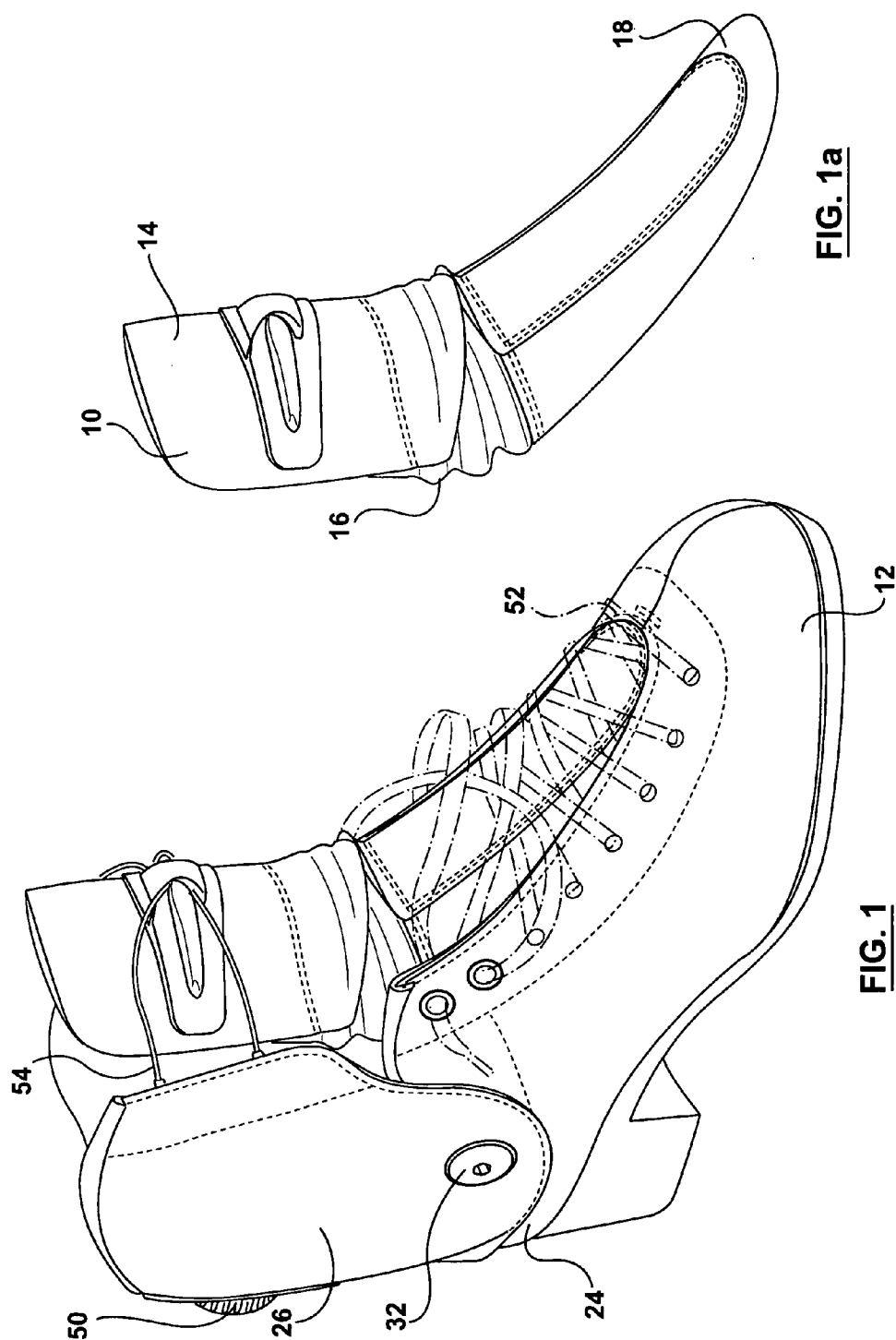
(57) **ABSTRACT**

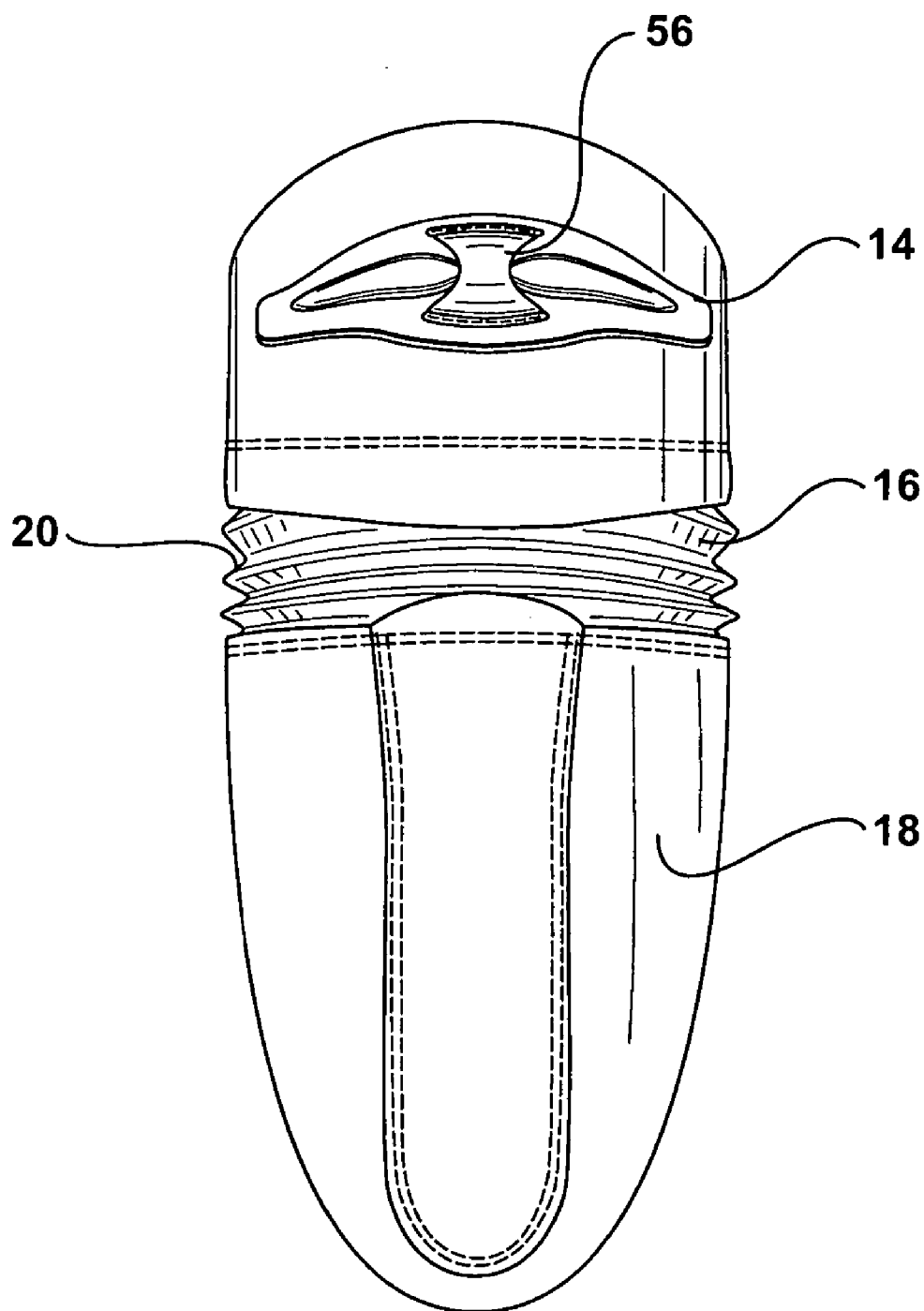
Articulated footwear having an expandable tongue including a first non expandable lower tongue portion, an expandable tongue portion and a second, non expandable upper tongue portion, wherein the expandable tongue portion is disposed between the lower tongue portion and the upper tongue portion.

