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UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

NIKE, INC.,

Plaintiff,

vs.

SKECHERS U.S.A., INC.,

Defendant.

Case No. 2:23-cv-09346-AB-PVC

SKECHERS U.S.A., INC.'S CLAIM CONSTRUCTION BRIEF ON THE PLAIN AND ORDINARY MEANING OF "TONGUE"

Skechers U.S.A. v. Nike, Inc.
IPR2025-00150
Patent No. 9,060,562
Ex. 2013

In the footwear context, the plain and ordinary meaning of "tongue" is a flap of material extending from a forward portion of the throat area to the ankle opening.

The word "tongue" itself, as opposed to "integral knit tongue," does not appear in the '562 and '636 patent claims. But it does appear in the specifications of those patents, including in Nike application 13/400,511, which is incorporated by reference in both patents. *See, e.g.*, '562 patent (D.I. 1-2) at 1:8-12. That application, which issued as U.S. 8,448,474 ("the '474 patent"), discloses footwear 100 in FIG. 1 having knitted component 130 comprising knit element 131 and "a tongue 124 that extends under lace 122 and lace apertures 123" from a forward portion of the throat area. Ex. AA at 5:22-23, FIG. 1.[1] The flap of material that is "tongue 124 is separate from knitted component 130 and joined to knitted component 130, possibly with stitching, an adhesive, or thermal bonding . . . following the knitting process." *Id.* at 23:18-22; FIG. 4B (showing tongue 124 separate from knitted component 130); FIG. 5 (showing knitted component 130 from FIG. 1).

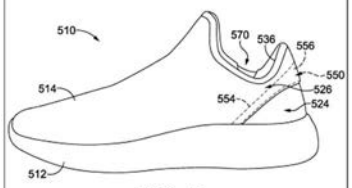
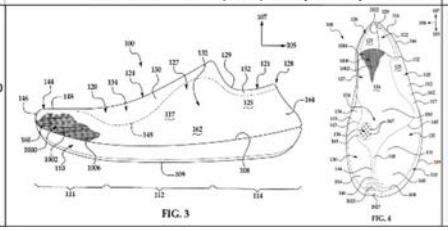
The '474 patent application also discloses footwear "in FIGS. 25 and 26," where "knitted component 130 includes a knitted tongue 170 that is formed of unitary knit construction with knit element 131." *Id.* at 23:22-25. As shown in FIG. 26, tongue 170, like tongue 124, is a flap of knitted material that "extends from a forward portion of the throat area to ankle opening 121." *Id.* at 23:33-37. It "is joined through knitting to knit element 131 in a portion of the throat area that is closest to forefoot region 101 in footwear 100." *Id.* at 24:53-56, 26:13-60, 28:6-13, and FIGs. 36A-36G.

The '562 and '636 patent specifications also contain a handful of references to "tongue" alone apart from the incorporated application. *E.g.,* '562 patent at 1:52-54, 7:9-12, 7:25-27. All of these references are consistent with dictionary definitions of "tongue." Ex. BB (Webster's 3d New Int'l Dictionary: "something resembling an animal's tongue in being elongated and fastened at one end only: as … the flap of

[1] The concurrent Declaration of Nick Wagner attaches all lettered exhibits.

leather or other material under the lacing or buckles of a shoe at the throat of the vamp"); Ex. CC (American Heritage Dictionary: "[t]he flap of material under the laces or buckles of a shoe").

All of the references are also consistent with Nike's own representations about what is ***not*** a "tongue." For example, (i) Nike's Application U.S. 2024/0114993 states that "upper 514 is tongue-less" in FIG. 5, Ex. DD at [0054]; (ii) Nike's U.S. Patent 10,130,142 states that "upper 120 can be substantially continuous between medial side 115 and lateral side 117 across throat 124" and "[a]s such, upper 120 can be 'sock-like' and 'tongue-less,'" Ex. EE at 5:54-65, FIG. 3; and (iii) Nike's website describes its Zoom Hyperspeed shoe as a "tongueless design," Ex. FF.

Nike App. U.S. 2024/0114993 (Ex. DD)	Nike U.S. Pat. 10,130,142 (Ex. EE)	Nike Website (Ex. FF)
 FIG. 5	 FIG. 3 FIG. 4	

At the *Markman* hearing, Nike contended that an "integral knit tongue" is simply "a tongue joined by knitting to the upper." Ex. GG (*Markman* Tr.) at 21:18-21. But Nike already claimed such a structure—as a "tongue," not as an "integral knit tongue"—in the '474 patent. Ex. AA, claims 5-6. The term "integral knit tongue" does not appear anywhere in the '474 patent. Nike introduced the term "integral knit tongue," along with the term "raised element"[2] and a significant amount of additional disclosure relating to both terms, in the later-filed specifications and claims of the '562 and '636 patents, which claim priority to the '474 patent. Exs. HH and II.

Nike coined the term "integral knit tongue" in the '562 and '636 patents and the term should be construed according to what Nike disclosed it to be. Otherwise, how will an "integral knit tongue" joined to the sides of a throat area be identified?

[2] As mentioned at the *Markman* hearing, to convince the Patent Office to issue the "integral knit tongue" claims of the '636 patent, Nike amended the claims during prosecution to add the "at least one raised element" limitation. *See* Ex. JJ.

Dated: September 30, 2024

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Case No. 2:23-cv-09346-AB-PVC

DECLARATION OF NICK WAGNER IN SUPPORT OF SKECHERS U.S.A., INC.'S SUPPLEMENTAL CLAIM CONSTRUCTION BRIEFING

I, Nick Wagner, declare as follows:

1. I am an attorney at the law firm of Irell & Manella LLP. I am a member in good standing of the State Bar of California. I have personal knowledge of the facts set forth herein and if called as a witness could and would testify competently to such facts under oath.

2. Attached as Exhibit AA is a true and correct copy of U.S. Patent No. 8,448,474, bearing Bates numbers SKECHERS-9346-00048856 - 00048938.

3. Attached as Exhibit BB is a true and correct copy of an excerpt from *Webster's Third New International Dictionary*, Unabridged (2002).

4. Attached as Exhibit CC is a true and correct copy of an excerpt from *The American Heritage Dictionary*, Fifth Edition (2011).

5. Attached as Exhibit DD is a true and correct copy of U.S. Patent Application Publication No. 2024/0114993. This copy was downloaded from https://patentcenter.uspto.gov/applications/18539456.

6. Attached as Exhibit EE is a true and correct copy of U.S. Patent No. 10,130,142. This copy was downloaded from https://patentcenter.uspto.gov/applications/15058252.

7. Attached as Exhibit FF is a true and correct copy of information displayed on a Nike.com webpage, https://www.nike.com/t/zoom-hyperspeed-court-se-volleyball-shoes-m4Fqj0, in which Nike advertises the Nike Zoom Hyperspeed Court SE. Exhibit FF is a compilation of screenshots from that interactive webpage.

8. Attached as Exhibit GG is a true and correct copy of the September 20, 2024 Markman Hearing Transcript in *Nike, Inc. v. Skechers U.S.A., Inc.*, Case No. CV 2:23-cv-09346-AB.

9. Attached as Exhibit HH is a comparison of the texts of U.S. Patent Nos. 8,448,474 and 9,060,562. The text file of each patent was downloaded from patentcenter.uspto.gov, and the files were compared using Workshare Compare. Red text signifies that the material was found exclusively in the 8,448,474 patent; green

text signifies that the material was found exclusively in the 9,060,562 patent; and black text signifies that the material was found in both patents.

10. Attached as Exhibit II is a comparison of the texts of U.S. Patent Nos. 8,448,474 and 9,510,636. The text file of each patent was downloaded from patentcenter.uspto.gov, and the files were compared using Workshare Compare. Red text signifies that the material was found exclusively in the 8,448,474 patent; green text signifies that the material was found exclusively in the 9,510,636 patent; and black text signifies that the material was found in both patents.

11. Attached as Exhibit JJ is a true and correct copy of Nike's January 7, 2016 response to the Patent Office's October 8, 2015 Office Action, in which Nike amended the claims of the application that issued as U.S. Patent No. 9,510,636, and the ensuing Notice of Allowance. Exhibit JJ bears Bates numbers NIKE-SKX_0520176 - 0520200.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on September 30, 2024, in Los Angeles, California.

/s/ Nick Wagner

Nick Wagner

Exhibit AA

US008448474B1

(12) **United States Patent**
Tatler et al.

(10) **Patent No.: US 8,448,474 B1**
(45) **Date of Patent: May 28, 2013**

(54) **ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH A TONGUE**

(75) Inventors: **Daren P. Tatler**, Hillsboro, OR (US); **Daniel A. Podhajny**, Beaverton, OR (US)

(73) Assignee: **NIKE, Inc.**, Beaverton, OR (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **13/400,511**

(22) Filed: **Feb. 20, 2012**

(51) **Int. Cl.**
D04B 7/04 (2006.01)

(52) **U.S. Cl.**
USPC **66/64**; 66/177

(58) **Field of Classification Search**
USPC ..... 36/10, 45, 3 A; 66/60, 64–73, 177, 66/169 R, 170, 171
See application file for complete search history.

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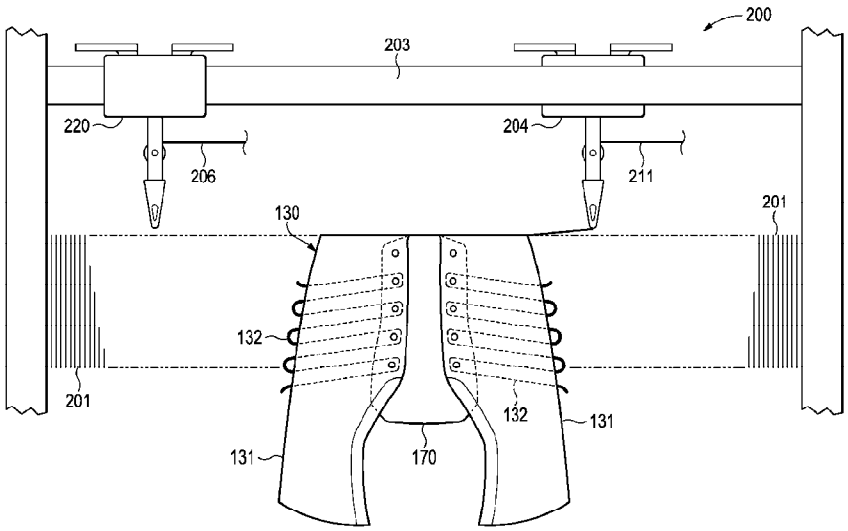
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Primary Examiner — Danny Worrell
(74) *Attorney, Agent, or Firm* — Plumsea Law Group, LLC

(57) **ABSTRACT**

Articles of footwear may have an upper that includes a knit element and a tongue. The knit element defines a portion of an exterior surface and an opposite interior surface of the upper, with the interior surface defining a void for receiving a foot. The tongue is formed of unitary knit construction with the knit element and extends through a throat area of the upper. Methods of manufacturing a knitted component for an article of footwear may include knitting a tongue. The tongue is held on needles of a knitting machine. A first portion of a knit element is formed with the knitting machine while the tongue is held on the needles. The tongue is then joined to the first portion of the knit element. Additionally, a second portion of the knit element is formed with the knitting machine.

9 Claims, 66 Drawing Sheets



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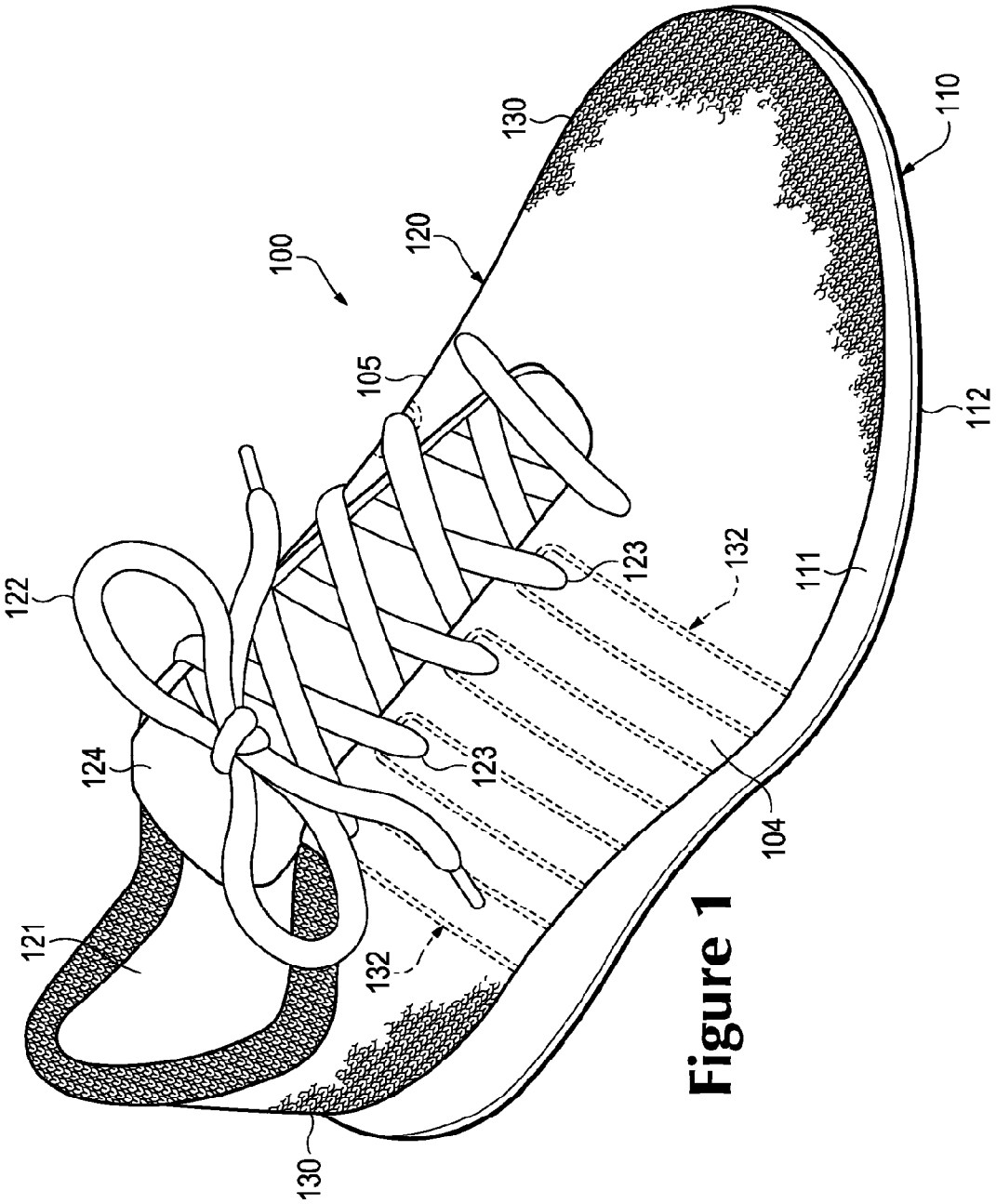


Figure 1

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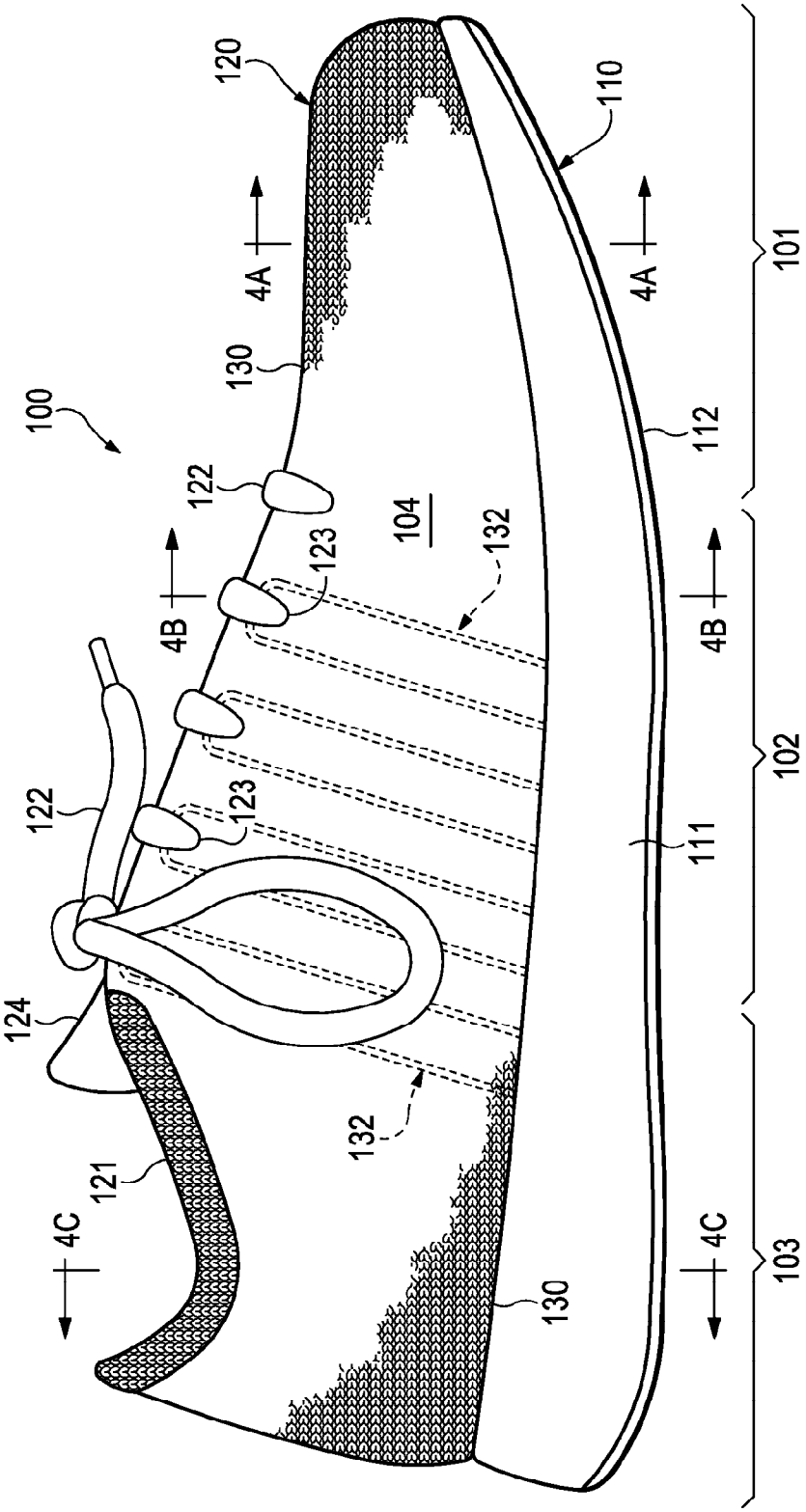


Figure 2

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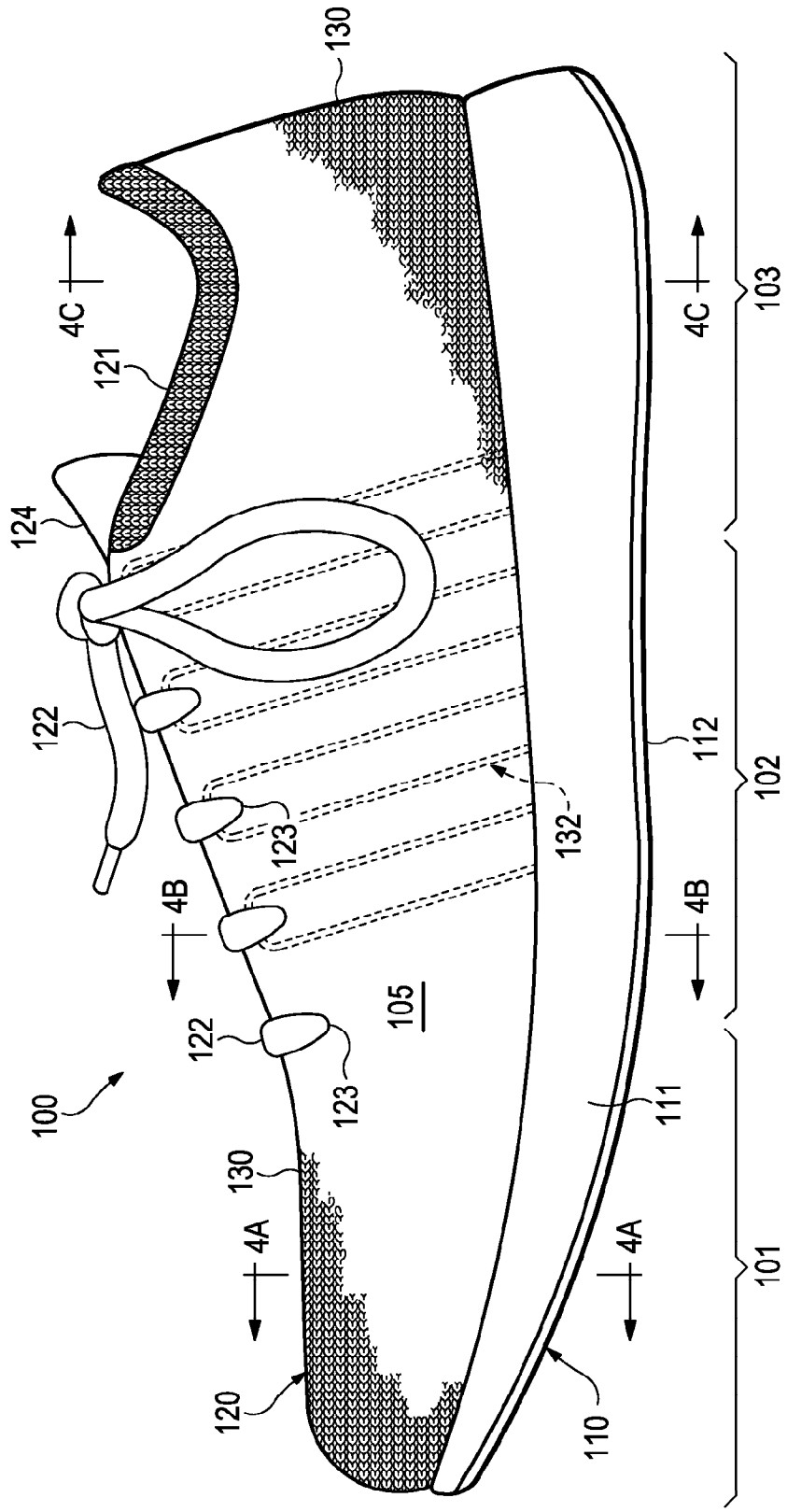


Figure 3

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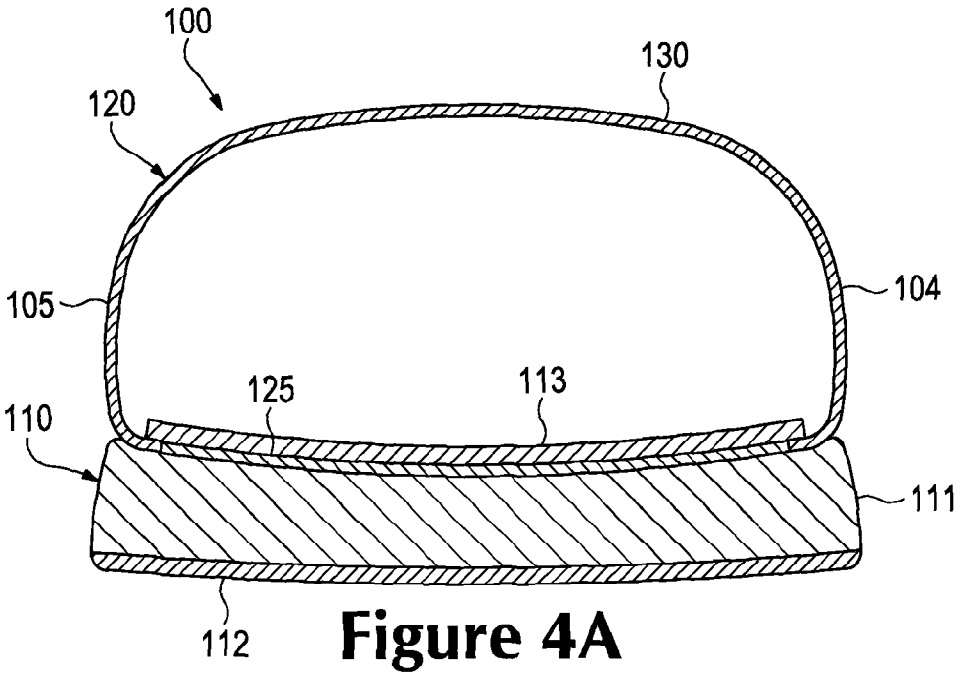


Figure 4A

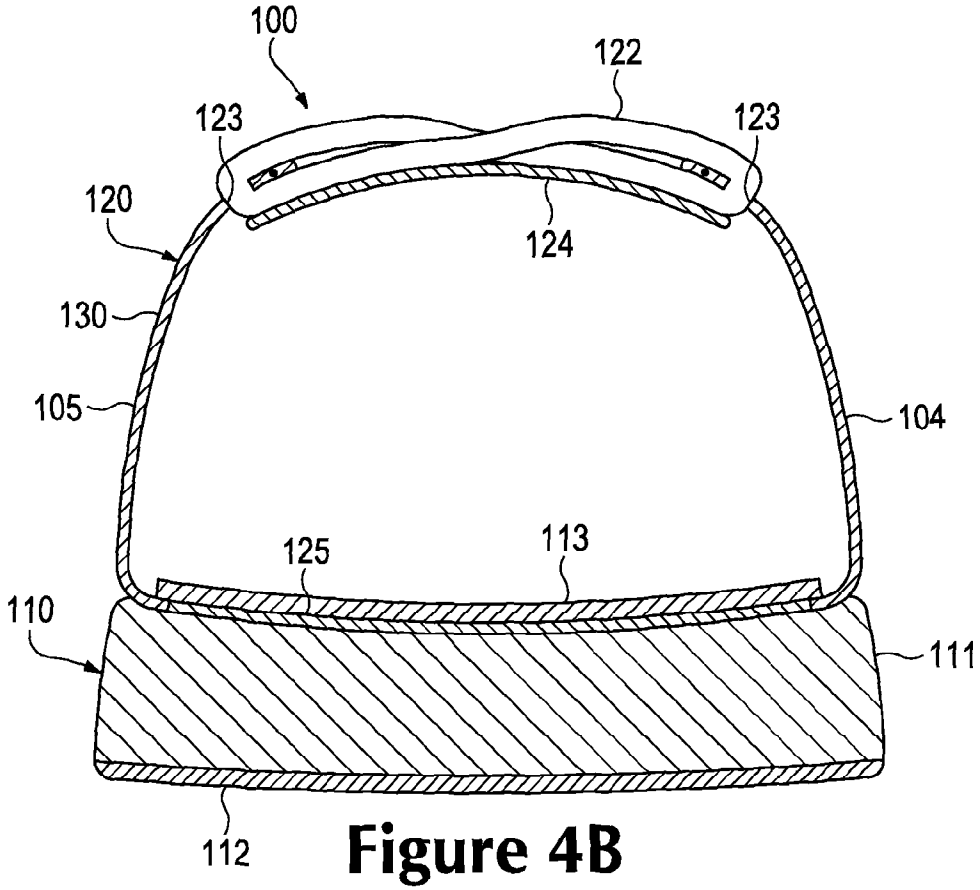


Figure 4B

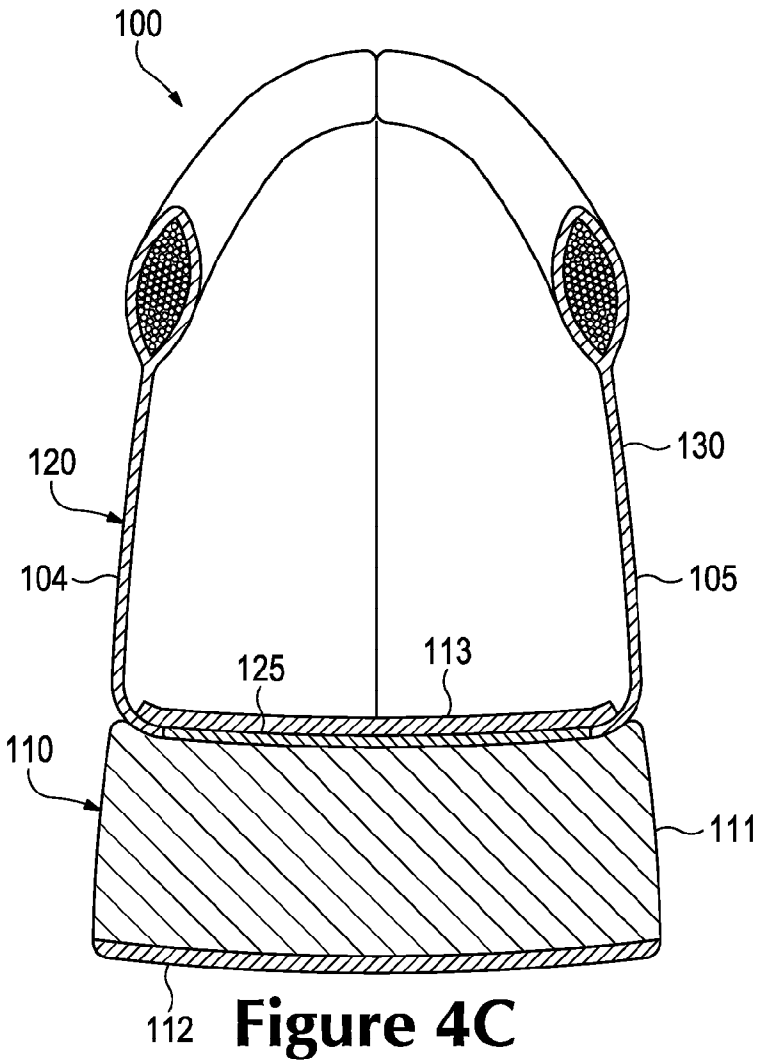


Figure 4C

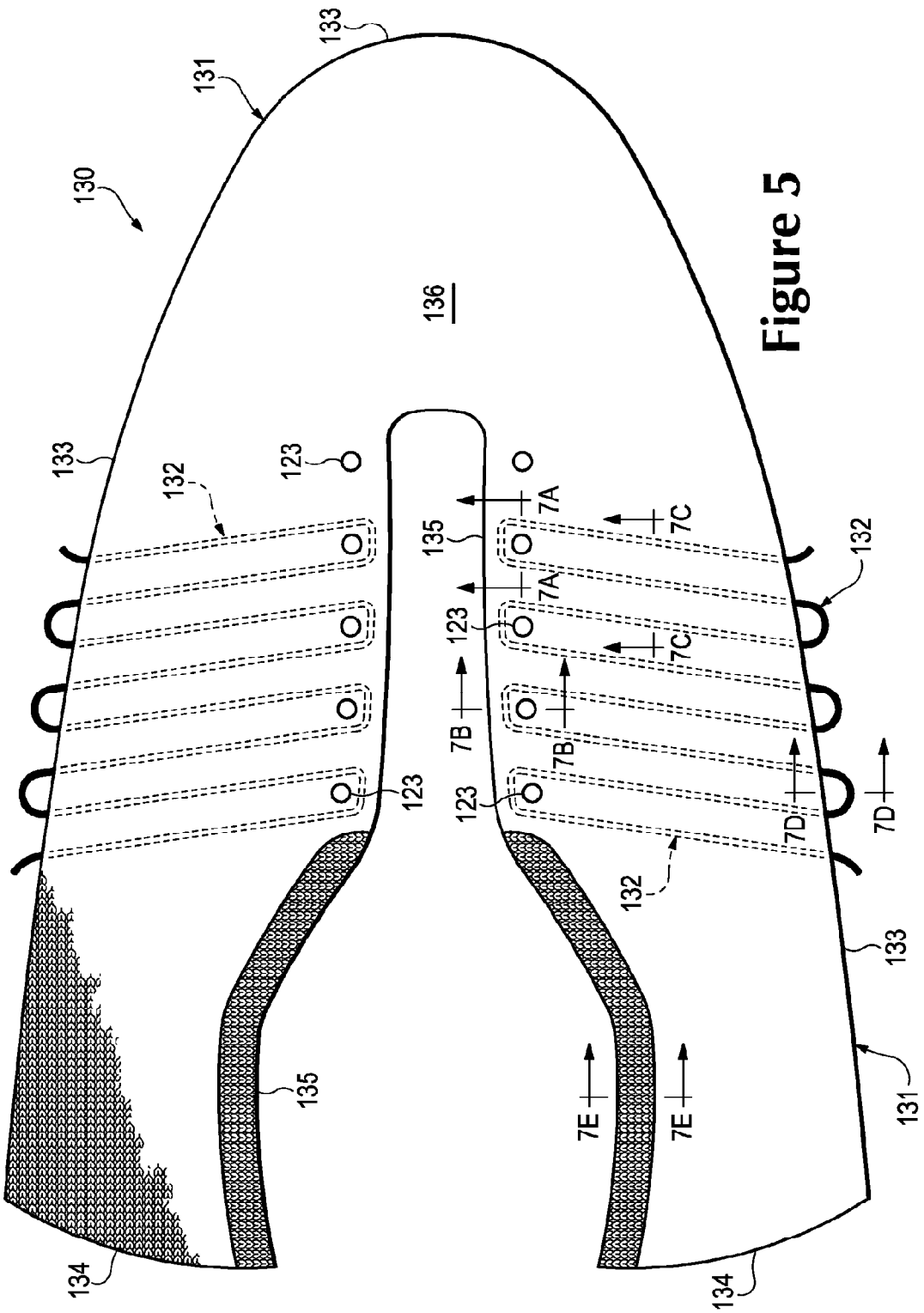


Figure 5

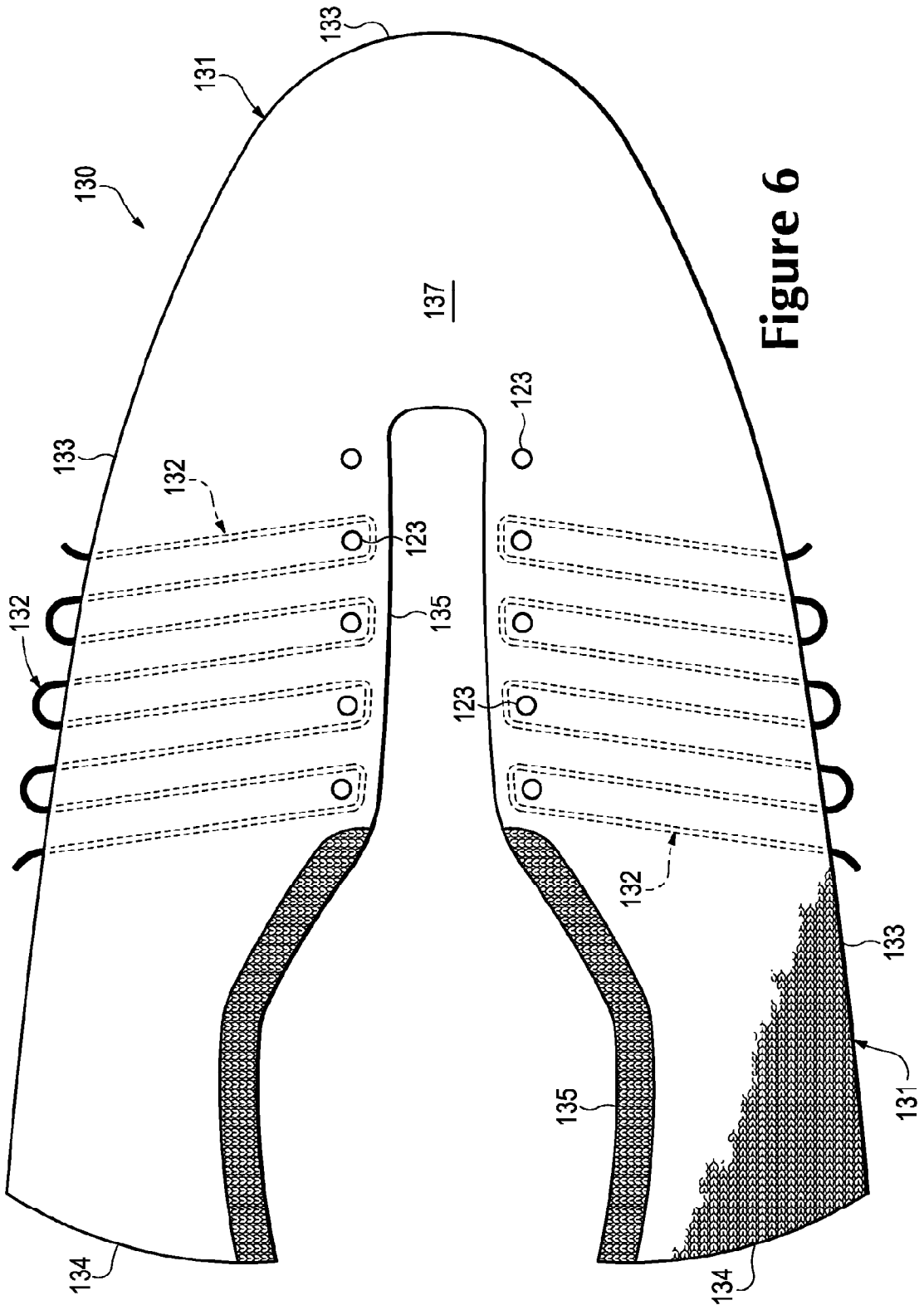


Figure 6

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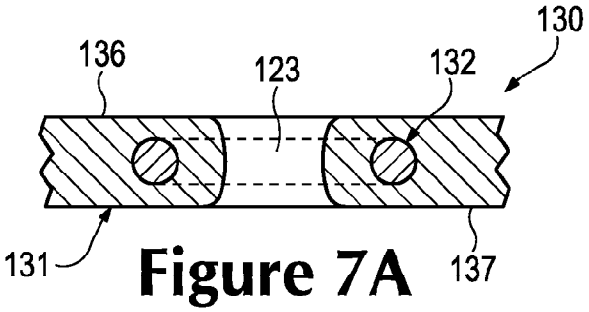


Figure 7A

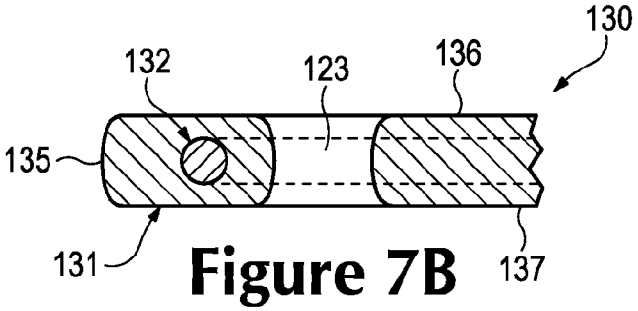


Figure 7B

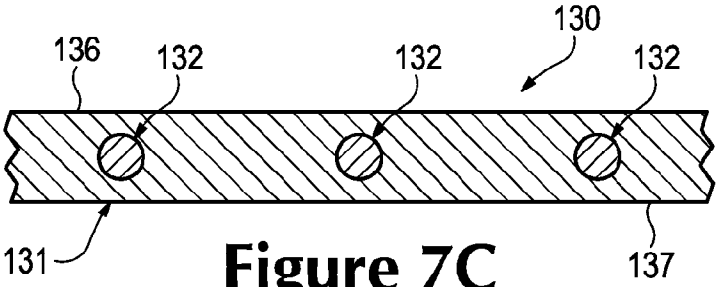


Figure 7C

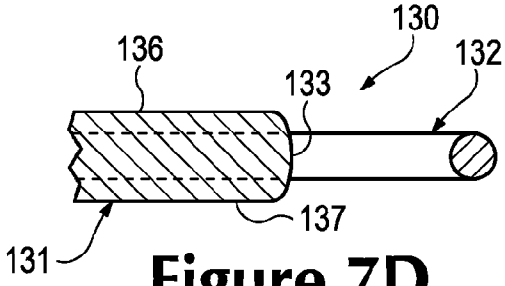


Figure 7D

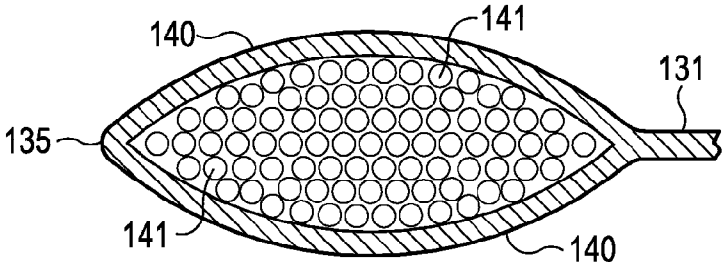


Figure 7E

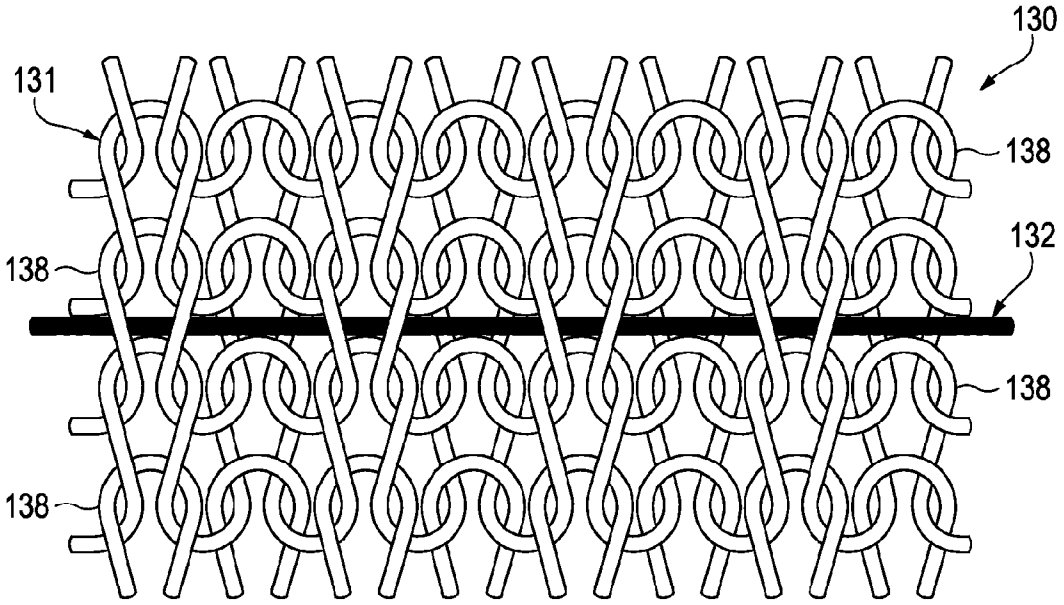


Figure 8A

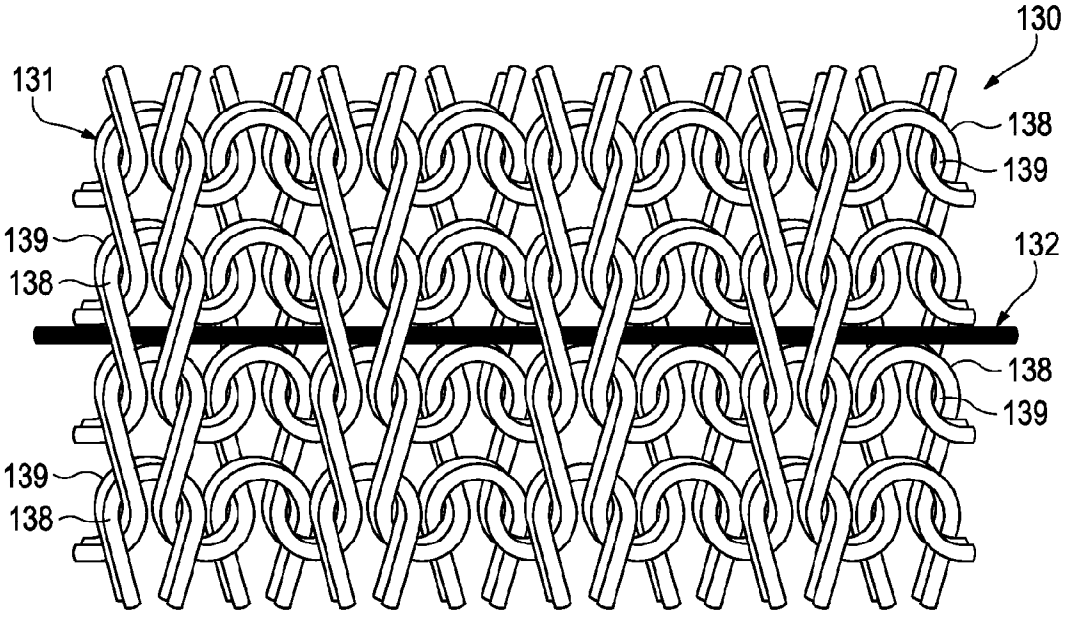


Figure 8B

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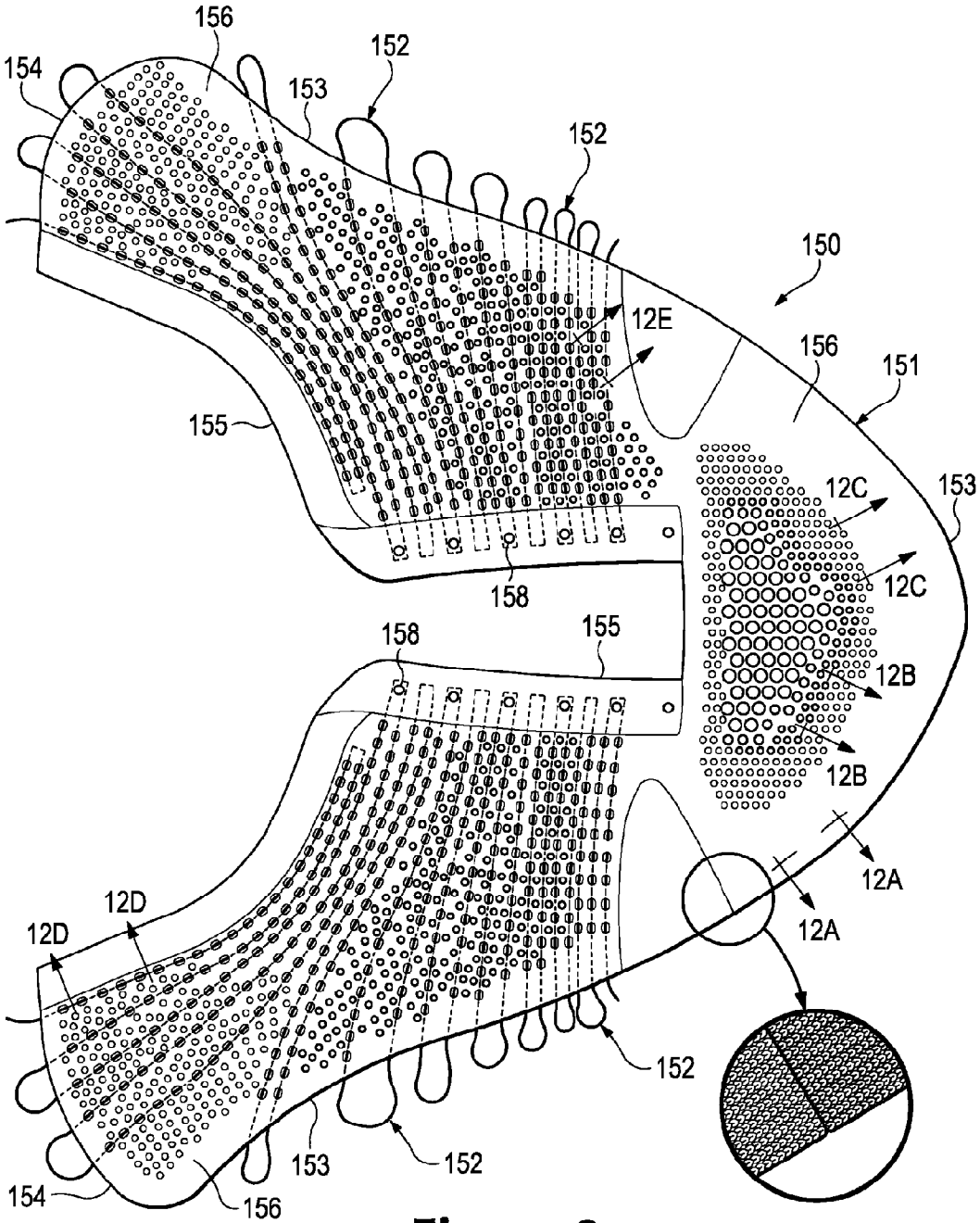

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Figure 9

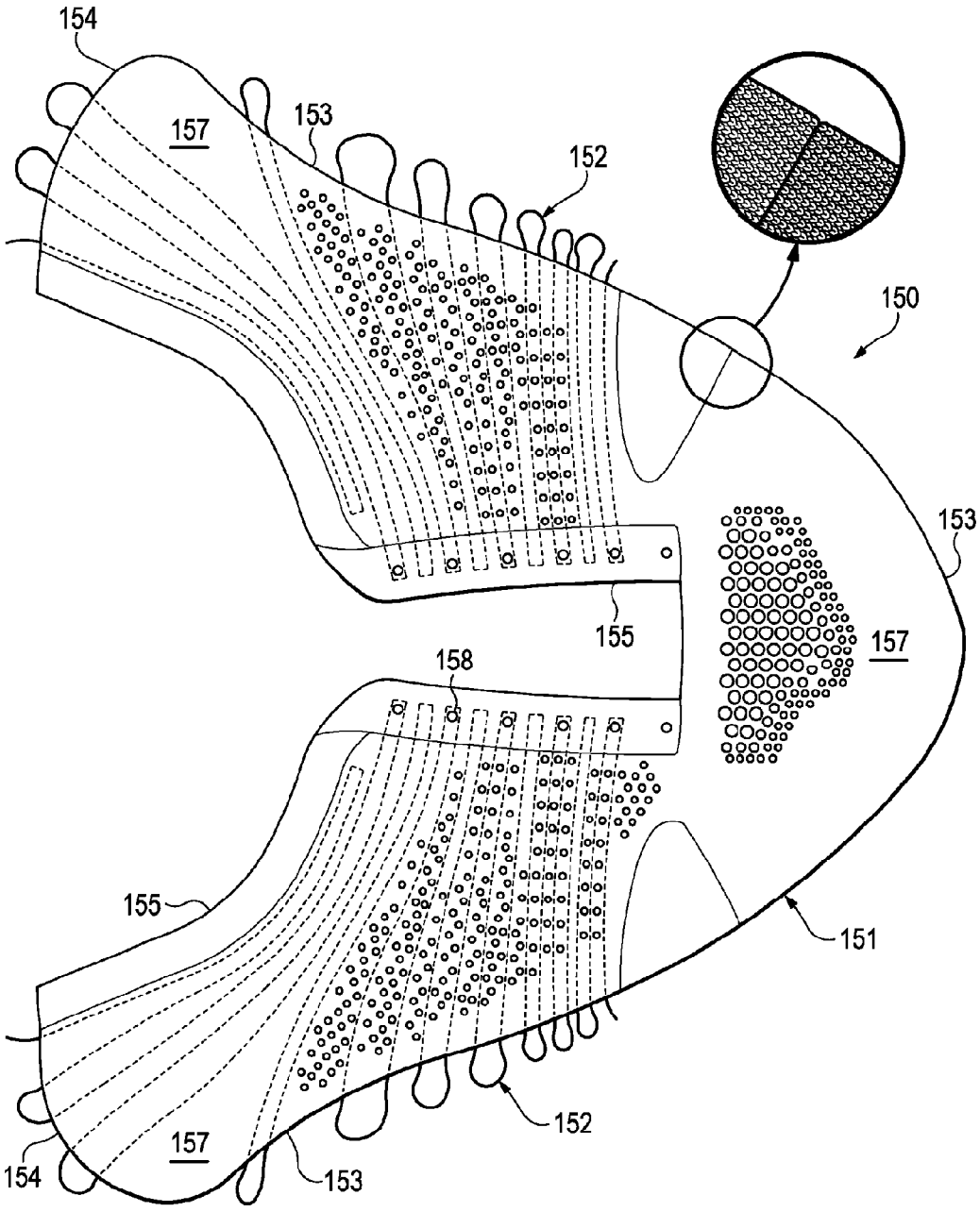


Figure 10

SKECHERS-9346-00048868

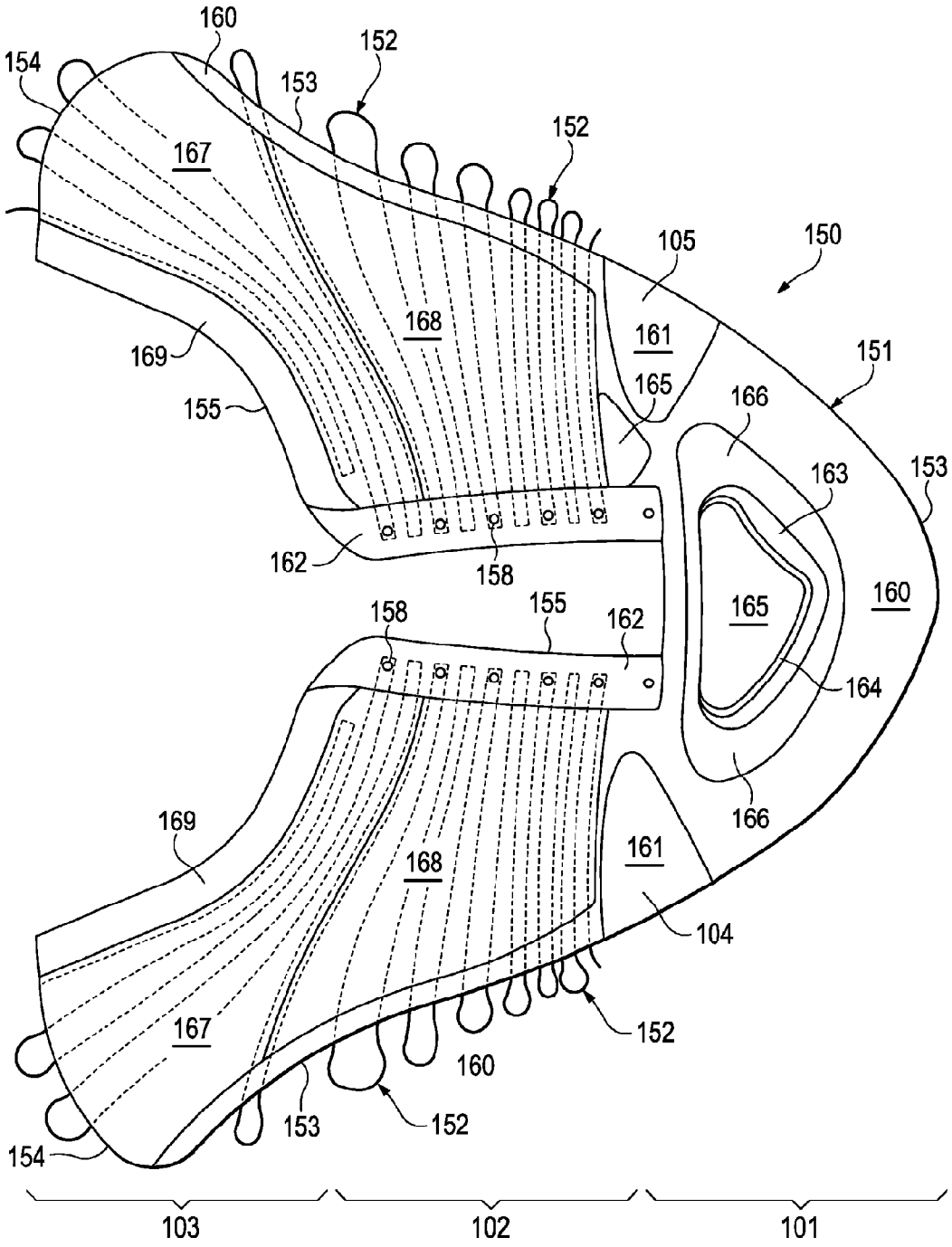


Figure 11

SKECHERS-9346-00048869

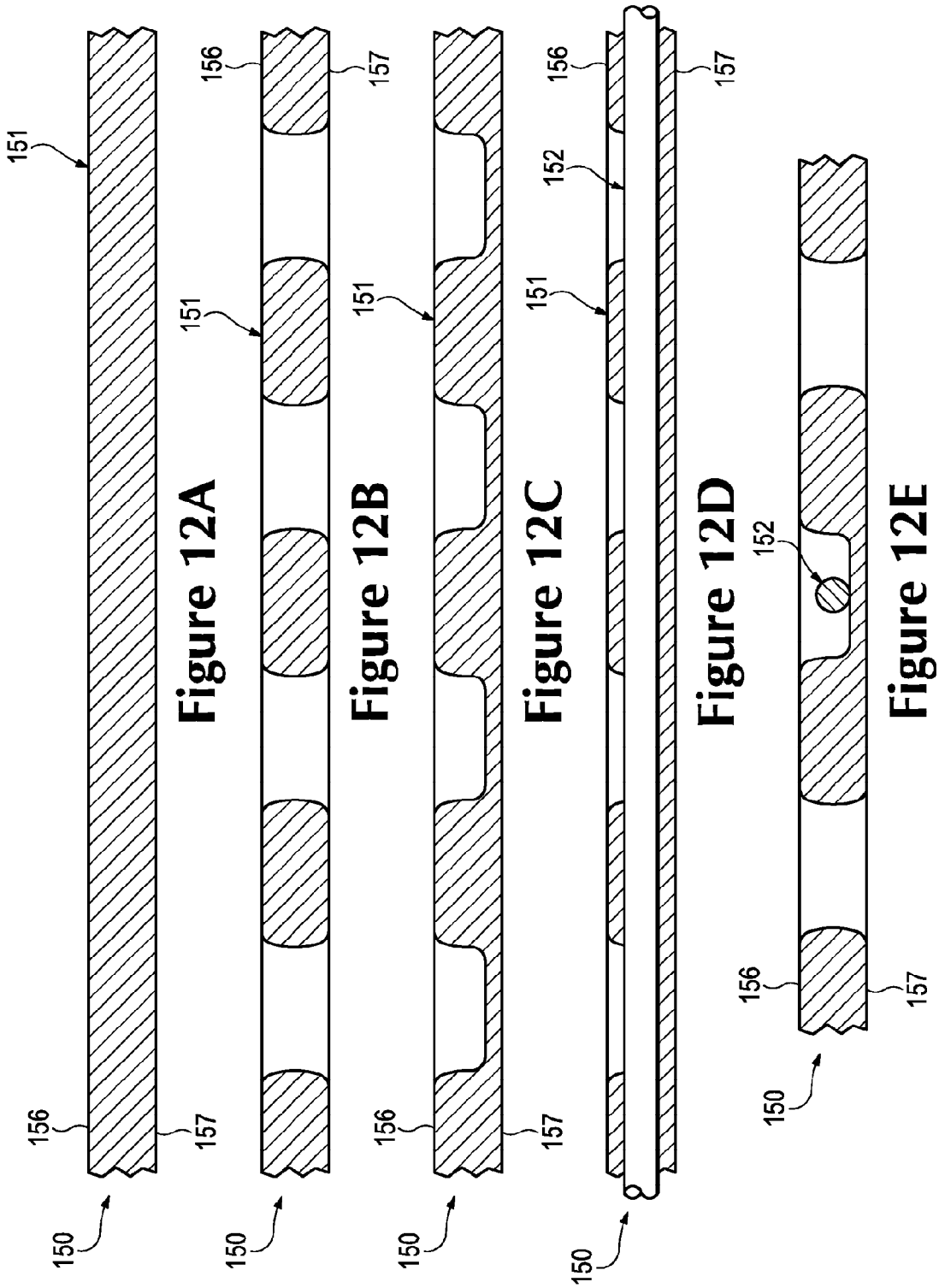


Figure 12A

Figure 12B

Figure 12C

Figure 12D

Figure 12E

SKECHERS-9346-00048870

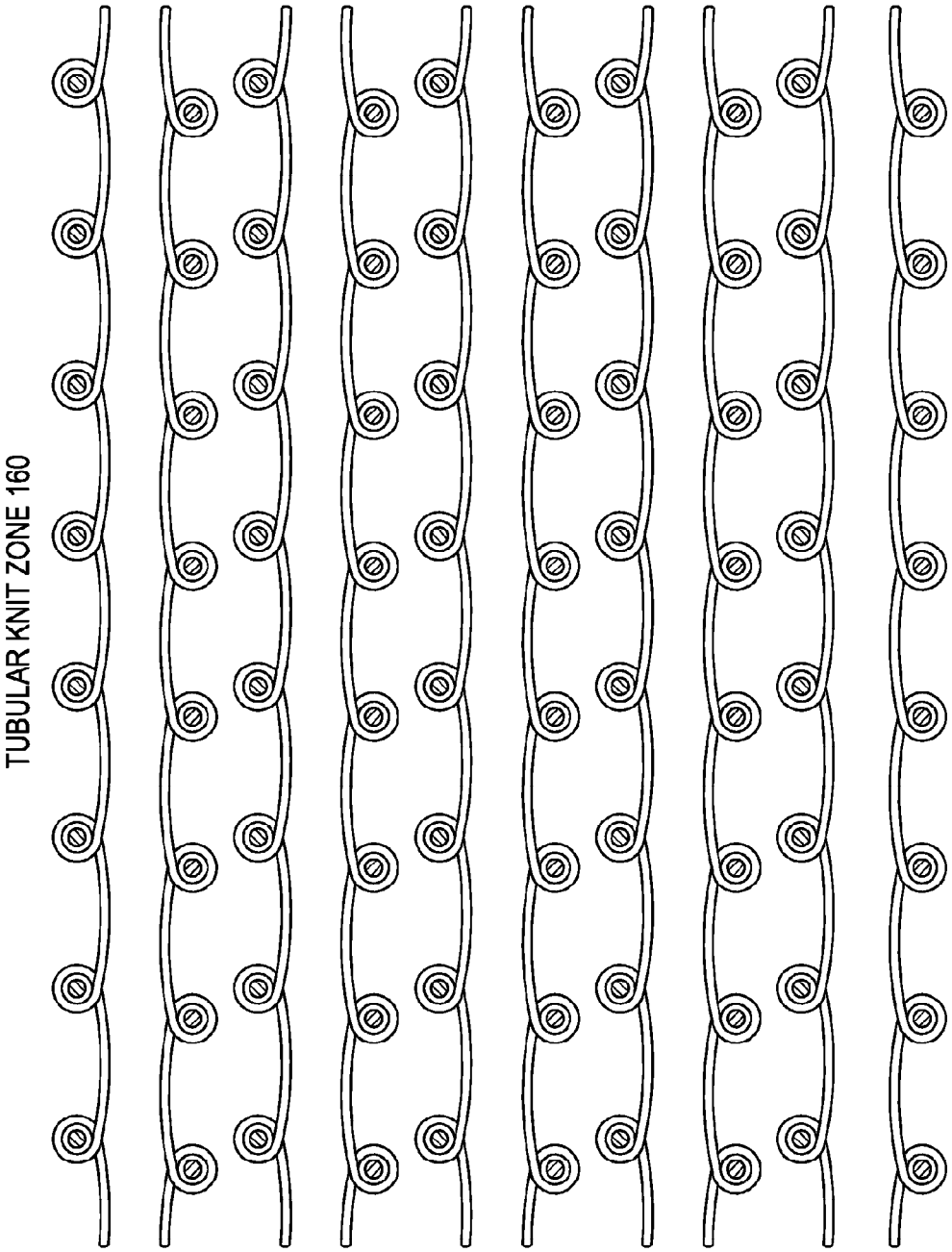


Figure 13A

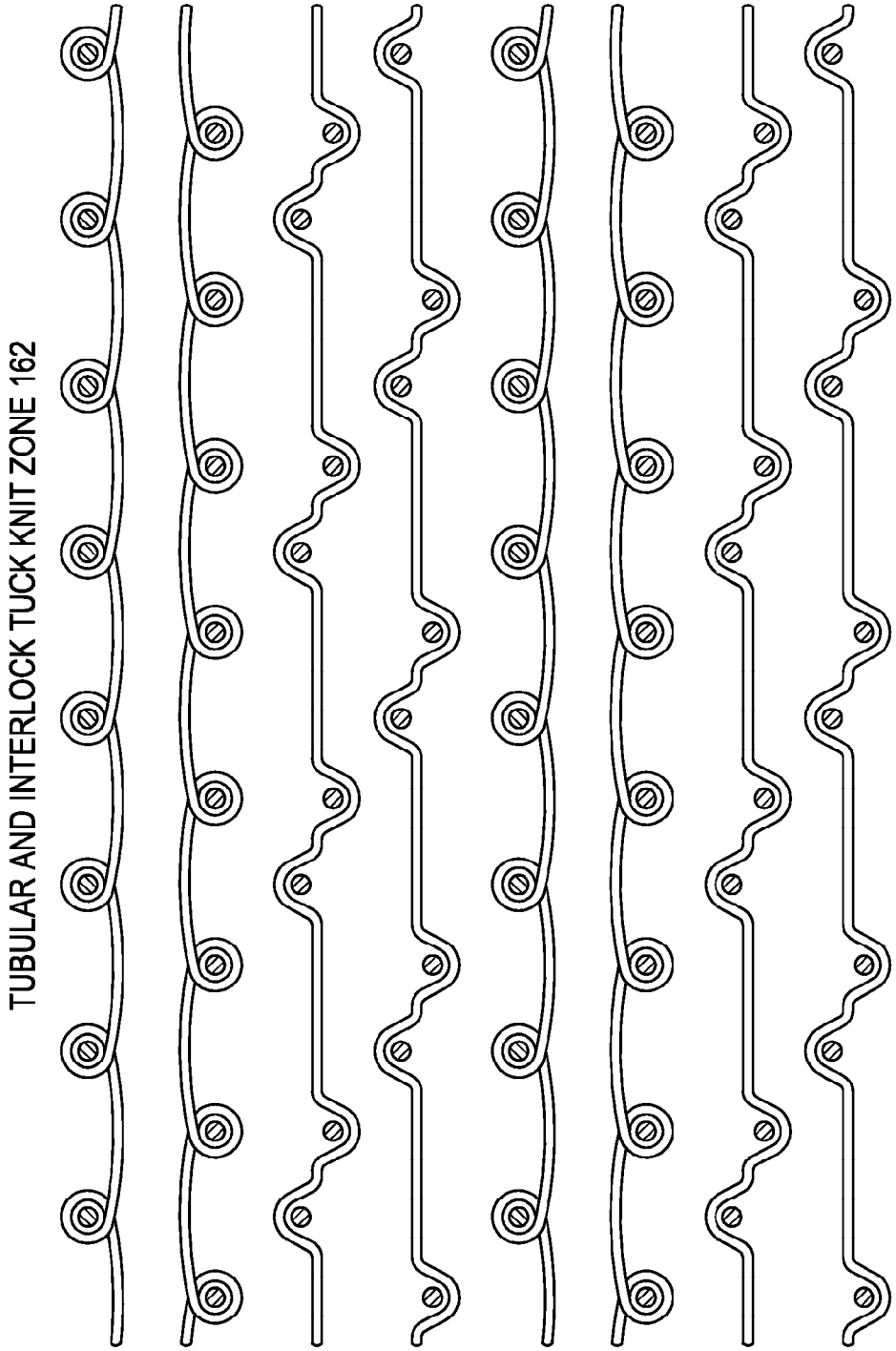


Figure 13B

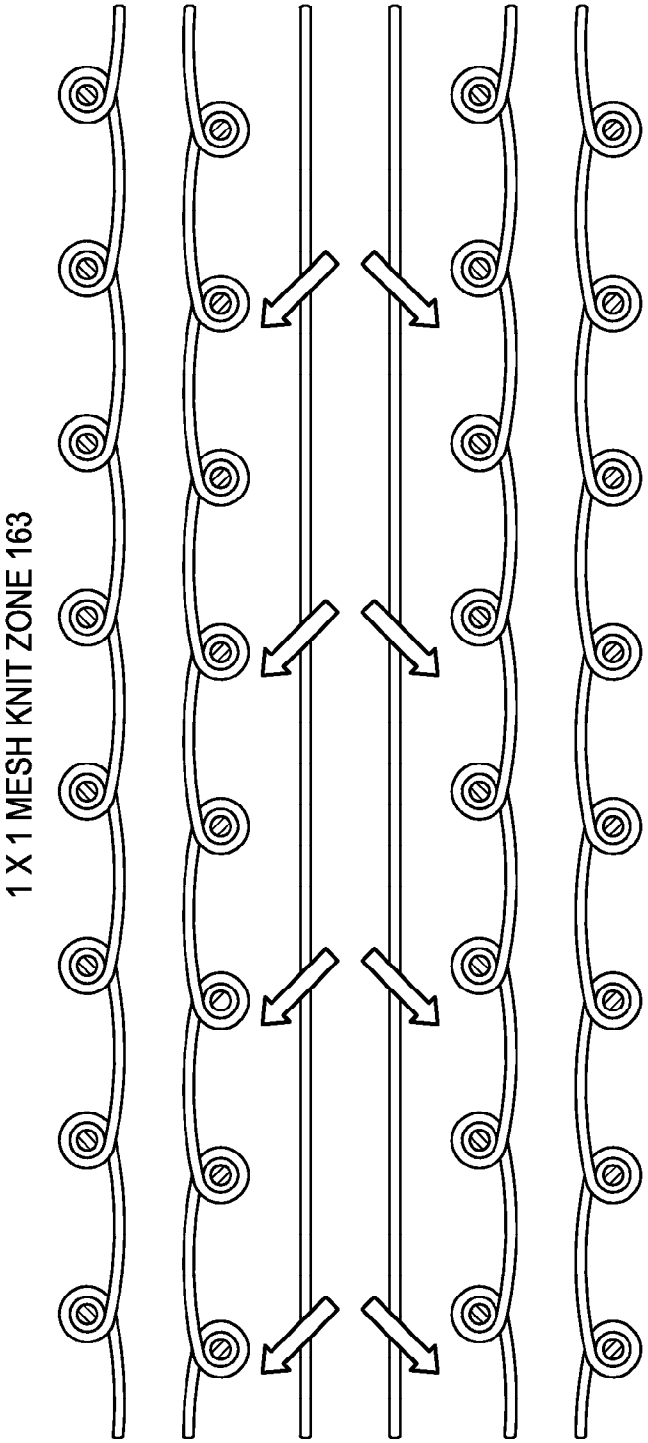


Figure 13C

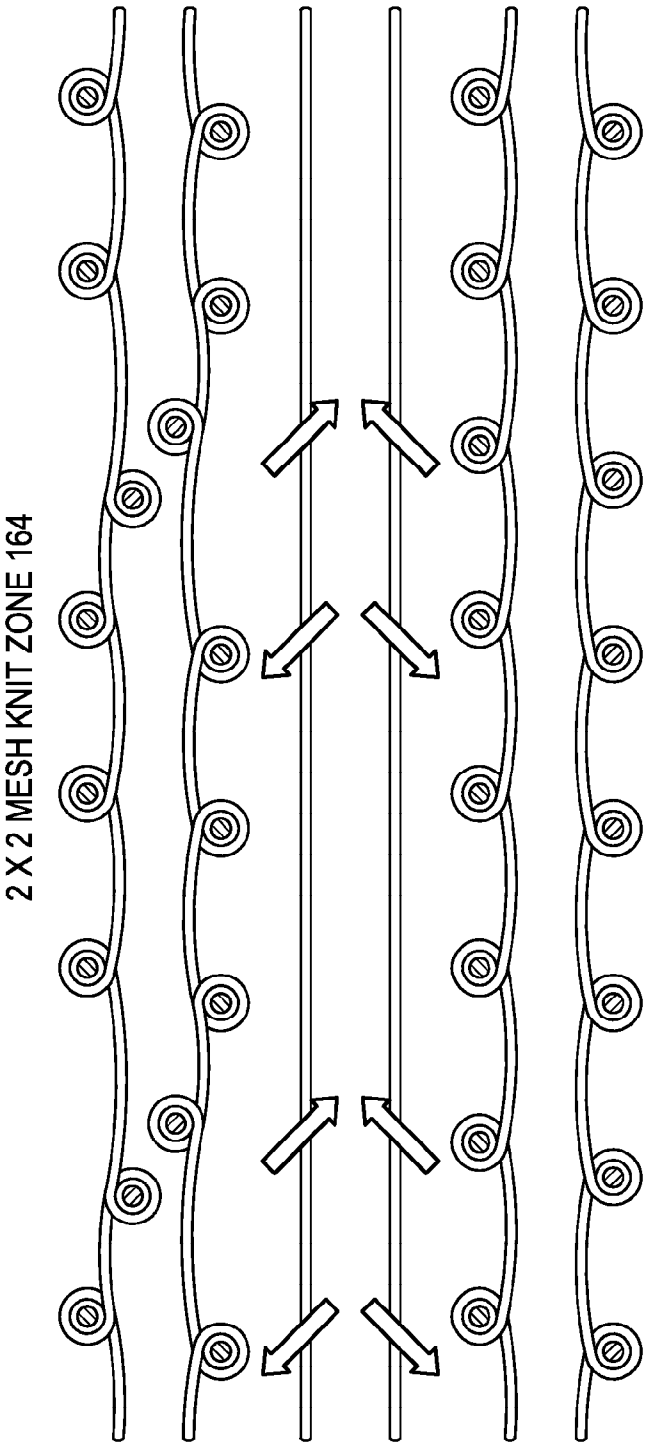


Figure 13D

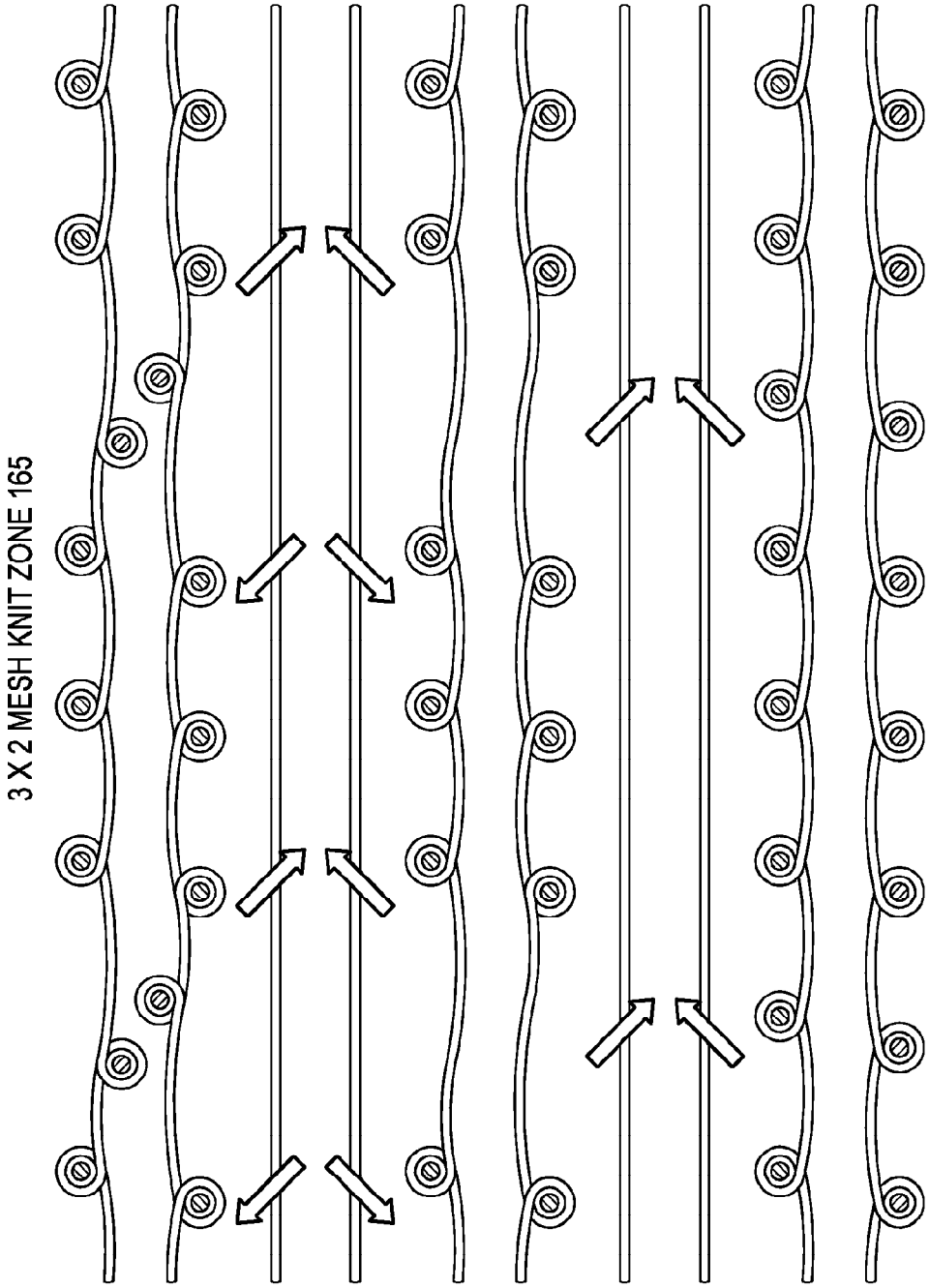


Figure 13E

SKECHERS-9346-00048875

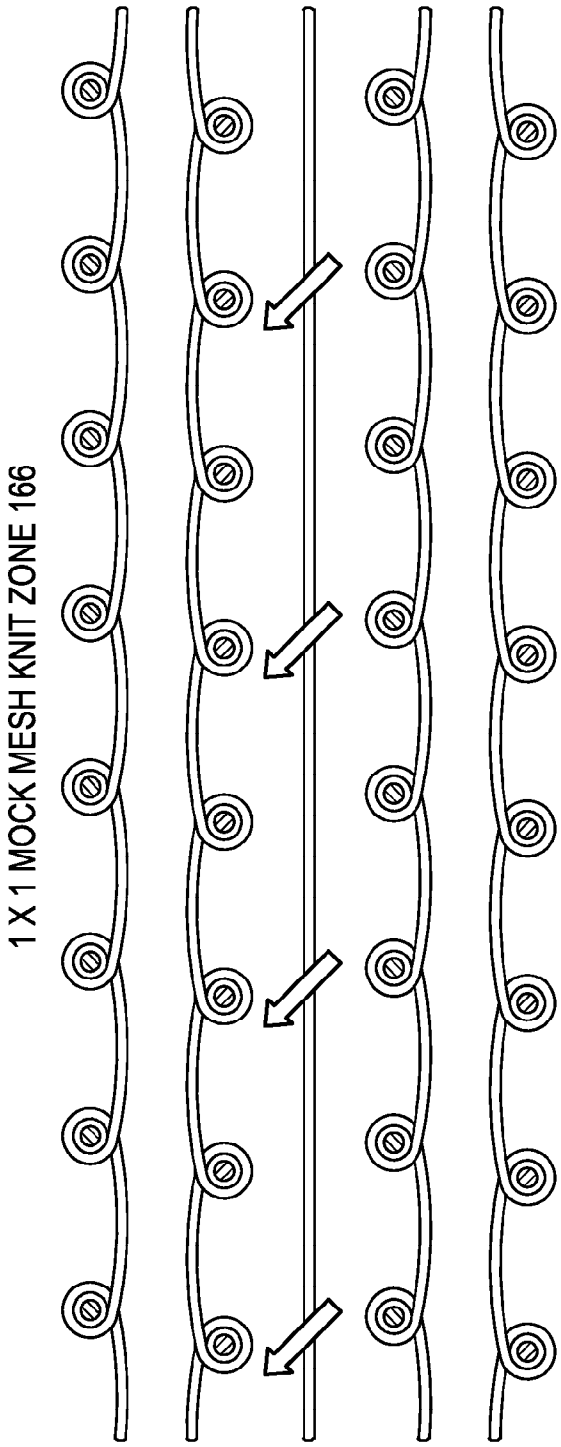


Figure 13F

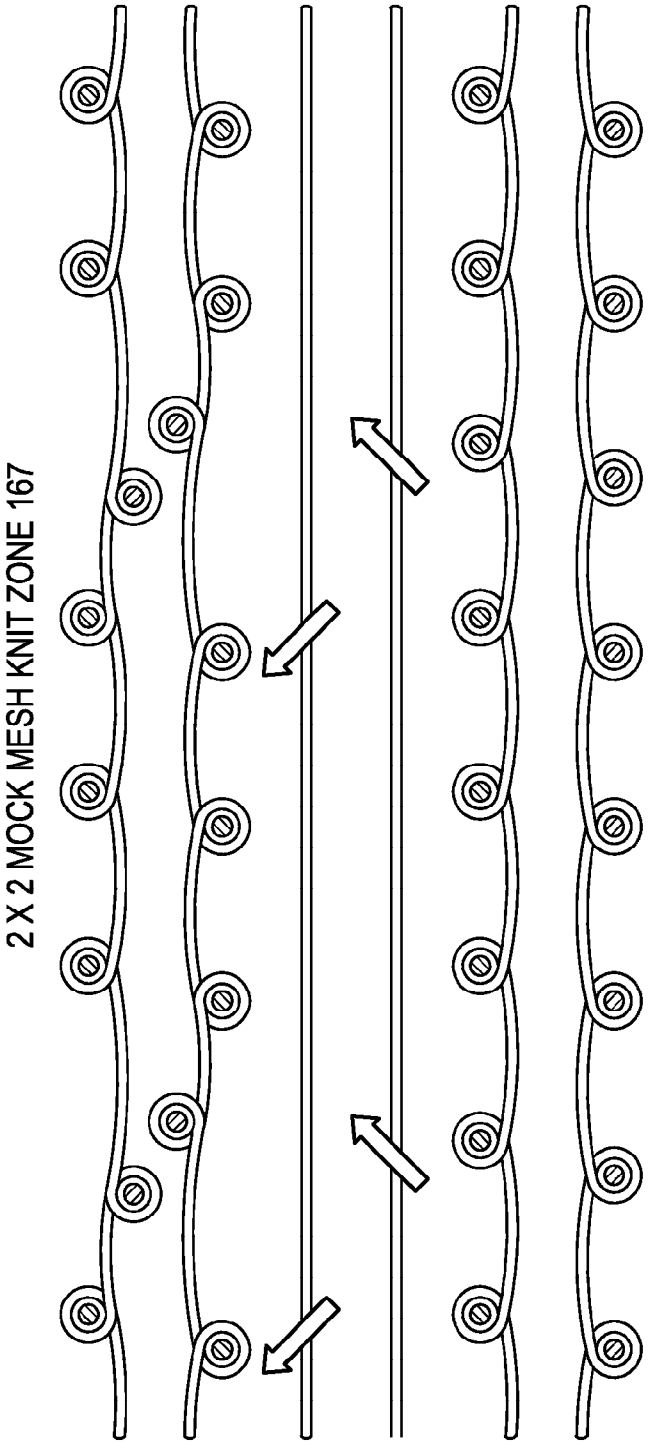


Figure 13G

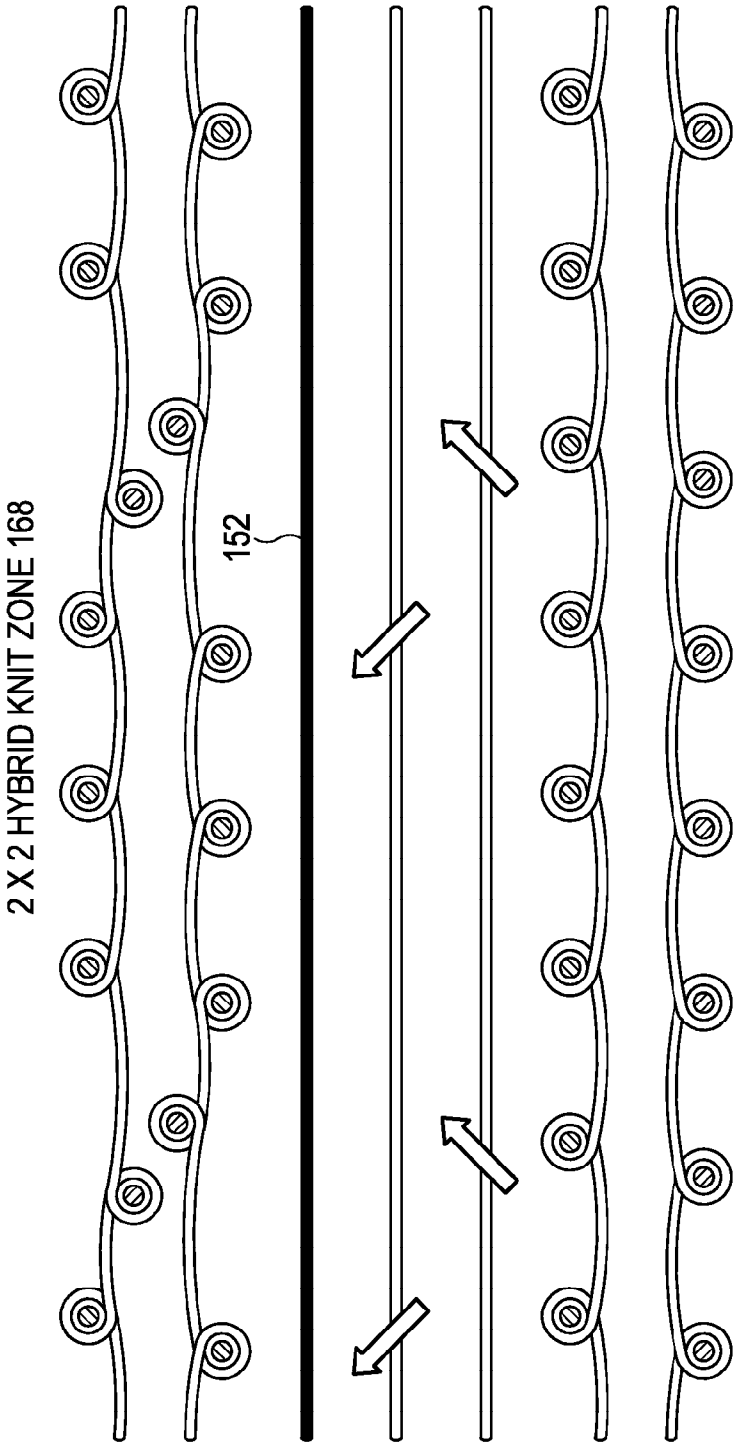


Figure 13H

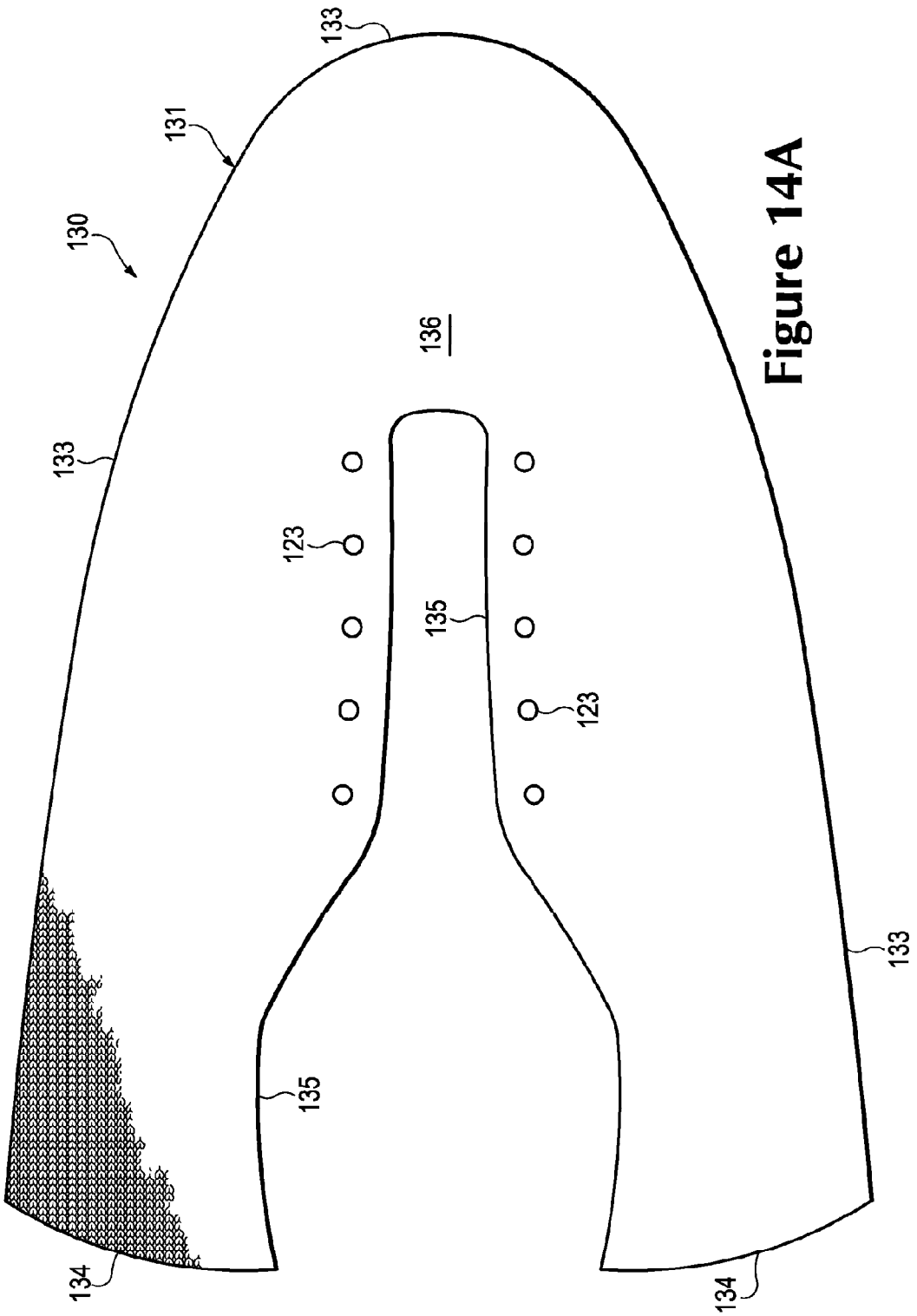


Figure 14A

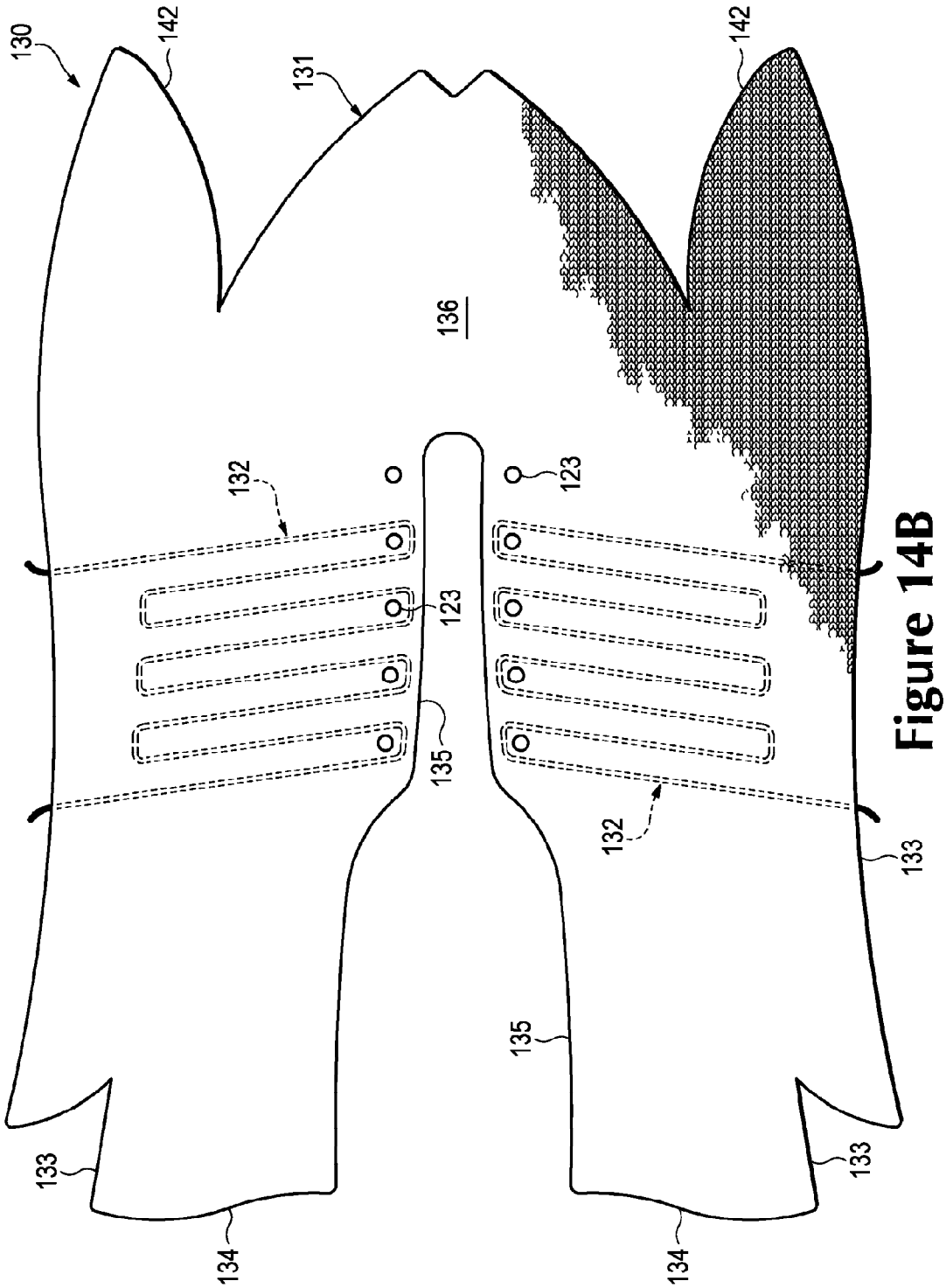


Figure 14B

SKECHERS-9346-00048880

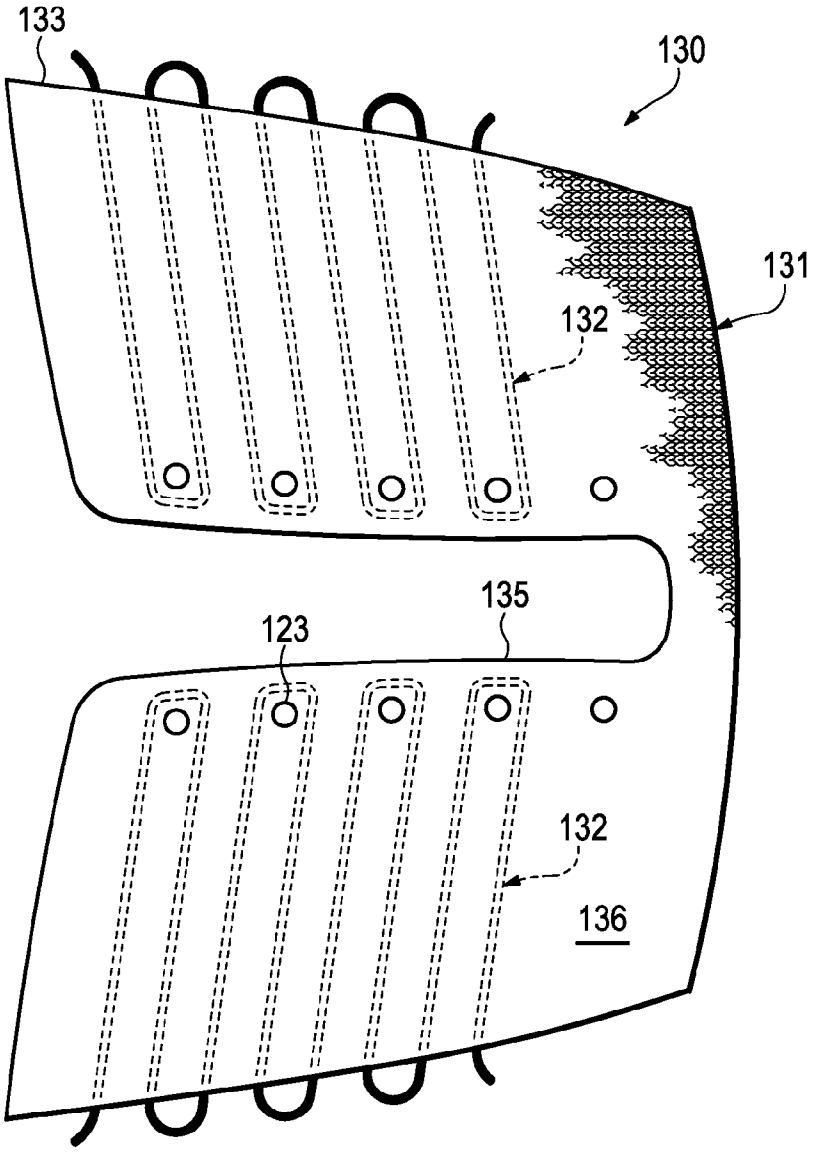


Figure 14C

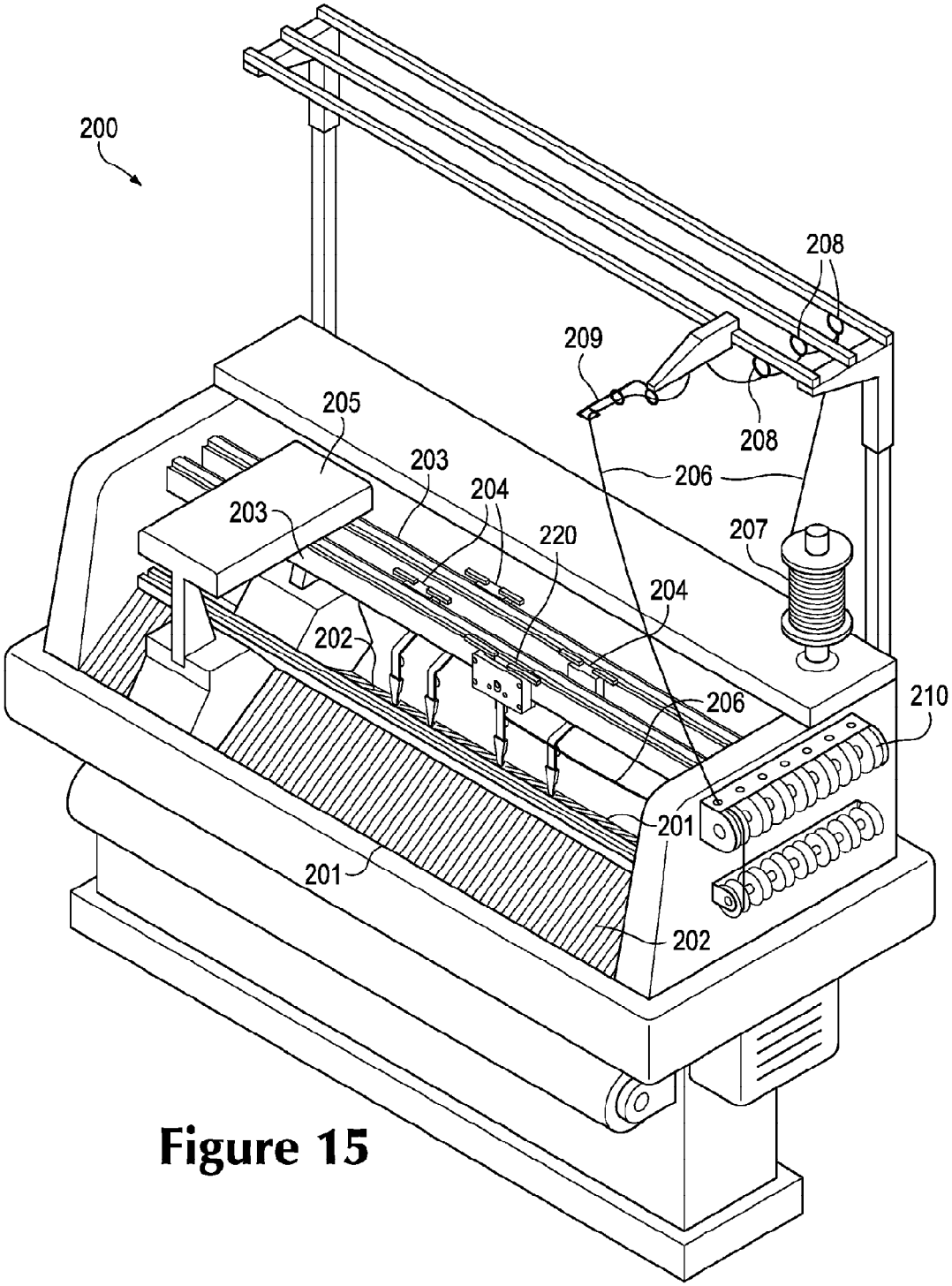


Figure 15

SKECHERS-9346-00048882

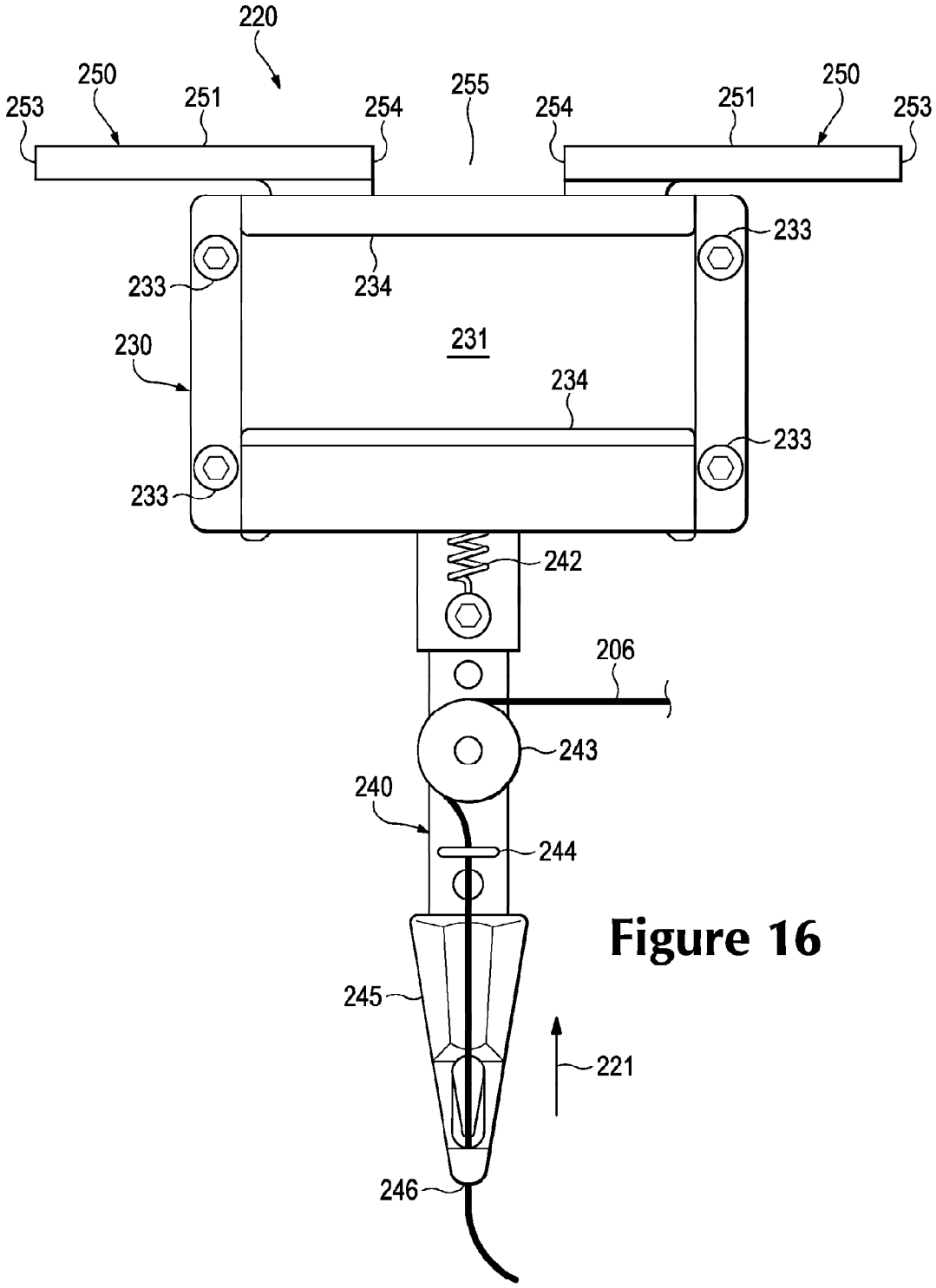

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Figure 16

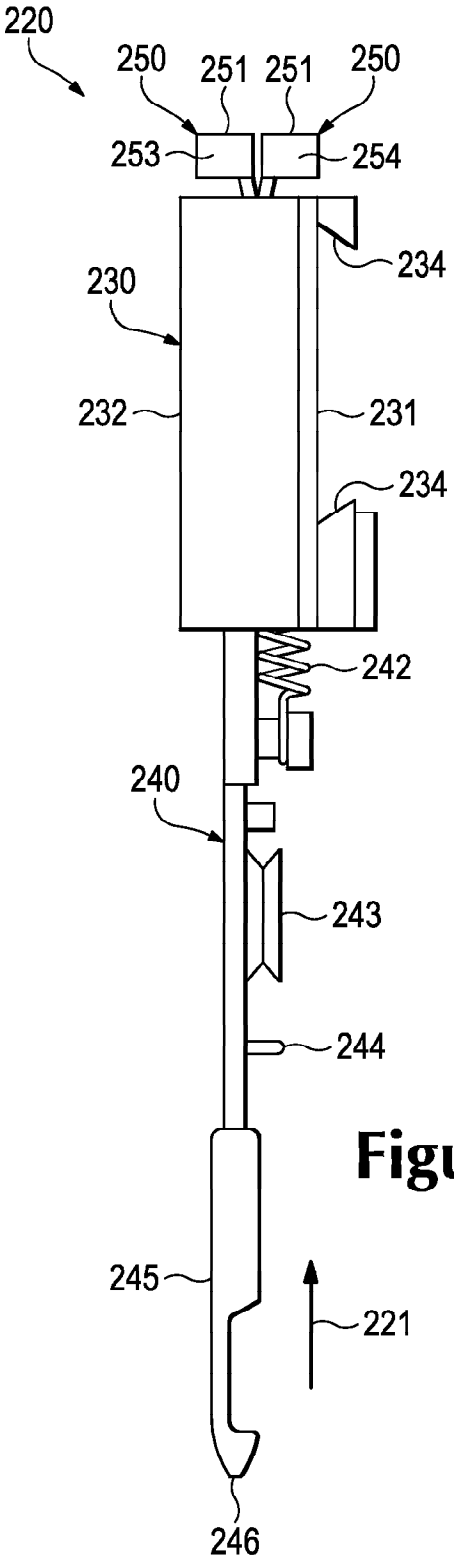


Figure 17

SKECHERS-9346-00048884

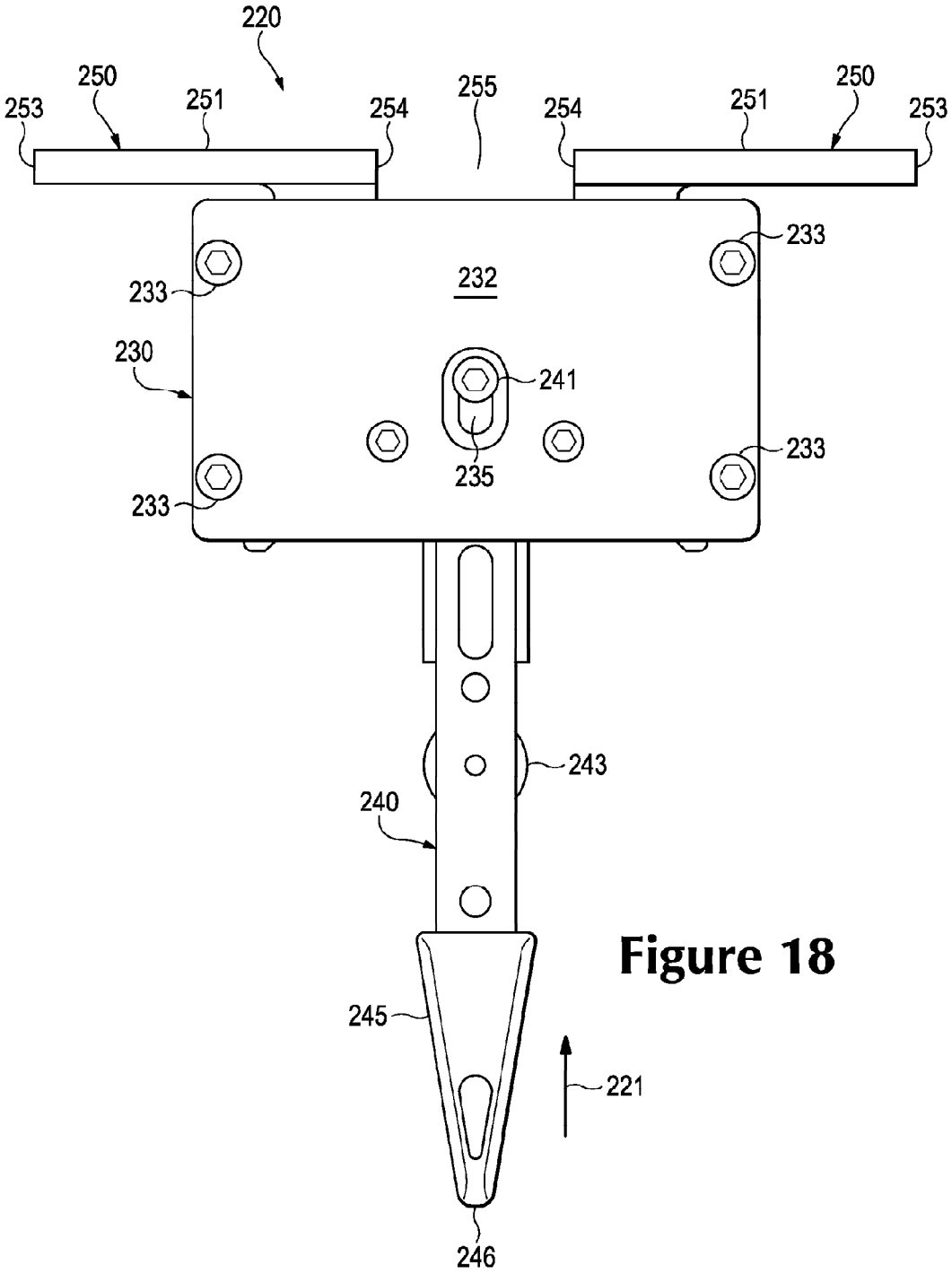

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Figure 18

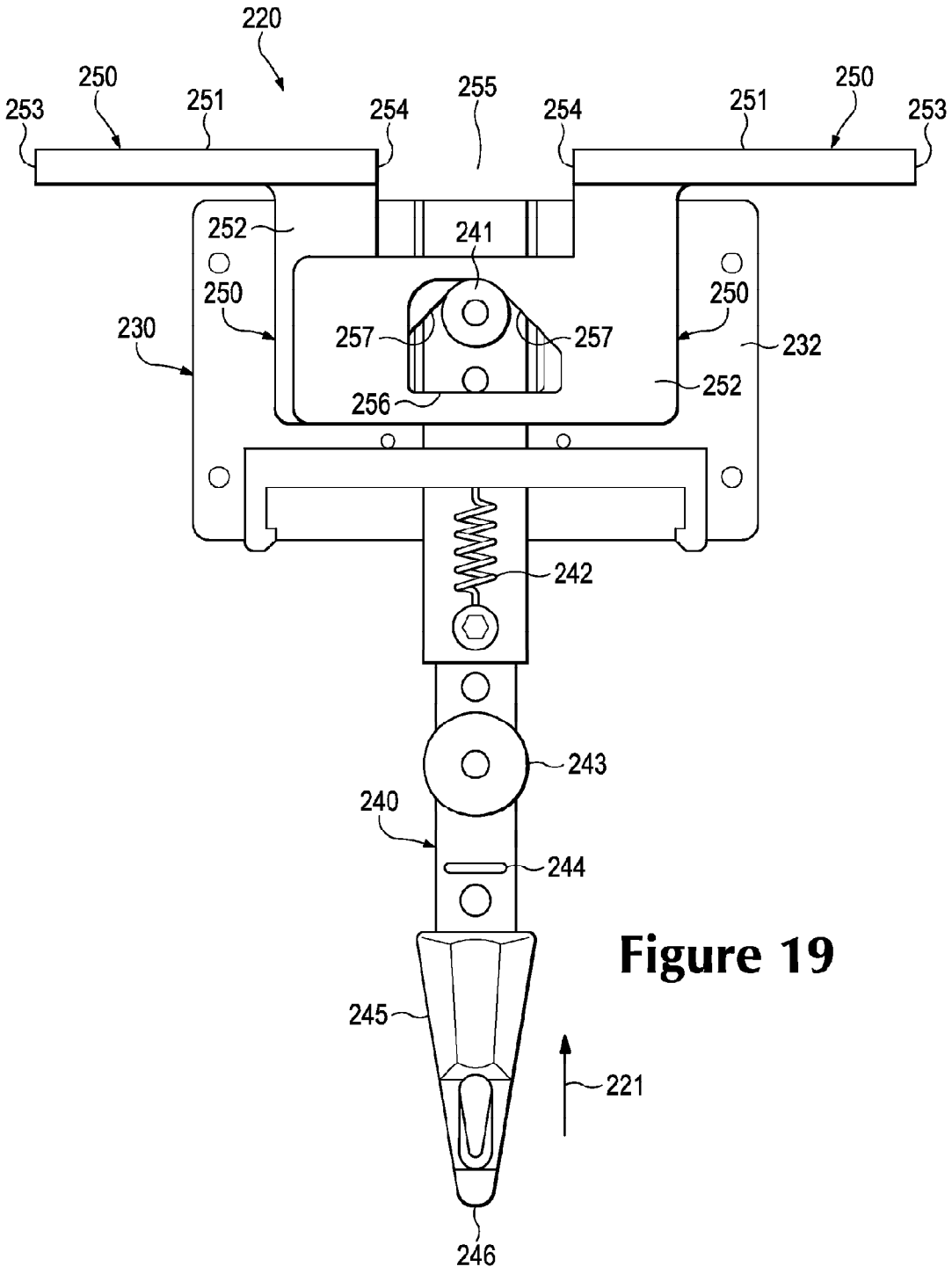


Figure 19

SKECHERS-9346-00048886

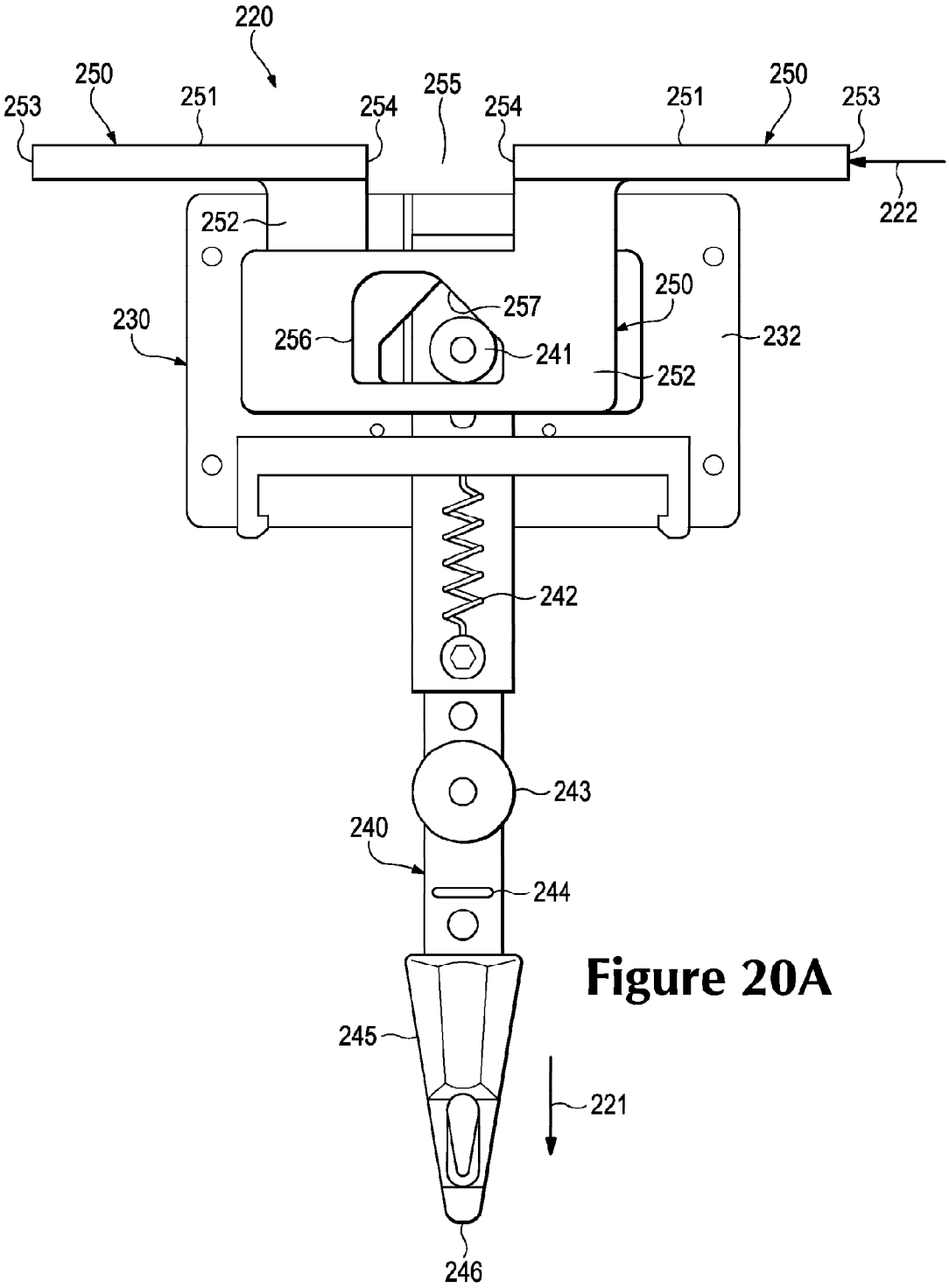


Figure 20A

SKECHERS-9346-00048887

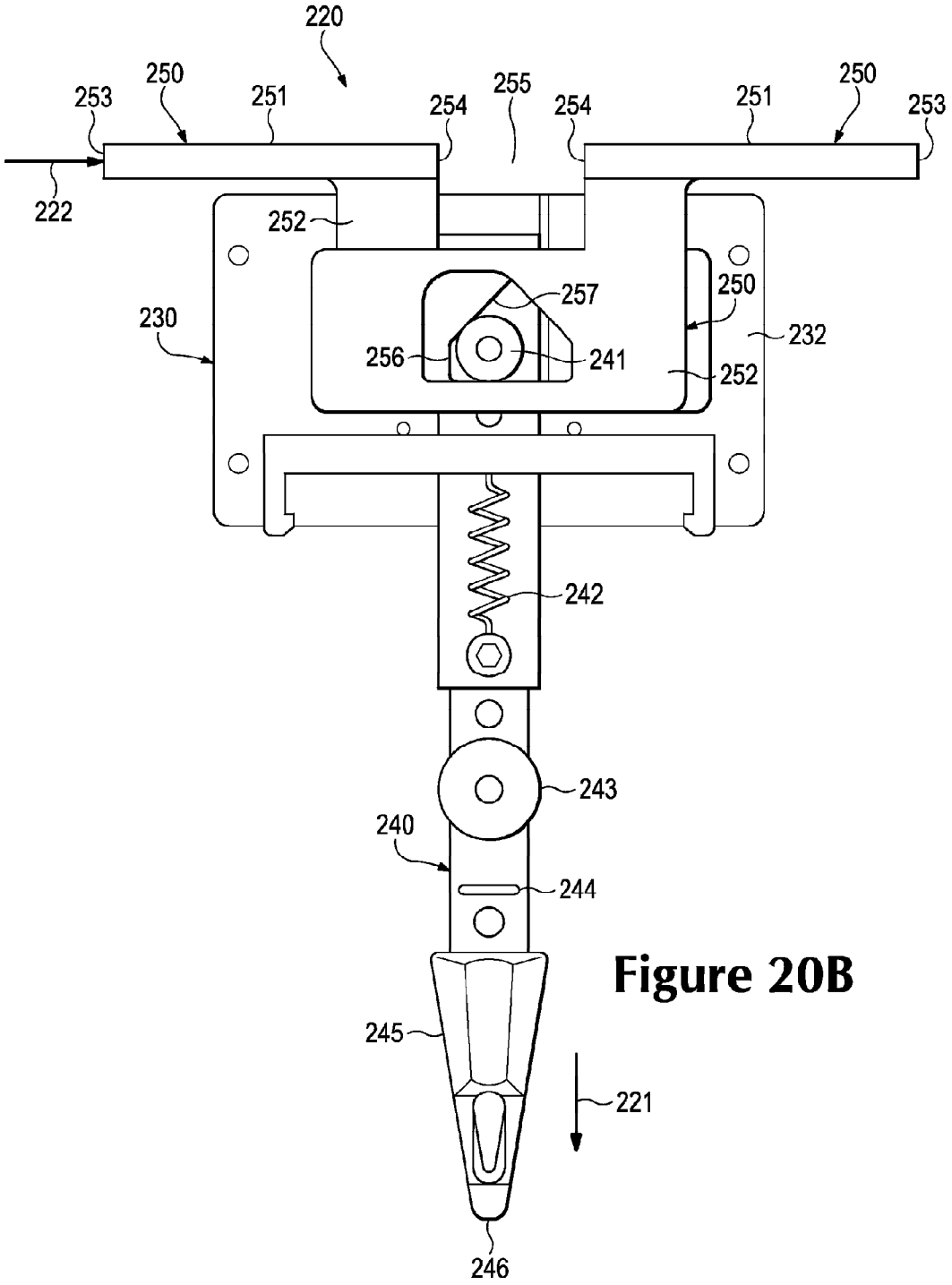

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Figure 20B

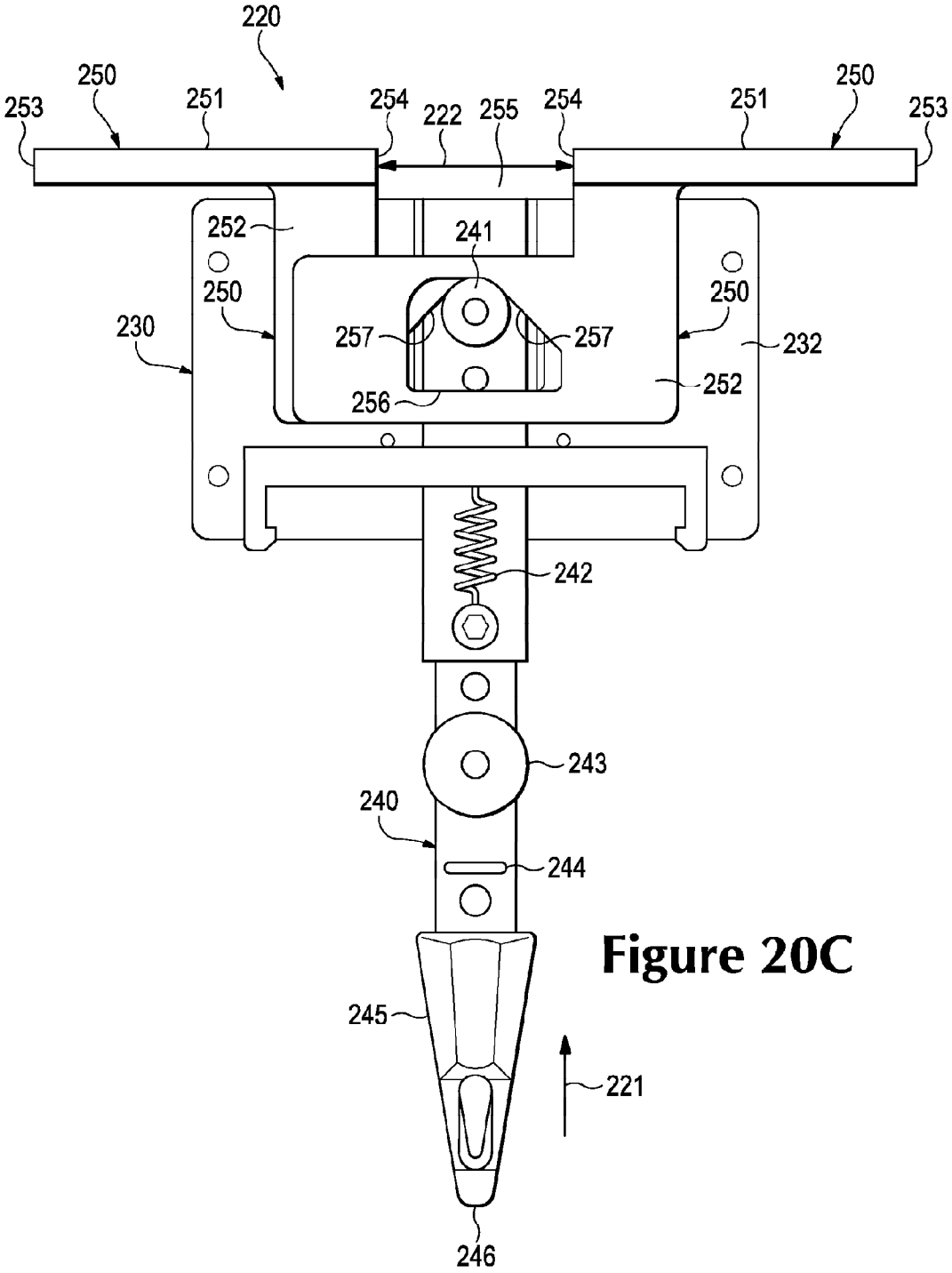


Figure 20C

SKECHERS-9346-00048889

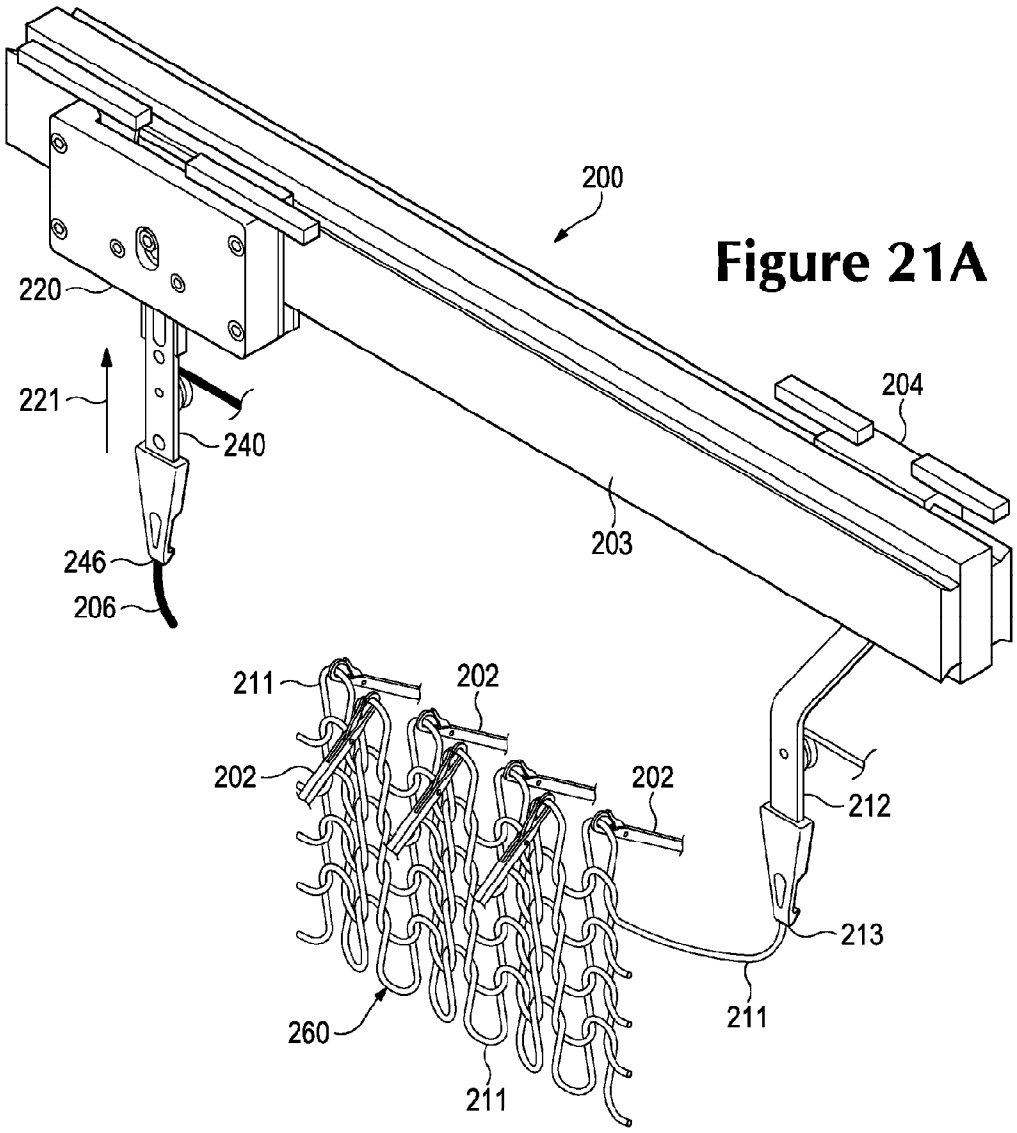

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Figure 21A

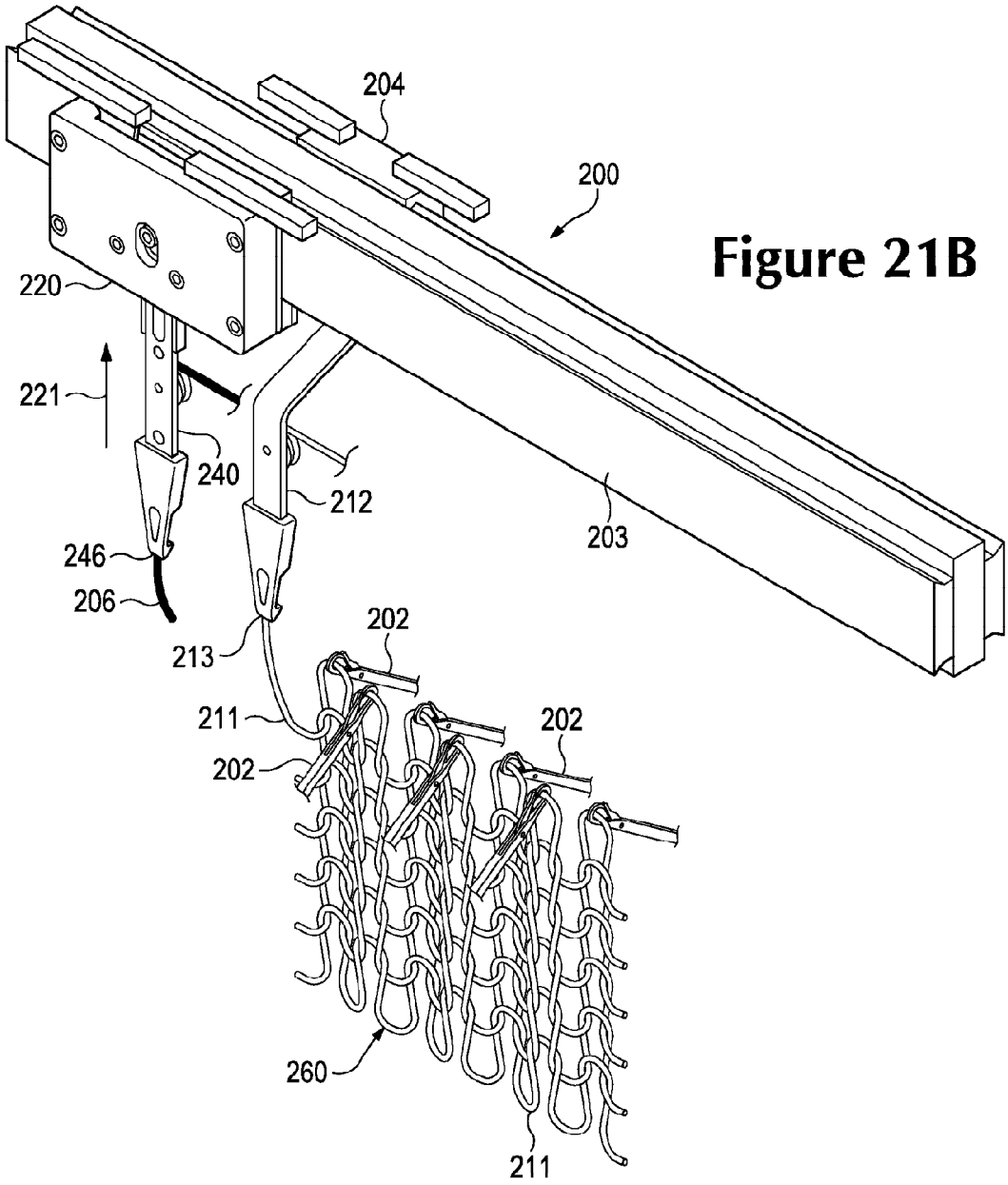


Figure 21B

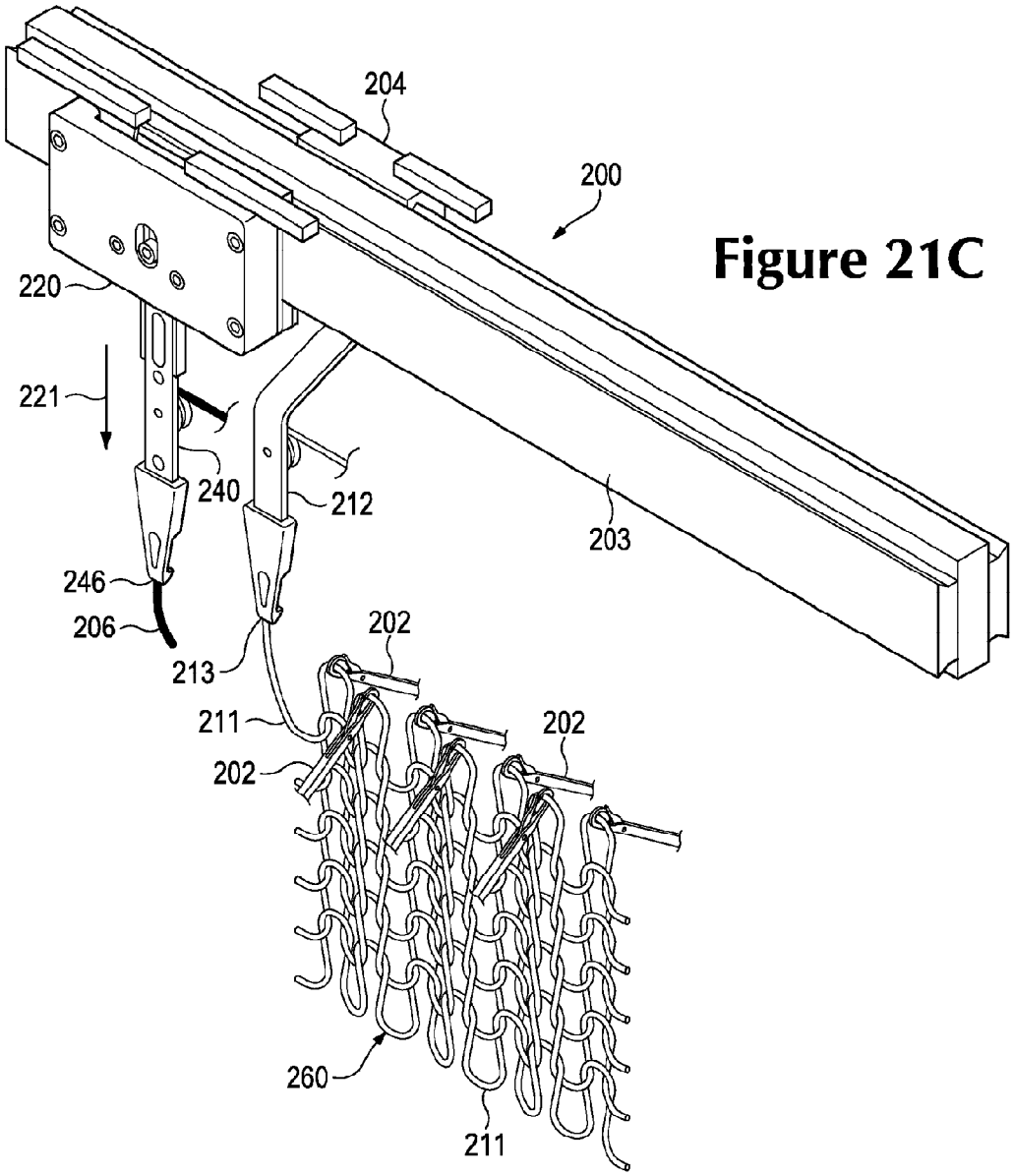


Figure 21C

SKECHERS-9346-00048892

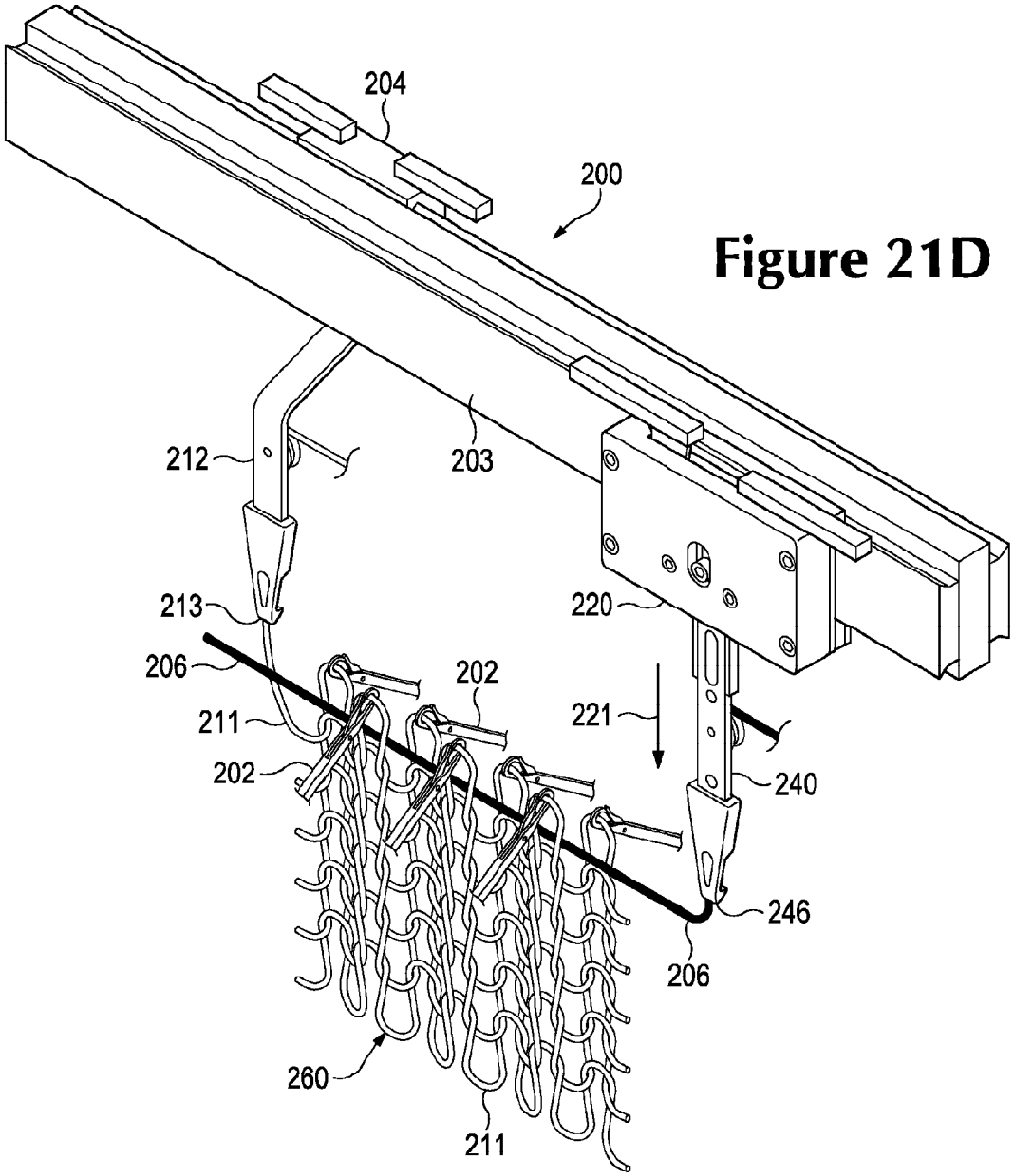


Figure 21D

SKECHERS-9346-00048893

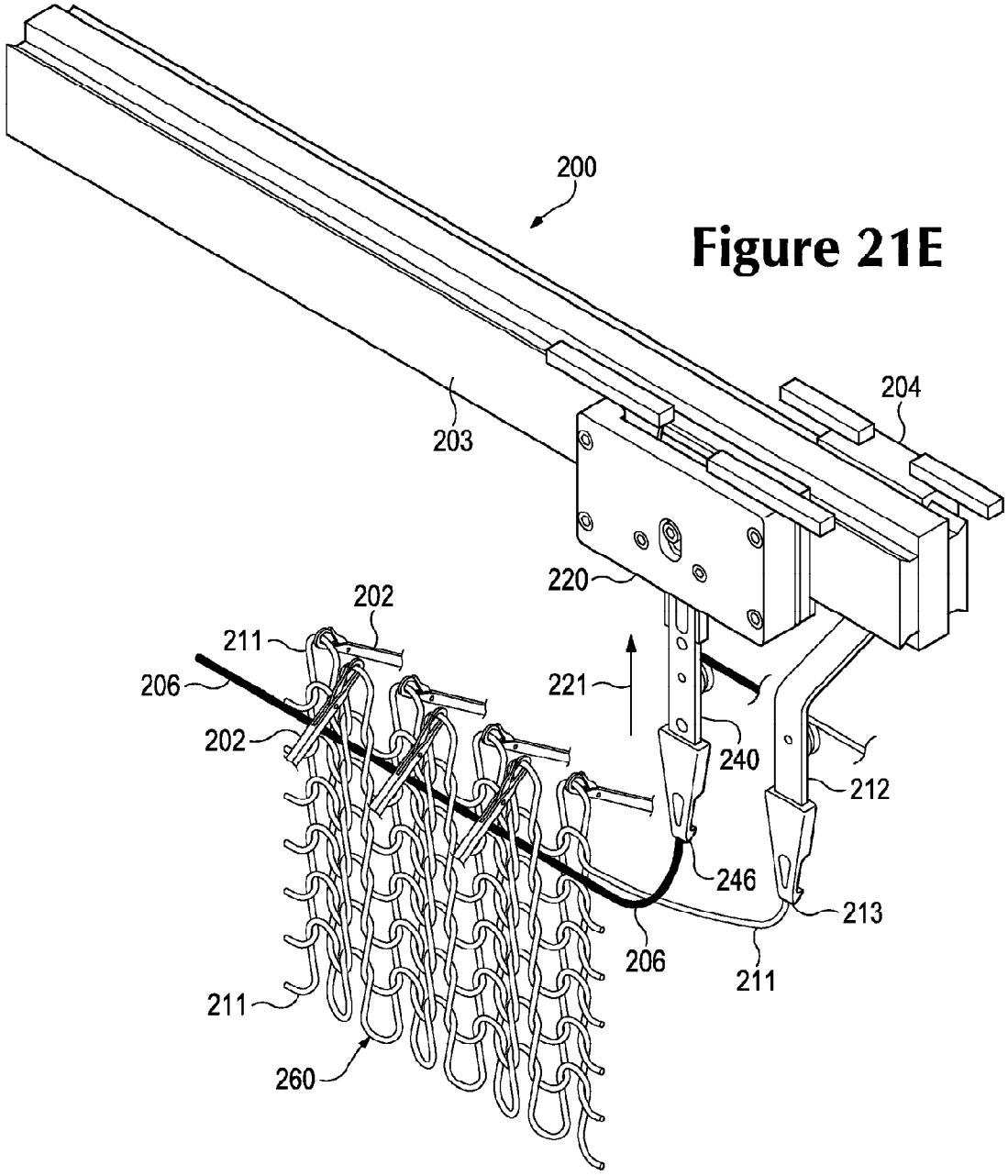

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Figure 21E

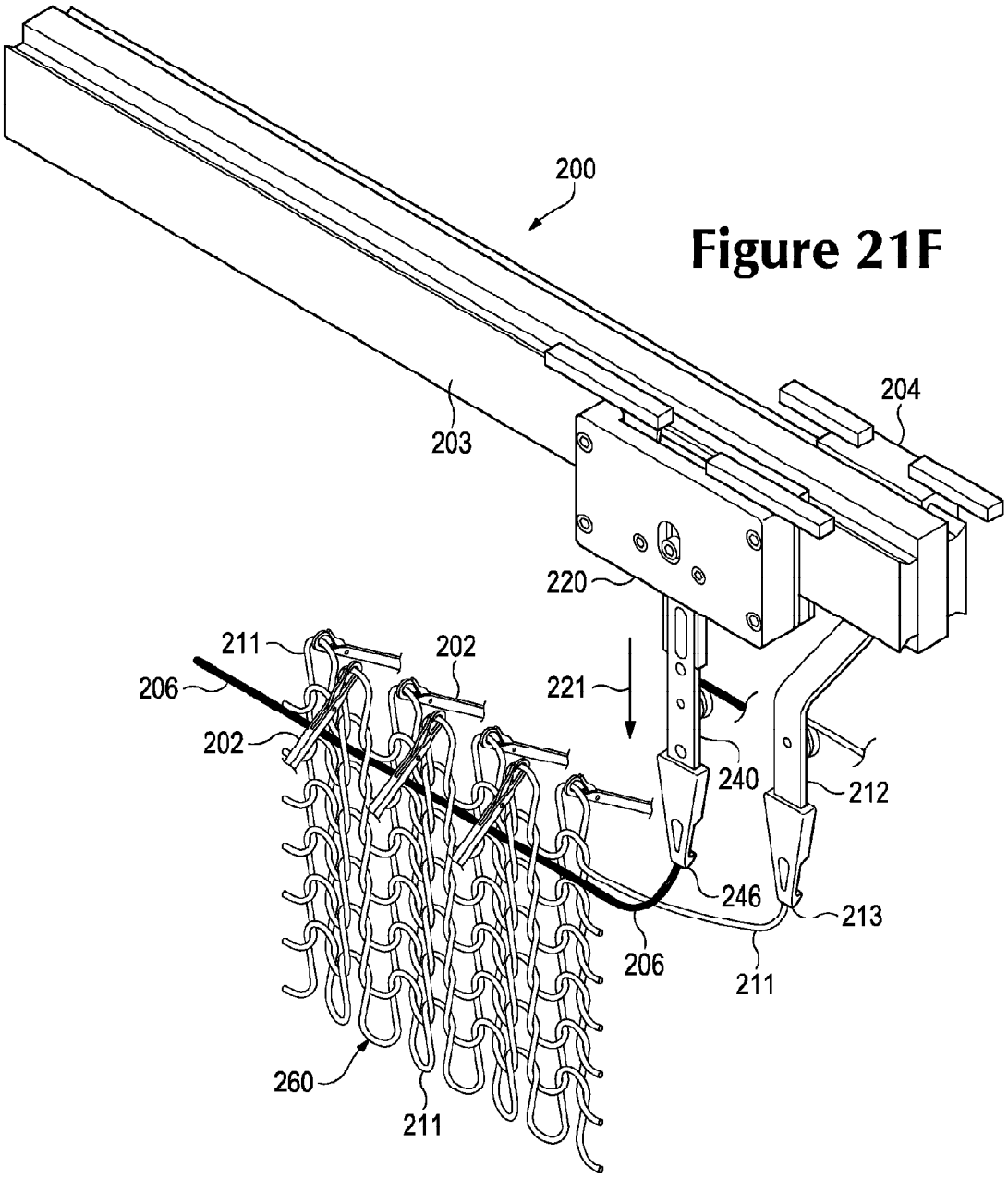

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Figure 21F

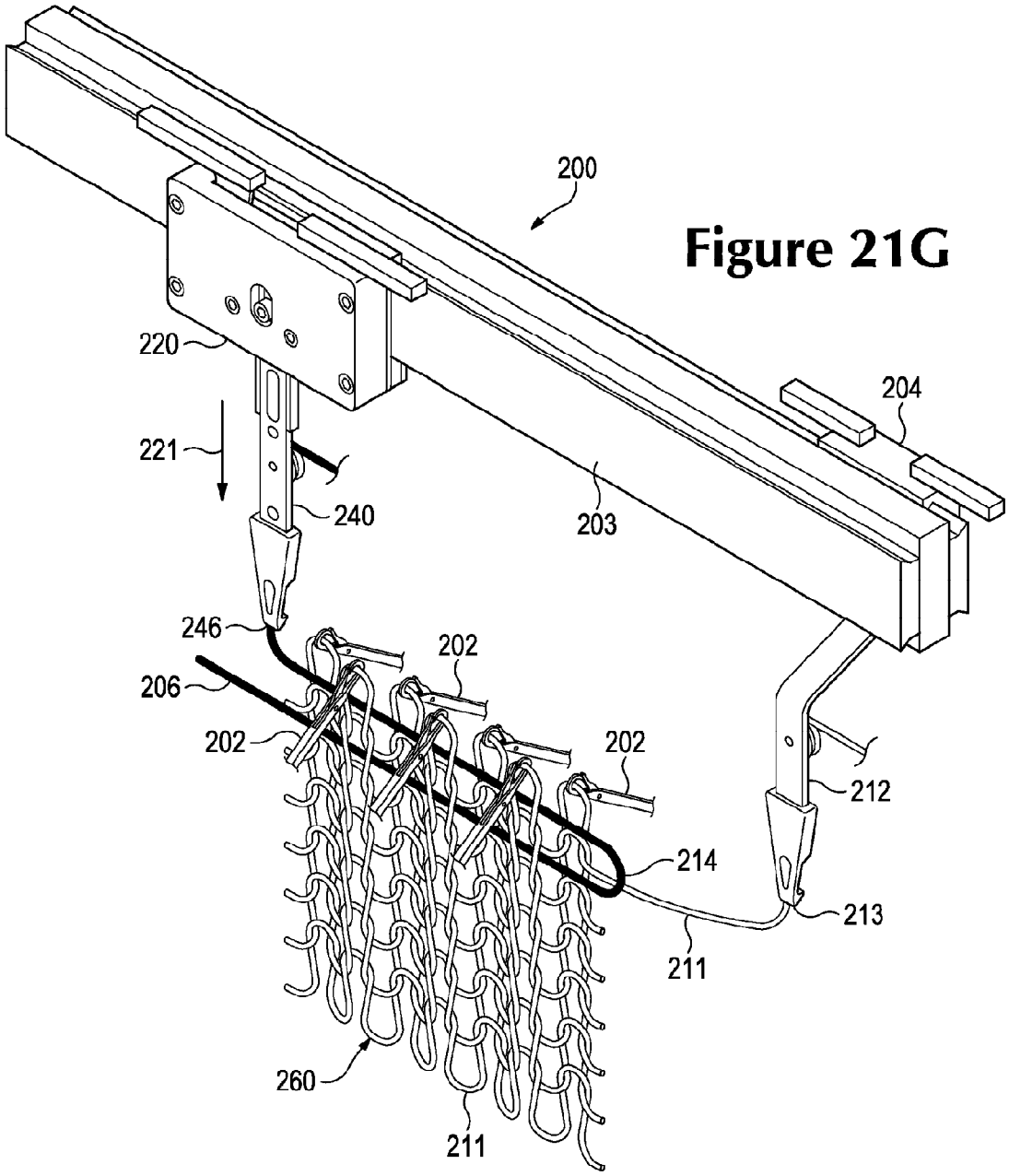


Figure 21G

SKECHERS-9346-00048896

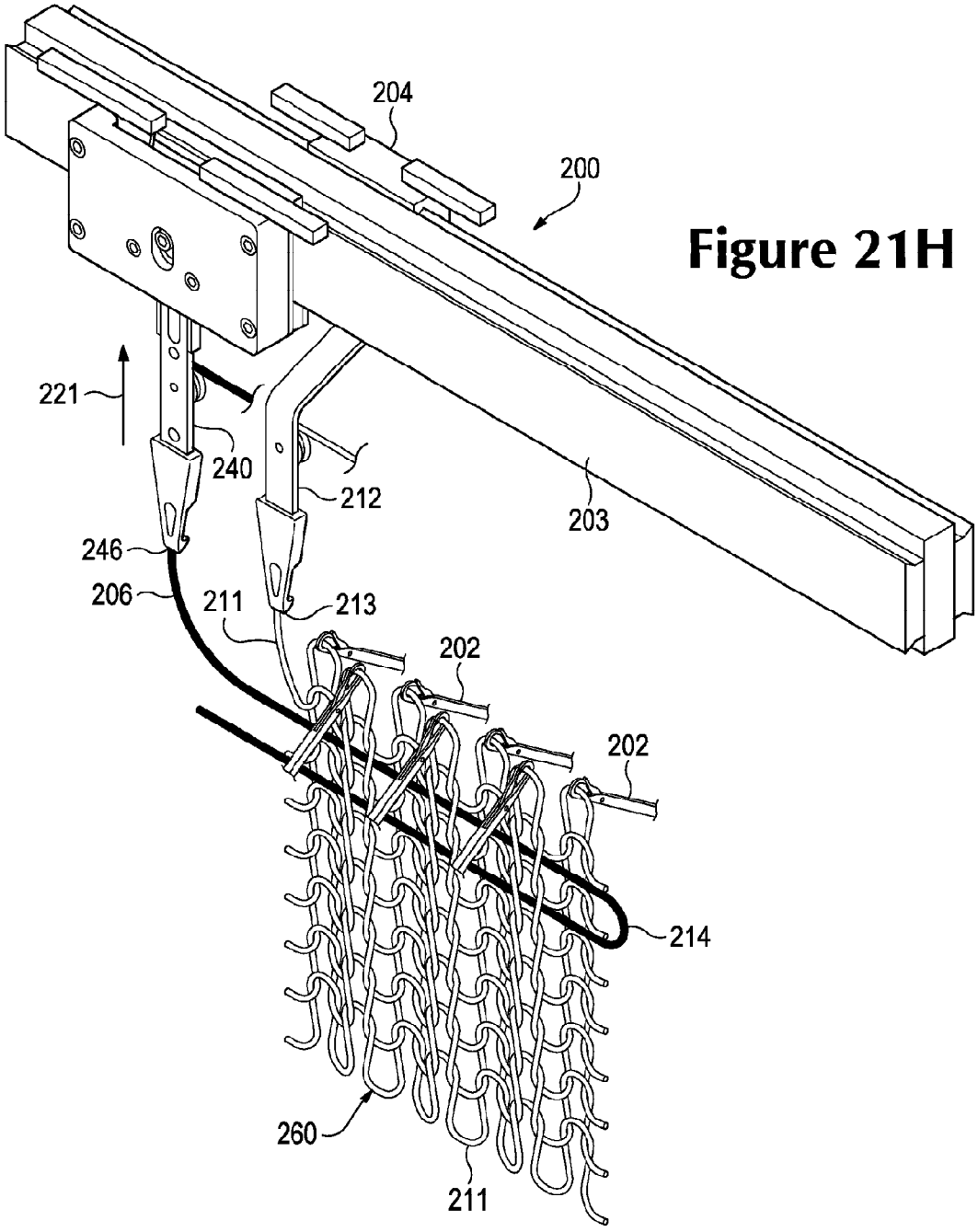


Figure 21H

SKECHERS-9346-00048897

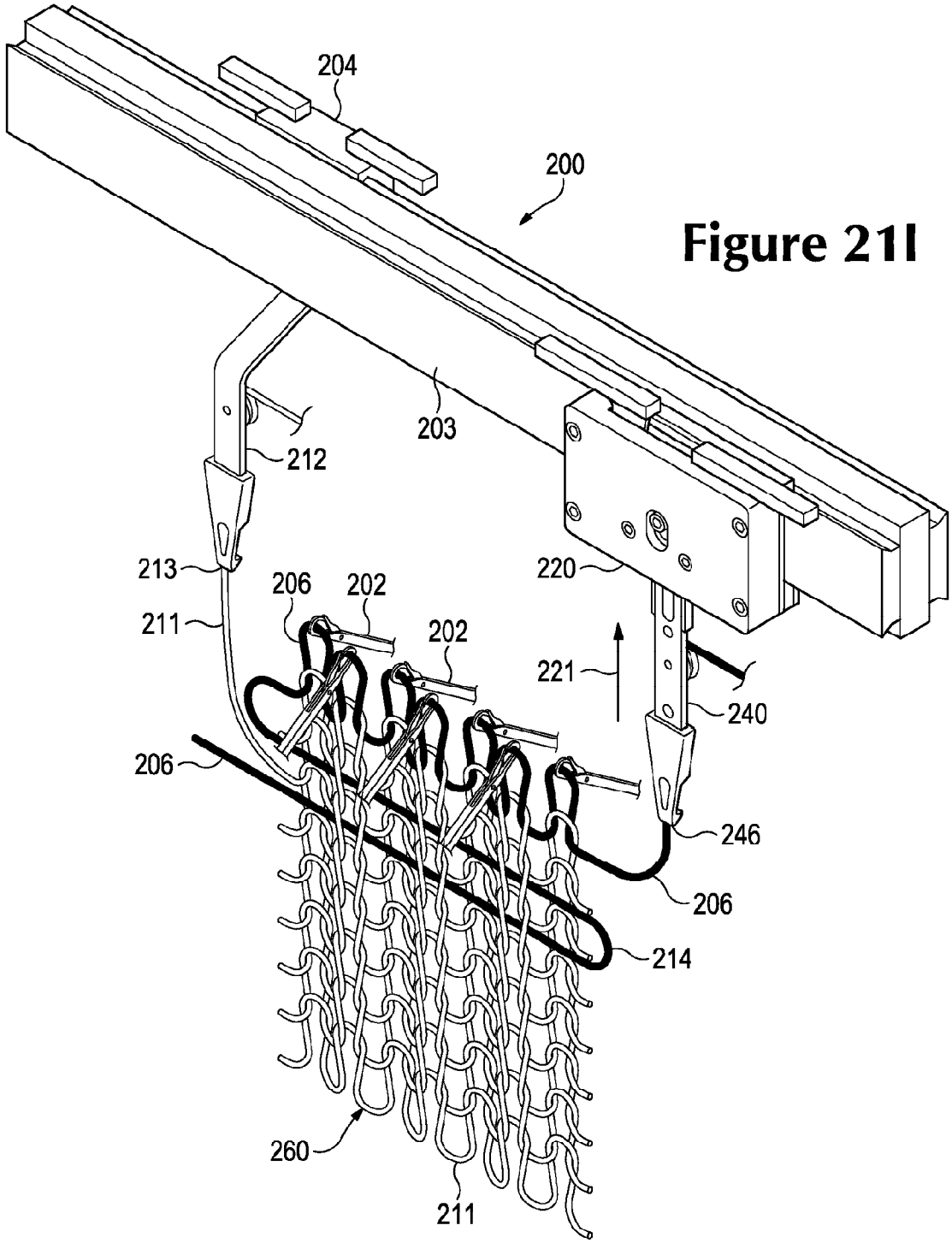


Figure 21I

SKECHERS-9346-00048898

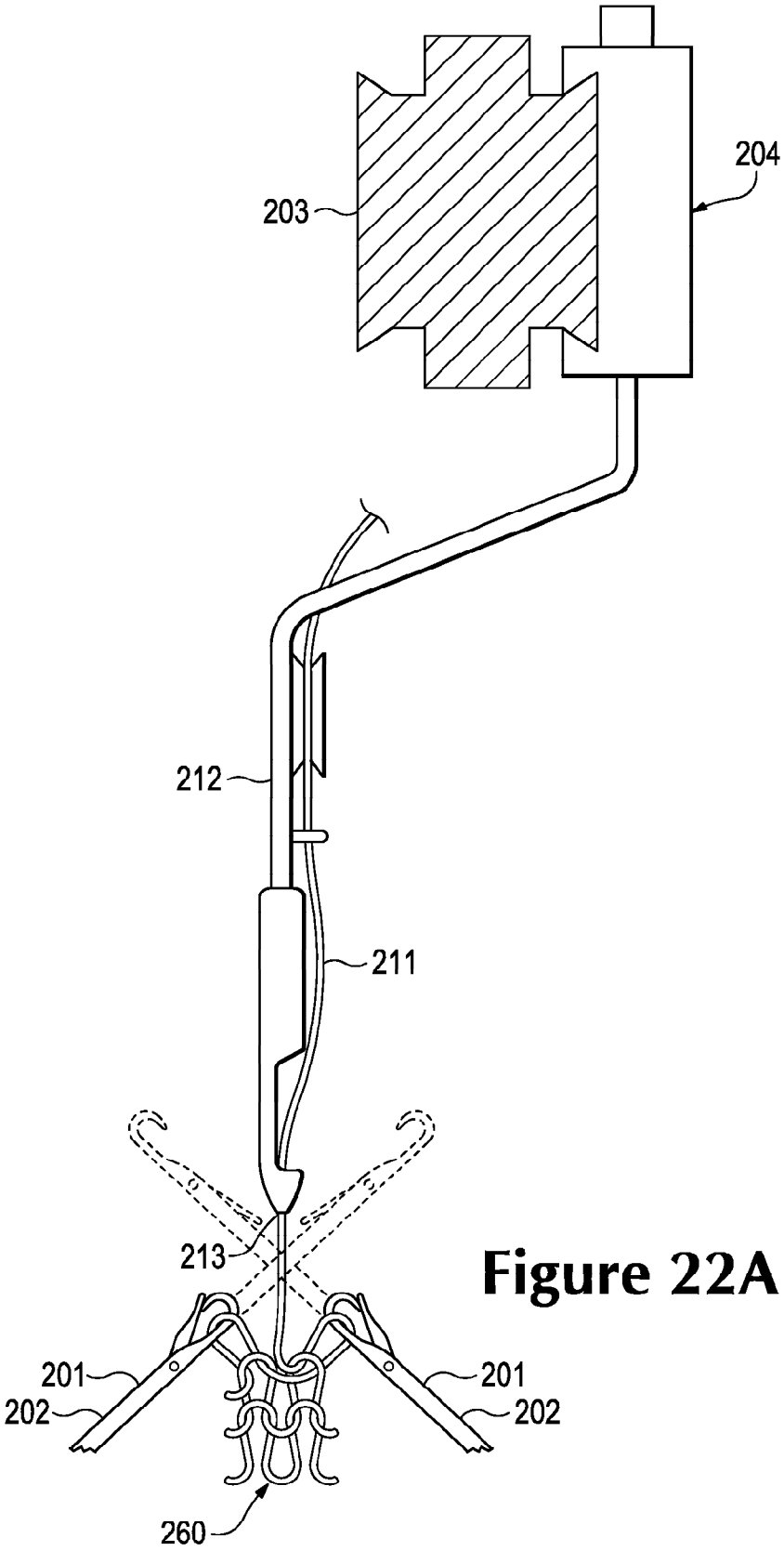


Figure 22A

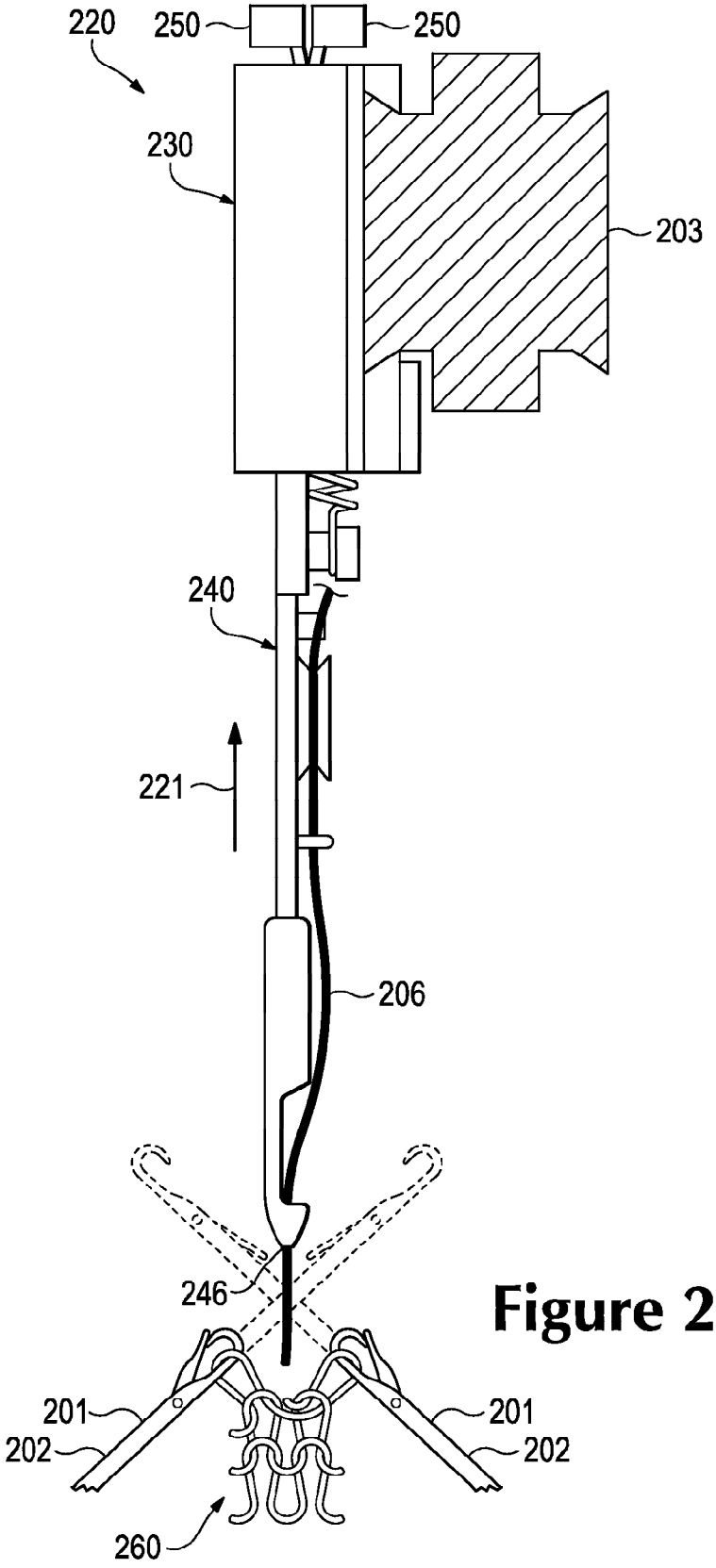


Figure 22B

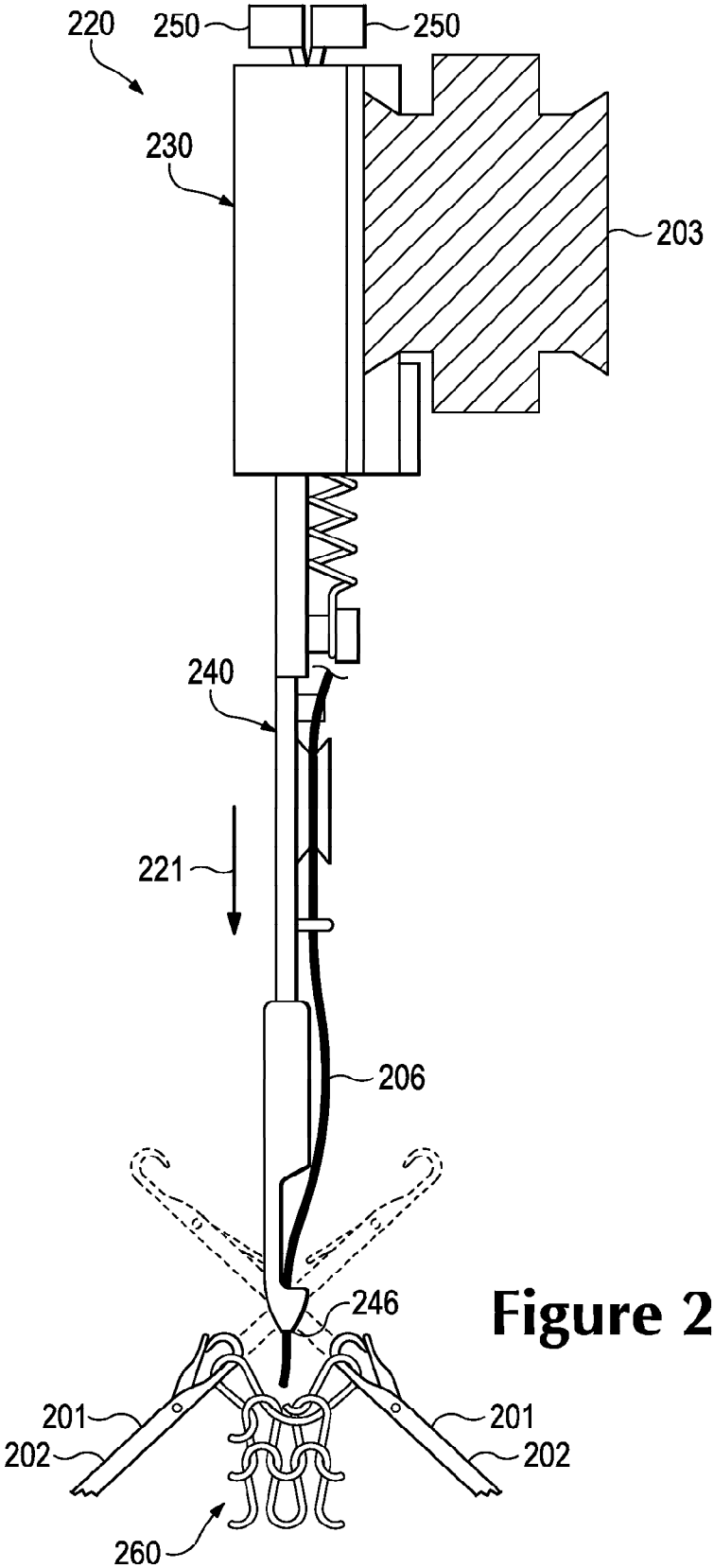


Figure 22C

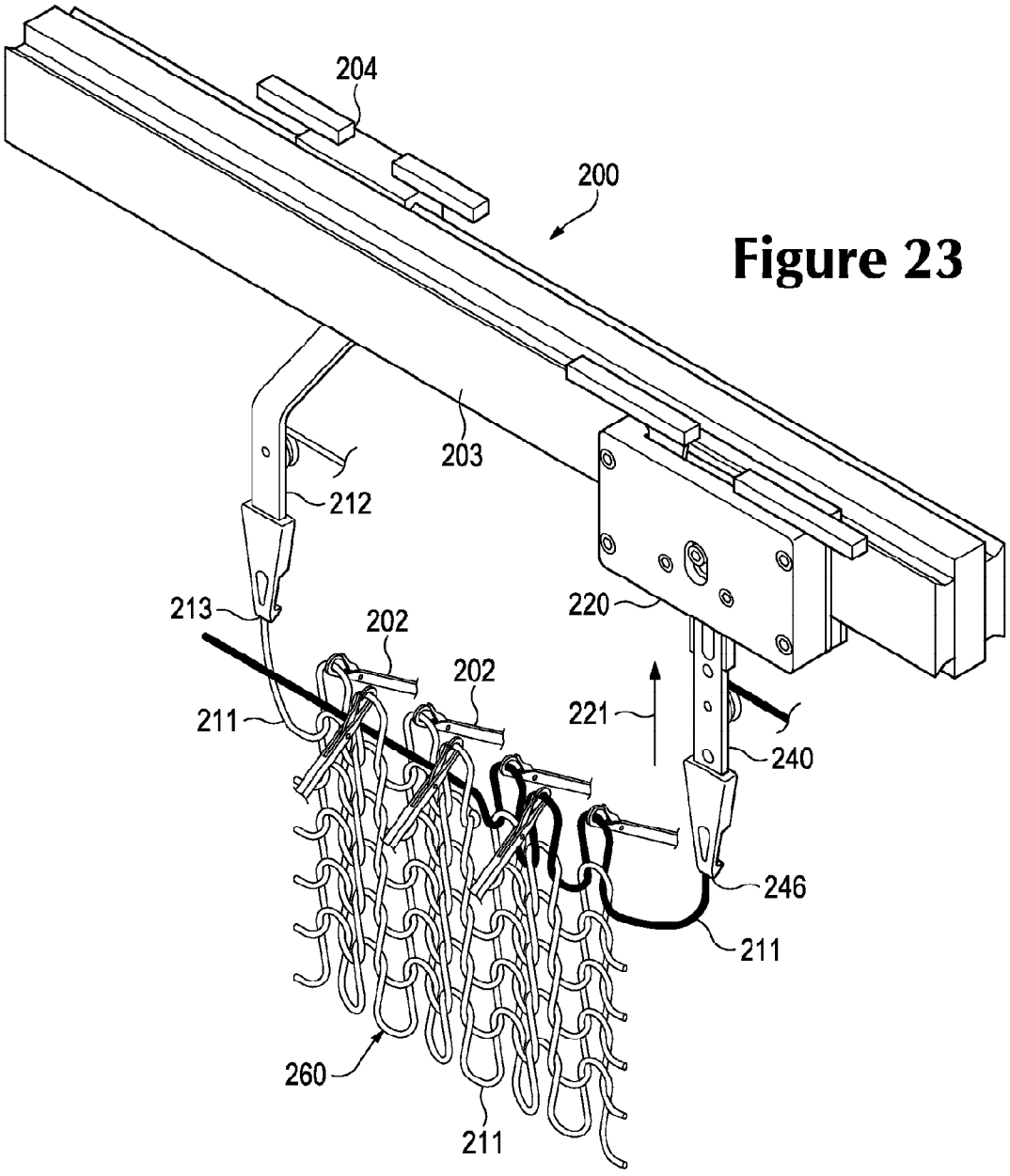


Figure 23

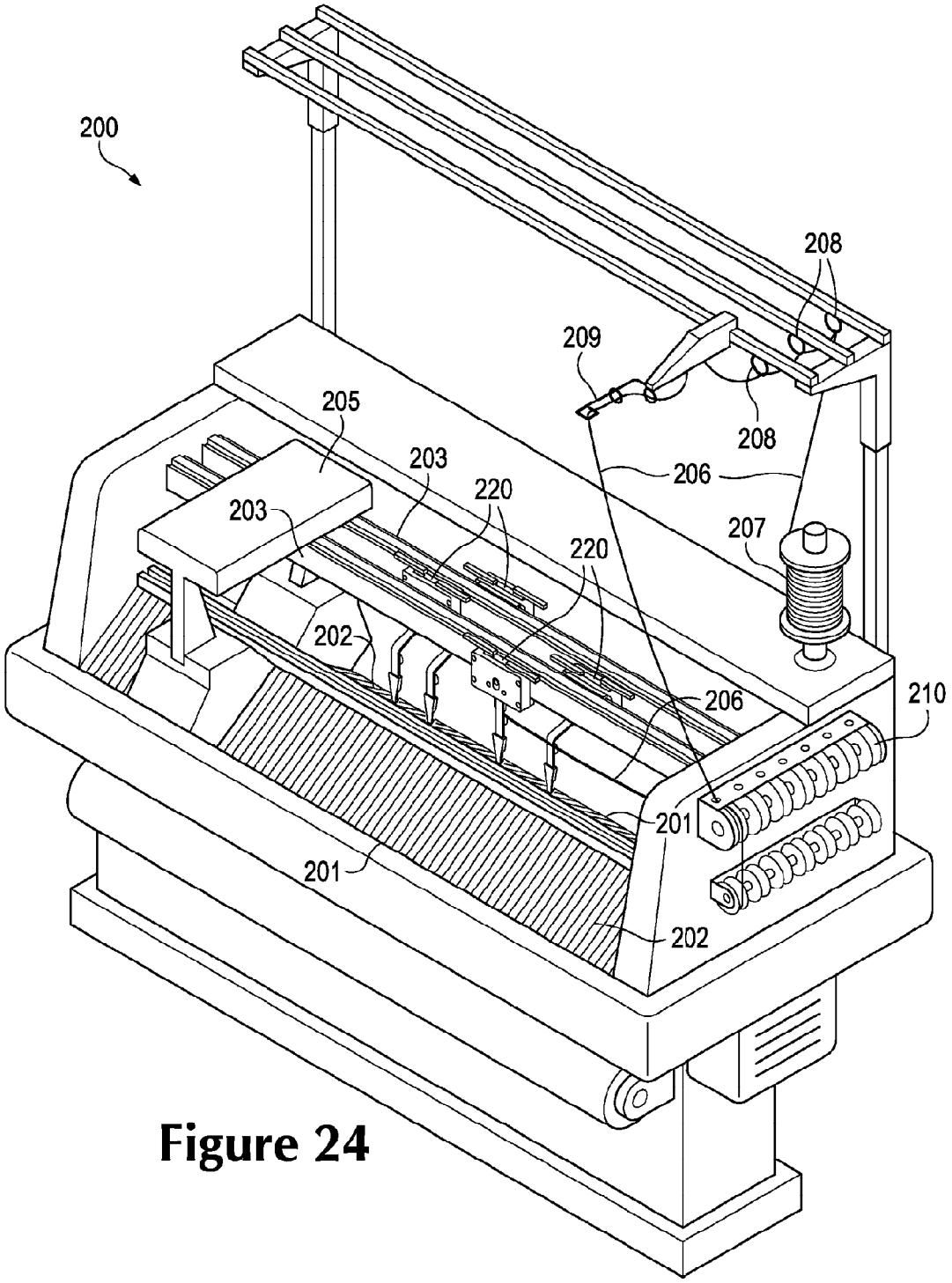


Figure 24

SKECHERS-9346-00048903

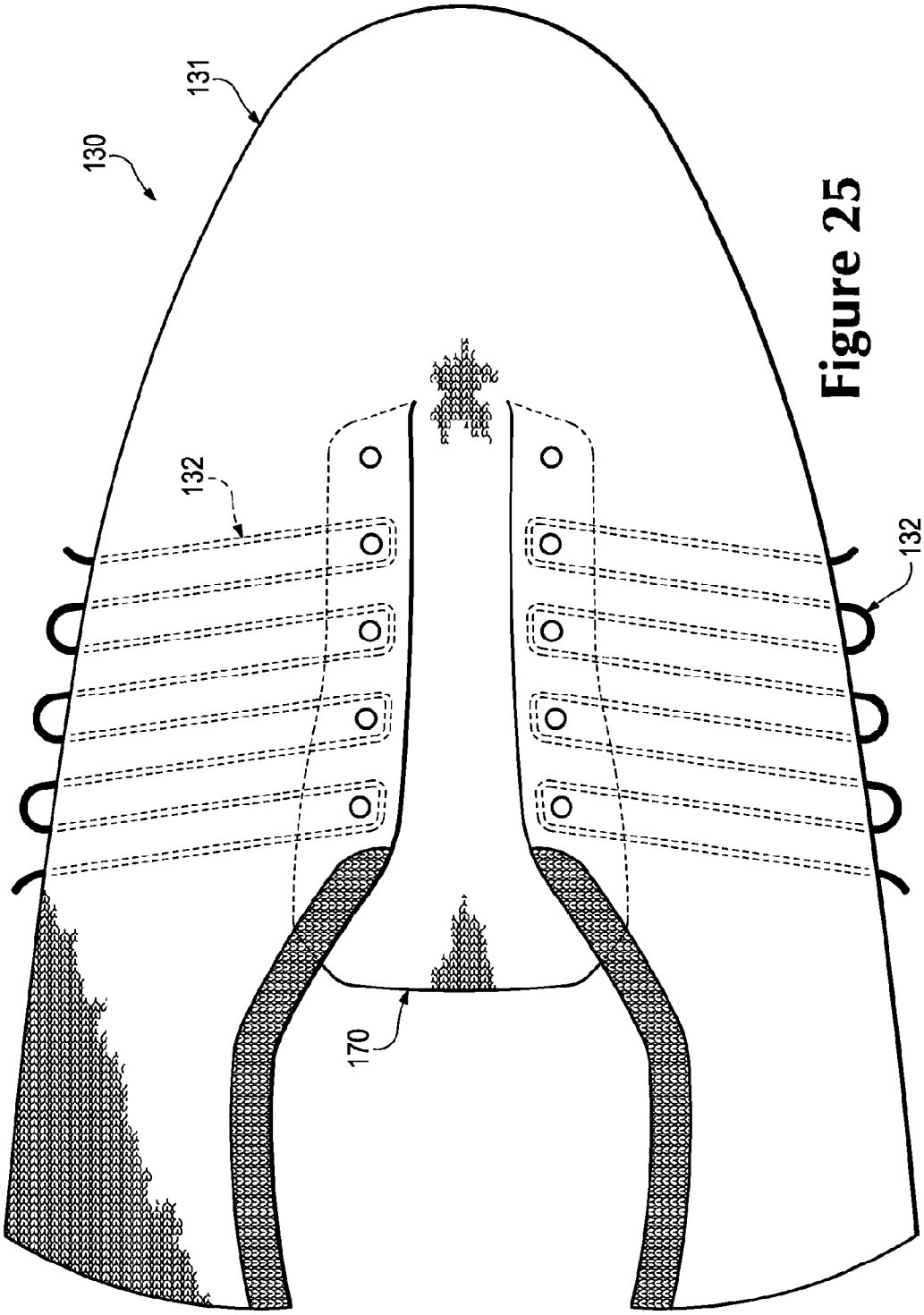


Figure 25

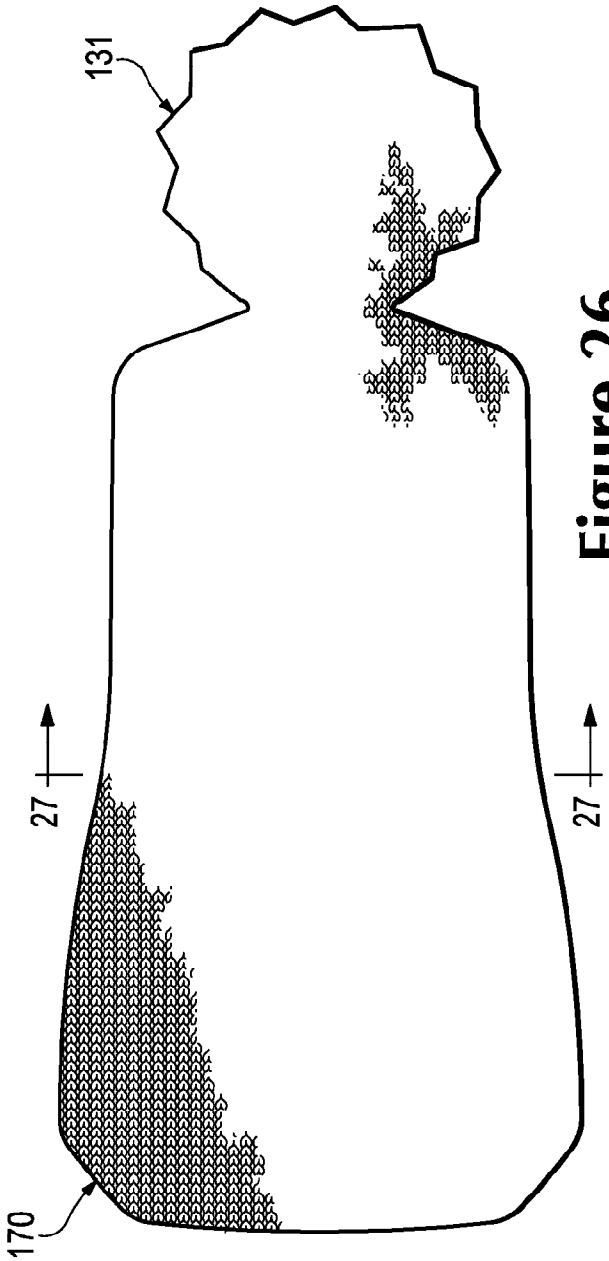


Figure 26

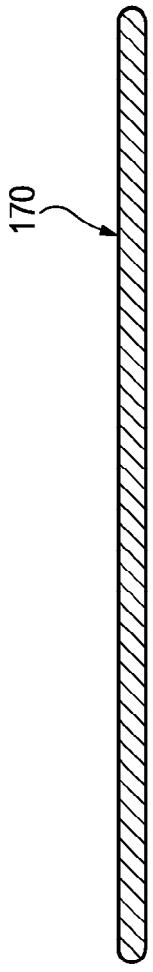


Figure 27

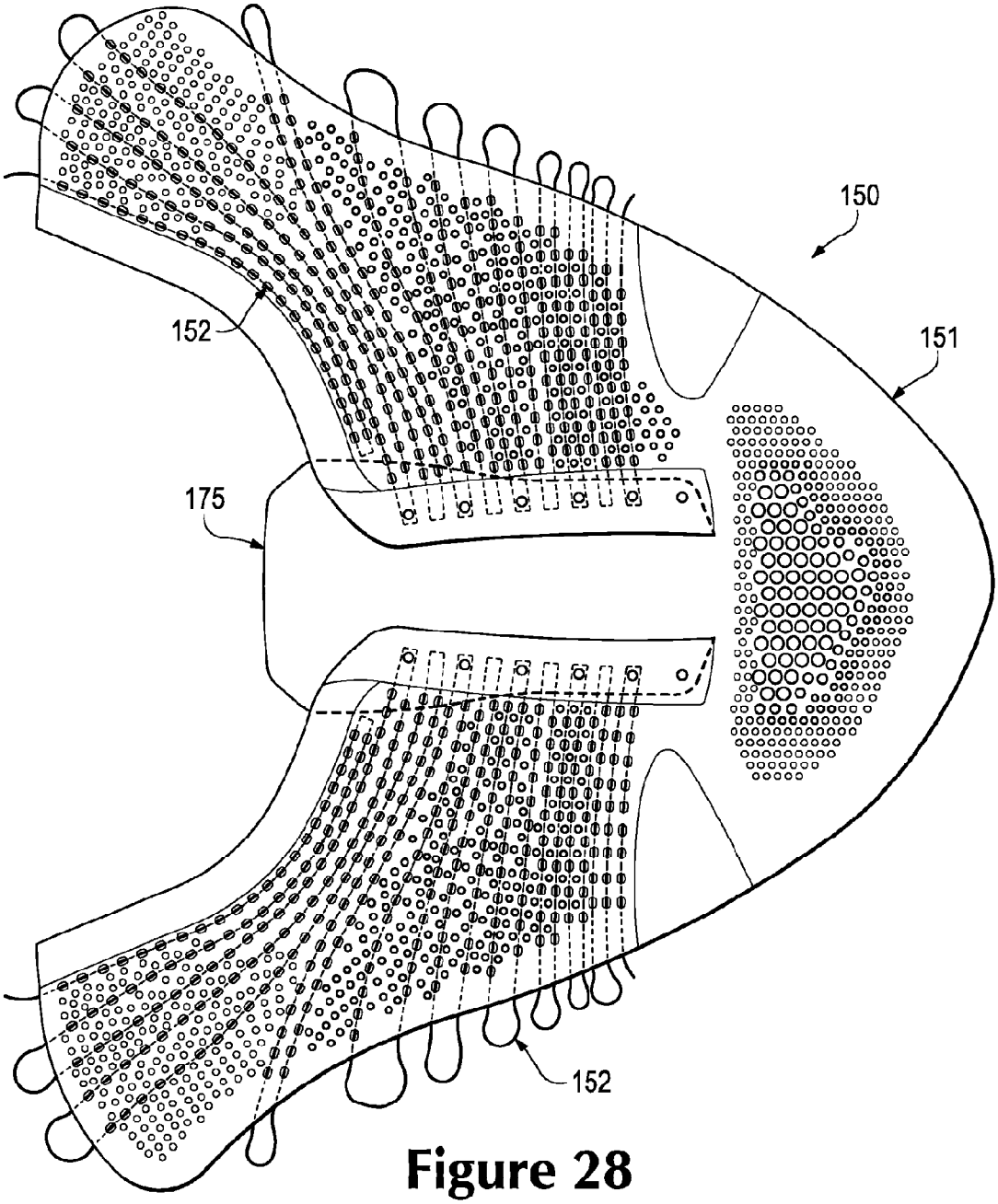


Figure 28

SKECHERS-9346-00048906

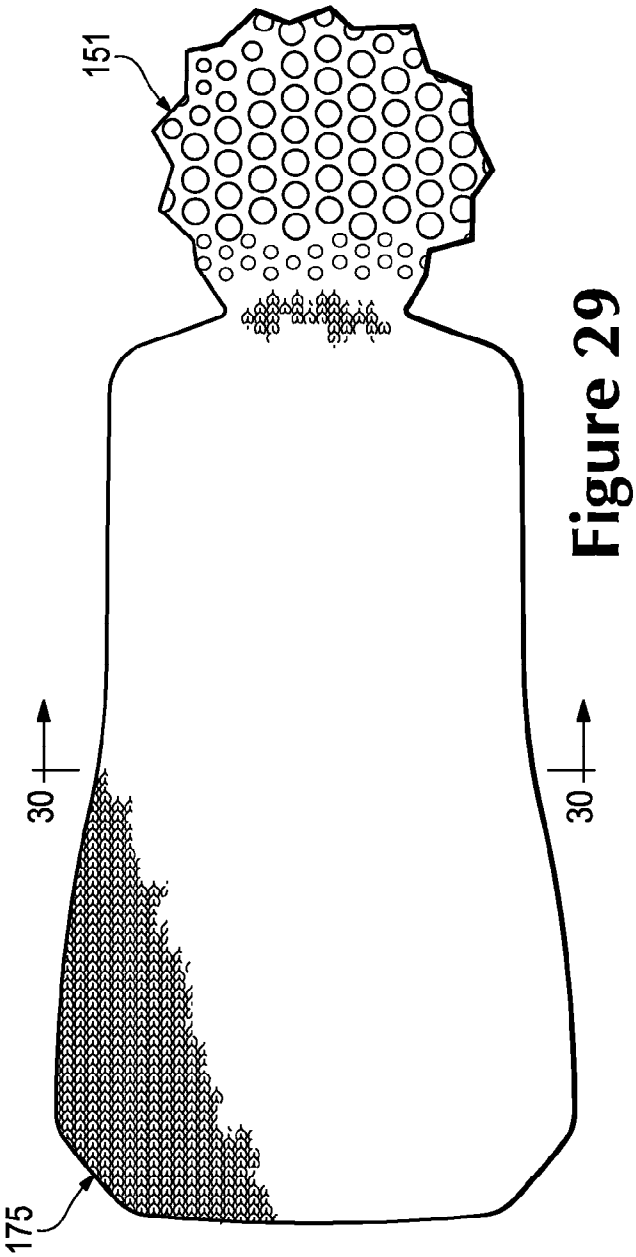


Figure 29

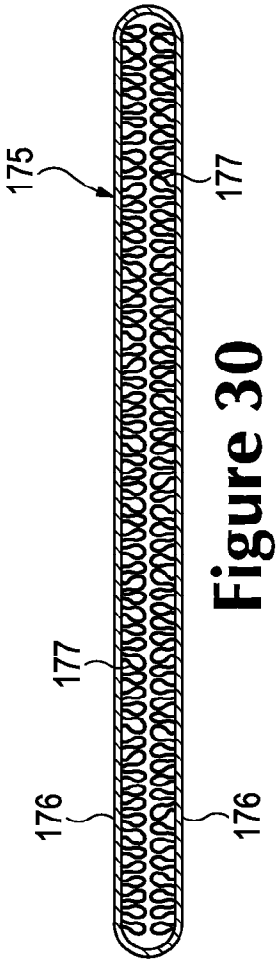


Figure 30

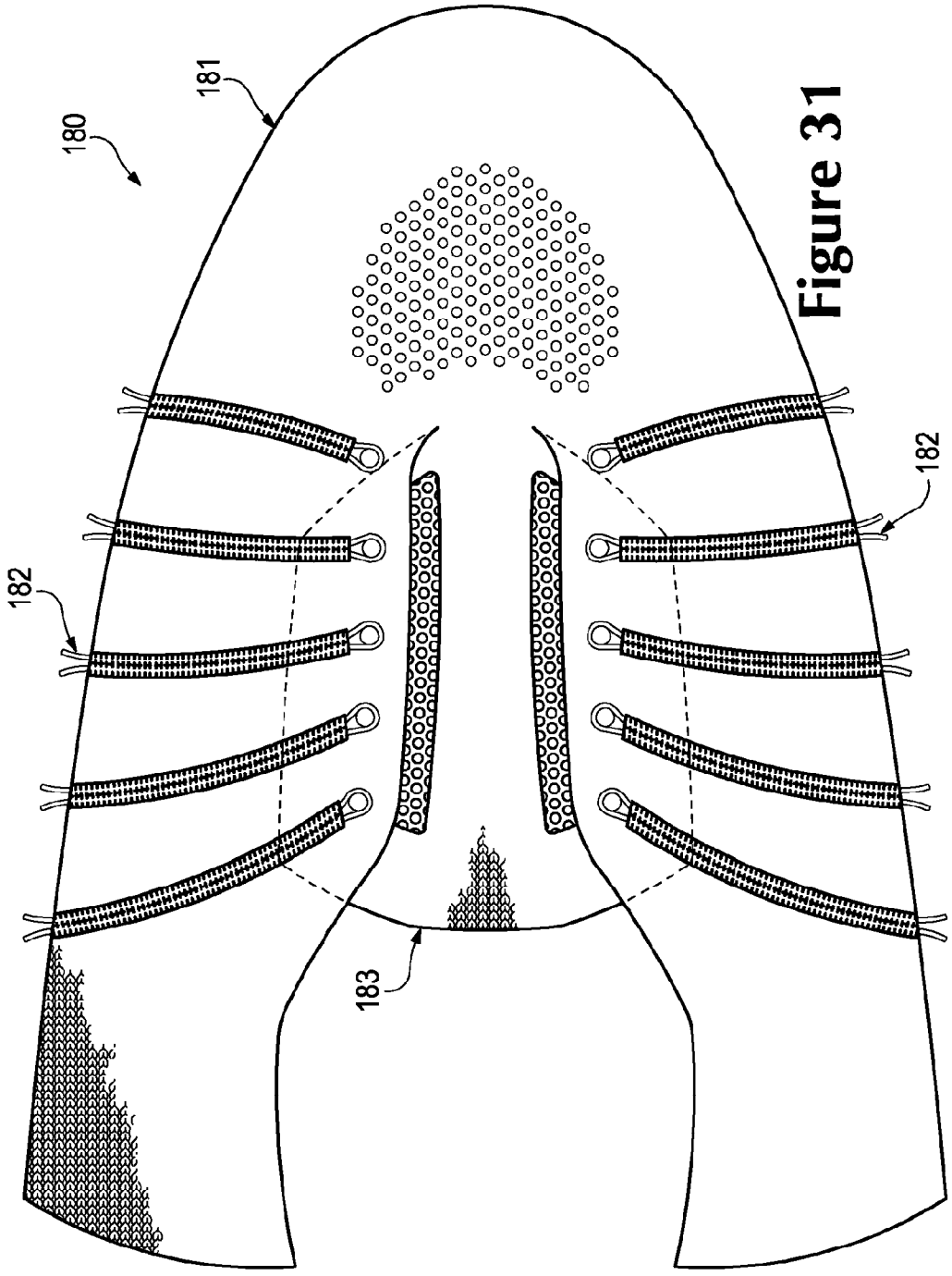


Figure 31

SKECHERS-9346-00048908

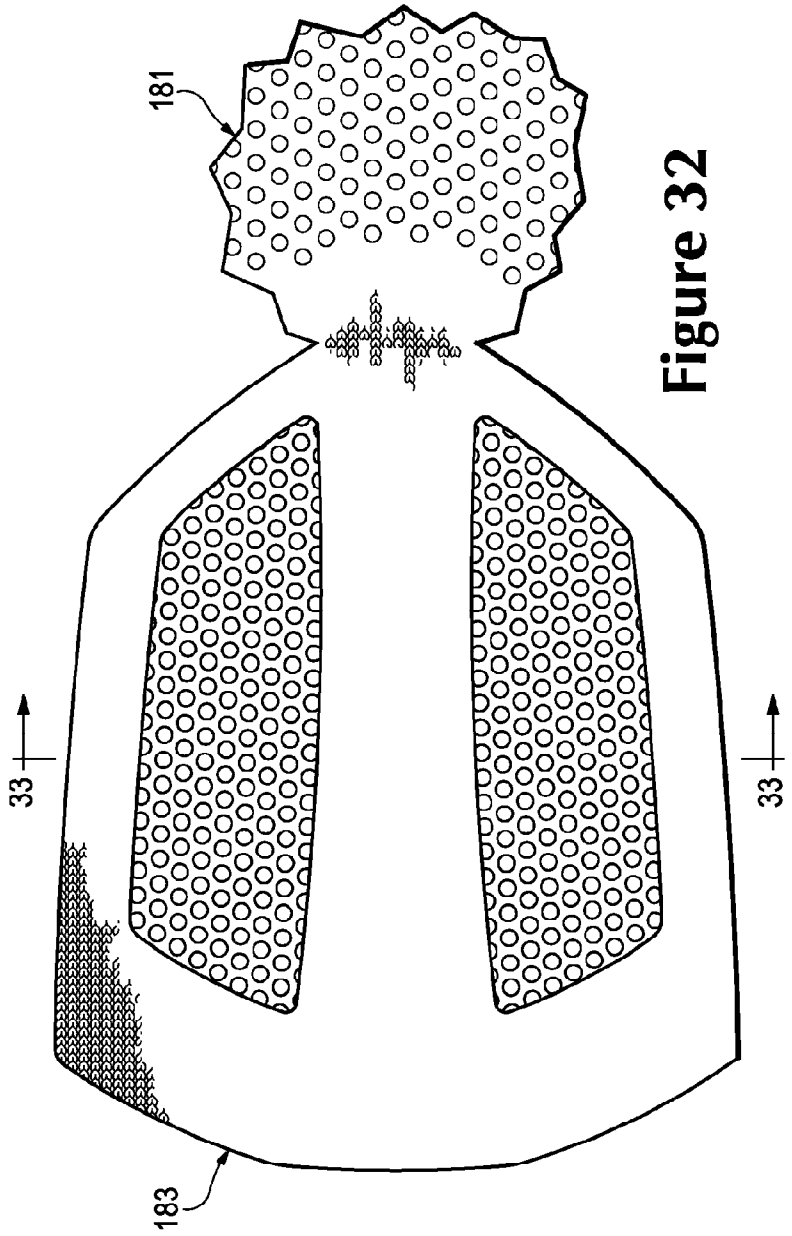


Figure 32

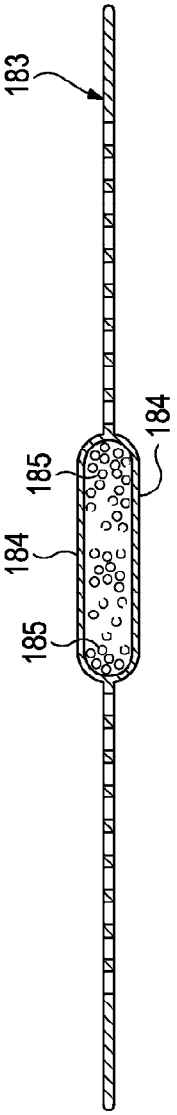


Figure 33

SKECHERS-9346-00048909

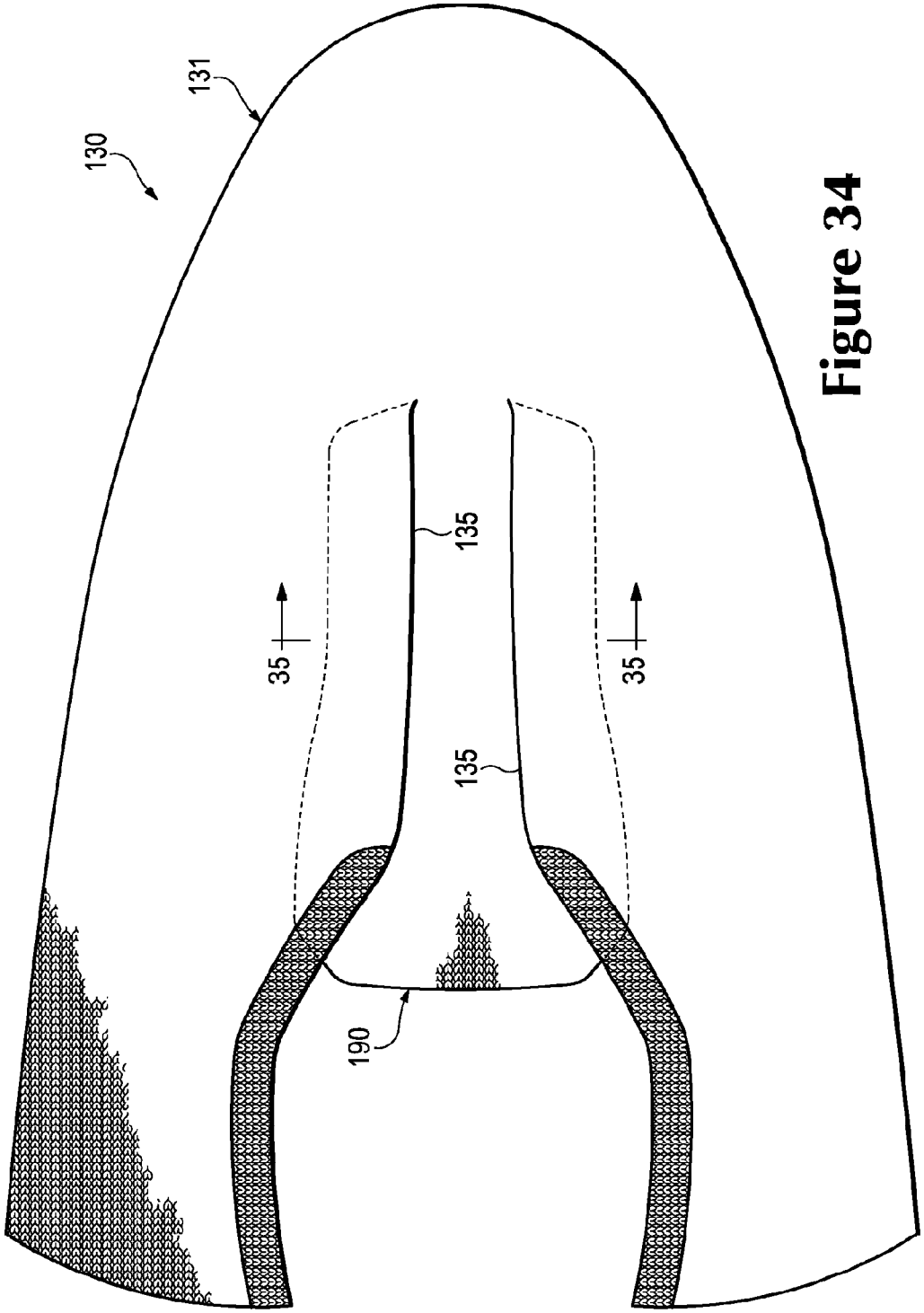


Figure 34

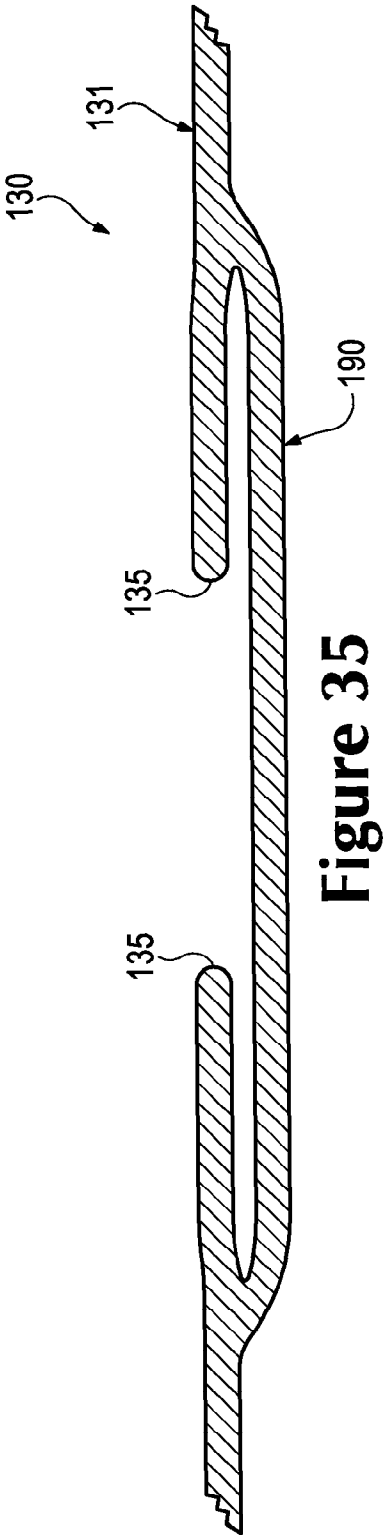


Figure 35

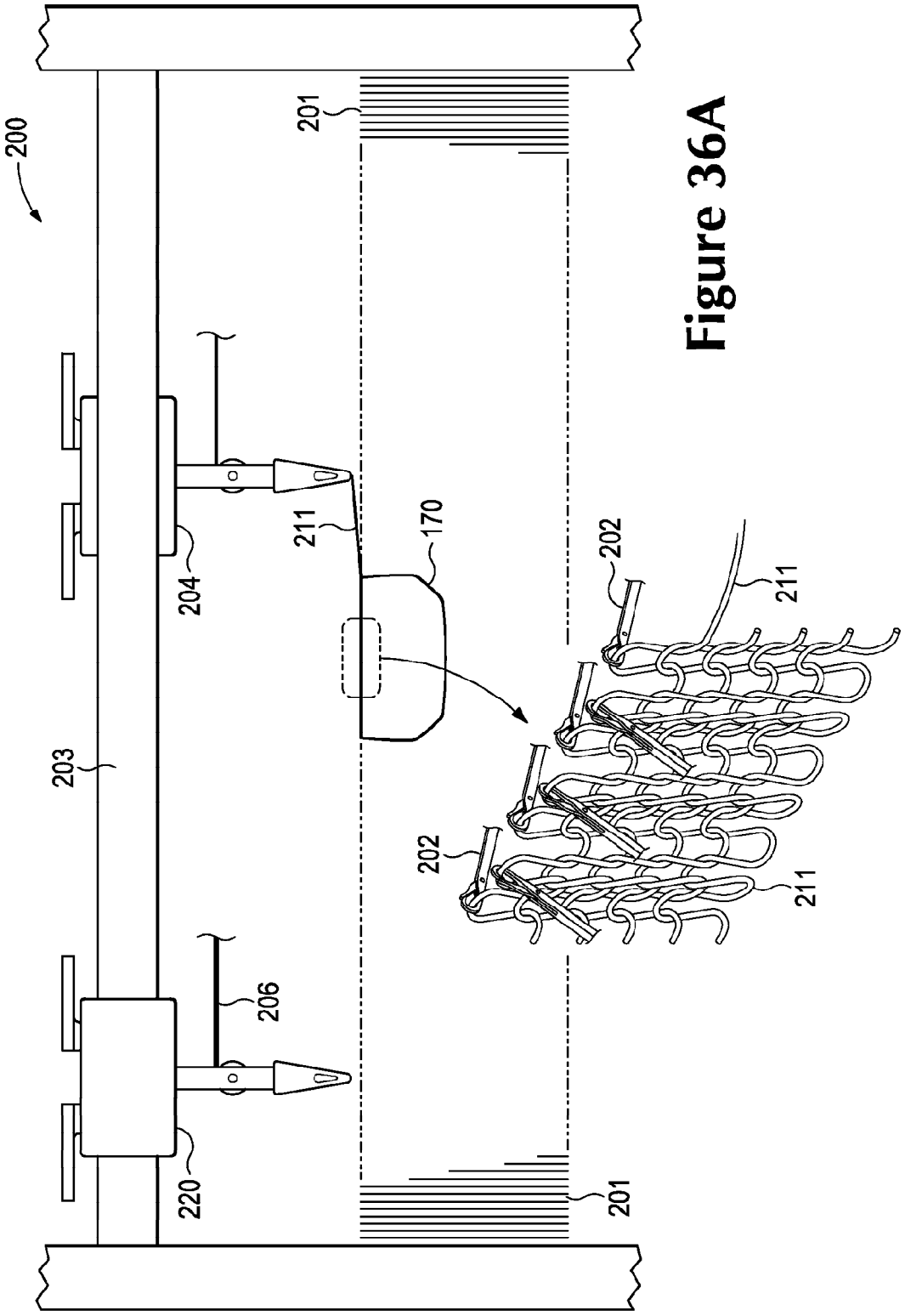


Figure 36A

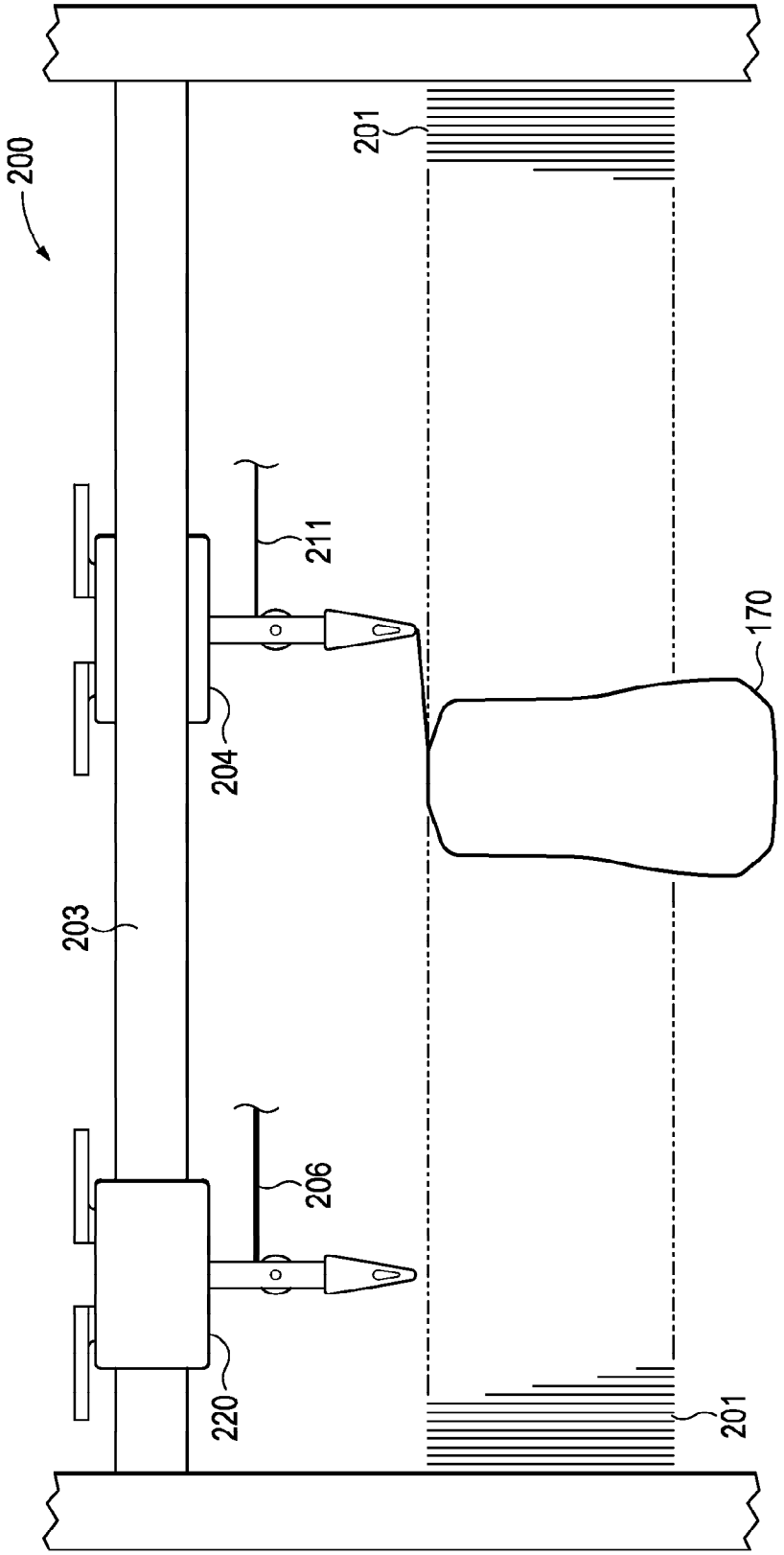


Figure 36B

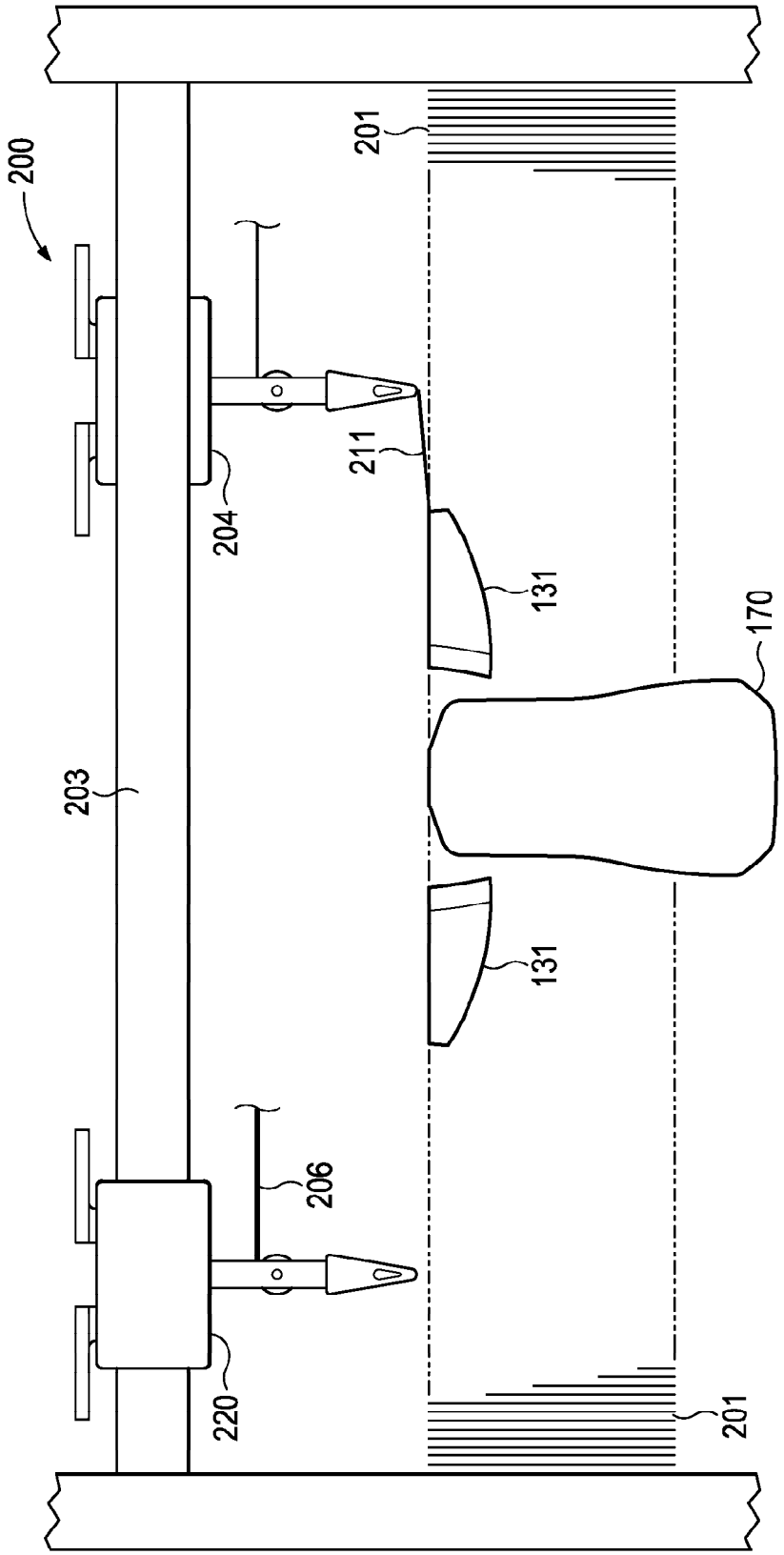


Figure 36C

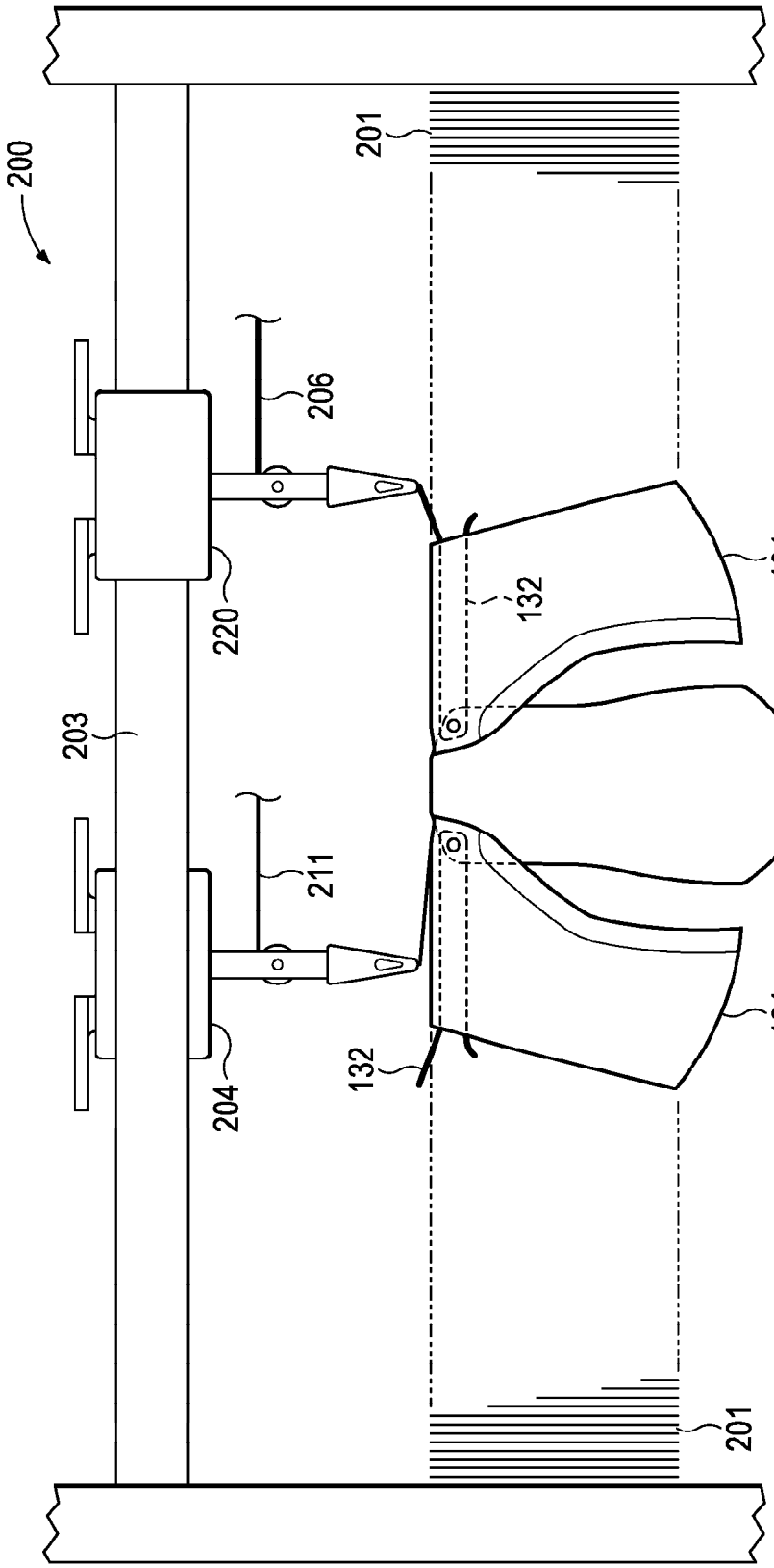


Figure 36D

SKECHERS-9346-00048915

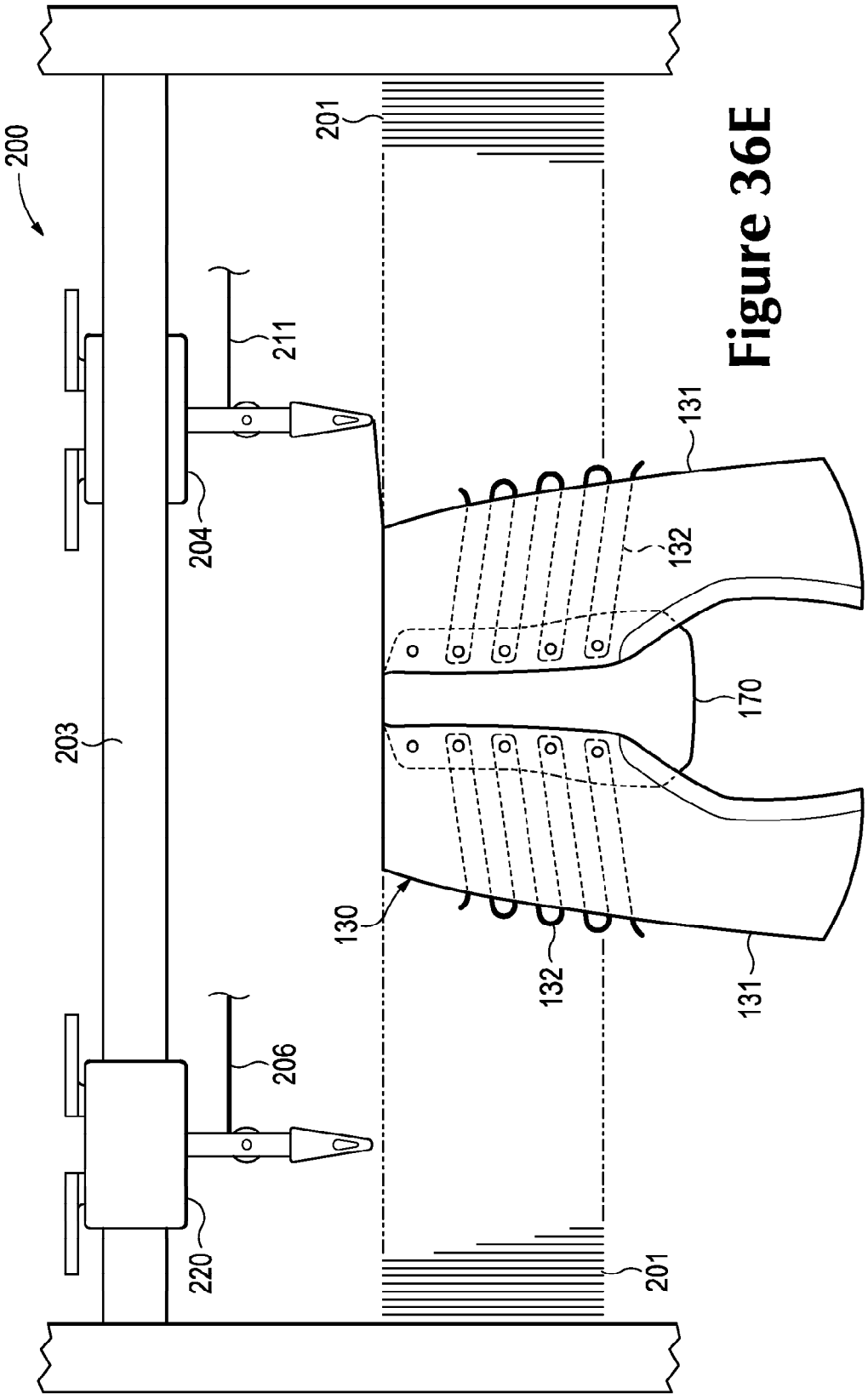


Figure 36E

SKECHERS-9346-00048916

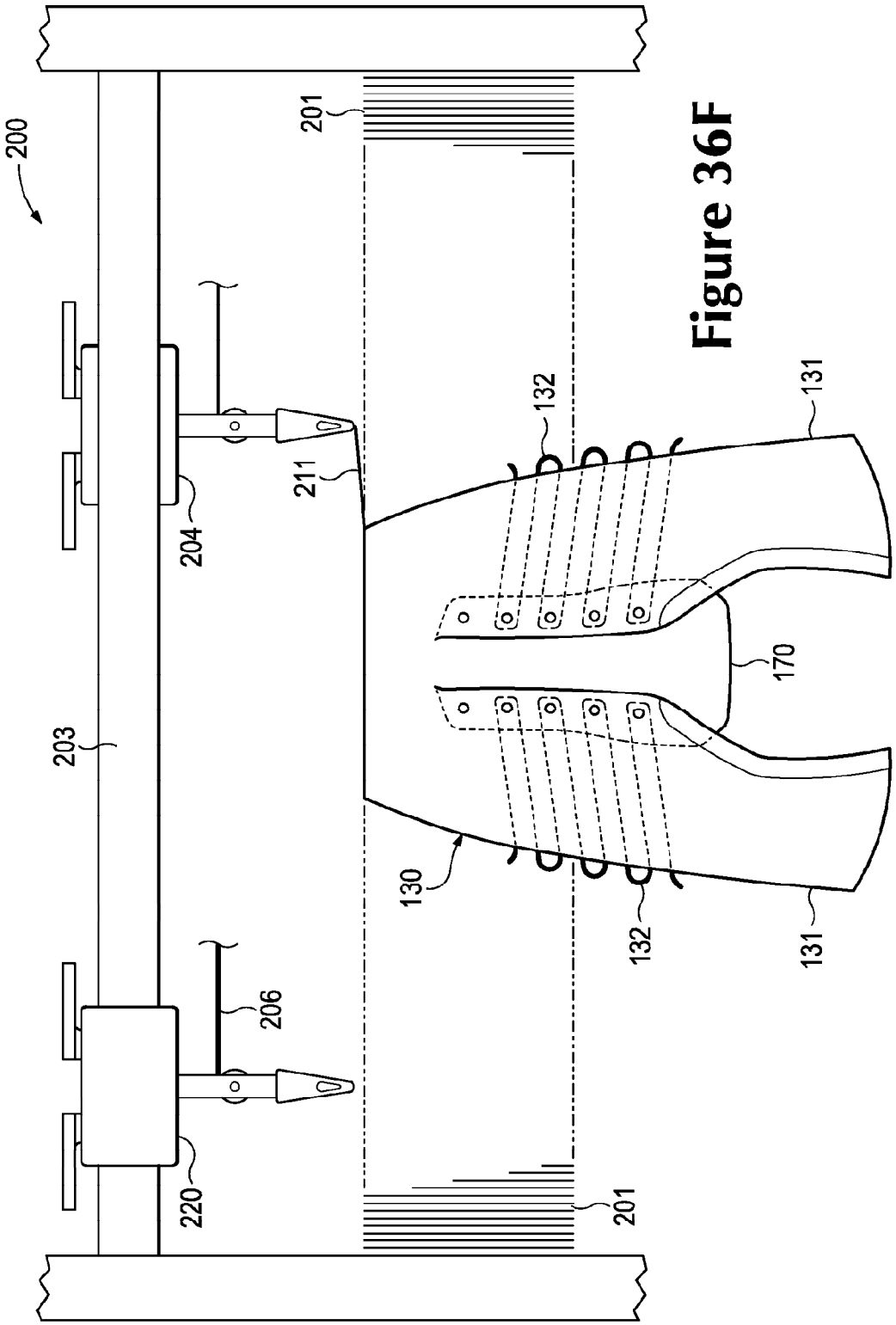


Figure 36F

SKECHERS-9346-00048917

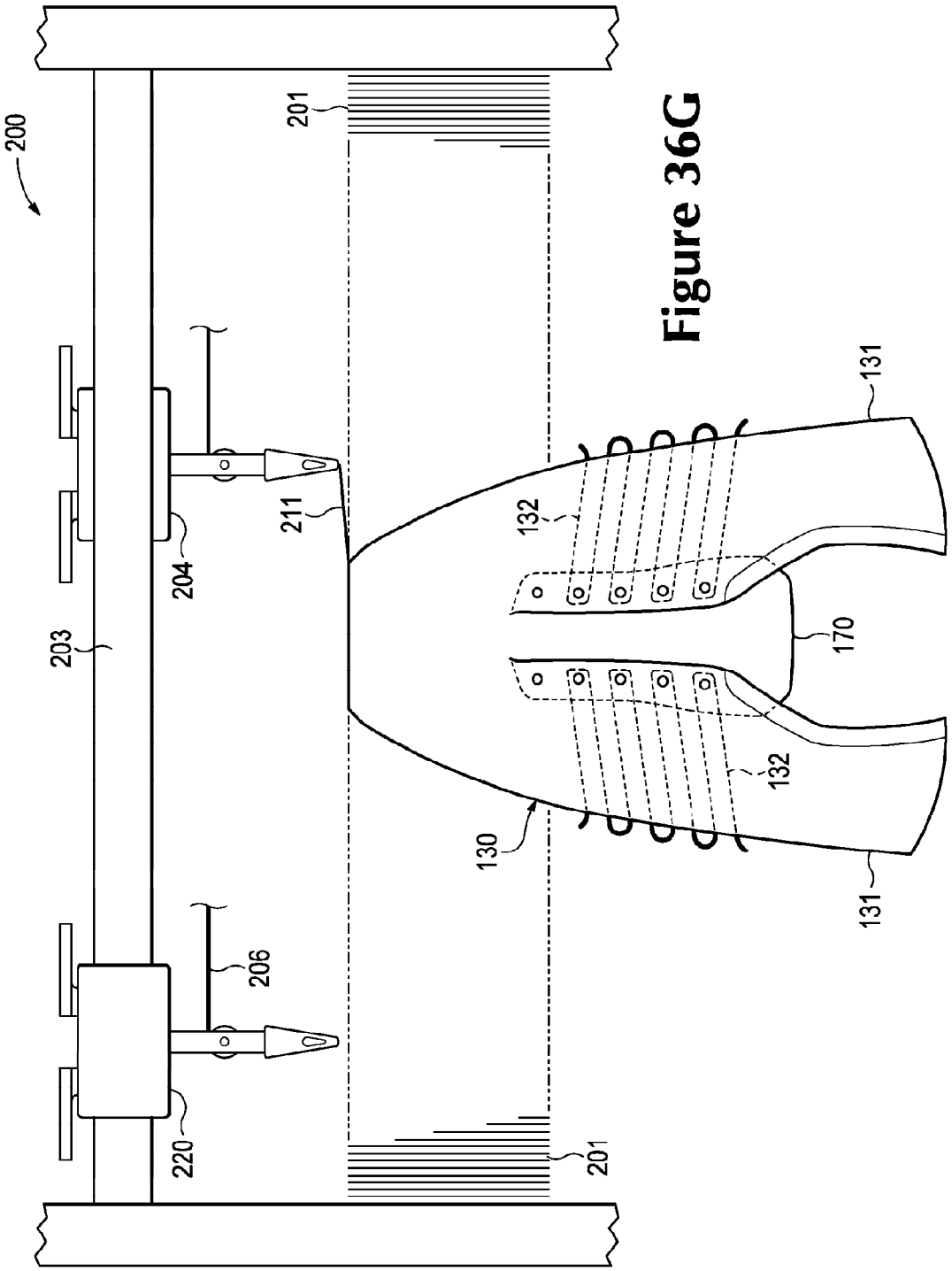


Figure 36G

SKECHERS-9346-00048918

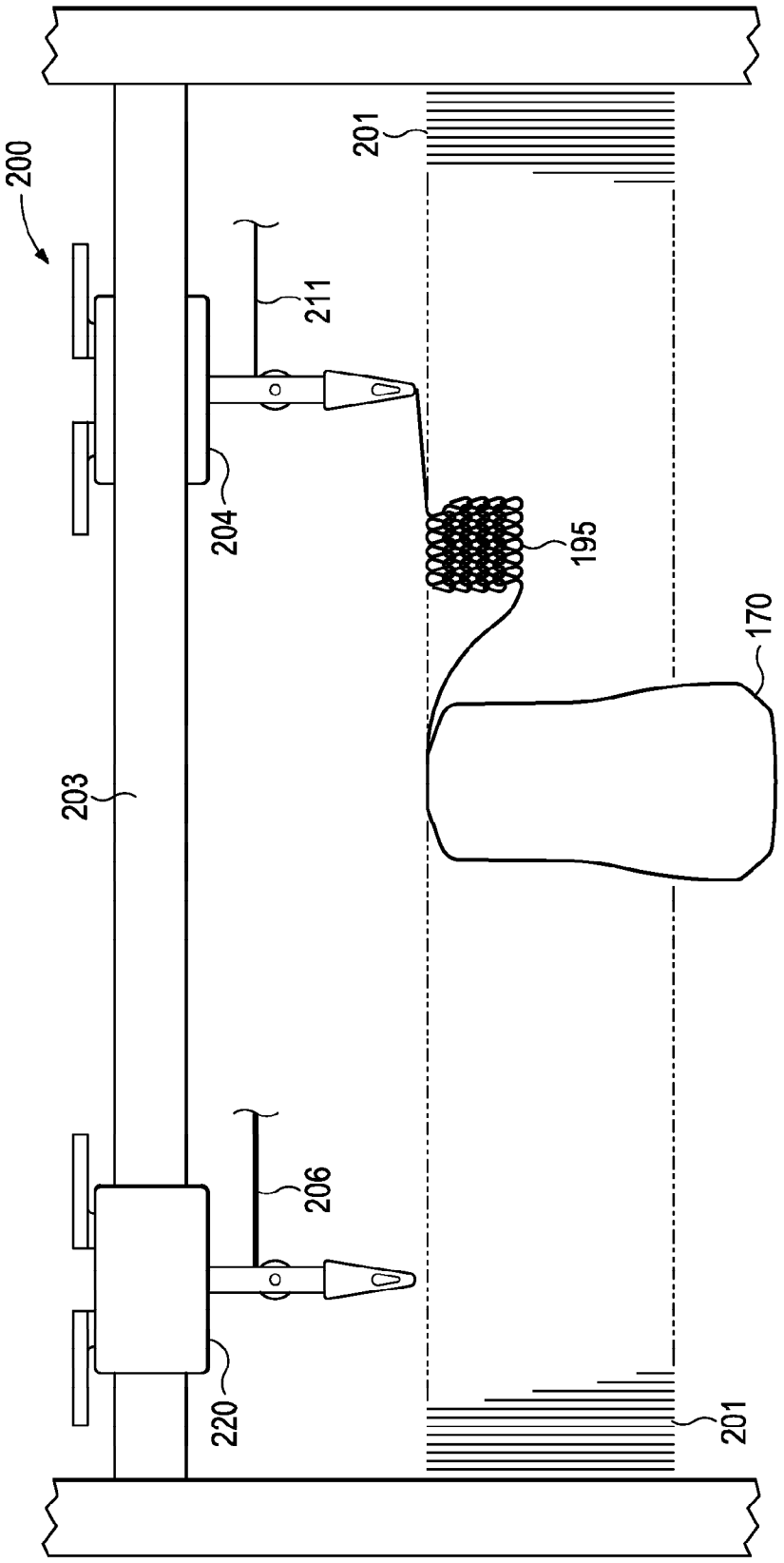


Figure 37

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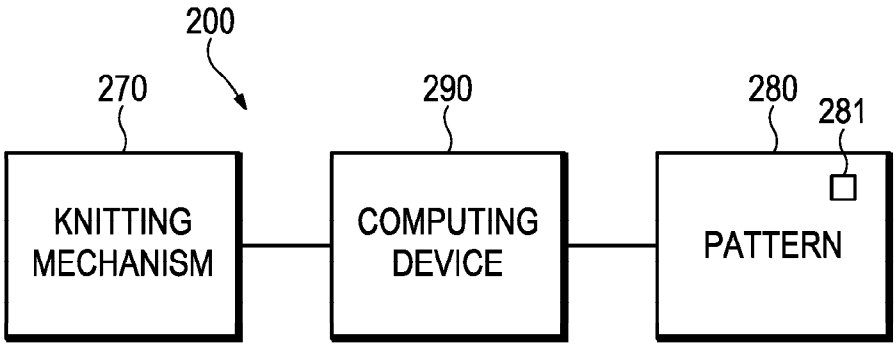


Figure 38

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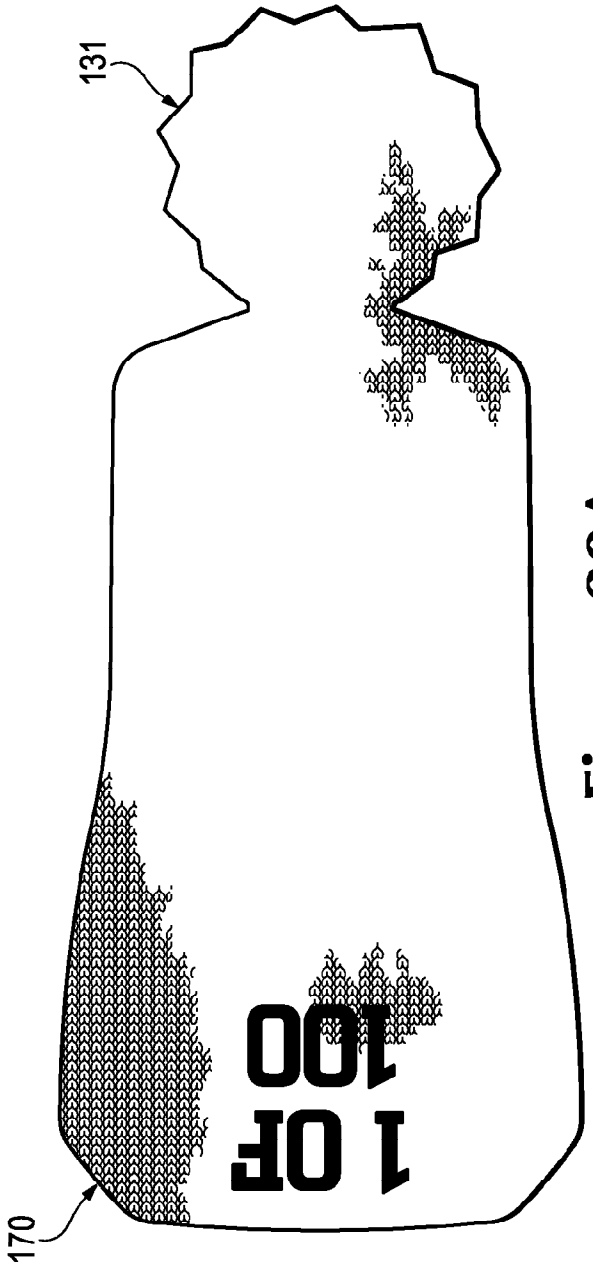


Figure 39A

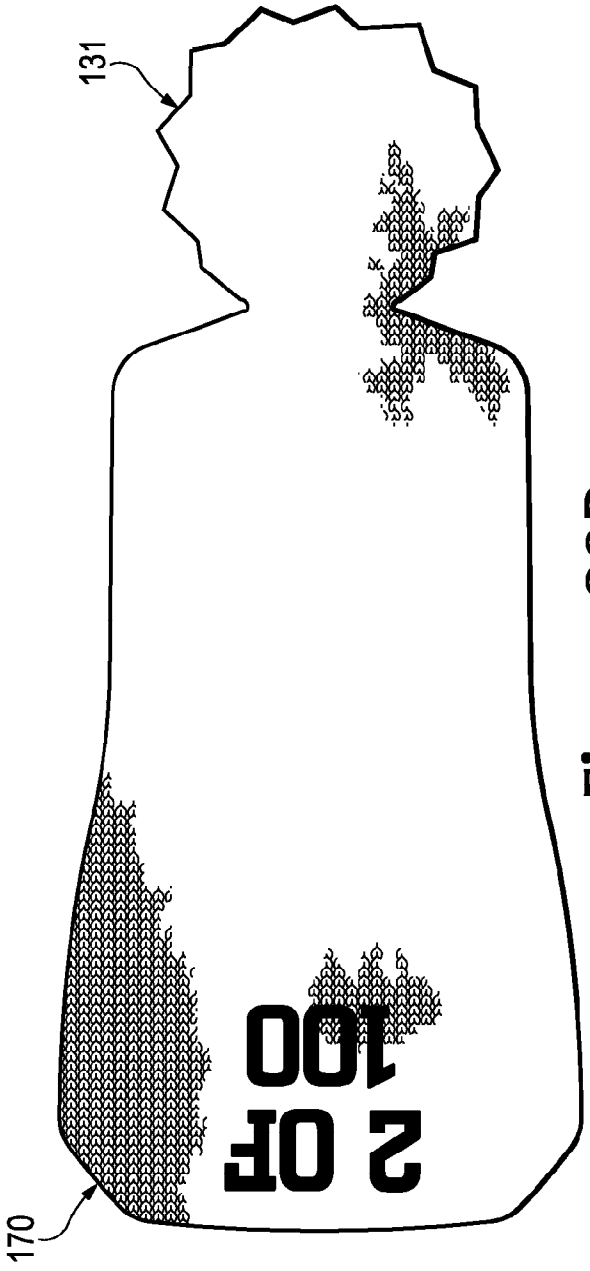


Figure 39B

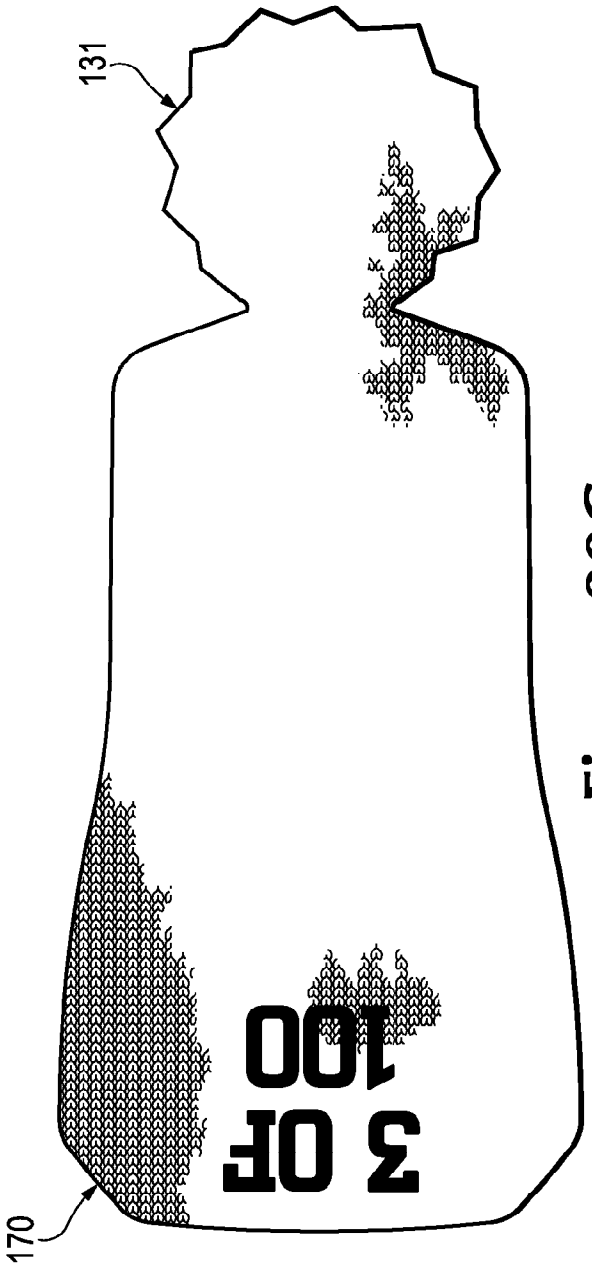


Figure 39C

ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH A TONGUE

BACKGROUND

Conventional articles of footwear generally include two primary elements, an upper and a sole structure. The upper is secured to the sole structure and forms a void on the interior of the footwear for comfortably and securely receiving a foot. The sole structure is secured to a lower area of the upper, thereby being positioned between the upper and the ground. In athletic footwear, for example, the sole structure may include a midsole and an outsole. The midsole often includes a polymer foam material that attenuates ground reaction forces to lessen stresses upon the foot and leg during walking, running, and other ambulatory activities. Additionally, the midsole may include fluid-filled chambers, plates, moderators, or other elements that further attenuate forces, enhance stability, or influence the motions of the foot. The outsole is secured to a lower surface of the midsole and provides a ground-engaging portion of the sole structure formed from a durable and wear-resistant material, such as rubber. The sole structure may also include a sockliner positioned within the void and proximal a lower surface of the foot to enhance footwear comfort.

The upper generally extends over the instep and toe areas of the foot, along the medial and lateral sides of the foot, under the foot, and around the heel area of the foot. In some articles of footwear, such as basketball footwear and boots, the upper may extend upward and around the ankle to provide support or protection for the ankle. Access to the void on the interior of the upper is generally provided by an ankle opening in a heel region of the footwear. A lacing system is often incorporated into the upper to adjust the fit of the upper, thereby permitting entry and removal of the foot from the void within the upper. The lacing system also permits the wearer to modify certain dimensions of the upper, particularly girth, to accommodate feet with varying dimensions. In addition, the upper may include a tongue that extends under the lacing system to enhance adjustability of the footwear, and the upper may incorporate a heel counter to limit movement of the heel.

A variety of material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) are conventionally utilized in manufacturing the upper. In athletic footwear, for example, the upper may have multiple layers that each include a variety of joined material elements. As examples, the material elements may be selected to impart stretch-resistance, wear-resistance, flexibility, air-permeability, compressibility, comfort, and moisture-wicking to different areas of the upper. In order to impart the different properties to different areas of the upper, material elements are often cut to desired shapes and then joined together, usually with stitching or adhesive bonding. Moreover, the material elements are often joined in a layered configuration to impart multiple properties to the same areas. As the number and type of material elements incorporated into the upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase. Waste material from cutting and stitching processes also accumulates to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements. By decreasing the number of material elements utilized in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper.

SUMMARY

Various configurations of an article of footwear may have an upper and a sole structure secured to the upper. The upper includes a knit element and a tongue. The knit element defines a portion of an exterior surface of the upper and an opposite interior surface of the upper, with the interior surface defining a void for receiving a foot. The tongue is formed of unitary knit construction with the knit element and extends through a throat area of the upper.

Methods of manufacturing a knitted component for an article of footwear may include knitting a tongue with a knitting machine. The tongue is held on needles of the knitting machine. A first portion of a knit element is formed with the knitting machine while the tongue is held on the needles. The tongue is then joined to the first portion of the knit element. Additionally, a second portion of the knit element is formed with the knitting machine.

Methods of knitting may also include providing a knitting pattern with a modifiable field. The modifiable field is updated with data representing a first alphanumeric character. A first component with a knit structure of the first alphanumeric character is formed. The modifiable field is updated with data representing a second alphanumeric character, the second alphanumeric character being different than the first alphanumeric character. Additionally, a second component with a knit structure of the second alphanumeric character is formed.

The advantages and features of novelty characterizing aspects of the invention are pointed out with particularity in the appended claims. To gain an improved understanding of the advantages and features of novelty, however, reference may be made to the following descriptive matter and accompanying figures that describe and illustrate various configurations and concepts related to the invention.

FIGURE DESCRIPTIONS

The foregoing Summary and the following Detailed Description will be better understood when read in conjunction with the accompanying figures.

FIG. **1** is a perspective view of an article of footwear.

FIG. **2** is a lateral side elevational view of the article of footwear.

FIG. **3** is a medial side elevational view of the article of footwear.

FIGS. **4**A-**4**C are cross-sectional views of the article of footwear, as defined by section lines **4**A-**4**C in FIGS. **2** and **3**.

FIG. **5** is a top plan view of a first knitted component that forms a portion of an upper of the article of footwear.

FIG. **6** is a bottom plan view of the first knitted component.

FIGS. **7**A-**7**E are cross-sectional views of the first knitted component, as defined by section lines **7**A-**7**E in FIG. **5**.

FIGS. **8**A and **8**B are plan views showing knit structures of the first knitted component.

FIG. **9** is a top plan view of a second knitted component that may form a portion of the upper of the article of footwear.

FIG. **10** is a bottom plan view of the second knitted component.

FIG. **11** is a schematic top plan view of the second knitted component showing knit zones.

FIGS. **12**A-**12**E are cross-sectional views of the second knitted component, as defined by section lines **12**A-**12**E in FIG. **9**.

FIGS. **13**A-**13**H are loop diagrams of the knit zones.

FIGS. **14**A-**14**C are top plan views corresponding with FIG. **5** and depicting further configurations of the first knitted component.

FIG. **15** is a perspective view of a knitting machine.

FIGS. **16-18** are elevational views of a combination feeder from the knitting machine.

FIG. **19** is an elevational view corresponding with FIG. **16** and showing internal components of the combination feeder.

FIGS. **20**A-**20**C are elevational views corresponding with FIG. **19** and showing the operation of the combination feeder.

FIGS. **21**A-**21**I are schematic perspective views of a knitting process utilizing the combination feeder and a conventional feeder.

FIGS. **22**A-**22**C are schematic cross-sectional views of the knitting process showing positions of the combination feeder and the conventional feeder.

FIG. **23** is a schematic perspective view showing another aspect of the knitting process.

FIG. **24** is a perspective view of another configuration of the knitting machine.

FIG. **25** is a top plan view of the first knitted component with a first knitted tongue.

FIG. **26** is a partial top plan view of the first knitted component with the first knitted tongue.

FIG. **27** is a cross-sectional view of the first knitted tongue, as defined by section line **27** in FIG. **26**.

FIG. **28** is a top plan view of the second knitted component with a second knitted tongue.

FIG. **29** is a partial top plan view of the second knitted component with the second knitted tongue.

FIG. **30** is a cross-sectional view of the second knitted tongue, as defined by section line **30** in FIG. **29**.

FIG. **31** is a top plan view of a third knitted component with a third knitted tongue.

FIG. **32** is a partial top plan view of the third knitted component with the third knitted tongue.

FIG. **33** is a cross-sectional view of the third knitted tongue, as defined by section line **33** in FIG. **32**.

FIG. **34** is a top plan view of a fourth knitted component with a fourth knitted tongue.

FIG. **35** is a cross-sectional view of the fourth knitted component and fourth knitted tongue, as defined by section line **35** in FIG. **34**.

FIGS. **36**A-**36**G are schematic elevational views of a knitting process for forming the first knitted component with the first knitted tongue.

FIG. **37** is a schematic elevational view depicting a further example step of the knitting process.

FIG. **38** is a schematic block diagram of the knitting machine.

FIGS. **39**A-**39**C are partial top plan views corresponding with FIG. **26** and depicting sequential variations in the first knitted tongue.

DETAILED DESCRIPTION

The following discussion and accompanying figures disclose a variety of concepts relating to knitted components and the manufacture of knitted components. Although the knitted components may be utilized in a variety of products, an article of footwear that incorporates one of the knitted components is disclosed below as an example. In addition to footwear, the knitted components may be utilized in other types of apparel (e.g., shirts, pants, socks, jackets, undergarments), athletic equipment (e.g., golf bags, baseball and football gloves, soccer ball restriction structures), containers (e.g., backpacks, bags), and upholstery for furniture (e.g., chairs, couches, car seats). The knitted components may also be utilized in bed coverings (e.g., sheets, blankets), table coverings, towels, flags, tents, sails, and parachutes. The knitted components may be utilized as technical textiles for industrial purposes, including structures for automotive and aerospace applications, filter materials, medical textiles (e.g. bandages, swabs, implants), geotextiles for reinforcing embankments, agrotextiles for crop protection, and industrial apparel that protects or insulates against heat and radiation. Accordingly, the knitted components and other concepts disclosed herein may be incorporated into a variety of products for both personal and industrial purposes.

Footwear Configuration

An article of footwear **100** is depicted in FIGS. **1-4**C as including a sole structure **110** and an upper **120**. Although footwear **100** is illustrated as having a general configuration suitable for running, concepts associated with footwear **100** may also be applied to a variety of other athletic footwear types, including baseball shoes, basketball shoes, cycling shoes, football shoes, tennis shoes, soccer shoes, training shoes, walking shoes, and hiking boots, for example. The concepts may also be applied to footwear types that are generally considered to be non-athletic, including dress shoes, loafers, sandals, and work boots. Accordingly, the concepts disclosed with respect to footwear **100** apply to a wide variety of footwear types.

For reference purposes, footwear **100** may be divided into three general regions: a forefoot region **101**, a midfoot region **102**, and a heel region **103**. Forefoot region **101** generally includes portions of footwear **100** corresponding with the toes and the joints connecting the metatarsals with the phalanges. Midfoot region **102** generally includes portions of footwear **100** corresponding with an arch area of the foot. Heel region **103** generally corresponds with rear portions of the foot, including the calcaneus bone. Footwear **100** also includes a lateral side **104** and a medial side **105**, which extend through each of regions **101-103** and correspond with opposite sides of footwear **100**. More particularly, lateral side **104** corresponds with an outside area of the foot (i.e. the surface that faces away from the other foot), and medial side **105** corresponds with an inside area of the foot (i.e., the surface that faces toward the other foot). Regions **101-103** and sides **104-105** are not intended to demarcate precise areas of footwear **100**. Rather, regions **101-103** and sides **104-105** are intended to represent general areas of footwear **100** to aid in the following discussion. In addition to footwear **100**, regions **101-103** and sides **104-105** may also be applied to sole structure **110**, upper **120**, and individual elements thereof.

Sole structure **110** is secured to upper **120** and extends between the foot and the ground when footwear **100** is worn. The primary elements of sole structure **110** are a midsole **111**, an outsole **112**, and a sockliner **113**. Midsole **111** is secured to a lower surface of upper **120** and may be formed from a compressible polymer foam element (e.g., a polyurethane or ethylvinylacetate foam) that attenuates ground reaction forces (i.e., provides cushioning) when compressed between the foot and the ground during walking, running, or other ambulatory activities. In further configurations, midsole **111** may incorporate plates, moderators, fluid-filled chambers, lasting elements, or motion control members that further attenuate forces, enhance stability, or influence the motions of the foot, or midsole **21** may be primarily formed from a fluid-filled chamber. Outsole **112** is secured to a lower surface of midsole **111** and may be formed from a wear-resistant rubber material that is textured to impart traction. Sockliner **113** is located within upper **120** and is positioned to extend

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under a lower surface of the foot to enhance the comfort of footwear **100**. Although this configuration for sole structure **110** provides an example of a sole structure that may be used in connection with upper **120**, a variety of other conventional or nonconventional configurations for sole structure **110** may also be utilized. Accordingly, the features of sole structure **110** or any sole structure utilized with upper **120** may vary considerably.

Upper **120** defines a void within footwear **100** for receiving and securing a foot relative to sole structure **110**. The void is shaped to accommodate the foot and extends along a lateral side of the foot, along a medial side of the foot, over the foot, around the heel, and under the foot. Access to the void is provided by an ankle opening **121** located in at least heel region **103**. A lace **122** extends through various lace apertures **123** in upper **120** and permits the wearer to modify dimensions of upper **120** to accommodate proportions of the foot. More particularly, lace **122** permits the wearer to tighten upper **120** around the foot, and lace **122** permits the wearer to loosen upper **120** to facilitate entry and removal of the foot from the void (i.e., through ankle opening **121**). In addition, upper **120** includes a tongue **124** that extends under lace **122** and lace apertures **123** to enhance the comfort of footwear **100**. In further configurations, upper **120** may include additional elements, such as (a) a heel counter in heel region **103** that enhances stability, (b) a toe guard in forefoot region **101** that is formed of a wear-resistant material, and (c) logos, trademarks, and placards with care instructions and material information.

Many conventional footwear uppers are formed from multiple material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) that are joined through stitching or bonding, for example. In contrast, a majority of upper **120** is formed from a knitted component **130**, which extends through each of regions **101-103**, along both lateral side **104** and medial side **105**, over forefoot region **101**, and around heel region **103**. In addition, knitted component **130** forms portions of both an exterior surface and an opposite interior surface of upper **120**. As such, knitted component **130** defines at least a portion of the void within upper **120**. In some configurations, knitted component **130** may also extend under the foot. Referring to FIGS. **4A-4C**, however, a strobel sock **125** is secured to knitted component **130** and an upper surface of midsole **111**, thereby forming a portion of upper **120** that extends under sockliner **113**.

Knitted Component Configuration

Knitted component **130** is depicted separate from a remainder of footwear **100** in FIGS. **5** and **6**. Knitted component **130** is formed of unitary knit construction. As utilized herein, a knitted component (e.g., knitted component **130**) is defined as being formed of "unitary knit construction" when formed as a one-piece element through a knitting process. That is, the knitting process substantially forms the various features and structures of knitted component **130** without the need for significant additional manufacturing steps or processes. Although portions of knitted component **130** may be joined to each other (e.g., edges of knitted component **130** being joined together) following the knitting process, knitted component **130** remains formed of unitary knit construction because it is formed as a one-piece knit element. Moreover, knitted component **130** remains formed of unitary knit construction when other elements (e.g., lace **122**, tongue **124**, logos, trademarks, placards with care instructions and material information) are added following the knitting process.

The primary elements of knitted component **130** are a knit element **131** and an inlaid strand **132**. Knit element **131** is formed from at least one yarn that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a variety of courses and wales. That is, knit element **131** has the structure of a knit textile. Inlaid strand **132** extends through knit element **131** and passes between the various loops within knit element **131**. Although inlaid strand **132** generally extends along courses within knit element **131**, inlaid strand **132** may also extend along wales within knit element **131**. Advantages of inlaid strand **132** include providing support, stability, and structure. For example, inlaid strand **132** assists with securing upper **120** around the foot, limits deformation in areas of upper **120** (e.g., imparts stretch-resistance) and operates in connection with lace **122** to enhance the fit of footwear **100**.

Knit element **131** has a generally U-shaped configuration that is outlined by a perimeter edge **133**, a pair of heel edges **134**, and an inner edge **135**. When incorporated into footwear **100**, perimeter edge **133** lays against the upper surface of midsole **111** and is joined to strobel sock **125**. Heel edges **134** are joined to each other and extend vertically in heel region **103**. In some configurations of footwear **100**, a material element may cover a seam between heel edges **134** to reinforce the seam and enhance the aesthetic appeal of footwear **100**. Inner edge **135** forms ankle opening **121** and extends forward to an area where lace **122**, lace apertures **123**, and tongue **124** are located. In addition, knit element **131** has a first surface **136** and an opposite second surface **137**. First surface **136** forms a portion of the exterior surface of upper **120**, whereas second surface **137** forms a portion of the interior surface of upper **120**, thereby defining at least a portion of the void within upper **120**.

Inlaid strand **132**, as noted above, extends through knit element **131** and passes between the various loops within knit element **131**. More particularly, inlaid strand **132** is located within the knit structure of knit element **131**, which may have the configuration of a single textile layer in the area of inlaid strand **132**, and between surfaces **136** and **137**, as depicted in FIGS. 7A-7D. When knitted component **130** is incorporated into footwear **100**, therefore, inlaid strand **132** is located between the exterior surface and the interior surface of upper **120**. In some configurations, portions of inlaid strand **132** may be visible or exposed on one or both of surfaces **136** and **137**. For example, inlaid strand **132** may lay against one of surfaces **136** and **137**, or knit element **131** may form indentations or apertures through which inlaid strand passes. An advantage of having inlaid strand **132** located between surfaces **136** and **137** is that knit element **131** protects inlaid strand **132** from abrasion and snagging.

Referring to FIGS. **5** and **6**, inlaid strand **132** repeatedly extends from perimeter edge **133** toward inner edge **135** and adjacent to a side of one lace aperture **123**, at least partially around the lace aperture **123** to an opposite side, and back to perimeter edge **133**. When knitted component **130** is incorporated into footwear **100**, knit element **131** extends from a throat area of upper **120** (i.e., where lace **122**, lace apertures **123**, and tongue **124** are located) to a lower area of upper **120** (i.e., where knit element **131** joins with sole structure **110**. In this configuration, inlaid strand **132** also extends from the throat area to the lower area. More particularly, inlaid strand repeatedly passes through knit element **131** from the throat area to the lower area.

Although knit element **131** may be formed in a variety of ways, courses of the knit structure generally extend in the same direction as inlaid strands **132**. That is, courses may extend in the direction extending between the throat area and the lower area. As such, a majority of inlaid strand **132** extends along the courses within knit element **131**. In areas adjacent to lace apertures **123**, however, inlaid strand **132**

may also extend along wales within knit element **131**. More particularly, sections of inlaid strand **132** that are parallel to inner edge **135** may extend along the wales.

As discussed above, inlaid strand **132** passes back and forth through knit element **131**. Referring to FIGS. **5** and **6**, inlaid strand **132** also repeatedly exits knit element **131** at perimeter edge **133** and then re-enters knit element **131** at another location of perimeter edge **133**, thereby forming loops along perimeter edge **133**. An advantage to this configuration is that each section of inlaid strand **132** that extends between the throat area and the lower area may be independently tensioned, loosened, or otherwise adjusted during the manufacturing process of footwear **100**. That is, prior to securing sole structure **110** to upper **120**, sections of inlaid strand **132** may be independently adjusted to the proper tension.

In comparison with knit element **131**, inlaid strand **132** may exhibit greater stretch-resistance. That is, inlaid strand **132** may stretch less than knit element **131**. Given that numerous sections of inlaid strand **132** extend from the throat area of upper **120** to the lower area of upper **120**, inlaid strand **132** imparts stretch-resistance to the portion of upper **120** between the throat area and the lower area. Moreover, placing tension upon lace **122** may impart tension to inlaid strand **132**, thereby inducing the portion of upper **120** between the throat area and the lower area to lay against the foot. As such, inlaid strand **132** operates in connection with lace **122** to enhance the fit of footwear **100**.

Knit element **131** may incorporate various types of yarn that impart different properties to separate areas of upper **120**. That is, one area of knit element **131** may be formed from a first type of yarn that imparts a first set of properties, and another area of knit element **131** may be formed from a second type of yarn that imparts a second set of properties. In this configuration, properties may vary throughout upper **120** by selecting specific yarns for different areas of knit element **131**. The properties that a particular type of yarn will impart to an area of knit element **131** partially depend upon the materials that form the various filaments and fibers within the yarn. Cotton, for example, provides a soft hand, natural aesthetics, and biodegradability. Elastane and stretch polyester each provide substantial stretch and recovery, with stretch polyester also providing recyclability. Rayon provides high luster and moisture absorption. Wool also provides high moisture absorption, in addition to insulating properties and biodegradability. Nylon is a durable and abrasion-resistant material with relatively high strength. Polyester is a hydrophobic material that also provides relatively high durability. In addition to materials, other aspects of the yarns selected for knit element **131** may affect the properties of upper **120**. For example, a yarn forming knit element **131** may be a monofilament yarn or a multifilament yarn. The yarn may also include separate filaments that are each formed of different materials. In addition, the yarn may include filaments that are each formed of two or more different materials, such as a bicomponent yarn with filaments having a sheath-core configuration or two halves formed of different materials. Different degrees of twist and crimping, as well as different deniers, may also affect the properties of upper **120**. Accordingly, both the materials forming the yarn and other aspects of the yarn may be selected to impart a variety of properties to separate areas of upper **120**.

As with the yarns forming knit element **131**, the configuration of inlaid strand **132** may also vary significantly. In addition to yarn, inlaid strand **132** may have the configurations of a filament (e.g., a monofilament), thread, rope, webbing, cable, or chain, for example. In comparison with the yarns forming knit element **131**, the thickness of inlaid strand **132** may be greater. In some configurations, inlaid strand **132** may have a significantly greater thickness than the yarns of knit element **131**. Although the cross-sectional shape of inlaid strand **132** may be round, triangular, square, rectangular, elliptical, or irregular shapes may also be utilized. Moreover, the materials forming inlaid strand **132** may include any of the materials for the yarn within knit element **131**, such as cotton, elastane, polyester, rayon, wool, and nylon. As noted above, inlaid strand **132** may exhibit greater stretch-resistance than knit element **131**. As such, suitable materials for inlaid strands **132** may include a variety of engineering filaments that are utilized for high tensile strength applications, including glass, aramids (e.g., para-aramid and meta-aramid), ultra-high molecular weight polyethylene, and liquid crystal polymer. As another example, a braided polyester thread may also be utilized as inlaid strand **132**.

An example of a suitable configuration for a portion of knitted component **130** is depicted in FIG. **8**A. In this configuration, knit element **131** includes a yarn **138** that forms a plurality of intermeshed loops defining multiple horizontal courses and vertical wales. Inlaid strand **132** extends along one of the courses and alternates between being located (a) behind loops formed from yarn **138** and (b) in front of loops formed from yarn **138**. In effect, inlaid strand **132** weaves through the structure formed by knit element **131**. Although yarn **138** forms each of the courses in this configuration, additional yarns may form one or more of the courses or may form a portion of one or more of the courses.

Another example of a suitable configuration for a portion of knitted component **130** is depicted in FIG. **8**B. In this configuration, knit element **131** includes yarn **138** and another yarn **139**. Yarns **138** and **139** are plated and cooperatively form a plurality of intermeshed loops defining multiple horizontal courses and vertical wales. That is, yarns **138** and **139** run parallel to each other. As with the configuration in FIG. **8**A, inlaid strand **132** extends along one of the courses and alternates between being located (a) behind loops formed from yarns **138** and **139** and (b) in front of loops formed from yarns **138** and **139**. An advantage of this configuration is that the properties of each of yarns **138** and **139** may be present in this area of knitted component **130**. For example, yarns **138** and **139** may have different colors, with the color of yarn **138** being primarily present on a face of the various stitches in knit element **131** and the color of yarn **139** being primarily present on a reverse of the various stitches in knit element **131**. As another example, yarn **139** may be formed from a yarn that is softer and more comfortable against the foot than yarn **138**, with yarn **138** being primarily present on first surface **136** and yarn **139** being primarily present on second surface **137**.

Continuing with the configuration of FIG. **8**B, yarn **138** may be formed from at least one of a thermoset polymer material and natural fibers (e.g., cotton, wool, silk), whereas yarn **139** may be formed from a thermoplastic polymer material. In general, a thermoplastic polymer material melts when heated and returns to a solid state when cooled. More particularly, the thermoplastic polymer material transitions from a solid state to a softened or liquid state when subjected to sufficient heat, and then the thermoplastic polymer material transitions from the softened or liquid state to the solid state when sufficiently cooled. As such, thermoplastic polymer materials are often used to join two objects or elements together. In this case, yarn **139** may be utilized to join (a) one portion of yarn **138** to another portion of yarn **138**, (b) yarn **138** and inlaid strand **132** to each other, or (c) another element (e.g., logos, trademarks, and placards with care instructions and material information) to knitted component **130**, for example. As such, yarn **139** may be considered a fusible yarn

given that it may be used to fuse or otherwise join portions of knitted component **130** to each other. Moreover, yarn **138** may be considered a non-fusible yarn given that it is not formed from materials that are generally capable of fusing or otherwise joining portions of knitted component **130** to each other. That is, yarn **138** may be a non-fusible yarn, whereas yarn **139** may be a fusible yarn. In some configurations of knitted component **130**, yarn **138** (i.e., the non-fusible yarn) may be substantially formed from a thermoset polyester material and yarn **139** (i.e., the fusible yarn) may be at least partially formed from a thermoplastic polyester material.

The use of plated yarns may impart advantages to knitted component **130**. When yarn **139** is heated and fused to yarn **138** and inlaid strand **132**, this process may have the effect of stiffening or rigidifying the structure of knitted component **130**. Moreover, joining (a) one portion of yarn **138** to another portion of yarn **138** or (b) yarn **138** and inlaid strand **132** to each other has the effect of securing or locking the relative positions of yarn **138** and inlaid strand **132**, thereby imparting stretch-resistance and stiffness. That is, portions of yarn **138** may not slide relative to each other when fused with yarn **139**, thereby preventing warping or permanent stretching of knit element **131** due to relative movement of the knit structure. Another benefit relates to limiting unraveling if a portion of knitted component **130** becomes damaged or one of yarns **138** is severed. Also, inlaid strand **132** may not slide relative to knit element **131**, thereby preventing portions of inlaid strand **132** from pulling outward from knit element **131**. Accordingly, areas of knitted component **130** may benefit from the use of both fusible and non-fusible yarns within knit element **131**.