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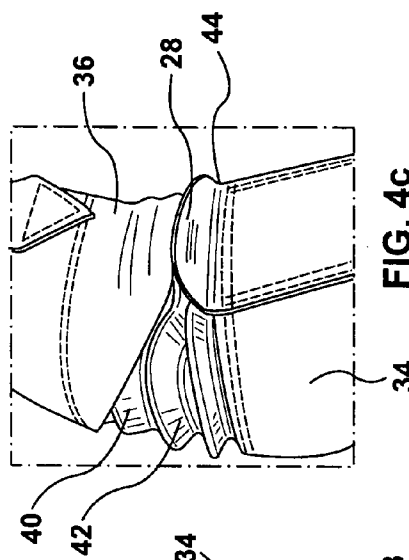
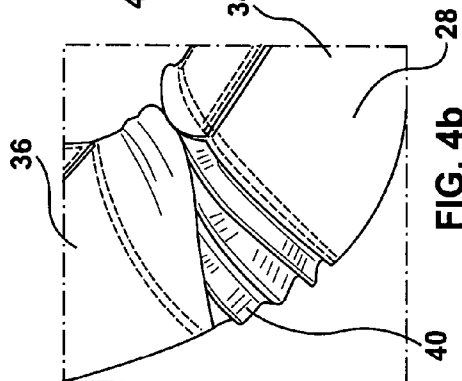
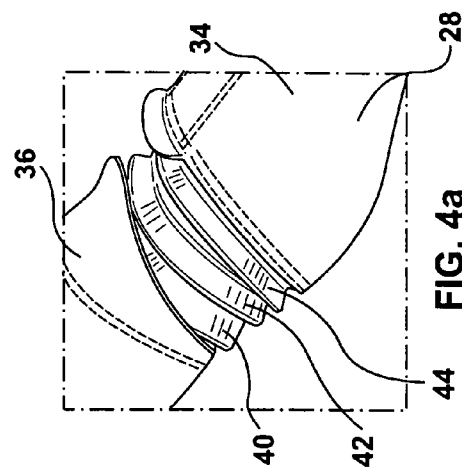
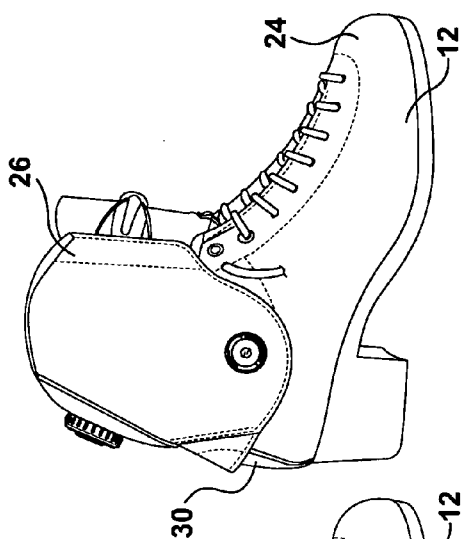
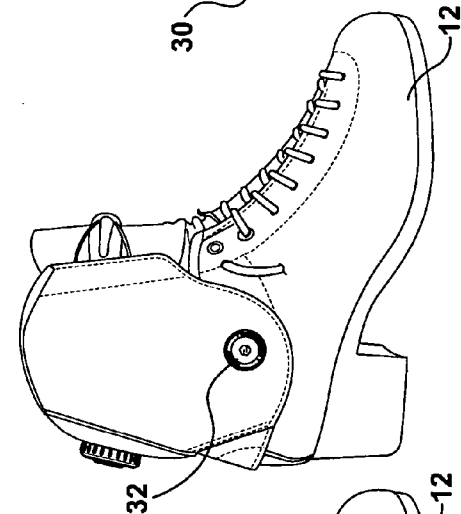
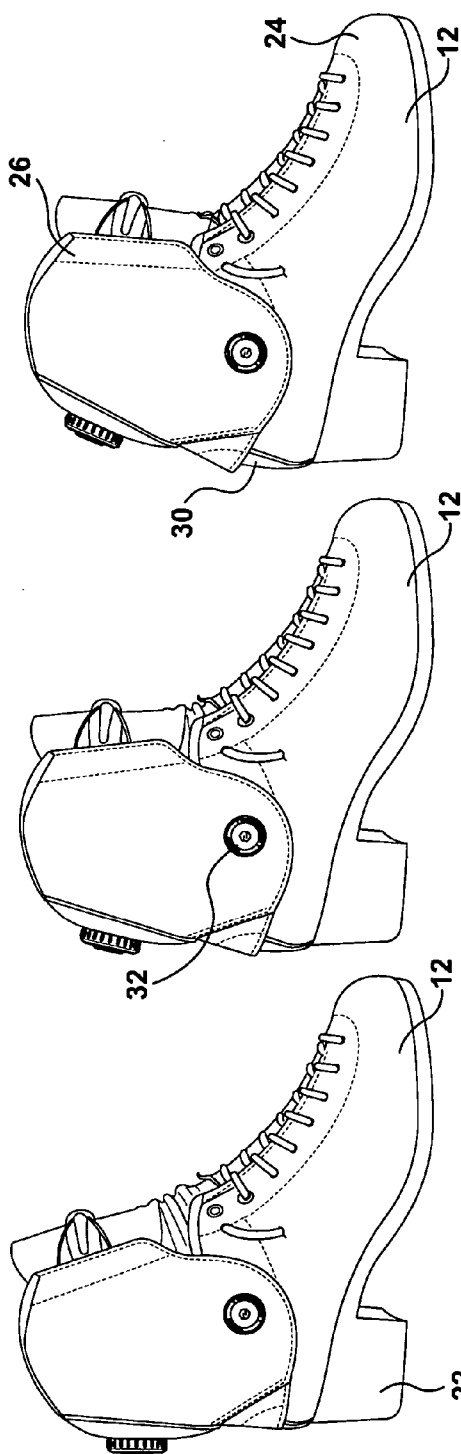
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**FIG. 2**



## EXPANDABLE TONGUE FOR ARTICULATED BOOTS

### FIELD OF THE INVENTION

[0001] The present invention relates to a tongue for an articulated boot. More specifically, the invention relates to an expandable tongue for articulated footwear, such as ice skates and ski boots that allows for a full range of ankle motion.

### BACKGROUND OF THE INVENTION

[0002] Articulated footwear is used in many skiing and skating boots today. Such articulated footwear currently relies on a traditional "one-piece" tongue. When the desired range of motion in these boots is large, however, this standard type of tongue limits full plantar-flexion and places high pressure on the anterior compartment of the ankle during dorsiflexion.

[0003] Prior art articulated footwear has attempted to address these noted issues. For example, U.S. Pat. No. 6,381,877 which issued May 7, 2002 to Filice relates to a flexible skate boot having lower and upper portions made of leather, synthetic leather or similar material is provided with a flexible ankle encircling cuff made of synthetic moldable plastic material capable flexing designed in amounts in the forward and aft and lateral directions to act as an energy storage and release device and without wrinkling so as to minimize discomfort and abrasion on the user's ankle and extend the useful life of the boot. The tongue portion of the boot has a similar molded synthetic flexible panel separating the upper and lower sections of the tongue, the tongue panel being aligned with the flexible ankle encircling cuff which separates the upper and lower parts of the boot from each other. The parts are designed to essentially lock the tongue in the desired frontal position to prevent tongue migration from the desired frontal position during skating. The foot confining portion of the boot can be hand formed of leather on a last for custom fit so that the boot can be used with minimal break in.