Another aspect of knitted component **130** relates to a padded area adjacent to ankle opening **121** and extending at least partially around ankle opening **121**. Referring to FIG. **7**E, the padded area is formed by two overlapping and at least partially coextensive knitted layers **140**, which may be formed of unitary knit construction, and a plurality of floating yarns **141** extending between knitted layers **140**. Although the sides or edges of knitted layers **140** are secured to each other, a central area is generally unsecured. As such, knitted layers **140** effectively form a tube or tubular structure, and floating yarns **141** may be located or inlaid between knitted layers **140** to pass through the tubular structure. That is, floating yarns **141** extend between knitted layers **140**, are generally parallel to surfaces of knitted layers **140**, and also pass through and fill an interior volume between knitted layers **140**. Whereas a majority of knit element **131** is formed from yarns that are mechanically-manipulated to form intermeshed loops, floating yarns **141** are generally free or otherwise inlaid within the interior volume between knitted layers **140**. As an additional matter, knitted layers **140** may be at least partially formed from a stretch yarn. An advantage of this configuration is that knitted layers will effectively compress floating yarns **141** and provide an elastic aspect to the padded area adjacent to ankle opening **121**. That is, the stretch yarn within knitted layers **140** may be placed in tension during the knitting process that forms knitted component **130**, thereby inducing knitted layers **140** to compress floating yarns **141**. Although the degree of stretch in the stretch yarn may vary significantly, the stretch yarn may stretch at least one-hundred percent in many configurations of knitted component **130**.

The presence of floating yarns **141** imparts a compressible aspect to the padded area adjacent to ankle opening **121**, thereby enhancing the comfort of footwear **100** in the area of ankle opening **121**. Many conventional articles of footwear incorporate polymer foam elements or other compressible materials into areas adjacent to an ankle opening. In contrast with the conventional articles of footwear, portions of knitted component **130** formed of unitary knit construction with a remainder of knitted component **130** may form the padded area adjacent to ankle opening **121**. In further configurations of footwear **100**, similar padded areas may be located in other areas of knitted component **130**. For example, similar padded areas may be located as an area corresponding with joints between the metatarsals and proximal phalanges to impart padding to the joints. As an alternative, a terry loop structure may also be utilized to impart some degree of padding to areas of upper **120**.

Based upon the above discussion, knitted component **130** imparts a variety of features to upper **120**. Moreover, knitted component **130** provides a variety of advantages over some conventional upper configurations. As noted above, conventional footwear uppers are formed from multiple material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) that are joined through stitching or bonding, for example. As the number and type of material elements incorporated into an upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase. Waste material from cutting and stitching processes also accumulates to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements. By decreasing the number of material elements utilized in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper. To this end, knitted component **130** forms a substantial portion of upper **120**, while increasing manufacturing efficiency, decreasing waste, and simplifying recyclability.

Further Knitted Component Configurations

A knitted component **150** is depicted in FIGS. **9** and **10** and may be utilized in place of knitted component **130** in footwear **100**. The primary elements of knitted component **150** are a knit element **151** and an inlaid strand **152**. Knit element **151** is formed from at least one yarn that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a variety of courses and wales. That is, knit element **151** has the structure of a knit textile. Inlaid strand **152** extends through knit element **151** and passes between the various loops within knit element **151**. Although inlaid strand **152** generally extends along courses within knit element **151**, inlaid strand **152** may also extend along wales within knit element **151**. As with inlaid strand **132**, inlaid strand **152** imparts stretch-resistance and, when incorporated into footwear **100**, operates in connection with lace **122** to enhance the fit of footwear **100**.

Knit element **151** has a generally U-shaped configuration that is outlined by a perimeter edge **153**, a pair of heel edges **154**, and an inner edge **155**. In addition, knit element **151** has a first surface **156** and an opposite second surface **157**. First surface **156** may form a portion of the exterior surface of upper **120**, whereas second surface **157** may form a portion of the interior surface of upper **120**, thereby defining at least a portion of the void within upper **120**. In many configurations, knit element **151** may have the configuration of a single textile layer in the area of inlaid strand **152**. That is, knit element **151** may be a single textile layer between surfaces **156** and **157**. In addition, knit element **151** defines a plurality of lace apertures **158**.

Similar to inlaid strand **132**, inlaid strand **152** repeatedly extends from perimeter edge **153** toward inner edge **155**, at least partially around one of lace apertures **158**, and back to

perimeter edge **153**. In contrast with inlaid strand **132**, however, some portions of inlaid strand **152** angle rearwards and extend to heel edges **154**. More particularly, the portions of inlaid strand **152** associated with the most rearward lace apertures **158** extend from one of heel edges **154** toward inner edge **155**, at least partially around one of the most rearward lace apertures **158**, and back to one of heel edges **154**. Additionally, some portions of inlaid strand **152** do not extend around one of lace apertures **158**. More particularly, some sections of inlaid strand **152** extend toward inner edge **155**, turn in areas adjacent to one of lace apertures **158**, and extend back toward perimeter edge **153** or one of heel edges **154**.

Although knit element **151** may be formed in a variety of ways, courses of the knit structure generally extend in the same direction as inlaid strands **152**. In areas adjacent to lace apertures **158**, however, inlaid strand **152** may also extend along wales within knit element **151**. More particularly, sections of inlaid strand **152** that are parallel to inner edge **155** may extend along wales.

In comparison with knit element **151**, inlaid strand **152** may exhibit greater stretch-resistance. That is, inlaid strand **152** may stretch less than knit element **151**. Given that numerous sections of inlaid strand **152** extend through knit element **151**, inlaid strand **152** may impart stretch-resistance to portions of upper **120** between the throat area and the lower area. Moreover, placing tension upon lace **122** may impart tension to inlaid strand **152**, thereby inducing the portions of upper **120** between the throat area and the lower area to lay against the foot. Additionally, given that numerous sections of inlaid strand **152** extend toward heel edges **154**, inlaid strand **152** may impart stretch-resistance to portions of upper **120** in heel region **103**. Moreover, placing tension upon lace **122** may induce the portions of upper **120** in heel region **103** to lay against the foot. As such, inlaid strand **152** operates in connection with lace **122** to enhance the fit of footwear **100**.

Knit element **151** may incorporate any of the various types of yarn discussed above for knit element **131**. Inlaid strand **152** may also be formed from any of the configurations and materials discussed above for inlaid strand **132**. Additionally, the various knit configurations discussed relative to FIGS. **8**A and **8**B may also be utilized in knitted component **150**. More particularly, knit element **151** may have areas formed from a single yarn, two plated yarns, or a fusible yarn and a non-fusible yarn, with the fusible yarn joining (a) one portion of the non-fusible yarn to another portion of the non-fusible yarn or (b) the non-fusible yarn and inlaid strand **152** to each other.

A majority of knit element **131** is depicted as being formed from a relatively untextured textile and a common or single knit structure (e.g., a tubular knit structure). In contrast, knit element **151** incorporates various knit structures that impart specific properties and advantages to different areas of knitted component **150**. Moreover, by combining various yarn types with the knit structures, knitted component **150** may impart a range of properties to different areas of upper **120**. Referring to FIG. **11**, a schematic view of knitted component **150** shows various zones **160-169** having different knit structures, each of which will now be discussed in detail. For purposes of reference, each of regions **101-103** and sides **104** and **105** are shown in FIG. **11** to provide a reference for the locations of knit zones **160-169** when knitted component **150** is incorporated into footwear **100**.

A tubular knit zone **160** extends along a majority of perimeter edge **153** and through each of regions **101-103** on both of sides **104** and **105**. Tubular knit zone **160** also extends inward from each of sides **104** and **105** in an area approximately located at an interface regions **101** and **102** to form a forward portion of inner edge **155**. Tubular knit zone **160** forms a relatively untextured knit configuration. Referring to FIG. **12**A, a cross-section through an area of tubular knit zone **160** is depicted, and surfaces **156** and **157** are substantially parallel to each other. Tubular knit zone **160** imparts various advantages to footwear **100**. For example, tubular knit zone **160** has greater durability and wear resistance than some other knit structures, especially when the yarn in tubular knit zone **160** is plated with a fusible yarn. In addition, the relatively untextured aspect of tubular knit zone **160** simplifies the process of joining strobel sock **125** to perimeter edge **153**. That is, the portion of tubular knit zone **160** located along perimeter edge **153** facilitates the lasting process of footwear **100**. For purposes of reference, FIG. **13**A depicts a loop diagram of the manner in which tubular knit zone **160** is formed with a knitting process.

Two stretch knit zones **161** extend inward from perimeter edge **153** and are located to correspond with a location of joints between metatarsals and proximal phalanges of the foot. That is, stretch zones extend inward from perimeter edge in the area approximately located at the interface regions **101** and **102**. As with tubular knit zone **160**, the knit configuration in stretch knit zones **161** may be a tubular knit structure. In contrast with tubular knit zone **160**, however, stretch knit zones **161** are formed from a stretch yarn that imparts stretch and recovery properties to knitted component **150**. Although the degree of stretch in the stretch yarn may vary significantly, the stretch yarn may stretch at least one-hundred percent in many configurations of knitted component **150**.

A tubular and interlock tuck knit zone **162** extends along a portion of inner edge **155** in at least midfoot region **102**. Tubular and interlock tuck knit zone **162** also forms a relatively untextured knit configuration, but has greater thickness than tubular knit zone **160**. In cross-section, tubular and interlock tuck knit zone **162** is similar to FIG. **12**A, in which surfaces **156** and **157** are substantially parallel to each other. Tubular and interlock tuck knit zone **162** imparts various advantages to footwear **100**. For example, tubular and interlock tuck knit zone **162** has greater stretch resistance than some other knit structures, which is beneficial when lace **122** places tubular and interlock tuck knit zone **162** and inlaid strands **152** in tension. For purposes of reference, FIG. **13**B depicts a loop diagram of the manner in which tubular and interlock tuck knit zone **162** is formed with a knitting process.

A 1×1 mesh knit zone **163** is located in forefoot region **101** and spaced inward from perimeter edge **153**. 1×1 mesh knit zone has a C-shaped configuration and forms a plurality of apertures that extend through knit element **151** and from first surface **156** to second surface **157**, as depicted in FIG. **12**B. The apertures enhance the permeability of knitted component **150**, which allows air to enter upper **120** and moisture to escape from upper **120**. For purposes of reference, FIG. **13**C depicts a loop diagram of the manner in which 1×1 mesh knit zone **163** is formed with a knitting process.

A 2×2 mesh knit zone **164** extends adjacent to 1×1 mesh knit zone **163**. In comparison with 1×1 mesh knit zone **163**, 2×2 mesh knit zone **164** forms larger apertures, which may further enhance the permeability of knitted component **150**. For purposes of reference, FIG. **13**D depicts a loop diagram of the manner in which 2×2 mesh knit zone **164** is formed with a knitting process.

A 3×2 mesh knit zone **165** is located within 2×2 mesh knit zone **164**, and another 3×2 mesh knit zone **165** is located adjacent to one of stretch zones **161**. In comparison with 1×1 mesh knit zone **163** and 2×2 mesh knit zone **164**, 3×2 mesh knit zone **165** forms even larger apertures, which may further enhance the permeability of knitted component **150**. For pur-

poses of reference, FIG. **13**E depicts a loop diagram of the manner in which 3×2 mesh knit zone **165** is formed with a knitting process.

A 1×1 mock mesh knit zone **166** is located in forefoot region **101** and extends around 1×1 mesh knit zone **163**. In contrast with mesh knit zones **163-165**, which form apertures through knit element **151**, 1×1 mock mesh knit zone **166** forms indentations in first surface **156**, as depicted in FIG. **12**C. In addition to enhancing the aesthetics of footwear **100**, 1×1 mock mesh knit zone **166** may enhance flexibility and decrease the overall mass of knitted component **150**. For purposes of reference, FIG. **13**F depicts a loop diagram of the manner in which 1×1 mock mesh knit zone **166** is formed with a knitting process.

Two 2×2 mock mesh knit zones **167** are located in heel region **103** and adjacent to heel edges **154**. In comparison with 1×1 mock mesh knit zone **166**, 2×2 mock mesh knit zones **167** forms larger indentations in first surface **156**. In areas where inlaid strands **152** extend through indentations in 2×2 mock mesh knit zones **167**, as depicted in FIG. **12**D, inlaid strands **152** may be visible and exposed in a lower area of the indentations. For purposes of reference, FIG. **13**G depicts a loop diagram of the manner in which 2×2 mock mesh knit zones **167** are formed with a knitting process.

Two 2×2 hybrid knit zones **168** are located in midfoot region **102** and forward of 2×2 mock mesh knit zones **167**. 2×2 hybrid knit zones **168** share characteristics of 2×2 mesh knit zone **164** and 2×2 mock mesh knit zones **167**. More particularly, 2×2 hybrid knit zones **168** form apertures having the size and configuration of 2×2 mesh knit zone **164**, and 2×2 hybrid knit zones **168** form indentations having the size and configuration of 2×2 mock mesh knit zones **167**. In areas where inlaid strands **152** extend through indentations in 2×2 hybrid knit zones **168**, as depicted in FIG. **12**E, inlaid strands **152** are visible and exposed. For purposes of reference, FIG. **13**H depicts a loop diagram of the manner in which 2×2 hybrid knit zones **168** are formed with a knitting process.

Knitted component **150** also includes two padded zones **169** having the general configuration of the padded area adjacent to ankle opening **121** and extending at least partially around ankle opening **121**, which was discussed above for knitted component **130**. As such, padded zones **169** are formed by two overlapping and at least partially coextensive knitted layers, which may be formed of unitary knit construction, and a plurality of floating yarns extending between the knitted layers.

A comparison between FIGS. **9** and **10** reveals that a majority of the texturing in knit element **151** is located on first surface **156**, rather than second surface **157**. That is, the indentations formed by mock mesh knit zones **166** and **167**, as well as the indentations in 2×2 hybrid knit zones **168**, are formed in first surface **156**. This configuration has an advantage of enhancing the comfort of footwear **100**. More particularly, this configuration places the relatively untextured configuration of second surface **157** against the foot. A further comparison between FIGS. **9** and **10** reveals that portions of inlaid strand **152** are exposed on first surface **156**, but not on second surface **157**. This configuration also has an advantage of enhancing the comfort of footwear **100**. More particularly, by spacing inlaid strand **152** from the foot by a portion of knit element **151**, inlaid strands **152** will not contact the foot.

Additional configurations of knitted component **130** are depicted in FIGS. **14**A-**14**C. Although discussed in relation to knitted component **130**, concepts associated with each of these configurations may also be utilized with knitted component **150**. Referring to FIG. **14**A, inlaid strands **132** are absent from knitted component **130**. Although inlaid strands **132** impart stretch-resistance to areas of knitted component **130**, some configurations may not require the stretch-resistance from inlaid strands **132**. Moreover, some configurations may benefit from greater stretch in upper **120**. Referring to FIG. **14**B, knit element **131** includes two flaps **142** that are formed of unitary knit construction with a remainder of knit element **131** and extend along the length of knitted component **130** at perimeter edge **133**. When incorporated into footwear **100**, flaps **142** may replace strobel sock **125**. That is, flaps **142** may cooperatively form a portion of upper **120** that extends under sockliner **113** and is secured to the upper surface of midsole **111**. Referring to FIG. **14**C, knitted component **130** has a configuration that is limited to midfoot region **102**. In this configuration, other material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) may be joined to knitted component **130** through stitching or bonding, for example, to form upper **120**.

Based upon the above discussion, each of knitted components **130** and **150** may have various configurations that impart features and advantages to upper **120**. More particularly, knit elements **131** and **151** may incorporate various knit structures and yarn types that impart specific properties to different areas of upper **120**, and inlaid strands **132** and **152** may extend through the knit structures to impart stretch-resistance to areas of upper **120** and operate in connection with lace **122** to enhance the fit of footwear **100**.

Knitting Machine And Feeder Configurations

Although knitting may be performed by hand, the commercial manufacture of knitted components is generally performed by knitting machines. An example of a knitting machine **200** that is suitable for producing either of knitted components **130** and **150** is depicted in FIG. **15**. Knitting machine **200** has a configuration of a V-bed flat knitting machine for purposes of example, but either of knitted components **130** and **150** or aspects of knitted components **130** and **150** may be produced on other types of knitting machines.

Knitting machine **200** includes two needle beds **201** that are angled with respect to each other, thereby forming a V-bed. Each of needle beds **201** include a plurality of individual needles **202** that lay on a common plane. That is, needles **202** from one needle bed **201** lay on a first plane, and needles **202** from the other needle bed **201** lay on a second plane. The first plane and the second plane (i.e., the two needle beds **201**) are angled relative to each other and meet to form an intersection that extends along a majority of a width of knitting machine **200**. As described in greater detail below, needles **202** each have a first position where they are retracted and a second position where they are extended. In the first position, needles **202** are spaced from the intersection where the first plane and the second plane meet. In the second position, however, needles **202** pass through the intersection where the first plane and the second plane meet.

A pair of rails **203** extend above and parallel to the intersection of needle beds **201** and provide attachment points for multiple standard feeders **204** and combination feeders **220**. Each rail **203** has two sides, each of which accommodates either one standard feeder **204** or one combination feeder **220**. As such, knitting machine **200** may include a total of four feeders **204** and **220**. As depicted, the forward-most rail **203** includes one combination feeder **220** and one standard feeder **204** on opposite sides, and the rearward-most rail **203** includes two standard feeders **204** on opposite sides. Although two rails **203** are depicted, further configurations of knitting machine **200** may incorporate additional rails **203** to provide attachment points for more feeders **204** and **220**.

Due to the action of a carriage **205**, feeders **204** and **220** move along rails **203** and needle beds **201**, thereby supplying

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yarns to needles **202**. In FIG. **15**, a yarn **206** is provided to combination feeder **220** by a spool **207**. More particularly, yarn **206** extends from spool **207** to various yarn guides **208**, a yarn take-back spring **209**, and a yarn tensioner **210** before entering combination feeder **220**. Although not depicted, additional spools **207** may be utilized to provide yarns to feeders **204**.

Standard feeders **204** are conventionally-utilized for a V-bed flat knitting machine, such as knitting machine **200**. That is, existing knitting machines incorporate standard feeders **204**. Each standard feeder **204** has the ability to supply a yarn that needles **202** manipulate to knit, tuck, and float. As a comparison, combination feeder **220** has the ability to supply a yarn (e.g., yarn **206**) that needles **202** knit, tuck, and float, and combination feeder **220** has the ability to inlay the yarn. Moreover, combination feeder **220** has the ability to inlay a variety of different strands (e.g., filament, thread, rope, webbing, cable, chain, or yarn). Accordingly, combination feeder **220** exhibits greater versatility than each standard feeder **204**.

As noted above, combination feeder **220** may be utilized when inlaying a yarn or other strand, in addition to knitting, tucking, and floating the yarn. Conventional knitting machines, which do not incorporate combination feeder **220**, may also inlay a yarn. More particularly, conventional knitting machines that are supplied with an inlay feeder may also inlay a yarn. A conventional inlay feeder for a V-bed flat knitting machine includes two components that operate in conjunction to inlay the yarn. Each of the components of the inlay feeder are secured to separate attachment points on two adjacent rails, thereby occupying two attachment points. Whereas an individual standard feeder **204** only occupies one attachment point, two attachment points are generally occupied when an inlay feeder is utilized to inlay a yarn into a knitted component. Moreover, whereas combination feeder **220** only occupies one attachment point, a conventional inlay feeder occupies two attachment points.

Given that knitting machine **200** includes two rails **203**, four attachment points are available in knitting machine **200**. If a conventional inlay feeder were utilized with knitting machine **200**, only two attachment points would be available for standard feeders **204**. When using combination feeder **220** in knitting machine **200**, however, three attachment points are available for standard feeders **204**. Accordingly, combination feeder **220** may be utilized when inlaying a yarn or other strand, and combination feeder **220** has an advantage of only occupying one attachment point.

Combination feeder **220** is depicted individually in FIGS. **16-19** as including a carrier **230**, a feeder arm **240**, and a pair of actuation members **250**. Although a majority of combination feeder **220** may be formed from metal materials (e.g., steel, aluminum, titanium), portions of carrier **230**, feeder arm **240**, and actuation members **250** may be formed from polymer, ceramic, or composite materials, for example. As discussed above, combination feeder **220** may be utilized when inlaying a yarn or other strand, in addition to knitting, tucking, and floating a yarn. Referring to FIG. **16** specifically, a portion of yarn **206** is depicted to illustrate the manner in which a strand interfaces with combination feeder **220**.

Carrier **230** has a generally rectangular configuration and includes a first cover member **231** and a second cover member **232** that are joined by four bolts **233**. Cover members **231** and **232** define an interior cavity in which portions of feeder arm **240** and actuation members **250** are located. Carrier **230** also includes an attachment element **234** that extends outward from first cover member **231** for securing feeder **220** to one of rails **203**. Although the configuration of attachment element **234** may vary, attachment element **234** is depicted as including two spaced protruding areas that form a dovetail shape, as depicted in FIG. **17**. A reverse dovetail configuration on one of rails **203** may extend into the dovetail shape of attachment element **234** to effectively join combination feeder **220** to knitting machine **200**. It should also be noted that second cover member **234** forms a centrally-located and elongate slot **235**, as depicted in FIG. **18**.

Feeder arm **240** has a generally elongate configuration that extends through carrier **230** (i.e., the cavity between cover members **231** and **232**) and outward from a lower side of carrier **230**. In addition to other elements, feeder arm **240** includes an actuation bolt **241**, a spring **242**, a pulley **243**, a loop **244**, and a dispensing area **245**. Actuation bolt **241** extends outward from feeder arm **240** and is located within the cavity between cover members **231** and **232**. One side of actuation bolt **241** is also located within slot **235** in second cover member **232**, as depicted in FIG. **18**. Spring **242** is secured to carrier **230** and feeder arm **240**. More particularly, one end of spring **242** is secured to carrier **230**, and an opposite end of spring **242** is secured to feeder arm **240**. Pulley **243**, loop **244**, and dispensing area **245** are present on feeder arm **240** to interface with yarn **206** or another strand. Moreover, pulley **243**, loop **244**, and dispensing area **245** are configured to ensure that yarn **206** or another strand smoothly passes through combination feeder **220**, thereby being reliably-supplied to needles **202**. Referring again to FIG. **16**, yarn **206** extends around pulley **243**, through loop **244**, and into dispensing area **245**. In addition, yarn **206** extends out of a dispensing tip **246**, which is an end region of feeder arm **240**, to then supply needles **202**.

Each of actuation members **250** includes an arm **251** and a plate **252**. In many configurations of actuation members **250**, each arm **251** is formed as a one-piece element with one of plates **252**. Whereas arms **251** are located outside of carrier **230** and at an upper side of carrier **230**, plates **252** are located within carrier **250**. Each of arms **251** has an elongate configuration that defines an outside end **253** and an opposite inside end **254**, and arms **251** are positioned to define a space **255** between both of inside ends **254**. That is, arms **251** are spaced from each other. Plates **252** have a generally planar configuration. Referring to FIG. **19**, each of plates **252** define an aperture **256** with an inclined edge **257**. Moreover, actuation bolt **241** of feeder arm **240** extends into each aperture **256**.

The configuration of combination feeder **220** discussed above provides a structure that facilitates a translating movement of feeder arm **240**. As discussed in greater detail below, the translating movement of feeder arm **240** selectively positions dispensing tip **246** at a location that is above or below the intersection of needle beds **201**. That is, dispensing tip **246** has the ability to reciprocate through the intersection of needle beds **201**. An advantage to the translating movement of feeder arm **240** is that combination feeder **220** (a) supplies yarn **206** for knitting, tucking, and floating when dispensing tip **246** is positioned above the intersection of needle beds **201** and (b) supplies yarn **206** or another strand for inlaying when dispensing tip **246** is positioned below the intersection of needle beds **201**. Moreover, feeder arm **240** reciprocates between the two positions depending upon the manner in which combination feeder **220** is being utilized.

In reciprocating through the intersection of needle beds **201**, feeder arm **240** translates from a retracted position to an extended position. When in the retracted position, dispensing tip **246** is positioned above the intersection of needle beds **201**. When in the extended position, dispensing tip **246** is positioned below the intersection of needle beds **201**. Dispensing tip **246** is closer to carrier **230** when feeder arm **240** is in the retracted position than when feeder arm **240** is in the

extended position. Similarly, dispensing tip **246** is further from carrier **230** when feeder arm **240** is in the extended position than when feeder arm **240** is in the retracted position. In other words, dispensing tip **246** moves away from carrier **230** when in the extended position, and dispensing tip **246** moves closer to carrier **230** when in the retracted position.

For purposes of reference in FIGS. **16-20**C, as well as further figures discussed later, an arrow **221** is positioned adjacent to dispensing area **245**. When arrow **221** points upward or toward carrier **230**, feeder arm **240** is in the retracted position. When arrow **221** points downward or away from carrier **230**, feeder arm **240** is in the extended position. Accordingly, by referencing the position of arrow **221**, the position of feeder arm **240** may be readily ascertained.

The natural state of feeder arm **240** is the retracted position. That is, when no significant forces are applied to areas of combination feeder **220**, feeder arm remains in the retracted position. Referring to FIGS. **16-19**, for example, no forces or other influences are shown as interacting with combination feeder **220**, and feeder arm **240** is in the retracted position. The translating movement of feeder arm **240** may occur, however, when a sufficient force is applied to one of arms **251**. More particularly, the translating movement of feeder arm **240** occurs when a sufficient force is applied to one of outside ends **253** and is directed toward space **255**. Referring to FIGS. **20**A and **20**B, a force **222** is acting upon one of outside ends **253** and is directed toward space **255**, and feeder arm **240** is shown as having translated to the extended position. Upon removal of force **222**, however, feeder arm **240** will return to the retracted position. It should also be noted that FIG. **20**C depicts force **222** as acting upon inside ends **254** and being directed outward, and feeder arm **240** remains in the retracted position.

As discussed above, feeders **204** and **220** move along rails **203** and needle beds **201** due to the action of carriage **205**. More particularly, a drive bolt within carriage **205** contacts feeders **204** and **220** to push feeders **204** and **220** along needle beds **201**. With respect to combination feeder **220**, the drive bolt may either contact one of outside ends **253** or one of inside ends **254** to push combination feeder **220** along needle beds **201**. When the drive bolt contacts one of outside ends **253**, feeder arm **240** translates to the extended position and dispensing tip **246** passes below the intersection of needle beds **201**. When the drive bolt contacts one of inside ends **254** and is located within space **255**, feeder arm **240** remains in the retracted position and dispensing tip **246** is above the intersection of needle beds **201**. Accordingly, the area where carriage **205** contacts combination feeder **220** determines whether feeder arm **240** is in the retracted position or the extended position.

The mechanical action of combination feeder **220** will now be discussed. FIGS. **19-20**B depict combination feeder **220** with first cover member **231** removed, thereby exposing the elements within the cavity in carrier **230**. By comparing FIG. **19** with FIGS. **20**A and **20**B, the manner in which force **222** induces feeder arm **240** to translate may be apparent. When force **222** acts upon one of outside ends **253**, one of actuation members **250** slides in a direction that is perpendicular to the length of feeder arm **240**. That is, one of actuation members **250** slides horizontally in FIGS. **19-20**B. The movement of one of actuation members **250** causes actuation bolt **241** to engage one of inclined edges **257**. Given that the movement of actuation members **250** is constrained to the direction that is perpendicular to the length of feeder arm **240**, actuation bolt **241** rolls or slides against inclined edge **257** and induces feeder arm **240** to translate to the extended position. Upon removal of force **222**, spring **242** pulls feeder arm **240** from the extended position to the retracted position.

Based upon the above discussion, combination feeder **220** reciprocates between the retracted position and the extended position depending upon whether a yarn or other strand is being utilized for knitting, tucking, or floating or being utilized for inlaying. Combination feeder **220** has a configuration wherein the application of force **222** induces feeder arm **240** to translate from the retracted position to the extended position, and removal of force **222** induces feeder arm **240** to translate from the extended position to the retracted position. That is, combination feeder **220** has a configuration wherein the application and removal of force **222** causes feeder arm **240** to reciprocate between opposite sides of needle beds **201**. In general, outside ends **253** may be considered actuation areas, which induce movement in feeder arm **240**. In further configurations of combination feeder **220**, the actuation areas may be in other locations or may respond to other stimuli to induce movement in feeder arm **240**. For example, the actuation areas may be electrical inputs coupled to servomechanisms that control movement of feeder arm **240**. Accordingly, combination feeder **220** may have a variety of structures that operate in the same general manner as the configuration discussed above.

Knitting Process

The manner in which knitting machine **200** operates to manufacture a knitted component will now be discussed in detail. Moreover, the following discussion will demonstrate the operation of combination feeder **220** during a knitting process. Referring to FIG. **21**A, a portion of knitting machine **200** that includes various needles **202**, rail **203**, standard feeder **204**, and combination feeder **220** is depicted. Whereas combination feeder **220** is secured to a front side of rail **203**, standard feeder **204** is secured to a rear side of rail **203**. Yarn **206** passes through combination feeder **220**, and an end of yarn **206** extends outward from dispensing tip **246**. Although yarn **206** is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through combination feeder **220**. Another yarn **211** passes through standard feeder **204** and forms a portion of a knitted component **260**, and loops of yarn **211** forming an uppermost course in knitted component **260** are held by hooks located on ends of needles **202**.

The knitting process discussed herein relates to the formation of knitted component **260**, which may be any knitted component, including knitted components that are similar to knitted components **130** and **150**. For purposes of the discussion, only a relatively small section of knitted component **260** is shown in the figures in order to permit the knit structure to be illustrated. Moreover, the scale or proportions of the various elements of knitting machine **200** and knitted component **260** may be enhanced to better illustrate the knitting process.