[0004] U.S. Pat. No. 6,550,159 issued to Madore on Apr. 22, 2003 relates to a skate boot which comprises a foot element adapted to be mounted to a ground engaging skating implement and for receiving at least partially the foot of a skater, and an articulated cuff for encircling and supporting the ankle of a skater. The articulated cuff is partially inserted in the foot element and slidably coupled to the foot element to permit unrestrained limited pivotal motion of the articulated cuff relative to an axis coinciding approximately with the pivot axis of the skater's ankle.

[0005] Attempts have been made to add flexibility to the traditional tongue but these attempts do not address the need for the tongue to expand and contract in articulated footwear, preserving the flexibility of the ankle while reducing or eliminating the pressure exerted on the anterior surface of the ankle by the tongue during dorsiflexion.

[0006] Thus, there is a need for a tongue for use in articulated footwear that would ease the current pressures placed on the ankle, and allow for more freedom of movement by the ankle.

### SUMMARY OF THE INVENTION

[0007] An object of one aspect of the present invention is to provide an improved expandable tongue with articulated.

[0008] In accordance with one aspect of the present invention there is provided an articulated footwear having an expandable tongue comprising a first non expandable lower tongue portion, an expandable tongue portion and a second, non expandable upper tongue portion, wherein the expandable tongue portion is disposed between the lower tongue portion and the upper tongue portion.

[0009] In accordance with another aspect of the present invention there is provided an articulated boot comprising a foot portion, a cuff portion and a tongue extending through both the foot portion and the cuff portion, wherein the cuff portion and said foot portions are distinct and the cuff portion is attached to an upper part of the foot portion through an articulated joint permitting the cuff portion to partially rotate around the articulated joint thereby to alter an angle formed between the cuff portion and the foot portion, and wherein the tongue includes a lower portion adapted to fit in the foot portion and an upper part adapted to fit in the cuff, and wherein the upper portion is connected to the lower portion through an expandable strip, the expandable strip adapted to permit the upper portion of the tongue to flex relatively to the lower portion said flexure occurring in the expandable strip.

[0010] Conveniently, the boot further comprises a first set of buckle or shoe lace attachments on the foot portion and a second buckle or shoe lace attachments on the cuff portion.

[0011] Advantages of the present invention are: expandable tongue allows for a full range of ankle motion by expanding and contracting in concert with the ankle joint and its anterior tissue; economical and easy to insert into current and traditional skate footwear; reduces injury to user; improves performance; can be used in other articulated footwear such as skiing and other sports employing skates; and can be used in other sports shoes such as basketball and volleyball.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0012] A detailed description of the preferred embodiments is provided herein below by way of example only and with reference to the following drawings, in which:

[0013] **FIG. 1** in a perspective view, illustrates an expandable tongue for articulated boots in accordance with a preferred embodiment of the present invention;

[0014] **FIG. 1a** in a perspective view, illustrates the expandable tongue of **FIG. 1**.

[0015] **FIG. 2** in a front plan view, illustrated the expandable tongue of **FIG. 1a**.

[0016] **FIG. 3a** illustrates in a side view the articulated boot in a back position.

[0017] **FIG. 3b** illustrates in a side view the articulated boot in a resting position.

[0018] **FIG. 3c** illustrates in a side view the articulated boot in a forward position.

[0019] **FIG. 4a** illustrated in a close up perspective view the expandable tongue when in the position illustrated in **FIG. 3a**.

[0020] **FIG. 4b** illustrated in a close up perspective view the expandable tongue when in the position illustrated in **FIG. 3b**.

[0021] FIG. 4c illustrated in a close up perspective view the expandable tongue when in the position illustrated in FIG. 3c.

[0022] In the drawings, preferred embodiments of the invention are illustrated by way of example. It is to be expressly understood that the description and drawings are only for the purpose of illustration and as an aid to understanding, and are not intended as a definition of the limits of the invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] Referring to FIGS. 11a, and 2, there is illustrated in perspective, side and front views, an expandable tongue 10 for articulated footwear 12 in accordance with a preferred embodiment of the present invention. The expandable tongue 10 for articulated footwear 12 includes a first non expandable lower tongue portion 14, an expandable tongue portion 16 and a second, non expandable upper tongue portion 18, wherein the expandable tongue portion 16 is disposed between the lower tongue portion 14 and the upper tongue portion 18. The expandable tongue portion 16 may be further defined to include accordion-like folds 20 similar to a bellows. The positioning of the accordion-like folds 20 generally sit over the ankle joint (not shown).

[0024] The expandable tongue portion 16 may be made of a flexible rubber material by way of example only and could be made out of any flexible material. In one embodiment, the expandable tongue portion 16 preferably has a resting length of approximately 1.5 inches, and can compress to 0.5 inches or expand to 2.5 inches, resulting in a total travel, or expansion, of 2 inches. It is contemplated that the range of expansion of the expandable regions can be anywhere from 0.5 inches to 2.5 inches, mostly dependent upon the size of the wearer's foot, and the anticipated range of ankle motion.

[0025] The expandable tongue portion 16 of the invention is designed to allow a full range of ankle motion in articulated footwear 12. "Articulated footwear" 12 as used herein means footwear that is hinged at the ankle. In most cases, articulated footwear 12, such as an articulated figure skating boot 22, as seen in FIGS. 3a-3c, is a two piece boot 22 having added flexibility allowing the user to, for example, point and flex the foot. It is clearly considered that other sports not presently using articulated footwear, may at some point begin to do so, and, as such, the term "articulated footwear" is intended to cover such footwear as well.

[0026] Referring to FIGS. 3a-3c and 4a-4c, the articulated footwear 12 may further include a foot portion 24, a cuff portion 26 and a tongue 28 that may extend through both the foot portion 24 and the cuff portion 26. The cuff portion 26 and the foot portions 26 may be distinct from one another. More specifically the cuff portion 26 may be attached to an upper part 30 of the foot portion 24 through an articulated joint 32 which permits the cuff portion 26 to partially rotate around the articulated joint 32. The ability to partially rotate the cuff portion 26 about the articulated joint 32 therefore allows one to alter an angle formed between the cuff portion 26 and the foot portion 24.

[0027] The tongue 28 may include a lower portion 34 that is adapted to fit in the foot portion 24 and an upper portion 36 that is adapted to fit in the cuff portion 26. The upper

portion 36 may be connected to the lower portion 38 though an expandable portion 40. The expandable portion 40 may be adapted to permit the upper portion 36 to flex relatively to the lower portion 34, whereby the flexing action may be attributed to the expandable portion 40. The articulated footwear 12 may further include fastening means 50 to ensure the articulated footwear 12 remains secure on the wearer's foot. The fastening means 50 may be further defined as laces 52 located on the foot portion 24 of the articulated footwear 12 and buckles 54 on the cuff portion 26 of the articulated footwear 12. The upper portion 36 of the tongue 28 may further include a loop 56 through which the buckle 54 may be positioned through to ensure proper placement of the tongue 28 and cuff portion 26.

[0028] The combination of an articulated connection between the cuff portion 26 of the articulated footwear 12 and the foot portion 24 of the articulated footwear 12 with the tongue 28 having the expandable portion 40 allows for a full range of ankle motion by expanding and contracting in concert with the ankle joint and its anterior tissue.

[0029] In operation, when a user flexes the ankle, the skin on the ankle actually stretches and constricts along with the movement of the foot. As such, the tongue 28 with its expandable portion 40, allows for similar expansion and constriction of the tongue 28 thereby mimicking the movement of the skin on the ankle. In a preferred embodiment, the expandable portion 40 may be further defined to include the addition of accordion-like folds 42 (similar to a bellows) located at a middle region 44 of the tongue 28. The accordion-like folds 42 may generally sit over the ankle joint of the wearer.