Standard feeder **204** includes a feeder arm **212** with a dispensing tip **213**. Feeder arm **212** is angled to position dispensing tip **213** in a location that is (a) centered between needles **202** and (b) above an intersection of needle beds **201**. FIG. **22**A depicts a schematic cross-sectional view of this configuration. Note that needles **202** lay on different planes, which are angled relative to each other. That is, needles **202** from needle beds **201** lay on the different planes. Needles **202** each have a first position and a second position. In the first position, which is shown in solid line, needles **202** are retracted. In the second position, which is shown in dashed line, needles **202** are extended. In the first position, needles **202** are spaced from the intersection where the planes upon which needle beds **201** lay meet. In the second position, however, needles **202** are extended and pass through the inter-

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section where the planes upon which needle beds **201** meet. That is, needles **202** cross each other when extended to the second position. It should be noted that dispensing tip **213** is located above the intersection of the planes. In this position, dispensing tip **213** supplies yarn **211** to needles **202** for purposes of knitting, tucking, and floating.

Combination feeder **220** is in the retracted position, as evidenced by the orientation of arrow **221**. Feeder arm **240** extends downward from carrier **230** to position dispensing tip **246** in a location that is (a) centered between needles **202** and (b) above the intersection of needle beds **201**. FIG. **22**B depicts a schematic cross-sectional view of this configuration. Note that dispensing tip **246** is positioned in the same relative location as dispensing tip **213** in FIG. **22**A.

Referring now to FIG. **21**B, standard feeder **204** moves along rail **203** and a new course is formed in knitted component **260** from yarn **211**. More particularly, needles **202** pulled sections of yarn **211** through the loops of the prior course, thereby forming the new course. Accordingly, courses may be added to knitted component **260** by moving standard feeder **204** along needles **202**, thereby permitting needles **202** to manipulate yarn **211** and form additional loops from yarn **211**.

Continuing with the knitting process, feeder arm **240** now translates from the retracted position to the extended position, as depicted in FIG. **21**C. In the extended position, feeder arm **240** extends downward from carrier **230** to position dispensing tip **246** in a location that is (a) centered between needles **202** and (b) below the intersection of needle beds **201**. FIG. **22**C depicts a schematic cross-sectional view of this configuration. Note that dispensing tip **246** is positioned below the location of dispensing tip **246** in FIG. **22**B due to the translating movement of feeder arm **240**.

Referring now to FIG. **21**D, combination feeder **220** moves along rail **203** and yarn **206** is placed between loops of knitted component **260**. That is, yarn **206** is located in front of some loops and behind other loops in an alternating pattern. Moreover, yarn **206** is placed in front of loops being held by needles **202** from one needle bed **201**, and yarn **206** is placed behind loops being held by needles **202** from the other needle bed **201**. Note that feeder arm **240** remains in the extended position in order to lay yarn **206** in the area below the intersection of needle beds **201**. This effectively places yarn **206** within the course recently formed by standard feeder **204** in FIG. **21**B.

In order to complete inlaying yarn **206** into knitted component **260**, standard feeder **204** moves along rail **203** to form a new course from yarn **211**, as depicted in FIG. **21**E. By forming the new course, yarn **206** is effectively knit within or otherwise integrated into the structure of knitted component **260**. At this stage, feeder arm **240** may also translate from the extended position to the retracted position.

FIGS. **21**D and **21**E show separate movements of feeders **204** and **220** along rail **203**. That is, FIG. **21**D shows a first movement of combination feeder **220** along rail **203**, and FIG. **21**E shows a second and subsequent movement of standard feeder **204** along rail **203**. In many knitting processes, feeders **204** and **220** may effectively move simultaneously to inlay yarn **206** and form a new course from yarn **211**. Combination feeder **220**, however, moves ahead or in front of standard feeder **204** in order to position yarn **206** prior to the formation of the new course from yarn **211**.

The general knitting process outlined in the above discussion provides an example of the manner in which inlaid strands **132** and **152** may be located in knit elements **131** and **151**. More particularly, knitted components **130** and **150** may be formed by utilizing combination feeder **220** to effectively insert inlaid strands **132** and **152** into knit elements **131**. Given the reciprocating action of feeder arm **240**, inlaid strands may be located within a previously formed course prior to the formation of a new course.

Continuing with the knitting process, feeder arm **240** now translates from the retracted position to the extended position, as depicted in FIG. **21**F. Combination feeder **220** then moves along rail **203** and yarn **206** is placed between loops of knitted component **260**, as depicted in FIG. **21**G. This effectively places yarn **206** within the course formed by standard feeder **204** in FIG. **21**E. In order to complete inlaying yarn **206** into knitted component **260**, standard feeder **204** moves along rail **203** to form a new course from yarn **211**, as depicted in FIG. **21**H. By forming the new course, yarn **206** is effectively knit within or otherwise integrated into the structure of knitted component **260**. At this stage, feeder arm **240** may also translate from the extended position to the retracted position.

Referring to FIG. **21**H, yarn **206** forms a loop **214** between the two inlaid sections. In the discussion of knitted component **130** above, it was noted that inlaid strand **132** repeatedly exits knit element **131** at perimeter edge **133** and then re-enters knit element **131** at another location of perimeter edge **133**, thereby forming loops along perimeter edge **133**, as seen in FIGS. **5** and **6**. Loop **214** is formed in a similar manner. That is, loop **214** is formed where yarn **206** exits the knit structure of knitted component **260** and then re-enters the knit structure.

As discussed above, standard feeder **204** has the ability to supply a yarn (e.g., yarn **211**) that needles **202** manipulate to knit, tuck, and float. Combination feeder **220**, however, has the ability to supply a yarn (e.g., yarn **206**) that needles **202** knit, tuck, or float, as well as inlaying the yarn. The above discussion of the knitting process describes the manner in which combination feeder **220** inlays a yarn while in the extended position. Combination feeder **220** may also supply the yarn for knitting, tucking, and floating while in the retracted position. Referring to FIG. **21**I, for example, combination feeder **220** moves along rail **203** while in the retracted position and forms a course of knitted component **260** while in the retracted position. Accordingly, by reciprocating feeder arm **240** between the retracted position and the extended position, combination feeder **220** may supply yarn **206** for purposes of knitting, tucking, floating, and inlaying. An advantage to combination feeder **220** relates, therefore, to its versatility in supplying a yarn that may be utilized for a greater number of functions than standard feeder **204**

The ability of combination feeder **220** to supply yarn for knitting, tucking, floating, and inlaying is based upon the reciprocating action of feeder arm **240**. Referring to FIGS. **22**A and **22**B, dispensing tips **213** and **246** are at identical positions relative to needles **220**. As such, both feeders **204** and **220** may supply a yarn for knitting, tucking, and floating. Referring to FIG. **22**C, dispensing tip **246** is at a different position. As such, combination feeder **220** may supply a yarn or other strand for inlaying. An advantage to combination feeder **220** relates, therefore, to its versatility in supplying a yarn that may be utilized for knitting, tucking, floating, and inlaying.

Further Knitting Process Considerations

Additional aspects relating to the knitting process will now be discussed. Referring to FIG. **23**, the upper course of knitted component **260** is formed from both of yarns **206** and **211**. More particularly, a left side of the course is formed from yarn **211**, whereas a right side of the course is formed from yarn **206**. Additionally, yarn **206** is inlaid into the left side of the course. In order to form this configuration, standard feeder **204** may initially form the left side of the course from yarn

211. Combination feeder **220** then lays yarn **206** into the right side of the course while feeder arm **240** is in the extended position. Subsequently, feeder arm **240** moves from the extended position to the retracted position and forms the right side of the course. Accordingly, combination feeder may inlay a yarn into one portion of a course and then supply the yarn for purposes of knitting a remainder of the course.

FIG. **24** depicts a configuration of knitting machine **200** that includes four combination feeders **220**. As discussed above, combination feeder **220** has the ability to supply a yarn (e.g., yarn **206**) for knitting, tucking, floating, and inlaying. Given this versatility, standard feeders **204** may be replaced by multiple combination feeders **220** in knitting machine **200** or in various conventional knitting machines.

FIG. **8**B depicts a configuration of knitted component **130** where two yarns **138** and **139** are plated to form knit element **131**, and inlaid strand **132** extends through knit element **131**. The general knitting process discussed above may also be utilized to form this configuration. As depicted in FIG. **15**, knitting machine **200** includes multiple standard feeders **204**, and two of standard feeders **204** may be utilized to form knit element **131**, with combination feeder **220** depositing inlaid strand **132**. Accordingly, the knitting process discussed above in FIGS. **21**A-**21**I may be modified by adding another standard feeder **204** to supply an additional yarn. In configurations where yarn **138** is a non-fusible yarn and yarn **139** is a fusible yarn, knitted component **130** may be heated following the knitting process to fuse knitted component **130**.

The portion of knitted component **260** depicted in FIGS. **21**A-**21**I has the configuration of a rib knit textile with regular and uninterrupted courses and wales. That is, the portion of knitted component **260** does not have, for example, any mesh areas similar to mesh knit zones **163**-**165** or mock mesh areas similar to mock mesh knit zones **166** and **167**. In order to form mesh knit zones **163**-**165** in either of knitted components **150** and **260**, a combination of a racked needle bed **201** and a transfer of stitch loops from front to back needle beds **201** and back to front needle beds **201** in different racked positions is utilized. In order to form mock mesh areas similar to mock mesh knit zones **166** and **167**, a combination of a racked needle bed and a transfer of stitch loops from front to back needle beds **201** is utilized.

Courses within a knitted component are generally parallel to each other. Given that a majority of inlaid strand **152** follows courses within knit element **151**, it may be suggested that the various sections of inlaid strand **152** should be parallel to each other. Referring to FIG. **9**, for example, some sections of inlaid strand **152** extend between edges **153** and **155** and other sections extend between edges **153** and **154**. Various sections of inlaid strand **152** are, therefore, not parallel. The concept of forming darts may be utilized to impart this non-parallel configuration to inlaid strand **152**. More particularly, courses of varying length may be formed to effectively insert wedge-shaped structures between sections of inlaid strand **152**. The structure formed in knitted component **150**, therefore, where various sections of inlaid strand **152** are not parallel, may be accomplished through the process of darting.

Although a majority of inlaid strands **152** follow courses within knit element **151**, some sections of inlaid strand **152** follow wales. For example, sections of inlaid strand **152** that are adjacent to and parallel to inner edge **155** follow wales. This may be accomplished by first inserting a section of inlaid strand **152** along a portion of a course and to a point where inlaid strand **152** is intended to follow a wale. Inlaid strand **152** is then kicked back to move inlaid strand **152** out of the way, and the course is finished. As the subsequent course is being formed, inlay strand **152** is again kicked back to move inlaid strand **152** out of the way at the point where inlaid strand **152** is intended to follow the wale, and the course is finished. This process is repeated until inlaid strand **152** extends a desired distance along the wale. Similar concepts may be utilized for portions of inlaid strand **132** in knitted component **130**.

A variety of procedures may be utilized to reduce relative movement between (a) knit element **131** and inlaid strand **132** or (b) knit element **151** and inlaid strand **152**. That is, various procedures may be utilized to prevent inlaid strands **132** and **152** from slipping, moving through, pulling out, or otherwise becoming displaced from knit elements **131** and **151**. For example, fusing one or more yarns that are formed from thermoplastic polymer materials to inlaid strands **132** and **152** may prevent movement between inlaid strands **132** and **152** and knit elements **131** and **151**. Additionally, inlaid strands **132** and **152** may be fixed to knit elements **131** and **151** when periodically fed to knitting needles as a tuck element. That is, inlaid strands **132** and **152** may be formed into tuck stitches at points along their lengths (e.g., once per centimeter) in order to secure inlaid strands **132** and **152** to knit elements **131** and **151** and prevent movement of inlaid strands **132** and **152**.

Following the knitting process described above, various operations may be performed to enhance the properties of either of knitted components **130** and **150**. For example, a water-repellant coating or other water-resisting treatment may be applied to limit the ability of the knit structures to absorb and retain water. As another example, knitted components **130** and **150** may be steamed to improve loft and induce fusing of the yarns. As discussed above with respect to FIG. **8**B, yarn **138** may be a non-fusible yarn and yarn **139** may be a fusible yarn. When steamed, yarn **139** may melt or otherwise soften so as to transition from a solid state to a softened or liquid state, and then transition from the softened or liquid state to the solid state when sufficiently cooled. As such, yarn **139** may be utilized to join (a) one portion of yarn **138** to another portion of yarn **138**, (b) yarn **138** and inlaid strand **132** to each other, or (c) another element (e.g., logos, trademarks, and placards with care instructions and material information) to knitted component **130**, for example. Accordingly, a steaming process may be utilized to induce fusing of yarns in knitted components **130** and **150**.

Although procedures associated with the steaming process may vary greatly, one method involves pinning one of knitted components **130** and **150** to a jig during steaming. An advantage of pinning one of knitted components **130** and **150** to a jig is that the resulting dimensions of specific areas of knitted components **130** and **150** may be controlled. For example, pins on the jig may be located to hold areas corresponding to perimeter edge **133** of knitted component **130**. By retaining specific dimensions for perimeter edge **133**, perimeter edge **133** will have the correct length for a portion of the lasting process that joins upper **120** to sole structure **110**. Accordingly, pinning areas of knitted components **130** and **150** may be utilized to control the resulting dimensions of knitted components **130** and **150** following the steaming process.

The knitting process described above for forming knitted component **260** may be applied to the manufacture of knitted components **130** and **150** for footwear **100**. The knitting process may also be applied to the manufacture of a variety of other knitted components. That is, knitting processes utilizing one or more combination feeders or other reciprocating feeders may be utilized to form a variety of knitted components. As such, knitted components formed through the knitting process described above, or a similar process, may also be utilized in other types of apparel (e.g., shirts, pants, socks,

jackets, undergarments), athletic equipment (e.g., golf bags, baseball and football gloves, soccer ball restriction structures), containers (e.g., backpacks, bags), and upholstery for furniture (e.g., chairs, couches, car seats). The knitted components may also be utilized in bed coverings (e.g., sheets, blankets), table coverings, towels, flags, tents, sails, and parachutes. The knitted components may be utilized as technical textiles for industrial purposes, including structures for automotive and aerospace applications, filter materials, medical textiles (e.g. bandages, swabs, implants), geotextiles for reinforcing embankments, agrotextiles for crop protection, and industrial apparel that protects or insulates against heat and radiation. Accordingly, knitted components formed through the knitting process described above, or a similar process, may be incorporated into a variety of products for both personal and industrial purposes.

Knitted Components With Tongues

In footwear **100**, tongue **124** is separate from knitted component **130** and joined to knitted component **130**, possibly with stitching, an adhesive, or thermal bonding. Moreover, tongue **124** is discussed as being added to knitted component **130** following the knitting process. As depicted in FIGS. **25** and **26**, however, knitted component **130** includes a knitted tongue **170** that is formed of unitary knit construction with knit element **131**. That is, knit element **131** and tongue **170** are formed as a one-piece element through a knitting process, which will be discussed in greater detail below. Although tongue **124** or another tongue may be joined to knit element **131** after knitted component **130** is formed, tongue **170** or another knitted tongue may be formed during the knitting process and of unitary knit construction with a portion of knitted component **130**.

Tongue **170** is located within a throat area (i.e., where lace **122** and lace apertures **123** are located) of knitted component **130** and extends along the throat area. When incorporated into footwear **100**, for example, tongue **170** extends from a forward portion of the throat area to ankle opening **121**. As with knit element **131**, tongue **170** is depicted as being formed from a relatively untextured textile and a common or single knit structure. Tongue **170** is also depicted in FIG. **27** as having a generally planar configuration. Examples of knit structures that may impart this configuration for tongue **170**, as well as knit element **131**, are any of the various knit structures in knit zones **160-162** discussed above. In further configurations, however, apertures may be formed in areas of tongue **170** by utilizing the knit structures of mesh knit zones **163-165**, indentations may be formed in areas of tongue **170** by utilizing the knit structures of mock mesh knit zones **166** or **167**, or a combination of apertures and indentations may be formed in areas of tongue **170** by utilizing the knit structure of hybrid knit zone **168**. Additionally, areas of tongue **170** may have a padded aspect when formed to have layers and floating yarns, for example, that are similar to padded zone **169**. Accordingly, the untextured and planar aspect of tongue **170** is shown for purposes of example, and various features may be imparted through the use of different knit structures.

Referring to FIGS. **28** and **29**, a knitted tongue **175** is depicted as being formed of unitary knit construction with knit element **151** of knitted component **150**. Tongue **175** has the same general shape as tongue **170**, but may have a padded aspect with greater thickness. More particularly, tongue **175** is depicted in FIG. **30** as including two overlapping and at least partially coextensive knitted layers **176**, which may be formed of unitary knit construction, and a plurality of yarn loops **177** located between layers **176**. Although the sides or edges of layers **176** are secured or knit to each other, a central area is generally unsecured. As such, layers **176** effectively form a tube or tubular structure, and yarn loops **177** are located between and extend outward from one of layers **176**. In effect, yarn loops **177** fill an interior volume between layers **176** and impart a compressible or padded aspect to tongue **175**. It should also be noted that each of layers **176** and yarn loops **177** may be formed of unitary knit construction during the knitting process that forms knitted component **150**.

Another knitted component **180** is depicted in FIG. **31** as including a knit element **181**, an inlaid strand **182**, and a knitted tongue **183**. With the exception of the presence of tongue **183**, knitted component **180** has a general structure of a knitted component disclosed in U.S. Patent Application Publication 2010/0154256 to Dua, which is incorporated herein by reference. Tongue **183** is formed of unitary knit construction with knit element **181** and includes various knit structures. Referring to FIG. **32**, for example, peripheral areas of tongue **183** exhibit an untextured configuration that may have any of the various knit structures in knit zones **160-162**. At least two areas of tongue **183** incorporate apertures and may have any of the various knit structures in mesh knit zones **163-165**. Referring to FIG. **33**, a central area of tongue **183** has a compressible or padded aspect that includes two overlapping and at least partially coextensive knitted layers **184**, which may be formed of unitary knit construction, and a plurality of floating yarns **185** extending between layers **184**. The central area of tongue **183** may exhibit, therefore, the knit structure of padded zone **169**. Although the sides or edges of layers **184** are secured to each other, a central area is generally unsecured. As such, layers **184** effectively form a tube or tubular structure, and floating yarns **185** may be located or inlaid between layers **184** to pass through the tubular structure. That is, floating yarns **185** extend between layers **184**, are generally parallel to surfaces of layers **184**, and also pass through and fill an interior volume between layers **184**. Whereas a majority of tongue **183** is formed from yarns that are mechanically-manipulated to form intermeshed loops, floating yarns **185** are generally free or otherwise inlaid within the interior volume between layers **184**. As an additional matter, layers **184** may be at least partially formed from a stretch yarn to impart the advantages discussed above for knitted layers **140** and floating yarns **141**.

Tongue **183** provides an example of the manner in which various knit structures may be utilized. As discussed above, the peripheral areas of tongue **183** exhibit an untextured configuration, two areas of tongue **183** incorporate apertures, and the central area of tongue **183** includes knitted layers **184** and floating yarns **185** to provide a compressible or padded aspect. Mock mesh knit structures and hybrid knit structures may also be utilized. Accordingly, various knit structures may be incorporated into tongue **183** or any other knitted tongue (e.g., tongues **170** and **175**) to impart different properties or aesthetics.

Tongue **170** is secured to a forward portion of the throat area of knit element **131**. That is, tongue **170** is joined through knitting to knit element **131** in a portion of the throat area that is closest to forefoot region **101** in footwear **100**. Each of tongues **175** and **183** are respectively secured or knit to a similar position in knitted components **150** and **180**. Referring to FIGS. **34** and **35**, however, a knitted tongue **190** is secured along a length of the throat area of a configuration of knitted component **131** that does not include inlaid strand **132** or lace apertures **123**. More particularly, edges of tongue **190** are knit to an area of knit element **131** that is spaced outward from inner edge **135**. Accordingly, any of the configurations of tongues **170**, **175**, **183**, and **190** may be secured (e.g., through unitary knit construction) to various locations in the throat areas of knitted components **130**, **150**, and **180**.

Advantages of constructing tongue **170** during the knitting process and of unitary knit construction are more efficient manufacture and common properties. More particularly, manufacturing efficiency may be increased by forming more of knitted component **130** during the knitting process and eliminating various steps (e.g., making a separate tongue, securing the tongue) that are often performed manually. Tongue **170** and knit element **131** may also have common properties when formed from the same yarn (or type of yarn) or with similar knit structures. For example, utilizing the same yarn in both of tongue **170** and knit element **131** imparts similar durability, strength, stretch, wear-resistance, biodegradability, thermal, and hydrophobic properties. In addition to physical properties, utilizing the same yarn in both of tongue **170** and knit element **131** may impart common aesthetic or tactile properties, such as color, sheen, and texture. Utilizing the same knit structures in both of tongue **170** and knit element **131** may also impart common physical properties and aesthetic properties. These advantages may also be present when at least a portion of knit element **131** and at least a portion of tongue **170** are formed from a common yarn (or type of yarn) or with common knit structures.

Tongue **175** includes yarn loops **177** between layers **176**, and tongue **183** includes floating yarns **185** between layers **184**. A benefit of yarn loops **177** and floating yarns **185** is that compressible or padded areas are formed. In addition to yarn loops **177** and floating yarns **185**, other types of free yarn sections may be utilized. For purposes of the present application, "free yarn sections" or variants thereof is defined as segments or portions of yarns that are not directly forming intermeshed loops (e.g., that define courses and wales) of a knit structure, such as floating yarns, inlaid yarns, terry loops, ends of yarns, and cut segments of yarn, for example. Moreover, it should be noted that free yarn sections may be one portion of an individual yarn, with other portions of the yarn forming intermeshed loops of the knit structure, For example, the portion of a yarn forming terry loops (e.g., the free yarn sections) may be between portions of the yarn forming intermeshed loops of a knit structure. As an alternative to free yarn sections, foam materials or other types of compressible materials may be utilized within either of tongues **175** and **183**.

As a final matter, although tongue **170** is disclosed in combination with knitted component **130**, tongue **170** may also be utilized with knitted components **150** and **180**, as well as other knitted components. Similarly, tongues **175**, **183**, and **190** may be utilized with any of knitted components **130**, **150**, and **180**, as well as other knitted components. The combinations disclosed herein are, therefore, for purposes of example and other combinations may also be utilized. Moreover, the specific configurations of tongues **170**, **175**, **183**, and **190** are also meant to provide examples and may also vary significantly. For example, the position of layers **184** and floating yarns **185** may be enlarged, moved to a periphery of tongue **183**, or removed from tongue **183**. Accordingly, the various combinations and configurations are intended to provide examples, and other combinations and configurations may also be utilized.

Tongue Knitting Process

The manner in which knitting machine **200** operates to manufacture a knitted component with a tongue will now be discussed in detail. Moreover, the following discussion will demonstrate the manner in which knit element **131** and tongue **170** are formed of unitary knit construction, but similar processes may be utilized for other knitted components and tongues. Referring to FIGS. **36**A-**36**G, a portion of knitting machine **200** is schematically-depicted as including needle beds **201**, one rail **203**, one standard feeder **204**, and one combination feeder **220**. It should be understood that although knitted component **130** is formed between needle beds **201**, knitted component **130** is shown adjacent to needle beds **201** to (a) be more visible during discussion of the knitting process and (b) show the position of portions of knitted component **130** relative to each other and needle beds **201**. Also, although one rail **203**, one standard feeder **204**, and one combination feeder **220** are depicted, additional rails **203**, standard feeders **204**, and combination feeders **220** may be utilized. Accordingly, the general structure of knitting machine **200** is simplified for purposes of explaining the knitting process.

Initially, a portion of tongue **170** is formed by knitting machine **200**, as depicted in FIG. **36**A. In forming this portion of tongue **170**, standard feeder **204** repeatedly moves along rail **203** and various courses are formed from at least yarn **211**. More particularly, needles **202** pull sections of yarn **211** through loops of a prior course, thereby forming another course. This action continues until tongue **170** is substantially formed, as depicted in FIG. **36**B. It should be noted at this stage that although tongue **170** is depicted as being formed from one yarn **211**, additional yarns may be incorporated into tongue **170** from further standard feeders **204**. For example, a fusible yarn may be incorporated into at least the upper or final course of tongue **170** to assist with ensuring that tongue **170** is properly joined or knitted with knit element **131**. Additionally, at least the final course of tongue **170** may include cross-tuck stitches with a relatively tight or dense knit to ensure that tongue **170** remains properly positioned on needles **202** during later stages of the knitting process.

Knitting machine **200** now begins the process of forming knit element **131**, as depicted in FIG. **36**C, in accordance with the knitting process discussed previously. As the knitting process continues, combination feeder **220** inlays yarn **206** to form inlaid strand **132**, as depicted in FIG. **36**D, also in accordance with the knitting process discussed previously. Through a comparison of FIGS. **36**C and **36**D, tongue **170** remains stationary relative to needle beds **201**, but knit element **131** moves downward and may overlap tongue **170** as successive courses are formed in knit element **131**. This continues until a course is formed that is intended to join tongue **170** to knit element **131**. More particularly, tongue **170** remains stationary relative to needle beds **201** as portions of knitted component **131** are formed. At the point depicted in FIG. **36**F, however, a course is formed that (a) extends across the final course of tongue **170**, which includes the cross-tuck stitches, and (b) joins with the final course of tongue **170**. In effect, this course joins tongue **170** to knit element **131**. At this stage, therefore, knit element **131** and tongue **170** are effectively formed of unitary knit construction.

Once tongue **170** is joined to knit element **131**, knitting machine **200** continues the process of forming courses, thereby forming more of knit element **131**, as depicted in FIG. **36**F. Given that tongue **170** is now joined to knit element **131**, tongue **170** moves downward with knit element **131** as successive courses are formed, as seen through a comparison of FIGS. **36**E and **36**F. Moving forward, knitting machine **200** continues the process of forming courses in knit element **131** until knitted component **130** is substantially formed, as depicted in FIG. **36**G.

Now that the general process associated with forming knitted component **130** to include tongue **170** is presented, additional aspects of the knitting process will be discussed. As noted above, a fusible yarn may be incorporated into at least the final course of tongue **170** to assist with ensuring that tongue **170** is properly joined or knitted with knit element **131**. In some knitting processes, the yarn forming the final

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course of tongue **170** is cut. By incorporating the fusible yarn into the final course of tongue **170**, the knit structure at the interface of tongue **170** with knit element **131** may be strengthened. That is, melting of the fusible yarn will fuse or otherwise join the sections of yarn at the interface and prevent unraveling of the cut yarn.

Also as noted above, at least the final course of tongue **170** may include cross-tuck stitches with a relatively tight or dense knit to ensure that tongue **170** remains properly positioned on needles **202** during later stages of the knitting process. During a majority of the knitting process that forms knit element **131**, tongue **170** remains stationary relative to needle beds **201**. Movement, vibration, or other actions of knitting machine **200** may, however, dislodge portions of the final course from needles **202**, thereby forming dropped stitches. By forming cross-tuck stitches with a relatively tight or dense knit, fewer dropped stitches are formed. Moreover, if dropped stitches are formed, the fusible yarn within the final course will fuse or otherwise join the dropped stitches within the knit structure.

Once tongue **170** is knit, various needles **202** hold tongue **170** in position while knit element **131** is formed. In effect, the needles **202** that hold tongue **170** are unavailable for further knitting until tongue **170** is joined with knit element **131**. As a result, only those needles **202** located beyond the edges (i.e., to the right and to the left) of tongue **170** are available for forming knit element **131**. The final course of tongue **170** should, therefore, have equal or less width than the distance between opposite sides of inner edge **135** in the area where tongue **170** is joined with knit element **131**. In other words, the design of knitted component **130** should account for (a) the length of the final course of tongue **170** and (b) the number of needles **202** that are reserved for holding tongue **170** while knit element **131** is formed.

In the knitting process discussed above, both tongue **170** and knit element **131** are formed from yarn **211**. Whereas tongue **170** remains stationary relative to needle beds **201** through a portion of the knitting process, portions of knit element **131** move downward as successive courses are formed. Given that a segment of yarn **211** may extend from the final course of tongue **170** to the first course of knit element **131** (i.e., the bottom edges of knit element **131**), this segment of yarn should have sufficient length to account for the downward movement of the first course of knit element **131**. In effect, a comparison of FIGS. **36C-36E**, demonstrates that the first course of knit element **131** moves downward and away from the final course of tongue **170** as knit element **131** is formed. Accordingly, if a segment of yarn **211** extends from the final course of tongue **170** to the first course of knit element **131**, this segment of yarn should have sufficient length to account for the growing distance between the final course of tongue **170** and the first course of knit element **131**.

Although various methods may be employed to account for the growing distance between the final course of tongue **170** and the first course of knit element **131**, FIG. **37** depicts an expansion section **195** as being formed following the formation of tongue **170**. Expansion section **195** may then be cast off of needles **202**. As the distance between the final course of tongue **170** and the first course of knit element **131** increases, expansion section **195** may unravel and lengthen. That is, unraveling of expansion section **195** may be used to effectively lengthen the section of yarn **211** between the final course of tongue **170** and the first course of knit element **131**. In some configurations, expansion section **195** may be formed as a jersey fabric to facilitate unraveling.

The various FIGS. **36A-36G** show knitted component **130** as being formed independently. In some knitting processes, however, a waste element is knit prior to forming knitted component **130**. The waste element engages various rollers that provide a downward force upon knitted component **130**. The downward force ensures that courses move away from needles **202** as later courses are formed.

Based upon the above discussion, knit element **131** and tongue **170** may be formed of unitary knit construction through a single knitting process. As described, tongue **170** is formed first and remains stationary upon needle beds **201** as knit element **131** is formed. After a course is formed that joins knit element **131** and tongue **170**, knit element **131** and tongue **170** move downward together as further portions of knit element **131** are formed.

Sequential Alterations

Knitting machine **200** includes, among other elements, a knitting mechanism **270**, a pattern **280**, and a computing device **290**, as schematically-depicted in FIG. **38**. Knitting mechanism **270** includes many of the mechanical components of knitting machine **200** (e.g., needles **202**, feeders **204** and **220**, carriage **205**) that mechanically-manipulate yarns **206** and **211** to form a knitted component (e.g., knitted component **130**). Pattern **280** includes data on the knitted component, including the yarns that are utilized for each stitch, the type of knit structures formed by each stitch, and the specific needles **202** and feeders **204** and **220** that are used for each stitch, for example. The operation of knitting machine **200** is governed by computing device **290**, which reads data from pattern **280** and directs the corresponding operation of knitting mechanism **270**.

Multiple and substantially identical knitted components may be formed by knitting machine **200**. More particularly, computing device **290** may repeatedly read pattern **280** and direct knitting mechanism **270** to form substantially identical knitted components. In general, therefore, each knitted component that is formed will be substantially identical to other knitted components that are formed based upon a particular pattern **280**. Referring to FIGS. **39A-39C**, however, three versions of tongue **170** are shown. Whereas FIG. **39A** depicts tongue **170** as including a knit structure (e.g., yarns with different colors) with alphanumeric characters that form "1 OF 100," FIGS. **39B** and **39C** respectively depict tongue **170** as including knit structures with alphanumeric characters that form "2 OF 100" and "3 OF 100."

One manner of accomplishing the sequential alterations of the type shown in FIGS. **39A-39C** is to create multiple patterns. In effect, each of the configurations of tongue **170** shown in FIGS. **39A-39C** may have a different pattern. As an alternative, an application (e.g., software) run by computing device **290** may alter pattern **280** while each successive tongue **170** is formed to provide sequential alterations. For example, pattern **280** may include a modifiable field **281**, which is an area of pattern **280** that can be updated or changed by computing device **290**. For purposes of reference, portions of pattern **280** that correspond with "1," "2," and "3" in FIGS. **39A-39C** may be governed by modifiable field **281**. Computing device **290** may include a counter, for example, that updates modifiable field **281** with each successive knitted component that is formed. Accordingly, sequential alterations of pattern **280** may be automated through the use of an application run by computing device **290**, thereby rectifying the need for different patterns **280** for each sequential variation of tongue **170**.

In operation, pattern **280** with modifiable field **281** is provided by an operator, designer, or manufacturer, for example. Computing device **290** may either form a first knitted component with a default setting for modifiable field **281** or may update modifiable field **281** according to other instructions or

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data. As such, for example, tongue **170** of FIG. **39**A may be knitted with "1 OF 100." Computing device **290** now updates modifiable field **281** with data representing another alphanumeric character, possibly a sequential alphanumeric character when computing device **290** includes a counter, and tongue **170** of FIG. **39**B may be knitted with "2 OF 100." The procedure repeats and computing device **290** updates modifiable field **281** with data representing another alphanumeric character and tongue **170** of FIG. **39**C may be knitted with "3 OF 100." Accordingly, modifiable field of pattern **280** may be repeatedly updated with data representing different alphanumeric characters, possibly sequential alphanumeric characters.

The invention is disclosed above and in the accompanying figures with reference to a variety of configurations. The purpose served by the disclosure, however, is to provide an example of the various features and concepts related to the invention, not to limit the scope of the invention. One skilled in the relevant art will recognize that numerous variations and modifications may be made to the configurations described above without departing from the scope of the present invention, as defined by the appended claims.

The invention claimed is:

1. A method of manufacturing a knitted component for an article of footwear, the method comprising:

knitting a tongue with a knitting machine;

holding the tongue on needles of the knitting machine;

knitting a first portion of a knit element with the knitting machine while the tongue is held on the needles;

joining the tongue to the first portion of the knit element; and

knitting a second portion of the knit element with the knitting machine.

2. The method recited in claim **1**, further including a step of selecting the knitting machine to be a flat knitting machine.

3. The method recited in claim **1**, further including a step of knitting an expansion section following the step of knitting the tongue, and wherein the step of knitting the first portion of the knit element includes unraveling the expansion section.

4. The method recited in claim **1**, wherein the step of knitting the tongue includes forming a course of the tongue to include at least one of (a) a fusible yarn and (b) cross-tuck stitches.

5. The method recited in claim **1**, wherein the step of joining the tongue includes forming a course with the knitting machine that joins the tongue to the knit element.

6. A method of manufacturing a knitted component for an article of footwear, the method comprising:

knitting a tongue with a knitting machine;

knitting a first portion of a knit element with the knitting machine, the tongue being stationary with respect to a needle bed of the knitting machine during knitting of the first portion of the knit element, and the first portion of the knit element moving with respect to the tongue during knitting of the first portion of the knit element;

forming a course with the knitting machine that joins the tongue to the knit element; and

knitting a second portion of the knit element with the knitting machine, the tongue and the first portion of the knit element moving together during knitting of the second portion of the knit element.

7. The method recited in claim **6**, further including a step of selecting the knitting machine to be a flat knitting machine.

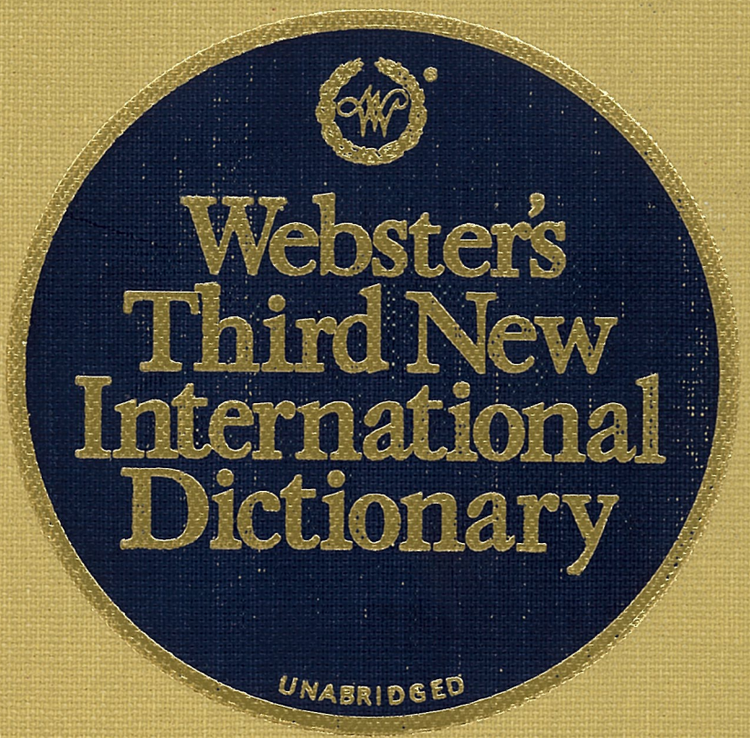
8. The method recited in claim **6**, further including a step of knitting an expansion section following the step of knitting the tongue, and wherein the step of knitting the first portion of the knit element includes unraveling the expansion section.

9. The method recited in claim **6**, wherein the step of knitting the tongue includes forming a final course of the tongue to include at least one of (a) a fusible yarn and (b) cross-tuck stitches.

* * * * *

Exhibit BB

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Webster's Third New International Dictionary

OF THE ENGLISH LANGUAGE

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SPRINGFIELD, MASSACHUSETTS, U.S.A.



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WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY
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Library of Congress Cataloging in Publication Data
Main entry under title:

Webster's third new international dictionary of the English language, unabridged: a Merriam-Webster/editor in chief, Philip Babcock Gove and the Merriam-Webster editorial staff.
p. cm.
ISBN 0-87779-201-1 (blue sturdite).—ISBN 0-87779-202-X (carrying case).—ISBN 0-87779-206-2 (imperial buckram).
1. English language—Dictionaries. I. Gove, Philip Babcock, 1902–1972. II. Merriam-Webster, Inc.
PE1625.W36
423-dc20

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MADE IN THE UNITED STATES OF AMERICA

52535455QKY050403

Case 2:23-cv-09346-AB-PVC Document 83-3 Filed 09/30/24 Page 5 of 5 Page ID #:2875

she was whistling —Jesse Lasky⟩ ~ *vt* : to sound on the tom-tom : play or execute on or as if on a tom-tom

[3]**tom-tom** \"\ *adj* : of or relating to the tom-tom ⟨traditional *tom-tom* beaters —*Time*⟩ : characteristic or suggestive of the tom-tom ⟨*tom-tom* muffs, with cords around the middle —Lois Long⟩

tom tram \-'tram\ *n, usu cap both Ts* [fr. *Tom Tram*, name of a legendary Eng. buffoon] *obs* : a professional fool : JESTER

tom walker *n, sometimes cap T&W* [*Tom* (nickname for Thomas) + *walker*] **1 tom walkers** *pl, dial* : STILTS **2** *slang* : a man on stilts

-to·my \d·əmē, təm-, -mi\ *n comb form* -ES [NL *-tomia*, fr. Gk, fr. *-tomos* cutting + *-ia* -y — more at -TOME] : incision : section ⟨cranio*tomy*⟩ ⟨laparo*tomy*⟩ ⟨sclero*tomy*⟩

[1]**ton** *obs var of* TUN

[2]**ton** \'tən\ *n, pl* **tons** *also* **ton** [ME *tonne, toun* tun, unit of ship capacity or of weight — more at TUN] **1** : any of various units of weight: **a** : a unit equal to 20 long hundredweight or 2240 pounds used chiefly in England — called also *long ton;* see MEASURE table **b** : a unit equal to 20 short hundredweight or 2000 pounds used chiefly in the U.S., Canada, and So. Africa — called also *short ton* **c** : METRIC TON **2 a** : a unit of internal capacity for ships equal to 100 cubic feet — called also *register ton;* see TONNAGE **b** : a unit approximately equal to the volume of a long ton weight of seawater used in reckoning the displacement of ships and equal to 35 cubic feet — called also *displacement ton* **c** : a unit of volume for cargo freight usu. reckoned at 40 cubic feet — called also *freight ton, measurement ton* **3** : a European unit of quantity for timber equal to 480 board feet **4** : a unit of cooling capacity equal to the cooling effect of a ton of ice melting in 24 hours **5** : a great quantity : a large supply : LOT, HEAP — used chiefly in pl. ⟨~*s* of propaganda flooding the country⟩ ⟨he's got ~*s* of money, so they say⟩

[3]**ton** \"\ *n* -S [F *thon* — more at TUNNY] : TUNNY

[4]**ton** \'tō^{n}\ *n* -S [F, lit., tone, fr. L *tonus* — more at TONE] **1 a** : the prevailing fashion or mode : VOGUE **b** : SMARTNESS, STYLE ⟨conversation as the evidence of ~, and the attribute of rank —E.G.Bulwer-Lytton⟩ **2** : the world of fashion : SMART SET ⟨the world of ~ which shook its head over a ruined friend —*Times Lit. Supp.*⟩

to·na·da \tə'nädə\ *n* -S [Sp, fr. *tono* tone (fr. L *tonus*) + *-ada* -ade, fr. LL *-ata*] : a Spanish folksong esp. of meditative character

to·na·di·lla \ˌtōnə'dē(y)ə, -ēlyə\ *n* -S [Sp, dim. of *tonada*] : a short Spanish scenic intermezzo of the 18th century written for a few soloists for performance between the acts of a serious play and in the 19th century becoming a short comic opera with soloists, a chorus, and occas. instrumental movements

ton·al \'tōn^{ə}l\ *adj* [ML *tonalis*, fr. L *tonus* tone + *-alis* -al] **1** : of or relating to tone, tonality, or tonicity **2** : having tonality — compare ATONAL **3** : having the intervals of a melodic subject that is repeated at a new pitch so modified as to remain in the same key ⟨~ fugue⟩ ⟨~ sequence⟩ ⟨~ imitation⟩ — compare REAL — **ton·al·ly** \-^{ə}lē, -^{ə}li\ *adv*

to·na·la·ma·tl \tə'näləˌmäd·^{ə}l\ *n* -S [Nahuatl, lit., book of days, fr. *tonalli* day + *amatl* paper, book] **1** : an Aztec divinatory book based on the tonalpohualli **2** : TONALPOHUALLI

ton·al·ism \'tōn^{ə}lˌizəm\ *n* -S [*tonal* + *-ism*] : the practice of composing tonal music — opposed to *atonalism*

ton·al·ist \-ˌləst\ *n* -S [*tonal* + *-ist*] : one who adheres to tonality esp. in musical composition

to·nal·ite \'tōn^{ə}lˌīt\ *n* -S [G *tonalit*, fr. *Tonale* (*Pass*) in the Lombard Alps + G *-it* -ite] **1** : a granular igneous rock consisting of quartz, andesine, and small amounts of orthoclase **2** : QUARTZ-DIORITE

to·nal·i·tive \tō'naləd·iv\ *adj* [*tonality* + *-ive*] : tending to tonality

to·nal·i·ty \tō'naləd·ē, -ətē, -i *sometimes* tə'-\ *n* -ES [*tonal* + *-ity*] **1** : tonal quality **2** : the principle of organizing all the tones and chords of a piece of music in relation to one tone : the quality of having a keynote or tonic : the recognition or acceptance of key and key relationships — opposed to *atonality* **3 a** : the arrangement or interrelation of the colors or color nuances of a picture : color scheme : tone system **b** : the effect or quality resulting from closely related tones esp. in the darker values

to·nal·po·hual·li \tō'nälpōˌwälē\ *n* -S [Nahuatl] : an Aztec calendar period of 260 days like the tzolkin of the Maya calendar

tonal row *n* : TWELVE-TONE ROW

to-name \'=ˌ=\ *n* [ME, fr. OE *tōnama*, fr. *tō* to + *nama* name] **1** *obs* : SURNAME **2** *Scot* : NICKNAME

ton·a·wan·da pine \ˌtänəˌwändə-\ *n, usu cap T* [fr. *Tonawanda* Creek, northwestern N.Y.] : WHITE PINE 1a

tonca bean *var of* TONKA BEAN

ton·di·no \tän'dē(ˌ)nō\ *n, pl* **tondi·ni** \-ēnē\ [It, dim. of *tondo* round] **1** : a circular molding **2** : a metal disk for striking a coin **3** : a small tondo

ton·do \'tän(ˌ)dō\ *n, pl* **ton·di** \-ndē\ [It, plate, circular plaque, fr. *tondo* round, short for *rotondo*, fr. L *rotundus* — more at ROUND] **1** : a circular painting **2** : a sculptured medallion

[1]**tone** \'tōn\ *pron* [ME *ton*, alter. (resulting from incorrect division of *thet on* the one, fr. OE *thæt ān*) of *on* — more at THAT, ONE] *chiefly dial* : ONE ⟨and by my faith . . . the ~ of us shall die —*Childe Maurice*⟩

[2]**tone** \"\ *n* -S *often attrib* [ME *ton, tone*, fr. L *tonus* tension, pitch, tone, fr. Gk *tonos* act of stretching, tension, pitch, tone, cord; akin to Skt *tāna* fibre, tone, Gk *teinein* to stretch — more at THIN] **1** : vocal or musical sound; *esp* : sound quality of a specific character ⟨a voice with full, clear ~⟩ ⟨spoke in low ~*s*⟩ ⟨sweet ~ of a flute⟩ ⟨harsh ~⟩ **2 a** : a sound that has such regularity of vibration as to impress the ear with a definite pitch sensation and is further characterized musically by loudness and timbre : musical sound — compare NOISE **b** : WHOLE STEP **c** : TONE QUALITY **3** : an ecclesiastical mode or a traditional tune or plain chant of the church ⟨the Gregorian ~⟩ **4 a** : accent or inflection of the voice as adapted to the emotion or passion expressed : vocal expressiveness **b** : vocal inflection characteristic of the speech of an individual, region, or nation : ACCENT **c** : artificial modulation in speaking or reading : singsong or affected intonation ⟨I never liked a man who spoke in a ~ of voice —O.Henry⟩ **5 a** : the musical pitch or intonation of a sound, word, or sentence often used to express differences of meaning or function — see TONE LANGUAGE **b** : one of the four notes or keys in which Chinese Mandarin sounds are pitched and which are often indicated beside the character or its romanized spelling by the figures 1, 2, 3, 4 **6 a** : a particular pitch or change of pitch constituting an element in the intonation of a phrase or sentence ⟨high ~⟩ ⟨low ~⟩ ⟨mid ~⟩ ⟨low-rising ~⟩ ⟨falling ~⟩ **b** : WORD STRESS **7** : style or manner of approach in speaking or writing : method of address ⟨began in a defiant ~⟩ ⟨seemed wise to adopt a conciliatory ~⟩ **8 a** : color quality or value : a tint or shade of color : a modification of a chromatic or achromatic color with respect to lightness or saturation **b** : the color that appreciably modifies a hue or white or black ⟨a bright, dark, or light ~ of blue⟩ ⟨the gray walls took on a greenish ~⟩ ⟨the soft ~*s* of the old marble⟩ **9** : the general effect in painting of the harmonious combination of light and shade together with color **10 a** : the part of a print made from a photoengraving bearing the black or the color **b** : the relative darkness or color strength of different areas of a printed picture ⟨dark, middle, and light ~*s*⟩ **c** : the color of a photographic image ⟨sepia ~⟩ ⟨warm ~*s*⟩ **11 a** (1) : the state of a living body or of any of its organs or parts in which the functions are healthy and performed with due vigor (2) : overall vigor and well-balanced growth in a plant indicating satisfactory balance of environmental factors (as nutrients, moisture, light, heat) **b** : normal tension or responsiveness to stimuli : TONICITY; *specif* : TONUS **12 a** : healthy or normal elasticity : power to function or react under stress : RESILIENCY ⟨restore the ~ of the body politic⟩ ⟨fine ~ of a critical intelligence⟩ **b** : general or prevailing character, quality, or trend of moral or social behavior ⟨a city's low moral ~⟩ ⟨judge a school by its ~⟩ **c** : frame of mind : MOOD, TEMPER ⟨philosophical ~⟩ **d** : the character of a market as reflected in activity, supply and demand, and price trend ⟨the ~ of the stock market was steady⟩ **13** : FEELING TONE **syn** see COLOR

[3]**tone** \"\ *vb* -ED/-ING/-S [ME *tonen*, fr. [2]*tone*] *vt* **1 a** *obs* : to sound with a musical quality **b** : to utter with a particular or affected tone : INTONE **2** : to give a particular intonation or inflection to ⟨fear *toned* his voice⟩ **3 a** : to impart tone to : improve or raise the quality of : STRENGTHEN ⟨exercise *toned* his muscles⟩ — used often with *up* ⟨prescribed a medicine to ~ up the system⟩ **b** : to reduce the emphatic or glaring quality of : make harmonious in color, appearance, or sound : SOFTEN, MELLOW — used usu. with *down* ⟨~ down clashing colors with brown tints⟩ ⟨advancing years had *toned* down his rash impulsiveness⟩ **c** : to change by treatment the tone or color of : modify in color; *specif* : to change the normal silver image of (a print, transparency, or lantern slide) into a colored image either by treatment with a solution containing some inorganic salt or by mordanting and dyeing ~ *vi* **1 a** : to assume a harmonious or pleasing color quality or tint ⟨the shingles will ~ with age and weathering⟩ — used often with *down* ⟨his clothes have *toned* down since his marriage⟩ **b** *of a photographic image* : to undergo a chemical reaction resulting in a change in color ⟨the average print will ~ in about 15 minutes —Jack Wright⟩ **2** : to blend with respect to tone or color quality : harmonize in color ⟨the rug ~*s* with the woodwork⟩

tone accent *n* : PITCH ACCENT 2

tone arm *n* : the movable part of a phonograph that carries the pickup and permits the needle to follow the record groove spiral

tone cluster *n* : a combination of musical tones sounded together each of which is a scale degree apart from one or two neighboring tones in the group ⟨C-D-E struck simultaneously are a *tone cluster*⟩

tonecolor *n* [trans. of G *klangfarbe*] **1** : TIMBRE 1b **2** : COLOR 10b

tone control *n* : a usu. manual control by which a listener can adjust the relative amplitude of the high, low, and intermediate frequencies in a radio set

toned \ˈtōnd\ *adj* [[2]*tone* + *-ed*] **1** : having or having been given tone or a specified tone : characterized or distinguished by a tone — often used in combination ⟨full-*toned*⟩ ⟨shrill-*toned*⟩ **2** : having or characterized by linguistic tones — see TONE LANGUAGE **3 a** *of paper* : having a slight tint : of an off-white color **b** *of a coin or medal* : having a mellow tint as a result of age

tone-deaf \'=ˈ=\ *adj* : relatively insensitive to differences in the pitch of musical tones

tone language *n* : a language (as Chinese, Sudanic, or Bantu) in which variations in tone are regularly used to distinguish words of different meaning that otherwise would sound alike

tone·less \'tōnləs\ *adj* : lacking in tone, modulation, or expression ⟨speaks her first complete sentence in that ~ bird-shrill voice —Lee Rogow⟩ ⟨theatrically ~ — lacking in any real quality or spirit —H.E.Clurman⟩ — **tone·less·ly** *adv* — **tone·less·ness** *n* -ES

tone long *n* : a vowel that is not long in Semitic or pre-Hebrew but becomes long in Hebrew by virtue of its position in relation to the accent of the word or phrase and may be shortened when that position is changed

to·neme \'tōˌnēm\ *n* -S [[2]*tone* + *-eme*] : a phoneme consisting of a specific intonation in a tone language — **to·ne·mic** \tō'nēmik\ *adj*

tone painting *n* : the use of varying timbres and sound symbolism in creating musical effects esp. in impressionistic composition or program music

tone picture *n* : a musical composition usu. for orchestra characterized by pictorial suggestion

tone poem *n* [[2]*tone* + *poem*] : an orchestral composition based on a literary subject or suggestive of poetic sentiments or images

tone poet *n* [trans. of G *tondichter*] : a composer of music; *esp* : a composer of program music

tone quality *n* **1** : TIMBRE 1 **2** : the character of musical tones with reference to their richness or perfection **3** : the character of the effect produced by a harmonic combination of musical tones

ton·er \'tōnə(r)\ *n* -S : one that tones: as **a** : an organic pigment that contains no inorganic pigment or inorganic carrier : a full-strength organic pigment — see DYE table I (under *Organic pigments*); compare [4]LAKE 1b **b** : one that tests the quality and color of paints **c** : a chemical solution capable of converting a silver photographic image to a colored image

tone-row \'=ˌ=\ *n* [trans. of G *tonreihe*] : TWELVE-TONE ROW

tones *pl of* TONE, *pres 3d sing of* TONE

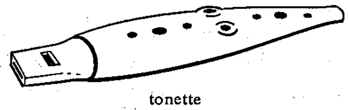
tone syllable *n* : an accented syllable

to·net·ic \tō'ned·ik\ *adj* [[2]*tone* + *-etic*] : relating to linguistic tones or to tone languages : dealing with or expressing intonation ⟨~ notation⟩ — **to·net·i·cal·ly** \-d·ək(ə)lē\ *adv*

to·ne·ti·cian \ˌtōnə'tishən *sometimes* ˌtän-\ *n* -S [*tonetic* + *-ian*] : a student of tonetics

to·net·ics \tō'ned·iks\ *n pl but sing in constr* [fr. *tonetic*, after E *phonetic: phonetics*] : the use or study of linguistic tones : the science of intonation

to·nette \(')tō'net\ *n* -S [[2]*tone* + *-ette*] : a small simple end-blown flute typically of plastic with a range somewhat exceeding an octave often used in elementary music education



tonette

tone-up \'=ˌ=\ *n* -S [fr. *tone up*, v.] : a toning-up exercise, treatment, or medicine

tone wheel *n* : a high-speed interrupter or commutator formerly used for producing a current of audio frequency in a radio receiver

toney *var of* TONY

ton-foot \'=ˈ=\ *n* [[2]*ton* + *foot*] : FOOT-TON

[1]**tong** \'täŋ, 'tȯŋ\ *n* -S [ME *tonge*, alter. of *tange* tang] **1** *dial* : TANG **2** *dial* : TINE

[2]**tong** \"\ *vb* -ED/-ING/-S [imit.] *vt, dial* : to cause (a bell) to give out a deep resonant tone ~ *vi, dial* : to give out a deep resonant tone

[3]**tong** \"\ *n* -S *dial* : a deep sound given out by a large bell

[4]**tong** \"\ *n* -S [fr. sing. of *tongs*] : TONGS

[5]**tong** \"\ *vb* -ED/-ING/-S [*tongs*] *vt* : to take, gather, hold, or handle with tongs ⟨~ oysters⟩ ⟨~ logs⟩ — often used with *up* ~ *vi* : to use tongs : take or gather something with tongs

[6]**tong** \"\ *n* -S [Chin (Cant) *t'ong* hall, meeting place] : a secret society or fraternal organization esp. among the Chinese in the U.S. formerly notorious for gang warfare and popularly associated with racketeering, gambling, and traffic in narcotics

[7]**tong** \"\ *n* -S [Afrik, tongue, flatfish, fr. MD *tonge, tong;* akin to OE *tunge* tongue — more at TONGUE] : a large commercially important southern African flatfish (*Australoglossus pectoralis*) much depleted by overfishing; *also* : a closely related fish (*A. microlepis*) distinguished by its minute scales

[1]**ton·ga** \'täŋgə\ *n* -S [Hindi *tāṅgā*] : a light 2-wheeled vehicle for two or four persons drawn by one horse and common in India

[2]**tonga** \'täŋ(g)ə, 'tȯŋ-\ *or* **ton·gan** \-)ən\ *n* -S [prob. fr. *Tonga* islands, southwest central Pacific ocean] **1** *also* **tongan creeper** : an epiphytic creeper (*Epipremnum mirabile*) of the family Araceae used in folk medicine in Malaysia **2** : a drug formerly used in pharmacy consisting of equal parts of tonga bark and the root of a verbenaceous tree (*Premna arborea*)

[3]**tonga** \"\ *n, pl* **tonga** *usu cap* **1 a** : any of several Bantu-speaking peoples found respectively in southern Portuguese East Africa, west of Lake Nyasa, and on the upper Zambezi river **b** : a member of one of these peoples **2** : any of the languages of the several Tonga peoples

[4]**ton·ga** \"\ *adj, usu cap* [fr. *Tonga* islands, southwest central Pacific ocean] : TONGAN

tonga bean *var of* TONKA BEAN

[1]**ton·gan** \'täŋ(g)ən, 'tȯŋ-\ *n* -S *usu cap* [*Tonga* islands, southwest central Pacific ocean + E *-an*] **1** : a member of a Polynesian people native to the Tonga islands of the southwest Pacific **2** : the Polynesian language of the Tongans

[2]**tongan** \"\ *adj, usu cap* : of or relating to the Tonga islands or the Tongans or their language

ton·ga·re·van \ˌtäŋ(g)əˌrevən, ˌtȯŋ-, -ˌrāv-\ *adj, usu cap* [*Tongareva* island, central Pacific ocean + E *-an*] : of, relating to, or characteristic of the island, the people, or the language of Tongareva in the Manihiki islands in the central Pacific

ton·gass \'täŋgəs\ *n, pl* **tongass** *or* **tongasses** *usu cap* **1** : a Tlingit people at the mouth of Portland canal, Alaska **2** : a member of the Tongass people

ton·ga·wal·la \ˌtäŋgə'wälə\ *n* -S [Hindi *tāṅgāvālā*, fr. *tāṅgā* tonga + *-vālā* man — more at WALLAH] : a driver of a tonga

tong·er \'täŋə(r), 'tȯŋ-\ *n* -S [[5]*tong* + *-er*] : one that tongs

tong·kang \'täŋ'kaŋ\ *n* -S [Malay] : a large native boat or junk used in the East Indies in fishing and in local trading

tongkingese *usu cap, var of* TONKINESE

tong·man \'=mən\ *n, pl* **tongmen 1** [[4]*tong* + *man*] : one who handles tongs : TONGER **2** [[6]*tong* + *man*] : a member of a tong

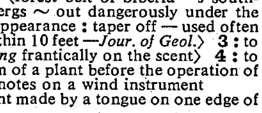
tongs \'täŋz, 'tȯŋz\ *n pl but sometimes sing in constr* [ME *tanges, tonges*, pl. of *tange, tonge*, fr. OE *tang, tange;* akin to OHG *zanga* tongs, ON *töng*, Gk *daknein* to bite, Skt *daśati* he bites, *daṁśa* bite] : any of numerous devices or instruments for taking hold of objects (as hot coals, hot metal, rails, logs, pipes), for ease and convenience in handling, or for lifting, dragging, or carrying and consisting commonly of two legs that are joined at one end by a pivot or spring or of two pieces hinged that are like scissors or pincers — often used with *pair* ⟨a pair of ~⟩

tongs·man \-zmən\ *n, pl* **tongsmen** [*tongs* + *man*] : TONGER

[1]**tongue** \'təŋ\ *n* -S *often attrib* [ME *tunge*, fr. OE; akin to OHG *zunga* tongue, ON *tunga*, Goth *tungo*, OL *dingua*, L *lingua*] **1 a** : a process of the floor of the mouths of most vertebrates that is attached basally to the hyoid bone, that consists essentially of a mass of extrinsic muscle attaching its base to other parts, intrinsic muscle by which parts of the structure move in relation to each other, and an epithelial covering rich in sensory end organs and small glands, and that serves esp. for taking and swallowing food, as the principal seat of the sense of taste, as an instrument for cleansing and grooming, as a tactile organ (as in a snake), and in some forms (as the toad) as a prehensile organ for the seizing of prey **b** : an analogous part of various invertebrate animals (as the radula of a mollusk or the lingula or proboscis of some insects) **2** : the flesh of the tongue of an animal (as the ox or sheep) used as food **3** : the agent of articulated speech : the power of communication or expression through speech ⟨though I speak with the ~*s* of men and of angels —1 Cor 13:1 (AV)⟩ ⟨wonders that no ~ can tell⟩ ⟨done to death by slanderous ~*s* —Shak.⟩ ⟨you had better hold your ~⟩ ⟨used the strongest words he could lay ~ to⟩ ⟨gave him the rough side of my ~⟩ **4 a** : a spoken language; *esp* : a speech used by a particular people or class or in a particular region : DIALECT **b** : a language other than one's own : a foreign or strange language **c tongues** *pl, archaic* : the learned languages (as Hebrew, Greek, and Latin) — used with *the* **d** *archaic* : a people having a distinct language ⟨gather all nations and ~*s* —Isa. 66:18 (AV)⟩ **e** : manner or quality of utterance with respect to tone or sound ⟨a soft ~⟩ or the sense of what is expressed ⟨a flattering ~⟩ ⟨a foolish ~⟩ or the intention of the speaker ⟨a flattering ~⟩ **f** : ecstatic usu. unintelligible utterance called forth in a moment of religious excitation ⟨any believer might offer a hymn, or a revelation, or a ~ —C.T.Craig⟩ — see GIFT OF TONGUES **g** : the cry of or as if of a hound pursuing or in sight of game — used esp. in the phrase *to give tongue* **5** : TONGUEFISH **6 a** : a tapering cone of flame ⟨Pentecostal ~*s* of fire⟩ **b** : a tapering decorative element used in relief carvings esp. on moldings ⟨~ and dart molding⟩ — compare EGG AND DART **7 a** : a point or long narrow strip of land projecting from the mainland into a body of water **b** : a point of ice projecting nearly horizontally from the submerged part of an iceberg **c** : a current that runs rapidly between rocks **d** : the lower part of a valley glacier **e** : a minor subdivision or specifically developed part of a sedimentary formation that thins laterally to disappearance in one direction **f** : an offshoot from a body of intrusive igneous rock **g** : a narrow body of air projecting from a main air mass ⟨interlocking dry and moist ~*s* along a cold front⟩ **8** : something resembling an animal's tongue in being elongated and fastened at one end only: as **a** : a movable pin in a buckle that passes through a hole in the strap to be secured; *also* : the corresponding pin of a brooch or clasp **b** : the index of a balance or scale **c** : a metal ball freely suspended inside a bell so as to strike against the sides as the bell is swung **d** (1) : the free vibrating end of the reed in an organ pipe or wind instrument (2) : the vibrating part of a Jew's harp **e** : the pole of a 2-horse vehicle ⟨wagon ~⟩ **f** : the flap of leather or other material under the lacing or buckles of a shoe at the throat of the vamp **g** : a switch piece consisting of a movable point with a suitable enclosing or supporting body structure and designed for use on one side of a railroad track esp. of a street railway **h** : TANG 2a **i** : the swiveling part of a carpenter's bevel **j** : the endpiece of a mainspring serving as its attachment to the inside of the enclosing barrel **k** : a short block of wood or iron so placed in the jaws of a gaff as to facilitate its sliding up and down the mast **9 a** : the projecting rib on one edge of a board that fits into a corresponding groove in an edge of another board to make a flush joint **b** : FEATHER 6 **syn** see LANGUAGE — **on the tip of one's tongue 1** : about to be uttered or blurted out **2** : just eluding recall ⟨had his name *on the tip of my tongue* but it's gone now⟩

[2]**tongue** \"\ *vb* -ED/-ING/-S *vt* **1 a** *archaic* : UTTER, SPEAK **b** : SCOLD, ABUSE **2** : to touch or lick with or as if with the tongue ⟨cows *tonguing* the long grass⟩ ⟨~ a cigarette⟩ ⟨arms full of squirming, *tonguing* dog —Walter Karig⟩ **3 a** : to cut a tongue on ⟨~ a board⟩ **b** : to join (as boards) by means of a tongue and groove **4** : to articulate (notes) by tonguing ⟨in vain did he lip and ~ the notes as instructed —Israel Zangwill⟩ ⟨a lightning-*tongued* cornet solo⟩ ~ *vi* **1** : TALK, CHATTER — used often with *it* ⟨~ it all day long⟩ **2 a** : to project in a tongue : send out tongues ⟨forest belt of Siberia ~*s* southwards —C.D.Forde⟩ ⟨icebergs ~ out dangerously under the surface⟩ **b** : to thin to disappearance : taper off — used often with *out* ⟨the bed ~*s* out within 10 feet —*Jour. of Geol.*⟩ **3** : to give tongue ⟨hounds *tonguing* frantically on the scent⟩ **4** : to make a cut or slit in the stem of a plant before the operation of layering **5** : to articulate notes on a wind instrument

tongue and groove *n* : a joint made by a tongue on one edge of a board fitting into a corresponding groove on the edge of another board



tongue and groove

tongue-and-lip joint \ˈ==ˈ=-\ *n* : a tongue-and-groove joint for boards in which the board with the tongue has also a flush bead which serves to conceal the joint

tongue bit *n* : a horse's bit having a plate to keep the tongue under the mouthpiece

tongue-biter \'=ˌ==\ *n* : a large parasitic isopod (*Codonophilus imbricatus*) of Australian waters that attaches itself to the tongue of marine fishes

tongue bone *n* : HYOID BONE

tongued \ˈtəŋd\ *adj* [ME *tunged*, fr. *tunge* tongue + *-ed*] **1** : having a tongue or such a kind of tongue or so many tongues ⟨~ lightning⟩ — often used in combination ⟨double-*tongued*⟩ ⟨golden-*tongued*⟩ **2** : provided with a tongue ⟨~ shoe⟩ ⟨~ lid of a paper box⟩ ⟨~ board⟩

tongue depressor *or* **tongue blade** *n* : a thin wooden blade rounded at both ends that is used by physicians chiefly for inspecting the throat

tongue fern *n* : any of several ferns (as *Cyclophorus lingua*) having fronds shaped like tongues

tonguefish \'=ˌ=\ *n* : a small flatfish of the family Cynoglossidae

tongueflower \'=ˌ=\ *n* [so called fr. its tongue-shaped lip] **1** : an Australian orchid of the genus *Glossodia* **2** : a plant or flower of the genus *Glossopetalon* (family Celastraceae)

tongue graft *n* : WHIP GRAFT 1

tongue grass *n* **1** : PEPPERGRASS 1 **2** : CHICKWEED

tongue in cheek *adv* (*or adj*) : with insincerity, irony, or whimsical exaggeration

tongue joint *n* : a joint usu. in metal with a tongue on one piece secured in a recess in the other

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Library of Congress Cataloging-in-Publication Data

The American Heritage dictionary of the English language. -- 5th ed.
p. cm.
Previous ed.: 2000.
ISBN 978-0-547-04101-8
1. English language--Dictionaries.
PE1628.A623 2011
423--dc22

2011004777

Manufactured in the United States of America

1 2 3 4 5 6 7 8 9 10–QGV–15 14 13 12 11

Case 2:23-cv-09346-AB-PVC Document 83-4 Filed 09/30/24 Page 5 of 6 Page ID #:2880



tombolo
Castle Tioram
Loch Moidart, Scotland



tondo
1825 painting of the Speckter sisters by Erwin Speckter (1806–1835)



Susumu Tonegawa

movements. [French < past participle of *tomber*, to fall; see TUMBREL.]

Tom·big·bee River (tŏm-bĭg′bē) A river, about 650 km (400 mi) long, rising in northeast Mississippi and flowing generally southward through western Alabama to join the Alabama River and form the Mobile River.

tom·bo·lo (tŏm′bə-lō′) *n., pl.* **-los** A sandbar that connects an island to the mainland or to another island. [Italian < Latin *tumulus*, mound; see TUMULUS.]

Tom·bouc·tou (tŏN′bo͝ok-to͞o′) See **Timbuktu.**

tom·boy (tŏm′boi′) *n.* A girl who behaves in a way that is perceived to be stereotypically bolsh or masculine: *"I was still a tomboy at heart and cared little about what I wore, just so long as it wasn't a dress"* (Lucy Grealy).

tomb·stone (to͞om′stōn′) *n.* A gravestone.

Tomb·stone (to͞om′stōn′) A city of southeast Arizona southeast of Tucson. After silver was discovered here in 1877, Tombstone became one of the richest and most lawless frontier mining towns.

tom·cat (tŏm′kăt′) *n.* A male cat. ❖ *intr.v.* **-cat·ted, -cat·ting, -cats** *Slang* To be sexually active with more than one partner. Used of men.

tom·cod (tŏm′kŏd′) *n., pl.* **tomcod** or **-cods** Either of two edible marine fishes, *Microgadus tomcod* of North American Atlantic waters or *M. proximus* of northern Pacific waters, closely related to and resembling the cod.

Tom Collins *n.* A drink consisting of gin, lemon or lime juice, carbonated water, and sugar. [< the name *Tom Collins*.]

Tom, Dick, and Harry *n. Informal* Anybody at all; a member of the public at large: *It's not a smart idea to admit every Tom, Dick, and Harry to the party.*

tome (tōm) *n.* **1.** One of the books in a work of several volumes. **2.** A book, especially a large or scholarly one. [French < Latin *tomus* < Greek *tomos*, a cutting, section < *temnein*, to cut; see **tem-** in App. I.]

–tome *suff.* **1.** Part; area; segment: *dermatome.* **2.** Cutting instrument: *microtome.* [New Latin *-tomus* < Greek *-tomos*, a cutting < *tomos*; see TOME.]

to·men·tose (tō-mĕn′tōs′, tō′mən-) *adj. Biology* Covered with short, dense, matted hairs. [New Latin *tōmentōsus* < Latin *tōmentum*, cushion stuffing.]

to·men·tum (tō-mĕn′təm) *n., pl.* **-ta** (-tə) *Biology* A covering of dense matted hairs. [Latin *tōmentum*, cushion stuffing.]

tom·fool (tŏm′fo͞ol′) *n.* A stupid or foolish person. ❖ *adj.* Extremely foolish or stupid. [*Tom* (nickname for *Thomas*) + FOOL.]

tom·fool·er·y (tŏm-fo͞o′lə-rē) *n., pl.* **-ies 1.** Foolish behavior. **2.** Something trivial or foolish; nonsense.

tom·my also **Tom·my** (tŏm′ē) *n., pl.* **-mies** *Chiefly British* A British soldier. [Short for *Tommy Atkins* < *Thomas Atkins*, a name often used on sample forms.]

Tommy gun *n. Informal* A Thompson submachine gun.

tom·my·rot (tŏm′ē-rŏt′) *n. Informal* Utter foolishness; nonsense. [Dialectal *tommy*, fool (< *Tommy*, nickname for *Thomas*) + ROT.]

to·mog·ra·phy (tō-mŏg′rə-fē) *n.* Any of several techniques for making detailed x-rays of a predetermined plane section of a solid object while blurring out the images of other planes. [Greek *tomos*, section; see TOME + –GRAPHY.] **—to′mo·gram′** (tō′mə-grăm′) *n.* **—to′mo·graph′** (-grăf′) *n.* **—to′mo·graph′ic** *adj.*

to·mor·row (tə-môr′ō, -mŏr′ō) *n.* **1.** The day following today. **2.** The future. ❖ *adv.* On or for the day following today: *"I won't think of it now. . . . I'll think of it tomorrow"* (Margaret Mitchell). [Middle English *to morow* < Old English *tō morgenne*, in the morning : *tō*, at, on; see TO + *morgenne*, dative of *morgen*, morning.]

tom·pi·on (tŏm′pē-ən) *n.* Variant of **tampion.**

Tomsk (tômsk, tŏmsk) A city of central Russia northeast of Novosibirsk. It is a major river port and an industrial center.

Tom Thumb *n.* **1.** A hero of English folklore, who was no bigger than his father's thumb. **2.** A person of very small physical stature.

tom·tit (tŏm′tĭt′) *n.* A small bird, such as a titmouse.

tom-tom (tŏm′tŏm′) also **tam-tam** (tŭm′tŭm′, tăm′tăm′) *n.* **1.** A mid-sized drum having one or two heads and a cylindrical body with a depth approximately equal to its diameter, often used in drum sets. Also called *tom.* **2.** Any of various small-headed drums, usually long and narrow, that are beaten with the hands. **3.** A monotonous rhythmical drumbeat or similar sound. [Hindi *ṭamṭam*, probably of imitative origin.]

–tomy *suff.* Act of cutting; incision: *gastrotomy.* [New Latin *-tomia* < Greek *-tomiā* < *tomos*, a cutting < *temnein*, to cut; see **tem-** in App. I.]

ton (tŭn) *n.* **1.** A unit of weight equal to 2,000 pounds (0.907 metric ton or 907.18 kilograms). Also called *net ton, short ton.* **2.** A unit of weight equal to 2,240 pounds (1.016 metric tons or 1,016.05 kilograms). Also called *long ton.* **3.** A metric ton. See table at **measurement. 4.** A unit of capacity for cargo in maritime shipping, normally estimated at 40 cubic feet. **5.** A unit of internal capacity of a ship equal to 100 cubic feet. **6.** A unit for measuring the displacement of ships, equal to 35 cubic feet, and supposed to equal the volume taken by a long ton of seawater. **7.** often **tons** *Informal* **a.** A large extent, amount, or number: *has a ton of work; gets tons of fan mail.* **b.** Used adverbially with *a* or in the plural to mean "to a great degree or extent" or "frequently": *felt a ton better; has seen her tons lately.* [Middle English *tonne*, a measure of weight; see TUN.]

ton·al (tō′nəl) *adj.* Of or relating to tones, a tone, or tonality. **—ton′al·ly** *adv.*

to·nal·i·ty (tō-năl′ĭ-tē) *n., pl.* **-ties 1.** *Music* **a.** A system or arrangement of seven tones built on a tonic key. **b.** The arrangement of all the tones and chords of a composition in relation to a tonic. **2.** The scheme or interrelation of the tones in a painting.

ton·do (tŏn′dō, tôn′-) *n., pl.* **-di** (-dē) also **-dos** A round painting, relief, or similar work of art. [Italian, short for *rotondo*, round < Latin *rotundus*; see ROTUND.]

tone (tōn) *n.* **1.** *Music* **a.** A sound of distinct pitch, quality, and duration; a note. **b.** The interval of a major second in the diatonic scale; a whole step. **c.** A recitational melody in a Gregorian chant. **2a.** The quality or character of sound. **b.** The characteristic quality or timbre of a particular instrument or voice. **3a.** The pitch of a word used to determine its meaning or to distinguish differences in meaning. **b.** The particular or relative pitch of a word, phrase, or sentence. **4.** Manner of expression in speech or writing: *took an angry tone with the reporters.* **5.** A general quality, effect, or atmosphere: *a room with an elegant tone.* **6a.** A color or shade of color: *light tones of blue.* **b.** Quality of color: *The green wallpaper had a particularly somber tone.* **7.** The general effect in painting of light, color, and shade. **8.** *Physiology* **a.** The normal state of elastic tension or partial contraction in resting muscles. **b.** Normal firmness of a tissue or an organ. ❖ *v.* **toned, ton·ing, tones** *—tr.* **1.** To give a particular tone or inflection to. **2.** To soften or change the color of (a painting or photographic negative, for example). **3.** To sound monotonously; intone. **4.** To make firmer or stronger. Often used with *up*: *exercises that tone up the body. —intr.* **1.** To assume a particular color quality. **2.** To harmonize in color. ***—phrasal verb:*** **tone down** To make less vivid, harsh, or violent; moderate. [Middle English *ton* < Old French < Latin *tonus* < Greek *tonos*, string, a stretching; see **ten-** in App. I.]

Tone (tōn), **(Theobald) Wolfe** 1763–1798. Irish nationalist who was a founder of the Society of the United Irishmen and worked for Catholic emancipation. He participated in a failed French invasion of Ireland (1796), was captured, and died in prison.

tone arm *n.* The arm of a phonograph turntable that holds the cartridge.

tone cluster *n.* A dissonant group of closely spaced notes played at the same time.

tone color *n.* The timbre of a singing voice or an instrument.

tone-deaf (tōn′dĕf′) *adj.* **1.** Unable to distinguish differences in musical pitch. **2.** Unable to appreciate or understand the concerns or difficulties of others; out-of-touch.

To·ne·ga·wa (tô-nĕ′gä-wä), **Susumu** Born 1939. Japanese molecular biologist. He won a 1987 Nobel Prize for discovering how the genetic material of certain cells of the immune system can rearrange itself to produce diverse antibodies.

tone language *n.* A language, as Mandarin or Somali, in which pitch or the pitch contour distinguishes the meanings of words that are otherwise the same phonologically.

tone·less (tōn′lĭs) *adj.* **1.** Lacking tone. **2.** Lacking vitality; listless. **—tone′less·ly** *adv.* **—tone′less·ness** *n.*

ton·eme (tō′nēm) *n.* Any of the phonemes of a tone language by which tone conveys differences in lexical meaning.

tone poem *n.* A piece of music that is based on an extramusical theme, such as a story or nationalistic ideal, and usually consists of a single extended movement for a symphony orchestra. Also called *symphonic poem.*

ton·er (tō′nər) *n.* One that tones, as: **a.** A chemical bath used to change the color of a photographic print or to preserve black-and-white prints or movie film. **b.** A powdery ink used dry or suspended in a liquid to produce a document by means of a photocopier or laser printer. **c.** A lotion used to refresh the skin.

tone row (rō) *n. Music* An ordering of notes employing all 12 pitches of the chromatic scale.

ton·ey (tō′nē) *adj.* Variant of **tony.**

tong[1] (tông, tŏng) *tr.v.* **tonged, tong·ing, tongs** To seize, hold, or manipulate with tongs. [Back-formation < TONGS.]

tong[2] (tông, tŏng) *n.* **1.** A Chinese association or political party. **2.** An association or a secret society of Chinese in the United States, believed to be involved in organized crime. [Cantonese *tong4*, assembly hall, familial relationship between cousins < Middle Chinese *tʰiaŋ* (also the source of Mandarin *táng*).]

Ton·ga (tŏng′gə) A country in the southwest Pacific Ocean east of Fiji comprising about 150 islands, some 36 of which are inhabited. Long inhabited by Polynesians, the islands were sighted by the Dutch in 1616 and visited by the British navigator Capt. James Cook, who named them "The Friendly Islands" in the late 1700s. It became a British protectorate in 1900 and gained independence as a constitutional monarchy in 1970. Nuku'alofa is the capital and the largest city.

Ton·gan (tŏng′gən, tŏng′ən) *adj.* Of or relating to Tonga or its people, language, or culture. ❖ *n.* **1a.** A native or inhabitant of Tonga. **b.** A person of Tongan ancestry. **2.** The Polynesian language of Tonga.

tongs (tôngz, tŏngz) *pl.n. (used with a sing. or pl. verb)* A grasping device consisting of two arms that are joined, often at one end, as by a pivot or a scissorlike hinge. [Middle English *tonges*, pl. of *tonge* < Old English *tang, tong.*]

tongue (tŭng) *n.* **1a.** The fleshy, movable, muscular organ, attached in most vertebrates to the floor of the mouth, that is the principal organ of taste, an aid in chewing and swallowing, and, in humans, an important organ of speech. **b.** An analogous organ or part in invertebrate animals, as in certain insects or mollusks. **2.** The tongue of an animal, such as a cow, used as food. **3.** A spoken language or dialect. **4a.** Speech; talk: *If there is goodness in your heart, it will come to your tongue.* **b.** The act or power of speaking: *She had no tongue to answer.* **c. tongues** Speech or vocal sounds produced in a state of religious ecstasy. **d.** Style or quality of utterance: *her sharp tongue.* **5.** The bark or baying of a hunting dog that sees game: *The dog gave tongue when the fox came through the hedge.* **6.** Something resembling a tongue in shape or function, as: **a.** The vibrating

end of a reed in a wind instrument. **b.** A flame. **c.** The flap of material under the laces or buckles of a shoe. **d.** A spit of land; a promontory. **e.** A bell clapper. **f.** The harnessing pole attached to the front axle of a horse-drawn vehicle. **7.** A protruding strip along the edge of a board that fits into a matching groove on the edge of another board. ❖ *v.* **tongued, tongu·ing, tongues** *—tr.* **1.** *Music* To separate or articulate (notes played on a brass or wind instrument) by shutting off the stream of air with the tongue. **2a.** To touch or lick with the tongue. **b.** To give (someone) a French-kiss. **3a.** To provide (a board) with a tongue. **b.** To join by means of a tongue and groove. **4.** *Archaic* To scold. *—intr.* **1.** *Music* To articulate notes on a brass or wind instrument. **2.** To project: *a spit of land tonguing into the bay.* ***—idioms:*** **have (**or **speak with) a forked tongue** To speak deceitfully; prevaricate or lie. **bite (**or **hold) (one's) tongue** To be or keep silent. **loosen (someone's) tongue** To cause (someone) to speak freely or carelessly or to divulge information. **lose (one's) tongue** To lose the capacity to speak, as from shock. **on the tip of (one's) tongue** On the verge of being recalled or expressed. [Middle English < Old English *tunge*; see **dṇghū-** in App. I.]

tongue and groove *n.* A joint made by fitting a tongue on the edge of a board into a matching groove on another board.

tongue depressor *n.* A thin blade for pressing down the tongue during a medical examination of the mouth and throat.

tongue·fish (tŭng′fĭsh′) *n., pl.* **tonguefish** or **-fish·es** Any of various marine flatfishes of the family Cynoglossidae, having the posterior part of the body tapering to a point. [From its tongue-shaped body.]

tongue-in-cheek (tŭng′ĭn-chēk′) *adj.* Meant or expressed ironically or facetiously.

tongue-lash·ing (tŭng′lăsh′ĭng) *n. Informal* A scolding.

tongue·less (tŭng′lĭs) *adj.* **1.** Having no tongue. **2.** Lacking the faculty of speech; mute.

Tongue River (tŭng) A river, about 360 km (225 mi) long, rising in northern Wyoming and flowing generally northeast to the Yellowstone River in southeast Montana.

tongue-tie (tŭng′tī′) *n.* Restricted mobility of the tongue resulting from abnormal shortness of the frenum. ❖ *tr.v.* **-tied, -ty·ing, -ties** To make tongue-tied.

tongue-tied (tŭng′tīd′) *adj.* **1.** Speechless or confused in expression, as from shyness, embarrassment, or astonishment. **2.** Affected with tongue-tie.

tongue twister *n.* **1.** A word or group of words difficult to articulate rapidly, usually because of a succession of similar consonantal sounds, as in *Shall she sell seashells?* **2.** Something difficult to pronounce.

tongue worm *n.* Any of various wormlike, sometimes tongue-shaped, parasitic invertebrates of the phylum Pentastomida, having a mouth surrounded by four hooks used to attach to the respiratory passages of reptiles, birds, and carnivorous mammals. Also called *pentastome, pentastomid.*

tongu·ing (tŭng′ĭng) *n.* Movement of the tongue in order to articulate notes on a brass or wind instrument.

–tonia *suff.* Degree or state of tonicity: *myotonia.* [New Latin < Latin *tonus*; see TONE.]

ton·ic (tŏn′ĭk) *n.* **1a.** An agent, such as a medication, that is supposed to restore or improve health or well-being. **b.** A liquid preparation for the scalp or hair. **2.** An invigorating, refreshing, or restorative agent or influence: *Laughter was a tonic for the dispirited team.* **3.** See **tonic water. 4.** *Boston* See **soft drink. 5.** *Music* The first note of a diatonic scale; the keynote. **6.** *Linguistics* A tonic accent. ❖ *adj.* **1.** Restorative or stimulating to health or well-being. **2a.** *Physiology* Of, relating to, or producing tone or tonicity in muscles or tissue: *a tonic reflex.* **b.** *Medicine* Characterized by continuous tension or contraction of muscles: *a tonic convulsion or spasm.* **3.** *Music* Of or based on the keynote. **4.** Stressed, as a syllable; accented. [New Latin *tonicus*, of tension or tone < Greek *tonikos*, capable of extension < *tonos*, a stretching, tone; see TONE.] **—ton′i·cal·ly** *adv.*

✦**OUR LIVING LANGUAGE** Generic terms for carbonated soft drinks vary widely in the United States. Probably the two most common words competing for precedence are *soda*, used in the northeast United States as well as St. Louis and vicinity, and *pop*, used from the Midwest westward. In the South any soft drink, regardless of flavor or brand name, is referred to as a *Coke, cold drink*, or just plain *drink*. Speakers in Boston and its environs have a term of their own: *tonic*. See Note at **dope.**

tonic accent *n. Linguistics* A stress produced by a change, especially a rise, in pitch as distinguished from increased volume. Also called *pitch accent.*

ton·ic-clon·ic (tŏn′ĭk-klŏn′ĭk) *adj. Medicine* Both tonic and clonic.

tonic-clonic seizure *n.* A generalized seizure marked by convulsions and loss of consciousness. Also called *grand mal seizure.*

to·nic·i·ty (tō-nĭs′ĭ-tē) *n., pl.* **-ties 1.** Normal firmness or functional readiness in body tissues or organs. **2.** The sustained partial contraction of resting or relaxed muscles.

tonic sol-fa *n. Music* A system of notation that is based on relationships between tones in a key and that replaces the usual staff notation with solmization syllables, such as *do, re,* and *mi,* or their abbreviations.

tonic water *n.* A carbonated beverage flavored with quinine. Also called *quinine water, tonic.*

to·night (tə-nīt′) *adv.* On or during the present or coming night. ❖ *n.* This night or the night of this day. [Middle English *to night* < Old English *tō niht*, at night : *tō*, at, on; see TO + *niht*, night; see NIGHT.]

ton·ka bean (tŏng′kə) *n.* **1.** A tropical South American tree *(Dipteryx odorata)* in the pea family, having pulpy, egg-shaped, one-seeded pods with fragrant seeds containing coumarin. **2.** The seed of this tree, formerly widely used as a flavoring for food or tobacco. Extracts from tonka beans have been banned as food additives in the United States. [Perhaps < Galibi *tonka.*]

Ton·kin (tŏn′kĭn′, tŏng′-) A historical region of southeast Asia on the **Gulf of Tonkin,** an arm of the South China Sea, now forming most of northern Vietnam. It was part of French Indochina from 1887 to 1946. **—Ton′kin·ese′** (-ēz′, -ēs′) *adj. & n.*

Ton·le Sap (tŏn′lā săp′, säp′) A lake of central Cambodia. It is the largest lake in southeast Asia.

ton·let (tŭn′lĭt) *n.* A skirt made of narrow metal plates worn as armor. [Late Middle English < Middle French *tonnellet* < diminutive of Old French *tonnelle*, tubular trellis or net; see TUNNEL.]

ton-mile (tŭn′mīl′) *n.* A unit of freight transportation equivalent to a ton of freight moved one mile.

ton·nage (tŭn′ĭj) *n.* **1.** The number of tons of water that a ship displaces when afloat. **2.** The capacity of a merchant ship in units of 100 cubic feet. **3.** A duty or charge per ton on cargo, as at a port or canal. **4.** The total shipping of a country or port, figured in tons, with reference to carrying capacity. **5.** Weight measured in tons. [TON + –AGE. Sense 3, Middle English < Old French < *tonne*, tun; see TONNE.]

tonne (tŭn) *n.* A metric ton. [French < Old French, tun < Late Latin *tunna*, probably of Celtic origin.]

ton·neau (tə-nō′, tŏn′ō′) *n., pl.* **-neaus 1.** The rear seating compartment of an early type of automobile. **2.** A removable cover that fits tightly over the cargo box of a pickup truck. [French < Old French *tonnel*, cask; see TUNNEL.]

to·nom·e·ter (tō-nŏm′ĭ-tər) *n.* **1.** Any of various instruments for measuring pressure or tension. **2.** An instrument for measuring hydrostatic pressure within the eyeball, used to detect glaucoma. **3.** *Music* An instrument, such as a graduated set of tuning forks, used to determine the pitch or vibration rate of tones. [Greek *tonos*, tension; see TONE + –METER.] **—to′no·met′ric** (tō′nə-mĕt′rĭk) *adj.* **—to·nom′e·try** *n.*

to·no·plast (tō′nə-plăst′) *n.* The cytoplasmic membrane that surrounds a vacuole of a plant cell. Also called *vacuolar membrane.* [Greek *tonos*, string, tension; see **ten-** in App. I + –PLAST.]

ton·sil (tŏn′səl) *n.* A small oral mass of lymphoid tissue, especially either of two such masses embedded in the lateral walls of the opening between the mouth and the pharynx, of uncertain function, but believed to help protect the body from respiratory infections. [< Latin *tōnsillae*, tonsils, diminutive of *tōlēs*, swollen tonsils.] **—ton′sil·lar** *adj.*

ton·sil·lec·to·my (tŏn′sə-lĕk′tə-mē) *n., pl.* **-mies** Surgical removal of tonsils or a tonsil.

ton·sil·li·tis (tŏn′sə-lī′tĭs) *n.* Inflammation of the tonsils. **—ton′sil·lit′ic** (-lĭt′ĭk) *adj.*

tonsillo– or **tonsill–** *pref.* Tonsil: *tonsillectomy.* [< Latin *tōnsillae*, tonsils; see TONSIL.]

ton·sil·lot·o·my (tŏn′sə-lŏt′ə-mē) *n., pl.* **-mies** Surgical incision of a tonsil.

ton·so·ri·al (tŏn-sôr′ē-əl) *adj.* Of or relating to barbering or a barber. [< Latin *tōnsōrius* < *tōnsor*, barber < *tōnsus*, past participle of *tondēre*, to shear; see **tem-** in App. I.]

ton·sure (tŏn′shər) *n.* **1.** The act of shaving the head or part of the head, especially as a preliminary to becoming a priest or a member of a monastic order. **2.** The part of a monk's or priest's head that has been shaved. ❖ *tr.v.* **-sured, -sur·ing, -sures** To shave the head of. [Middle English < Old French < Medieval Latin *tōnsūra* < Latin, a shearing < *tōnsus*, past participle of *tondēre*, to shear; see **tem-** in App. I.]

ton·tine (tŏn′tēn′, tŏn-tēn′) *n.* **1.** An investment plan in which participants buy shares in a common fund and receive an annuity that increases every time a participant dies, with the entire fund going to the final survivor or to those who survive after a specified time. **2.** Each member's share of a tontine. **3.** The subscribers to a tontine. [French, after Lorenzo *Tonti* (1635–1690?), Italian-born French banker.]

to·nus (tō′nəs) *n., pl.* **-nus·es** Body or muscular tone; tonicity. [Latin, tone; see TONE.]

ton·y also **ton·ey** (tō′nē) *adj.* **-i·er, -i·est** *Informal* Marked by an elegant or exclusive manner or quality: *a tony country club.* [< TONE.]

To·ny (tō′nē) *n., pl.* **-nys** A trademark for an award presented by the American Theatre Wing for excellence in the production and creation of Broadway shows.

too (tōō) *adv.* **1.** In addition; also: *He's coming along too.* **2.** More than enough; excessively: *She worries too much.* **3.** To a regrettable degree: *My error was all too apparent.* **4.** Very; extremely; immensely: *He's only too willing to be of service.* **5.** *Informal* Indeed; so: *You will too do it!* [Middle English *to* < Old English *tō*, to, furthermore; see **de-** in App. I.]

✦**USAGE NOTE** Some people object to the use of *not too* as an equivalent of *not very,* as in *She was not too pleased with the results.* In many contexts this construction is entirely idiomatic and should pass without notice: *It wasn't too long ago that deregulation was being hailed as the savior of the savings and loan industry. It was not too bright of them to build in an area where rock slides occur.* In these cases *not too* adds a note of ironic understatement. • Negation of *too* by *can't* may sometimes lead to ambiguities, as in *You can't check your child's temperature too often,* which may mean either that the temperature should be checked only occasionally or that it should be checked as frequently as possible.

too·dles (tōōd′lz) also **too·dle-oo** (tōōd′l-ōō) *interj. Informal* Used to express farewell. [Alteration of *toodle-oo*, perhaps imitative of a horn or akin to earlier *toddle (off)*, to depart.]

took (tŏŏk) *v.* Past tense of **take.**

took·en (tŏŏk′ən) *Chiefly Southern US v.* A past participle of **took.**



Tonga


tongs
left to right: kitchen and block-ice tongs

Exhibit CC
Page 97

ă	pat	oi	boy
ā	pay	ou	out
âr	care	o͝o	took
ä	father	o͝or	lure
ĕ	pet	o͞o	boot
ē	be	ŭ	cut
ĭ	pit	ûr	urge
ī	bite	th	thin
îr	pier	th	this
ŏ	pot	zh	vision
ō	toe	ə	about, item
ô	paw		
ôr	core		

Stress marks: ′ (primary); ″ (secondary), as in **dictionary** (dĭk′shə-nĕr′ē)

Exhibit DD

US 20240114993A1

(19) **United States**

(12) **Patent Application Publication**

Hopkins

(10) **Pub. No.: US 2024/0114993 A1**

(43) **Pub. Date: Apr. 11, 2024**

(54) **FOOTWEAR ARTICLE WITH ASYMMETRIC ANKLE COLLAR**

(71) Applicant: **Nike, Inc.**, Beaverton, OR (US)

(72) Inventor: **Timothy P. Hopkins**, Lake Oswego, OR (US)

(21) Appl. No.: **18/539,456**

(22) Filed: **Dec. 14, 2023**

Related U.S. Application Data

(60) Continuation of application No. 17/135,220, filed on Dec. 28, 2020, which is a division of application No. 16/230,912, filed on Dec. 21, 2018, now Pat. No. 10,897,956.

Publication Classification

(51) **Int. Cl.**

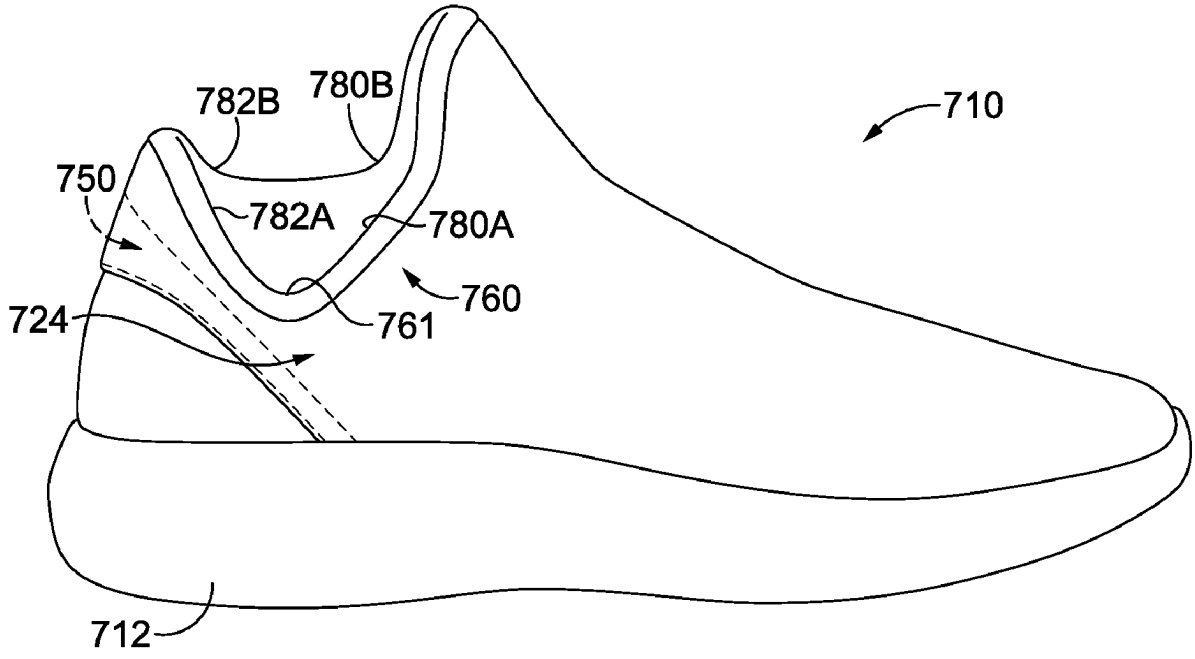
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A43B 5/00	(2006.01)
A43B 23/02	(2006.01)
A43B 23/04	(2006.01)

(52) **U.S. Cl.**

CPC ***A43B 11/00*** (2013.01); ***A43B 5/00*** (2013.01); ***A43B 23/027*** (2013.01); ***A43B 23/047*** (2013.01)

(57) **ABSTRACT**

A footwear article includes an asymmetric ankle collar that may expand in a manner that facilitates donning and doffing the footwear article, such as when the wearer slides his or her heel out of the footwear article. The footwear article may also include a collar elevator.



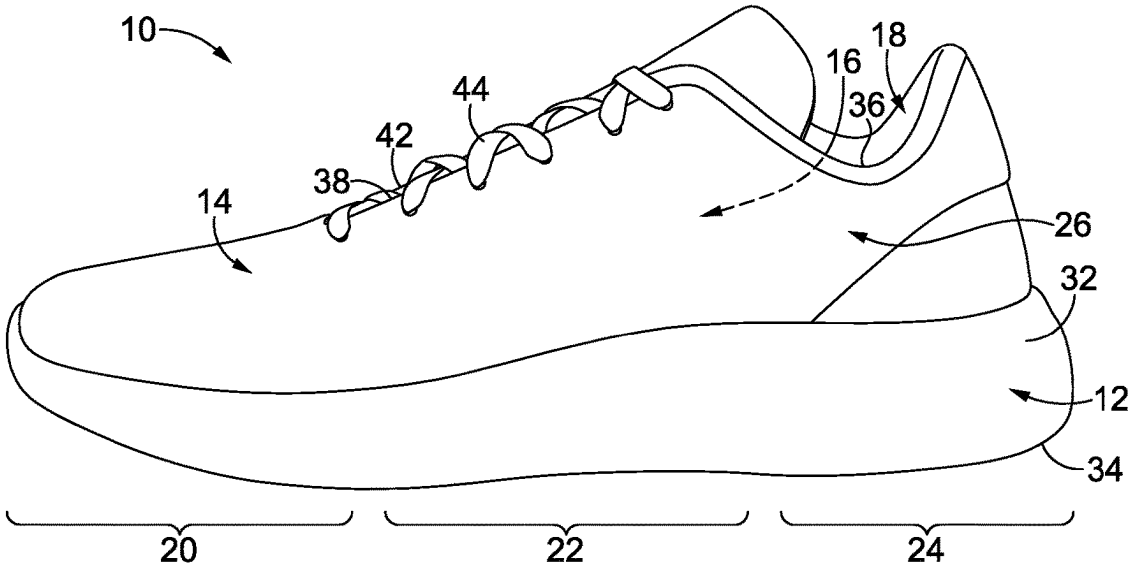

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FIG. 1

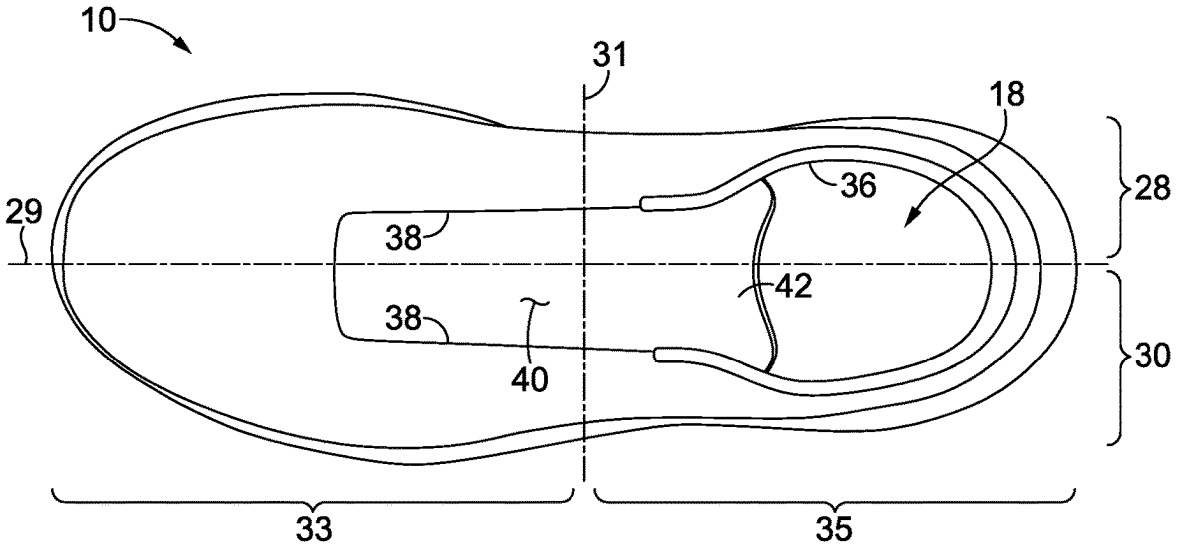

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FIG. 2

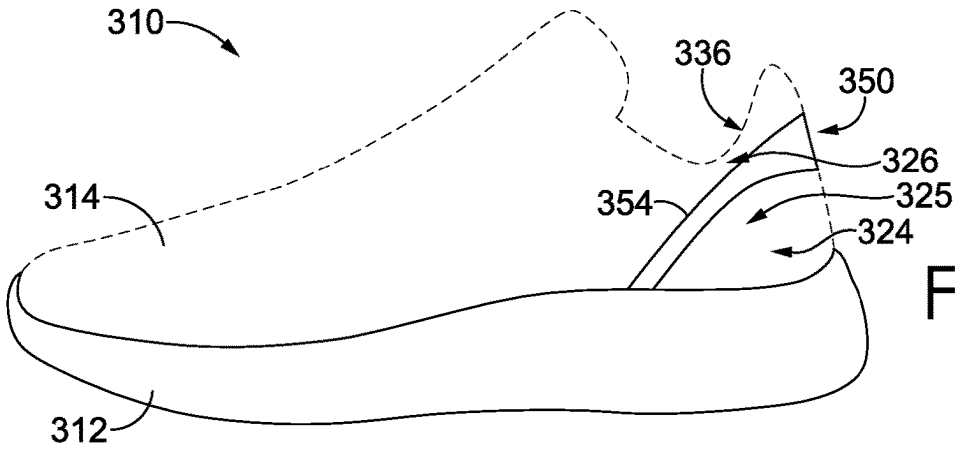


FIG. 3A

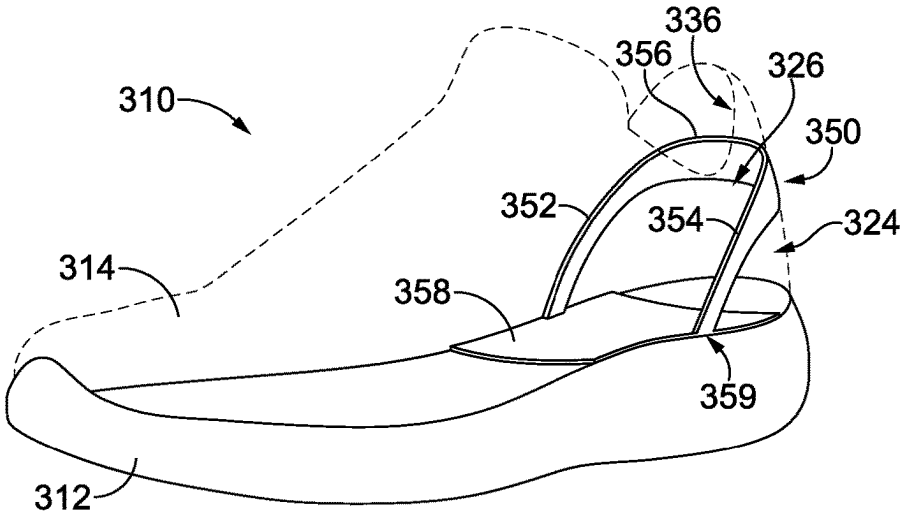


FIG. 3B

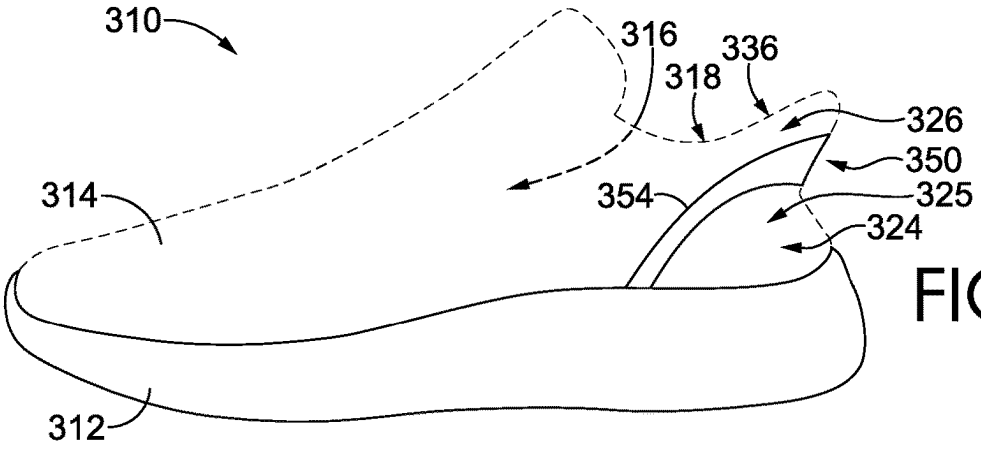


FIG. 3C

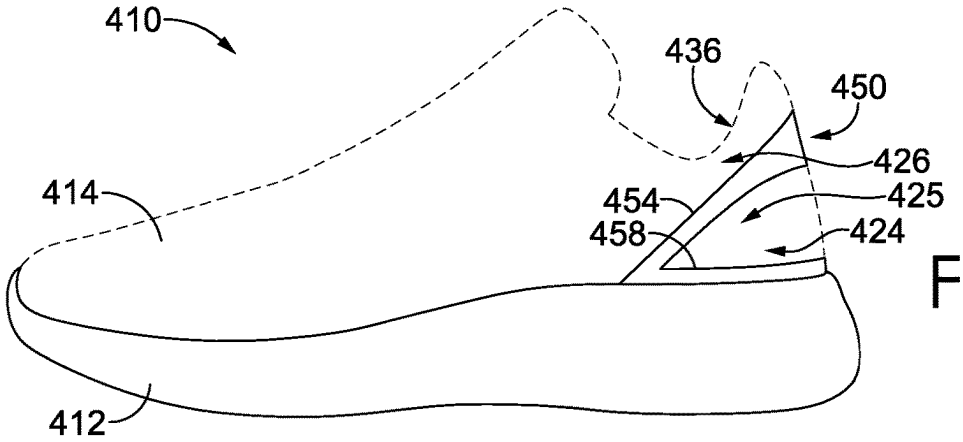


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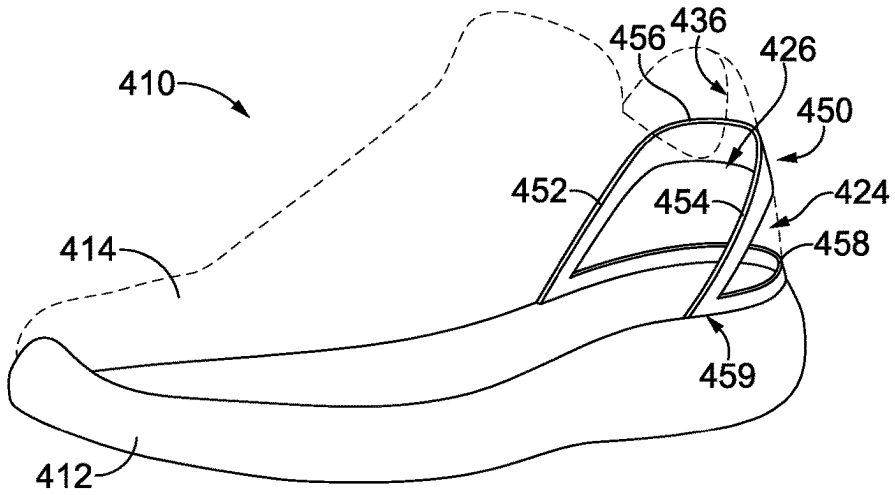


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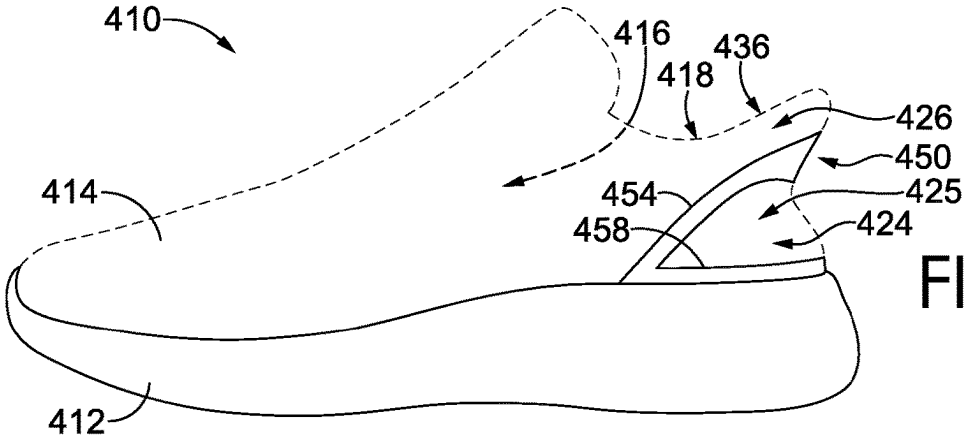


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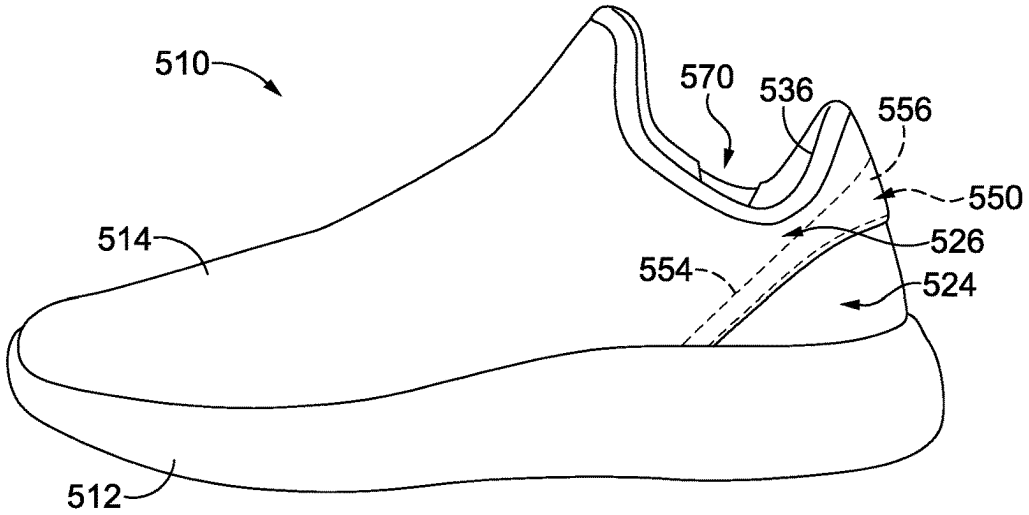


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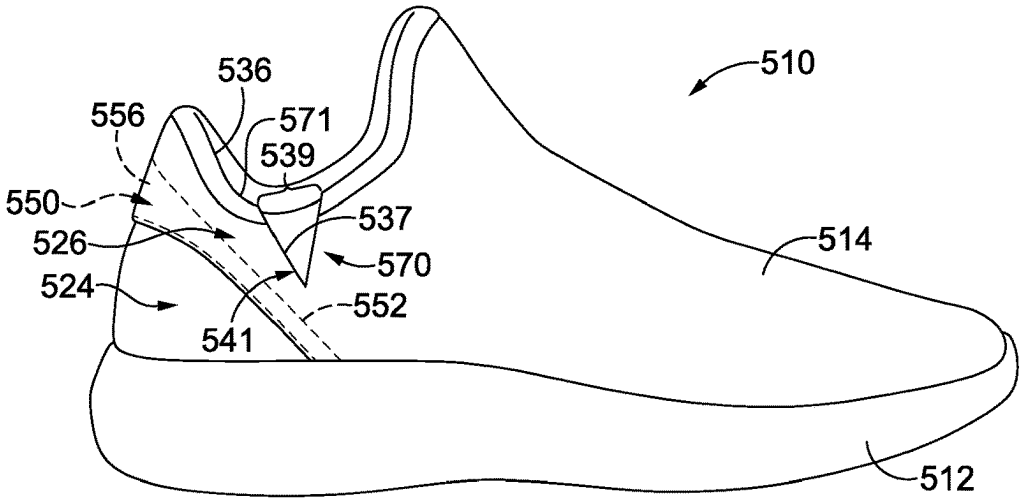


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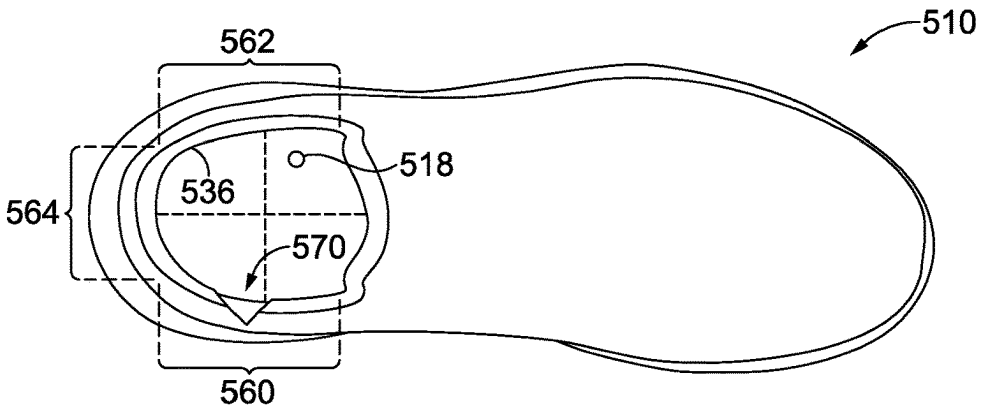


FIG. 7

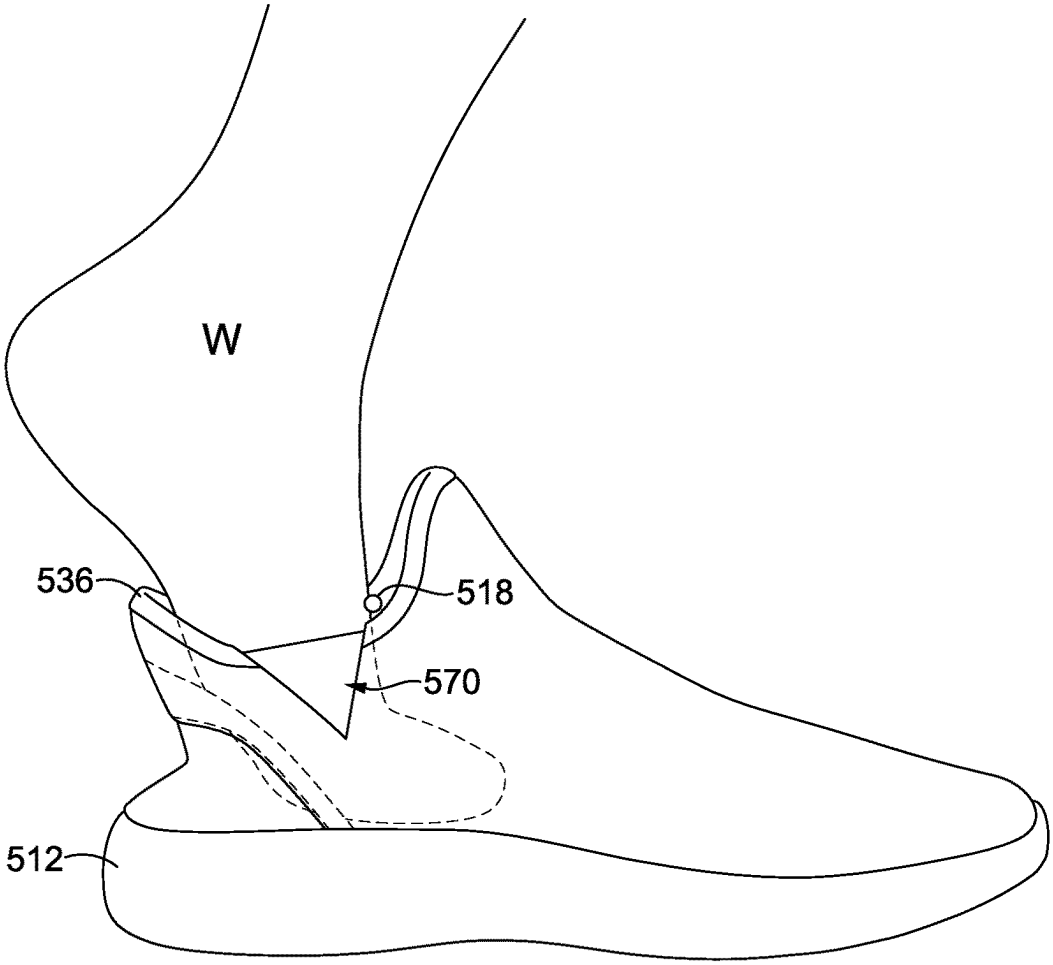


FIG. 8

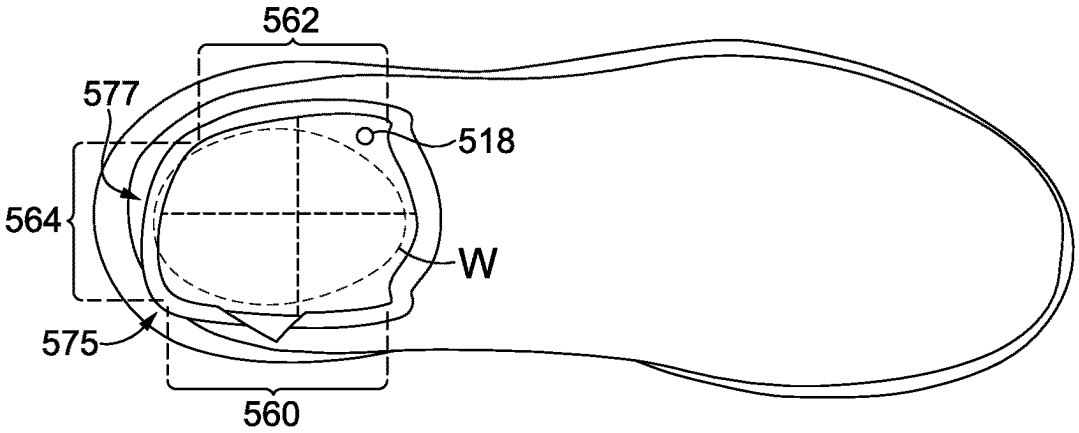


FIG. 9

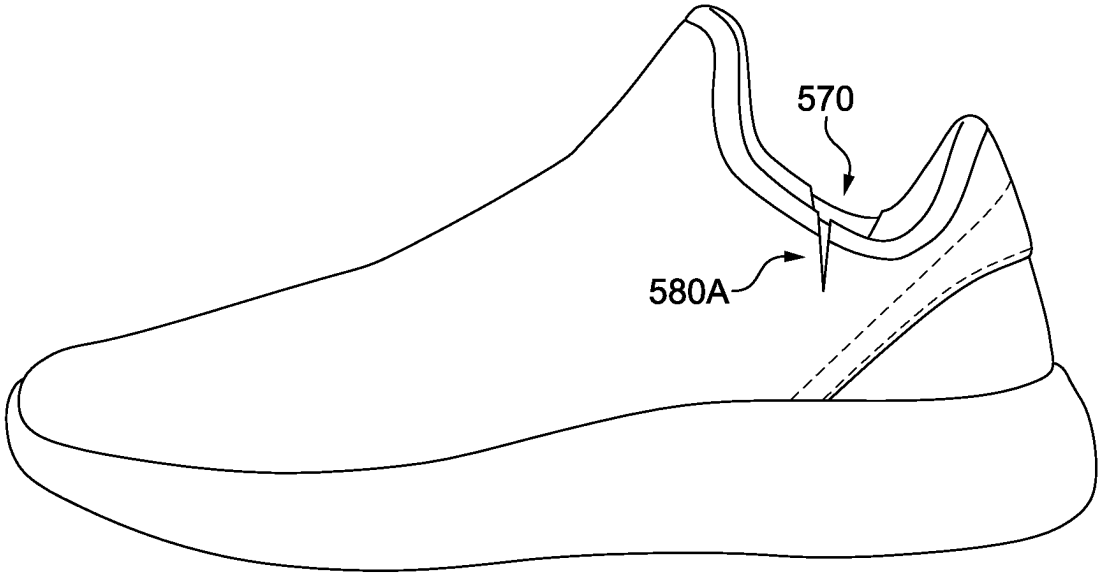


FIG. 10

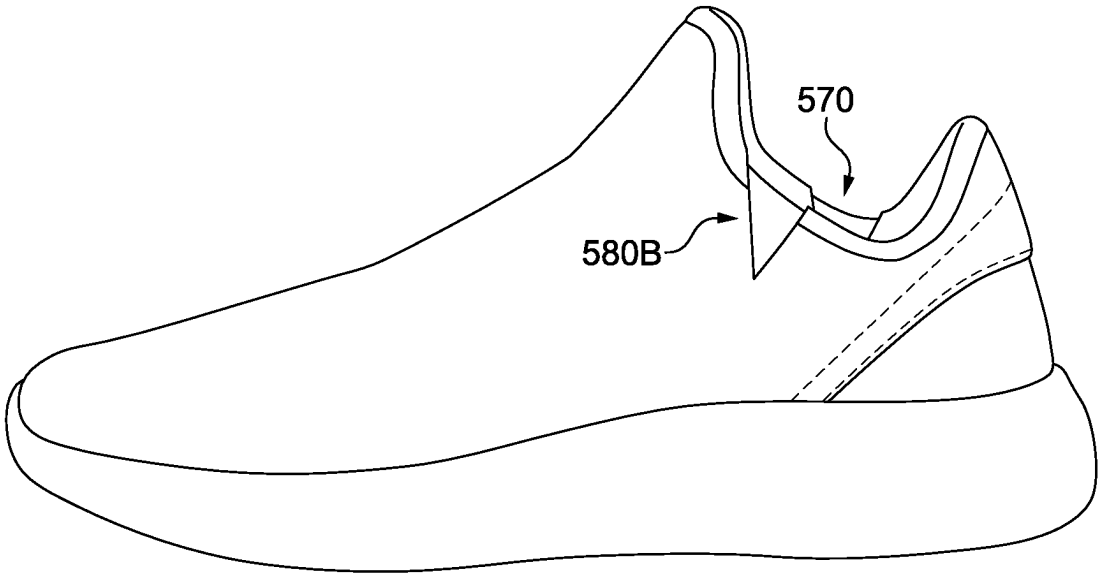


FIG. 11

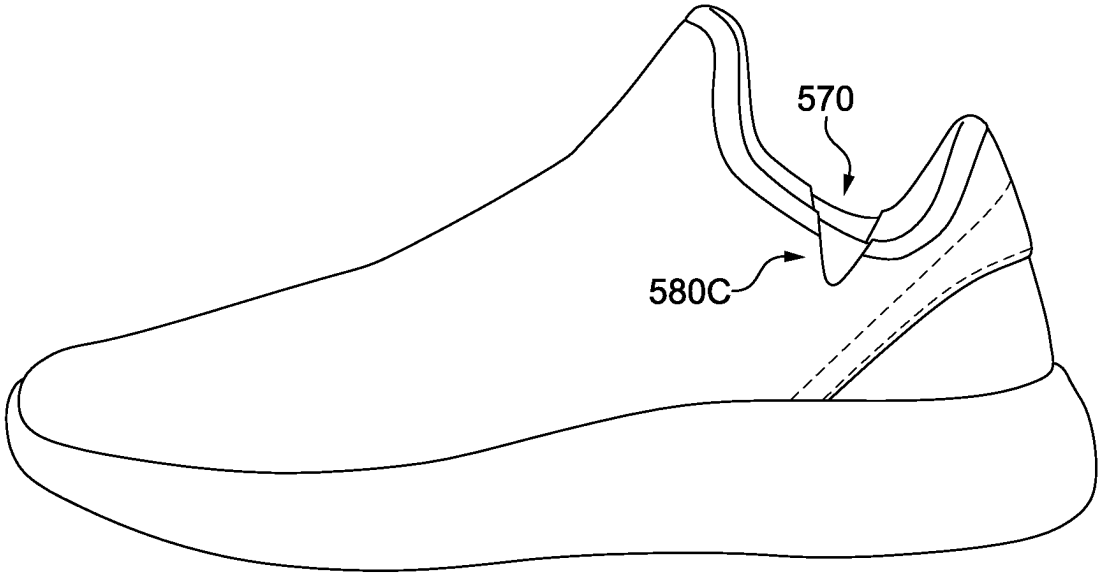


FIG. 12

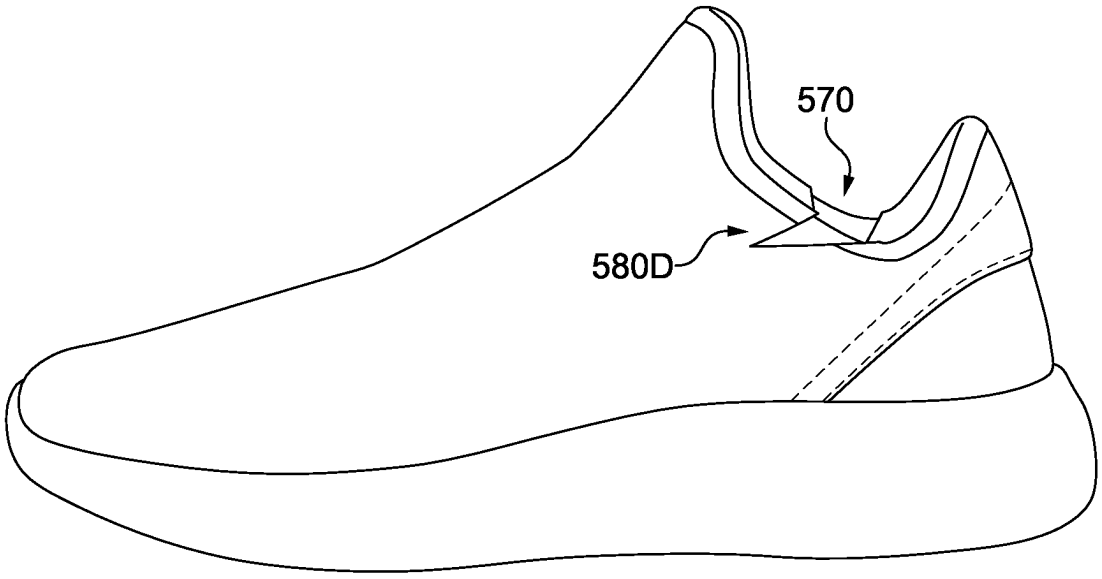


FIG. 13

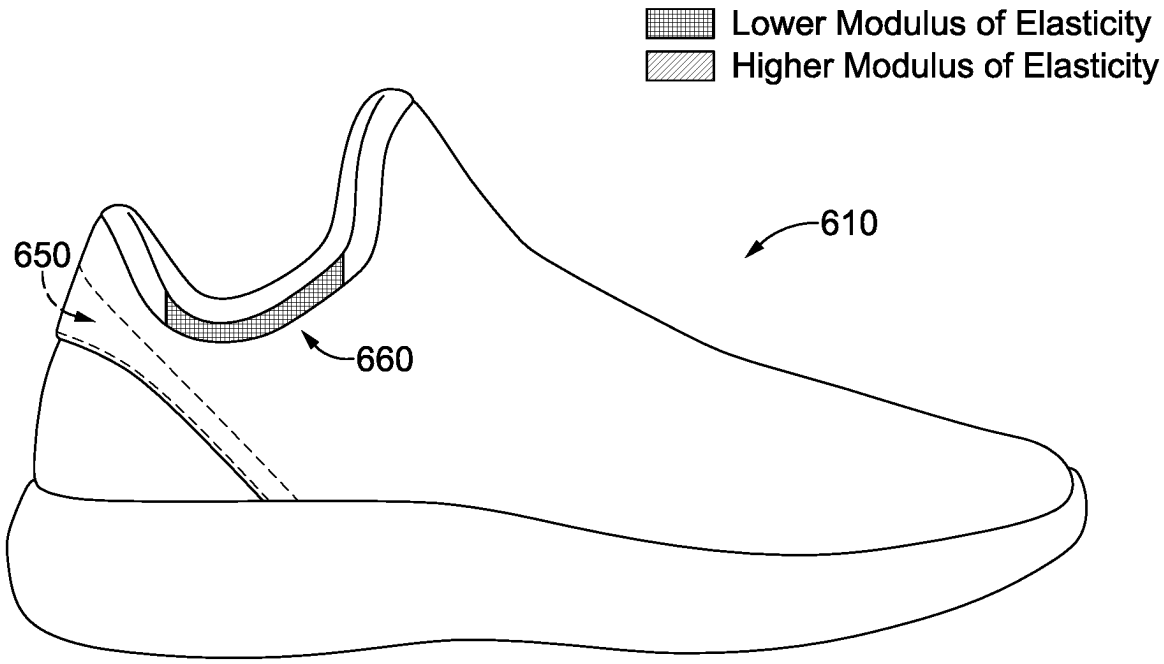

Lower Modulus of Elasticity
Higher Modulus of Elasticity
650
610
660

FIG. 14

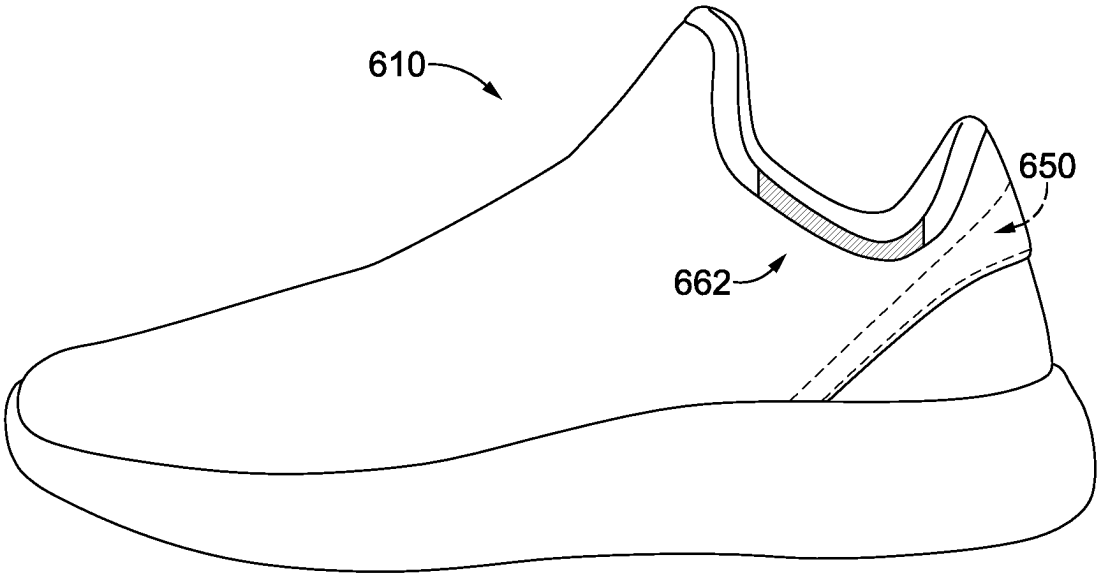

610
650
662

FIG. 15

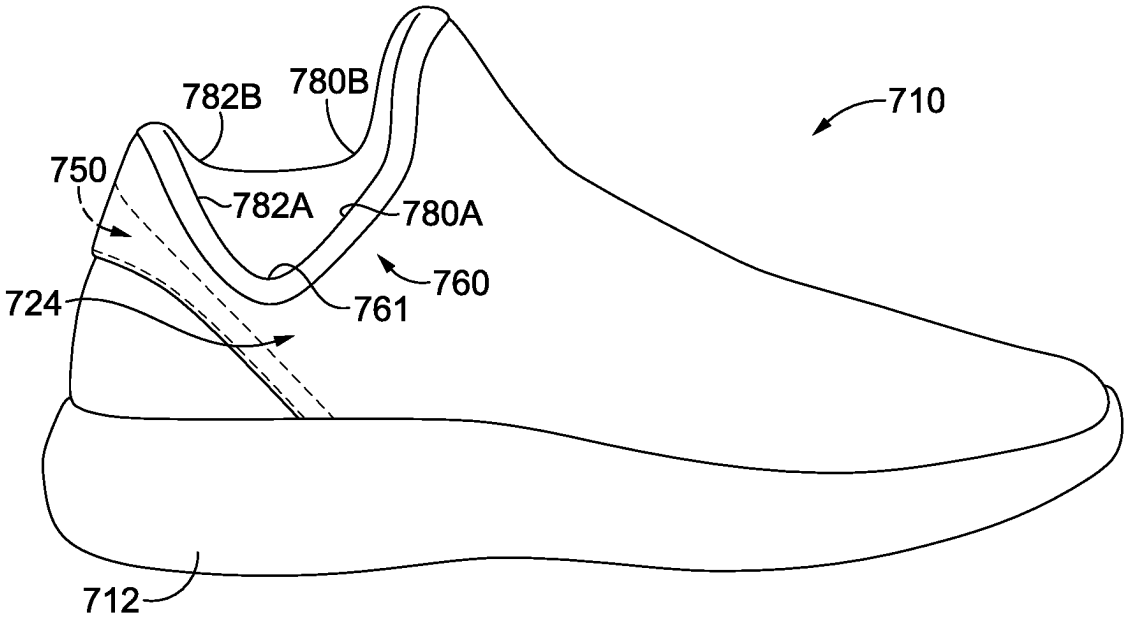


FIG. 16

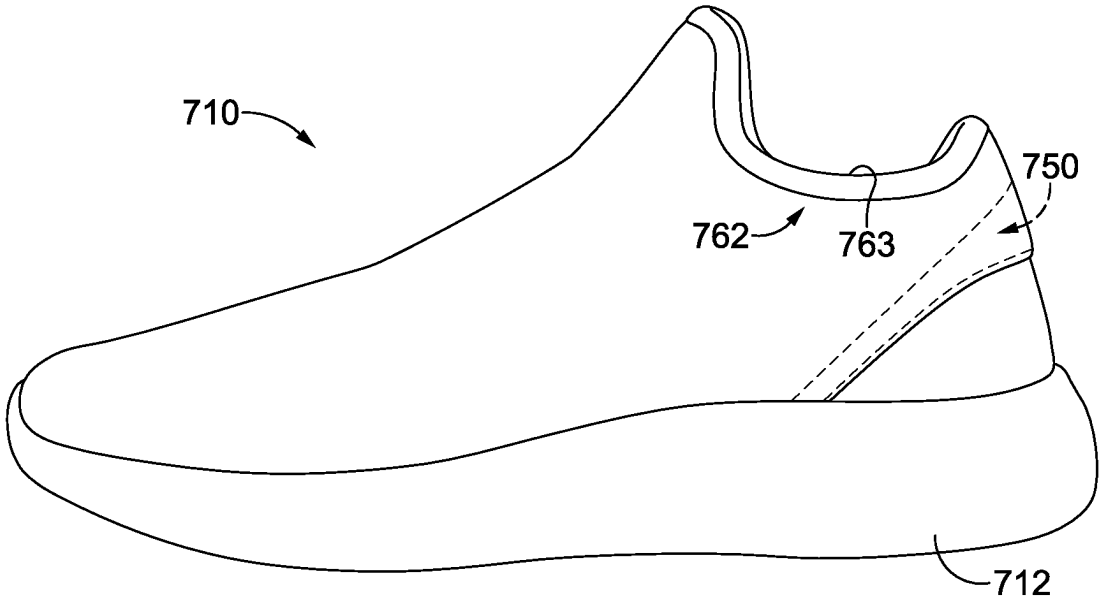


FIG. 17

FOOTWEAR ARTICLE WITH ASYMMETRIC ANKLE COLLAR

CROSS-REFERENCE TO RELATED APPLICATIONS AND PRIORITY CLAIM

[0001] This application is a continuation of prior application Ser. No. 17/135,220 (filed Dec. 28, 2020), which as a divisional of prior application Ser. No. 16/230,912 (filed Dec. 21, 2018), which are incorporated herein by reference in their entireties.

TECHNICAL FIELD

[0002] This disclosure relates to a footwear article having an asymmetric ankle collar having medial-side properties that are different from lateral-side properties.

BACKGROUND

[0003] Some footwear articles include an ankle collar that is manipulated when the footwear article is put on. For example, the ankle collar may be depressed towards the sole as the wearer's foot is slid into the upper. Furthermore, some of these footwear articles include a collar elevator operable to move the ankle collar from the depressed or lowered state to the raised state. An example of one type of collar elevator is described in U.S. Pat. No. 9,820,527, and examples of other collar elevators are described in US Pat. Pub. 2018/0110292 and US Pat. Pub. 2018/0289109.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] Some subject matter described in this disclosure makes reference to drawing figures, which are incorporated herein by reference in their entirety.

[0005] FIG. **1** depicts a side view of a footwear article in accordance with an aspect of this disclosure.

[0006] FIG. **2** depicts a top view of the footwear article of FIG. **1** in accordance with an aspect of this disclosure.

[0007] FIGS. **3**A-**3**C depict another footwear article having a collar elevator in accordance with an aspect of this disclosure.

[0008] FIGS. **4**A-**4**C depict another footwear article having an alternative collar elevator in accordance with an aspect of this disclosure.

[0009] FIGS. **5-9** depict another footwear article in accordance with an aspect of this disclosure.

[0010] FIGS. **10-13** each depict a respective alternative footwear article in accordance with an aspect of this disclosure.

[0011] FIGS. **14-15** depict another footwear article in accordance with an aspect of this disclosure.

[0012] FIGS. **16-17** depict another footwear article in accordance with an aspect of this disclosure.

DETAILED DESCRIPTION

[0013] Subject matter is described throughout this Specification in detail and with specificity in order to meet statutory requirements. The aspects described throughout this Specification are intended to be illustrative rather than restrictive, and the description itself is not intended necessarily to limit the scope of the claims Rather, the claimed subject matter might be practiced in other ways to include different elements or combinations of elements that are equivalent to the ones described in this Specification and that are in conjunction with other present technologies or future technologies. Upon reading the present disclosure, alternative aspects may become apparent to ordinary skilled artisans that practice in areas relevant to the described aspects, without departing from the scope of this disclosure. It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by, and is within the scope of, the claims.

[0014] The subject matter described in this Specification generally relates to, among other things, a footwear article having an asymmetric ankle collar, including manufactures and methods associated therewith. In some aspects, the asymmetric ankle collar may expand in a manner that facilitates donning and doffing the footwear article, such as when the wearer slides his or her heel out of the footwear article. Some aspects of this disclosure are directed to a footwear article with an asymmetric ankle collar and a collar elevator.

[0015] Before describing the figures in more detail, some additional explanation will now be provided related to certain terminology that may be used in this disclosure.

[0016] "A," "an," "the," "at least one," and "one or more" might be used interchangeably to indicate that at least one of the items is present. When such terminology is used, a plurality of such items might be present unless the context clearly indicates otherwise. All numerical values of parameters (e.g., of quantities or conditions) in this specification, unless otherwise indicated expressly or clearly in view of the context, including the appended claims, are to be understood as being modified in all instances by the term "about" whether or not "about" actually appears before the numerical value. "About" indicates that the stated numerical value allows some slight imprecision (with some approach to exactness in the value; approximately or reasonably close to the value; nearly). If the imprecision provided by "about" is not otherwise understood in the art with this ordinary meaning, then "about" as used herein indicates at least variations that may arise from ordinary methods of measuring and using such parameters. In addition, a disclosure of a range is to be understood as specifically disclosing all values and further divided ranges within the range. All references referred to are incorporated herein in their entirety.

[0017] The terms "comprising," "including," and "having" are inclusive and therefore specify the presence of stated features, steps, operations, elements, or components, but do not preclude the presence or addition of one or more other features, steps, operations, elements, or components. Orders of steps, processes, and operations may be altered when possible, and additional or alternative steps may be employed. As used in this specification, the term "or" includes any one and all combinations of the associated listed items. The term "any of" is understood to include any possible combination of referenced items, including "any one of" the referenced items. The term "any of" is understood to include any possible combination of referenced claims of the appended claims, including "any one of" the referenced claims.

[0018] For consistency and convenience, directional adjectives might be employed throughout this detailed description corresponding to the illustrated examples. Ordinary skilled artisans will recognize that terms such as "above," "below," "upward," "downward," "top," "bottom,"

etc., may be used descriptively relative to the figures, without representing limitations on the scope of the invention, as defined by the claims.

[0019] The term "longitudinal," as possibly used throughout this detailed description and in the claims, refers to a direction extending a length of a component. For example, a longitudinal direction of a shoe extends between a forefoot region and a heel region of the shoe. The term "forward" or "anterior" is used to refer to the general direction from a heel region toward a forefoot region, and the term "rearward" or "posterior" is used to refer to the opposite direction, i.e., the direction from the forefoot region toward the heel region. In some cases, a component may be identified with a longitudinal axis as well as a forward and rearward longitudinal direction along that axis. The longitudinal direction or axis may also be referred to as an anterior-posterior direction or axis.

[0020] The term "transverse," as possibly used throughout this detailed description and in the claims, refers to a direction extending a width of a component. For example, a transverse direction of a shoe extends between a lateral side and a medial side of the shoe. The transverse direction or axis may also be referred to as a lateral direction or axis or a mediolateral direction or axis.

[0021] The term "vertical," as possibly used throughout this detailed description and in the claims, refers to a direction generally perpendicular to both the lateral and longitudinal directions. For example, in cases where a sole is planted flat on a ground surface, the vertical direction may extend from the ground surface upward. It will be understood that each of these directional adjectives may be applied to individual components of a sole. The term "upward" or "upwards" refers to the vertical direction pointing towards a top of the component, which may include an instep, a fastening region, and/or a throat of an upper. The term "downward" or "downwards" refers to the vertical direction pointing opposite the upwards direction, toward the bottom of a component, and may generally point towards the bottom of a sole structure of an article of footwear.

[0022] The "interior" of an article of footwear, such as a shoe, refers to portions at the space that is occupied by a wearer's foot when the shoe is worn. The "inner side" of a component refers to the side or surface of the component that is (or will be) oriented toward the interior of the component or article of footwear in an assembled article of footwear. The "outer side" or "exterior" of a component refers to the side or surface of the component that is (or will be) oriented away from the interior of the shoe in an assembled shoe. In some cases, other components may be between the inner side of a component and the interior in the assembled article of footwear. Similarly, other components may be between an outer side of a component and the space external to the assembled article of footwear. Further, the terms "inward" and "inwardly" shall refer to the direction toward the interior of the component or article of footwear, such as a shoe, and the terms "outward" and "outwardly" shall refer to the direction toward the exterior of the component or article of footwear, such as a shoe. In addition, the term "proximal" refers to a direction that is nearer a center of a footwear component, or is closer toward a foot when the foot is inserted in the article of footwear as it is worn by a user. Likewise, the term "distal" refers to a relative position that is further away from a center of the footwear component or is further from a foot when the foot is inserted in the article of footwear as it is worn by a user. Thus, the terms proximal and distal may be understood to provide generally opposing terms to describe relative spatial positions.

[0023] In order to aid in the explanation of, and understanding of, aspects of this Specification, reference is now made to FIGS. **1** and **2** to describe elements of a typical footwear article **10**, which may include a tongue reinforcer. FIG. **1** depicts a lateral side of the footwear article **10**, and FIG. **2** depicts a top of the footwear article. When describing the various figures mentioned in this disclosure, like reference numbers refer to like components throughout the views.

[0024] The footwear article **10** includes at least two primary elements including a sole structure **12** and an upper **14**. When the footwear article **10** is worn (as intended on a foot), the sole structure **12** is typically positioned near the foot plantar surface (i.e., the bottom of the foot). The sole structure **12** may protect the bottom of the foot, and in addition, may attenuate ground-reaction forces, absorb energy, provide traction, and control foot motion, such as pronation and supination. The upper **14** is coupled to the sole structure **12**, and together with the sole structure **12**, forms a foot-receiving cavity **16**. That is, while the sole structure **12** typically encloses the bottom of the foot, the upper **14** extends over, and at least partially covers, a dorsal portion of the foot (i.e., the top of the foot or the instep) and secures the footwear article **10** to the foot. The upper **14** includes a foot-insertion opening **18**, through which a foot is inserted when the footwear article **10** is put on as the foot is arranged into the foot-receiving cavity **16**.

[0025] As indicated in FIG. **1**, the footwear article **10** may include a forefoot region **20**, a midfoot region **22**, a heel region **24**, and an ankle region **26**. The forefoot region **20**, the midfoot region **22**, and the heel region **24** extend through the sole structure **12** and the upper **14**. The ankle region **26** is located in a portion of the upper **14**. The forefoot region **20** generally includes portions of the footwear article **10** corresponding with the toes and the joints connecting the metatarsals with the phalanges. The midfoot region **22** generally includes portions of the footwear article **10** corresponding with the arch area and instep of the foot. The heel region **24** corresponds with rear portions of the foot, including the calcaneus bone. The ankle region **26** corresponds with the ankle. The forefoot region **20**, the midfoot region **22**, the heel region **24**, and the ankle region **26** are not intended to demarcate precise areas of the footwear article **10**, and are instead intended to represent general areas of the footwear article **10** to aid in the understanding of various aspects of this Specification. In addition, portions of a footwear article may be described in relative terms using these general zones. For example, a first structure may be described as being more heelward than a second structure, in which case the second structure would be more toeward and closer to the forefoot.

[0026] The footwear article **10** also has a medial side **28** (identified in FIG. **2** and obscured from view in FIG. **1**) and a lateral side **30** (identified in FIG. **2** and viewable in FIG. **1**). The medial side **28** and the lateral side **30** extend through each of the forefoot region **20**, the midfoot region **22**, the heel region **24**, and the ankle region **26**, and correspond with opposite sides of the footwear article **10**, each falling on an opposite side of a longitudinal midline reference plane **29** of the footwear article **10**, as is understood by those skilled in the art. For example, the longitudinal midline reference

plane **29** may pass through the foremost point of the sole structure and the rearmost point of the sole structure. The medial side **29** is thus considered opposite to the lateral side **30**. Typically, the lateral side corresponds with an outside area of the foot (i.e., the surface that faces away from the other foot), and the medial side corresponds with an inside area of the foot (i.e., the surface that faces toward the other foot). In another aspect, the footwear article includes an anterior portion **33** and a posterior portion **35**, falling on an opposite side of a latitudinal midline reference plane **31** of the footwear article **10**. The latitudinal midline reference plane **31** extends perpendicular to the longitudinal midline reference plane **29** and to the ground-surface plane and is spaced evenly between the foremost point of the footwear article **10** and the rearmost point of the footwear article **10**. In addition, these terms may also be used to describe relative positions of different structures. For example, a first structure that is closer to the inside portion of the footwear article might be described as medial to a second structure, which is closer to the outside area and is more lateral.

[0027] In describing a footwear article, the relative terms "inferior" and "superior" may also be used. For example, the superior portion generally corresponds with a top portion that is oriented closer towards a person's head when the person's feet are positioned flat on a horizontal ground surface and the person is standing upright, whereas the inferior portion generally corresponds with a bottom portion oriented farther from a person's head and closer to the ground surface.

[0028] The sole structure **12** may be constructed of various materials and may include various elements. For example, the sole structure **12** may include a midsole **32** and an outsole **34**. The midsole **32** may be formed from a compressible polymer foam element (e.g., a polyurethane or ethylvinylacetate (EVA) foam) that attenuates ground reaction forces (i.e., provides cushioning) when compressed between the foot and the ground during walking, running, or other ambulatory activities. In further aspects, the midsole **32** may incorporate fluid-filled chambers, plates, moderators, or other elements that further attenuate forces, enhance stability, or influence motions of the foot. The midsole **32** may be a single, one-piece midsole, or could be multiple components integrated as a unit. In some aspects, the midsole **32** may be integrated with the outsole **34** as a unisole. The outsole **34** may be one-piece, or may be several outsole components, and may be formed from a wear-resistant rubber material that may be textured to impart traction and/or may include traction elements such as tread or cleats secured to the midsole **32**. The outsole **34** may extend either the entire length and width of the sole or only partially across the length and/or width.

[0029] The upper **14** may also be constructed of various materials and may include various features. For example, the upper **14** may be constructed of leather, textiles, or other synthetic or natural materials. Further, the upper **14** may be a knit textile, woven, braided, non-woven, laminate, or any combination thereof. The upper **14** may have various material properties related to breathability, stretch, flexibility, wicking, water resistance, and the like.

[0030] The upper **14** typically includes a portion that overlaps with, and is connected to, the sole structure **12**, and the junction of this connection may be referred to as a biteline. In addition, the upper **14** may include a "strobel," which includes a material panel extending from the upper **14** and across at least a portion of a foot-facing surface of the sole structure **12**, and the strobel may be used to hold the upper **14** on a last when the sole structure **12** is attached to the upper **14**. Stated differently, the sole structure **12** that is integrated into the footwear article **10** includes a foot-facing surface, and in some instances, the upper **14** may include a panel (referred to as a strobel) that extends inward from near the biteline region and at least partially covers the foot-facing surface. In that instance, the strobel is positioned underneath a foot when the footwear article is worn. The strobel may be covered by an insole or other layer of material.

[0031] The upper **14** includes other features. For example, the upper **14** includes an ankle collar **36** that forms a perimeter around at least a portion of the foot-insertion opening **18**. In addition, the upper **14** includes a throat **38** that often extends from the ankle collar **36** and forms a perimeter along at least one or more sides of an elongated opening **40**. A tongue **42** is located in the elongated opening **40**, and a size of the elongated opening **40** can be adjusted using various closure systems. For example, FIG. **1** illustrates laces **44**, and other closure systems may include elastic bands, hook-and-loop straps, zippers, buckles, and the like. The position of the tongue **42** and the connections of the closure system can be adjusted to vary a size of the foot-insertion opening and the elongated opening, such as by making the openings larger when the footwear article is being donned or doffed and by making the openings smaller when the footwear article is being secured onto a foot. As will be described in other portions of this disclosure, the tongue **42** might include a tongue reinforcer, which might help the tongue maintain a shape and position when the tongue is subjected to forces or adjustments, such as from other footwear-article elements or from a wearer.

[0032] The footwear article **10** might include an athletic-type shoe, such as might be worn when running or walking, and the description of the footwear article **10**, including the elements described with respect to FIGS. **1** and **2**, might also be applicable to other types of shoes, such as basketball shoes, tennis shoes, American football shoes, soccer shoes, leisure or casual shoes, dress shoes, work shoes, a sandal, a slipper, a boot, hiking shoes, and the like.

[0033] Having described FIGS. **1** and **2**, reference is now made to FIGS. **3**A-**3**C and **4**A-**4**C to describe some other aspects of this disclosure. Each of FIGS. **3**A, **3**B, and **3**C depicts a footwear article **310**, which includes an upper **314** coupled to a sole **312**, and the upper **314** includes a heel region **324** and an ankle region **326** with an ankle collar **336**. The ankle collar **336** is movable between a lowered state (as depicted in FIG. **3**C) and a raised state (as depicted in FIGS. **3**A and **3**B). In the lowered state, the ankle collar **336** is positioned closer to the sole **312**, and in the raised state, the ankle collar **336** is positioned farther from the sole **312**. Similarly, the footwear article **410** includes an upper **414** coupled to a sole **412**, and the upper **414** includes a heel region **424** and an ankle region **426** with an ankle collar **436**.

[0034] Furthermore, the footwear article **310** includes a collar elevator **350** that is coupled to the upper **314** near the heel region **324** and/or the ankle region **326** and that is operable to move the ankle collar **336** from the lowered state to the raised state. More specifically, the collar elevator **350** includes portions that are positioned in the heel region **324** and that extend up into the ankle region **326**. As previously, indicated, there are not necessarily precise delineations

between the heel region **324** and the ankle region **326**; rather, describing the positioning of the collar elevator **350** with respect to these regions is one way to describe that the collar elevator **350** extends from a more inferior part closer to the sole to a more superior part closer to the ankle collar **336**. As far as the coupling of the collar elevator **350** to the upper **314** near the heel region **324** and/or near the ankle region **326**, this coupling may take various forms. For example, the collar elevator **350** may be coupled to the upper in the heel region **324**, in the ankle region **326**, to the ankle collar **336**, or any and all combinations thereof. The collar elevator **350** is an example of one type of collar elevator operable to move an ankle collar from the lowered state to the raised state, and as will be described in other portions of this disclosure, a collar elevator may include one or more alternative structures than those depicted in FIGS. **3**A-**3**C. For example, FIGS. **4**A-**4**C depict a footwear article **410** with a collar elevator **450** that is operable to move the ankle collar **436** from the lowered state (e.g., FIG. **4**C) to the raised state (e.g., FIGS. **4**A and **4**B) and that has a different structure from the collar elevator **350**.

[0035] For illustrative purposes, the upper **314** and the upper **414** is ghosted in dashed lines, and a collar elevator may be arranged in various locations with respect to an upper. For example, a collar elevator may be affixed at least partially, and possibly entirely, between an exterior layer and an inner lining in the heel region, in the ankle region, in the ankle collar, or any and all combinations thereof. In another aspect, a collar elevator may be at least partially exposed and arranged on the outside or exterior surface of the upper. In a further aspect, at least a portion of the collar elevator may be arranged on the inside, foot-facing surface of an inner lining. In another aspect, the collar elevator might be arranged on the exterior of the footwear article and might be attached to a heel portion of the ankle collar by a tab, heat stake, bonding agent, stitch, or other coupling.

[0036] A collar elevator (such as the collar elevators **350** and **450**) may include various elements. In one aspect, a collar elevator includes a medial lever arm, a lateral lever arm, and a center connecting band that couples the medial lever arm to the lateral lever arm and that is located in a heel portion of the ankle collar. In a further aspect, each lever arm is affixed to a base, which remains stationary relative to the lever arms as the lever arms deform when the ankle collar is moved to a lowered state. The base may be a portion of the footwear article, such as a portion of the sole or a portion of the upper. In addition, the base may be one or more other anchors affixed directly or indirectly to the sole, the sole itself, or any combination thereof. U.S. Pat. No. 9,820,527 describes one or more collar elevators, some of which may be referred to as a deformable member or as deformable members (with or without a base), and the full disclosure of U.S. Pat. No. 9,820,527 is incorporated herein by reference in its entirety. In accordance with an aspect of this disclosure, at least some of the deformable members described in U.S. Pat. No. 9,820,527 include a medial lever arm, a lateral lever arm, and a center connecting band that couples the medial lever arm to the lateral lever arm. In other examples, US 2018/0110292 and US 2018/0289109 each describes a plurality of other collar elevators, some of which are referred to as a control bar (with or without a base), and the full disclosures of US 2018/0110292 and US 2018/0289109 are incorporated herein by reference in their entirety. In accordance with an aspect of this disclosure, at least some of the control bars described in US 2018/0110292 and US 2018/0289109 include a medial lever arm, a lateral lever arm, and a center connecting band that couples the medial lever arm to the lateral lever arm.

[0037] Each of the illustrated collar elevators **350** and **450** depicts examples of medial lever arms **352** and **452**, respectively. In addition, each of the illustrated collar elevators **350** and **450** depicts examples of lateral lever arms **354** and **454**, respectively, and center connecting bands **356** and **456**, respectively. Furthermore, the lever arms **352** and **354** attach to a base **358**, and the lever arms **452** and **454** attach to a base **458** having a different structure from the base **358**. The base **358** is affixed to or near a foot-facing surface of the sole **312**, and the base **358** might be a portion of an outsole, a portion of a midsole, a portion of an insole, a portion of a strobel, a plate or sheet of material layered between any of these sole layers, or any combination thereof. Among other things, the base **358** might include a rigid portion or section to which the lever arms **352** and **354** are anchored. FIGS. **4**A-**4**C depict a different aspect, in which the base **458** might attach to a portion of the upper (e.g., a heel counter), a portion of the midsole sidewall, or any combination thereof, and the base **458** wraps around a backside of the footwear article, as opposed to extending through the footbed in the manner described with respect to the base **358**.

[0038] The medial lever arm, the lateral lever arm, and the center connecting band may be a single continuous body, such that clear demarcation may not exist between the medial lever arm, the lateral lever arm, and the center connecting band. For example, the medial and lateral arms and the center connecting band may be molded, cast, 3D printed, or otherwise formed as a single, integrally formed unit. In other aspects, the medial lever arm and the lateral lever arm may be discrete, separate, and distinct elongated members, which are connected to the center connecting band, such as by a mechanical or chemical coupling, a friction fit, sheathing, or other coupling.

[0039] Having generally described some of the structural elements of a collar elevator, some operational aspects of a collar elevator will now be described. As briefly described above, the collar elevator moves the ankle collar from the lowered state to the raised state. More specifically, at least a portion of the medial lever arm, the lateral lever arm, the center connecting band, or any combination thereof, is affixed to a portion of the upper. In one aspect, the center connecting band may be affixed near a heel portion of the ankle collar. For example, as described in other portions of this disclosure, the center connecting band may be attached to the heel portion of the ankle collar by an adhesive, connection tab, heat stake, stitch, and the like. As such, when the ankle collar is moved to a lowered state closer to the sole, the medial lever arm and the lateral lever arm deform to a more compressed or more loaded position. Stated differently, the collar elevator stores potential energy by elastically deforming from a less compressed configuration (e.g., FIGS. **3**A and **4**A) to a more compressed configuration (e.g., FIGS. **3**C and **4**C) when an applied force moves the ankle collar from the raised state to the lowered state. The potential energy returns the collar elevator to the less compressed configuration upon removal of the applied force, and since the collar elevator is affixed to the upper, the ankle collar is also moved from the lowered state to the raised state. While the compression of the collar elevator may be greater when the ankle collar is moved to the lowered state (as compared

with the raised state), in the raised state the collar elevator may still store potential energy in an at least partially deformed state (i.e., preloaded compression) so as to be able to hold a rear, heel portion of the ankle collar about the heel of the wearer. For example, if the collar elevator is attached to the upper heel region and/or the upper ankle region, then portions of the upper may hold or retain the collar elevator in the preloaded configuration when the ankle collar is in the raised state. In other aspects, the collar elevator may be unloaded when the ankle collar is in the raised state.

[0040] In one aspect, the portion **325** or **425** of the upper below the center connecting band may include wall of one or more textiles that are more flexible than other portions of the upper. This more flexible region of the upper may, for example, be at least partially in the heel-counter region. Among other things, this more flexible portion **325** or **425** of the upper may collapse more easily when the ankle collar is moved to a lower state and may provide less resistance for the collar elevator (as compared with a less flexible upper in other parts of the footwear article or in a typical footwear article) when the collar elevator is returning to the less compressed state.

[0041] In some aspects, the combination of the medial lever arm, the lateral lever arm, and the center connecting band may be referred to as a deformable element. The term "deformable element" refers to a resiliently flexible member that can be bent or compressed but has a bias to move towards a non-bent or uncompressed state. The deformable element may include a single, integrally formed, deformable element, extending continuously from the medial lever arm to the lateral lever arm. In other aspects, the medial lever arm and the lateral lever arm may be two or more separate and distinct deformable elements that connect to the center connecting band, which may also be referred to as a heel piece.

[0042] In some aspects, the deformable element might be directly coupled, mounted, or attached to the base. In other aspects, the base may include one or more anchors that engage and retain the deformable element in place. For example, anchors may be located at a junction (e.g., **359** and **459**) between the lever arms and the base. Such anchors might be integrally formed with, coupled to and/or located within or between or outside of portions of the sole (e.g., insole, midsole, outsole). For example, an anchor may be disposed in a block, plate, or wedge layered among, on top, or beneath the sole. In some instances, a portion of the sole (e.g., midsole) might be carved or cut out to attach to or house an anchor. In another aspect, a base extending in the mediolateral orientation (e.g., base **358**) includes an anchor-shaped receptacle into which an anchor engages by way of a resistance fit, compression fit, a snap fit, or via an interlocking mechanism/configuration. In other examples, the anchors may be integrally formed with, coupled to, and/or located within, between, or outside of portions of the upper. For example, anchors may be located in the upper, in a heel counter, or any combination thereof. A single anchor may extend a full width of the footwear article, or two anchors may be positioned on opposing sides of the footwear article (e.g., on the medial and lateral sides). The deformable member may attach to the base or to an anchor at an angle. For example, the deformable member might attach at a perpendicular angle to the base and then curve or arc rearwardly. In another aspect, the deformable member might attach at a forwardly inclining angle (i.e., upwards and forwards) or a rearwardly reclining angle (i.e., upwards and rearwards) before rearwardly arcing.

[0043] A connection between the deformable member and the base or the anchors may be described in various manners. For example, in one aspect, the deformable element does not pivot (i.e., is non-pivoting) about the base (e.g., about an insole, midsole, or outsole). Described differently, the deformable element may be non-rotatably coupled to the base. In various aspects, engagement between the deformable element and the base (or anchor) is free of play, meaning that there is little or no relative movement between the two components.

[0044] A deformable element may include one or more of a tube, a wire, a spring, a shape memory structure or material, and the like. Furthermore, a deformable element can include one or more materials such as carbon steel, stainless steel, titanium, nickel titanium (nitinol) and other metals and alloys (shape-memory or otherwise), polymers (shape-memory or otherwise), composite materials, foam materials, graphite, carbon fiber, fiberglass, thermoplastic polyester elastomers (TPC-ET), silicone, thermoplastic polyurethane (TPU), and polycarbonate. For example, a deformable element might include titanium or be a titanium wire. Also, one or more deformable elements might be made of a first material, e.g., titanium, and one or more additional deformable elements might be made of a second material, e.g., graphite.

[0045] In some aspects, the deformable element might include a single, unitary piece. For instance, a first end of the deformable element (e.g., an end of the medial lever arm) might be embedded in, or attached to, a medial anchor; a second end of the deformable element (e.g., an end of the lateral lever arm) might be embedded in or attached to a lateral anchor; and a middle portion of the deformable element (e.g., the center connecting band) might extend around the heel portion or ankle portion of the upper, or be embedded within some additional heel-piece structure.

[0046] In other aspects, the deformable element might include a plurality of separate and distinct components. For instance, a deformable element might include two separate components, with a first component (e.g., medial lever arm) having a first end embedded in or attached to a medial anchor and a second end embedded in or attached to the medial side of a heel piece or center connecting band. As such, a second component (e.g., lateral lever arm) might similarly include a first end embedded in or attached to a lateral anchor and a second end embedded in or attached to the lateral side of the heel piece or center connecting band. The plurality of separate and distinct components can be secured together, for example, with one or more of a tape wrap, woven encasing, overmold (e.g., TPU), heat shrink tube, and the like, each of which can provide different stabilities and strengths. For example, a deformable element might include one or more wires encased independently or encased together in a cover, sleeve, overmold, or heat shrink tube. The one or more wires can arch, bend, and sway and then return to an initial/normal state in order to help facilitate the elastic deformation of the deformable element.

[0047] A deformable element might have variable mechanical properties along its length and/or at distinct points along its length. Such variation might be provided by the deformable element (e.g., by a wire or bundle of two or more wires), by a securement surrounding all or a portion of the deformable element(s), or any combination thereof. For

example, the deformable element and/or the securement might have a variable cross-section, a variable density, a variable material, and/or the like along its length. A variable cross-section, in turn, can be provided by variation in thickness or shape, or twisting of the deformable element otherwise having a constant thickness or shape along its length.

[0048] As briefly described above, a deformable element may include a cover, sleeve, overmold, or other suitable structure, which might protect other elements (e.g., wire, spring, etc.) of the deformable element and might control, guide, support and/or otherwise affect the flexure or compression of the deformable element. In some aspects, the cover, based on its material of manufacture, shape, geometry, etc., is configured to facilitate mechanical stress distribution by transferring mechanical bending/deforming forces from the deformable element (e.g., from the wire(s) or spring) to the cover to prevent, or at least inhibit, the deformable element from damage or breakage that may otherwise result from the concentrated and repeated mechanical stress experienced by the deformable element. For example, the cover may have dimensions that vary along its length, such as a funnel-like tapering shape, to help distribute stress and contribute to the dynamic flexing of the deformable element. In the event that the deformable element breaks, the cover might still provide at least some degree of bias, thereby still helping to move the ankle collar from the lowered position to the raised position. Further, the cover may provide additional padding and/or support to the deformable element and may prevent, or at least inhibit, a wearer from feeling the deformable element.

[0049] As briefly described above, the center connecting band may also be referred to as a heel piece. The center connecting band may be integrally formed with the medial and lateral lever arms, as a single, continuous unit. In other aspects, the center connecting band may be a separate piece that extends between, and bridges, the medial and lateral lever arms. Among other things, the center connecting band may provide a coupling to the upper and may provide a frame to the ankle collar, to inhibit the ankle collar from collapsing into the foot-receiving opening when a foot is being inserted.

[0050] When being put on by a wearer, a footwear article with a collar elevator (e.g., collar elevators **350** and **450**) might be slipped on by the wearer without the wearer using his or her hands to manipulate the footwear article. For example, the wearer's toes may be inserted through the foot-insertion openings **318** or **418**, while the arch or heel of his or her foot is used to press downward on the ankle collars **336** or **436** towards the soles **312** or **412**. This adjustment of the ankle collar **336** or **436** into the lowered state closer to the sole may increase a size of the foot-insertion opening **318** or **418**. Once the wearer's foot has been slid into the foot-receiving cavity **316** or **416**, the collar elevator **350** or **450** moves the ankle collar from the lowered state (i.e., FIGS. **3**C and **4**C) to the raised state (i.e., FIGS. **3**A and **4**A) to help secure the footwear article to the wearer's foot.

[0051] Among other things, the collar elevators **350** and **450** may reduce potential structural breakdown of the upper heel region and upper ankle region over time, which could result from repeated hands-free donning, by providing a frame operational to return to, or bias in, the raised state. Furthermore, the collar elevators **350** and **450** may allow the user to more easily don (i.e., put on) his or her shoes without the use of hands and/or without having to bend down to tie the laces, without having to use a shoe horn, or without using other such adjustment features, elements, or mechanisms for fit. Moreover, the footwear articles **310** and **410** may more easily receive, or more easily direct a wearer's foot into, or otherwise accommodate, a wearer's foot with respect to, the foot-receiving opening. This potentially easier donning may result from, among other things, the collar elevators **350** and **450** helping to provide a larger foot-insertion opening without allowing a topline of the ankle collar to fold inward towards the foot-receiving cavity.

[0052] Operation of the footwear articles **310** and **410** may be described in various manners. For example, the ankle collars **336** and **436** may be elastic or may include a goring element that permits expansion of the foot-insertion openings **318** and **418**, such as when the ankle collar is moved to a lowered state. In the lowered state, the foot-insertion openings **318** and **418** may be expanded by at least about 5%, or at least about 10%, or at least about 15%. This measured expansion may be detected in various manners. For example, a first circumference of the foot-insertion opening may be measured when the ankle collar is in a first state, and a second circumference may be measured when the ankle collar is in a second state, which is closer to the sole (relative to the first state). The distance of the ankle collar from the sole in the first and second states may be measured in a vertical plane (i.e., perpendicular relative to the horizontal reference plane, including a flat ground surface on which the ground-contacting surface sits in an at-rest position), and the distance may be measured from a rearmost point of the ankle collar topline edge to a topline edge of the sole (e.g., where the sole connects to the upper at the biteline). As such, the distance in the first state will be longer than the distance in the second state, and in one aspect, the second distance is equal to or shorter than 75% of the first distance. Continuing with the above example, in the second state having the distance equal to or shorter than 75% of the distance in the first state, the circumference may be expanded by at least about 5%, or at least about 10%, or at least about 15%. In a further example, a circumference of the foot-insertion openings **318** and **418** may be expandable by at least about 1.0 inch (about 2.54 centimeters), when the ankle collar is in the second state having the distance equal to or shorter than 75% of the distance in the first state. An amount of the expansion of the foot-insertion opening **318** and **418** may vary with the shoe style and size. In other aspects, a height of the ankle collars **336** and **436** above the soles **312** and **412** in the lowered state is about 50% lower than the height in the raised state, however, as with other parameters, this may vary depending on the shoe style and size.

[0053] As described in other portions of this disclosure, the collar elevators **350** and **450** provide a return force when moving the ankle collars **336** and **436** from the lowered state to the raised state. In some aspects, the return force is between about 1 pound-force and about 15 pound-force, and this may be measured at various positions of the ankle collar. For example, as explained above, the ankle collar may include a first state having a first distance from the sole and a second state having a second distance from the sole, which is shorter than the distance in the first state. In one aspect, the collar elevators **350** and **450** provide the return force between about 1 pound-force and about 15 pound-force in the second state having the distance equal to or shorter than

about 85% of the distance in the first state. In a further aspect, the collar elevators **350** and **450** provide the return force between about 1 pound-force and about 15 pound-force in the second state having the distance equal to or shorter than about 75% of the distance in the first state. Further still, the collar elevators **350** and **450** might provide the return force between about 1 pound-force and about 15 pound-force in the second state having the distance equal to or shorter than about 50% of the distance in the first state. The return force may be strong enough such that the rear of the ankle collar rebounds back up from the second state and snugly fits around the wearer's heel. For example, the ankle collars **336** and **436** may be elevated from the lowered state to the raised state in less than about 1 second, when the distance between the ankle collar and the sole in the lowered state is shorter than 85%, or shorter than 75%, or shorter than 50% of the distance in the raised state. In other aspects, ankle collars **336** and **436** may be elevated from the lowered state to the raised state in less than about 0.5 seconds, when the distance between the ankle collar and the sole in the lowered state is shorter than 85%, or shorter than 75%, or shorter than 50% of the distance in the raised state. And in further aspects, the ankle collars **336** and **436** may be elevated from the lowered state to the raised state in less than about 0.2 seconds, when the distance between the ankle collar and the sole in the lowered state is shorter than 85%, or shorter than 75%, or shorter than 50% of the distance in the raised state. This rebound time is measured absent any counteracting external forces, such as friction that might be imparted by the wearer's heel.

[0054] Referring now to FIGS. **5-9**, another footwear article **510** is described having an upper **514** coupled to a sole **512**. The upper **514** includes a heel region **524** and an ankle region **526** having an ankle collar **536**. The ankle collar **536** is movable between a lowered state (e.g., FIG. **8**) positioned closer to the sole **512** and a raised state (e.g., FIGS. **5** and **6**) positioned farther from the sole **512**. In addition, the footwear article **510** includes a collar elevator **550** coupled to the heel region **524** of the upper, to the ankle region **526** of the upper, near or to the ankle collar **536**, or to any combination thereof, and operable to move the ankle collar **536** from the lowered state to the raised state. For example, as explained in other portions of this disclosure, the center connecting band **556** may be affixed to (or near) the rear portion of the ankle collar **536**, and/or the lever arms **552** and **554** may be affixed to the heel region **524** of the upper. The collar elevator **550** is an example of one type of collar elevator, and in other aspects of this disclosure, the footwear article **510** may include any of a variety of other collar elevators disclosed in this specification. The upper **514** is tongue-less, such that the vamp extends all the way from the forefoot region up to the front, topline edge of the ankle collar **536**. In an alternative aspect, the upper **514** might include a throat (e.g., **38**), a tongue (e.g., **42**), and a closure system (such as hook-and-loop straps, elastic bands, laces **44**, and the like).

[0055] In an aspect of the disclosure, the ankle collar **536** includes an ankle-collar, medial-side portion **560**; an ankle-collar, lateral-side portion **562**; and an ankle-collar, rear-transverse portion **564** that wraps around the back side and connects the medial-side portion **560** and the lateral-side portion **562**. In FIGS. **5-9**, the portions **560**, **562**, and **564** extend continuously from one to another, such that the ankle collar **536** continuously extends from the medial side, through the rear transverse portion, and to the lateral side. The portions **560**, **562**, and **562** are not necessarily intended to provide precise demarcations along the ankle collar **536**, and may be helpful when describing the relative positioning of features.

[0056] In another aspect of the disclosure, the ankle collar **536** is asymmetric and includes a first set of structures or properties in the medial-side portion **560** that are different from a second set of structures or properties in the lateral-side portion **562**. For example, in one aspect of this disclosure, the ankle collar **536** includes a gusset **570** along the medial-side portion **560** without a corresponding gusset along the lateral-side portion **562**.

[0057] As used in this disclosure, a "gusset" includes a piece of a textile (e.g., panel or strip) that is affixed to, and expands, a portion of the ankle collar. For example, the gusset **570** may include an elastic material that includes a first, at-rest state, that stretches when the ankle collar is depressed (such as when a wearer is slipping his or her foot through the foot-insertion opening), and that returns to the first, at-rest state when the ankle collar returns to the raised position. In this sense, the gusset **570** provides a temporary expansion of the ankle collar **536**, which may also increase a size of the foot-insertion opening **518**. In one aspect, the ankle collar **536** includes a v-shaped notch **537** in a topline edge **571**, and the v-shaped notch **537** tapers from a wider mouth **539** along the topline edge **571** to a narrower base **541** as the v-shaped notch **537** extends from the topline edge **571** towards the sole **512**. In addition, the elastic material of the gusset **570** spans the v-shaped notch **537** to permit temporary expansion of the ankle collar **536** along the topline edge **571**. For example, FIG. **8** provides an illustration of a wearer W inserting his or her left foot through the foot-insertion opening **518** and using his or her foot to depress the ankle collar **536** (e.g., in the rear-transverse portion **564**). As illustrated in FIG. **8**, the gusset **570** is in a more stretched or elongated state than the at-rest state depicted in FIG. **6**. The gusset **570** is depicted as mostly unobscured. For example, the gusset may be affixed to the upper around the edges of the gusset material panel. In some other instances, a gusset may include a strip of material, and at least part of the strip may be encased between material layers of the ankle collar or of the ankle region.

[0058] Further, as used in this disclosure, a "corresponding gusset" refers to a gusset having a substantially similar configuration as another gusset, including a similar size, shape, material, angular orientation, and position along the longitudinal orientation (i.e., front-to-back such that the gusset and the corresponding gusset are substantially aligned in the medial-to-lateral orientation). As stated above, in an aspect of this disclosure, a footwear article includes a gusset (e.g., **570**) along the medial-side portion (e.g., **560**) without a corresponding gusset along the lateral-side portion (e.g., **562**). As such, along the lateral-side portion the footwear article may include a smaller gusset, a gusset constructed of a different material, a gusset positioned more forward or rearward, a gusset having a different angular orientation, or any and all combinations thereof. In a further example, the lateral-side portion of the footwear article may not include any gusset, as illustrated in FIGS. **5-7**.

[0059] In accordance with an aspect of this disclosure, a footwear article having a gusset along the medial-side portion without a corresponding gusset along the lateral-side portion may operate in various manners. Referring to FIG.

9, a top view is depicted of the footwear article **510** with the ankle collar **536** in a more stretched state, such as when the ankle collar **536** is depressed. As compared with the at-rest state in FIG. **7**, the ankle collar **536** in FIG. **9** has elongated more in the medial-side portion **560** than in the lateral-side portion **562**. Varied elongation and expansion at differing portions of the ankle collar **536** may provide utility in various contexts. For example, the position of elongation elements (e.g., gussets) may be configured to correspond with donning/doffing techniques or limitations of some wearers. That is, in some instances, a wearer may more commonly depress on the ankle collar **236** at a position (e.g., **275**) closer to the medial side than to the lateral side. A wearer might depress the ankle collar **236** at the position **275**, as opposed to a more centrally located position, for various reasons. For example, a wearer may have limited dexterity and range-of-motion that may make the position **275** an easier target for depressing the ankle collar. In other instances, it may be more natural for a wearer to bank or twist the lateral portion of his or her foot (e.g., supination) downward as his or her foot is inserted through the foot-insertion opening, and this rotation may adjust his or her heel inward and more aligned with the position **275**. In other instances, when doffing a footwear article, the wearer's heel may not be lifted along a path in direct alignment with the more centrally positioned location **277**. For example, the heel might be pulled from the foot-insertion opening **518** along a path that is more aligned with the position **275**, such that the expansion along the medial-side portion **560** is positioned to facilitate easier footwear removal.

[0060] In other instances, a wearer may still apply depression forces in the more centrally positioned location **277**, and not including a corresponding gusset along the lateral-side portion **264** may preserve the structure of the lateral-side portion **264** for other purposes. For example, when a corresponding gusset is not included along the lateral-side portion **264**, then a selected esthetic of lateral-side portion **264** (and the ankle region **526** and heel region **524**) may be preserved or different functional elements may be included within the lateral-side upper that might otherwise be disrupted by a corresponding gusset. Examples of different functional elements might include a textile having a stiffness, an amount of breathability, an amount of insulation, an amount of water resistance, and the like.

[0061] FIGS. **5-9** depict one example in which the lateral-side portion **562** does not include any gusset. In other aspects, the lateral-side portion may include a gusset that is not a corresponding gusset, since the gusset on the lateral side includes a different size, a different shape, a position, a different angular orientation, a different material, or any combination thereof. For example, in FIG. **10** the lateral-side gusset **580**A is not a corresponding gusset, relative to the medial-side gusset **570**, because the lateral-side gusset **580**A is smaller (i.e., narrower), even though the lateral-side gusset **580**A and the medial-side gusset **570** are aligned in the medial-to-lateral orientation and include similar angular orientations. In another example, provided by FIG. **11**, the lateral-side gusset **580**A includes a different longitudinal position than the gusset **270**, such that the gussets **580**A and **570** are not latitudinally aligned in the medial-to-lateral orientation. As such, gusset **580**/*b* is not a corresponding gusset even though it has a similar size, shape, and angular orientation. FIG. **12** provides another example, and the lateral-side gusset **580**C is not a corresponding gusset, relative to the medial-side gusset **570**, because the lateral-side gusset **580**C has a different shape, even though the lateral-side gusset **580**C and the medial-side gusset **570** are aligned in the medial-to-lateral orientation and include similar size and angular orientations. In FIG. **13**, the lateral-side gusset **580**D is not a corresponding gusset, relative to the medial-side gusset **570**, because the lateral-side gusset **580**D has a different angular orientation. The angular orientation of a gusset may be determined in various manners. For example, a reference line may extend from the midpoint of a gusset base to the midpoint of a gusset mouth, and angle may be measured at which the reference line intersects a horizontal reference plane (e.g., flat ground surface on which the ground-contacting surface sits in an at-rest position). FIGS. **10-13** are merely examples of some various footwear article with collar elevators and with asymmetric ankle collars, and in other aspects, a non-corresponding gusset on the lateral side may have other differences as compared with a medial-side gusset.

[0062] As indicated in other portions of this disclosure, the ankle collar **536** is asymmetric and includes a first set of structures or properties in the medial-side portion **560** that are different from a second set of structures or properties in the lateral-side portion **562**. FIGS. **5-13** illustrate some aspects in which the footwear article includes a gusset along the medial-side portion **560** without a corresponding gusset along the lateral-side portion **562**. The ankle collar **536** may be asymmetric in other ways, as well. For example, referring to FIGS. **14** and **15** an alternative footwear article **610** is depicted having a collar elevator **650**. In addition, the medial-side portion **660** may include a first upper construction having a first set of one or more materials arranged in one or more material layers, and the lateral-side portion **662** may include a second upper construction having a second set of one or more materials arranged in one or more material layers. In accordance with an aspect of this disclosure, the first upper construction may include different material properties than the second upper construction. Examples of material properties that might differ include a modulus of elasticity or a stiffness. These properties might be measured using one or more standards or testing methodologies determined to be appropriate by an ordinary skilled artisan. For example, a modulus of elasticity of the first upper construction and the second upper construction might be measured pursuant to ASTM WK 27572 (initiated on Feb. 11, 2010), ASTM D5034, or a similar testing methodology. If ASTM D5034 is applied, then in one aspect the longer side of the test specimens would align in the fore-to-aft orientation along the upper.

[0063] In a further aspect, the first upper construction of the medial-side portion **660** includes a lower modulus of elasticity than the second upper construction. In another aspect, the first upper construction of the medial-side portion **660** is more flexible than the second upper construction. Furthermore, the medial-side portion **660** might be both more elastic and more flexible than the lateral-side portion **662**. Greater elasticity, greater flexibility, or a combination thereof may contribute to an operation of the footwear article **610** in various ways. For example, the ankle-collar asymmetry including greater elasticity and/or greater flexibility along the medial-side portion **660** might facilitate more expansion along the medial side during donning and doffing, similar to the operation described with respect to FIG. **9**.

[0064] The first construction may be different from the second construction in various ways. For example, the first construction may include a first knit structure and the second construction may include a second knit structure. The first knit structure may include a stitch size or a stitch type that contributes to the lower modulus of elasticity, the more flexibility, or the combination thereof. In another example, the first construction may include a material with higher elastic yarn content, the second construction may include one or more additional material layers not included in the first construction, or a combination thereof.

[0065] In another alternative example, referring to FIGS. **16** and **17**, another footwear article **710** is depicted having a collar elevator **750**. In addition, the medial-side portion **760** of the ankle collar includes a medial-side topline edge **761**, and the lateral-side portion **762** includes a lateral-side topline edge **763**. In an aspect of the disclosure, the ankle collar **736** is asymmetric based on the differences between the medial-side topline edge **761** and the lateral-side topline edge **763**. For example, the medial-side topline edge **761** has a valley that dips downward more aggressively towards the sole **712** as it extends from an anterior portion to a posterior portion. In contrast, the lateral-side topline edge **763** extends more horizontally without an aggressive dip as the lateral-side topline edge **763** extends anteriorly to posteriorly. The topline edges **761** and **763** may be compared in various manners. For example, the inferior most portion of the medial-side topline edge **761** is closer to the sole **712** than the inferior most portion of the lateral-side topline edge. In addition, the medial-side topline edge **761** is longer than the lateral-side topline edge **763**. For example, if a first medial-to-lateral reference plane extends through points **780**A and **780**B and a second medial-to-lateral reference plane, which is parallel to the first, extends through points **782**A and **782**B, then a length of the medial-side topline edge **761** between the planes is longer than a length of the lateral-side topline edge **763** between the planes.

[0066] The more inferior portion of the medial-side topline edge **761**, the longer length of the medial-side topline edge **761**, or a combination thereof may contribute to an operation of the footwear article **710** in various ways. For example, the ankle-collar asymmetry including the differences in the topline edges **761** and **763** might facilitate more expansion along the medial side during donning and doffing, similar to the operation described with respect to FIG. **9**. In operation, when the ankle collar undergoing a depression cycle (such as during a hands-free donning operation when the foot is pressing down on the ankle collar) the straighter and more superior lateral-side topline edge **763** may provide tension and resistance to rearward collapsing earlier in the depression cycle (and throughout the depression cycle), as compared with the medial-side topline edge **761**, which may be more susceptive to deformation in the medial-side, heel portion of the upper **724**.

[0067] Some aspects of this disclosure have been described with respect to the examples provided in the figures. Additional aspects of the disclosure will now be described that may be related subject matter included in one or more claims or clauses of this application at the time of filing, or one or more related applications, but the claims or clauses are not limited to only the subject matter described in the below portions of this description. These additional aspects may include features illustrated by the figures, features not illustrated by the figures, and any combination thereof. When describing these additional aspects, reference may be made to elements depicted by the figures for illustrative purposes.

[0068] An aspect of this disclosure is directed to a footwear article comprising a sole. The footwear article also comprises an upper coupled to the sole, which as a heel region and an ankle region. Additionally, the footwear article comprises an ankle collar positioned in the ankle region. The ankle collar includes an ankle-collar medial side and an ankle-collar lateral side, wherein the ankle collar is movable between a lowered state positioned closer to the sole and a raised state positioned farther from the sole. The footwear article comprises a collar elevator positioned in at least the heel region and operable to move the ankle collar from the lowered state to the raised state. Furthermore, the footwear article comprises a gusset positioned along the ankle-collar medial side without a corresponding gusset along the ankle-collar lateral side.

[0069] Another aspect of this disclosure is directed to a footwear article comprising a sole. The footwear article also comprises an upper coupled to the sole, which as a heel region and an ankle region. The footwear article comprises an ankle collar positioned in the ankle region as well. The ankle collar consists of an ankle-collar medial side and an ankle-collar lateral side, wherein the ankle collar is movable between a lowered state positioned closer to the sole and a raised state positioned farther from the sole. The ankle-collar medial side includes a medial-side topline edge and the ankle-collar lateral side includes a lateral-side topline edge, which does not mirror the medial-side topline edge. Further, the footwear article comprises a collar elevator positioned in at least the heel region, which is operable to move the ankle collar from the lowered state to the raised state.

[0070] In addition, an aspect of this disclosure is directed to a footwear article comprising a sole. The footwear article also comprises an upper coupled to the sole, which has a heel region and an ankle region with an ankle collar. The ankle collar includes an ankle-collar medial side and an ankle-collar lateral side. The ankle-collar medial side, in response to an applied force, comprises a lower modulus of elasticity, more flexibility, or a combination thereof, than the ankle-collar lateral side. The ankle collar is reversibly movable from a raised state positioned farther from the sole to a lowered state positioned closer to the sole in response to the applied force. Additionally, the footwear article comprises a collar elevator positioned in the heel region and operable to move the ankle collar from the lowered state to the raised state when the applied force is removed.

[0071] From the foregoing, it will be seen that this invention is one well adapted to attain all the ends and objects hereinabove set forth together with other advantages which would be realized by an ordinary skilled artisan and which are inherent to the structure.

[0072] It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

[0073] Since many possible aspects may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

[0074] As used herein and in connection with the claims listed hereinafter, the terminology "any of clauses" or simi-

lar variations of said terminology is intended to be interpreted such that features of claims/clauses may be combined in any combination. For example, an exemplary clause 4 may indicate the method/apparatus of any of clauses 1 through 3, which is intended to be interpreted such that features of clause 1 and clause 4 may be combined, elements of clause 2 and clause 4 may be combined, elements of clause 3 and 4 may be combined, elements of clauses 1, 2, and 4 may be combined, elements of clauses 2, 3, and 4 may be combined, elements of clauses 1, 2, 3, and 4 may be combined, and/or other variations. Further, the terminology "any of clauses" or similar variations of said terminology is intended to include "any one of clauses" or other variations of such terminology, as indicated by some of the examples provided above.

[0075] The following clauses are aspects contemplated herein.

[0076] Clause 1. A footwear article comprising: a sole; an upper coupled to the sole and having a heel region and an ankle region; an ankle collar positioned in the ankle region and having an ankle-collar medial side and an ankle-collar lateral side, wherein the ankle collar is movable between a lowered state positioned closer to the sole and a raised state positioned farther from the sole; a collar elevator positioned in at least the heel region and operable to move the ankle collar from the lowered state to the raised state; and a gusset positioned along the ankle-collar medial side without a corresponding gusset along the ankle-collar lateral side.

[0077] Clause 2. The apparatus of any of the clauses, wherein the collar elevator stores potential energy by elastically deforming from a first configuration to a second configuration when an applied force moves the ankle collar from the raised state to the lowered state, and wherein the potential energy returns the collar elevator to the first configuration upon removal of the applied force.

[0078] Clause 3. The apparatus of any of the clauses, wherein the collar elevator includes a medial lever arm, a lateral lever arm, and a center connecting band that couples the medial lever arm to the lateral lever arm and that is located in a rear portion of the ankle collar.

[0079] Clause 4. The apparatus of any of the clauses, wherein ankle-collar lateral side does not include a gusset.

[0080] Clause 5. The apparatus of any of the clauses, wherein the ankle-collar lateral side includes a non-corresponding gusset that is smaller than the gusset.

[0081] Clause 6. The apparatus of any of the clauses, wherein the ankle-collar lateral side includes a non-corresponding gusset comprising a first material, which is less elastic than a second material of the gusset.

[0082] Clause 7. The apparatus of any of the clauses, wherein the ankle-collar lateral side includes a non-corresponding gusset that is positioned more anterior than the gusset.

[0083] Clause 8. The apparatus of any of the clauses, wherein the ankle-collar lateral side includes a non-corresponding gusset having a different angular orientation than the gusset.

[0084] Clause 9. The apparatus of any of the clauses, wherein the ankle-collar lateral side includes a non-corresponding gusset having a different shape than the gusset.

[0085] Clause 10. A footwear article comprising: a sole; an upper coupled to the sole and having a heel region and an ankle region; an ankle collar positioned in the ankle region and having an ankle-collar medial side and an ankle-collar lateral side, wherein the ankle collar is movable between a lowered state positioned closer to the sole and a raised state positioned farther from the sole, wherein the ankle-collar medial side includes a medial-side topline edge and the ankle-collar lateral side includes a lateral-side topline edge, which does not mirror the medial-side topline edge; and a collar elevator positioned in at least the heel region and operable to move the ankle collar from the lowered state to the raised state.

[0086] Clause 11. The apparatus of any of the clauses, wherein the medial-side topline edge includes a first topline-edge portion extending from an anterior position to a posterior position, wherein the lateral-side topline edge includes a second topline-edge portion extending from the anterior portion to the posterior portion, and wherein the first topline-edge portion includes a deeper valley than the second topline-edge portion.

[0087] Clause 12. The apparatus of any of the clauses, wherein a most inferior portion of the first topline-edge portion is closer to the sole than a most inferior portion of the second topline-edge portion.

[0088] Clause 13. The apparatus of any of the clauses, wherein the first topline-edge portion is longer than the second topline-edge portion.

[0089] Clause 14. A footwear article comprising: a sole; an upper coupled to the sole and having a heel region and an ankle region with an ankle collar; the ankle collar comprising an ankle-collar medial side and an ankle-collar lateral side, wherein in response to an applied force, the ankle-collar medial side comprises a lower modulus of elasticity, more flexibility, or a combination thereof, than the ankle-collar lateral side; wherein the ankle collar is reversibly movable from a raised state positioned farther from the sole to a lowered state positioned closer to the sole in response to the applied force; and a collar elevator positioned in the heel region and operable to move the ankle collar from the lowered state to the raised state when the applied force is removed.

[0090] Clause 15. The apparatus of any of the clauses, wherein the ankle-collar medial side includes a first knit structure, wherein the ankle-collar lateral side includes a second knit structure, and wherein the first knit structure includes a stitch size or a stitch type that contributes to the lower modulus of elasticity, the more flexibility, or the combination thereof.

[0091] Clause 16. The apparatus of any of the clauses, wherein the ankle-collar medial side includes one or more medial-side textiles and the ankle-collar lateral side includes one or more lateral-side textiles, and wherein the one or more medial-side textiles include a higher elastic-yarn content than the one or more lateral-side textiles.

1. A footwear article, comprising:

a sole;

an upper coupled to the sole, the upper having a heel region, an ankle region and a forefoot region, the upper defining a foot-receiving cavity and a foot-insertion

opening into the foot-receiving cavity with a topline edge defining a perimeter around the foot-insertion opening;

a collar support disposed at least partially in the heel region;

wherein the upper is tongue-less and comprises a vamp extending from the forefoot region to the topline edge;

wherein the collar support is operable to move at least partially rearward from a first position to a second position during insertion of a foot through the foot-insertion opening and to return to the first position such that the foot-insertion opening temporarily expands at the topline edge during insertion of the foot in the second position;

wherein the upper has a region of greater elasticity forward of a lowest extent of the topline edge than rearward of the lowest extent, such that the temporary expansion of the foot-insertion opening at the topline edge in the second position is more forward of the lowest extent than rearward of the lowest extent.

2. The footwear article of claim **1**, wherein the collar support is configured to store potential energy as the collar support moves from the first position to the second position upon an applied force during insertion of the foot, and wherein the collar support is configured to be returned to the first position upon removal of the applied force via the stored potential energy.

3. The footwear article of claim **1**, wherein, upon the applied force during insertion of the foot, at least a portion of the heel region of the upper moves downwardly towards the sole.

4. The footwear article of claim **1**, wherein the foot-insertion opening has a medial side and a lateral side, and wherein the region of greater elasticity is on the medial side.

5. The footwear article of claim **1**, wherein the foot-insertion opening has a medial side and a lateral side, and wherein the region of greater elasticity is on the lateral side.

6. The footwear article of claim **5**, further comprising a second region of greater elasticity on the medial side forward of a lowest extent of the topline edge than rearward of the lowest extent.

7. The footwear article of claim **6**, wherein the first region of greater elasticity has a different elasticity than the second region of greater elasticity.

8. The footwear article of claim **6**, wherein the first region of greater elasticity has a different shape than the second region of greater elasticity.

9. The footwear article of claim **1**, wherein the collar support is coupled with the upper in the heel region between an exterior layer of the upper and an inner lining of the upper.

10. The footwear article of claim **1**, wherein the upper comprises a knit textile portion and the region of greater elasticity is a portion of the knit textile.

11. The footwear article of claim **1**, further comprising a base, and wherein the collar support is connected with the base.

12. The footwear article of claim **1**, wherein the collar support is disposed at least partially around a rear of the foot-receiving opening in the heel region.

* * * * *

Exhibit EE

US010130142B2

(12) **United States Patent**
Meir

(10) **Patent No.: US 10,130,142 B2**
(45) **Date of Patent: Nov. 20, 2018**

(54) **ARTICLE OF FOOTWEAR WITH KNITTED COMPONENT HAVING BIASED INTER-TOE MEMBER**

(71) Applicant: **NIKE, Inc.**, Beaverton, OR (US)

(72) Inventor: **Adrian Meir**, Portland, OR (US)

(73) Assignee: **NIKE, Inc.**, Beaverton, OR (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15/058,252**

(22) Filed: **Mar. 2, 2016**

(65) **Prior Publication Data**

US 2016/0302526 A1 Oct. 20, 2016

Related U.S. Application Data

(60) Provisional application No. 62/147,331, filed on Apr. 14, 2015.

(51) **Int. Cl.**
A43B 23/00 (2006.01)
A43B 23/02 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***A43B 23/0245*** (2013.01); ***A43B 1/04*** (2013.01); ***A43B 3/0036*** (2013.01); ***A43B 23/0265*** (2013.01); ***A43B 23/04*** (2013.01)

(58) **Field of Classification Search**
CPC A43B 1/04; A43B 3/0036; A43B 23/0245; A43B 23/0265; A43B 23/04; A43B 23/027; A41B 11/003; A41B 11/004; D04B 1/26
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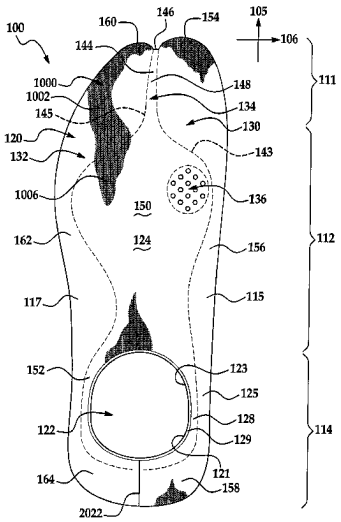
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Primary Examiner — Jameson Collier
Assistant Examiner — Heather Mangine
(74) *Attorney, Agent, or Firm* — Brinks Gilson & Lione

(57) **ABSTRACT**

An article of footwear includes a sole structure and an upper that is attached to the sole structure. The upper includes a forefoot region that is configured to receive a plurality of toes of a foot. The upper includes a first zone having a first elasticity, a second zone having a second elasticity, and a third zone having a third elasticity. The third zone is disposed between the first zone and the second zone. The third elasticity is greater than the first elasticity and the second elasticity. The third zone is configured to bias the first zone and the second zone toward each other. The third zone is biased generally toward the sole structure and configured to be received in a space located between two of the plurality of toes of the foot.

12 Claims, 8 Drawing Sheets



(51) **Int. Cl.**
A43B 3/00 (2006.01)
A43B 23/04 (2006.01)
A43B 1/04 (2006.01)

(58) **Field of Classification Search**
USPC ..... 36/45, 94, 49; 66/178 R, 184, 185, 186
See application file for complete search history.