[0030] The expandable portion 40 is not limited to comprising a rubber material. It is still within the scope of this invention to use any material that has some stretching quality, and such material can have any of a variety of different dimensions. It is also possible to use non stretchable material for the expandable portion connecting the upper and lower tongue parts provided that the material forms an expandable zone, such as for example the expandable zone used in the so called "comfort waist line slacks" What is important is that upon flexing of the tongue 28, the expandable zone expands to compensate for the skin expansion of the wearer during his or her ankle flexure.

[0031] Articulated footwear 12 such as an articulated figure skating boot according to this invention allows the required full range of ankle motion (approximately 50 degrees). Although conceived for figure skating, the combined articulated cuff portion 26 connection to the foot portion 24 of the footwear 12 together with the expandable portion 40 of the tongue 28 will work equally well on other sport boots where ankle articulation is important. Skiing and skating sports are examples currently using articulated boots. Other sports such as basketball and volleyball may at some point implement an articulated footwear design.

[0032] Other variations and modifications of the invention are possible. All such modifications or variations are believed to be within the sphere and scope of the invention as defined by the claims appended hereto.

We claim:

1. An expandable tongue for articulated footwear comprising:

- (a) a first non expandable lower tongue portion;
- (b) an expandable tongue portion; and
- (c) a second, non expandable upper tongue portion,

wherein said expandable tongue portion is disposed between said lower tongue portion and said upper tongue portion.

2. An expandable tongue as claimed in claim 1 wherein said expandable tongue portion has accordion-like folds.

3. An expandable tongue as claimed in claim 1 wherein said expandable tongue portion is made of a flexible material.

4. An expandable tongue as claimed in claim 3 wherein said flexible material is rubber.

5. An expandable tongue as claimed in claim 2 wherein said expandable tongue portion can compress to 0.5 inches or expand to 2.5 inches.

6. An expandable tongue as claimed in claim 1 wherein said expandable tongue portion is non stretchable material connecting said upper and lower tongue portions whereby said non stretchable material forms an expandable zone.

7. An expandable tongue as claimed in claim 1 wherein said articulated footwear is a figure skate boot.

8. An expandable tongue as claimed in claim 1 wherein said articulated footwear is a ski boot.

9. An expandable tongue as claimed in claim 1 wherein said articulated footwear is basketball footwear.

10. An expandable tongue as claimed in claim 1 wherein said articulated footwear is volleyball footwear.

11. Articulated footwear comprising:

- (a) a foot portion;
- (b) a cuff portion; and
- (c) a tongue having a lower portion adapted to fit in said foot portion and an upper portion adapted to fit in said

cuff portion, and wherein said upper portion of said tongue is connected to said lower portion by an expandable portion,

wherein said cuff portion and said foot portions are distinct and said cuff portion is attached to an upper part of said foot portion through an articulated joint permitting said cuff portion to partially rotate around said articulated joint thereby to alter an angle formed between said cuff portion and said foot portion, and wherein said tongue extends between said foot portion and said cuff portion, said expandable portion adapted to permit said upper portion of said tongue to flex relatively to said lower portion, said flexing occurring in said expandable portion.

12. Articulated footwear as claimed in claim 11 wherein said expandable portion has accordion-like folds.

13. Articulated footwear as claimed in claim 11 wherein said expandable portion is made of a flexible material.

14. Articulated footwear as claimed in claim 13 wherein said flexible material is rubber.

15. Articulated footwear as claimed in claim 12 wherein said expandable portion can compress to 0.5 inches or expand to 2.5 inches.

16. Articulated footwear as claimed in claim 11 wherein said expandable portion is non stretchable material connecting said upper and lower portions whereby said non stretchable material forms an expandable zone.

17. Articulated footwear as claimed in claim 11 wherein said articulated footwear is a figure skate boot.

18. Articulated footwear as claimed in claim 11 wherein said articulated footwear is a ski boot.

19. Articulated footwear as claimed in claim 11 wherein said articulated footwear is basketball footwear.

20. Articulated footwear as claimed in claim 11 wherein said articulated footwear is volleyball footwear.

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