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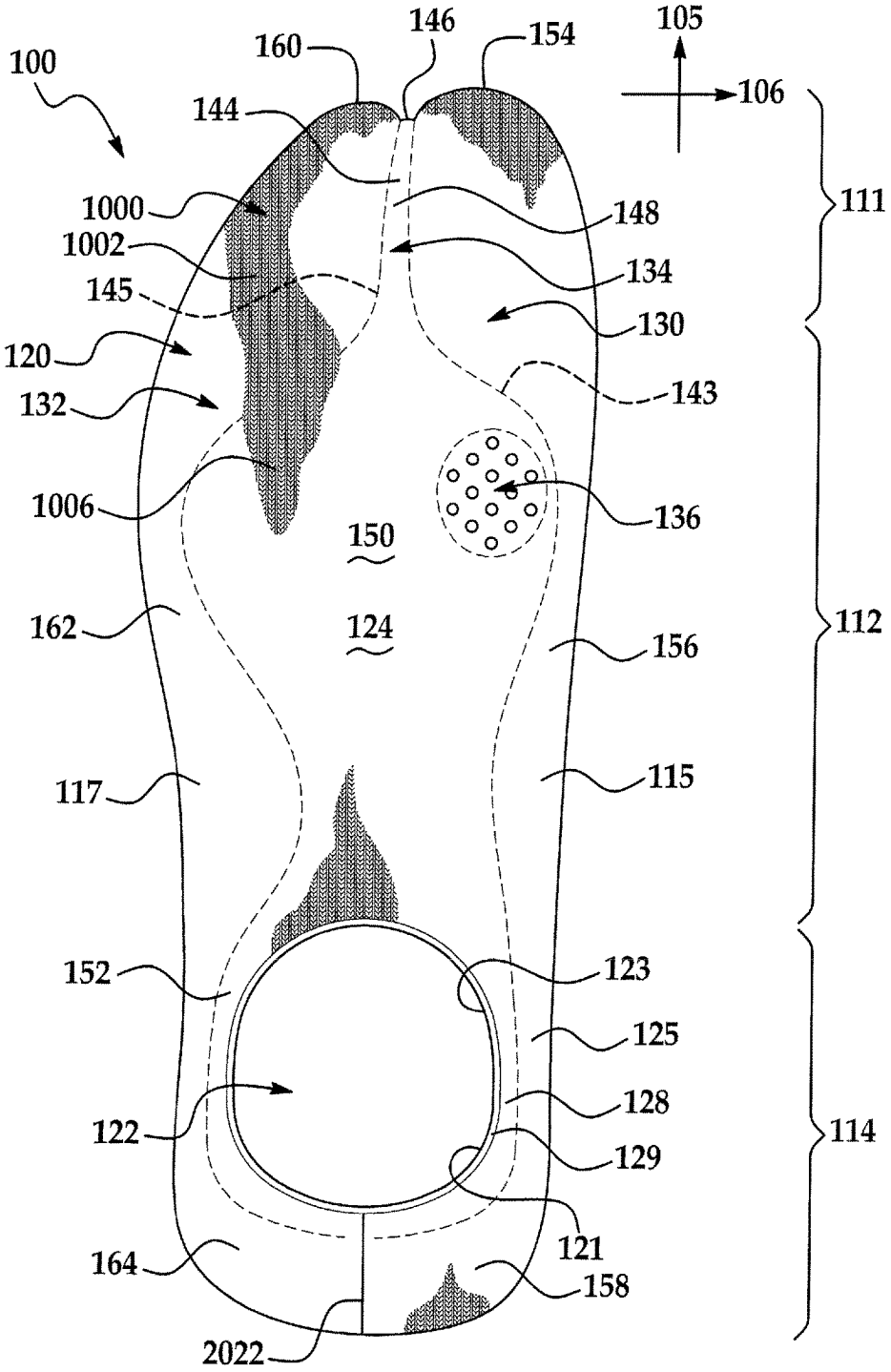

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FIG. 1

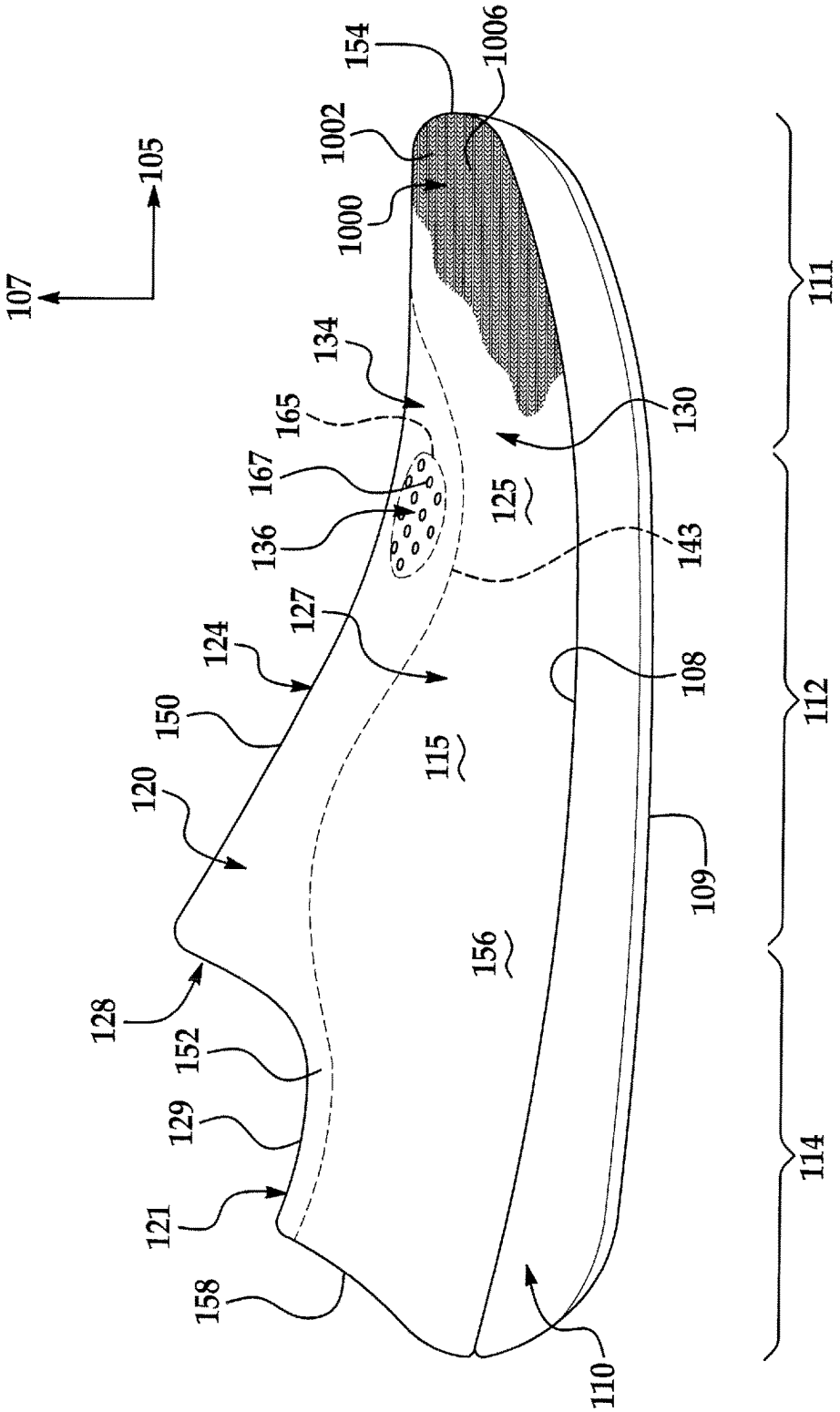

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FIG. 2

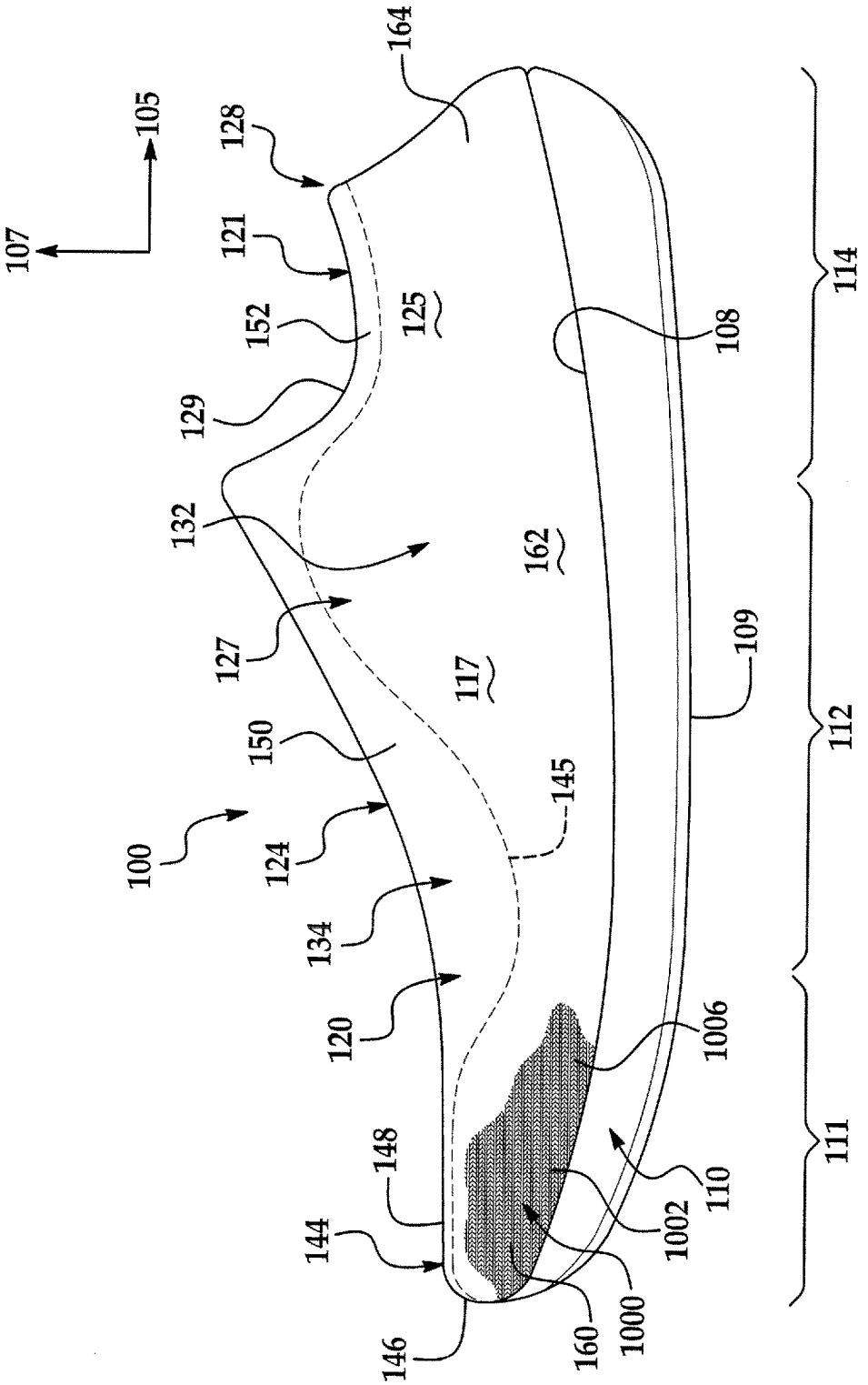

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FIG. 3

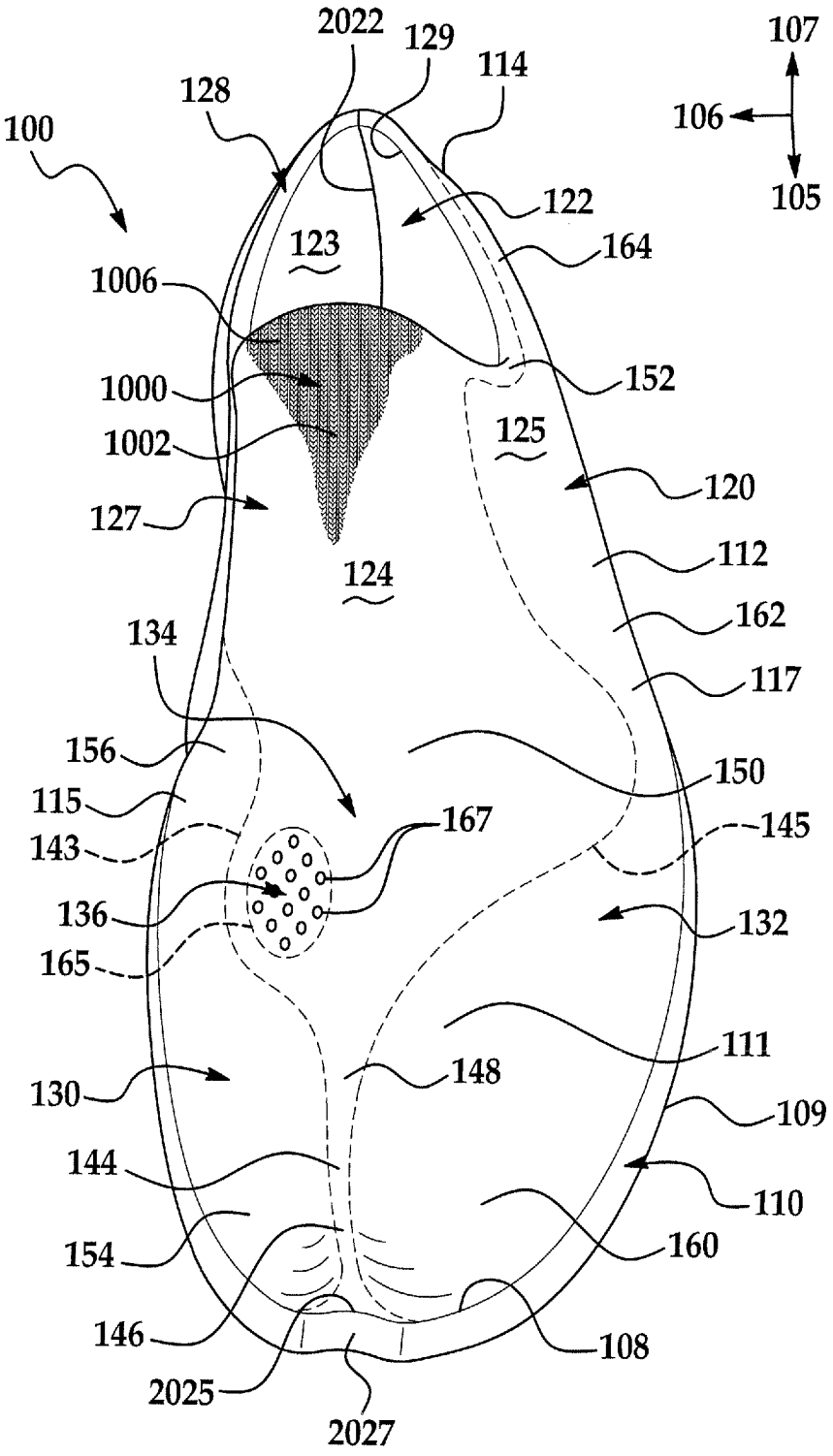

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FIG. 4

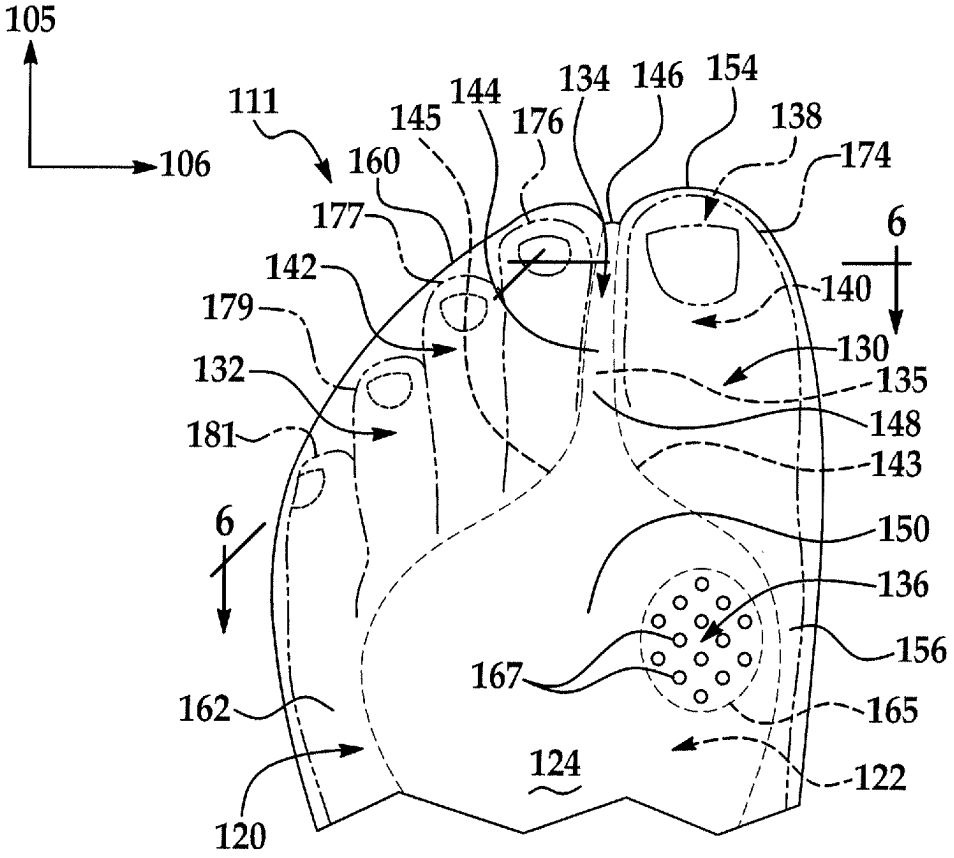

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FIG. 5

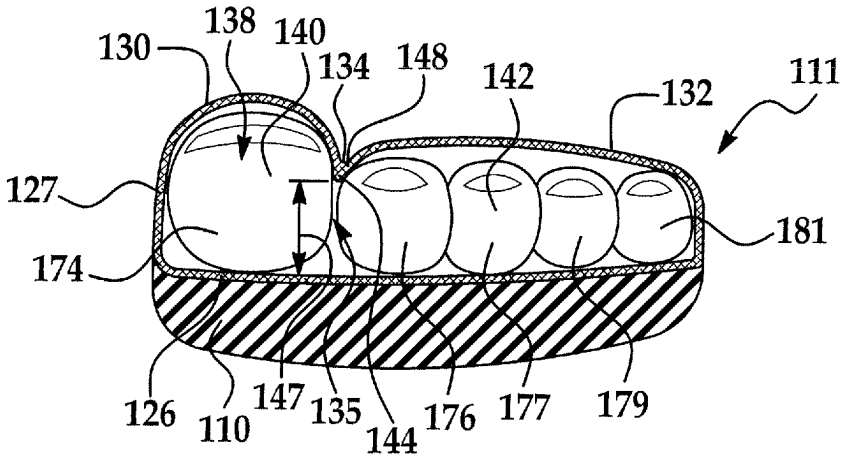

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FIG. 6

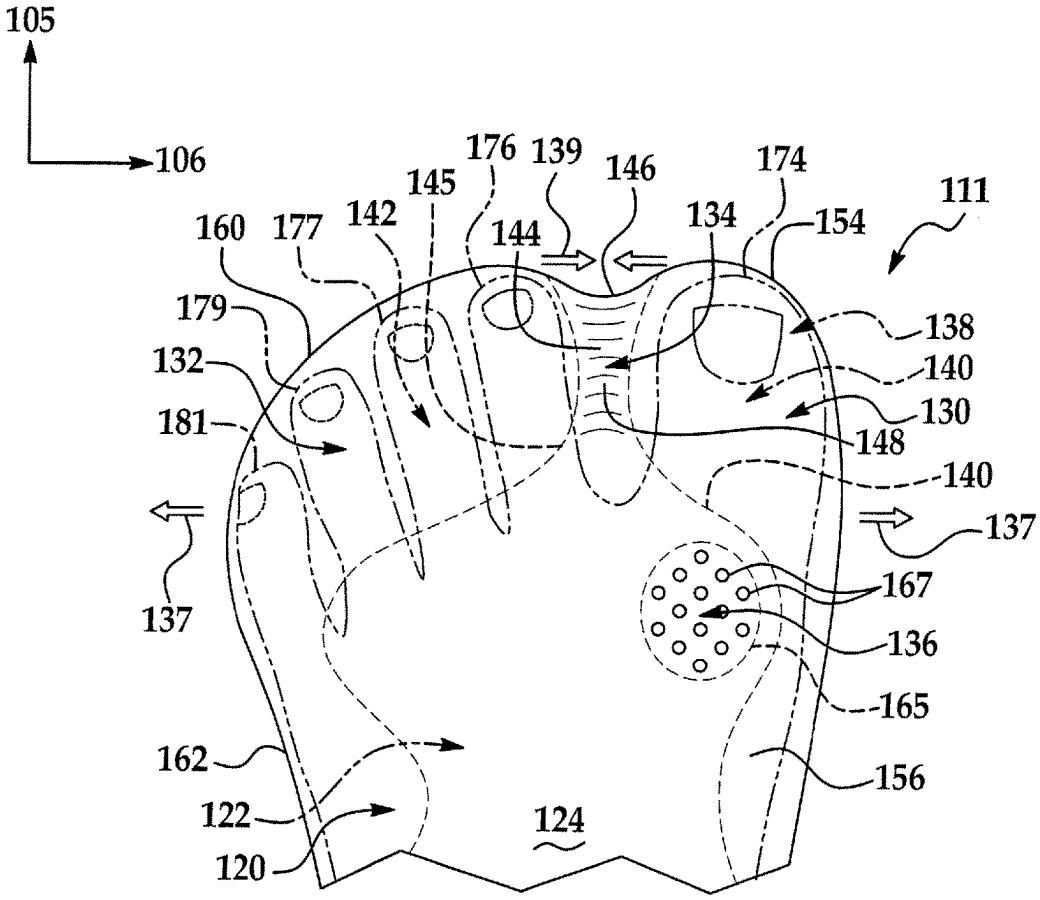

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FIG. 7

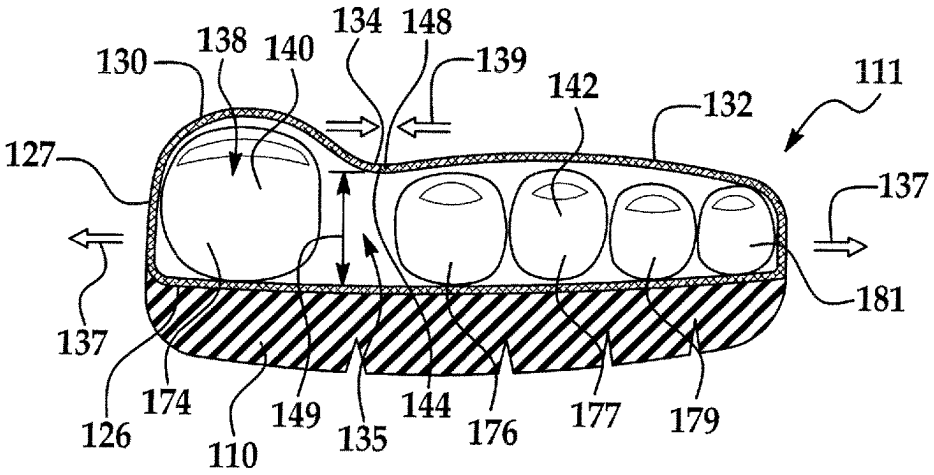

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FIG. 8

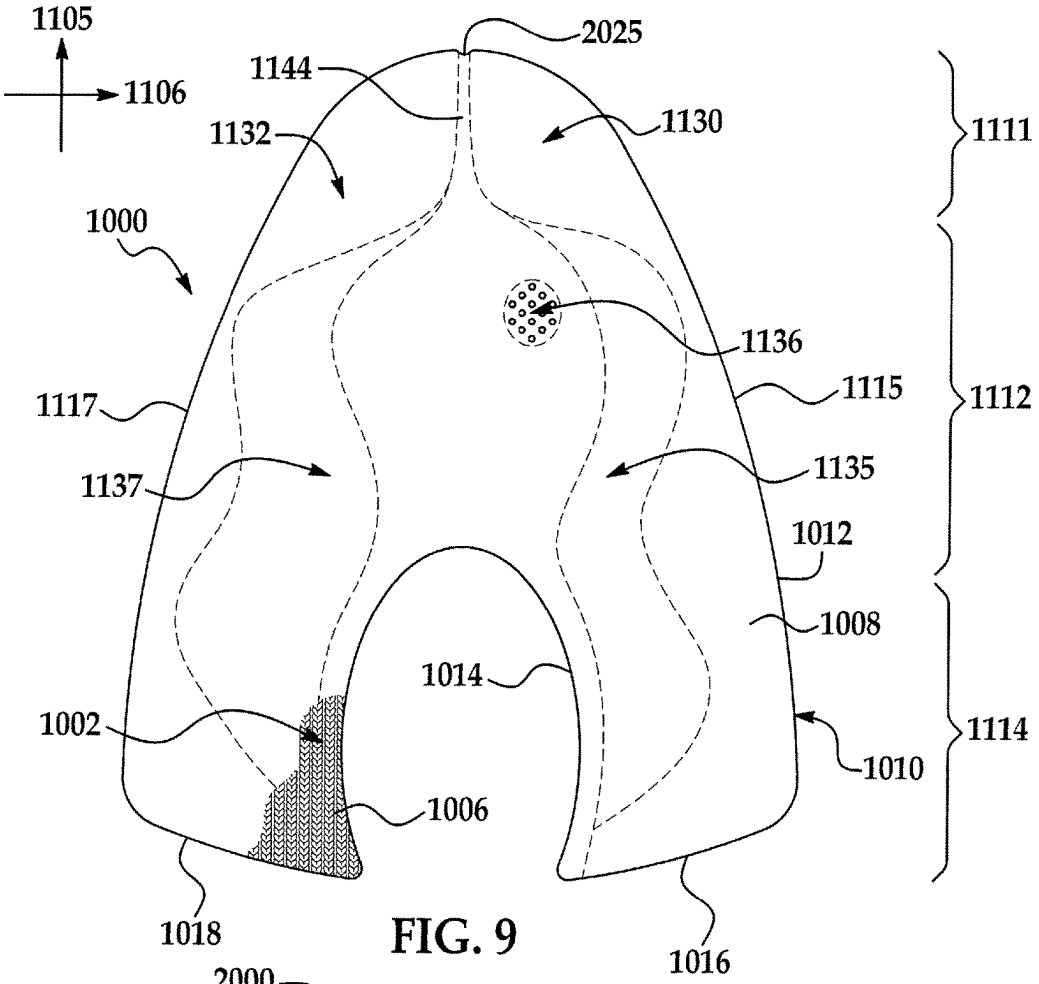

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FIG. 9

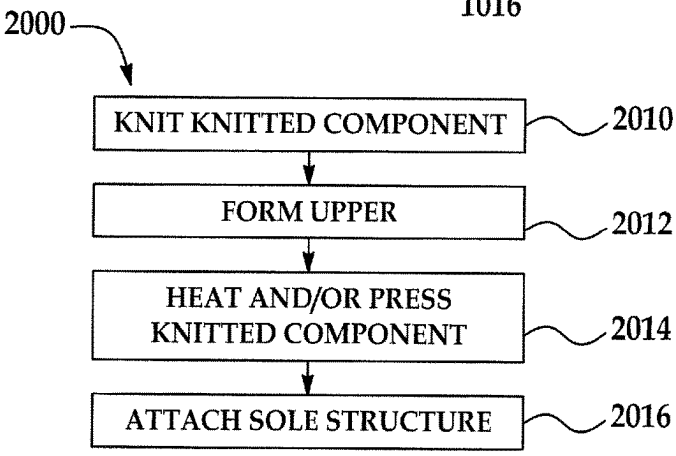

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2012
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2014
ATTACH SOLE STRUCTURE
2016

FIG. 10

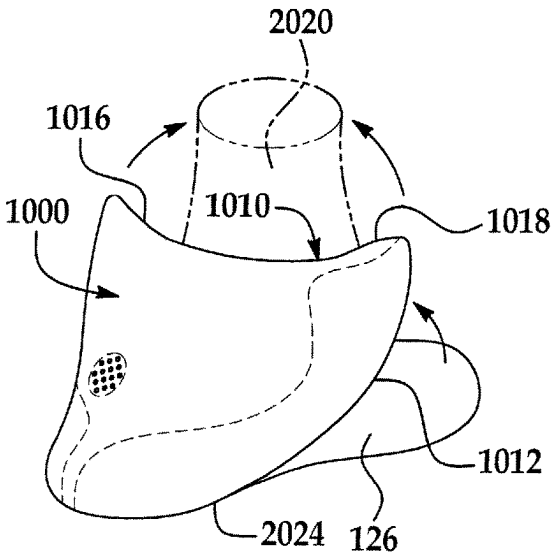


FIG. 11

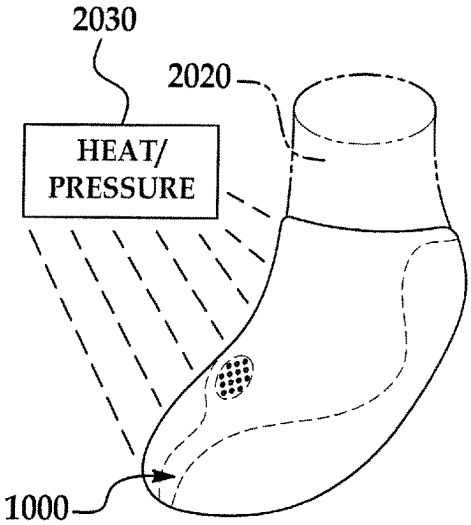


FIG. 12

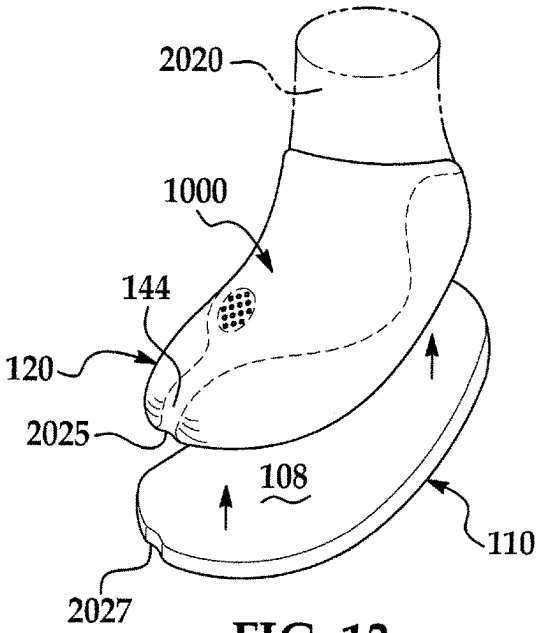


FIG. 13

ARTICLE OF FOOTWEAR WITH KNITTED COMPONENT HAVING BIASED INTER-TOE MEMBER

RELATED APPLICATIONS

This application claims priority to U.S. Provisional Application Ser. No. 62/147,331 filed on Apr. 14, 2015, which is incorporated by reference herein in its entirety.

BACKGROUND

Conventional articles of footwear generally include two primary elements: an upper and a sole structure. The upper is secured to the sole structure and forms a void within the footwear for comfortably and securely receiving a foot. The sole structure is secured to a lower surface of the upper so as to be positioned between the upper and the ground. In some articles of athletic footwear, for example, the sole structure may include a midsole and an outsole. The midsole may be formed from a polymer foam material that attenuates ground reaction forces to lessen stresses upon the foot and leg during walking, running, and other ambulatory activities. The outsole is secured to a lower surface of the midsole and forms a ground-engaging portion of the sole structure that is formed from a durable and wear-resistant material. The sole structure may also include a sockliner positioned within the void and proximal to a lower surface of the foot to enhance footwear comfort.

The upper generally extends over the instep and toe areas of the foot, along the medial and lateral sides of the foot, and around the heel area of the foot. In some articles of footwear, such as basketball footwear and boots, the upper may extend upward and around the ankle to provide support or protection for the ankle. Access to the void on the interior of the upper is generally provided by an ankle opening in a heel region of the footwear. A lacing system is often incorporated into the upper to adjust the fit of the upper, thereby permitting entry and removal of the foot from the void within the upper. The lacing system also permits the wearer to modify certain dimensions of the upper, particularly girth, to accommodate feet with varying dimensions. In addition, the upper may include a tongue that extends under the lacing system to enhance adjustability of the footwear, and the upper may incorporate a heel counter to limit movement of the heel.

Various materials are conventionally utilized in manufacturing the upper. The upper of athletic footwear, for example, may be formed from multiple material elements. The materials may be selected based upon various properties, including stretch-resistance, wear-resistance, flexibility, air-permeability, compressibility, and moisture-wicking, for example. With regard to an exterior of the upper, the toe area and the heel area may be formed of leather, synthetic leather, or a rubber material to impart a relatively high degree of wear-resistance. Leather, synthetic leather, and rubber materials may not exhibit the desired degree of flexibility and air-permeability for various other areas of the exterior. Accordingly, the other areas of the exterior may be formed from a synthetic textile, for example. The exterior of the upper may be formed, therefore, from numerous material elements that each imparts different properties to the upper. An intermediate or central layer of the upper may be formed from a lightweight polymer foam material that provides cushioning and enhances comfort. Similarly, an interior of the upper may be formed of a comfortable and moisture-wicking textile that removes perspiration from the area immediately surrounding the foot. The various material elements and other components may be joined with an adhesive or stitching. Accordingly, the conventional upper is formed from various material elements that each imparts different properties to various areas of the footwear.

SUMMARY

An article of footwear is disclosed that includes a sole structure and an upper that is attached to the sole structure. The upper includes a forefoot region that is configured to receive a plurality of toes of a foot. The upper includes a first zone having a first elasticity, a second zone having a second elasticity, and a third zone having a third elasticity. The third zone is disposed between the first zone and the second zone. The third elasticity is greater than the first elasticity and the second elasticity. The third zone is configured to bias the first zone and the second zone toward each other. The third zone is biased generally toward the sole structure and configured to be received in a space between two of the plurality of toes of the foot.

A method of manufacturing an article of footwear is also disclosed. The method includes forming an upper of the article of footwear to include a first zone, a second zone, and a third zone that is disposed between the first zone and the second zone. The method also includes attaching a sole structure to the upper. Forming the upper includes providing the first zone with a first elasticity, the second zone with a second elasticity, and the third zone with a third elasticity. The third elasticity is greater than the first elasticity and the second elasticity. Also, forming the upper includes forming the third zone such that the third zone biases the first zone and the second zone toward each other. Furthermore, forming the upper includes forming the third zone such that the third zone is biased toward the sole structure and is configured to be received in a space between two of the plurality of toes of the foot.

Moreover, an article of footwear is disclosed that includes a sole structure with an attachment area. The article of footwear includes an upper that is attached to the attachment area of the sole structure. The upper also includes a knitted component formed of unitary knit construction. The knitted component defines a forefoot region and a heel region of the upper. The forefoot region includes a first zone extending from the attachment area and defining a first cavity configured to receive a hallux of the foot. The first zone has a first elasticity. The forefoot region also includes a second zone extending from the attachment area and defining a second cavity configured to receive a second toe of the foot. The second zone has a second elasticity. The forefoot region additionally includes a third zone extending from the attachment area and disposed between the first zone and the second zone. The third zone has a third elasticity that is greater than the first elasticity and the second elasticity. The third zone is biased toward the sole structure and biased generally toward the heel region. The third region is configured to be received within a space between the hallux and the second toe.

In addition, an upper for an article of footwear is disclosed. The upper is configured to attach to a sole structure. The upper includes a knitted component formed of unitary knit construction. The knitted component defines a sole attachment area that is configured to attach to the sole structure. The knitted component defines a forefoot region of the upper. The forefoot region includes a first zone having a first elasticity, a second zone having a second elasticity, and a third zone having a third elasticity. The third zone is disposed between the first zone and the second zone. The

third elasticity is greater than the first elasticity and the second elasticity. The third zone is configured to bias the first zone and the second zone toward each other to define an inter-toe member. The inter-toe member is configured to be biased generally toward the sole structure and is configured to be received in a space between two of the plurality of toes of the foot.

Other systems, methods, features and advantages of the present disclosure will be, or will become, apparent to one of ordinary skill in the art upon examination of the following figures and detailed description. It is intended that all such additional systems, methods, features and advantages be included within this description and this summary, be within the scope of the present disclosure, and be protected by the following claims.

DESCRIPTION OF THE DRAWINGS

The present disclosure can be better understood with reference to the following drawings and description. The components in the figures are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the present disclosure. Moreover, in the figures, like reference numerals designate corresponding parts throughout the different views.

FIG. **1** is a top view of an article of footwear according to exemplary embodiments;

FIG. **2** is a medial view of the article of footwear of FIG. **1**;

FIG. **3** is a lateral view of the article of footwear of FIG. **1**;

FIG. **4** is a front view of the article of footwear of FIG. **1**;

FIG. **5** is a top view of a forefoot region of the article of footwear of FIG. **1**, wherein the forefoot region is shown in a neutral position;

FIG. **6** is a section view of the article of footwear taken along the line **6-6** of FIG. **5**, wherein the forefoot region is shown in the neutral position;

FIG. **7** is a top view of the forefoot region of the article of footwear of FIG. **1**, wherein the forefoot region is shown in a stretched position;

FIG. **8** is a section view of the forefoot region of the article of footwear shown in the stretched position;

FIG. **9** is a plan view of a knitted component of the article of footwear of FIG. **1** according to exemplary embodiments;

FIG. **10** is a flowchart illustrating a method of forming the article of footwear of FIG. **1** according to exemplary embodiments;

FIG. **11** is a schematic illustration of one or more steps of the method of FIG. **10**;

FIG. **12** is a schematic illustration of one or more steps of the method of FIG. **10**; and

FIG. **13** is a schematic illustration of one or more steps of the method of FIG. **10**.

DETAILED DESCRIPTION

The following discussion and accompanying figures disclose an article of footwear having an upper with a forefoot region that covers the toes and that is at least partially received between toes of the wearer. For example, the upper can include an inter-toe member that wedges between the wearer's toes to engage the forefoot region to the foot. The forefoot region can also conform at least partially to the shape of the toes and/or nest against the toes in some embodiments. Moreover, the forefoot region can be flexible and can resiliently stretch in some embodiments to conform and/or nest against the toes. As such, the upper can engage the forefoot of the wearer and provide improved support.

Furthermore, the following discussion and figures disclose an article of footwear having an upper with two or more zones that differ in one or more predetermined characteristics. For example, two or more zones of the upper can differ in elasticity, stretchability, stretch resistance, and resilience. As a result, the upper can be biased toward a position in which predetermined portions are received between the toes.

Additionally, in some embodiments, the upper can include a knitted component. The knitted component can include one or more knitted elastic areas that allow portions of the upper to be received between the toes.

Footwear Configurations

Referring initially to FIGS. **1-4**, an article of footwear **100** is illustrated according to exemplary embodiments. Footwear **100** is disclosed as having a general configuration suitable for running or walking. Concepts associated with footwear **100**, including the upper, may also be applied to a variety of other athletic footwear types, including baseball shoes, basketball shoes, cross-training shoes, cycling shoes, football shoes, soccer shoes, sprinting shoes, tennis shoes, and hiking boots, for example. The concepts may also be applied to footwear types that are generally considered to be non-athletic, including dress shoes, loafers, sandals, and work boots. The concepts disclosed herein apply, therefore, to a wide variety of footwear types.

For reference purposes, footwear **100** may be divided into three general regions: a forefoot region **111**, a midfoot region **112**, and a heel region **114**. Forefoot region **111** can generally include portions of footwear **100** corresponding with forward portions of the wearer's foot, including the toes and joints connecting the metatarsals with the phalanges. Midfoot region **112** can generally include portions of footwear **100** corresponding with middle portions of the wearer's foot, including an arch area. Heel region **114** can generally include portions of footwear **100** corresponding with rear portions of the wearer's foot, including the heel and calcaneus bone.

Footwear **100** can also include a medial side **115** and a lateral side **117**. Medial side **115** and lateral side **117** can extend through forefoot region **111**, midfoot region **112**, and heel region **114** in some embodiments. Medial side **115** and lateral side **117** can correspond with opposite sides of footwear **100**. More particularly, medial side **115** can correspond with an inside area of the wearer's foot and can face toward the wearer's other foot. Lateral side **117** can correspond with an outside area of the wearer's foot and can face away from the wearer's other foot.

Forefoot region **111**, midfoot region **112**, heel region **114**, lateral side **117**, and medial side **115** are not intended to demarcate precise areas of footwear **100**. Rather, forefoot region **111**, midfoot region **112**, heel region **114**, lateral side **117**, and medial side **115** are intended to represent general areas of footwear **100** to aid in the following discussion. These terms can also be used in reference to individual components of footwear **100**.

Footwear **100** can also extend along various directions. For example, as shown in FIGS. **2-4**, footwear **100** can extend along a longitudinal direction **105** and a vertical direction **107**. As shown in FIGS. **1** and **4**, footwear **100** can further extend along a transverse direction **106**. Longitudinal direction **105** can extend generally between heel region **114** and forefoot region **111**. Transverse direction **106** can extend generally between lateral side **117** and medial side **115**. Also, vertical direction **107** can extend substantially perpendicular

to both longitudinal direction **105** and transverse direction **106**. It will be appreciated that longitudinal direction **105**, transverse direction **106**, and vertical direction **107** are merely included for reference purposes and to aid in the following discussion.

Generally, footwear **100** can include a sole structure **110** and an upper **120**. Upper **120** can receive the wearer's foot and secure footwear **100** to the wearer's foot whereas sole structure **110** can extend underneath upper **120** and provide cushioning, traction, and/or support for the wearer's foot.

As shown in FIGS. **2-4**, sole structure **110** can be secured to upper **120** and can extend underneath the wearer's foot. Stated differently, sole structure **110** can include an attachment area **108** that faces upper and that is fixed to upper **120**. Attachment area **108** can be adhesively attached, lasted, or otherwise attached to upper **120**. Also, sole structure **110** can extend between the upper **120** and the ground. Thus, sole structure **110** can include a ground engaging surface **109** that provides traction for the article of footwear **100**. In some embodiments, ground engaging surface **109** can be defined by an outsole, and sole structure **110** can additionally include a midsole that includes padding, foam, fluid-filled bladders, or other components that provide cushioning, dampening of impact loads, and the like.

Also, in some embodiments, sole structure **110** can have relatively high flexibility so as to allow relatively high flexibility of upper **120**. For example, sole structure **110** can include one or more highly flexible materials. Additionally, ground engaging surface **109** can include openings, such as grooves, sipes, recesses, or other features that increase flexibility of sole structure **110**.

Additionally, as shown in FIG. **4**, the periphery of sole structure **110** can include a recess **2025** in some embodiments. Recess **2025** can be disposed in forefoot region **111** in some embodiments. As will be discussed, recess **2025** can provide increased flexibility of sole structure **110** at forefoot region **111**. Also, in some embodiments, recess **2025** can be substantially aligned with features of upper **120** that have increased elasticity such that recess **2025** accommodates flexure of those areas of upper **120**.

As shown in FIGS. **1-4**, upper **120** can extend generally upward from attachment area **108**, between medial side **115** and lateral side **117** of sole structure **110**, and longitudinally from forefoot region **111** to heel region **114** of sole structure **110**. Upper **120** can define a void **122** within footwear **100**. Stated differently, upper **120** can include an inner surface **123** that defines void **122**. Void **122** can receive a foot of a wearer. Upper **120** can additionally include an outer surface **125** that faces opposite inner surface **123**. Upper **120** can also define a collar **128** with an upper edge **129** that defines a collar opening **121**. Collar opening **121** can provide access to void **122** and can allow passage of the foot into and out of upper **120**.

Upper **120** can also include a throat **124** that extends in the longitudinal direction **105** between forefoot region **111** and collar **128**, and in the transverse direction **106** between medial side **115** and lateral side **117**. In some embodiments, throat **124** can include a tongue. In some embodiments, tongue can be attached to forefoot region **111** of upper **120** and can be detached from medial side **115** and/or lateral side **117**. In other embodiments, such as the embodiments of FIGS. **1-4**, upper **120** can be substantially continuous between medial side **115** and lateral side **117** across throat **124**. As such, upper **120** can be "sock-like" and "tongueless."

Additionally, in some embodiments, footwear **100** can include a securement element, such as a shoelace, cable, wire, strap, buckle, or other suitable implements for securing upper **120** to the wearer's foot. In other embodiments, such as the embodiment of FIGS. **1-4**, footwear **100** can be more "sock-like," "lace-less," and/or otherwise without a securement element. In some embodiments, upper **120** can constrict and compress against the wearer's foot for securing footwear **100** to the wearer's foot.

In some embodiments, upper **120** can extend both over the wearer's foot and underneath the wearer's foot. More specifically, as shown in FIG. **6**, upper **120** can include an underfoot part **126** and an overfoot part **127**. Overfoot part **127** can be those areas of upper **120** that are exposed from sole structure **110** and that extend over the wearer's foot. In contrast, underfoot part **126** can be layered directly on sole structure **110**, and underfoot part **126** can extend underneath the wearer's foot. In some embodiments, underfoot part **126** can span underneath the foot between opposite peripheral edges of overfoot part **127**. As such, underfoot part **126** and overfoot part **127** can cooperate to define the void **122** of the upper **120**. It will be appreciated that overfoot part **127** and underfoot part **126** can be a single, integrally attached body. In other embodiments, overfoot part **127** and underfoot part **126** can be removably attached together. In the latter example, overfoot part **127** and underfoot part **126** can form a seam, which is attached via adhesives, stitching, fasteners, or another attachment device. Additionally, it will be appreciated that the underfoot part **126** can be referred to as a "strobel," a "strobel sock," or a "strobel part."

In further configurations, upper **120** may include additional elements. For example, upper **120** can include a toe guard in forefoot region **101** that is formed of a wear-resistant material. Upper **120** can additionally include logos, trademarks, symbols, and placards with care instructions and material information. Those having ordinary skill in the art will appreciate that upper **120** can include still further elements without departing from the scope of the present disclosure.

Also, footwear **100** can additionally include a sockliner that extends underneath the wearer's foot. For example, the sockliner can be a removable insert that is provided within the void **122** and that provides a padded surface underneath the wearer's foot. In some embodiments, underfoot part **126** of upper **120** can be disposed between the sockliner and sole structure **110**.

In some embodiments, upper **120** can include an inter-toe member **144** that is at least partially received between the wearer's toes. The inter-toe member **144** can help engage the upper **120** to the wearer's foot as will be discussed. Furthermore, inter-toe member **144** can cause upper **120** to conform closely to the surfaces of the toes for engaging upper **120** with the foot. Additionally, in some embodiments, inter-toe member **144** can wedge between and maintain some degree of separation between the toes. Thus, in some embodiments, inter-toe member **144** can separate the toes to increase the wearer's stability and/or thrusting power when running. Also, in some embodiments, inter-toe member **144** can act as a barrier to prevent the toes from rubbing together uncomfortably.

Inter-toe member **144** can be defined on a portion of upper **120**, which is directed inward into void **122** and which can be received between the wearer's toes. For example, inter-toe member **144** can be a portion of upper **120** that is partially folded or wrinkled and directed inward into the void **122**.

In some embodiments, upper **120** can be stretchable between an unstretched position and a stretched position. Upper **120** can include inter-toe member **144** when upper

120 is in the unstretched position in some embodiments. For example, when the wearer takes off footwear 100 and upper 120 is unstretched, portions of upper 120 can be directed inward into void 122 to define inter-toe member 144. Additionally, when the foot is received within void 122, inter-toe member 144 can be elastically biased toward a space 135 defined between toes of the wearer's foot. Furthermore, in some embodiments, upper 120 can stretch to accommodate the foot, and in this stretched position, inter-toe member 144 can be elastically biased toward the space 135.

Furthermore, inter-toe member 144 can be defined in a zone of upper 120 having relatively high elasticity. In some embodiments, for example, the highly elastic zone can bias and pull adjacent areas toward each other, causing the highly elastic zone to draw inward into void 122. In some embodiments, the highly elastic zone can at least partially fold inward on itself to form a fold, indentation wrinkle, cleft, or cleavage, which defines inter-toe member 144.

Furthermore, in some embodiments, upper 120 can include a plurality of different regions, areas, or zones that differ in one or more characteristics. For example, the different regions can differ in elasticity, stretchability, stretch-resistance, flexibility, breathability, color, moisture wicking ability, insulation, texture, softness, thickness, stitch density, or in other ways.

For example, in some embodiments discussed below, upper 120 can include multiple zones that differ in elasticity. "Elasticity" as used herein will be understood generally as the tendency of the upper 120 to stretch out under the influence of a stretching force and to recover toward an unstretched condition once the stretching load is reduced. The stretching and recovery can occur in the longitudinal direction 105, the transverse direction 106, and/or the vertical direction 107.

In some embodiments, inter-toe member 144 can be formed in a zone having higher elasticity, and zones of upper 120 that are adjacent to inter-toe member 144 can have lower elasticity. Thus, the zone forming inter-toe member 144 can pull those adjacent areas toward each other, causing upper 120 to conform and nest forefoot area 111 against the metatarsals, toe joints, and/or toes of the wearer's foot. Stated differently, forefoot area 111 of upper 120 can shape against the toes to form multiple toe-shaped cavities. As such, upper 120 can be secured and engaged to the wearer's foot and can flex with the wearer's foot during walking, running, or other activities.

Configurations of Forefoot Region and Other Regions of Upper

Referring now to FIGS. 1, 4, and 5-8, forefoot region 111 and other regions of upper 120 will be discussed according to exemplary embodiments. In some embodiments, forefoot region 111 can generally include a first zone 130, a second zone 132, and a third zone 134.

Third zone 134 can be disposed between first zone 130 and second zone 132 in some embodiments. For example, first zone 130 can be disposed proximate the medial side 115 of upper 120, second zone 132 can be disposed proximate the lateral side 117, and third zone 134 can be disposed centrally, between first zone 130 and second zone 132. Also, in some embodiments, first zone 130, second zone 132, and/or third zone 134 can extend rearward from forefoot region 111, generally into midfoot region 112. Additionally, in some embodiments, first zone 130, second zone 132, and/or third zone 134 can extend rearward from forefoot region 111, generally into heel region 114.

First zone 130 can have a first elasticity, second zone 132 can have a second elasticity, and third zone 134 can have a third elasticity. In some embodiments, the elasticity of third zone 134 can be greater than the elasticity of first zone 130 and the elasticity of second zone 132. As such, when a stretching load is applied to upper 120, third zone 134 can stretch out more than first zone 130 and second zone 132. Stated differently, first zone 130 and second zone 132 can resist stretching while third zone 134 stretches due to the stretching load. In some embodiments, first zone 130 and second zone 132 can be substantially inelastic while third zone 134 can be elastic and stretchable. Additionally, in some embodiments, first zone 130 and second zone 132 can have substantially equal elasticities, and third zone 134 can have greater elasticity than both.

These stretching and elasticity characteristics can be observed and measured in various ways. For example, when the upper 120 is unstretched and in a neutral position, the widths of first zone 130, second zone 132, and third zone 134 can be measured in a direction extending generally between the medial side 115 and the lateral side 117. Then, a stretching force or load can be applied to stretch and elongate the upper 120 substantially in the transverse direction 106. The increase in widths of first zone 130, second zone 132, and third zoned 134 can then be calculated. In additional embodiments, independent specimens of first zone 130, second zone 132, and third zone 134 can be stretch tested individually and compared. Additionally, in some cases, these stretching and elasticity characteristics can be measured using the procedure set forth in ASTM D2594 or its equivalent. In other cases, these stretching and elasticity characteristics can be measured using other industry-accepted standard testing procedures. In some embodiments, third zone 134 can stretch out elastically at least 20% more than first zone 130 and second zone 132 when subjected to the stretching load. In additional embodiments, third zone 134 can stretch out elastically at least 40% more than first zone 130 and second zone 132 when subjected to the stretching load.

The differences in elasticity between first zone 130, second zone 132, and third zone 134 can be achieved in various ways without departing from the scope of the present disclosure. For example, in some embodiments, first zone 130, second zone 132, and third zone 134 can be made from different materials of different elasticity. Alternatively, in some embodiments, the first zone 130, second zone 132, and third zone 134 can include the same materials, but first zone 130, second zone 132, and third zone 134 can be structurally different to provide the differences in elasticity. More specifically, in some embodiments, third zone 134 can have a different material density such that third zone 134 is more elastic than first zone 130 and second zone 132.

As shown in FIGS. 7 and 8, forefoot region 111 can stretch under the influence of a stretching force indicated by arrows 137. In the embodiments illustrated, the stretching load is directed in the transverse direction 106 and can occur, for example, as the toes are spread apart. As shown, third zone 134 can stretch to a high degree under the influence of the stretching force represented by arrows 137.

Then, as the stretching load is reduced on the upper 120, forefoot region 111 can recover toward the position represented in FIGS. 5 and 6. For example, in some embodiments, as the stretching load is reduced, third zone 134 can recover resiliently from the stretched state toward an unstretched state. As a result, third zone 134 can bias first zone 130 and second zone 132 toward each other as indicated by arrows 139.

Additionally, in some embodiments, the elasticity of third zone **134** can bias third zone **134** generally toward sole structure **110**. For example, third zone **134** can be drawn and biased toward sole structure **110** to form inter-toe member **144** that is received between the toes of the wearer.

More specifically, as shown in FIG. **6**, third zone **134** can be spaced at a distance **147** from sole structure **110** when forefoot region **111** is unstretched. As forefoot region **111** is stretched, the distance **147** between third zone **134** and sole structure **110** can increase to distance **149** as shown in FIG. **8**. As the stretching force is reduced, third zone **134** can bias and recover back toward the sole structure **110** as shown in FIG. **6**. As third zone **134** is drawn downward toward sole structure **110**, third zone **134** can be received between two of the wearer's toes. Stated differently, third zone **134** can resiliently recover from a stretched position to be received in space **135** defined between two of the plurality of toes **138** (FIGS. **5** and **6**).

Inter-toe member **144** can separate forefoot region **111** into a plurality of cavities, each configured to receive one or more of the wearer's toes. These cavities can at least partially conform and/or nest against the toes. For example, first zone **130** can form a cavity that conforms and/or nests against one or more toes, and second zone **132** can form a cavity that conforms and/or nests against one or more other toes. More specifically, in some embodiments, first zone **130** and third zone **134** can cooperate to define a first toe cavity **140** that receives one or more toes. Inner surface **123** at this area of upper **120** can define first toe cavity **140**, and this portion of inner surface **123** can nest against the toe(s) within first toe cavity **140**. Similarly, second zone **132** and third zone **134** can cooperate to define a second toe cavity **142** that receives one or more other toes. Inner surface **123** at this area of upper **120** can define second toe cavity **142**, and this portion of inner surface **123** can nest against the toe(s) within second toe cavity **142**. Additionally, third zone **134** can be drawn generally into a space **135** between the toes to define inter-toe member **144**.

Accordingly, upper **120** can securely engage with the wearer's foot. Inter-toe member **144** can draw upper **120** within the inter-toe space **135** to engage the foot. Also, elasticity of inter-toe member **144** can cause first zone **130** and/or second zone **132** to nest against the wearer's toes **138** to engage the foot.

Specific embodiments of forefoot region **111** and other portions of upper **120** will now be discussed in reference to the embodiments of FIGS. **1-8**. As stated, forefoot region **111** can include first zone **130**, second zone **132**, and third zone **134**. Third zone **134** will be discussed initially.

An exemplary embodiment of third zone **134** is defined in the figures by a first boundary **143** and a second boundary **145**, each represented by a respective broken line in the figures. As shown, first boundary **143** and second boundary **145** can extend generally in the longitudinal direction **105**. Thus, third zone **134** can be generally elongate and can extend in the longitudinal direction **105**. Also, in some embodiments, third zone **134** can extend from attachment area **108** of sole structure **110**, along throat **124** of upper **120**, toward collar **128**.

In some embodiments, third zone **134** can be sub-divided into a front portion **146** and a lofted portion **148**. The front portion **146** can extend from the attachment area **108** of sole structure **110** and away from sole structure **110**, generally in the vertical direction **107**. Front portion **146** can be disposed generally in front of inter-toe space **135**. In some embodiments, front portion **146** can stretch elastically in both the vertical direction **107** and the transverse direction **106**.

Also, lofted portion **148** can extend from front portion **146**, generally in the longitudinal direction **105** toward heel region **114**. As shown in FIG. **6**, lofted portion **148** can be spaced from sole structure **110** at a distance **147** and can be disconnected from sole structure **110**. Lofted portion **148** can be disposed generally above the inter-toe space **135**. In some embodiments, lofted portion **148** can stretch elastically in both the transverse direction **106** and the longitudinal direction **105**.

Additionally, third zone **134** can include a vamp portion **150**. Vamp portion **150** can extend from lofted portion **148** in the longitudinal direction **105**. Also, vamp portion **150** of third zone **134** can extend generally along throat **124** toward heel region **114**. As such, vamp portion **150** can stretch and/or conform against the superior area of the wearer's foot, for example, along the metatarsal arch. As shown in FIG. **1**, vamp portion **150** can be wider than lofted portion **148** and front portion **146**. In some embodiments, the transition between vamp portion **150** and lofted portion **148** can correspond to one or more joints on the toes or foot.

Furthermore, third zone **134** can include a collar portion **152**. Collar portion **152** can branch away from vamp portion **150** and can extend at least partially about collar **128**. For example, in some embodiments, collar portion **152** of third zone **134** can extend continuously around the collar opening **121**.

First zone **130** can be disposed primarily on medial side **115** of upper **120**. In some embodiments, first zone **130** can be sub-divided into a front portion **154** and a medial portion **156**. Front portion **154** can extend from the attachment area **108** of sole structure **110** and away from sole structure **110**, generally in the vertical direction **107**. Also, medial portion **156** can extend from front portion **154**, generally in the longitudinal direction **105** along medial side **115** toward heel region **114**. Also, medial portion **156** can be defined between sole structure **110** and first boundary **143**. Furthermore, medial portion **156** can terminate proximate heel region **114**. As such, front portion **154** can be disposed generally in front of toes **138**, and medial portion **156** can be disposed on the medial area, inferior arch, and/or other inside areas of the wearer's foot.

Additionally, in some embodiments, second zone **132** can be disposed primarily on lateral side **117** of upper **120**. In some embodiments, second zone **132** can be sub-divided into a front portion **160** and a lateral portion **162**. The front portion **160** can extend from the attachment area **108** of sole structure **110** and away from sole structure **110**, generally in the vertical direction **107**. Also, lateral portion **162** can extend from front portion **160**, generally in the longitudinal direction **105** along lateral side **117** toward heel region **114**. Also, lateral portion **162** can be defined between sole structure **110** and second boundary **145**. Furthermore, lateral portion **162** can terminate proximate heel region **114**. As such, front portion **160** can be disposed generally in front of toes **138**, and lateral portion **162** can be disposed on the outer, lateral areas of the wearer's foot.

In some embodiments, upper **120** can include additional zones. For example, upper **120** can include a fourth zone **136** as shown in FIGS. **1**, **2**, **4**, and **5**. In some embodiments, fourth zone **136** can be defined by a boundary **165**, represented by a broken line in FIGS. **1**, **2**, **4**, and **5**. In some embodiments, fourth zone **136** can be encompassed and surrounded within another zone. For example, fourth zone **136** can be encompassed and disposed within first zone **130**. As such, fourth zone **136** can be referred to as a "sub-zone" of first zone **130**. Also, fourth zone **136** can be disposed proximate forefoot region **111** in some embodiments. Also,

fourth zone **136** can be rounded, for example. Specifically, fourth zone **136** can be substantially circular in some embodiments. Fourth zone **136** can be disposed proximate forefoot region **111** proximate medial side **115**, for example, to cover and correspond to a joint of the wearer's big toe (i.e., first toe, hallux). As such, fourth zone **136** can distribute compression forces that upper **120** applies to the joint for increased comfort.

Fourth zone **136** can differ in one or more characteristics from at least one of the other zones of upper **120**. For example, in some embodiments, fourth zone **136** can have a different stretchability, elasticity, resiliency, porosity, breathability, and/or density as compared to the other zone(s). In some embodiments, fourth zone **136** can include a plurality of openings **167** that provide these differences. Openings **167** can be through-holes and can create a mesh-like structure in some embodiments.

Referring now to FIGS. **5** and **6**, the fit of the forefoot region **111** on the wearer's toes will be explained according to exemplary embodiments. As shown, the first zone **130** and the third zone **134** can cooperate to define the first toe cavity **140**, and first toe cavity **140** can receive the first toe **174** (i.e., big toe or hallux) of the wearer. Also, the second zone **132** and the third zone **134** can cooperate to define the second toe cavity **142**. In some embodiments, second toe cavity **142** can receive one or more of the toes that are disposed laterally away from the first toe **174**. Specifically, in some embodiments, second toe cavity **142** can receive the second toe **176**, the third toe **177**, the fourth toe **179**, and the fifth toe **181** of the wearer.

Furthermore, the third zone **134** can be drawn toward the sole structure **110** to define inter-toe member **144**. For example, third zone **134** can be drawn at least partially into the inter-toe space **135** between two toes, specifically the first toe **174** and the second toe **176**. In some embodiments, front portion **146** can bias toward attachment area **108** in the vertical direction **107**. Also, front portion **146** can bias rearwardly slightly toward heel region **114** in longitudinal direction **105**, and lofted portion **148** can be biased downward in the vertical direction **107** to define inter-toe member **144**.

In some embodiments, for example, when upper **120** compresses against the foot, first zone **130** and/or third zone **134** can compress, conform, and/or nest against the first toe **174**. Likewise, when upper **120** compresses against the foot, the second zone **132** and/or third zone **134** can compress, conform, and/or nest against the other toe(s). Meanwhile, inter-toe member **144** can be drawn into and can engage the areas of foot between the first toe **174** and the second toe **176**. Accordingly, the upper **120** can fit snugly and can engage the wearer's foot. This can improve comfort and/or support for the wearer.

Embodiments of Materials and Construction of Upper

Upper **120** can be constructed from any suitable materials. Also, upper **120** can be constructed from one or more parts. In some embodiments, upper **120** can be formed from multiple material elements (e.g., polymer foam, polymer sheets, leather, synthetic leather) that are joined together through stitching, adhesives, bonding, or fasteners, for example. In some embodiments, separate parts can define first zone **130**, second zone **132**, and third zone **134**.

In other embodiments, the majority of upper **120** can be formed from a unitary, monolithic, single-body. As such, upper **120** can be constructed in an efficient manner and can include a relatively low number of parts. Additionally, upper **120** can flex with, conform against, and/or nest against the wearer's foot because of the single-body construction.

Additionally, in some embodiments, upper **120** can be at least partially formed from a textile element. Specifically, upper **120** can be at least partially formed via a knitting process in some embodiments. In other embodiments, upper **120** can be at least partially formed via a weaving process. As such, upper **120** can be lightweight, breathable, and soft to the touch. However, the fabric can be constructed such that upper **120** is durable and strong. Moreover, the knitting or weaving processes can provide manufacturing efficiencies and can result in a relatively low amount of waste. Also, the fabric can provide elasticity to the upper **120**. For example, the fabric can have some degree of elasticity due to the knitted or woven construction. Furthermore, in some embodiments, the fabric can be knitted or woven from elastic and stretchable yarns, which further enhance the stretchiness of the upper.

In some embodiments, upper **120** can be at least partially formed from a knitted component **1000** as indicated in FIGS. **1-4**. Knitted component **1000** can at least partially extend through forefoot region **111**, midfoot region **112**, and/or heel region **114** of upper **120**. Knitted component **1000** can also extend along lateral side **104**, medial side **105**, over forefoot region **101**, and/or around heel region **103**. In addition, knitted component **1000** can at least partially define inner surface **123** and/or outer surface **125** of upper **120**.

As will be discussed, knitted component **1000** can provide the upper **120** with weight savings as compared with other conventional uppers. Additionally, in some embodiments, knitted component **1000** can be configured with different zones having different characteristics. For example, one or more predetermined zones can have more elasticity and stretchability than other zones. Stated differently, certain zones can have more stretch resistance than other zones. Also, knitted component **1000** can provide the upper **120** with aesthetically pleasing features and textures. Still further, knitted component **1000** can provide advantages in the manufacture of footwear **100**. Other advantages due to the knitted component **1000** will be explored in detail below.

In some embodiments, knitted component **1000** can be made at least partially through a flat knitting or circular knitting process. An exemplary flat-knitted component **1000** is shown in plan view in FIG. **9**.

Knitted component **1000** can be formed of unitary knit construction. As defined herein and as used in the claims, the term "unitary knit construction" means that knitted component **1000** is formed as a one-piece element through a knitting process. That is, the knitting process substantially forms the various features and structures of knitted component **1000** without the need for significant additional manufacturing steps or processes. A unitary knit construction may be used to form a knitted component having structures or elements that include one or more courses of yarn or other knit material that are joined such that the structures or elements include at least one course in common (i.e., sharing a common strand or common yarn) and/or include courses that are substantially continuous between each portion of knitted component **1000**. With this arrangement, a one-piece element of unitary knit construction is provided.

Although portions of knitted component **1000** may be joined to each other following the knitting process, knitted component **1000** remains formed of unitary knit construction because it is formed as a one-piece knit element. Moreover, knitted component **1000** remains formed of unitary knit construction when other elements (e.g., an inlaid strand, a closure element, logos, trademarks, placards with care instructions and material information, and other structural elements) are added following the knitting process.

Thus, upper **120** can be constructed with a relatively low number of material elements. This can decrease waste while also increasing the manufacturing efficiency and recyclability of upper **120**. Additionally, knitted component **1000** of upper **120** can incorporate a smaller number of seams or other discontinuities. This can further increase manufacturing efficiency of footwear **100**. Moreover, inner surface **123** and outer surface **125** of upper **120** can be substantially smooth and uniform to enhance the overall comfort of footwear **100**.

In some embodiments, knitted component **1000** can be primarily defined by a knit element **1002**. As shown in FIG. **9**, knit element **1002** of knitted component **1000** may be formed from at least one yarn, cable, fiber, filament, or other strand that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a plurality of courses and wales.

Knitted component **1000** can also generally include at least one tensile element. In some embodiments, tensile element can be a yarn, cable, fiber, filament, or other elongate strand. Tensile element can extend across and can be attached to knit element **1002**. In some embodiments, tensile element can be inlaid within a course and/or a wale of knit element **1002**. As such, the tensile elements can be formed of unitary knit construction with knit element **1002**. In other embodiments, tensile element can be laid across and attached to knit element **1002**. Tensile elements can provide support to knitted component **1000**. More specifically, in some embodiments, tension within tensile elements can allow knitted component **1000** to resist deformation, stretching, or otherwise provide support for the wearer's foot during running, jumping, or other movements of the wearer's foot.

Knitted component **1000**, knit element **1002**, and/or tensile element can incorporate the teachings of one or more of commonly-owned U.S. Pat. No. 8,490,299 to Dua et al., filed on Dec. 18, 2008, and granted on Jul. 23, 2013, and U.S. patent application Ser. No. 13/048,514 to Huffa et al., entitled "Article Of Footwear Incorporating A Knitted Component," filed on Mar. 15, 2011 and published as U.S. Patent Application Publication Number 2012/0233882 on Sep. 20, 2012, both of which are hereby incorporated by reference in their entirety.

Knit element **1002** can be formed from one or more yarns **1006** of any suitable type. For example, at least one yarn **1006** of knit element **1002** can be made from cotton, elastane, rayon, wool, nylon, polyester, or other material. Also, in some embodiments, at least one yarn **1006** can be elastic and resilient. As such, yarn **1006** can be elongated from a first length, and yarn **1006** can be biased to recover to its first length. Thus, such an elastic yarn **1006** can allow knit element **1002** to stretch elastically and resiliently under the influence of a force. When that force is reduced, knit element **1002** can recover back to its neutral position.

Furthermore, in some embodiments, at least one yarn **1006** can be at least partially formed from a thermoset polymer material that can melt when heated and that can return to a solid state when cooled. As such, yarn **1006** can be a fusible yarn and can be used to join two objects or elements together. In additional embodiments, knit element **1002** can include a combination of fusible and non-fusible yarns. In some embodiments, for example, knitted component **1000** and upper **120** can be constructed according to the teachings of U.S. Patent Publication No. 2012/0233882, which published on Sep. 20, 2012, the disclosure of which is hereby incorporated by reference in its entirety.

Additionally, in some embodiments, a single yarn **1006** can form each of the courses and wales of knit element **1002**. In other embodiments, knit element **1002** can include a plurality of yarns **1006**. For example, different yarns **1006** can form different courses and/or different wales. In additional embodiments, a plurality of yarns can be plated together and can cooperate to define a common loop, a common course and/or a common wale of knit element **1002**.

Features of knitted component **1000** illustrated in FIG. **9** will now be discussed in greater detail according to exemplary embodiments. Knitted component **1000** can define features of the upper **120** shown in FIGS. **1-4**. As such, knitted component **1000** can include a forefoot region **1111**, a midfoot region **1112**, and a heel region **1114** that define forefoot region **111** of upper **120**, midfoot region **112** of upper **120**, and heel region **114** of upper **120**, respectively. Also, knitted component **1000** can include a medial side **1115** that defines medial side **115** of upper **120**, and knitted component **1000** can include a lateral side **1117** that defines lateral side **117** of upper **120**.

In FIG. **9**, knitted component **1000** is shown in plan view such that knitted component **1000** appears flat and sheet-like. An outer boundary of knitted component **1000** can be defined by a peripheral edge **1010**. Also, knitted component **1000** can include a front surface **1008** that spans between opposing segments of peripheral edge **1010**. Although not shown in FIG. **9**, knitted component **1000** can also include a back surface that opposes front surface **1008**.

Peripheral edge **1010** can be sub-divided into a plurality of segments. For example, edge **1010** can include a substantially U-shaped first segment **1012**. Edge **1010** can also include a substantially U-shaped second segment **1014**. Moreover, edge **1010** can include a third segment **1016** and a fourth segment **1018**. Third segment **1016** and/or fourth segment **1018** can be substantially straight. Also, third segment **1016** can extend between the ends of first and second segments **1012**, **1014** proximate medial side **1115**, and fourth segment **1018** can extend between ends of first and second segments **1012**, **1014** proximate lateral side **1117**.

In some embodiments, front surface **1008** of knitted component **1000** can define outer surface **125** of upper **120** and the opposing back surface of knitted component **1000** can define inner surface **123** of upper **120**. In other embodiments, a skin or other object can be layered and attached to knitted component **1000**, and the skin or other object can define the inner surface **123** or outer surface **125** of upper **120**.

Knitted component **1000** can also define the plurality of zones of upper **120** discussed above in relation to FIGS. **1-4**. The boundaries of the different zones are indicated in FIG. **9** with broken lines according to exemplary embodiments.

As shown, knitted component **1000** can include a first knit zone **1130** that at least partially defines first zone **130** of upper **120**. Knitted component **1000** can further include a second knit zone **1132** that at least partially defines second zone **132** of upper **120**. Moreover, knitted component **1000** can additionally include a third knit zone **1134** that at least partially defines third zone **134** of upper **120**. Furthermore, knitted component **1000** can include a fourth knit zone **1136** that at least partially defines fourth zone **136** of upper **120**. As shown in FIG. **9**, knitted component **1000** can additionally include a fifth knit zone **1135** and a sixth knit zone **1137**, which will be discussed in detail below.

In the embodiment of FIG. **9**, for example, first knit zone **1130** can be disposed generally on the medial side **1115** of

knitted component **1000** and can extend generally in the longitudinal direction **1105** from forefoot region **1111**, through midfoot region **1112**, to heel region **1114**. Also, first knit zone **1130** can extend along first segment **1012** of peripheral edge **1010** on medial side **1115**, and first knit zone **1130** can also extend along third segment **1016** of peripheral edge **1010** in some embodiments.

Additionally, second knit zone **1132** can be disposed generally on the lateral side **1117** of knitted component **1000** and can extend generally in the longitudinal direction **1105** from forefoot region **1111**, through midfoot region **1112**, to heel region **1114** in some embodiments. Also, second knit zone **1132** can extend along first segment **1012** of peripheral edge **1010** on medial side **1117**, and second knit zone **1132** can also extend along fourth segment **1018** of peripheral edge **1010** in some embodiments.

Furthermore, third knit zone **1134** can be disposed centrally on knitted component **1000** and can extend generally in the longitudinal direction **1105** from forefoot region **1111**, through midfoot region **1112**, to heel region **1114** in some embodiments. Also, third knit zone **1134** can be disposed between first zone **1130** and second zone **1132**. Additionally, third knit zone **1134** can extend from first segment **1012** of peripheral edge **1010** toward second segment **1014** of peripheral edge **1010**. In some embodiments, third knit zone **1134** can branch apart such that one branch extends to third segment **1016** and the other branch extends to fourth segment **1018** of peripheral edge **1010**.

Moreover, fourth knit zone **1136** can be rounded and can be disposed in midfoot region **1112**, proximate forefoot region **1111**. Fourth knit zone **1136** can be surrounded by third knit zone **1134** and can be disposed closer to medial side **1115** than lateral side **1117**.

In some embodiments, fifth knit zone **1135** can be disposed proximate medial side **1115** and can extend generally in the longitudinal direction **1105** from midfoot region **1112** to heel region **1114**. Fifth knit zone **1135** can be spaced away from peripheral edge **1010**. In some embodiments, fifth knit zone **1135** can be bordered on one side by first knit zone **1130** and on the other side by third knit zone **1134**.

Additionally, in some embodiments, sixth knit zone **1137** can be disposed proximate lateral side **1117** and can extend generally in the longitudinal direction **1105** from midfoot region **1112** to heel region **1114**. Sixth knit zone **1137** can be spaced away from peripheral edge **1010**. In some embodiments, sixth knit zone **1137** can be bordered on one side by second knit zone **1132** and on the other side by third knit zone **1134**.

The different zones can differ in one or more characteristics as discussed above with respect to FIGS. **1-8**. Thus, in some embodiments, third knit zone **1134** can be more elastic than first zone **1130** and second zone **1132**. Furthermore, in some embodiments, third knit zone **1134** can be more elastic, more resilient, and/or more stretchable than fifth zone **1135** and sixth zone **1137**.

This difference can be a result of knitting third zone **1134** from yarns that are more elastic than the yarns knitted in the other zones. Also, fusible yarns can be knitted and fused within first zone **1130**, second zone **1132**, fifth zone **1135**, and/or sixth zone **1137**, whereas third zone **1134** can be devoid of fusible yarns.

In a specific embodiment, third knit zone **1134** can be more elastic than each of the first knit zone **1130**, second knit zone **1132**, fifth knit zone **1135**, and sixth knit zone **1137**. Also, fifth and sixth knit zones **1135**, **1137** can have substantially equal elasticity to each other, and fifth and sixth knit zones **1135**, **1137** can have greater elasticity than first and second knit zones **1130**, **1132**. Furthermore, first and second knit zones **1130**, **1132** can have substantially equal elasticity. Accordingly, central regions of knitted component **1000** can exhibit higher elasticity and stretchability for conforming knitted component **1000** to the foot whereas peripheral regions of knitted component **1000** can have greater stiffness for supporting the wearer's foot.

Furthermore, fourth knit zone **1136** can be more porous than the other knit zones of knitted component **1000**. For example, fourth knit zone **1136** can include one or more holes. This increased porosity can be a result of the knitting operation used to form fourth knit zone **1136**. For example, fourth knit zone **1136** can be knit using a so-called "mesh-knit" structure.

Also, because of its increased elasticity, third knit zone **1134** can elastically bias or pull first and fifth knit zones **1130**, **1135** generally toward second and sixth knit zones **1132**, **1137** in the transverse direction **1106**. Additionally, in forefoot region **1111**, an inter-toe area **1144** of third knit zone **1134** can bias or pull first knit zone **1130** and second knit zone **1132** toward each other. Accordingly, inter-toe area **1144** of third knit zone **1134** can define inter-toe member **144** discussed above.

In some embodiments, inter-toe area **1144** can define a recess **2025** at peripheral edge **1010** of knitted component **1000**. Stated differently, the increased elasticity of inter-toe area **1144** can pull peripheral edge **1010** inward to define recess **2025**. In some embodiments, recess **2025** can be present when knitted component **1000** is in its unstretched or neutral position and recess **2025** can become more pronounced as knitted component **1000** is stretched in the transverse direction **1106**.

Referring now to FIGS. **10-13**, a method **2000** of forming the article of footwear **100** from knitted component **1000** will be discussed according to exemplary embodiments. As shown in FIG. **10**, method **2000** can begin in step **2010**, in which knitted component **1000** is formed. In some embodiments, knitted component **1000** can be flat knitted to include the features discussed above and shown in FIG. **9**.

Then, in step **2012**, upper **120** can be formed using knitted component **1000**. For example, as shown in FIG. **11**, knitted component **1000** can be wrapped over and around a foot-shaped last **2020** and third segment **1016** and fourth segment **1018** of peripheral edge **1010** can be joined together to define a seam **2022** behind the heel of the last **2020**. (The seam **2022** is shown in greater detail in FIGS. **1** and **4**.) Next, underfoot part **126** can be attached to knitted component **1000**. Specifically, underfoot part **126** can be attached to first segment **1012** of knitted component **1000** to define a lower seam **2024**.

Next, in step **2014** heat and/or pressure can be applied to knitted component **1000** from a source **2030** as shown in FIG. **12**. In some embodiments, application of heat and/or pressure can slightly shrink knitted component **1000** against last **2020**. This heat and/or pressure can shape knitted component **1000** such that knitted component **1000** appears more contoured and conformed to the surface of last **2020**. To illustrate this effect, FIG. **13** shows knitted component **1000** after heat/pressure has been applied. As shown, the curvature of inter-toe member **144** and recess **2024** is shown more pronounced than in FIGS. **11** and **12**.

In some embodiments, source **2030** can apply steam to knitted component **1000**. In other embodiments, source **2030** can apply a dry heat to knitted component **1000**. In still additional embodiments, a source **2030** can include a press that applies pressure for shaping knitted component **1000**.

Additionally, source **2030** can be used for attaching a skin, tag, decal, or other objects to knitted component **1000**.

The method **2000** of assembly can continue in step **2016**, wherein the sole structure **110** is attached. This step is illustrated schematically in FIG. **13**. As shown, sole structure **110** and upper **120** can be moved toward each other. Then, sole structure **110** can be attached or lasted to upper **120**. It is noted that recess **2027** of sole structure **110** can be aligned with recess **2025** of knitted component **1000** and then attached. As such, recess **2027** of sole structure **110** and recess **2025** of knitted component **1000** can both flex in substantially unison as the foot flexes. Furthermore, recess **2027** of sole structure **110** can enable a greater degree of biasing of recess **2025** into the space **135** between the wearer's toes for engaging the foot.

In summary, the article of footwear **100** can include inter-toe member **144** that is received between the toes of the wearer's foot. This can allow upper **120** to engage the foot and toe area of the foot. Additionally, inter-toe member **144** can be associated with a relatively elastic portion of the upper **120**. As such, inter-toe member **144** can bias other portions of upper **120** toward each other and conform portions of upper **120** to the toes and foot. Accordingly, upper **120** can provide a high degree of comfort and support to the foot of the wearer.

While various embodiments of the present disclosure have been described, the description is intended to be exemplary, rather than limiting and it will be apparent to those of ordinary skill in the art that many more embodiments and implementations are possible that are within the scope of the present disclosure. Accordingly, the present disclosure is not to be restricted except in light of the attached claims and their equivalents. Also, various modifications and changes may be made within the scope of the attached claims. Moreover, as used in the claims "any of" when referencing the previous claims is intended to mean (i) any one claim, or (ii) any combination of two or more claims referenced.

What is claimed is:

1. An article of footwear, the article of footwear comprising:

an upper comprising a forefoot region, a midfoot region, and a heel region;

the upper comprising a first zone, a second zone, and a third zone, each of the first, second, and third zones extending from a terminal toe edge of the upper and toward the heel region;

the first zone extending laterally from a medial side edge of the upper to a first internal boundary of the upper;

the second zone extending laterally from a lateral side edge of the upper to a second internal boundary of the upper;

the third zone extending in-between the first internal boundary and the second internal boundary and entirely separating the first zone from the second zone in at least the forefoot region;

the third zone defining an indentation, the indentation extending from the terminal toe edge of the upper toward the heel region;

the first zone having a first elasticity, the second zone having a second elasticity, and the third zone having a third elasticity, wherein the third elasticity is greater than the first elasticity and the second elasticity;

and wherein the difference in elasticity between the first, second, and third zones forms the indentation.

2. The article of footwear of claim **1**, wherein the third zone is biased toward the heel region.

3. The article of footwear of claim **1**, wherein the third zone and the first zone cooperate to define a first portion of a toe cavity that is configured to receive at least one of a plurality of toes; the toe cavity defined by an inner surface of the upper; wherein at least a portion of the inner surface is configured to nest against the at least one of the plurality of toes.

4. The article of footwear of claim **3**, wherein the at least one toe of the plurality of toes is a hallux of a foot; wherein the third zone and the second zone cooperate to define a second portion of the toe cavity that is configured to receive a second toe of the foot; and wherein the third zone is configured to be received in the space located between the hallux and the second toe.

5. The article of footwear of claim **1**, wherein the upper includes a knitted component formed of unitary knit construction; and wherein the knitted component defines the third zone.

6. The article of footwear of claim **5**, wherein the knitted component defines at least one of an inner surface of the upper and an outer surface of the upper.

7. The article of footwear of claim **1**, wherein the upper includes a knitted component and wherein the knitted component defines the first zone, the second zone, and the third zone; and wherein the first zone, the second zone, and the third zone are formed of unitary knit construction with each other.

8. The article of footwear of claim **1**, wherein the third zone is knitted from an elastic yarn; wherein at least one of the first zone and the second zone is knitted from an additional yarn; and wherein the elastic yarn has greater elasticity than the additional yarn.

9. The article of footwear of claim **1**, further comprising a sole structure, wherein the sole structure includes an attachment area that attaches to the upper; wherein the third zone includes a front portion and a lofted portion, wherein the front portion extends from the attachment area away from the sole structure, wherein the lofted portion extends from the front portion generally toward the heel region; and wherein the front portion and the lofted portion are configured to be received within the space formed between two of a plurality of toes.

10. The article of footwear of claim **1**, further comprising a sole structure, wherein the sole structure includes an attachment area that attaches to the upper; wherein the upper includes a collar with a collar opening configured to allow passage of a foot into and out of the upper; wherein the upper includes a throat that is disposed between the first internal boundary to the second internal boundary of the upper; and wherein the third zone extends from the attachment area of the sole structure, along the throat, toward the collar.

11. The article of footwear of claim **10**, wherein the third zone extends along the throat to the collar, and wherein the third zone extends continuously around the collar opening.

12. The article of footwear of claim **1**, wherein the first elasticity is equal to the second elasticity.

* * * * *

Exhibit FF





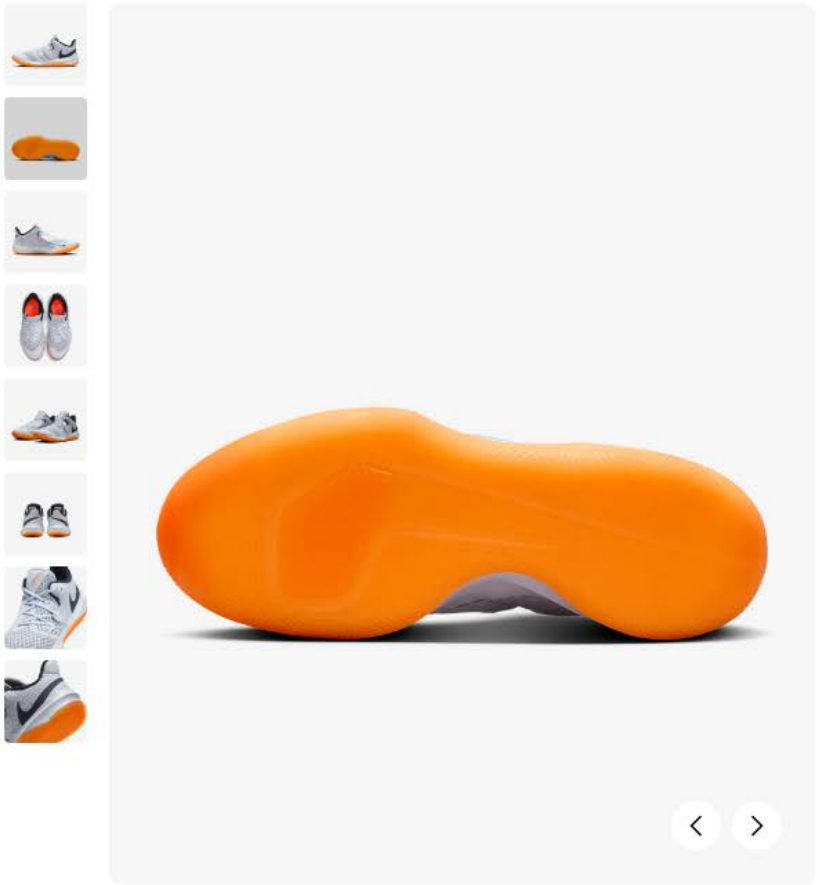
Nike Zoom Hyperspeed Court SE

Volleyball Shoes

$95

Select Size Size Guide

M 3 / W 4.5	M 3.5 / W 5
M 4 / W 5.5	M 4.5 / W 6
M 5 / W 6.5	M 5.5 / W 7
M 6 / W 7.5	M 6.5 / W 8
M 7 / W 8.5	M 7.5 / W 9
M 8 / W 9.5	M 8.5 / W 10
M 9 / W 10.5	M 9.5 / W 11
M 10 / W 11.5	M 10.5 / W 12
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M 15 / W 16.5	



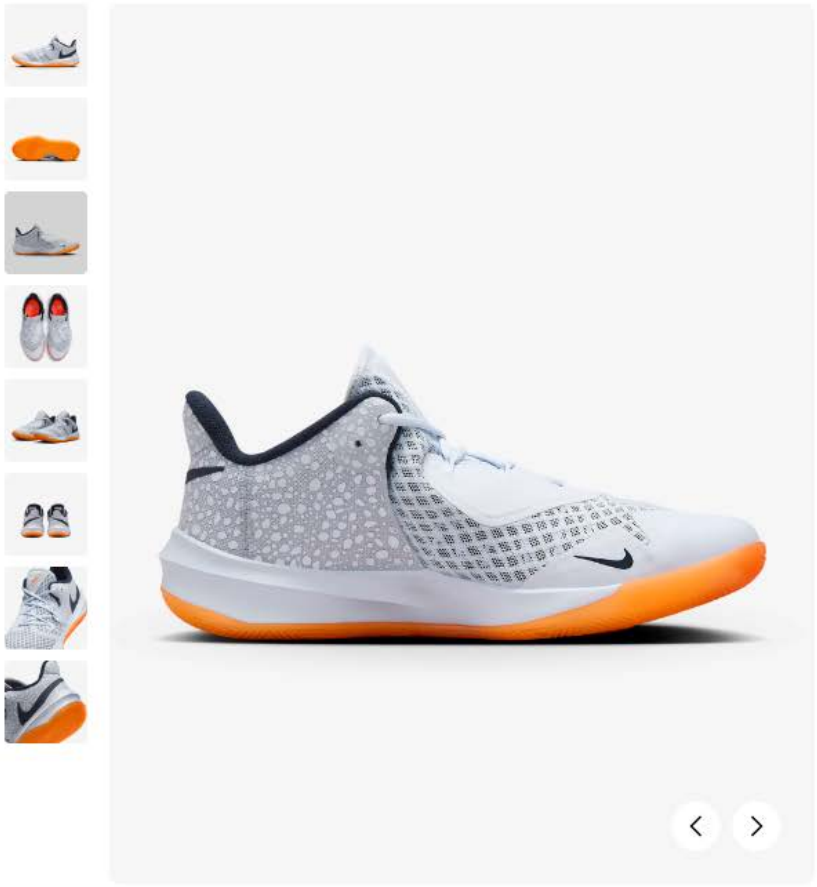
Nike Zoom Hyperspeed Court SE

Volleyball Shoes

$95

Select Size Size Guide

M 3 / W 4.5	M 3.5 / W 5
M 4 / W 5.5	M 4.5 / W 6
M 5 / W 6.5	M 5.5 / W 7
M 6 / W 7.5	M 6.5 / W 8
M 7 / W 8.5	M 7.5 / W 9
M 8 / W 9.5	M 8.5 / W 10
M 9 / W 10.5	M 9.5 / W 11
M 10 / W 11.5	M 10.5 / W 12
M 11 / W 12.5	M 11.5 / W 13
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M 6 / W 7.5	M 6.5 / W 8
M 7 / W 8.5	M 7.5 / W 9
M 8 / W 9.5	M 8.5 / W 10
M 9 / W 10.5	M 9.5 / W 11
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M 7 / W 8.5	M 7.5 / W 9
M 8 / W 9.5	M 8.5 / W 10
M 9 / W 10.5	M 9.5 / W 11
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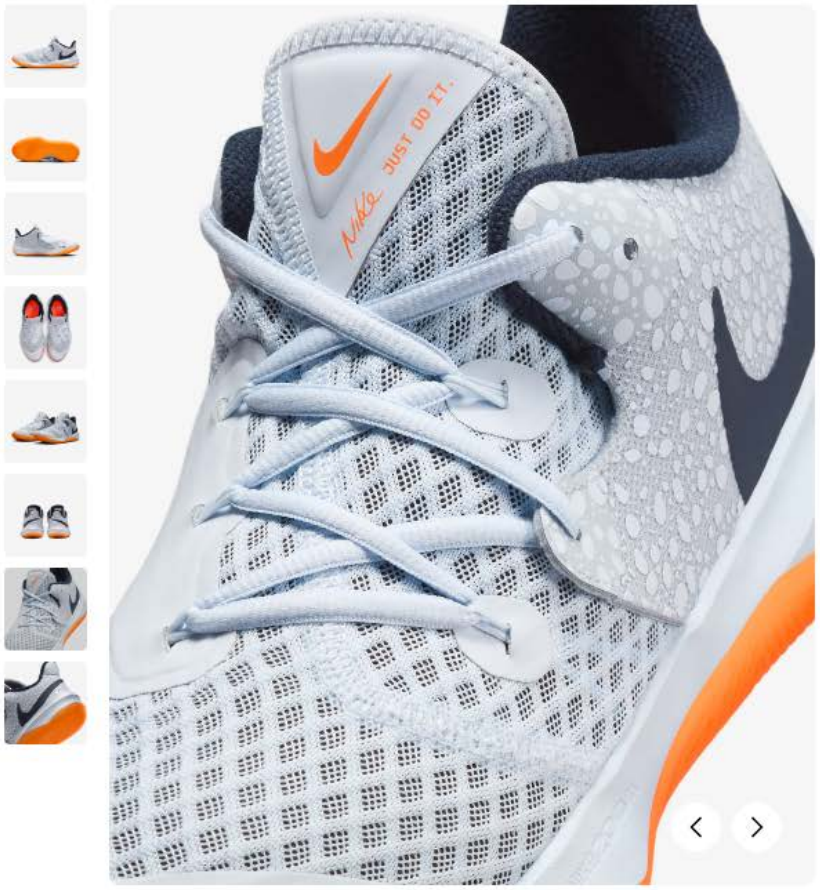
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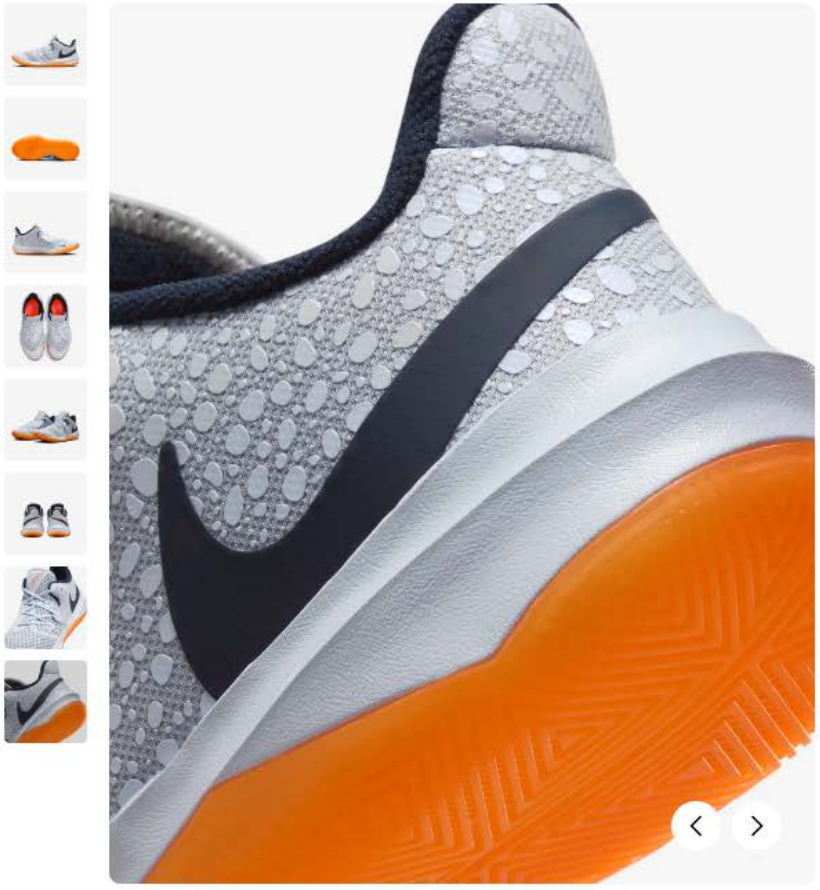
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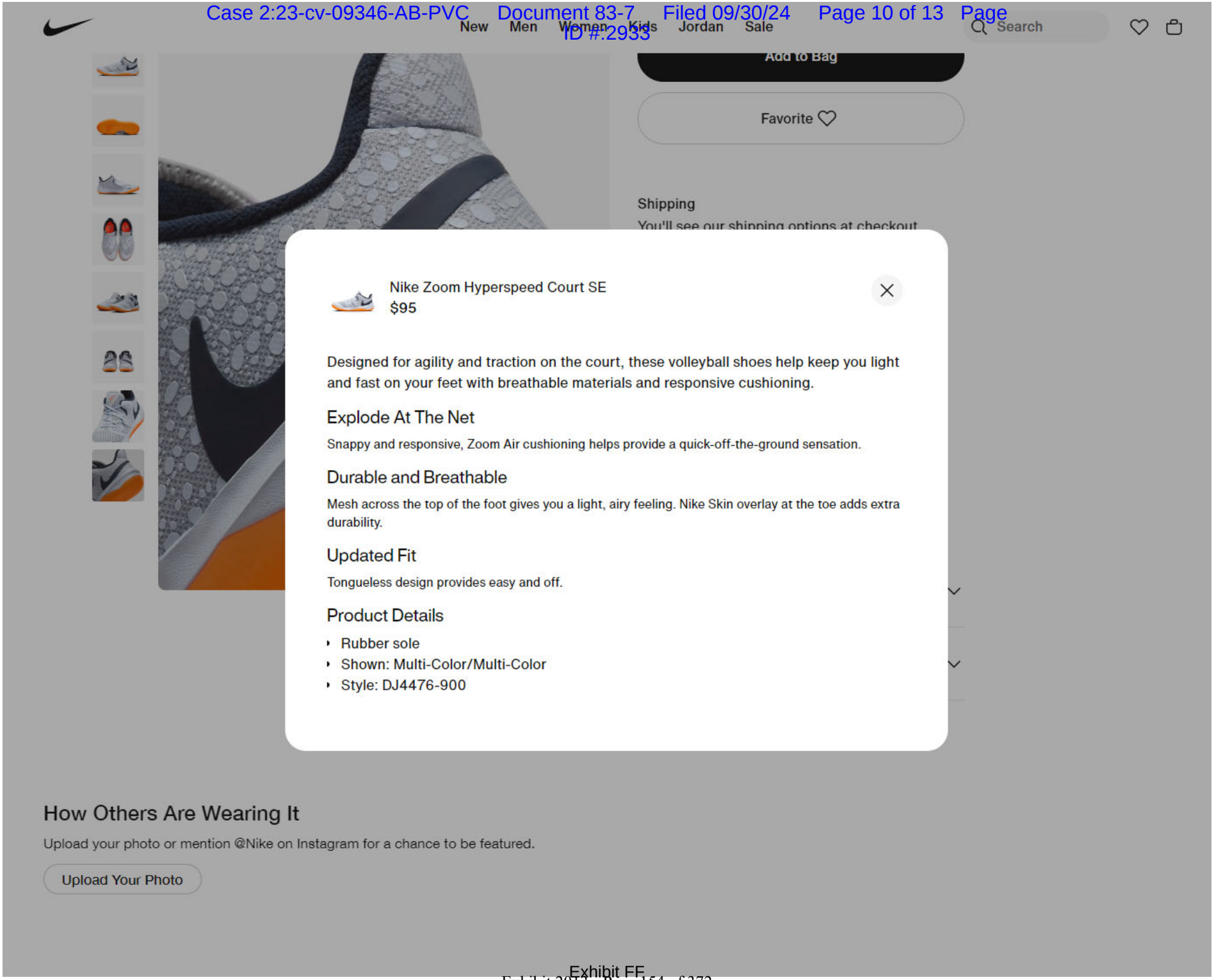
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Exhibit GG

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

WESTERN DIVISION

-oOo-

HONORABLE ANDRE BIROTTE JR., UNITED STATES DISTRICT JUDGE

NIKE, INC.,

Plaintiff,

v. No. 2:23-cv-09346-AB

SKECHERS U.S.A., INC.,

Defendant.

REPORTER'S TRANSCRIPT OF PROCEEDINGS

LOS ANGELES, CALIFORNIA

SEPTEMBER 20, 2024

SUZANNE M. McKENNON, CRR, RMR
UNITED STATES COURT REPORTER

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ALSO PRESENT: Mosima Thema

(Proceedings commenced on September 20, 2024, at 10:45 a.m.)

THE COURTROOM DEPUTY: Calling Item 5, CV 23-09346, Nike, Inc., versus Sketchers U.S.A., Inc.

Counsel, please come forward and state your appearances for the record.

THE COURT: Go ahead, Counsel.

MR. HARRIS: Michael Harris for Plaintiff Nike, Inc. And I would also like to note that in-house counsel for Nike had planned to be here today. Her name is Kim Van Voorhis. She tested positive for COVID and did not make the trip here and wanted to extend our apologies on her behalf.

THE COURT: All right. No worries.

MS. STAUBACH: Lindsey Staubach also on behalf of Nike.

THE COURT: All right. Good Morning.

MR. LU: Good morning, Your Honor. Samuel Lu on behalf of Skechers. With me here today are my colleagues Keith Orso.

THE COURT: All right.

MR. LU: Michael Rosen, and Connor He-Schaefer. And with us is our client representative Mosima Thema.

THE COURT: Oh, I see. I'm sorry. Okay.

So I've got some questions apart from the hope or wish this was a battle between Nike's premium brand and Nike Dunk so I could the latest and greatest from both shoe companies.

But let me just pull up my notes here. I'll just get right into it. At least some of the questions that I had --- just I want to talk about the throat area, if I could for a moment.

And I'll ask the plaintiffs: How would you explain that throat area to a jury?

MS. STAUBACH: Sorry, Your Honor.

THE COURT: Take your time. The lectern adjusts if you need it. On the left hand -- to your right-hand side, I believe.

MS. STAUBACH: Okay. Thank you.

Are you able to see it on the screen?

THE COURT: Nothing. If it doesn't show up on the screen to the left, I'm not seeing it, either.

THE COURTROOM DEPUTY: I fixed it up.

MS. STAUBACH: Thank you for your question, Your Honor. So we think that, in the context of the claims, the claim term can't be read in a vacuum. We have to look at it within the claim itself. That there will be no confusion over what a throat area means.

If we look at claim 1 of the '562 patent, we have every instance of throat area highlighted here. So what you will see is that the integral knit tongue extends through a throat area.

THE COURT: If you don't mind, do me a favor. I think you have the preview as opposed to the full screen.

Okay. There. That's a little better.

MS. STAUBACH: Okay.

THE COURT: Go ahead.

MS. STAUBACH: So the integral knit tongue extends through a throat area of the knitted component. So the claim itself makes clear that the throat area is the area over which the tongue extends. We don't believe there is any dispute over where the tongue extends. A tongue is a term of art. Surely Your Honor is familiar with it as well, where a tongue would be in an article of footwear.

THE COURT: I guess, can the throat area extend from anywhere other than the ankle opening?

MS. STAUBACH: So the throat area -- this is actually one of Skechers' lines.

THE COURT: Okay.

MS. STAUBACH: This is in their foot gear overview section. So this is like a generic cartoon picture of a shoe here, and we have a throat area labeled. So the throat area would extend from the forefront region up to the ankle opening.

THE COURT: And when you say "forefront region," you are talking closer to where the lacing sign is or lacing --

MS. STAUBACH: The bottom --

THE COURT: Bottom.

MS. STAUBACH: -- end of the lacing where the shoe connects -- the upper connects with the toe box, that would be

the forefront region.

THE COURT: Okay. Let me just see. I just had a couple of questions that I wanted to make sure we covered.

MS. STAUBACH: Well, this may be helpful to you, Your Honor.

THE COURT: Okay.

MS. STAUBACH: So we actually don't dispute the majority of Skechers' proposed construction for this term. Our only dispute really is over their incorporation of ankle opening and their construction of ankle opening. So if Your Honor agrees with us on ankle, we have no concern with adopting Skechers' proposed construction for this term.

THE COURT: Okay. All right. That is good to know. Let me just jot that down here.

All right. And admittedly I'm jumping around here. So it's going to be a bit of a tennis match.

Is there anything you wanted to add with respect to the throat area?

MR. ROSEN: No, Your Honor. If Nike is now saying they will effectively agree to our construction --

THE COURT: If.

MR. ROSEN: If ankle opening is construed or sort of bracketing the issue of ankle opening, then I think we're in agreement on that.

THE COURT: Okay. All right. Great. So the next

area I --

(Court reporter interrupted.)

MR. ROSEN: I'm sorry. Michael Rosen for Skechers.

THE COURT: We just got a lot of people here so Ms. McKennon just wants to make sure she gets everybody's attributes to the witty remarks of everyone to the right person.

Can we shift for a second to the knitting and integral knit tongue that is of unitary knit construction? Okay. I have a question for Skechers. It doesn't seem to this leadite to be anymore confusing than the patent language in general, so tell me why you think it lacks sufficient clarity.

MR. ROSEN: Again, Your Honor, Michael Rosen for Skechers. May it please the Court.

To make sure I understand your question, Your Honor, you're asking specifically about the unitary knit construction aspect of the claim?

THE COURT: Right.

MR. ROSEN: So there are intentionally two issues with the construction here with what Skechers is proposing to construe: One is that the entire integral knit tongue be of unitary knit construction; that it be formed as a one-piece element with the rest of the upper; that's part one. And part two, that it extend from the forefoot over the instep to the ankle opening. You will hear a lot of that today.

Is there a particular one of those two aspects that the Court would like us to focus on?

THE COURT: No. Just generally, I think, if I read it right, you believe it lacks sufficient clarity that requires construction. Tell me why.

MR. ROSEN: So there are actually a few different places to what explains our construction. The first piece of this, and this is slide number -- I think it's 109. No. I'm sorry. 99.

So the first piece of this is that we're clarifying the actual word structure. As Your Honor can see, the claim term itself is -- it's sort of a little bit out of order with the upper -- with the knitting machine. So we've simply rearranged the terms to make it more grammatically sound. That's part one.

The second part is to make clear that our construction is consistent to what the parties have already agreed to on the actual term unitary knit construction. Just to be clear, Your Honor, the parties do agree to what that phase means. We all agree that that means formed as a one-piece element through a knitting process.

The key here is to show that the integral knit tongue and the upper are satisfied in that unitary knit construction; that they're together.

And then the last piece is just to clarify what the throat

area is, which we just addressed, that it is respective to the ankle opening.

So the key here again is to make sure that it's clear to the jury that both upper and the integral knit tongue are formed as a one-piece knit element. And that is crystal clear in the specification throughout, but it is not 100 percent clear in the language of the terms, of the claim term, itself. And our understanding is that Nike disputes that, in fact, it should be construed this way.

But, again, as we go through these, in every case, in every embodiment that is presented in the patent the knit element is forming the upper and the integral knit tongue together. It's unitary knit construction of all of that. It's defined that way; right? Moving through these, this is column 7 to column 8 of the '562 patent. It's defined as being a one-piece element.

And Nike, from what we gather to the extent we understand Nike's position, they dispute that. They seem to be arguing that only a portion of the upper can be considered of unitary knit construction, meaning it could conceivably be stitched together from other pieces. But the evidence they cite, there is actually -- you'll see, Your Honor, there is some brackets and a little bit of cutting out.

If we look at the entire quote -- what we put up here is from Nike's brief. If we look at what the patent actually

says, it says that the upper extends through each of region -- forefoot region 101, the midfoot region 102, the heel region 103, along both lateral sides, over the forefoot region, and around the heel region.

And, again, we just put up figure 1 so the Court can see this illustrated. That's the whole shoe. That's all of it; right? So it's not a portion. It's everything. It's the whole shoe.

So the key here, again, Your Honor, is just we want to make sure the '636 patent is consistent. We want to make sure that the jury will understand the upper and the integral knit tongue together, one piece, unitary. And we think that is what's necessary for that. So that is the unitary piece of it.

THE COURT: Okay.

MR. ROSEN: We can talk about the extend, or we can pause there.

THE COURT: Let's pause. I want to hear Nike's response to that. And if it's easier for you to stay there as long as you bring the microphone close to you so our reporter can hear you.

MR. HARRIS: I'll approach if that is okay.

THE COURT: That's fine.

Skechers must have hacked it.

MR. HARRIS: Okay. Michael Harris for Nike. Your Honor, I'm glad you asked this question because, as we were

preparing for this hearing, we had the same thought. Why are we construing this term? It's 31 words that Skechers is construing with even more words. And, you know, in their briefing they say it's for clarity, but their construction provides no fair clarity.

And I want to start by looking at this disputed phrase. There are individual terms -- there are terms within this disputed phrase that the parties are separately disputing -- for instance, integral knit tongue. That is a separate dispute. It doesn't need to be construed here.

Unitary knit construction, as my colleague noted, the parties agree on the construction on unitary knit construction so why are we construing it again here in the context of this phrase.

Upper, the parties don't dispute the meaning of upper.

Knitting machine, the parties don't dispute the meaning of knitting machine.

Extending through a throat area, well, I think that we've confirmed that we agree on throat area. We just don't agree on ankle opening.

There is nothing else in this claim limitation that requires the Court to provides any clarity. And the clarity that Skechers is asking the Court to provide -- I'm now on slide 76 of Nike's demonstratives. Let's take a look at it. They're adding words to the claim that find no support in the

specification, no support in the claim language.

Their proposed construction requires that the knitting machine knit a tongue through a knitting process that's formed as one piece with the rest of the upper. That claim language is nowhere. I mean, that language is nowhere in the claims. It's nowhere in the spec. They are adding that limitation. This isn't about clarity; it's about trying to create or manufacture a noninfringement defense for Skechers.

There is no reason to construe this term, this phrase. You can construe integral knit tongue. Unitary knit construction has already been construed. Throat has been construed. You don't have to construe this phrase.

Now, Skechers -- I've pointed you to -- I'm going to go back. We're jumping around a little bit. This is slide 121 of Skechers' demonstratives. This is what Skechers pointed you to. I think their argument is the entire upper of article of footwear must be knitted and can have no other nonknitted components. I think that is really what they're trying to get at because they believe that will establish or create some noninfringement defenses for them.

And they point to this example here and say, oh, well, look. The whole upper is knitted. This is one example, one nonlimiting example, from the specification. And, in fact, this example doesn't say that the entirety of the upper has to be knitted. It says the majority of the upper is for a

permitting component. This is Skechers' slide.

You can see they grayed out the sentence that begins, "In addition." Well, they didn't go on to show you what the specification says. So this is the actual specification from '636 patent. It is document 5554 attached to an exhibit to our opening brief. I want to show you what the rest of the language says. Oops.

That portion of the spec -- I've highlighted it here, Your Honor. It goes onto say, "In addition, knitted component forms portions of an anterior and exterior surface." Not the entirety. It doesn't have to form the entirety.

The spec continues on "As such knitted component defines at least a portion of the void." Not the entire void. It doesn't have to be the whole thing. The spec contemplates that the upper, the entirety of the upper, does not have to be knitted. There can be other nonknitted components.

So that's Nike's position on that term. Any other questions, Your Honor?

THE COURT: Not on that issue. Forgive me. I have certain things that were troubling or just a concern of when me and the crew -- when we were going over this, so I just wanted to make sure I covered those. And so thank you. Let me see here what I have --

MR. ROSEN: Your Honor, may I respond?

THE COURT: Yes. Go ahead.

MR. ROSEN: And, Mr. Cruz, if I can get slide 113 please. Thank you.

Just to make sure that the Court understands this -- I know we're jumping around a little bit. It's important to note, Your Honor, that one of the very key central aspects of this invention is the unitary knit construction. It's making everything out of one single piece. In fact, throughout the patent, through the background section during the patent prosecution, the applicant over and over again contrasted what used to be the way of making shoes or what they say used to be the way of making shoes -- taking lots of pieces and cobbling them together; literally the term "cobbler"; right?

And the new inventive way that they have which is taking a single piece, taking one flat knit element out of which the entire upper can be made. And we just want to be clear that in both the way that the patent -- the applicants described it in their invention over and over again, described what their invention is contrasted with what came back before, that, in fact, it needs to be clear the unitary knit construction, when putting it together, together is the upper and the integral knit tongue -- all one piece. That's really the key.

THE COURT: Okay. The parties have disagreement as it relates. While I want to give you an opportunity to give me your spiel as it related to -- not spiel, but give me your position as it relates to integral knit tongue.

MR. ROSEN: My colleague Mr. Orso will handle that.

THE COURT: All right. So everyone looks like they're going to get a chance today to handle that.

MR. ORSO: Keith Orso on behalf of Skechers and may it please the Court.

If we could start, Mr. Cruz, with slide 48.

So here is our construction of integral knit tongue, Your Honor. Throat area between overhanging portions of the upper or adjacent to one or more raised elements. And I think it will make sense to address this. This is what you requested. We may need to veer into raised element as well, but let's start here.

Integral knit tongue is a coined term. It has no ordinary and customary meaning. And Nike hasn't disputed this and hasn't submitted any evidence of an ordinary or customary meaning for the term.

And we know, if we go to slide 52, please -- we know that, if a disputed term has no previous meaning to those of ordinary skill in the art, its meaning then must be found in the patent. So we turn to the specification. That is the Irdeto case.

So when we go to the specification, if we can have slide 54 -- this is just a summary, but we see the specification identifying as integral knit tongues: one, the throat area adjacent to, often including, one or more structures referred to as raised elements; and, two, in the absence of raised

elements, the throat area between overhanging portions of the upper.

And we can walk through the parts of the patent that disclose that. I don't think Nike disputes those disclosures, though, in the patent. And I'm happy to go circle in if need be. But I think Nike's position is we shouldn't be looking to the specification to construe integral knit tongue.

Nike asserts that integral knit tongue, those three words, that phrase, can be broken up into its constituent words and construed that way. Although their position, of course, is no construction is required. But they think it's understandable by breaking it up into its individual words. But Nike offers, as I said, no corresponding sort of sum of the parts construction for integral knit tongue. It simply argues that integral knit tongue relates to how a tongue is affixed, and that is not a construction. And it doesn't help anyone to determine whether there is an integral knit tongue or not.

Nike argues that everyone knows what a tongue is, in the context of shoes, but if that is true, then it should be easy to construe it, but it isn't.

If I can have slide 50, please.

What is shown here on slide 50 is probably what most people consider a tongue. You see a flap of material on the right. It's kind of splayed open, so that you can see it coming out. And it's connected to the rest of the shoe. And

if it's connected to the rest of the shoe by knitting, then, Nike would say, well, that is an integral knit tongue.

If I could have slide 51, please.

But Nike will say that, according to the patent, integral knit tongues can be also joined by knitting -- you see the highlighted portion -- at least along a portion of both the lateral side and medial side of that throat area.

So if we go to slide 63, what do we do with a shoe like this? Does this have an integral knit tongue that is joined by knitting up the sides of the throat area? Well, Nike says, "No."

If I can have slide 64, please.

This is an excerpt from a piece of prior art. It's referred to as Dua 2. It's U.S. 2005/0193592, and it has these figures in it.

If we go to slide 69, Nike's expert has argued that Dua 2 does not disclose an integral knit tongue. Do you see at the bottom portion of the slide quoted?

And if we look at slide 68, please, Nike's expert also says that an integral knit tongue is not just any knitted material that exists over the throat area/instep of the foot. And you can see the figure at the top of the slide. That's that figure, one of those figures from Dua 2.

So the problem, of course, -- and it's been recognized -- if you look at slide 65, as the patent examiner recognized in

examining a related patent claim -- recognized that the integral knit tongue loses the features characteristic of a tongue by fixing it on all sides of the throat area.

So Nike thinks that the shoe, on slide 50 that we saw, does have an integral knit tongue, that one with the tongue splayed open, but that the shoe on slide 64 doesn't have an integral knit tongue. And Nike makes no effort to draw a line between the two.

That's important because, if we look at slide 66, Nike actually accuses of infringement shoes that look a lot like those on slide 64. On the left you have again those figures from Dua, and on right you have an excerpt showing some of the accused shoes that Nike says have integral knit tongues.

Something is missing from that shoe on slide 64.

Will you bring that up again?

Something is missing from that shoe on slide 64. Something extra must be needed for that shoe to have an integral knit tongue. And the patent specification tells us what that is. It's either raised elements or those overhanging portions of the upper.

So maybe it makes sense to transition to raised element --

THE COURT: I want to hear Nike's response before we get to the raised element.

MR. ORSO: Please. Yes.

THE COURT: Obviously, you can cover whatever area

you think is appropriate, but as it relates to last photograph that was shown, is it Nike's position that, I guess, the pink, sand, or beige shoe has an integral knit tongue?

Daniel. There we go.

MS. STAUBACH: Thank you, Your Honor. I think I'll start in a little bit of a different spot and end up with your question.

THE COURT: Okay.

MS. STAUBACH: So integral knit tongue, first of all, Skechers says this is a coined term. They say Nike agrees with that. Nike doesn't agree with that. But to begin with, I want to start by looking at Skechers' proposed construction here. So the term is integral knit tongue. And as you can see on the upper right side here, they've construed this as throat area between overhanging portions of the upper or adjacent to one or more raised elements, and then they have this extended proposed construction of raised element here.

But what you'll notice -- and as Your Honor knows, claims are the cornerstone of a claim construction analysis, and we should be giving meaning to every word in the claim. And if we are proposing constructions, they should be explaining the claim language and adding clarity for the jury.

But if you look at this construction on the right, what you won't see is any requirement that this tongue be knit, and you won't see any requirement that this tongue be integral.

"Knit" doesn't even appear in here, and there is no suggestion that this is knit in their construction. So that is the first reason we think Skechers' proposed construction is improper.

Furthermore, Skechers' proposed construction, it doesn't explain what the integral knit tongue is. What it does, it says there is this area of the shoe, and it provides like a positional relationship between other optional features of the specification, which is an overhanging portion or a raised element.

So Skechers goes into the specification. They cherry-pick these two features from the specification, and they say --

(Court reporter interrupted.)

MS. STAUBACH: This is what it needs to be.

And so let's go back to coined term. This is not a coined term. There is no dispute between the parties that tongue has an ordinary meaning.

THE COURT: So, I mean, we don't need to construe the term "tongue"?

MS. STAUBACH: We don't need to construe the term "tongue."

We don't need an affirmative construction for integral knit tongue. That is Nike's position.

But a coined term means that there is no accepted common meaning, and that the inventor coined this term for this particular patent application. And that's not the case here.

What we're looking at is the word "tongue," that there is no dispute. Everyone knows what that means. And then "tongue" is modified by "integral" and "knit. And so that means a knit tongue that is a part of the article of footwear or that is a part of the upper or connected to the upper.

And Skechers concedes this in their briefing with what is highlighted here. This is from Skechers' claim construction brief. It says, "Given what it means for two things to be integrated, given what knitting is, and given the well understood shape of a tongue, both generally and in the construction of shoes." Skechers knows that this has an ordinary meaning. So this is not a coined term.

But even if we did look at this, all three words together, integral knit tongue, as a coined term, federal circuit law says the inquiry for an ordinary meaning doesn't stop there. We have to look at each word separately, as opposing Counsel mentioned when they were up here.

So, again, like we just discussed, we know what "tongue" means; we know what "knit" means; we know what "integral" means. Putting those together, we would have a tongue joined by knitting to the upper.

THE COURT: Okay.

MS. STAUBACH: Plain and simple.

Keeping that in mind, that either this isn't a coined term or, if it is, it has an ordinary meaning, Skechers' proposed

construction is improper because their entire argument is based around limiting this to certain embodiments in the specifications, and that runs contrary to the most fundamental claim construction law, which is you can't import limitations from a specification into the claims.

Now, with respect to that image that they put up, which I'm sorry I don't have in my slide presentation --

THE COURT: At least from my naked eye, is there a tongue there? Or is it your view that, because as you define -- we all know what a tongue is, we all know what knitted is, and integral is part of it. So because it's knit and it's part of the shoe, we can just say there is a tongue there?

MS. STAUBACH: Well, it's a good question, Your Honor but --

THE COURT: Even a broken clock is read twice a day.

MS. STAUBACH: Nike's position is that a tongue, as we've discussed -- we know what it is; we know what it looks like. A tongue may have different features, which some of these are in Skechers' proposed construction. In the context of this patent, could have overhanging portions, could have raised elements, could be under laces, could be partially connected and partially free at the end, could have an overhanging extension at the ankle.

THE COURT: I get that. But the photo that was

shown, does it fit within any of those from Nike's view?

MS. STAUBACH: Yes, Your Honor. So something that was a little bit misleading, I think, in what Skechers put up is that, from the side view, you could only see that each side seemed to have like a little bit of an overhanging portion at the ankle opening.

But if you look at the patent figure head-on next to Skechers' shoe, you would actually see that there is a tongue-like feature at the top of Skechers shoe; whereas in the image from the patent, there was only this little notch in the middle.

THE COURT: So are you saying that -- I'm just trying to envision this shoe. If there is a little lip at the top, in your view, that would be enough to be characterized as a tongue?

MS. STAUBACH: If it's distinctive enough and has the shape of a tongue, then, yes, I think that is our view.

THE COURT: Got it. Okay.

Let me hear from Skechers. I see a box that says "Skechers." Is the shoe here?

MR. LU: Yes, Your Honor.

THE COURT: Okay. So let's have a little show and tell.

MR. LU: I would be happy to pass it up.

THE COURT: Well, I think I saw it. Maybe I just ask

Nike point blank, from your perspective, is there a tongue on the shoe, and if so, where is it?

MS. STAUBACH: Yes. Thank you, Your Honor.

Yes, we do think there is a tongue on this shoe, and we think that because -- and we can pass it up to you if that would be helpful. But there is a lip that extends all the way across where a tongue would go, and it is knitted through a throat area to the forefront and to the medial and lateral sides of the throat area.

THE COURT: Even though the knitting is -- I guess the counter on it, it's just one shoe that just happens to have a shape at the top; right? And so but your view is that, when you look at the term, because there is knitting and it's in the upper portion, that is enough for it to be a tongue?

MS. STAUBACH: So if this wasn't raised, if there wasn't this lip here, it would not be our opinion that this was an integral knit tongue.

THE COURT: So literally if -- I'm being a leadite here. You shave off of top quarter inch of that, then there is no tongue?

MS. STAUBACH: Yes, Your Honor.

THE COURT: Okay. All right. Let me hear from Skechers.

MR. ORSO: Thank you, Your Honor.

THE COURT: And if that is in size 11, you can leave

that.

If I could have 64 again, please, -- 64. Here we go. So this is this the Dua 2 reference that Nike's expert says does not have a tongue.

I don't think I can use the tracing feature here. But do you see there is a little notch on the inside on figure 8, on the inside of the "U" shape? In fact, on figure 1 at the top you see there is a little pointy spot on the side view of the shoe?

THE COURT: Right. Hold on. We've been having some trouble.

MR. ORSO: Are you able to see the cursor? That's the best I can do. The cursor up here?

THE COURT: Yeah, I can see it.

MR. ORSO: Okay. So I was talking about this portion up here.

THE COURT: Right.

MR. ORSO: And I was also talking about this portion here, that little thing that sticks out.

THE COURT: That's aerial view up top looking from --

MR. ORSO: Yes, Your Honor. So what I'm circling now is on the upper as it's splayed out.

THE COURT: Right.

MR. ORSO: You have the top view of the shoe down here in the lower left corner.

THE COURT: Right.

MR. ORSO: Is that a tongue?

THE COURT: You see --

MR. ORSO: That is a rhetorical question, yes.

THE COURT: Okay.

MR. ORSO: So let me get back to sort of what -- I think, what Counsel told you with respect to this shoe, I believe is inconsistent with what their expert said with respect to that shoe, the Dua 2 shoe.

I do want to get back to this question of whether this a coined term, because Counsel got up and stated that it is not a coined term, but you didn't see her point to any evidence of its use in the art at all because there isn't any evidence. They put in no evidence.

THE COURT: But is that dispositive?

MR. ORSO: Well, what is the evidence that it's a coined term. She's saying that to you. We're showing you that this patent uses this term -- it's a term; right? It's a three-word term.

THE COURT: Right.

MR. ORSO: And there is no evidence in the record that it's a term known in the art or term used in the art. They don't cite other patents that use the term other than maybe their own patents do, because they're related. They don't cite prior art. They don't have expert testimony.

THE COURT: But I guess the question is what about the converse? There is no evidence to the contrary, is there?

MR. ORSO: Well, but they're the ones taking the position that it's not a coined term. So we see this language, and they came forward with no evidence that, oh, here is what it is. Here's where you can find it in whatever.

THE COURT: I get their argument. I am not going to speak for Nike. But you've got three words, I mean, and they're not overly complex; right?

MR. ORSO: Right.

THE COURT: Integral knit tongue. What more do you need?

MR. ORSO: So that gets back to the point that we talked about earlier which is this word "tongue."

And if we go to -- what is it -- slide 50, please.

Again, we talked about this sort of canonical example, maybe you'd say, of a tongue; right?

THE COURT: Right.

MR. ORSO: Splayed out. We all have them oftentimes on our shoes.

The other thing that Counsel for Nike didn't tell you, when she was up here, was how to actually define tongue. So I said it in my first -- in my opening statements. I mentioned that, if it's so known and knowable, what is the definition? So I am very sure that Nike would not want to limit itself to a

flap-like structure joined to an upper.

THE COURT: Because there is no flap; right? At least with the shoe at issue.

MR. ORSO: She said this is infringing. So what would be Nike's definition of tongue? What would Nike tell a jury the word "tongue" meant in the context of shoes. I don't think it's simple. I think they may want to tell us, oh, everyone knows what a tongue is, but do we? And do we know what a tongue is in this context where it is an integral knit tongue where the patent says, well, you can join it up the sides?

So what is a tongue then? That is the whole question here. The word "tongue" does need construction. It's not enough to say that there's is a tongue, and it's joined by knitting or whatever to the rest of the upper.

THE COURT: Okay. I would like to hear Ms. Staubach's response to that, only because it's interesting, just to me, playing this out in front of a jury, you know, do we need to define what a tongue is, because I think most people would at first think it's the flap? And they might be surprised or at least interested to hear that Nike's view is that that upper lip portion is also a tongue.

So does that beg the question that perhaps tongue needs to be defined? Look, initially, I think no, but hearing this back and forth, maybe it does.

MS. STAUBACH: Your Honor, I would like to begin by addressing opposing Counsel's remark about coined term. So it is Skechers' position that this is a coined term. There is no evidence in the record that it is. Coined terms are generally established by sometimes agreement of the parties, if you look at the case law, or by expert testimony. There is no expert testimony in this case.

Because they say it's a coined term, it is their burden to prove that. It is not our burden to come forward with evidence up-front about why this is not a coined term. And Skechers has not established that this is a coined term.

And can you remind me of your question?

THE COURT: Yes. Do we now need to discuss or construe the term "tongue," I mean, because I'll tell you just --

MS. STAUBACH: Yes.

THE COURT: -- hearing it, it is a little bit surprising that Nike takes the position that that upper -- I'll just call it upper lip towards the ankle opening is a tongue, when, I think, many people -- and I'm curious -- would feel differently; that they would think of a flap, like the long flap. And your view is that, because there is this knitting connected to the ankle opening and it's integral to the shoe, that also equals tongue.

So the question is: Do we need to construe the term

"tongue"?

MS. STAUBACH: We think that tongue is evident from the claim itself. So the claim describes that the tongue -- it describes where it extends; right? It extends through a throat area of the knitted component.

THE COURT: Throat area of the knitted component. So, in your view, you have a knitted component with the shoe at issue in front of you. And it's extending through the throat area, which is where again?

MS. STAUBACH: It's from the forefront of the foot to the ankle opening to the --

THE COURT: Forefront of the foot to the ankle opening.

MS. STAUBACH: -- instep.

That's Skechers' language --

THE COURT: Right.

MS. STAUBACH: That we said earlier that we would agree with.

THE COURT: And so you think this knitting extends over that throat area in the shoe at issue?

MS. STAUBACH: Yes, it does. You think about a conventional tongue that is not joined by knitting at the sides or at the forefront location. It's in the same location. Only here it is integrally knitted with the upper, and it still has features of a conventional tongue. For example, like we just

talked about with this shoe, it still has this. This piece right here, that would be the top of the tongue.

THE COURT: So if you cut that off, then it's not a tongue.

MS. STAUBACH: So Nike's position is that, if this shoe right here did not have this look, then this would not have an integral knit tongue.

THE COURT: Okay. Okay. All right. That's helpful. Thank you. I appreciate it.

I think you want to talk about raised element, which is the other area, but I assume you want -- as lawyers you want to have the last word so you want to respond?

MR. ORSO: Just very, very briefly.

THE COURT: Okay. All right.

MR. ORSO: And I'll just end with this which is, if we bring up slide 64, what Nike just told you does not distinguish the shoe on slide 64. How do we know -- it's like a shell game; right? They want to have all their options open in trial on what integral knit tongue is. They want to say, "Our shoe has one." But they've already they said that this shoe doesn't, that you see on this slide. And so I don't think that we've moved the ball here. There is still no definition on the table of what a tongue is.

THE COURT: I think Ms. Staubach -- she defined it. You guys have a different interpretation of what that means. I

mean it's the knitting through that throat area up to the ankle opening. There is knitting in that throat area up to the ankle opening; right?

MR. ORSO: That's what she said with respect to this. But what about this one? This one is knitted. And this has -- remember we talked about those -- the part up here and this part here. My point is that we don't have a construction we can use to assess alleged infringement and validity.

THE COURT: Okay. Okay.

MR. ORSO: Let me speak briefly, unless you have further questions on integral knit tongue, about raised element.

THE COURT: Go ahead.

MR. ORSO: I think it would be relatively quick. We can start with slide 56, please. This is our construction of raised element -- a flap or overhanging portion extends outward away from the surface of the upper along the length of the side of the tongue.

Again, our position here, as it is with respect to integral knit tongue, is that this is a coined term. It's obviously very difficult to prove a negative. They haven't come forward with evidence that it is a coined term.

THE COURT: It's interesting. Both of you are both saying -- your pointing fingers at each other saying, "You need to prove it."

"No, you need to prove it."

MR. ORSO: So I guess they are saying, if we had come in with an expert saying it was a coined term, then they would have folded. I doubt that is true.

THE COURT: I doubt that as well.

MR. ORSO: That's true. But raised element, we don't see that anywhere else. "Element" itself is kind of an empty word; right? "Element" is kind of a placeholder word. Raised element.

So we have to look to the specifications. We think it's a coined term so we think you look straight to the specification. I think if you just look at raised element on its own, you say, "What am I going to do with that? I don't know what that means." So I've got to look to the patent specification. It doesn't work -- don't even argue that you can break it apart and construe it that way. So we look to the specification and what do --

(Court reporter interrupted.)

MR. ORSO: We see a sole description on slide 57. So this is in the '562 patent, column 9, lines 63 to 66, and this is where we get the language. This is talking about a flap or overhanging portion of integral knit tongue '512 that extends outward away from the first surface '530 of upper '502.

If we look at, I believe, the next slide, yes, here we see slide 58. We see examples of the raised element, and there are

a couple different examples. You see in the upper left you have that flap with the overhanging portion. You see a cross-sectional view, figure 6, in the bottom left of the slide. And on the right you have an embodiment where there are holes for laces in there.

So this is all we have. This is literally all we have from the patent specification about what a raised element is. So absent anything else, there is no more general description that what you saw on previous slide 57. There is no more general description than that. That is all we have to go on.

So that is how we arrived at our proposed construction for raised element. If we just say to the jury that there are raised elements there, I think the jury is going to look at each other and say, "We don't know what that means."

So we think it needs construction. And we think the only thing you can do is look to the patent to identify what a raised element is.

THE COURT: Okay. Ms. Staubach, any response?

MS. STAUBACH: Yes, Your Honor. Just like integral knit tongue, Skechers says that raised element is a coined term. Just like integral knit tongue, this is not a coined term, and even if it was, it would be the sum of its parts, just like integral knit tongue.

But once again, its Skechers' position that this is a coined term. There is no evidence in the record for this term

either. No expert testimony. No agreement of the parties. They just expect the Court to take Skechers' word for it.

And as you know, there is a heavy presumption that claim terms are given their ordinary and customary meaning. It can't be that you can just pluck any series of words out of a claim and be like, well, this only has a meaning within this patent application or this specification.

If that were the case, that would run directly contrary to the most fundamental claim construction law. But getting to the words of the term itself -- raised element -- that is not confusing. That is not confusing to positas. That is not confusing to lay persons. It is two words. The first is "raised." "Raised" is protruding above, elevated, heightened. Maybe with respect to something else in this case it would be with respect to the knitted component. And "element" is a component or part of something. That's not confusing. It's a component that is raised; that is raised with respect to the knitted component.

And, you know, Skechers says, "Well, 'element' is a knots word." Well, that is kind of conflating means plus function claim construction with a coined term because it means less function. You may have like a means for -- I don't know. A means for forming something.

And then you have to understand what that means is -- that is able to achieve that function is, and then you go to

specification, and you look for that. But there is no functional claim in here. This isn't something that is doing anything. It is a raised element that is on a knitted component.

So taking that into account that this is not a coined term -- or if it is, just like integral knit tongue, it is a sum of its parts. Skechers' construction is improper. It has to be because, you know, they concede in their argument "We are limiting this to certain things in the specification. We are limiting this to either flap or overhanging portion. Where it's a flap or overhanging portion that extends along the length of the side of the tongue.

But those aren't in claim language. You can see the claim here. And the underlying portion is where raised element is. At least one raised element extending --

THE COURT: Slow down. Ms. McKennon -- go ahead.

MS. STAUBACH: At least one raised element extending a height above the exterior surface of knitted component. So there is no requirement in here for flap or overhanging portion or that it extend along the length of the side of the tongue. And the specification makes clear that, if there is a flap or overhanging portion, that is just a nonlimiting example of what a raised element can be. The claims are broader than that. The claims just say "raised element" or "extending above the surface of the knitted component."

We don't think a jury would be confused by this term. We don't think it requires any affirmative construction. And it's not a coined term.

THE COURT: Okay. Mr. Orso, I assume you have something you want to say in response. Go ahead.

MR. ORSO: Very brief, Your Honor.

What Counsel just articulated as the sort of split apart construction of something that is protruding above and an element being just a thing. So I guess my question would be -- let's go back to our friend, this shoe. Does this have raised elements? I mean, maybe you can't see -- and I won't approach obviously without your permission, but there is texture on here.

THE COURT: Right.

MR. ORSO: What if a shoe has ribs? Ribs are one of the terms -- there is a term with ribs --

THE COURT: Right.

MR. ORSO: -- that is at issue here today.

THE COURT: Is that a raised element?

MR. ORSO: Is that a raised element? Are they really taking the position that any protuberance, anything extending above some plain in the shoe is a raised element.

I think when we look at the patent and we look at the specification, the patent is clear about what raised elements are, and I don't think we have much else to go on except that.

And if they want to blow it up and say any single thing, I would be surprised because during prosecution adding the term "raised elements" is what allowed them to get their claim through. And if anything in the world is rising above the surface can be a raised element, I don't know how that would have distinguished the prior art. Thank you, Your Honor.

THE COURT: Let me ask Ms. Staubach. I am curious of that question.

Does that shoe -- does that contain raised elements, in your view -- not yours. I mean Nike's view.

MS. STAUBACH: So opposing Counsel pointed to ribs on here.

THE COURT: The texture of the shoe; right?

MS. STAUBACH: There --

THE COURT: Would be considered a raised element?

MS. STAUBACH: -- are some other textures on here. And the answer to the question is "No," Your Honor. And all we have to do to ascertain that is to look at language of the claim itself.

THE COURT: Okay.

MS. STAUBACH: And so we can see that the claim says a knitted component; right? This is knitted component here.

THE COURT: Okay.

MS. STAUBACH: So if we then also have to have an additional element that says, "At least one raised element

extending a height above the exterior surface of the knitted component," we aren't going to look at things that are the knitted component itself.

THE COURT: But read that last portion that you just said, "raised above." Would you mind reading that one more time?

MS. STAUBACH: Sure. "At least one raised element extending a height above the exterior surface of the knitted component."

THE COURT: So a height above the exterior component. I've got teenagers, so sneakers are all over the house. I've seen all different types -- slip ons, dunks. I've seen some that have that sort of material on that shoe, but they have a fabric that kind of adds as, I guess it would be, a rib. It does extend above the height.

Would that be infringing, potentially infringing? I mean, I don't -- I'm not intentionally trying to put you on the spot. But my question is that, in a shoe -- I can literally just see it right now, in our entryway where there is ridges above the knitting. Is there a potential for that be viewed as a raised element?

MS. STAUBACH: Can I have just a moment?

THE COURT: Absolutely.

(A discussion was held off the record between Counsel.)

MS. STAUBACH: Thank you, Your Honor.

THE COURT: Sure.

MS. STAUBACH: So, first of all, to assess infringement we would need to have -- consider whether a shoe meets all of the limitations in this claim, and we would really have to see the shoe to assess whether it has something distinctive enough to be a raised element.

THE COURT: Fair enough. You can see the other argument that, hey, use in that could be a problem. But your point is that we would have to see the specific shoe before we can make an assessment on that. Okay. Fair enough. Okay. Go ahead.

MS. STAUBACH: Nonetheless, for all the reasons we just discussed, Skechers' proposed construction is incorrect because it's not a coined term. Just throwing that out there.

THE COURT: Okay. Got it. Let me see --

MR. ORSO: Your Honor, can I point you to piece of evidence?

THE COURT: All right.

MR. ORSO: I won't bring it up.

THE COURT: Just get close to the mic.

MR. ORSO: I'm sorry. Can I just point to piece of evidence? If you look at claim 16 of the '636 patent, it's the knitted component recited in claim 13 where at least one raised element is formed of unitary knit construction with the upper and integral knit tongue.

So it's talking about one piece that has a raised element, unitary knit construction.

THE COURT: Okay. Fair enough. All right. Look, those are all questions I have. Although I have to tell you, just hearing the discussion which was very helpful and both sides did a great job, I'm contemplating -- which means generally that I'm going to do this. I'm wondering if I can get the parties' position in maybe a two-page supplement on whether or not -- what is the plain and ordinary meaning of tongue?

I mean, I am little sort of torn about that particularly in light of seeing the shoe, the shoe that has been presented. And probably we should state for the record what is the brand of that shoe or model of that shoe?

MR. ORSO: Your Honor, that is a Skechers' shoe. That's an accused shoe in this case.

THE COURT: No, no. But which one is -- if you know, like the model.

MR. ORSO: This is the Go Walk Arch Fit 2.0 Paityn, P-A-I-T-Y-N in mauve.

THE COURT: In mauve.

MR. LU: This is Samuel Lu. It's probably best to also provide the style number 125300.

THE COURT: Okay. So in light of seeing the mauve shoe, it just raises a question in my mind -- I'm just trying

to play this out long term, summary judgment, trial.

Is this going to be an issue. So I guess I come down to -- I mean, would the parties be willing to give me a two-page brief or supplement and the evidence supporting sort of the plain and ordinary meaning of tongue, because I think there is an --

MR. HARRIS: Sure.

THE COURT: Go ahead, Mr. Harris.

MR. HARRIS: Michael Harris for Nike. Yeah, we would be happy to do that, Your Honor. One or two pages, whatever you want.

THE COURT: Two pages. I assume you folks want to get the billables up before the end of the month so we can get it done in the next ten days. That would be fine, by on or before September 30. That would work.

MR. ORSO: Yes, Your Honor.

MR. HARRIS: Yes, Your Honor

THE COURT: All right. So we've been going at this a little while. I don't have any other questions. If there is some burning issues that either side wishes to raise in the next few minutes, I'm happy to hear it. But we spent a lot of time going through it so I wanted to try to make this as productive as possible by focusing on some of the issues that I was struggling with.

Mr. Harris?

MR. HARRIS: Thank you, Your Honor, really productive. I'm glad we could focus on your issues. We don't have any burning issues that we need to address, but thank you.

THE COURT: Mr. Orso?

MR. ORSO: Nothing further, Your Honor.

THE COURT: I am just curious. Again, I love shoes. So what shoe is that that you have in your hand, Mr. Lu?

MR. LU: Well, Your Honor, I think there was a little bit of confusion regarding the difference between a flat knit and a three-dimensional upper. And so one of the things we did, Your Honor, was to print some of the patent figures on T-shirts. And this was kind of my idea.

THE COURT: Okay.

MR. LU: And then we cut these flat knit elements that you were shown in the patent, which as you can see are two dimensional. This was, I think, addressed on a number of the claim construction elements, and I am not going to go into that. But what we ended up showing is how those flat knit elements would be situated on what is called a last, which is the shape of a foot that they use to make shoes.

And as Your Honor can see, that makes it a three-dimensional upper that has an interior and exterior and ankle opening and all of the other stuff. And this back portion here, as explained in the briefing and as shown in some figures, gets kind of wrapped --

THE COURT: Wrapped around the back heel?

MR. LU: Yeah. And oftentimes there is a seam -- there is a layer that gets put on top of that to hide the seam.

THE COURT: Got it.

MR. LU: But that was kind of, you know, the purpose of this. And we actually had some concerns that security wouldn't allow us to bring this through because they're really heavy.

THE COURT: Oh, but they did. Okay. Good.

All right. Well, thank you. I appreciate the time.

Mr. He-Schaefer, I just want to give you an opportunity so you can justify your existence today.

Anything that you wanted to add? I'm teasing, of course. But I just didn't want you to feel left out.

MR. HE-SCHAEFER: Oh, I don't feel left out. Thank you, Your Honor.

THE COURT: All right. Okay. Thank you very much. I really appreciate it. I'm just going to be candid with you all. I've been in trial since August 20, in back-to-back trials. I've got another one starting next week, so it may be a little while before I issue our order in connection with this case.

In fact, actually, I'm going to wait. I want to wait until I get your positions with respect to tongue. So I'll probably get that done sometime in mid to late October then.

All right. Thank you all. Have a wonderful weekend. Safe travels. All right.

(Adjourned at 11:50 a.m.)

-oOo-

REPORTER'S CERTIFICATE

I certify that the foregoing is a correct transcript of proceedings in the above-entitled matter.

/s/ Suzanne M. McKennon, CSR, CRR, RMR
United States Court Reporter

Date: 09/25/2024

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Exhibit HH

US Patent & Trademark Office

Patent Public Search | Text View

United States Patent
8484749060562 Kind Code
Patent
2013June 23, 2015 Inventor(s)
P.Meir; Adrain et al.

B12 Date of
May 28,
Tatler; Daren

ArticleMethod of footwear incorporatingknitting a knitted component with aan integral knit tongue

Abstract

Articles of footwear may have an upper that includes a knit element and a tongue. The knit element defines a portion of an exterior surface and an opposite interior surface of the upper, with the interior surface defining a void for receiving a foot. The tongue is formed of unitary knit construction with the knit element and extends through a throat area of the upper. Methods of manufacturing a knitted component for an article of footwear maythat include knitting a tongue. The tongue is held on needles of a knitting machine. A first portion of a knit element is formed with the knitting machine while the tongue is held on the needles. The tongue is then joined to the first portion of the knit element. Additionally, a second portion of the knit element is formed with the knitting machinean upper with an integral knit tongue during a knitting process on a knitting machine are described. The knitting process forms the integral knit tongue of unitary knit construction with the upper so that the integral knit tongue extends through a throat area of the knitted component. The integral knit tongue can include raised elements formed of unitary knit construction with the tongue.

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Appl. No.: 13/400511781551

Filed: February 20, 2012 28, 2013

Prior Publication Data

Document Identifier	Publication Date
US 20130239625 A1	Sep. 19, 2013

Related U.S. Application Data

continuation-in-part parent-doc US 13400511 20120220 US 8448474 child-doc US 13781551

Publication Classification

Int. Cl.: D04B7/04 D04B7/30 (20060101); A43B1/04 (20060101); D04B1/24 (20060101); A43B23/02 (20060101); A43B23/26 (20060101); D04B1/22 (20060101); D04B15/56 (20060101); D04B7/28 (20060101)

U.S. Cl.:

USPC 66/64; 66/177 CPC A43B1/04 (20130101); D04B1/24 (20130101); A43B23/0245 (20130101); A43B23/0265 (20130101); A43B23/26 (20130101); D04B1/22 (20130101); D04B15/56 (20130101); A43B23/0205 (20130101); D04B7/28 (20130101); D10B2403/02411 (20130101); D10B2403/032 (20130101); D10B2501/043 (20130101); D10B2403/0113 (20130101)

Field of Classification Search

CPC: D04B (1/24); D04B (2401/043); D04B (2403/032); A43B (1/04); A43B (23/0245); A43B (23/26)

USPC: 36/10;45;3A; 66/60;64-73;177;169 R;170;171;177; 2/3 R;3A;84;114;47

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION This application is a continuation- in-part of co-pending U.S. patent application Ser. No. 13/400,511, entitled "Article Of Footwear Incorporating A Knitted Component With A Tongue", filed on Feb. 20, 2012, which application is hereby incorporated by reference in its entirety.

(1) BACKGROUND

(2) The present invention relates generally to methods of manufacturing articles of footwear, and, in particular, to a knitting process for a knitted component with an integral knit tongue for an article of footwear.

(3) ~~**(2)**~~Conventional articles of footwear generally include two primary elements, an upper and a sole structure. The upper is secured to the sole structure and forms a void on the interior of the footwear for comfortably and securely receiving a foot. The sole structure is secured to a lower area of the upper, thereby being positioned between the upper and the ground. In athletic footwear, for example, the sole structure may include a midsole and an outsole. The midsole often includes a polymer foam material that attenuates ground reaction forces to lessen stresses upon the foot and leg during walking, running, and other ambulatory activities. Additionally, the midsole may include fluid-filled chambers, plates, moderators, or other elements that further attenuate forces, enhance stability, or influence

the motions of the foot. The outsole is secured to a lower surface of the midsole and provides a ground-engaging portion of the sole structure formed from a durable and wear-resistant material, such as rubber. The sole structure may also include a sockliner positioned within the void and proximal a lower surface of the foot to enhance footwear comfort.

(4) ~~(3)~~The upper generally extends over the instep and toe areas of the foot, along the medial and lateral sides of the foot, under the foot, and around the heel area of the foot. In some articles of footwear, such as basketball footwear and boots, the upper may extend upward and around the ankle to provide support or protection for the ankle. Access to the void on the interior of the upper is generally provided by an ankle opening in a heel region of the footwear. A lacing system is often incorporated into the upper to adjust the fit of the upper, thereby permitting entry and removal of the foot from the void within the upper. The lacing system also permits the wearer to modify certain dimensions of the upper, particularly girth, to accommodate feet with varying dimensions. In addition, the upper may include a tongue that extends under the lacing system to enhance adjustability of the footwear, and the upper may incorporate a heel counter to limit movement of the heel.

(5) ~~(4)~~A variety of material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) are conventionally ~~utilized~~**used** in manufacturing the upper. In athletic footwear, for example, the upper may have multiple layers that each include a variety of joined material elements. As examples, the material elements may be selected to impart stretch-resistance, wear-resistance, flexibility, air-permeability, compressibility, comfort, and moisture-wicking to different areas of the upper. In order to impart the different properties to different areas of the upper, material elements are often cut to desired shapes and then joined together, usually with stitching or adhesive bonding. Moreover, the material elements are often joined in a layered configuration to impart multiple properties to the same areas. As the number and type of material elements incorporated into the upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase. Waste material from cutting and stitching processes also accumulates to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements. By decreasing the number of material elements ~~utilized~~**used** in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper.

(6) Therefore, there exists a need for an article of footwear that incorporates a knitted component with an integral knit tongue.

(7) ~~(5)~~SUMMARY

(8) ~~(6)~~Various configurations of an article of footwear may have an upper and a sole structure secured to the upper. ~~The upper includes a knit element and a tongue~~**A knitted component including the upper and an integral knit tongue is incorporated into the article of footwear. The upper and the integral knit tongue are formed as a one-piece knit element**. The knit element defines a portion of an exterior surface of the upper and an opposite interior surface of the upper, with the interior surface defining a void for receiving a foot. The **integral knit** tongue is formed of unitary knit construction with the **upper as a**

one-piece knit element and extends through a throat area of the upper. ~~(7)Methods of manufacturing a knitted component for an article of footwear may include knitting a tongue with a knitting machine. The tongue is held on needles of the knitting machine. A first portion of a knit element is formed with the knitting machine while the tongue is held on the needles. The tongue is then joined to the first portion of the knit element. Additionally, a second portion of the knit element is formed with the knitting machine.(8)Methods of knitting may also include providing a knitting pattern with a modifiable field. The modifiable field is updated with data representing a first alphanumeric character. A first component with a knit structure of the first alphanumeric character is formed. The modifiable field is updated with data representing a second alphanumeric character, the second alphanumeric character being different than the first alphanumeric character. Additionally, a second component with a knit structure of the second alphanumeric character is formed.~~ The integral knit tongue incorporates raised elements providing lace apertures for a lacing system.

(9) In one aspect, the invention provides a method of manufacturing a knitted component for an article of footwear, the method comprising: knitting a portion of the knitted component defining an upper with a knitting machine, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component; and knitting an integral knit tongue that is of unitary knit construction with the upper with the knitting machine, the integral knit tongue extending through a throat area of the knitted component; and wherein the integral knit tongue is joined by knitting with the knitting machine to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

(10) In another aspect, the invention provides a method of manufacturing a knitted component for an article of footwear, the method comprising: knitting a first portion of the knitted component defining an upper with a first feeder of a knitting machine, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component; knitting a second portion of the knitted component defining the upper with a second feeder of the knitting machine; and knitting an integral knit tongue that is of unitary knit construction with the upper with at least one of the first feeder and the second feeder of the knitting machine, the integral knit tongue extending through a throat area of the knitted component; and wherein the integral knit tongue is joined by knitting with the knitting machine to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

(11) In another aspect, the invention provides a method of manufacturing a knitted component for an article of footwear, the method comprising: knitting a first portion of the knitted component defining an upper with a first feeder of a knitting machine, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component; knitting a second portion of the knitted component defining the upper with a second feeder of

the knitting machine; and knitting an integral knit tongue that is of unitary knit construction with the upper with a third feeder of the knitting machine, the integral knit tongue extending through a throat area of the knitted component; and wherein the integral knit tongue is joined by knitting with the knitting machine to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

(12) (9)TheOther systems, methods, features and advantages and features of novelty characterizing aspects of the invention are pointed out with particularity in the appended claims. To gain an improved understanding of the advantages and features of novelty, however, reference may be made to the following descriptive matter and accompanying figures that describe and illustrate various configurations and concepts related toof the invention will be, or will become, apparent to one of ordinary skill in the art upon examination of the following figures and detailed description. It is intended that all such additional systems, methods, features and advantages be included within this description and this summary, be within the scope of the invention, and be protected by the following claims.

Description

(1) FIGURE DESCRIPTIONSBRIEF DESCRIPTION OF THE DRAWINGS

(2) The foregoing Summary and the following Detailed Description will be better understood when read in conjunction with the accompanying figures.invention can be better understood with reference to the following drawings and description. The components in the figures are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention. Moreover, in the figures, like reference numerals designate corresponding parts throughout the different views.

(3) FIG. 1 is a perspectivean isometric view of an exemplary embodiment of an article of footwear.;

(4) FIG. 2 is a lateral side elevational view of thean exemplary embodiment of an article of footwear.;

(5) FIG. 3 is a medial side elevational view of the article of footwear.

(6)FIGS. 4A-4C are cross-sectional views of the article of footwear, as defined by section lines 4A-4C in FIGS. 2 and 3.(7)FIG. 5 is a top plan view of a first knitted component that forms a portion of an upperview of an exemplary embodiment of thean article of footwear.;

(6) (8)FIG. 6 is a bottom plan view of the first knitted component.(9)FIGS. 7A-7E are4A is a cross-sectional views of the first knitted componentview of the article of footwear, as defined by section lines 7A-7E4A in FIG. 5.

(10)FIGS. 8A and 8B are plan views showing knit structures of the first knitted component.(11)FIG. 9 is a top plan view of a second knitted component that

~~may form a portion of the upper of the article of footwear.~~FIGS. 2 and 3;

(7) FIG. 4B is a cross-sectional view of the article of footwear, as defined by section lines 4B in FIGS. 2 and 3;

(8) FIG. 5 is a top plan view of an exemplary embodiment of a knitted component with an integral knit tongue;

(9) FIG. 6 is a cross-sectional view of the knitted component with the integral knit tongue, as defined by section line 6 in FIG. 5;

(10) FIG. 7 is an enlarged schematic view of the integral knit tongue of the knitted component;

(11) FIG. 8 is a top plan view of an alternate embodiment of a knitted component with an integral knit tongue;

(12) FIG. 9 is a cross-sectional view of the knitted component with the integral knit tongue, as defined by section line 9 in FIG. 8;

(13) ~~(12)~~FIG. 10 is a ~~bottom~~top plan view of ~~the second~~an alternate embodiment of a knitted component~~.~~ with an integral knit tongue having a partially integral portion;

(14) ~~(13)~~FIG. 11 is ~~a~~an enlarged schematic ~~top plan view of the second knitted component showing knit zones.(14)FIGS. 12A-12E are cross-sectional views of the second knitted component, as defined by section lines 12A-12E in FIG. 9.~~view of the integral knit tongue of the knitted component having a partially integral portion;

(15) FIG. 12 is a cross-sectional view of the knitted component with the integral knit tongue having a partially integral portion, as defined by section line 12 in FIG. 11;

(16) FIG. 13 is a top plan view of an alternate embodiment of a knitted component with an integral knit tongue having partially decoupled knit elements;

(17) FIG. 14 is a cross-sectional view of the integral knit tongue of the knitted component having partially decoupled knit elements, as defined by section line 14 in FIG. 13;

(18) FIG. 15 is a cross-sectional view of the integral knit tongue of the knitted component having partially decoupled knit elements, as defined by section line 15 in FIG. 13;

(19) ~~(15)FIGS. 13A-13H are loop diagrams of the knit zones.~~

~~(16)FIGS. 14A-14C are top plan views corresponding with FIG. 5 and depicting further configurations of the first knitted component.(17)FIG. 15 is a perspective~~FIG. 16 is a loop diagram of an exemplary embodiment of an integral knit tongue;

(20) FIG. 17 is an isometric view of **an exemplary embodiment of** a knitting machine**.;**

(21) ~~**(18)FIGS**~~**FIG**. ~~**16-18 are elevational views of a combination feeder from the knitting machine.(19)FIG. 19 is an elevational view corresponding with FIG. 16 and showing**~~**18 is a schematic view of** internal components of the ~~**combination feeder.**~~**knitting machine in operation;**

(22) ~~(20)FIGS. 20A-20C are elevational views corresponding with FIG. 19 and showing the operation of the combination feeder.~~FIG. 19 is a schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue;

(23) FIG. 20 is a schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue;

(24) ~~(21)FIGS. 21A-21I are schematic perspective views of a knitting process utilizing the combination feeder and a conventional feeder.~~FIG. 21 is a schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue;

~~(22)FIGS. 22A-22C are schematic cross-sectional views of the knitting process showing positions of the combination feeder and the conventional feeder.~~

(25) FIG. 22 is a schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue having a partially integral portion;

(26) ~~(23)~~FIG. 23 is a schematic ~~perspective view showing another aspect of the knitting process.~~view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue having a partially integral portion;

(27) ~~(24)~~FIG. 24 is a ~~perspective~~schematic view of ~~another configuration~~internal components of the knitting machine~~.~~ in operation to manufacture a knitted component with an integral knit tongue having a partially integral portion;

(28) ~~(25)~~FIG. 25 is a ~~top plan view of the first~~schematic view of internal components of the knitting machine in operation to manufacture a knitted component with ~~a first knitted~~an integral knit tongue~~.~~ having a partially integral portion;

(29) ~~(26)~~FIG. 26 is a ~~partial top plan view of the first~~schematic view of internal components of the knitting machine in operation to manufacture a knitted component with ~~the first knitted tongue.~~an integral knit tongue having partially decoupled knit layers;

(30) ~~(27)~~FIG. 27 is a ~~cross-sectional view of the first knitted tongue, as defined by section line 27 in FIG. 26.~~schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue having partially decoupled knit layers;

(31) ~~(28)~~FIG. 28 is a ~~top plan view of the second~~schematic view of internal components of the knitting machine in operation to manufacture a knitted component with ~~a second knitted tongue.~~an integral knit tongue having partially decoupled knit layers; and

(32) ~~(29)~~FIG. 29 is a ~~partial top plan view of the second knitted component with the second knitted tongue.~~

~~(30)FIG. 30 is a cross-sectional view of the second knitted tongue, as defined by section line 30 in FIG. 29.~~

~~(31)FIG. 31 is a top plan view of a third knitted component with a third knitted tongue.~~

~~(32)FIG. 32 is a partial top plan view of the third knitted component with the third knitted tongue.~~

~~(33)FIG. 33 is a cross-sectional view of the third knitted tongue, as defined by section line 33 in FIG. 32.~~

~~(34)FIG. 34 is a top plan view of a fourth knitted component with a fourth knitted tongue.~~

~~(35)FIG. 35 is a cross-sectional view of the fourth knitted component and fourth knitted tongue, as defined by section line 35 in FIG. 34.~~

~~(36)FIGS. 36A-36G are schematic elevational views of a knitting process for forming the first knitted component with the first knitted tongue.~~

~~(37)FIG. 37 is a schematic elevational view depicting a further example step of the knitting process.(38)FIG. 38 is a schematic block diagram of the knitting machine.(39)FIGS. 39A-39C are partial top plan views corresponding with FIG. 26 and depicting sequential variations in the first knitted tongue.~~schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue having partially decoupled knit layers.

(33) ~~(40)~~DETAILED DESCRIPTION

(34) ~~(41)~~The following discussion and accompanying figures disclose a variety of concepts relating to knitted components and the manufacture of knitted components. Although the knitted components may be ~~utilized~~used in a variety of products, an article of footwear that incorporates one of the knitted components is disclosed below as an example. In addition to footwear, the knitted components may be ~~utilized~~used in other types of apparel (e.g., shirts, pants, socks, jackets, undergarments), athletic equipment (e.g., golf bags, baseball and football gloves, soccer ball restriction structures), containers (e.g., backpacks, bags), and upholstery for furniture (e.g., chairs, couches, car seats). The knitted components may also be ~~utilized~~used in bed coverings (e.g., sheets, blankets), table coverings, towels, flags, tents, sails, and parachutes. The knitted components may be ~~utilized~~used as technical textiles for industrial purposes, including structures for automotive and aerospace applications, filter materials, medical textiles (e.g. bandages, swabs, implants), geotextiles for reinforcing embankments, agrotextiles for crop protection, and industrial apparel that protects or insulates against heat and radiation. Accordingly, the knitted components and other concepts disclosed herein may be incorporated into a variety of products for both personal and industrial purposes.

(35) ~~(42)~~Footwear ~~Configuration~~Configurations

(36) FIGS. 1 through 15 illustrate various footwear configurations according to the principles described and illustrated herein. In particular, FIGS. 1-4B illustrate an exemplary embodiment of an article of footwear incorporating a knitted component including an upper and an integral knit tongue.

(37) ~~(43)An~~FIGS. 1 through 4B illustrate an exemplary embodiment of an article of footwear 100, also referred to simply as footwear 100. In some embodiments, article of footwear 100 ~~is depicted in FIGS. 1-4C as including~~may include a sole structure 110 and an upper 120. Although footwear 100 is illustrated as having a general configuration suitable for running, concepts associated with footwear 100 may also be applied to a variety of other athletic footwear types, including baseball shoes, basketball shoes, cycling shoes, football shoes, tennis shoes, soccer shoes, training shoes, walking shoes, and hiking boots, for example. The concepts may also be applied to footwear types that are generally considered to be non-athletic, including dress shoes, loafers, sandals, and work boots. Accordingly, the concepts disclosed with respect to footwear 100 ~~apply~~may be applied to a wide variety of footwear types.

(38) ~~(44)~~For reference purposes, footwear 100 may be divided into three general regions: a forefoot region 101, a midfoot region 102, and a heel region ~~103.~~103, as shown in FIGS. 1, 2, and 3. Forefoot region 101 generally includes portions of footwear 100 corresponding with the toes and the joints connecting the metatarsals with the phalanges. Midfoot region 102 generally includes portions of footwear 100 corresponding with an arch area of the foot. Heel region 103 generally corresponds with rear portions of the foot, including the calcaneus bone. Footwear 100 also includes a lateral side 104 and a medial side 105, which extend through each of ~~regions 101~~ forefoot region 101, midfoot region 102, and heel region 103 and correspond with opposite sides of footwear 100. More particularly, lateral side 104 corresponds with an outside area of the foot (i.e., the surface that faces away from the other foot), and medial side 105 corresponds with an inside area of the foot (i.e., the surface that faces toward the other foot). ~~Regions 101-103 and sides 104~~ Forefoot region 101, midfoot region 102, and heel region 103 and lateral side 104, medial side 105 are not intended to demarcate precise areas of footwear 100. Rather, ~~regions 101-103 and sides 104~~ forefoot region 101, midfoot region 102, and heel region 103 and lateral side 104, medial side 105 are intended to represent general areas of footwear 100 to aid in the following discussion. In addition to footwear 100, ~~regions 101-103 and sides 104~~ forefoot region 101, midfoot region 102, and heel region 103 and lateral side 104, medial side 105 may also be applied to sole structure 110, upper 120, and individual elements thereof.

(39) ~~(45)Sole~~In an exemplary embodiment, sole structure 110 is secured to upper 120 and extends between the foot and the ground when footwear 100 is worn. ~~The~~In some embodiments, the primary elements of sole structure 110 are a midsole 111, an outsole 112, and a sockliner ~~113.~~113 (shown in FIGS. 4A and 4B). Midsole 111 is secured to a lower surface of upper 120 and may be formed from a compressible polymer foam element (e.g., a polyurethane or ethylvinylacetate foam) that attenuates ground reaction forces (i.e., provides cushioning) when compressed between the foot and the ground during walking, running, or other ambulatory activities. In ~~further configurations~~other embodiments,

midsole 111 may incorporate plates, moderators, fluid-filled chambers, lasting elements, or motion control members that further attenuate forces, enhance stability, or influence the motions of the foot, or midsole ~~21~~111 may be primarily formed from a fluid-filled chamber. Outsole 112 is secured to a lower surface of midsole 111 and may be formed from a wear-resistant rubber material that is textured to impart traction. Sockliner 113 is located within upper 120 and is positioned to extend under a lower surface of the foot to enhance the comfort of footwear 100. Although this configuration for sole structure 110 provides an example of a sole structure that may be used in connection with upper 120, a variety of other conventional or nonconventional configurations for sole structure 110 may also be ~~utilized~~used. Accordingly, **in other embodiments,** the features of sole structure 110 or any sole structure ~~utilized~~used with upper 120 may vary ~~considerably~~.

(40) ~~(46)Upper~~**In some embodiments, upper** 120 defines a void within footwear 100 for receiving and securing a foot relative to sole structure 110. The void is shaped to accommodate the foot and extends along a lateral side of the foot, along a medial side of the foot, over the foot, around the heel, and under the foot. Access to the void is provided by an ankle opening 121 located in at least heel region 103. **In some embodiments, a throat area 123 extends from ankle opening 121 in heel region 103 over an area corresponding to an instep of the foot to an area adjacent to forefoot region 101. In an exemplary embodiment, an integral knit tongue 140 is formed of unitary knit construction with upper 120 and extends through throat area 123 of upper 120 between lateral side 104 and medial side 105.**

(41) A lace 122 extends through various lace apertures ~~123 in upper 120~~**143 in raised elements 142 of integral knit tongue 140** and permits the wearer to modify dimensions of upper 120 to accommodate proportions of the foot. More particularly, lace 122 permits the wearer to tighten upper 120 around the foot, and lace 122 permits the wearer to loosen upper 120 to facilitate entry and removal of the foot from the void (i.e., through ankle opening 121). In addition, **integral knit tongue 140 of** upper 120 ~~includes a tongue 124 that~~ extends under lace 122 ~~and lace apertures 123~~ to enhance the comfort of footwear 100. In further configurations, upper 120 may include additional elements, such as (a) a heel counter in heel region 103 that enhances stability, ~~(b)~~ **(b)** a toe guard in forefoot region 101 that is formed of a wear-resistant material, and (c) logos, trademarks, and placards with care instructions and material information.

(42) ~~(47)~~Many conventional footwear uppers are formed from multiple material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) that are joined through stitching or bonding, for example. In contrast, a majority of upper 120 is formed from a knitted component 130, which extends through each of ~~regions 101~~ **forefoot region 101, midfoot region 102, and heel region** 103, along both lateral side 104 and medial side 105, over forefoot region 101, and around heel region 103. In addition, knitted component 130 forms portions of both an exterior surface and an opposite interior surface of upper 120. As such, knitted component 130 defines at least a portion of the void within upper 120. In some configurations, knitted component 130 may also extend under the foot. Referring to FIGS. 4A~~,~~ **and** 4~~C~~**B**, however, a strobel sock 125 is secured to knitted component 130 and an upper surface of midsole 111, thereby forming a portion of upper 120 that extends under sockliner 113.

(43) In some embodiments, knitted component 130 may include upper 120 and integral knit tongue 140 formed of unitary knit construction. Knitted components that include upper 120 and integral knit tongue 140 may be formed with a relatively smaller number of material elements. As discussed in the Background section above, decreasing the number of material elements used in forming an upper may decrease waste, while also increasing the manufacturing efficiency and recyclability of the upper. The tongue and other portions, such as the collar, of conventional uppers are often formed from multiple separate material elements that are later joined together. As discussed in greater detail below, however, integral knit tongue element may be primarily formed through knitting processes (rather than stitch and turn methods) that decrease waste and increase manufacturing efficiency and recyclability. Additionally, the structure of integral knit tongue element 140 may incorporate smaller numbers of seams or other discontinuities, thereby enhancing the overall comfort of footwear 100.

(44) Additional advantages of constructing integral knit tongue 140 during the knitting process and of unitary knit construction with upper 120 include providing more efficient manufacture and common properties. More particularly, manufacturing efficiency may be increased by forming more of knitted component 130 during the knitting process and eliminating various steps (e.g., making a separate tongue, securing the tongue) that are often performed manually. Integral knit tongue 140 and upper 120 may also have common properties when formed from the same yarn (or type of yarn) or with similar knit structures. For example, using the same yarn in both of integral knit tongue 140 and upper 120 imparts similar durability, strength, stretch, wear-resistance, biodegradability, thermal, and hydrophobic properties. In addition to physical properties, using the same yarn in both of integral knit tongue 140 and upper 120 may impart common aesthetic or tactile properties, such as color, sheen, and texture. Using the same knit structures in both of integral knit tongue 140 and upper 120 may also impart common physical properties and aesthetic properties. These advantages may also be present when at least a portion of integral knit tongue 140 and at least a portion of upper 120 are formed from a common yarn (or type of yarn) or with common knit structures.

(45) ~~**(48)**~~Knitted Component ~~**Configuration**~~**Configurations**

(46) ~~**(49)Knitted component 130 is**~~**FIGS. 5 through 15 illustrate various embodiments of knitted components that may be incorporated into articles of footwear in a similar manner as the exemplary embodiment of FIGS. 1 through 4B. The knitted components illustrated in FIGS. 5 through 15 are** depicted separate from a remainder of footwear ~~**100 in FIGS. 5 and 6. Knitted component 130 is**~~**100. However, it should be understood that each of the embodiments of knitted components described herein may be**

combined with the elements of footwear 100, described above, to form an article of footwear incorporating the knitted component.

(47) Referring now to FIG. 5, an exemplary embodiment of a first knitted component 500 is shown in a top plan view. First knitted component 500 may be substantially

similar to knitted component 130, described above. In some embodiments, first knitted component 500 includes a first portion defining an upper 502 and a second portion defining an integral knit tongue 512. In an exemplary embodiment, first knitted component 500 incorporates upper 502 and integral knit tongue element 512 formed of unitary knit construction. As ~~utilized~~used herein and in the claims, a knitted component (e.g., first knitted component ~~130~~500, or other knitted components described herein) is defined as being formed of "unitary knit construction" when formed as a one-piece element through a knitting process. That is, the knitting process substantially forms the various features and structures of first knitted component ~~130~~500 without the need for significant additional manufacturing steps or processes. A unitary knit construction may be used to form a knitted component having structures or elements (including upper 502 and integral knit tongue 512) that include one or more courses of yarn or other knit material that are joined such that the structures or elements include at least one course in common (i.e., sharing a common yarn) and/or include courses that are substantially continuous between each of the structures or elements. With this arrangement, a one-piece element of unitary knit construction is provided.

(48) Although portions of first knitted component ~~130~~500 may be joined to each other (e.g., edges of first knitted component ~~130~~500 being joined together) following the knitting process, first knitted component ~~130~~500 remains formed of unitary knit construction because it is formed as a one-piece knit element. Moreover, first knitted component ~~130~~500 remains formed of unitary knit construction when other elements (e.g., a lace ~~122, tongue 124,~~, logos, trademarks, placards with care instructions and material information, structural elements) are added following the knitting process.

(49) ~~(50)The~~In an exemplary embodiment, the primary ~~elements~~element of first knitted component ~~130 are~~500 is a knit element ~~131 and an inlaid strand 132. Knit element 131 is~~forming upper 502 and integral knit tongue 512. A knit element may be formed from at least one yarn that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a variety of courses and wales. That is, the knit element ~~131~~forming first knitted component 500 has the structure of a knit textile. ~~Inlaid strand 132 extends through knit element 131 and passes between the various loops within knit element 131. Although inlaid strand 132 generally extends along courses within knit element 131, inlaid strand 132 may also extend along wales within knit element 131. Advantages of inlaid strand 132 include providing support, stability, and structure. For example, inlaid strand 132 assists with securing upper 120 around the foot, limits deformation in areas of upper 120 (e.g., imparts stretch-resistance) and operates in connection with lace 122 to enhance the fit of footwear 100.(51)Knit element 131~~Other embodiments of knitted components, including the embodiments described below, may include a knit element and at least one tensile element.

(50) First knitted component 500 has a generally U-shaped configuration that is outlined by ~~a perimeter edge 133, a pair of heel edges 134, and an inner edge 135.~~an outer perimeter and an inner perimeter. In this embodiment, the outer perimeter includes a front perimeter edge 503, a lateral perimeter edge 504, a medial perimeter edge 505, and a pair of heel edges, including a lateral heel edge 506 and a medial heel edge 507. The inner perimeter of first knitted component 500 includes a lateral inner edge 508,

a medial inner edge 509, and a front inner edge 510. When incorporated into **an article of footwear, including** footwear 100, **front** perimeter edge ~~133 lays against the~~**503, lateral perimeter edge 504, medial perimeter edge 505, and at least a portion of lateral heel edge 506 and medial heel edge 507 lays against an** upper surface of **a midsole and is joined to a strobel sock (e.g.,** midsole 111 and ~~is joined to~~ strobel sock ~~125. Heel edges 134~~**125, described above). In addition, lateral heel edge 506 and medial heel edge 507** are joined to each other and extend vertically in **a** heel region ~~103.~~**.** In some configurations of footwear ~~100,~~**,** a material element may cover a seam between **lateral** heel ~~edges 134~~**edge 506 and medial heel edge 507** to reinforce the seam and enhance the aesthetic appeal of **the** footwear ~~100. Inner edge 135 forms~~**. Taken together, lateral inner edge 508, medial inner edge 509, and front inner edge 510 form an ankle opening, including** ankle opening 121 **described above,** and extends forward to ~~an~~**a throat** area **520** where ~~lace 122, lace apertures 123, and tongue 124 are located. In addition, knit element 131 has~~**integral knit tongue 512 is located. Additionally, in some embodiments, throat area 520 may further include a lace and lace apertures for receiving the lace.**

(51) In addition, first knitted component 500 may have a first surface ~~136~~**530** and an opposite second surface ~~137.~~**532.** First surface ~~136~~**530** forms a portion of the exterior surface of upper ~~120,~~**502,** whereas second surface ~~137~~**532** forms a portion of the interior surface of upper ~~120,~~**502,** thereby defining at least a portion of the void within upper ~~120.~~**502.**

(52) ~~Inlaid strand 132, as noted above, extends through knit element 131 and passes between the various loops within knit element 131. More particularly, inlaid strand 132 is located within the knit structure of knit element 131, which may have the configuration of a single textile layer in the area of inlaid strand 132, and between surfaces 136 and 137, as depicted in FIGS. 7A-7D. When knitted component 130 is incorporated into footwear 100, therefore, inlaid strand 132 is located between the exterior surface and the interior surface of upper 120. In some configurations, portions of inlaid strand 132 may be visible or exposed on one or both of surfaces 136 and 137. For example, inlaid strand 132 may lay against one of surfaces 136 and 137, or knit element 131 may form indentations or apertures through which inlaid strand passes. An advantage of having inlaid strand 132 located between surfaces 136 and 137 is that knit element 131 protects inlaid strand 132 from abrasion and snagging.~~

~~(53)Referring to FIGS. 5 and 6, inlaid strand 132 repeatedly extends from perimeter edge 133 toward inner edge 135 and adjacent to a side of one lace aperture 123, at least partially around the lace aperture 123 to an opposite side, and back to perimeter edge 133. When knitted component 130 is incorporated into footwear 100, knit element 131 extends from a throat area of upper 120 (i.e., where lace 122, lace apertures 123, and tongue 124 are located) to a lower area of upper 120 (i.e., where knit element 131 joins with sole structure 110. In this configuration, inlaid strand 132 also extends from the throat area to the lower area. More particularly, inlaid strand repeatedly passes through knit element 131 from the throat area to the lower area.~~

~~(54)Although knit element 131 may be formed in a variety of ways, courses of the knit structure generally extend in the same direction as inlaid strands 132. That is, courses may extend in the direction extending between the throat area and the lower area. As~~

~~such, a majority of inlaid strand 132 extends along the courses within knit element 131. In areas adjacent to lace apertures 123, however, inlaid strand 132 may also extend along wales within knit element 131. More particularly, sections of inlaid strand 132 that are parallel to inner edge 135 may extend along the wales.~~

~~(55)As discussed above, inlaid strand 132 passes back and forth through knit element 131. Referring to FIGS. 5 and 6, inlaid strand 132 also repeatedly exits knit element 131 at perimeter edge 133 and then re-enters knit element 131 at another location of perimeter edge 133, thereby forming loops along perimeter edge 133. An advantage to this configuration is that each section of inlaid strand 132 that extends between the throat area and the lower area may be independently tensioned, loosened, or otherwise adjusted during the manufacturing process of footwear 100. That is, prior to securing sole structure 110 to upper 120, sections of inlaid strand 132 may be independently adjusted to the proper tension.~~

~~(56)In comparison with knit element 131, inlaid strand 132 may exhibit greater stretch resistance. That is, inlaid strand 132 may stretch less than knit element 131. Given that numerous sections of inlaid strand 132 extend from the throat area of upper 120 to the lower area of upper 120, inlaid strand 132 imparts stretch-resistance to the portion of upper 120 between the throat area and the lower area. Moreover, placing tension upon lace 122 may impart tension to inlaid strand 132, thereby inducing the portion of upper 120 between the throat area and the lower area to lay against the foot. As such, inlaid strand 132 operates in connection with lace 122 to enhance the fit of footwear 100.(57)Knit element 131~~**In various embodiments, a knitted component** may incorporate various types of yarn that impart different properties to separate areas of **the** upper ~~120. That is.~~ **For example**, one area of ~~knit element 131~~**first knitted component 500** may be formed from a first type of yarn that imparts a first set of properties, and another area of ~~knit element 131~~**first knitted component 500** may be formed from a second type of yarn that imparts a second set of properties. In this configuration, properties may vary throughout upper ~~120~~**502** by selecting specific yarns for different areas of ~~knit element 131.~~ **first knitted component 500.**

(53) The properties that a particular type of yarn will impart to an area of ~~knit element 131~~**a knitted component** partially depend upon the materials that form the various filaments and fibers within the yarn. Cotton, for example, provides a soft hand, natural aesthetics, and biodegradability. Elastane and stretch polyester each provide substantial stretch and recovery, with stretch polyester also providing recyclability. Rayon provides high luster and moisture absorption. Wool also provides high moisture absorption, in addition to insulating properties and biodegradability. Nylon is a durable and abrasion-resistant material with relatively high strength. Polyester is a hydrophobic material that also provides relatively high durability.

(54) In addition to materials, other aspects of the yarns selected for ~~knit element 131~~**a knitted component** may affect the properties of **the** upper ~~120.~~**.** For example, a yarn forming ~~knit element 131~~**first knitted component 500** may be a monofilament yarn or a multifilament yarn. The yarn may also include separate filaments that are each formed of different materials. In addition, the yarn may include filaments that are each formed of two

or more different materials, such as a ~~bicomponent~~ **bi-component** yarn with filaments having a sheath-core configuration or two halves formed of different materials. Different degrees of twist and crimping, as well as different deniers, may also affect the properties of upper ~~120.~~**502.** Accordingly, both the materials forming the yarn and other aspects of the yarn may be selected to impart a variety of properties to separate areas of upper ~~120.~~**502.**

(55) In some embodiments, integral knit tongue 512 may be centrally-located in throat area 520 of first knitted component 500 and may extend from an ankle opening in a heel region over an area corresponding to an instep of the foot to an area adjacent to a forefoot region, as well as extending between a lateral side and a medial side of first knitted component. In an exemplary embodiment, integral knit tongue 512 is formed of unitary knit construction with upper 502 at a forward portion of throat area 520 of first knitted component 500. That is, integral knit tongue 512 is joined through knitting to upper 502 at the forward portion of throat area 520 such that integral knit tongue 512 and upper 502 include at least one course in common and/or include courses that are substantially continuous between integral knit tongue 512 and upper 502 at the forward portion of throat area 520.

(56) In an exemplary embodiment, integral knit tongue 512 may be further formed of unitary knit construction with upper 502 along the sides of integral knit tongue 512 extending along a length of throat area 520 of first knitted component 500. Accordingly, integral knit tongue 512 is joined through knitting to upper 502 along each of a lateral side and a medial side of throat area 520 such that integral knit tongue 512 and upper 502 include at least one course in common and/or include courses that are substantially continuous between integral knit tongue 512 and upper 502 along the sides extending through throat area 520.

(57) ~~**(58)As with the yarns forming knit element 131, the configuration of inlaid strand 132 may also vary significantly. In addition to yarn, inlaid strand 132 may have the configurations of a filament (e.g., a monofilament), thread, rope, webbing, cable, or chain, for example. In comparison with the yarns forming knit element 131, the thickness of inlaid strand 132 may be greater. In some configurations, inlaid strand 132 may have a significantly greater thickness than the yarns of knit element 131. Although the cross- sectional shape of inlaid strand 132 may be round, triangular, square, rectangular, elliptical, or irregular shapes may also be utilized. Moreover, the materials forming inlaid strand 132 may include any of the materials for the yarn within knit element 131, such as cotton, elastane, polyester, rayon, wool, and nylon. As noted above, inlaid strand 132 may exhibit greater stretch-resistance than knit element 131. As such, suitable materials for inlaid strands 132 may include a variety of engineering filaments that are utilized for high tensile strength applications, including glass, aramids (e.g., para-aramid and meta- aramid), ultra-high molecular weight polyethylene, and liquid crystal polymer. As another example, a braided polyester thread may also be utilized as inlaid strand 132.(59)An example of a suitable configuration for a portion of knitted component 130 is depicted in FIG. 8A. In this configuration, knit element 131 includes a yarn 138 that forms a plurality of intermeshed loops defining multiple horizontal courses and vertical wales. Inlaid strand 132 extends along one of the courses and alternates between being located (a)**

behind loops formed from yarn 138 and (B) in front of loops formed from yarn In some embodiments, integral knit tongue 512 may include raised elements disposed on opposite sides of throat area 520 and extending along the length of integral knit tongue 512. Raised elements may be a portion of integral knit tongue 512 that are formed through the knitting process to be a flap or overhanging portion of integral knit tongue 512 that extends outward away from first surface 530 of upper 502. As shown in FIG. 5, integral knit tongue 512 includes a lateral raised element 514 and a medial raised element 515. In an exemplary embodiment, lateral raised element 514 and medial raised element 515 are formed of unitary knit construction with integral knit tongue 512 and upper 502 according to the method below. With this arrangement, lateral raised element 514 and medial raised element 515 include one or more common courses and/or courses that are substantially continuous with integral knit tongue 512 and upper 502.

(58) In some embodiments, raised elements associated with an integral knit tongue, including lateral raised element 514 and medial raised element 515 associated with integral knit tongue 512, may include one or more lace apertures disposed at various locations along the raised element for receiving a lace. In some cases, the lace apertures may be a void or opening within the knitted structure forming the raised element that is sufficient to allow a lace to pass through. In other cases, the lace apertures may be a hole or opening that is cut or removed from the material forming the raised elements. In still other cases, the lace apertures may include additional elements, including, but not limited to loops, grommets, eyelets, eye hooks, or other suitable lace receiving members.

(59) Referring now to FIG. 6, a cross-sectional view of integral knit tongue 512 is illustrated. In an exemplary embodiment, raised elements are formed of unitary knit construction with integral knit tongue 512 and upper 502 such that first knitted component 500 is a one-piece element. In this embodiment, lateral raised element 514 is joined with upper 502 at a first proximal end 600 and medial raised element 515 is joined with upper 502 at a second proximal end 601. Each raised element extends outward from first surface 530 of upper 502 in a flap-like arrangement to form an overhanging portion of integral knit tongue 512. In this embodiment, lateral raised element 514 extends outward from first proximal end 600 to a first distal end 602 and includes a first outward facing side 604 and a first inward facing side 606. Similarly, medial raised element 515 extends outward from second proximal end 601 to a second distal end 603 and includes a second outward facing side 605 and a second inward facing side 607. In an exemplary embodiment, first outward facing side 604 and/or second outward facing side 605 may be oriented towards each side of first knitted component 500, while first inward facing side 606 and/or second inward facing side 607 may be oriented towards the center of first knitted component 500 where integral knit tongue 512 is located.

(60) In addition, as shown in FIG. 6, lateral raised element 514 and medial raised element 515 are shown in a flat configuration such that first inward facing side 606 and/or second inward facing side 607 is oriented towards first surface 530. In various embodiments, however, raised elements, including lateral raised element 514 and medial raised element 515, may be positioned in an upright configuration. Referring

now to FIG. 7, lateral raised element 514 and medial raised element 515 are shown in an upright configuration such that first inward facing side 606 and/or second inward facing side 607 is oriented generally perpendicular to or at a raised angle with regard to first surface 530. In some embodiments, the process of pulling upper 502 tight on opposite sides of integral knit tongue 512 (for example, by joining first knitted component 500 with a sole structure to form an article of footwear) may cause each of lateral raised element 514 and medial raised element 515 to move from the flat configuration to the upright configuration.

(61) In an exemplary embodiment, lateral raised element 514 and medial raised element 515 of integral knit tongue 512 may extend a first height H1 above first surface 530 of first knitted component 500. In some embodiments, upright configuration of lateral raised element 514 and medial raised element 515 may be used to incorporate lace apertures into integral knit tongue 512. In this embodiment, a plurality of lace apertures 700 are shown disposed along the respective sides of lateral raised element 514 and medial raised element 515 and extending through from first outward facing side 604 to first inward facing side 606 and from second outward facing side 605 to second inward facing side 607. In some cases, plurality of lace apertures 700 may be a void or opening within the knitted structure of integral knit tongue 512 forming the raised elements. In other cases, plurality of lace apertures 700 may have a different structure, including any of the suitable structures for lace apertures described above.

(62) Referring to FIGS. 8 and 9, an exemplary embodiment of a second knitted component 800 is shown in a top plan view. Second knitted component 800 may be substantially similar to knitted component 130 and/or first knitted component 500, described above. In some embodiments, second knitted component 800 includes a first portion defining an upper 802 and a second portion defining an integral knit tongue 812. In an exemplary embodiment, second knitted component 800 incorporates upper 802 and integral knit tongue 812 formed of unitary knit construction.

(63) As with first knitted component 500, second knitted component 800 has a generally U-shaped configuration that is outlined by an outer perimeter and an inner perimeter. In this embodiment, the outer perimeter includes a front perimeter edge 803, a lateral perimeter edge 804, a medial perimeter edge 805, and a pair of heel edges, including a lateral heel edge 806 and a medial heel edge 807. The inner perimeter of second knitted component 800 includes a lateral inner edge 808 and a medial inner edge 809 which may form an ankle opening. In addition, second knitted component 800 may have a first surface 830 forming a portion of the exterior surface of upper 802 and an opposite second surface 832 forming a portion of the interior surface of upper 802.

(64) In an exemplary embodiment, second knitted component 800 may include integral knit tongue 812 that includes a top end 814 that extends into the portion of second knitted component 800 that is associated with an ankle opening. Top end 814 may be generally free from other portions of second knitted component 800. Integral knit tongue 812 may be formed of unitary knit construction with upper 802 at a

forward portion of a throat area 820 of second knitted component 800 and along the sides of integral knit tongue 812 extending along a length of throat area 820. In an exemplary embodiment, integral tongue 812 of second knitted component 800 does not include raised elements. Accordingly, in contrast with first knitted component 500, second knitted component 800 includes a portion of upper 802 that extends over integral knit tongue 812 to form a lateral inner edge 816 and a medial inner edge 817. More particularly, edges of integral knit tongue 812 are knit to an area of second knitted component 800 that is spaced outward from lateral inner edge 816 and medial inner edge 817.

(65) Referring now to FIG. 9, a cross-sectional view of integral knit tongue 812 is illustrated. In an exemplary embodiment, edges of integral knit tongue 812 are formed of unitary knit construction with upper 802 such that second knitted component 800 is a one- piece element. In this embodiment, first edge 900 and second edge 902 of integral knit tongue 812 are joined with second surface 832 of upper 802 such that integral knit tongue 812 extends below lateral inner edge 816 and medial inner edge 817 of upper 802. With this arrangement, a top surface of integral knit tongue 812 may be oriented facing towards second surface 832 of second knitted component 800 disposed on the portion of upper 802 extending out to lateral inner edge 816 and medial inner edge 817. In an exemplary embodiment, the configuration of integral knit tongue 812 included in second knitted component 800 may be provided to lay in a substantially flat condition.

(66) In various embodiments, provisions may be made within a knitted component to assist a wearer with inserting and/or removing a foot from an ankle opening of an article of footwear. In some embodiments, an integral knit tongue of a knitted component may be modified to allow for a larger ankle opening. FIGS. 10 through 15 illustrate alternate embodiments of knitted components that have been provided with mechanisms to allow a larger ankle opening when incorporated into an article of footwear.

(67) FIGS. 10 through 12 illustrate an alternate embodiment of a knitted component that includes a mechanism to allow a larger ankle opening when incorporated into an article of footwear. Referring now to FIG. 10, a top plan view of an alternate embodiment of a knitted component with an integral knit tongue having a partially integral portion is illustrated. In some embodiments, a third knitted component 1000 may include a first portion defining an upper 1002 and a second portion defining an integral knit tongue 1010. Third knitted component 1000 may be substantially similar to knitted component 130, first knitted component 500, and/or second knitted component 800, described above. As with first knitted component 500 and/or second knitted component 800, third knitted component 1000 may have a generally U-shaped configuration that is outlined by an outer perimeter and an inner perimeter. In this embodiment, the outer perimeter includes a front perimeter edge 1003, a lateral perimeter edge 1004, a medial perimeter edge 1005, and a pair of heel edges, including a lateral heel edge 1006 and a medial heel edge 1007. The inner perimeter of third knitted component 1000 includes a lateral inner edge 1008 and a medial inner edge 1009 which may form an ankle opening. In addition, third knitted component 1000 may have a first surface 1030 forming a portion of the exterior surface of upper 1002

and an opposite second surface 1032 forming a portion of the interior surface of upper 1002.

(68) In some embodiments, third knitted component 1000 may further include additional structures. In an exemplary embodiment, third knitted component 1000 may include at least one tensile element 1040 that is inlaid within the knit structure of third knitted component 1000. Suitable materials for tensile element 1040 may include, but is not limited to, yarn or an inlaid strand in the configuration of a filament (e.g., a monofilament), thread, rope, webbing, cable, or chain. Tensile element 1040 extends through third knitted component 1000 and passes between the various loops within a knit structure 1042 formed within third knitted component 1000. Although tensile element 1040 generally extends along courses within knit structure 1042, tensile element 1040 may also extend along wales within knit structure 1042. Advantages of tensile element 1040 include providing support, stability, and structure. For example, tensile element 1040 assists with securing upper 1002 around the foot, limits deformation in areas of upper 1002 (e.g., imparts stretch-resistance) and operates in connection with a lace to enhance the fit of the article of footwear incorporating third knitted component.

(69) A tensile element in the form of an inlaid strand or other suitable element, as well as the method of manufacturing a knitted component incorporating an inlaid strand and knit structures, for use in the embodiments described herein is disclosed in one or more of commonly-owned U.S. patent application Ser. No. 12/338,726 to Dua et al., entitled "Article of Footwear Having An Upper Incorporating A Knitted Component", filed on Dec. 18, 2008 and published as U.S. Patent Application Publication Number 2010/0154256 on Jun. 24, 2010, and U.S. patent application Ser. No. 13/048,514 to Huffa et al., entitled "Article Of Footwear Incorporating A Knitted Component", filed on Mar. 15, 2011 and published as U.S. Patent Application Publication Number 2012/0233882 on Sep. 20, 2012, both of which applications are hereby incorporated by reference in their entirety (collectively referred to herein as the "Inlaid Strand cases").

(70) ~~138.~~In ~~effect, inlaid strand 132 weaves through the structure formed by knit element 131. Although yarn 138 forms each of the courses in this configuration, additional yarns may form one or more of the courses or may form a portion of one or more of the courses.(60)Another example of a suitable configuration for a portion of knitted component 130 is depicted in FIG. 8B. In this configuration, knit element 131 includes yarn 138 and another yarn 139. Yarns 138 and 139 are plated and cooperatively form a plurality of intermeshed loops defining multiple horizontal courses and vertical wales. That is, yarns 138 and 139 run parallel to each other. As with the configuration in FIG. 8A, inlaid strand 132 extends along one of the courses and alternates between being located (a) behind loops formed from yarns 138 and 139 and (b) in front of loops formed from yarns 138 and~~an exemplary embodiment, third knitted component 1000 incorporates upper 1002 and integral knit tongue 1010 formed of unitary knit construction such that at least a portion of upper 1002 and a portion of integral knit tongue 1010 are a one-piece element. In one embodiment, integral knit tongue 1010 may further include a first portion that is formed of unitary knit construction with upper 1002 along the sides of integral knit tongue 1010 and a

second portion that is formed of unitary knit construction with the first portion, but is otherwise free from upper 1002. In this embodiment, third knitted component 1000 includes integral knit tongue 1010 having a partially integral portion 1012 and a free portion 1014.

(71) In an exemplary embodiment, partially integral portion 1012 may be centrally-located in a throat area 1020 of third knitted component 1000 and may extend from a distance D1 adjacent to an ankle opening in a heel region over an area corresponding to an instep of the foot to an area adjacent to a forefoot region, as well as extending between a lateral side and a medial side of third knitted component 1000. In one embodiment, partially integral portion 1012 is formed of unitary knit construction with upper 1002 at a forward portion of throat area 1020 as well as along the sides extending along a length of throat area 1020 of third knitted component 1000. Accordingly, partially integral portion 1012 is joined through knitting to upper 1002 along the forward portion and each of a lateral side and a medial side of throat area 1020 such that partially integral portion 1012 and upper 1002 include at least one course in common and/or include courses that are substantially continuous.

139.An advantage of this configuration is that the properties of each of yarns 138 and 139 may be present in this area of knitted component 130. For example, yarns 138 and 139 may have different colors, with the color of yarn 138 being primarily present on a face of the various stitches in knit element 131 and the color of yarn 139 being primarily present on a reverse of the various stitches in knit element 131. As another example, yarn 139 may be formed from a yarn that is softer and more comfortable against the foot than yarn 138, with yarn 138 being primarily present on first surface 136 and yarn 139 being primarily present on second surface 137.

(61)Continuing with the configuration of FIG. 8B, yarn 138 may be formed from at least one of a thermoset polymer material and natural fibers (e.g., cotton, wool, silk), whereas yarn 139 may be formed from a thermoplastic polymer material. In general, a thermoplastic polymer material melts when heated and returns to a solid state when cooled. More particularly, the thermoplastic polymer material transitions from a solid state to a softened or liquid state when subjected to sufficient heat, and then the thermoplastic polymer material transitions from the softened or liquid state to the solid state when sufficiently cooled. As such, thermoplastic polymer materials are often used to join two objects or elements together. In this case, yarn 139 may be utilized to join (a) one portion of yarn 138 to another portion of yarn 138, (b) yarn 138 and inlaid strand 132 to each other, or (c) another element (e.g., logos, trademarks, and placards with care instructions and material information) to knitted component 130, for example. As such, yarn 139 may be considered a fusible yarn given that it may be used to fuse or otherwise join portions of knitted component 130 to each other. Moreover, yarn 138 may be considered a non- fusible yarn given that it is not formed from materials that are generally capable of fusing or otherwise joining portions of knitted component 130 to each other. That is, yarn 138 may be a non-fusible yarn, whereas yarn 139 may be a fusible yarn. In some configurations of knitted component 130, yarn 138 (i.e., the non-fusible yarn) may be substantially formed from a thermoset polyester material and yarn 139 (i.e., the fusible yarn) may be at least partially formed from a thermoplastic polyester material.

(62)The use of plated yarns may impart advantages to knitted component 130. When yarn 139 is heated and fused to yarn 138 and inlaid strand 132, this process may have the effect of stiffening or rigidifying the structure of knitted component 130. Moreover, joining (a) one portion of yarn 138 to another portion of yarn 138 or (b) yarn 138 and inlaid strand 132 to each other has the effect of securing or locking the relative positions of yarn 138 and inlaid strand 132, thereby imparting stretch-resistance and stiffness. That is, portions of yarn 138 may not slide relative to each other when fused with yarn 139, thereby preventing warping or permanent stretching of knit element 131 due to relative movement of the knit structure. Another benefit relates to limiting unraveling if a portion of knitted component 130 becomes damaged or one of yarns 138 is severed. Also, inlaid strand 132 may not slide relative to knit element 131, thereby preventing portions of inlaid strand 132 from pulling outward from knit element 131. Accordingly, areas of knitted component 130 may benefit from the use of both fusible and non-fusible yarns within knit element 131.

(63)Another aspect of knitted component 130 relates to a padded area adjacent to ankle opening 121 and extending at least partially around ankle opening 121. Referring to FIG. 7E, the padded area is formed by two overlapping and at least partially coextensive knitted layers 140, which may be formed of unitary knit construction, and a plurality of floating yarns 141 extending between knitted layers 140. Although the sides or edges of knitted layers 140 are secured to each other, a central area is generally unsecured. As such, knitted layers 140 effectively form a tube or tubular structure, and floating yarns 141 may be located or inlaid between knitted layers 140 to pass through the tubular structure. That is, floating yarns 141 extend between knitted layers 140, are generally parallel to surfaces of knitted layers 140, and also pass through and fill an interior volume between knitted layers 140. Whereas a majority of knit element 131 is formed from yarns that are mechanically manipulated to form intermeshed loops, floating yarns 141 are generally free or otherwise inlaid within the interior volume between knitted layers 140. As an additional matter, knitted layers 140 may be at least partially formed from a stretch yarn. An advantage of this configuration is that knitted layers will effectively compress floating yarns 141 and provide an elastic aspect to the padded area adjacent to ankle opening 121. That is, the stretch yarn within knitted layers 140 may be placed in tension during the knitting process that forms knitted component 130, thereby inducing knitted layers 140 to compress floating yarns 141. Although the degree of stretch in the stretch yarn may vary significantly, the stretch yarn may stretch at least one-hundred percent in many configurations of knitted component 130.

(72) In an exemplary embodiment, integral knit tongue 1010 may include raised elements disposed on opposite sides of throat area 1020 and extending along the length of integral knit tongue 1010. Raised elements may be a portion of integral knit tongue 1010 that are formed through the knitting process to be a flap or overhanging portion of integral knit tongue 1010 that extends outward away from first surface 1030 of upper 1002. As shown in FIGS. 10 and 11, integral knit tongue 1010 includes a lateral raised element 1016 and a medial raised element 1015 that are formed of unitary knit construction with upper 1002 and partially integral portion 1012 of integral knit tongue 1010. Lateral raised element 1016 and/or medial raised element

1015 may be substantially similar to, and similarly formed as lateral raised element 514 and medial raised element 515, described above.

(73) ~~(64)The presence of floating yarns 141 imparts a compressible aspect to the padded area adjacent to ankle opening 121, thereby enhancing the comfort of footwear 100 in the area of ankle opening 121. Many conventional articles of footwear incorporate polymer foam elements or other compressible materials into areas adjacent to an ankle opening. In contrast with the conventional articles of footwear, portions of knitted component 130 formed of unitary knit construction with a remainder of knitted component 130 may form the padded area adjacent to ankle opening 121. In further configurations of footwear 100, similar padded areas may be located in other areas of knitted component 130. For example, similar padded areas may be located as an area corresponding with joints between the metatarsals and proximal phalanges to impart padding to the joints. As an alternative, a terry loop structure may also be utilized to impart some degree of padding to areas of upper 120.~~Referring now to FIG. 11, in an exemplary embodiment, free portion 1014 may be disposed at a top end of throat area 1020 of third knitted component 1000 adjacent to the ankle opening. In one embodiment, free portion 1014 is formed of a unitary knit construction with partially integral portion 1012 at a rearward portion 1100 of throat area 1020, but is otherwise not joined or attached to other portions of upper 1002 and/or third knitted component 1000. With this arrangement, an ankle opening may be provided with a larger opening corresponding to the location of rearward portion 1100 of partially integral portion 1012 of integral knit tongue 1010 that extends distance D1 from the ankle opening along throat area 1020 of third knitted component 1000. Free portion 1014 of integral knit tongue 1010 may serve to cover a foot of a wearer disposed within the ankle opening to enhance the comfort of the article of footwear incorporating third knitted component 1000.

(74) In some embodiments, partially integral portion 1012 of integral knit tongue 1010 may include multiple knit structures, including knit structures of different types. For example, partially integral portion 1012 may include a first knit structure 1102 and a second knit structure 1104. First knit structure 1102 may be associated with a first knit type and may be centrally located and extending along integral knit tongue 1010 from rearward portion 1100 to the forward portion of throat area 1020. Second knit structure 1104 may be associated with a second knit type and may be located along peripheral sides of integral knit tongue 1010 between first knit structure 1102 and each of lateral raised element 1016 and medial raised element 1015 extending similarly from rearward portion 1100 to the forward portion of throat area 1020. In one embodiment, first knit structure 1102 and second knit structure 1104 may be different knit structures or different types of knit structures. For example, in some cases, first knit structure 1102 may be a mesh or similar knit type and second knit structure 1104 may be a jersey or similar knit type. In other cases, first knit structure 1102 may be a double-knit jersey structure and second knit structure 1104 may be a single-knit jersey structure. As shown in FIG. 12, first knit structure 1102 may have a greater thickness than second knit structure 1104 disposed on either peripheral side of first knit structure 1102 extending along the length of partially integral portion 1012 of integral knit tongue 1010.

(75) In some embodiments, lace apertures for receiving a lace may be provided by tensile element 1040. In an exemplary embodiment, a plurality of lace loops 1110 may be disposed at portions of tensile element 1040 that extend out from knit structure 1042 adjacent to lateral raised element 1016 and medial raised element 1015 on opposite sides of throat area 1020 of third knitted component 1000. With this configuration, a lace (not shown) may be disposed through plurality of lace loops 1110 to assist with securing an article of footwear incorporating third knitted component 1000 onto a foot of a wearer. In other embodiments, lace apertures may have a different structure, including any of the suitable structures for lace apertures described above.

(76) ~~(65)Based upon the above discussion, knitted component 130 imparts a variety of features to upper 120. Moreover, knitted component 130 provides a variety of advantages over some conventional upper configurations. As noted above, conventional footwear uppers are formed from multiple material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) that are joined through stitching or bonding, for example. As the number and type of material elements incorporated into an upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase. Waste material from cutting and stitching processes also accumulates to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements. By decreasing the number of material elements utilized in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper. To this end, knitted component 130 forms a substantial portion of upper 120, while increasing manufacturing efficiency, decreasing waste, and simplifying recyclability.~~

~~(66)Further Knitted Component Configurations~~

~~(67)A knitted component 150 is depicted in FIGS. 9 and 10 and may be utilized in place of knitted component 130 in footwear 100. The primary elements of knitted component 150 are a knit element 151 and an inlaid strand 152. Knit element 151 is formed from at least one yarn that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a variety of courses and wales. That is, knit element 151 has the structure of a knit textile. Inlaid strand 152 extends through knit element 151 and passes between the various loops within knit element 151. Although inlaid strand 152 generally extends along courses within knit element 151, inlaid strand 152 may also extend along wales within knit element 151. As with inlaid strand 132, inlaid strand 152 imparts stretch-resistance and, when incorporated into footwear 100, operates in connection with lace 122 to enhance the fit of footwear 100.(68)Knit element 151 has a generally U-shaped configuration that is outlined by a perimeter edge 153, a pair of heel edges 154, and an inner edge 155. In addition, knit element 151 has a first surface 156 and an opposite second surface 157. First surface 156 may form a portion of the exterior surface of upper 120, whereas second surface 157 may form a portion of the interior surface of upper 120, thereby defining at least a portion of the~~

void within upper 120. In many configurations, knit element 151 may have the configuration of a single textile layer in the area of inlaid strand 152. That is, knit element 151 may be a single textile layer between surfaces 156 and 157. In addition, knit element 151 defines a plurality of lace apertures 158.FIGS. 13 through 15 illustrate another alternate embodiment of a knitted component with a mechanism to allow a larger ankle opening when incorporated into an article of footwear. Referring now to FIG. 13, a top plan view of an alternate embodiment of a knitted component with an integral knit tongue having partially decoupled knit elements is illustrated. In some embodiments, a fourth knitted component 1300 may include a first portion defining an upper 1302 and a second portion defining an integral knit tongue 1310. Fourth knitted component 1300 may share one or more substantially similar features with knitted component 130, first knitted component 500, second knitted component 800, and/or third knitted component 1000, described above. As with the previous embodiments of knitted components, fourth knitted component 1300 may similarly have a generally U-shaped configuration that is outlined by an outer perimeter and an inner perimeter. In this embodiment, the outer perimeter includes a front perimeter edge 1303, a lateral perimeter edge 1304, a medial perimeter edge 1305, and a pair of heel edges, including a lateral heel edge 1306 and a medial heel edge 1307. The inner perimeter of fourth knitted component 1300 includes a lateral inner edge 1308 and a medial inner edge 1309 which may form an ankle opening. In addition, fourth knitted component 1300 may have a first surface 1330 forming a portion of the exterior surface of upper 1302 and an opposite second surface 1332 forming a portion of the interior surface of upper 1302.

(69)Similar to inlaid strand 132, inlaid strand 152 repeatedly extends from perimeter edge 153 toward inner edge 155, at least partially around one of lace apertures 158, and back to perimeter edge 153. In contrast with inlaid strand 132, however, some portions of inlaid strand 152 angle rearwards and extend to heel edges 154. More particularly, the portions of inlaid strand 152 associated with the most rearward lace apertures 158 extend from one of heel edges 154 toward inner edge 155, at least partially around one of the most rearward lace apertures 158, and back to one of heel edges 154. Additionally, some portions of inlaid strand 152 do not extend around one of lace apertures 158. More particularly, some sections of inlaid strand 152 extend toward inner edge 155, turn in areas adjacent to one of lace apertures 158, and extend back toward perimeter edge 153 or one of heel edges 154.

(70)Although knit element 151 may be formed in a variety of ways, courses of the knit structure generally extend in the same direction as inlaid strands 152. In areas adjacent to lace apertures 158, however, inlaid strand 152 may also extend along wales within knit element 151. More particularly, sections of inlaid strand 152 that are parallel to inner edge 155 may extend along wales.

(71)In comparison with knit element 151, inlaid strand 152 may exhibit greater stretch resistance. That is, inlaid strand 152 may stretch less than knit element 151. Given that numerous sections of inlaid strand 152 extend through knit element 151, inlaid strand 152 may impart stretch resistance to portions of upper 120 between the throat area and the lower area. Moreover, placing tension upon lace 122 may impart tension to inlaid strand 152, thereby inducing the portions of upper 120 between the throat area

and the lower area to lay against the foot. Additionally, given that numerous sections of inlaid strand 152 extend toward heel edges 154, inlaid strand 152 may impart stretch-resistance to portions of upper 120 in heel region 103. Moreover, placing tension upon lace 122 may induce the portions of upper 120 in heel region 103 to lay against the foot. As such, inlaid strand 152 operates in connection with lace 122 to enhance the fit of footwear 100.

(72) Knit element 151 may incorporate any of the various types of yarn discussed above for knit element 131. Inlaid strand 152 may also be formed from any of the configurations and materials discussed above for inlaid strand 132. Additionally, the various knit configurations discussed relative to FIGS. 8A and 8B may also be utilized in knitted component 150. More particularly, knit element 151 may have areas formed from a single yarn, two plated yarns, or a fusible yarn and a non-fusible yarn, with the fusible yarn joining (a) one portion of the non-fusible yarn to another portion of the non-fusible yarn or (b) the non-fusible yarn and inlaid strand 152 to each other.

(77) In some embodiments, fourth knitted component 1300 may further include additional structures, including at least one tensile element 1340 that is inlaid within a knit structure 1342 of fourth knitted component 1300. Tensile element 1340 may be substantially similar to tensile element 1040, described above, including suitable materials and methods of manufacturing a knitted component incorporating tensile elements and knit structures disclosed in the Inlaid Strand cases. In an exemplary embodiment, tensile element 1340 may further include a plurality of lace loops 1344 that may be configured to receive a lace. Plurality of lace loops 1344 may be disposed at portions of tensile element 1340 that extend out from knit structure 1342 and may have a substantially similar structure as lace loops 1110, described above. In some cases, lace loops 1344 may serve as lace apertures for receiving a lace. In other cases, lace loops 1344 may coordinate with one or more lace apertures disposed within raised elements of integral knit tongue 1310 to receive a lace. In still other cases, lace loops 1344 may be disposed through lace apertures disposed within raised elements and may receive a lace that extends through a throat area 1320 of upper 1302.

(78) In an exemplary embodiment, fourth knitted component 1300 incorporates upper 1302 and integral knit tongue 1310 formed of unitary knit construction such that at least a portion of upper 1302 and a portion of integral knit tongue 1310 are a one-piece element. In one embodiment, portions of upper 1302 may be formed from multiple knit element layers. Accordingly, integral knit tongue 1310 may be formed of unitary knit construction with at least one of the knit element layers.

(79) In some embodiments, integral knit tongue 1310 may be centrally-located in throat area 1320 of fourth knitted component 1300 and may extend from a top end 1314 adjacent to an ankle opening in a heel region over an area corresponding to an instep of the foot to an area adjacent to a forefoot region, as well as extending between a lateral side and a medial side of upper 1302. In an exemplary embodiment, integral knit tongue 1310 is formed of unitary knit construction with at least one knit element layer associated with upper 1302 at a forward portion of throat area 1320 and along the sides extending along a length of throat area 1320 of fourth knitted component 1300.

(80) In an exemplary embodiment, fourth knitted component 1300 may further include raised elements disposed on opposite sides of throat area 1320 and extending along the length of integral knit tongue 1310. As shown in FIGS. 13 through 15, fourth knitted component 1300 includes a lateral raised element 1312 and a medial raised element 1313 that are formed of unitary knit construction with at least one knit element layer of upper 1302. Lateral raised element 1312 and/or medial raised element 1313 may be substantially similar to, and similarly formed as lateral raised elements 514, 1016 and/or medial raised elements 515, 1015, described above.

(81) In some embodiments, the portion of fourth knitted component 1300 forming integral knit tongue 1310 may made from a different material than the remaining portion of fourth knitted component 1300. In an exemplary embodiment, integral knit tongue 1310 may be made from an elastic yarn that has a large degree of elasticity, while the remaining portions of fourth knitted component 1300 may be made from a regular yarn that is substantially inelastic or that has a smaller degree of elasticity compared with the elastic yarn. With this arrangement, integral knit tongue portion 1310 of fourth knitted component 1300 may be configured with throat area 1320 that is allowed to stretch to accommodate a foot of a wearer inserted through an ankle opening of an article of footwear incorporating fourth knitted component 1300.

(82) Additionally, in some embodiments, by forming integral knit tongue 1310 of unitary knit construction with a first knit element layer of fourth knitted component 1300 that is partially decoupled from a second knit element layer, the throat area 1320 may further be permitted to stretch to allow a larger ankle opening for an article of footwear incorporating fourth knitted component 1300. The partial decoupling of the first knit element layer and the second knit element layer may be shown in FIGS. 14 and 15.

(83) Referring now to FIGS. 14 and 15, in this embodiment, upper 1302 may include a first knit element layer 1400 associated with first surface 1330 of fourth knitted component 1300 and a second knit element layer 1402 associated with second surface 1332 of fourth knitted component 1300. In an exemplary embodiment, first knit element layer 1400 and second knit element layer 1402 may be partially decoupled at the portion of fourth knitted component 1300 associated with integral knit tongue 1310. That is, while other portions of fourth knitted component 1300 may include a single knit element having first surface 1330 on one side and second surface 1332 on the opposite side, the partially decoupled portion of fourth knitted component 1300 includes separate first knit element layer 1400 and second knit element layer 1402 disposed adjacent to one another, but not joined along the entirety of their surfaces. Accordingly, first surface 1330 is disposed on one side of first knit element layer 1400 and second surface 1332 is disposed on one side of second knit element layer 1402. At other portions of fourth knitted component 1300, first knit element layer 1400 and second knit element layer 1402 may be rejoined with one another through the knitting process so as to form a single knit element extending through the remaining portion of fourth knitted component 1300.

(84) In an exemplary embodiment, integral knit tongue 1310 may be formed of unitary knit construction with at least one knit element layer. In one embodiment,

integral knit tongue 1310 is formed of unitary knit construction with second knit element layer 1402. As shown in FIGS. 14 and 15, integral knit tongue 1310 is joined through knitting to second knit element layer 1402 of upper 1302 along each of a lateral side and a medial side of throat area 1320 such that integral knit tongue 1310 and second knit element layer 1402 include at least one course in common and/or include courses that are substantially continuous between integral knit tongue 1310 and second knit element layer 1402 along the sides of upper 1302 extending through throat area 1320. Similarly, in an exemplary embodiment, raised elements, including lateral raised element 1312 and medial raised element 1313, may be formed of unitary knit construction with first knit element layer 1400.

(85) In some embodiments, integral knit tongue 1310 may include multiple knit structures, including knit structures of different types, as described above. For example, integral knit tongue 1310 may include a first knit structure 1410 and a second knit structure 1412. First knit structure 1410 may be associated with a first knit type and may be centrally located and extending along integral knit tongue 1310 from a rearward portion to the forward portion of throat area 1320. Second knit structure 1412 may be associated with a second knit type and may be located along peripheral sides of integral knit tongue 1310 between first knit structure 1410 and each of lateral raised element 1312 and medial raised element 1313 extending similarly from the rearward portion to the forward portion of throat area 1320. In this embodiment, first knit structure 1410 and second knit structure 1412 may be similar made of an elastic yarn, however, first knit structure 1410 may be a double-knit jersey structure and second knit structure 1412 may be a single-knit jersey structure. As shown in FIGS. 14 and 15, first knit structure 1410 may have a greater thickness than second knit structure 1412.

(86) In some embodiments, portions of first knit element layer 1400 and second knit element layer 1402 may be joined to secure first knit element layer 1400 and second knit element layer 1402 at desired locations along integral knit tongue 1310. As shown in FIG. 14, a first yarn 1404 may be used to join first knit element layer 1400 to second knit element layer 1402 at a first end 1406 where lateral raised element 1312 begins to extend outward over integral knit tongue 1310. Similarly, a second yarn 1403 may be used to join first knit element layer 1400 to second knit element layer 1402 at a second end 1405 where medial raised element 1313 begins to extend outward over integral knit tongue 1310. In some cases, first yarn 1404 and/or second yarn 1403 may include a single yarn or a plurality of yarns from fourth knitted component 1300 that join first knit element layer 1400 to second knit element layer 1402 during the knitting process. In other cases, first yarn 1404 and/or second yarn 1403 may include a stitch or a plurality of stitches that are used to join first knit element layer 1400 to second knit element layer 1402 after the knitting process.

(87) ~~(73)A majority of knit element 131 is depicted as being formed from a relatively untextured textile and a common or single knit structure (e.g., a tubular knit structure). In contrast, knit element 151 incorporates various knit structures that impart specific properties and advantages to different areas of knitted component 150. Moreover, by combining various yarn types with the knit structures, knitted component 150 may impart a range of properties to different areas of upper 120.~~

~~Referring to FIG. 11, a schematic view of knitted component 150 shows various zones 160-169 having different knit structures, each of which will now be discussed in detail. For purposes of reference, each of regions 101-103 and sides 104 and 105 are shown in FIG. 11 to provide a reference for the locations of knit zones 160-169 when knitted component 150 is incorporated into footwear 100.(74)A tubular knit zone 160 extends along a majority of perimeter edge 153 and through each of regions 101-103 on both of sides 104 and 105. Tubular knit zone 160 also extends inward from each of sides 104 and 105 in an area approximately located at an interface regions 101 and 102 to form a forward portion of inner edge 155. Tubular knit zone 160 forms a relatively untextured knit configuration. Referring to FIG. 12A, a cross-section through an area of tubular knit zone 160 is depicted, and surfaces 156 and 157 are substantially parallel to each other. Tubular knit zone 160 imparts various advantages to footwear 100. For example, tubular knit zone 160 has greater durability and wear resistance than some other knit structures, especially when the yarn in tubular knit zone 160 is plated with a fusible yarn. In addition, the relatively untextured aspect of tubular knit zone 160 simplifies the process of joining strobel sock 125 to perimeter edge 153. That is, the portion of tubular knit zone 160 located along perimeter edge 153 facilitates the lasting process of footwear 100.~~**In one embodiment, the location of first yarn 1404 and/or second yarn 1403 may be chosen to coincide with one or more of lace loops 1344 of tensile element 1340. With this arrangement, first knit element layer 1400 and second knit element layer 1402 may be secured to each other at the location that corresponds to where a lace may be used to secure throat area 1320 of upper 1302 to fit onto a foot of a wearer of an article of footwear incorporating fourth knitted component 1300. In contrast, the partially decoupled portion of fourth knitted component 1300 shown in FIG. 15 does not include first yarn 1404 and/or second yarn 1403 joining first knit element layer 1400 to second knit element layer 1402. Accordingly, at the partially decoupled portion, first knit element layer 1400 and second knit element layer 1402 may be allowed to move independently of one another. This arrangement, together with the use of an elastic yarn to form one or more portions of second knit element layer forming integral knit tongue 1310, allows throat area 1320 to stretch to allow a larger ankle opening for an article of footwear incorporating fourth knitted component 1300.**

(88) Knitting Process for a Knitted Component

(89) FIGS. 16 through 29 illustrate various knitting processes that may be used to manufacture a knitted component in accordance with the principles described herein. In various embodiments described herein, the different knit structures of a particular knitted component may be made using various types of knit structures, including knit types and yarn types.

(90) In an exemplary embodiment, the integral knit tongue of a knitted component that includes raised elements along a medial side and a lateral side may be formed using a specific knitting process. For purposes of reference, FIG. ~~13A~~**16** depicts a loop diagram of the manner in which ~~tubular knit zone 160~~**raised elements associated with an integral knit tongue, including, for example, any of raised elements 142, raised elements 514, 515, raised elements 1015, 1016, and/or raised elements 1312, 1313** is

formed with a knitting process. 1600.

(91) (75)Two stretch knit zones 161 extend inward from perimeter edge 153 and are located to correspond with a location of joints between metatarsals and proximal phalanges of the foot. That is, stretch zones extend inward from perimeter edge in the area approximately located at the interface regions 101 and 102. As with tubular knit zone 160, the knit configuration in stretch knit zones 161 may be a tubular knit structure. In contrast with tubular knit zone 160, however, stretch knit zones 161 are formed from a stretch yarn that imparts stretch and recovery properties to knitted component 150. Although the degree of stretch in the stretch yarn may vary significantly, the stretch yarn may stretch at least one- hundred percent in many configurations of knitted component 150.As shown in FIG. 16, knitting process 1600 for an integral knit tongue having raised elements may include loop diagrams indicating the direction and type of knitting operation being performed to make the integral knit tongue. It should be understood that the remaining portion of a knitted component may be made according to any suitable knitting process, knitting process 1600 details an exemplary knitting process for an integral knit tongue portion of the overall knitted component. Accordingly, in a first step 1601, yarn is transferred to a back bed of a knitting machine. Next, in a second step 1602, the yarn is knit along a first direction as shown, then back along a second, opposite direction in a third step 1603. Next, in a fourth step 1604, the yarn is transferred to a front bed of the knitting machine and the yarn is knit along the first direction in a fifth step 1605. With this process, a raised element along one side of the integral knit tongue is formed. While an exemplary knit type is illustrated for fifth step 1605 which may form the central portion of an integral knit tongue, any suitable knit type may be used to make a central portion of the integral knit tongue having any desired knit structure.

(76)A tubular and interlock tuck knit zone 162 extends along a portion of inner edge 155 in at least midfoot region 102. Tubular and interlock tuck knit zone 162 also forms a relatively untextured knit configuration, but has greater thickness than tubular knit zone 160. In cross-section, tubular and interlock tuck knit zone 162 is similar to FIG. 12A, in which surfaces 156 and 157 are substantially parallel to each other. Tubular and interlock tuck knit zone 162 imparts various advantages to footwear 100. For example, tubular and interlock tuck knit zone 162 has greater stretch resistance than some other knit structures, which is beneficial when lace 122 places tubular and interlock tuck knit zone 162 and inlaid strands 152 in tension. For purposes of reference, FIG. 13B depicts a loop diagram of the manner in which tubular and interlock tuck knit zone 162 is formed with a knitting process.

(77)A 1.times.1 mesh knit zone 163 is located in forefoot region 101 and spaced inward from perimeter edge 153. 1.times.1 mesh knit zone has a C-shaped configuration and forms a plurality of apertures that extend through knit element 151 and from first surface 156 to second surface 157, as depicted in FIG. 12B. The apertures enhance the permeability of knitted component 150, which allows air to enter upper 120 and moisture to escape from upper 120. For purposes of reference, FIG. 13C depicts a loop diagram of the manner in which 1.times.1 mesh knit zone 163 is formed with a knitting process.

(78)A 2.times.2 mesh knit zone 164 extends adjacent to 1.times.1 mesh knit zone 163. In comparison with 1.times.1 mesh knit zone 163, 2.times.2 mesh knit zone 164 forms larger apertures, which may further enhance the permeability of knitted component 150. For purposes of reference, FIG. 13D depicts a loop diagram of the manner in which 2.times.2 mesh knit zone 164 is formed with a knitting process.

(79)A 3.times.2 mesh knit zone 165 is located within 2.times.2 mesh knit zone 164, and another 3.times.2 mesh knit zone 165 is located adjacent to one of stretch zones 161. In comparison with 1.times.1 mesh knit zone 163 and 2.times.2 mesh knit zone 164, 3.times.2 mesh knit zone 165 forms even larger apertures, which may further enhance the permeability of knitted component 150. For purposes of reference, FIG. 13E depicts a loop diagram of the manner in which 3.times.2 mesh knit zone 165 is formed with a knitting process.

(92) (80)A 1.times.1 mock mesh knit zone 166 is located in forefoot region 101 and extends around 1.times.1 mesh knit zone 163. In contrast with mesh knit zones 163-165, which form apertures through knit element 151, 1.times.1 mock mesh knit zone 166 forms indentations in first surface 156, as depicted in FIG. 12C. In addition to enhancing the aesthetics of footwear 100, 1.times.1 mock mesh knit zone 166 may enhance flexibility and decrease the overall mass of knitted component 150. For purposes of reference, FIG. 13F depicts a loop diagram of the manner in which 1.times.1 mock mesh knit zone 166 is formed with a knitting process.Similarly, from fifth step 1605, a raised element disposed on the opposite side of the integral knit tongue may also be formed. As shown in FIG. 16, after completing knitting associated with fifth step 1605, the yarn may be transferred to the back bed of the knitting machine at a sixth step 1606 and the yarn is knit along the second direction as shown in a seventh step 1607, then back along in the opposite, first direction in an eighth step 1608. The yarn may then be transferred back to the front bed of the knitting machine at a ninth step 1609 and the yarn is knit along the second direction in a tenth step 1610 along the entirety of the width of the integral knit tongue. The exemplary knitting process 1600 may be repeated multiple times to make an integral knit tongue with raised elements having the desired length along the knitted component. Similarly, portions of the integral knit tongue may be made wider or narrower by changing a number of needles that are associated with knitting process 1600. For example, portions of knitting process 1600, including fifth step 1605 and/or tenth step 1610, may be varied to include a larger or smaller number of needles to correspondingly increase or decrease the width of the integral knit tongue. In addition, as noted above, other knitting processes not shown here may be used to make the remaining portions of the knitted component.

(81)Two 2.times.2 mock mesh knit zones 167 are located in heel region 103 and adjacent to heel edges 154. In comparison with 1.times.1 mock mesh knit zone 166, 2.times.2 mock mesh knit zones 167 forms larger indentations in first surface 156. In areas where inlaid strands 152 extend through indentations in 2.times.2 mock mesh knit zones 167, as depicted in FIG. 12D, inlaid strands 152 may be visible and exposed in a lower area of the indentations. For purposes of reference, FIG. 13G depicts a loop diagram of the manner in which 2.times.2 mock mesh knit zones 167 are formed with

a knitting process.

(82)Two 2.times.2 hybrid knit zones 168 are located in midfoot region 102 and forward of 2.times.2 mock mesh knit zones 167. 2.times.2 hybrid knit zones 168 share characteristics of 2.times.2 mesh knit zone 164 and 2.times.2 mock mesh knit zones 167. More particularly, 2.times.2 hybrid knit zones 168 form apertures having the size and configuration of 2.times.2 mesh knit zone 164, and 2.times.2 hybrid knit zones 168 form indentations having the size and configuration of 2.times.2 mock mesh knit zones 167. In areas where inlaid strands 152 extend through indentations in 2.times.2 hybrid knit zones 168, as depicted in FIG. 12E, inlaid strands 152 are visible and exposed. For purposes of reference, FIG. 13H depicts a loop diagram of the manner in which 2.times.2 hybrid knit zones 168 are formed with a knitting process.

(83)Knitted component 150 also includes two padded zones 169 having the general configuration of the padded area adjacent to ankle opening 121 and extending at least partially around ankle opening 121, which was discussed above for knitted component 130. As such, padded zones 169 are formed by two overlapping and at least partially coextensive knitted layers, which may be formed of unitary knit construction, and a plurality of floating yarns extending between the knitted layers.

(84)A comparison between FIGS. 9 and 10 reveals that a majority of the texturing in knit element 151 is located on first surface 156, rather than second surface 157. That is, the indentations formed by mock mesh knit zones 166 and 167, as well as the indentations in 2.times.2 hybrid knit zones 168, are formed in first surface 156. This configuration has an advantage of enhancing the comfort of footwear 100. More particularly, this configuration places the relatively untextured configuration of second surface 157 against the foot. A further comparison between FIGS. 9 and 10 reveals that portions of inlaid strand 152 are exposed on first surface 156, but not on second surface 157. This configuration also has an advantage of enhancing the comfort of footwear 100. More particularly, by spacing inlaid strand 152 from the foot by a portion of knit element 151, inlaid strands 152 will not contact the foot.

(93) (85)Additional configurations of knitted component 130 are depicted in FIGS. 14A-14C. Although discussed in relation to knitted component 130, concepts associated with each of these configurations may also be utilized with knitted component 150. Referring to FIG. 14A, inlaid strands 132 are absent from knitted component 130. Although inlaid strands 132 impart stretch-resistance to areas of knitted component 130, some configurations may not require the stretch-resistance from inlaid strands 132. Moreover, some configurations may benefit from greater stretch in upper 120. Referring to FIG. 14B, knit element 131 includes two flaps 142 that are formed of unitary knit construction with a remainder of knit element 131 and extend along the length of knitted component 130 at perimeter edge 133. When incorporated into footwear 100, flaps 142 may replace strobel sock 125. That is, flaps 142 may cooperatively form a portion of upper 120 that extends under sockliner 113 and is secured to the upper surface of midsole 111. Referring to FIG. 14C, knitted component 130 has a configuration that is limited to midfoot region 102. In this

~~configuration, other material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) may be joined to knitted component 130 through stitching or bonding, for example, to form upper 120.(86)Based upon the above discussion, each of knitted components 130 and 150 may have various configurations that impart features and advantages to upper 120. More particularly, knit elements 131 and 151 may incorporate various knit structures and yarn types that impart specific properties to different areas of upper 120, and inlaid strands 132 and 152 may extend through the knit structures to impart stretch resistance to areas of upper 120 and operate in connection with lace 122 to enhance the fit of footwear 100.~~Additionally, the knit types illustrated in FIG. 16 are exemplary and in different embodiments may be varied. For example, as shown in knitting process 1600, each raised element is made from a double-jersey half-gauge knit, whereas the central portion of the integral knit tongue is made from a single-jersey half-gauge knit. However, in other embodiments, one or more knit types may vary. For example, in some cases, the central portion of the integral knit tongue may include one or more portions of full-gauge (or "all- needle") single or double-jersey knit. In other cases, the width of various knit types along the central portion of the integral tongue may be varied repeatedly, for example, by using different numbers of needles, as noted above. Still other cases may include a combination of knit types and/or knit structures employing various combinations of knit, tuck, or float stitches.

~~(87)Knitting Machine And Feeder Configurations~~

(94) ~~(88)~~Although knitting may be performed by hand, the commercial manufacture of knitted components is generally performed by knitting machines. ~~An example~~FIG. 17 illustrates an exemplary embodiment of a knitting machine ~~200~~1700 that is suitable for producing ~~either~~any of the knitted components ~~130 and 150 is depicted in FIG. 15. Knitting machine 200~~described in the previous embodiments, including knitted component 130, first knitted component 500, second knitted component 800, third knitted component 1000, and/or fourth knitted component 1300, as well as other configurations of knitted components not explicitly illustrated or described but made according to the principles described herein. In this embodiment, knitting machine 1700 has a configuration of a V- bed flat knitting machine for purposes of example, but ~~either~~any of the knitted components ~~130 and 150~~ or ~~aspects~~portions of knitted components ~~130 and 150~~ may be produced on other types of knitting machines.

(95) ~~(89)Knitting~~In an exemplary embodiment, knitting machine ~~200 includes~~1700 may include two needle beds ~~201~~, including a front needle bed 1701 and a back needle bed 1702, that are angled with respect to each other, thereby forming a V-bed. Each of front needle ~~beds 201~~bed 1701 and back needle bed 1702 include a plurality of individual needles ~~202~~ that lay on a common plane~~.~~, including needles 1703 associated with front bed 1701 and needles 1704 associated with back bed 1702. That is, needles ~~202~~1703 from ~~one~~front needle bed ~~201~~1701 lay on a first plane, and needles ~~202~~1704 from ~~the other~~back needle bed ~~201~~1702 lay on a second plane. The first plane and the second plane (i.e., the two needle beds ~~201~~1701, 1702) are angled relative to each other and meet to form an intersection that extends along a majority of a width of knitting machine ~~200.~~1700. As described in greater detail below, needles ~~202~~1703, 1704 each have a first position where they are retracted and a second position where they are extended. In the first

position, needles ~~202~~1703, 1704 are spaced from the intersection where the first plane and the second plane meet. In the second position, however, needles ~~202~~1703, 1704 pass through the intersection where the first plane and the second plane meet.

(96) ~~(90)~~A pair of rails ~~203 extend~~**, including a forward rail 1710 and a rear rail 1711, extends** above and parallel to the intersection of needle beds ~~201~~1701, 1702 and provide attachment points for multiple standard feeders ~~204~~1720 and combination feeders ~~220.~~1722. Each rail ~~203~~1710, 1711 has two sides, each of which accommodates either one standard feeder ~~204~~1720 or one combination feeder ~~220.~~**1722. In this embodiment, rails 1710, 1711 include a front side 1712 and a back side 1714.** As such, knitting machine ~~200~~1700 may include a total of four feeders ~~204~~1720 and ~~220.~~1722. As depicted, the forward-most rail ~~203~~**, forward rail 1710,** includes one combination feeder ~~220~~1722 and one standard feeder ~~204~~1720 on opposite sides, and the rearward- most rail ~~203~~**, rear rail 1711,** includes two standard feeders ~~204~~1720 on opposite sides. Although two rails ~~203~~1710, 1711 are depicted, further configurations of knitting machine ~~200~~1700 may incorporate additional rails ~~203~~ to provide attachment points for more **standard** feeders ~~204 and 220.~~**1720 and/or combination feeders 1722.**

(97) ~~(91)~~Due to the action of a carriage ~~205,~~**1730,** feeders ~~204~~1720 and ~~220~~1722 move along rails ~~203~~1710, 1711 and needle beds ~~201,~~**1701, 1702,** thereby supplying yarns to needles ~~202. In~~**1703, 1704. As shown in** FIG. ~~15,~~**17,** a yarn ~~206~~1724 is provided to combination feeder ~~220~~1722 by a spool ~~207.~~**1726.** More particularly, yarn ~~206~~1724 extends from spool ~~207~~1726 to various yarn guides ~~208,~~**1728,** a yarn take-back spring ~~209,~~**,** and a yarn tensioner ~~210~~ before entering combination feeder ~~220.~~**1722.** Although not depicted, additional spools ~~207~~ may be ~~utilized~~**used** to provide yarns to feeders ~~204.~~**1720 in a substantially similar manner as spool 1726.**

(98) ~~(92)~~Standard feeders ~~204~~**1720** are conventionally-~~utilized~~**used** for a V-bed flat knitting machine, such as knitting machine ~~200.~~**1700.** That is, existing knitting machines incorporate standard feeders ~~204.~~**1720.** Each standard feeder ~~204~~**1720** has the ability to supply a yarn that needles ~~202~~**1703, 1704** manipulate to knit, tuck, and float. As a comparison, combination feeder ~~220~~**1722** has the ability to supply a yarn (e.g., yarn ~~206~~**1724**) that needles ~~202~~**1703, 1704** knit, tuck, and float, and combination feeder ~~220~~**1722 further** has the ability to inlay the yarn. Moreover, combination feeder ~~220~~**1722** has the ability to inlay a variety of different **tensile elements, including yarn or other types of** strands (e.g., filament, thread, rope, webbing, cable, **or** chain~~, or yarn~~). Accordingly, combination feeder ~~220~~**1722** exhibits greater versatility than each standard feeder ~~204.~~**1720.**

~~(93)As noted above, combination feeder 220 may be utilized when inlaying a yarn or other strand, in addition to knitting, tucking, and floating the yarn. Conventional knitting machines, which do not incorporate combination feeder 220, may also inlay a yarn. More particularly, conventional knitting machines that are supplied with an inlay feeder may also inlay a yarn. A conventional inlay feeder for a V-bed flat knitting machine includes two components that operate in conjunction to inlay the yarn. Each of the components of the inlay feeder are secured to separate attachment points on two adjacent rails, thereby occupying two attachment points. Whereas an individual standard feeder 204 only occupies one attachment point, two attachment points are generally occupied when an inlay feeder is utilized to inlay a yarn into a knitted component. Moreover, whereas combination feeder 220 only occupies one attachment point, a conventional inlay feeder occupies two attachment points.~~

~~(94)Given that knitting machine 200 includes two rails 203, four attachment points are available in knitting machine 200. If a conventional inlay feeder were utilized with knitting machine 200, only two attachment points would be available for standard feeders 204. When using combination feeder 220 in knitting machine 200, however, three attachment points are available for standard feeders 204. Accordingly, combination feeder 220 may be utilized when inlaying a yarn or other strand, and combination feeder 220 has an advantage of only occupying one attachment point.~~

~~(95)Combination feeder 220 is depicted individually in FIGS. 16-19 as including a carrier 230, a feeder arm 240, and a pair of actuation members 250. Although a majority of combination feeder 220 may be formed from metal materials (e.g., steel, aluminum, titanium), portions of carrier 230, feeder arm 240, and actuation members 250 may be formed from polymer, ceramic, or composite materials, for example. As discussed above, combination feeder 220 may be utilized when inlaying a yarn or other strand, in addition to knitting, tucking, and floating a yarn. Referring to FIG. 16 specifically, a portion of yarn 206 is depicted to illustrate the manner in which a strand interfaces with combination feeder 220.~~

~~(96)Carrier 230 has a generally rectangular configuration and includes a first cover member 231 and a second cover member 232 that are joined by four bolts 233. Cover members 231 and 232 define an interior cavity in which portions of feeder arm 240 and actuation members 250 are located. Carrier 230 also includes an~~

attachment element 234 that extends outward from first cover member 231 for securing feeder 220 to one of rails 203. Although the configuration of attachment element 234 may vary, attachment element 234 is depicted as including two spaced protruding areas that form a dovetail shape, as depicted in FIG. 17. A reverse dovetail configuration on one of rails 203 may extend into the dovetail shape of attachment element 234 to effectively join combination feeder 220 to knitting machine 200. It should also be noted that second cover member 234 forms a centrally-located and elongate slot 235, as depicted in FIG. 18.

(97)Feeder arm 240 has a generally elongate configuration that extends through carrier 230 (i.e., the cavity between cover members 231 and 232) and outward from a lower side of carrier 230. In addition to other elements, feeder arm 240 includes an actuation bolt 241, a spring 242, a pulley 243, a loop 244, and a dispensing area 245. Actuation bolt 241 extends outward from feeder arm 240 and is located within the cavity between cover members 231 and 232. One side of actuation bolt 241 is also located within slot 235 in second cover member 232, as depicted in FIG. 18. Spring 242 is secured to carrier 230 and feeder arm 240. More particularly, one end of spring 242 is secured to carrier 230, and an opposite end of spring 242 is secured to feeder arm 240. Pulley 243, loop 244, and dispensing area 245 are present on feeder arm 240 to interface with yarn 206 or another strand. Moreover, pulley 243, loop 244, and dispensing area 245 are configured to ensure that yarn 206 or another strand smoothly passes through combination feeder 220, thereby being reliably supplied to needles 202. Referring again to FIG. 16, yarn 206 extends around pulley 243, through loop 244, and into dispensing area 245. In addition, yarn 206

extends out of a dispensing tip 246, which is an end region of feeder arm 240, to then supply needles 202.

(99) (98)Each of actuation members 250 includes an arm 251 and a plate 252. In many configurations of actuation members 250, each arm 251 is formed as a one-piece element with one of plates 252. Whereas arms 251 are located outside of carrier 230 and at an upper side of carrier 230, plates 252 are located within carrier 250. Each of arms 251 has an elongate configuration that defines an outside end 253 and an opposite inside end 254, and arms 251 are positioned to define a space 255 between both of inside ends 254. That is, arms 251 are spaced from each other. Plates 252 have a generally planar configuration. Referring to FIG. 19, each of plates 252 define an aperture 256 with an inclined edge 257. Moreover, actuation bolt 241 of feeder arm 240 extends into each aperture 256.(99)The configuration of combination feeder 220 discussed above provides a structure that facilitates a translating movement of feeder arm 240. As discussed in greater detail below, the translating movement of feeder arm 240 selectively positions dispensing tip 246 at a location that is above or below the intersection of needle beds 201. That is, dispensing tip 246 has the ability to reciprocate through the intersection of needle beds 201. An advantage to the translating movement of feeder arm 240 is that combination feeder 220 (a) supplies yarn 206 for knitting, tucking, and floating when dispensing tip 246 is positioned above the intersection of needle beds 201 and (b) supplies yarn 206 or another strand for inlaying when dispensing tip 246 is positioned below the intersection of needle beds 201. Moreover, feeder arm 240 reciprocates between the two positions depending upon the manner in which combination feeder 220 is being utilized.Standard feeders 1720

and combination feeder 1722 may have substantially similar configurations as the structure of standard feeders and the combination feeder described in

(100)In reciprocating through the intersection of needle beds 201, feeder arm 240 translates from a retracted position to an extended position. When in the retracted position, dispensing tip 246 is positioned above the intersection of needle beds 201. When in the extended position, dispensing tip 246 is positioned below the intersection of needle beds 201. Dispensing tip 246 is closer to carrier 230 when feeder arm 240 is in the retracted position than when feeder arm 240 is in the extended position. Similarly, dispensing tip 246 is further from carrier 230 when feeder arm 240 is in the extended position than when feeder arm 240 is in the retracted position. In other words, dispensing tip 246 moves away from carrier 230 when in the extended position, and dispensing tip 246 moves closer to carrier 230 when in the retracted position.

(101)For purposes of reference in FIGS. 16-20C, as well as further figures discussed later, an arrow 221 is positioned adjacent to dispensing area 245. When arrow 221 points upward or toward carrier 230, feeder arm 240 is in the retracted position. When arrow 221 points downward or away from carrier 230, feeder arm 240 is in the extended position. Accordingly, by referencing the position of arrow 221, the position of feeder arm 240 may be readily ascertained.U.S. patent application Ser. No. 13/400,511, entitled "Article Of Footwear Incorporating A Knitted Component With A Tongue", filed on Feb. 20, 2012, the disclosure of which has been incorporated by reference above.

(102)The natural state of feeder arm 240 is the retracted position. That is, when no significant forces are applied to areas of combination feeder 220, feeder arm remains in the retracted position. Referring to FIGS. 16-19, for example, no forces or other influences are shown as interacting with combination feeder 220, and feeder arm 240 is in the retracted position. The translating movement of feeder arm 240 may occur, however, when a sufficient force is applied to one of arms 251. More particularly, the translating movement of feeder arm 240 occurs when a sufficient force is applied to one of outside ends 253 and is directed toward space 255. Referring to FIGS. 20A and 20B, a force 222 is acting upon one of outside ends 253 and is directed toward space 255, and feeder arm 240 is shown as having translated to the extended position. Upon removal of force 222, however, feeder arm 240 will return to the retracted position. It should also be noted that FIG. 20C depicts force 222 as acting upon inside ends 254 and being directed outward, and feeder arm 240 remains in the retracted position.

(103)As discussed above, feeders 204 and 220 move along rails 203 and needle beds 201 due to the action of carriage 205. More particularly, a drive bolt within carriage 205 contacts feeders 204 and 220 to push feeders 204 and 220 along needle beds 201. With respect to combination feeder 220, the drive bolt may either contact one of outside ends 253 or one of inside ends 254 to push combination feeder 220 along needle beds 201. When the drive bolt contacts one of outside ends 253, feeder arm 240 translates to the extended position and dispensing tip 246 passes below the intersection of needle beds 201. When the drive bolt contacts one of inside ends 254 and is located within space 255, feeder arm 240 remains in the retracted position and dispensing tip 246 is above the intersection of needle beds 201. Accordingly, the area where carriage 205 contacts combination feeder 220 determines whether feeder arm 240 is in the

retracted position or the extended position.

(104)The mechanical action of combination feeder 220 will now be discussed. FIGS. 19-20B depict combination feeder 220 with first cover member 231 removed, thereby exposing the elements within the cavity in carrier 230. By comparing FIG. 19 with FIGS. 20A and 20B, the manner in which force 222 induces feeder arm 240 to translate may be apparent. When force 222 acts upon one of outside ends 253, one of actuation members 250 slides in a direction that is perpendicular to the length of feeder arm 240. That is, one of actuation members 250 slides horizontally in FIGS. 19-20B. The movement of one of actuation members 250 causes actuation bolt 241 to engage one of inclined edges 257. Given that the movement of actuation members 250 is constrained to the direction that is perpendicular to the length of feeder arm 240, actuation bolt 241 rolls or slides against inclined edge 257 and induces feeder arm 240 to translate to the extended position. Upon removal of force 222, spring 242 pulls feeder arm 240 from the extended position to the retracted position.

(105)Based upon the above discussion, combination feeder 220 reciprocates between the retracted position and the extended position depending upon whether a yarn or other strand is being utilized for knitting, tucking, or floating or being utilized for inlaying. Combination feeder 220 has a configuration wherein the application of force 222 induces feeder arm 240 to translate from the retracted position to the extended position, and removal of force 222 induces feeder arm 240 to translate from the extended position to the retracted position. That is, combination feeder 220 has a configuration wherein the application and removal of force 222 causes feeder arm 240 to reciprocate between opposite sides of needle beds 201. In general, outside ends 253 may be considered actuation areas, which induce movement in feeder arm 240. In further configurations of combination feeder 220, the actuation areas may be in other locations or may respond to other stimuli to induce movement in feeder arm 240. For example, the actuation areas may be electrical inputs coupled to servomechanisms that control movement of feeder arm 240. Accordingly, combination feeder 220 may have a variety of structures that operate in the same general manner as the configuration discussed above.

(106)Knitting Process

(100) (107)The manner in which knitting machine 200 operates to manufacture a knitted component will now be discussed in detail. Moreover, the following discussion will demonstrate the operation of combination feeder 220 during a knitting process. Referring to FIG. 21A, a portion of knitting machine 200 that includes various needles 202, rail 203, standard feeder 204, and combination feeder 220 is depicted. Whereas combination feeder 220 is secured to a front side of rail 203, standard feeder 204 is secured to a rear side of rail 203. Yarn 206 passes through combination feeder 220, and an end of yarn 206 extends outward from dispensing tip 246. Although yarn 206 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through combination feeder 220. Another yarn 211 passes through standard feeder 204 and forms a portion of a knitted component 260, and loops of yarn 211 forming an uppermost course in knitted component 260 are held by hooks located on ends of needles 202.(108)The knitting process discussed herein relates to the formation of knitted component 260, which may be any knitted component, including knitted

components that are similar to knitted components 150 and 250. For purposes of the discussion, only a relatively small section of knitted component 260 is shown in the figures in order to permit the knit structure to be illustrated. Moreover, the scale or proportions of the various elements of knitting machine 200 and knitted component 260 may be enhanced to better illustrate the knitting process.(109)Standard feeder 204 includes a feeder arm 212 with a dispensing tip 213. Feeder arm 212 is angled to position dispensing tip 213 in a location that is (a) centered between needles 202 and (b) above an intersection of needle beds 201. FIG. 22A depicts a schematic cross-sectional view of this configuration. Note that needles 202 lay on different planes, which are angled relative to each other. That is, needles 202 from needle beds 201 lay on the different planes. Needles 202 each have a first position and a second position. In the first position, which is shown in solid line, needles 202 are retracted. In the second position, which is shown in dashed line, needles 202 are extended. In the first position, needles 202 are spaced from the intersection where the planes upon which needle beds 201 lay meet. In the second position, however, needles 202 are extended and pass through the intersection where the planes upon which needle beds 201 meet. That is, needles 202 cross each other when extended to the second position. It should be noted that dispensing tip 213 is located above the intersection of the planes. In this position, dispensing tip 213 supplies yarn 211 to needles 202 for purposes of knitting, tucking, and floating.

(110)Combination feeder 220 is in the retracted position, as evidenced by the orientation of arrow 221. Feeder arm 240 extends downward from carrier 230 to position dispensing tip 246 in a location that is (a) centered between needles 202 and (b) above the intersection of needle beds 201. FIG. 22B depicts a schematic cross-sectional view of this configuration. Note that dispensing tip 246 is positioned in the same relative location as dispensing tip 213 in FIG. 22A.

(111)Referring now to FIG. 21B, standard feeder 204 moves along rail 203 and a new course is formed in knitted component 260 from yarn 211. More particularly, needles 202 pulled sections of yarn 211 through the loops of the prior course, thereby forming the new course. Accordingly, courses may be added to knitted component 260 by moving standard feeder 204 along needles 202, thereby permitting needles 202 to manipulate yarn 211 and form additional loops from yarn 211.

(112)Continuing with the knitting process, feeder arm 240 now translates from the retracted position to the extended position, as depicted in FIG. 21C. In the extended position, feeder arm 240 extends downward from carrier 230 to position dispensing tip 246 in a location that is (a) centered between needles 202 and (b) below the intersection of needle beds 201. FIG. 22C depicts a schematic cross-sectional view of this configuration. Note that dispensing tip 246 is positioned below the location of dispensing tip 246 in FIG. 22B due to the translating movement of feeder arm 240.

(113)Referring now to FIG. 21D, combination feeder 220 moves along rail 203 and yarn 206 is placed between loops of knitted component 260. That is, yarn 206 is located in front of some loops and behind other loops in an alternating pattern. Moreover, yarn 206 is placed in front of loops being held by needles 202 from one needle bed 201, and yarn 206 is placed behind loops being held by needles 202 from the other needle bed 201. Note that feeder arm 240 remains in the extended position in order to lay yarn

206 in the area below the intersection of needle beds 201. This effectively places yarn 206 within the course recently formed by standard feeder 204 in FIG. 21B.

(114)In order to complete inlaying yarn 206 into knitted component 260, standard feeder 204 moves along rail 203 to form a new course from yarn 211, as depicted in FIG. 21E. By forming the new course, yarn 206 is effectively knit within or otherwise integrated into the structure of knitted component 260. At this stage, feeder arm 240 may also translate from the extended position to the retracted position.

(115)FIGS. 21D and 21E show separate movements of feeders 204 and 220 along rail 203. That is, FIG. 21D shows a first movement of combination feeder 220 along rail 203, and FIG. 21E shows a second and subsequent movement of standard feeder 204 along rail 203. In many knitting processes, feeders 204 and 220 may effectively move simultaneously to inlay yarn 206 and form a new course from yarn 211. Combination feeder 220, however, moves ahead or in front of standard feeder 204 in order to position yarn 206 prior to the formation of the new course from yarn 211.

(116)The general knitting process outlined in the above discussion provides an example of the manner in which inlaid strands 132 and 152 may be located in knit elements 131 and 151. More particularly, knitted components 130 and 150 may be formed by utilizing combination feeder 220 to effectively insert inlaid strands 132 and 152 into knit elements 131. Given the reciprocating action of feeder arm 240, inlaid strands may be located within a previously formed course prior to the formation of a new course.

(117)Continuing with the knitting process, feeder arm 240 now translates from the retracted position to the extended position, as depicted in FIG. 21F. Combination feeder 220 then moves along rail 203 and yarn 206 is placed between loops of knitted component 260, as depicted in FIG. 21G. This effectively places yarn 206 within the course formed by standard feeder 204 in FIG. 21E. In order to complete inlaying yarn 206 into knitted component 260, standard feeder 204 moves along rail 203 to form a new course from yarn 211, as depicted in FIG. 21H. By forming the new course, yarn 206 is effectively knit within or otherwise integrated into the structure of knitted component 260. At this stage, feeder arm 240 may also translate from the extended position to the retracted position.

(118)Referring to FIG. 21H, yarn 206 forms a loop 214 between the two inlaid sections. In the discussion of knitted component 130 above, it was noted that inlaid strand 132 repeatedly exits knit element 131 at perimeter edge 133 and then re-enters knit element 131 at another location of perimeter edge 133, thereby forming loops along perimeter edge 133, as seen in FIGS. 5 and 6. Loop 214 is formed in a similar manner. That is, loop 214 is formed where yarn 206 exits the knit structure of knitted component 260 and then re-enters the knit structure.

(119)As discussed above, standard feeder 204 has the ability to supply a yarn (e.g., yarn 211) that needles 202 manipulate to knit, tuck, and float. Combination feeder 220, however, has the ability to supply a yarn (e.g., yarn 206) that needles 202 knit, tuck, or float, as well as inlaying the yarn. The above discussion of the knitting process describes the manner in which combination feeder 220 inlays a yarn while in the

extended position. Combination feeder 220 may also supply the yarn for knitting, tucking, and floating while in the retracted position. Referring to FIG. 21I, for example, combination feeder 220 moves along rail 203 while in the retracted position and forms a course of knitted component 260 while in the retracted position. Accordingly, by reciprocating feeder arm 240 between the retracted position and the extended position, combination feeder 220 may supply yarn 206 for purposes of knitting, tucking, floating, and inlaying. An advantage to combination feeder 220 relates, therefore, to its versatility in supplying a yarn that may be utilized for a greater number of functions than standard feeder 204

(120)The ability of combination feeder 220 to supply yarn for knitting, tucking, floating, and inlaying is based upon the reciprocating action of feeder arm 240. Referring to FIGS. 22A and 22B, dispensing tips 213 and 246 are at identical positions relative to needles 220. As such, both feeders 204 and 220 may supply a yarn for knitting, tucking, and floating. Referring to FIG. 22C, dispensing tip 246 is at a different position. As such, combination feeder 220 may supply a yarn or other strand for inlaying. An advantage to combination feeder 220 relates, therefore, to its versatility in supplying a yarn that may be utilized for knitting, tucking, floating, and inlaying.

(121)Further Knitting Process Considerations

(122)Additional aspects relating to the knitting process will now be discussed. Referring to FIG. 23, the upper course of knitted component 260 is formed from both of yarns 206 and 211. More particularly, a left side of the course is formed from yarn 211, whereas a right side of the course is formed from yarn 206. Additionally, yarn 206 is inlaid into the left side of the course. In order to form this configuration, standard feeder 204 may initially form the left side of the course from yarn 211. Combination feeder 220 then lays yarn 206 into the right side of the course while feeder arm 240 is in the extended position. Subsequently, feeder arm 240 moves from the extended position to the retracted position and forms the right side of the course. Accordingly, combination feeder may inlay a yarn into one portion of a course and then supply the yarn for purposes of knitting a remainder of the course.

(123)FIG. 24 depicts a configuration of knitting machine 200 that includes four combination feeders 220. As discussed above, combination feeder 220 has the ability to supply a yarn (e.g., yarn 206) for knitting, tucking, floating, and inlaying. Given this versatility, standard feeders 204 may be replaced by multiple combination feeders 220 in knitting machine 200 or in various conventional knitting machines.

(124)FIG. 8B depicts a configuration of knitted component 130 where two yarns 138 and 139 are plated to form knit element 131, and inlaid strand 132 extends through knit element 131. The general knitting process discussed above may also be utilized to form this configuration. As depicted in FIG. 15, knitting machine 200 includes multiple standard feeders 204, and two of standard feeders 204 may be utilized to form knit element 131, with combination feeder 220 depositing inlaid strand 132. Accordingly, the knitting process discussed above in FIGS. 21A-21I may be modified by adding another standard feeder 204 to supply an additional yarn. In configurations where yarn 138 is a non-fusible yarn and yarn 139 is a fusible yarn, knitted component 130 may be heated following the knitting process to fuse knitted

component 130.

(125)The portion of knitted component 260 depicted in FIGS. 21A-21I has the configuration of a rib knit textile with regular and uninterrupted courses and wales. That is, the portion of knitted component 260 does not have, for example, any mesh areas similar to mesh knit zones 163-165 or mock mesh areas similar to mock mesh knit zones 166 and 167. In order to form mesh knit zones 163-165 in either of knitted components 150 and 260, a combination of a racked needle bed 201 and a transfer of stitch loops from front to back needle beds 201 and back to front needle beds 201 in different racked positions is utilized. In order to form mock mesh areas similar to mock mesh knit zones 166 and 167, a combination of a racked needle bed and a transfer of stitch loops from front to back needle beds 201 is utilized.

(126)Courses within a knitted component are generally parallel to each other. Given that a majority of inlaid strand 152 follows courses within knit element 151, it may be suggested that the various sections of inlaid strand 152 should be parallel to each other. Referring to FIG. 9, for example, some sections of inlaid strand 152 extend between edges 153 and 155 and other sections extend between edges 153 and 154. Various sections of inlaid strand 152 are, therefore, not parallel. The concept of forming darts may be utilized to impart this non-parallel configuration to inlaid strand 152. More particularly, courses of varying length may be formed to effectively insert wedge-shaped structures between sections of inlaid strand 152. The structure formed in knitted component 150, therefore, where various sections of inlaid strand 152 are not parallel, may be accomplished through the process of darting.(127)Although a majority of inlaid strands 152 follow courses within knit element 151, some sections of inlaid strand 152 follow wales. For example, sections of inlaid strand 152 that are adjacent to and parallel to inner edge 155 follow wales. This may be accomplished by first inserting a section of inlaid strand 152 along a portion of a course and to a point where inlaid strand 152 is intended to follow a wale. Inlaid strand 152 is then kicked back to move inlaid strand 152 out of the way, and the course is finished. As the subsequent course is being formed, inlay strand 152 is again kicked back to move inlaid strand 152 out of the way at the point where inlaid strand 152 is intended to follow the wale, and the course is finished. This process is repeated until inlaid strand 152 extends a desired distance along the wale. Similar concepts may be utilized for portions of inlaid strand 132 in knitted component 130.1700 operates to manufacture a knitted component will now be discussed in detail. Moreover, the following discussion will demonstrate the operation of one or more standard feeders 1720 and/or combination feeders 1722 during a knitting process. The knitting process discussed herein relates to the formation of various knitted components, which may be any knitted component, including knitted components that are similar to knitted components in the embodiments described above. For purposes of the discussion, only a relatively small section of a knitted component may be shown in the figures in order to permit the knit structure to be illustrated. Moreover, the scale or proportions of the various elements of knitting machine 1700 and a knitted component may be enhanced to better illustrate the knitting process. It should be understood that although a knitted component is formed between needle beds 1701, 1702, for purposes of illustration in FIGS. 18 through 29, a knitted component is shown adjacent to needle beds 1701, 1702 to (a) be more visible during discussion of the knitting process and (b)

show the position of portions of the knitted component relative to each other and needle beds 1701, 1702. Also, although one rail, and limited numbers of standard feeders and combination feeders are depicted, additional rails, standard feeders, and combination feeders may be used. Accordingly, the general structure of knitting machine 1700 is simplified for purposes of explaining the knitting process.

(101) FIGS. 18 through 21 illustrate an exemplary process of knitting a knitted component in the form of first knitted component 500, described above. Referring to FIG. 18, a portion of knitting machine 1700 that includes needles 1703 associated with front needle bed 1701, needles 1704 associated with back needle bed 1702, and forward rail 1710 is shown. Additionally, in this embodiment, knitting machine 1700 may include a first standard feeder 1800 and a second standard feeder 1802 that are substantially similar to standard feeder 1720, described above. First standard feeder 1800 may be secured to a front side of front rail 1710 and second standard feeder 1802 may be secured to a rear side of front rail 1710. In other embodiments, additional feeders may be used and may be located on the front or rear side of front rail 1710 and/or rear rail 1711.

(102) In this embodiment, a first yarn 1801 from a spool (not shown) passes through first standard feeder 1800 and an end of yarn 1801 extends outward from a dispensing tip at the end of first standard feeder 1800. Although yarn 1801 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through first standard feeder 1800. A second yarn 1803 similarly passes through second standard feeder 1802 and extends outward from a dispensing tip. In an exemplary embodiment, first yarn 1801 and second yarn 1803 may be used to form portions of first knitted component 500. In this embodiment, loops of first yarn 1801 are shown forming an uppermost course of medial heel edge 507 of first knitted component 500 and are held by hooks located on ends of needles 1703 and needles 1704. Similarly, loops of second yarn 1803 may be used to form lateral heel edge 506 of first knitted component 500.

(103) Next, as shown in FIG. 19, knitting machine 1700 may use a similar process to add additional courses to the material forming first knitted component 500 to form further portions, including lateral perimeter edge 504, medial perimeter edge 505, lateral inner edge 508, medial inner edge 509, and front inner edge 510 of integral knit tongue 512. In this embodiment, first standard feeder 1800 and second standard feeder 1802 may form integral knit tongue 512 according to the loop diagram illustrated in FIG. 16, above. FIG. 20 illustrates knitting machine 1700 completing the courses associated with knitting integral knit tongue 512, lateral raised element 514, medial raised element 515, and a portion of the rest of first knitted component 500 forming upper 502. FIG. 21 illustrates knitting machine 1700 nearly completing the knitting process of forming first knitted component 500. By adding additional courses using a similar process, first knitted component 500 may be completed.

(104) FIGS. 22 through 25 illustrate an exemplary process of knitting a knitted component in the form of third knitted component 1000, described above. Referring to FIG. 22, a portion of knitting machine 1700 that includes needles 1703 associated with front needle bed 1701, needles 1704 associated with back needle bed 1702, and forward rail 1710 is shown. Additionally, in this embodiment, knitting machine 1700 may include a first standard feeder 2200 and a second standard feeder 2204 that are substantially similar to standard feeder 1720, described above and a combination feeder 2202 that is substantially similar to combination feeder 1722, described above. First standard feeder 1800 and combination feeder 2202 may be secured to a front side of front rail 1710 and second standard feeder 2204 may be secured to a rear side of front rail 1710. In other embodiments, additional feeders may be used and may be located on the front or rear side of front rail 1710 and/or rear rail 1711.

(105) In this embodiment, a first yarn 2201 from a spool (not shown) passes through first standard feeder 2200 and an end of yarn 2201 extends outward from a dispensing tip at the end of first standard feeder 2200. Although yarn 2201 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through first standard feeder 2200. A second yarn 2205 similarly passes through second standard feeder 2204 and extends outward from a dispensing tip. A third yarn 2203 passes through combination feeder 2202 to a dispensing tip. In an exemplary embodiment, third yarn 2203 may be a different type of yarn than first yarn 2201

and/or second yarn 2205. In this embodiment, third yarn 2203 may be a tensile element or other inlaid strand. In an exemplary embodiment, first yarn 2201 and second yarn 2205 may be used to form portions of a knit element of third knitted component 1000, whereas third yarn 2203 may be inlaid within the knit element as a tensile element of third knitted component 1000. In other embodiments, however, third yarn 2203 may be used to form portions of a knit element of third knitted component 1000.

(106) ~~(128)A variety of procedures may be utilized to reduce relative movement between (a) knit element 131 and inlaid strand 132 or (b) knit element 151 and inlaid strand 152. That is, various procedures may be utilized to prevent inlaid strands 132 and 152 from slipping, moving through, pulling out, or otherwise becoming displaced from knit elements 131 and 151. For example, fusing one or more yarns that are formed from thermoplastic polymer materials to inlaid strands 132 and 152 may prevent movement between inlaid strands 132 and 152 and knit elements 131 and 151. Additionally, inlaid strands 132 and 152 may be fixed to knit elements 131 and 151 when periodically fed to knitting needles as a tuck element. That is, inlaid strands 132 and 152 may be formed into tuck stitches at points along their lengths (e.g., once per centimeter) in order to secure inlaid strands 132 and 152 to knit elements 131 and 151 and prevent movement of inlaid strands 132 and 152.~~In this embodiment, loops of first yarn 2201 and loops of second yarn 2205 are shown forming free portion 1014 of integral knit tongue 1010 of third knitted component 1000 and are held by hooks located on ends of needles 1703 and needles 1704. Additionally, FIG. 23 illustrates knitting machine 1700 completing the courses forming free portion 1014. In some embodiments, at least the final course of free portion 1014 may include cross-tuck stitches with a relatively tight or dense knit to ensure that free portion 1014 of integral knit tongue 1010 remains properly positioned on needles 1701, 1702 during later stages of the knitting process to be joined with the remaining portion of integral knit tongue 1010.

(107) Knitting machine 1700 now begins the process of forming the remaining portion of the knit element forming third knitted component 1000, in accordance with a similar knitting process discussed above. In an exemplary embodiment, loops of first yarn 2201 may then begin to form an uppermost course of medial heel edge 1007 of third knitted component 1000 and loops of second yarn 2205 may be used to form lateral heel edge 1006 of third knitted component 1000.

(108) Referring now to FIG. 24, as the knitting process continues, first standard feeder 2200 and second standard feeder 2204 may continue adding courses to third knitting component 1000, including lateral perimeter edge 1004, medial perimeter edge 1005, lateral inner edge 1008, medial inner edge 1009, and partially integral portion 1012 of integral knit tongue 1010. In this embodiment, first standard feeder 2200 and second standard feeder 2204 may form partially integral portion 1012 of integral knit tongue 1010 according to the loop diagram illustrated in FIG. 16, above. Additionally, in this embodiment, combination feeder 2202 inlays third yarn 2203 to form tensile element 1040, as depicted in FIG. 24, also in accordance with the knitting process discussed in the Inlaid Strand cases.

(109) (129)Following the knitting process described above, various operations may be performed to enhance the properties of either of knitted components 130 and 150. For example, a water-repellant coating or other water-resisting treatment may be applied to limit the ability of the knit structures to absorb and retain water. As another example, knitted components 130 and 150 may be steamed to improve loft and induce fusing of the yarns. As discussed above with respect to FIG. 8B, yarn 138 may be a non-fusible yarn and yarn 139 may be a fusible yarn. When steamed, yarn 139 may melt or otherwise soften so as to transition from a solid state to a softened or liquid state, and then transition from the softened or liquid state to the solid state when sufficiently cooled. As such, yarn 139 may be utilized to join (a) one portion of yarn 138 to another portion of yarn 138, (b) yarn 138 and inlaid strand 132 to each other, or (c) another element (e.g., logos, trademarks, and placards with care instructions and material information) to knitted component 130, for example. Accordingly, a steaming process may be utilized to induce fusing of yarns in knitted components 130 and 150.(130)Although procedures associated with the steaming process may vary greatly, one method involves pinning one of knitted components 130 and 150 to a jig during steaming. An advantage of pinning one of knitted components 130 and 150 to a jig is that the resulting dimensions of specific areas of knitted components 130 and 150 may be controlled. For example, pins on the jig may be located to hold areas corresponding to perimeter edge 133 of knitted component 130. By retaining specific dimensions for perimeter edge 133, perimeter edge 133 will have the correct length for a portion of the lasting process that joins upper 120 to sole structure 110. Accordingly, pinning areas of knitted components 130 and 150 may be utilized to control the resulting dimensions of knitted components 130 and 150 following the steaming process.(131)The knitting process described above for forming knitted component 260 may be applied to the manufacture of knitted components 130 and 150 for footwear 100. The knitting process may also be applied to the manufacture of a variety of other knitted components. That is, knitting processes utilizing one or more combination feeders or other reciprocating feeders may be utilized to form a variety of knitted components. As such, knitted components formed through the knitting process described above, or a similar process, may also be utilized in other types of apparel (e.g., shirts, pants, socks, jackets, undergarments), athletic equipment (e.g., golf bags, baseball and football gloves, soccer ball restriction structures), containers (e.g., backpacks, bags), and upholstery for furniture (e.g., chairs, couches, car seats). The knitted components may also be utilized in bed coverings (e.g., sheets, blankets), table coverings, towels, flags, tents, sails, and parachutes. The knitted components may be utilized as technical textiles for industrial purposes, including structures for automotive and aerospace applications, filter materials, medical textiles (e.g. bandages, swabs, implants), geotextiles for reinforcing embankments, agrotextiles for crop protection, and industrial apparel that protects or insulates against heat and radiation. Accordingly, knitted components formed through the knitting process described above, or a similar process, may be incorporated into a variety of products for both personal and industrial purposes.(132)Knitted Components With TonguesIn an exemplary embodiment, during the knitting process depicted between FIG. 23 and FIG. 24, free portion 1014 of integral knit tongue 1010 may remain stationary relative to needle beds 1701, 1702, as the portions of third knitted component 1000 move

downward and may overlap free portion 1014 as successive courses are formed in third knitted component 1000. This continues until a course is formed that is intended to join free portion 1014 to the partially integral portion 1012 of integral knit tongue 1010 formed with the rest of third knitted component 1000. FIG. 25 illustrates knitting machine 1700 nearly completing the knitting process of forming third knitted component 1000. By adding additional courses using a similar process, third knitted component 1000 may be completed.

(110) Additionally, in the knitting process depicted in FIGS. 22 through 25, the relative position of the various feeders on first rail 1710 may restrict the portions of third knitted component 1000 that may be formed by each respective feeder. For example, because of the placement of combination feeder 2202, first standard feeder 2200 may be permitted to form both a front and back portion (associated with first surface 1030 and second surface 1032, respectively) of third knitted component 1000 along a medial side and across partially integral portion 1012 of integral knit tongue 1010, but be restricted from forming a portion of third knitted component 1000 along a lateral side. Similarly, second standard feeder 2204 may be permitted to form both the front and back portion of third knitted component 1000 along the lateral side and across partially integral portion 1012 of integral knit tongue 1010, but be restricted from forming a portion of third knitted component 1000 along the medial side. With this arrangement, the knitting process depicted in FIGS. 22-25 may require that specific feeders are used to form specific portions of third knitted component 1000.

~~(133)In footwear 100, tongue 124 is separate from knitted component 130 and joined to knitted component 130, possibly with stitching, an adhesive, or thermal bonding. Moreover, tongue 124 is discussed as being added to knitted component 130 following the knitting process. As depicted in FIGS. 25 and 26, however, knitted component 130 includes a knitted tongue 170 that is formed of unitary knit construction with knit element 131. That is, knit element 131 and tongue 170 are formed as a one-piece element through a knitting process, which will be discussed in greater detail below. Although tongue 124 or another tongue may be joined to knit element 131 after knitted component 130 is formed, tongue 170 or another knitted tongue may be formed during the knitting process and of unitary knit construction with a portion of knitted component 130.~~

~~(134)Tongue 170 is located within a throat area (i.e., where lace 122 and lace apertures 123 are located) of knitted component 130 and extends along the throat area. When incorporated into footwear 100, for example, tongue 170 extends from a forward portion of the throat area to ankle opening 121. As with knit element 131, tongue 170 is depicted as being formed from a relatively untextured textile and a common or single knit structure. Tongue 170 is also depicted in FIG. 27 as having a generally planar configuration. Examples of knit structures that may impart this configuration for tongue 170, as well as knit element 131, are any of the various knit structures in knit zones 160-162 discussed above. In further configurations, however, apertures may be formed in areas of tongue 170 by utilizing the knit structures of mesh knit zones 163-165, indentations may be formed in areas of tongue 170 by utilizing the knit structures of mock mesh knit zones 166 or 167, or a combination of apertures~~

~~and indentations may be formed in areas of tongue 170 by utilizing the knit structure of hybrid knit zone 168.~~

(111) FIGS. 26 through 29 illustrate an exemplary process of knitting a knitted component similar to fourth knitted component 1300, described above. Referring to FIG. 26, a portion of knitting machine 1700 that includes needles 1703 associated with front needle bed 1701, needles 1704 associated with back needle bed 1702, and forward rail 1710 is shown. Additionally, in this embodiment, knitting machine 1700 may include a first standard feeder 2600, a second standard feeder 2602, and a third standard feeder 2604 that are substantially similar to standard feeder 1720, described above. In addition, in embodiments where fourth knitted component 1300 includes tensile elements, a combination feeder (not shown) that is substantially similar to combination feeder 1722, described above, may be included to form tensile element 1340 according to the process described above with regard to the knitting process of third knitted component 1000 and as described in the Inlaid Strand cases. For the purposes of ease of illustration, therefore, fourth knitted component 1300 will be illustrated in FIGS. 26 through 29 without tensile element 1340.

(112) Referring again to FIG. 26, first standard feeder 2600 and second standard feeder 2602 may be secured to a front side of front rail 1710 and third standard feeder 2604 may be secured to a rear side of front rail 1710. In other embodiments, additional feeders may be used and may be located on the front or rear side of front rail 1710 and/or rear rail 1711.

(113) In this embodiment, a first yarn 2601 from a spool (not shown) passes through first standard feeder 2600 and an end of yarn 2601 extends outward from a dispensing tip at the end of first standard feeder 2600. Although yarn 2601 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through first standard feeder 2600. A second yarn 2603 similarly passes through second standard feeder 2602 and extends outward from a dispensing tip. A third yarn 2605 also passes through third standard feeder 2604 to a dispensing tip in a similar manner. In an exemplary embodiment, second yarn 2603 may be a different type of yarn than first yarn 2601 and/or third yarn 2605. In this embodiment, second yarn 2603 may be an elastic yarn that has a larger amount or degree of elasticity than first yarn 2601 and/or third yarn 2605, which may be a substantially inelastic yarn or a yarn with a small amount or degree of elasticity. In an exemplary embodiment, first yarn 2601 and third yarn 2605 may be used to form lateral and medial portions of a knit element forming fourth knitted component 1300, whereas second yarn 2603 may be used to form the elastic portion of integral knit tongue 1310 that is centrally-located within throat area 1320 of fourth knitted component 1300. In other embodiments, however, second yarn 2603 may be further used to form other portions of the knit element of fourth knitted component 1300.

(114) Referring now to FIG. 27, loops of first yarn 2601 are shown forming an uppermost course of medial heel edge 1307 of fourth knitted component 1300 and loops of third yarn 2605 may be used to form lateral heel edge 1306 of fourth knitted component 1300. Second yarn 2603 may not yet be used to form any portion of fourth knitted component 1300. Next, as shown in FIG. 28, knitting machine 1700 may use a

similar process to add additional courses to the material forming fourth knitted component 1300 to form further portions, including lateral perimeter edge 1304, medial perimeter edge 1305, lateral inner edge 1308, and medial inner edge 1309. In addition, at this point, second standard feeder 2602 may have begun to use second yarn 2603 to form portions of fourth knitted component 1300, including integral knit tongue 1312, which extends from needles 1701, 1702 to the completed top end 1314.

(115) In this embodiment, second standard feeder 2602 may form integral knit tongue 1310 using an elastic yarn so as to permit throat area 1320 of fourth knitted component 1300 to stretch. In addition, fourth knitted component 1300 may be formed with one or more decoupled knit layers, as described above. FIG. 29 illustrates knitting machine 1700 completing the courses associated with knitting integral knit tongue 1310 and the rest of fourth knitted component 1300 forming upper 1302. By adding additional courses using a similar process, fourth knitted component 1300 may be completed.

(116) Additionally, areas of tongue 170 may have a padded aspect when formed to have layers and floating yarns, for example, that are similar to padded zone 169. Accordingly, the untextured and planar aspect of tongue 170 is shown for purposes of example, and various features may be imparted through the use of different knit structures.(135)Referring to FIGS. 28 and 29, a knitted tongue 175 is depicted as being formed of unitary knit construction with knit element 151 of knitted component 150. Tongue 175 has the same general shape as tongue 170, but may have a padded aspect with greater thickness. More particularly, tongue 175 is depicted in FIG. 30 as including two overlapping and at least partially coextensive knitted layers 176, which may be formed of unitary knit construction, and a plurality of yarn loops 177 located between layers 176. Although the sides or edges of layers 176 are secured or knit to each other, a central area is generally unsecured. As such, layers 176 effectively form a tube or tubular structure, and yarn loops 177 are located between and extend outward from one of layers 176. In effect, yarn loops 177 fill an interior volume between layers 176 and impart a compressible or padded aspect to tongue 175. It should also be noted that each of layers 176 and yarn loops 177 may be formed of unitary knit construction during the knitting process that forms knitted component 150.

(136)Another knitted component 180 is depicted in FIG. 31 as including a knit element 181, an inlaid strand 182, and a knitted tongue 183. With the exception of the presence of tongue 183, knitted component 180 has a general structure of a knitted component disclosed in U.S. Patent Application Publication 2010/0154256 to Dua, which is incorporated herein by reference. Tongue 183 is formed of unitary knit construction with knit element 181 and includes various knit structures. Referring to FIG. 32, for example, peripheral areas of tongue 183 exhibit an untextured configuration that may have any of the various knit structures in knit zones 160-162. At least two areas of tongue 183 incorporate apertures and may have any of the various knit structures in mesh knit zones 163-165. Referring to FIG. 33, a central area of tongue 183 has a compressible or padded aspect that includes two overlapping and at least partially coextensive knitted layers 184, which may be formed of unitary knit construction, and a plurality of floating yarns 185 extending between layers 184. The central area of tongue 183 may exhibit, therefore, the knit structure of padded zone 169. Although the

sides or edges of layers 184 are secured to each other, a central area is generally unsecured. As such, layers 184 effectively form a tube or tubular structure, and floating yarns 185 may be located or inlaid between layers 184 to pass through the tubular structure. That is, floating yarns 185 extend between layers 184, are generally parallel to surfaces of layers 184, and also pass through and fill an interior volume between layers 184. Whereas a majority of tongue 183 is formed from yarns that are mechanically-manipulated to form intermeshed loops, floating yarns 185 are generally free or otherwise inlaid within the interior volume between layers 184. As an additional matter, layers 184 may be at least partially formed from a stretch yarn to impart the advantages discussed above for knitted layers 140 and floating yarns 141.

(137)Tongue 183 provides an example of the manner in which various knit structures may be utilized. As discussed above, the peripheral areas of tongue 183 exhibit an untextured configuration, two areas of tongue 183 incorporate apertures, and the central area of tongue 183 includes knitted layers 184 and floating yarns 185 to provide a compressible or padded aspect. Mock mesh knit structures and hybrid knit structures may also be utilized. Accordingly, various knit structures may be incorporated into tongue 183 or any other knitted tongue (e.g., tongues 170 and 175) to impart different properties or aesthetics.

(138)Tongue 170 is secured to a forward portion of the throat area of knit element 131. That is, tongue 170 is joined through knitting to knit element 131 in a portion of the throat area that is closest to forefoot region 101 in footwear 100. Each of tongues 175 and 183 are respectively secured or knit to a similar position in knitted components 150 and 180. Referring to FIGS. 34 and 35, however, a knitted tongue 190 is secured along a length of the throat area of a configuration of knitted component 131 that does not include inlaid strand 132 or lace apertures 123. More particularly, edges of tongue 190 are knit to an area of knit element 131 that is spaced outward from inner edge 135. Accordingly, any of the configurations of tongues 170, 175, 183, and 190 may be secured (e.g., through unitary knit construction) to various locations in the throat areas of knitted components 130, 150, and 180.

(139)Advantages of constructing tongue 170 during the knitting process and of unitary knit construction are more efficient manufacture and common properties. More particularly, manufacturing efficiency may be increased by forming more of knitted component 130 during the knitting process and eliminating various steps (e.g., making a separate tongue, securing the tongue) that are often performed manually. Tongue 170 and knit element 131 may also have common properties when formed from the same yarn (or type of yarn) or with similar knit structures. For example, utilizing the same yarn in both of tongue 170 and knit element 131 imparts similar durability, strength, stretch, wear resistance, biodegradability, thermal, and hydrophobic properties. In addition to physical properties, utilizing the same yarn in both of tongue 170 and knit element 131 may impart common aesthetic or tactile properties, such as color, sheen, and texture. Utilizing the same knit structures in both of tongue 170 and knit element 131 may also impart common physical properties and aesthetic properties. These advantages may also be present when at least a portion of knit element 131 and at least a portion of tongue 170 are formed from a common yarn (or type of yarn) or with common knit structures.

(140)Tongue 175 includes yarn loops 177 between layers 176, and tongue 183 includes floating yarns 185 between layers 184. A benefit of yarn loops 177 and floating yarns 185 is that compressible or padded areas are formed. In addition to yarn loops 177 and floating yarns 185, other types of free yarn sections may be utilized. For purposes of the present application, "free yarn sections" or variants thereof is defined as segments or portions of yarns that are not directly forming intermeshed loops (e.g., that define courses and wales) of a knit structure, such as floating yarns, inlaid yarns, terry loops, ends of yarns, and cut segments of yarn, for example. Moreover, it should be noted that free yarn sections may be one portion of an individual yarn, with other portions of the yarn forming intermeshed loops of the knit structure, For example, the portion of a yarn forming terry loops (e.g., the free yarn sections) may be between portions of the yarn forming intermeshed loops of a knit structure. As an alternative to free yarn sections, foam materials or other types of compressible materials may be utilized within either of tongues 175 and 183.(141)As a final matter, although tongue 170 is disclosed in combination with knitted component 130, tongue 170 may also be utilized with knitted components 150 and 180, as well as other knitted components. Similarly, tongues 175, 183, and 190 may be utilized with any of knitted components 130, 150, and 180, as well as other knitted components. The combinations disclosed herein are, therefore, for purposes of example and other combinations may also be utilized. Moreover, the specific configurations of tongues 170, 175, 183, and 190 are also meant to provide examples and may also vary significantly. For example, the position of layers 184 and floating yarns 185 may be enlarged, moved to a periphery of tongue 183, or removed from tongue 183. Accordingly, the various combinations and configurations are intended to provide examples, and other combinations and configurations may also be utilized. **in the knitting process depicted in FIGS. 26 through 29, the relative position of the various feeders on first rail 1710 may restrict the portions of fourth knitted component 1300 that may be formed by each respective feeder. For example, because the placement of second standard feeder 2602 is needed to form integral knit tongue 1310 with an elastic second yarn 2603, first standard feeder 2600 may be permitted to form both a front and back portion (associated with first surface 1330 and second surface 1332, respectively) of fourth knitted component 1300 along only a medial side of fourth knitted component 1300. Similarly, third standard feeder 2604 may be permitted to form both the front and back portion of fourth knitted component 1300 along only a lateral side of fourth knitted component 1300. Accordingly, second standard feeder 2602 may be used to form integral knit tongue 1310 spanning between the lateral side and the medial side of fourth knitted component 1300. With this arrangement, the knitting process depicted in FIGS. 26-29 may require that specific feeders are used to form specific portions of fourth knitted component 1300.**

(117) The processes and methods for knitting a knitted component described above and illustrated in FIGS. 16 through 29 are exemplary and are not meant to be exhaustive. Therefore, it should be understood that additional knitted components including the features of the embodiments described herein, as well as similar knitted components not explicitly described herein, may be made using one or more knitting processes that are substantially similar to the knitting methods for knitted

components described above and/or in the Inlaid Strands cases.

(142)Tongue Knitting Process

(143)The manner in which knitting machine 200 operates to manufacture a knitted component with a tongue will now be discussed in detail. Moreover, the following discussion will demonstrate the manner in which knit element 131 and tongue 170 are formed of unitary knit construction, but similar processes may be utilized for other knitted components and tongues. Referring to FIGS. 36A-36G, a portion of knitting machine 200 is schematically depicted as including needle beds 201, one rail 203, one standard feeder 204, and one combination feeder 220. It should be understood that although knitted component 130 is formed between needle beds 201, knitted component 130 is shown adjacent to needle beds 201 to (a) be more visible during discussion of the knitting process and (b) show the position of portions of knitted component 130 relative to each other and needle beds 201. Also, although one rail 203, one standard feeder 204, and one combination feeder 220 are depicted, additional rails 203, standard feeders 204, and combination feeders 220 may be utilized. Accordingly, the general structure of knitting machine 200 is simplified for purposes of explaining the knitting process.

(144)Initially, a portion of tongue 170 is formed by knitting machine 200, as depicted in FIG. 36A. In forming this portion of tongue 170, standard feeder 204 repeatedly moves along rail 203 and various courses are formed from at least yarn 211. More particularly, needles 202 pull sections of yarn 211 through loops of a prior course, thereby forming another course. This action continues until tongue 170 is substantially formed, as depicted in FIG. 36B. It should be noted at this stage that although tongue 170 is depicted as being formed from one yarn 211, additional yarns may be incorporated into tongue 170 from further standard feeders 204. For example, a fusible yarn may be incorporated into at least the upper or final course of tongue 170 to assist with ensuring that tongue 170 is properly joined or knitted with knit element 131. Additionally, at least the final course of tongue 170 may include cross-tuck stitches with a relatively tight or dense knit to ensure that tongue 170 remains properly positioned on needles 202 during later stages of the knitting process.

(145)Knitting machine 200 now begins the process of forming knit element 131, as depicted in FIG. 36C, in accordance with the knitting process discussed previously. As the knitting process continues, combination feeder 220 inlays yarn 206 to form inlaid strand 132, as depicted in FIG. 36D, also in accordance with the knitting process discussed previously. Through a comparison of FIGS. 36C and 36D, tongue 170 remains stationary relative to needle beds 201, but knit element 131 moves downward and may overlap tongue 170 as successive courses are formed in knit element 131. This continues until a course is formed that is intended to join tongue 170 to knit element 131. More particularly, tongue 170 remains stationary relative to needle beds 201 as portions of knitted component 131 are formed. At the point depicted in FIG. 36E, however, a course is formed that (a) extends across the final course of tongue 170, which includes the cross- tuck stitches, and (b) joins with the final course of tongue 170. In effect, this course joins tongue 170 to knit element 131. At this stage, therefore, knit element 131 and tongue 170 are effectively formed of unitary knit

construction.

(146)Once tongue 170 is joined to knit element 131, knitting machine 200 continues the process of forming courses, thereby forming more of knit element 131, as depicted in FIG. 36F. Given that tongue 170 is now joined to knit element 131, tongue 170 moves downward with knit element 131 as successive courses are formed, as seen through a comparison of FIGS. 36E and 36F. Moving forward, knitting machine 200 continues the process of forming courses in knit element 131 until knitted component 130 is substantially formed, as depicted in FIG. 36G.

(147)Now that the general process associated with forming knitted component 130 to include tongue 170 is presented, additional aspects of the knitting process will be discussed. As noted above, a fusible yarn may be incorporated into at least the final course of tongue 170 to assist with ensuring that tongue 170 is properly joined or knitted with knit element 131. In some knitting processes, the yarn forming the final course of tongue 170 is cut. By incorporating the fusible yarn into the final course of tongue 170, the knit structure at the interface of tongue 170 with knit element 131 may be strengthened. That is, melting of the fusible yarn will fuse or otherwise join the sections of yarn at the interface and prevent unraveling of the cut yarn.

(148)Also as noted above, at least the final course of tongue 170 may include cross-tuck stitches with a relatively tight or dense knit to ensure that tongue 170 remains properly positioned on needles 202 during later stages of the knitting process. During a majority of the knitting process that forms knit element 131, tongue 170 remains stationary relative to needle beds 201. Movement, vibration, or other actions of knitting machine 200 may, however, dislodge portions of the final course from needles 202, thereby forming dropped stitches. By forming cross-tuck stitches with a relatively tight or dense knit, fewer dropped stitches are formed. Moreover, if dropped stitches are formed, the fusible yarn within the final course will fuse or otherwise join the dropped stitches within the knit structure.

(118) (149)Once tongue 170 is knit, various needles 202 hold tongue 170 in position while knit element 131 is formed. In effect, the needles 202 that hold tongue 170 are unavailable for further knitting until tongue 170 is joined with knit element 131. As a result, only those needles 202 located beyond the edges (i.e., to the right and to the left) of tongue 170 are available for forming knit element 131. The final course of tongue 170 should, therefore, have equal or less width than the distance between opposite sides of inner edge 135 in the area where tongue 170 is joined with knit element 131. In other words, the design of knitted component 130 should account for (a) the length of the final course of tongue 170 and (b) the number of needles 202 that are reserved for holding tongue 170 while knit element 131 is formed.

(150)In the knitting process discussed above, both tongue 170 and knit element 131 are formed from yarn 211. Whereas tongue 170 remains stationary relative to needle beds 201 through a portion of the knitting process, portions of knit element 131 move downward as successive courses are formed. Given that a segment of yarn 211 may extend from the final course of tongue 170 to the first course of knit element 131 (i.e., the bottom edges of knit element 131), this segment of yarn should have sufficient length to account for the downward movement of the first course of knit element 131.

In effect, a comparison of FIGS. 36C-36E, demonstrates that the first course of knit element 131 moves downward and away from the final course of tongue 170 as knit element 131 is formed. Accordingly, if a segment of yarn 211 extends from the final course of tongue 170 to the first course of knit element 131, this segment of yarn should have sufficient length to account for the growing distance between the final course of tongue 170 and the first course of knit element 131.

(151)Although various methods may be employed to account for the growing distance between the final course of tongue 170 and the first course of knit element 131, FIG. 37 depicts an expansion section 195 as being formed following the formation of tongue 170. Expansion section 195 may then be cast off of needles 202. As the distance between the final course of tongue 170 and the first course of knit element 131 increases, expansion section 195 may unravel and lengthen. That is, unraveling of expansion section 195 may be used to effectively lengthen the section of yarn 211 between the final course of tongue 170 and the first course of knit element 131. In some configurations, expansion section 195 may be formed as a jersey fabric to facilitate unraveling.

(152)The various FIGS. 36A-36G show knitted component 130 as being formed independently. In some knitting processes, however, a waste element is knit prior to forming knitted component 130. The waste element engages various rollers that provide a downward force upon knitted component 130. The downward force ensures that courses move away from needles 202 as later courses are formed.

(153)Based upon the above discussion, knit element 131 and tongue 170 may be formed of unitary knit construction through a single knitting process. As described, tongue 170 is formed first and remains stationary upon needle beds 201 as knit element 131 is formed. After a course is formed that joins knit element 131 and tongue 170, knit element 131 and tongue 170 move downward together as further portions of knit element 131 are formed.

(154)Sequential Alterations(155)Knitting machine 200 includes, among other elements, a knitting mechanism 270, a pattern 280, and a computing device 290, as schematically depicted in FIG. 38. Knitting mechanism 270 includes many of the mechanical components of knitting machine 200 (e.g., needles 202, feeders 204 and 220, carriage 205) that mechanically manipulate yarns 206 and 211 to form a knitted component (e.g., knitted component 130). Pattern 280 includes data on the knitted component, including the yarns that are utilized for each stitch, the type of knit structures formed by each stitch, and the specific needles 202 and feeders 204 and 220 that are used for each stitch, for example. The operation of knitting machine 200 is governed by computing device 290, which reads data from pattern 280 and directs the corresponding operation of knitting mechanism 270.

(156)Multiple and substantially identical knitted components may be formed by knitting machine 200. More particularly, computing device 290 may repeatedly read pattern 280 and direct knitting mechanism 270 to form substantially identical knitted components. In general, therefore, each knitted component that is formed will be substantially identical to other knitted components that are formed based upon a

particular pattern 280. Referring to FIGS. 39A-39C, however, three versions of tongue 170 are shown. Whereas FIG. 39A depicts tongue 170 as including a knit structure (e.g., yarns with different colors) with alphanumeric characters that form "1 OF 100," FIGS. 39B and 39C respectively depict tongue 170 as including knit structures with alphanumeric characters that form "2 OF 100" and "3 OF 100."

(157)One manner of accomplishing the sequential alterations of the type shown in FIGS. 39A-39C is to create multiple patterns. In effect, each of the configurations of tongue 170 shown in FIGS. 39A-39C may have a different pattern. As an alternative, an application (e.g., software) run by computing device 290 may alter pattern 280 while each successive tongue 170 is formed to provide sequential alterations. For example, pattern 280 may include a modifiable field 281, which is an area of pattern 280 that can be updated or changed by computing device 290. For purposes of reference, portions of pattern 280 that correspond with "1," "2," and "3" in FIGS. 39A-39C may be governed by modifiable field 281. Computing device 290 may include a counter, for example, that updates modifiable field 281 with each successive knitted component that is formed. Accordingly, sequential alterations of pattern 280 may be automated through the use of an application run by computing device 290, thereby rectifying the need for different patterns 280 for each sequential variation of tongue 170.

(158)In operation, pattern 280 with modifiable field 281 is provided by an operator, designer, or manufacturer, for example. Computing device 290 may either form a first knitted component with a default setting for modifiable field 281 or may update modifiable field 281 according to other instructions or data. As such, for example, tongue 170 of FIG. 39A may be knitted with "1 OF 100." Computing device 290 now updates modifiable field 281 with data representing another alphanumeric character, possibly a sequential alphanumeric character when computing device 290 includes a counter, and tongue 170 of FIG. 39B may be knitted with "2 OF 100." The procedure repeats and computing device 290 updates modifiable field 281 with data representing another alphanumeric character and tongue 170 of FIG. 39C may be knitted with "3 OF 100." Accordingly, modifiable field of pattern 280 may be repeatedly updated with data representing different alphanumeric characters, possibly sequential alphanumeric characters.(159)The invention is disclosed above and in the accompanying figures with reference to a variety of configurations. The purpose served by the disclosure, however, is to provide an example of the various features and concepts related to the invention, not to limit the scope of the invention. One skilled in the relevant art will recognize that numerous variations and modifications may be made to the configurations described above without departing from the scope of the present invention, as defined by the appended claims.While various embodiments of the invention have been described, the description is intended to be exemplary, rather than limiting and it will be apparent to those of ordinary skill in the art that many more embodiments and implementations are possible that are within the scope of the invention. Accordingly, the invention is not to be restricted except in light of the attached claims and their equivalents. Also, various modifications and changes may be made within the scope of the attached claims.

Claims

1. A method of manufacturing a knitted component for an article of footwear, the method comprising: knitting a ~~tongue~~**portion of the knitted component defining an upper** with a knitting machine~~; holding the tongue on needles of the knitting machine; knitting a first portion of a knit element with the knitting machine while the tongue is held on the needles; joining the tongue to the first portion of the knit element; and knitting a second portion of the knit element with the knitting machine~~**, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component; and knitting an integral knit tongue that is of unitary knit construction with the upper with the knitting machine, the integral knit tongue extending through a throat area of the knitted component; and wherein the integral knit tongue is joined by knitting with the knitting machine to: (1) a forward portion of the throat area, and (2) at least along a portion of both of a lateral side and a medial side of the throat area of the knitted component extending through a portion of a length of the throat area in a longitudinal direction from the forward portion to an ankle opening of the upper**.

2. The method recited in claim 1, further including a step of selecting the knitting machine to be a flat knitting machine.

3. The method recited in claim 1, ~~further including a step of knitting an expansion section following the step of knitting the tongue, and~~ wherein the step of knitting the ~~first portion of the knit element includes unraveling the expansion section.4.The method recited in claim 1, wherein the step of knitting the~~**integral knit** tongue includes forming a course of the **integral knit** tongue to include at least one ~~of (a) a fusible yarn and (b) cross-tuck stitches~~**common yarn with the upper**.

4. ~~5.~~The method recited in claim 1, wherein the step of joining the **integral knit** tongue **by knitting** includes forming a course with the knitting machine that joins the **integral knit** tongue to the ~~knit element~~**upper**.

5. ~~6.A method of manufacturing a knitted component for an article of footwear~~**The method recited in claim 1, wherein the integral knit tongue comprises a partially integral portion and a free portion**, the method **further** comprising: knitting ~~a tongue with a~~**the partially integral portion with the knitting machine of unitary knit construction with the upper at the forward portion of the throat area and at least along the portion of both of the lateral side and the medial side of the throat area of the knitted component extending through the portion of the length of the throat area in the longitudinal direction; and knitting the free portion with the knitting machines of unitary knit construction with the partially integral portion at a rearward portion of the integral knit tongue and remaining unattached to the remaining portions of the knitted component.**

6. The method recited in claim 5, wherein the step of knitting the free portion further comprises: knitting the free portion of the integral knit tongue with the knitting machine; holding the free portion on needles of the knitting machine; knitting a first portion of ~~a knit element~~**the upper** with the knitting machine~~, the tongue being~~ **while**

the free portion is held on the needles, the first portion of the upper including at least the rearward portion of the integral knit tongue; joining the free portion to the integral knit tongue at the rearward portion; and knitting a second portion of the upper with the knitting machine.

7. The method recited in claim 6, wherein the step of knitting the first portion further comprises holding the free portion stationary with respect to a needle bed of the knitting machine during knitting of the first portion of the ~~knit element~~upper, and the first portion of the ~~knit element~~upper moving with respect to the ~~tongue~~free portion during knitting of the first portion of the ~~knit element;~~upper; wherein the step of joining the free portion includes forming a course with the knitting machine that joins the ~~tongue~~free portion to the integral knit ~~element~~tongue; and wherein the step of knitting ~~a second portion of the knit element with the knitting machine, the tongue and the first portion of the knit element moving~~the second portion further comprises moving the free portion and the upper together during knitting of the second portion of the ~~knit element~~upper.

8. ~~7.The method recited in claim 6, further including a step of selecting the knitting machine to be a flat knitting machine.8.The method recited in claim 6, further including a step of knitting an expansion section following the step of knitting the tongue, and wherein the step of knitting the first portion of the knit element includes unraveling the expansion section.9.The method recited in claim 6, wherein the step of knitting the tongue includes forming a final course of the tongue to include at least one of (a) a fusible yarn and (b) cross-tuck stitches.~~A method of manufacturing a knitted component for an article of footwear, the method comprising: knitting a first portion of the knitted component defining an upper with a first feeder of a knitting machine, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component; knitting a second portion of the knitted component defining the upper with a second feeder of the knitting machine; and knitting an integral knit tongue that is of unitary knit construction with the upper with at least one of the first feeder and the second feeder of the knitting machine, the integral knit tongue extending through a throat area of the knitted component; and wherein the integral knit tongue is joined by knitting with the knitting machine to: (1) a forward portion of the throat area, and (2) at least along a portion of both of a lateral side and a medial side of the throat area of the knitted component extending through a portion of a length of the throat area in a longitudinal direction from the forward portion to an ankle opening of the upper.

9. The method recited in claim 8, wherein the step of knitting the first portion further comprises: knitting the exterior surface of the first portion of the upper with the first feeder; knitting the opposite interior surface of the first portion of the upper with the first feeder; and knitting at least a portion of the integral knit tongue with the first feeder.

10. The method recited in claim 9, wherein the step of knitting the second portion further comprises: knitting the exterior surface of the first portion of the upper with the second feeder; knitting the opposite interior surface of the second portion of the upper with the second feeder; and knitting at least a portion of the integral knit

tongue with the second feeder.

11. The method recited in claim 8, wherein the first portion of the upper is one of a medial side and a lateral side of the knitted component.

12. The method recited in claim 8, wherein the step of knitting the integral knit tongue includes forming a course of the integral knit tongue to include at least one common yarn with the upper.

13. The method recited in claim 12, further comprising forming at least one course of the first portion of the upper or the second portion of the upper with the knitting machine that is substantially continuous with at least one course of the integral knit tongue at the forward portion of the throat area of the upper.

14. The method recited in claim 12, further comprising: forming at least one course of the first portion of the upper that is substantially continuous with at least one course of the integral knit tongue along the lateral side of the throat area of the upper; and forming at least one course of the second portion of the upper that is substantially continuous with at least one course of the integral knit tongue along the medial side of the throat area of the upper.

15. The method recited in claim 8, wherein the integral knit tongue comprises a partially integral portion and a free portion, the method further comprising: knitting the free portion of the integral knit tongue with at least one feeder of the knitting machine; holding the free portion on needles of the knitting machine; knitting the first portion of the upper with the first feeder of the knitting machine and knitting the second portion of the upper with the second feeder while the free portion is held on the needles, the first portion of the upper and the second portion of the upper including at least a rearward portion of the integral knit tongue; joining the free portion to the integral knit tongue at the rearward portion; and resuming knitting the first portion of the upper with the first feeder of the knitting machine and resuming knitting the second portion of the upper with the second feeder of the knitting machine.

16. A method of manufacturing a knitted component for an article of footwear, the method comprising: knitting a first portion of the knitted component defining an upper with a first feeder of a knitting machine, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component; knitting a second portion of the knitted component defining the upper with a second feeder of the knitting machine; and knitting an integral knit tongue that is of unitary knit construction with the upper with a third feeder of the knitting machine, the integral knit tongue extending through a throat area of the knitted component; and wherein the integral knit tongue is joined by knitting with the knitting machine to: (1) a forward portion of the throat area, and (2) at least along a portion of both of a lateral side and a medial side of the throat area of the knitted component extending through a portion of a length of the throat area in a longitudinal direction from the forward portion to an ankle opening of the upper.

17. The method recited in claim 16, wherein the upper comprises a first type of yarn; and wherein the integral knit tongue comprises a second type of yarn, the second type

of yarn being different from the first type of yarn.

18. The method recited in claim 17, wherein the second type of yarn is an elastic yarn.

19. The method recited in claim 16, wherein the step of knitting the integral knit tongue includes forming a course of the integral knit tongue to include at least one common yarn with the upper.

20. The method recited in claim 19, further comprising forming at least one course of the first portion of the upper or the second portion of the upper with the knitting machine that is substantially continuous with at least one course of the integral knit tongue at the forward portion of the throat area of the upper.

21. **The method recited in claim 19, further comprising: forming at least one course of the first portion of the upper that is substantially continuous with at least one course of the integral knit tongue along the lateral side of the throat area of the upper; and forming at least one course of the second portion of the upper that is substantially continuous with at least one course of the integral knit tongue along the medial side of the throat area of the upper.**

22. **The method recited in claim 16, wherein the step of knitting the first portion further comprises: knitting the exterior surface of the first portion of the upper with the first feeder; and knitting the opposite interior surface of the first portion of the upper with the first feeder.**

23. **The method recited in claim 22, wherein the step of knitting the second portion further comprises: knitting the exterior surface of the first portion of the upper with the second feeder; knitting the opposite interior surface of the second portion of the upper with the second feeder.**

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Exhibit II

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United States Patent
8448474 9510636 Kind Code
Patent
2013 December 06, 2016 Inventor(s)
P. Dua; Bhupesh et al.

B1 2 Date of
May 28,
Tatler; Daren

Article of footwear incorporating a knitted component with a an integral knit tongue

Abstract

Articles of footwear may have are described that incorporate a knitted component that has an upper that includes a and an integral knit element and a tongue. The integral knit element defines a portion of an exterior surface and an opposite interior surface of the upper, with the interior surface defining a void for receiving a foot. The tongue is formed of unitary knit construction with the knit element upper and extends through a throat area of the upper knitted component. The integral knit tongue includes raised elements formed of unitary knit construction with the tongue. Methods of manufacturing a knitted component for an article of footwear may include knitting a tongue. The tongue is held on needles of a knitting machine. A first portion of a knit element is formed with the knitting machine while the tongue is held on the needles. The tongue is then joined to the first portion of the knit element. Additionally, a second portion of the knit element is formed with the the upper and the integral knit tongue during a knitting process on a knitting machine.

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Family ID: 48445228 50440803

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Appl. No.: 13/400511 781525

Filed: February 20, 2012 28, 2013

Prior Publication Data

Document Identifier	Publication Date
US 20130239438 A1	Sep. 19, 2013

Related U.S. Application Data

continuation parent-doc US 13400511 20120220 US 8448474 child-doc US 13474531

continuation-in-part parent-doc US 13474531 20120517 US 8621891 child-doc US 13781525

Publication Classification

Int. Cl.: ~~D04B7/04~~ D04B1/22 (20060101); A43B1/04 (20060101); A43B23/02 (20060101); A43B23/26 (20060101); D04B15/56 (20060101); D04B1/24 (20060101); D04B7/28 (20060101)

U.S. Cl.:

~~USPC 66/64; 66/177~~CPC A43B1/04 (20130101); A43B23/0205 (20130101); A43B23/0245 (20130101); A43B23/0265 (20130101); A43B23/26 (20130101); D04B1/22 (20130101); D04B1/24 (20130101); D04B7/28 (20130101); D04B15/56 (20130101); D10B2403/0113 (20130101); D10B2403/0243 (20130101); D10B2403/02411 (20130101); D10B2403/032 (20130101); D10B2501/043 (20130101)

Field of Classification Search

~~USPC: 36/10;45;3A; 66/60;64-73;177;169R;170;171~~CPC: D04B (1/126); D04B (1/22); D04B (1/24); D04B (7/24); D04B (15/56)

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Patent No.	Issued Date

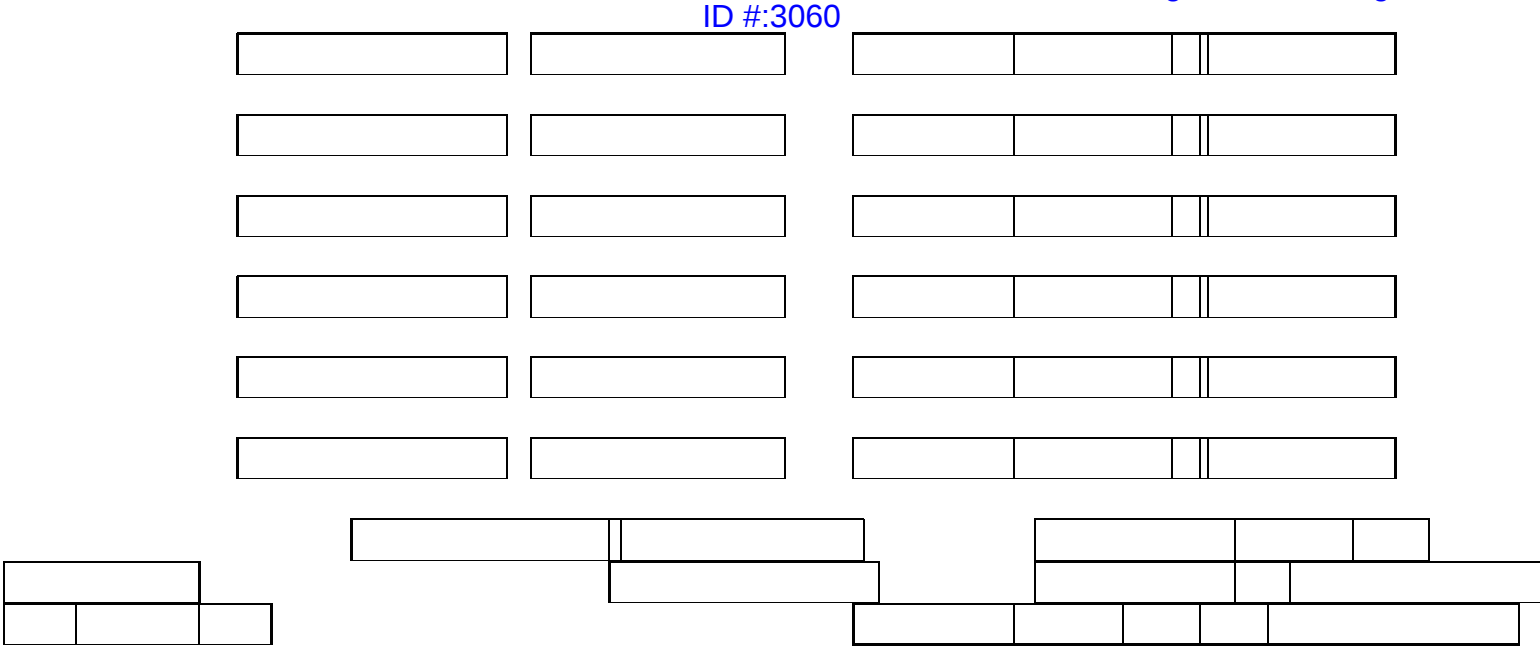
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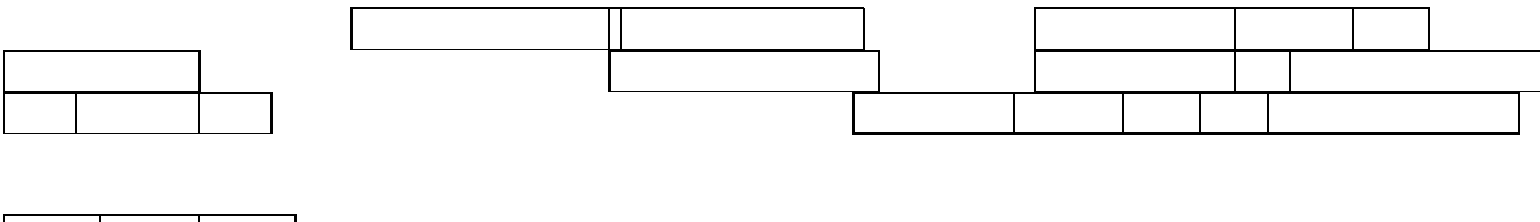
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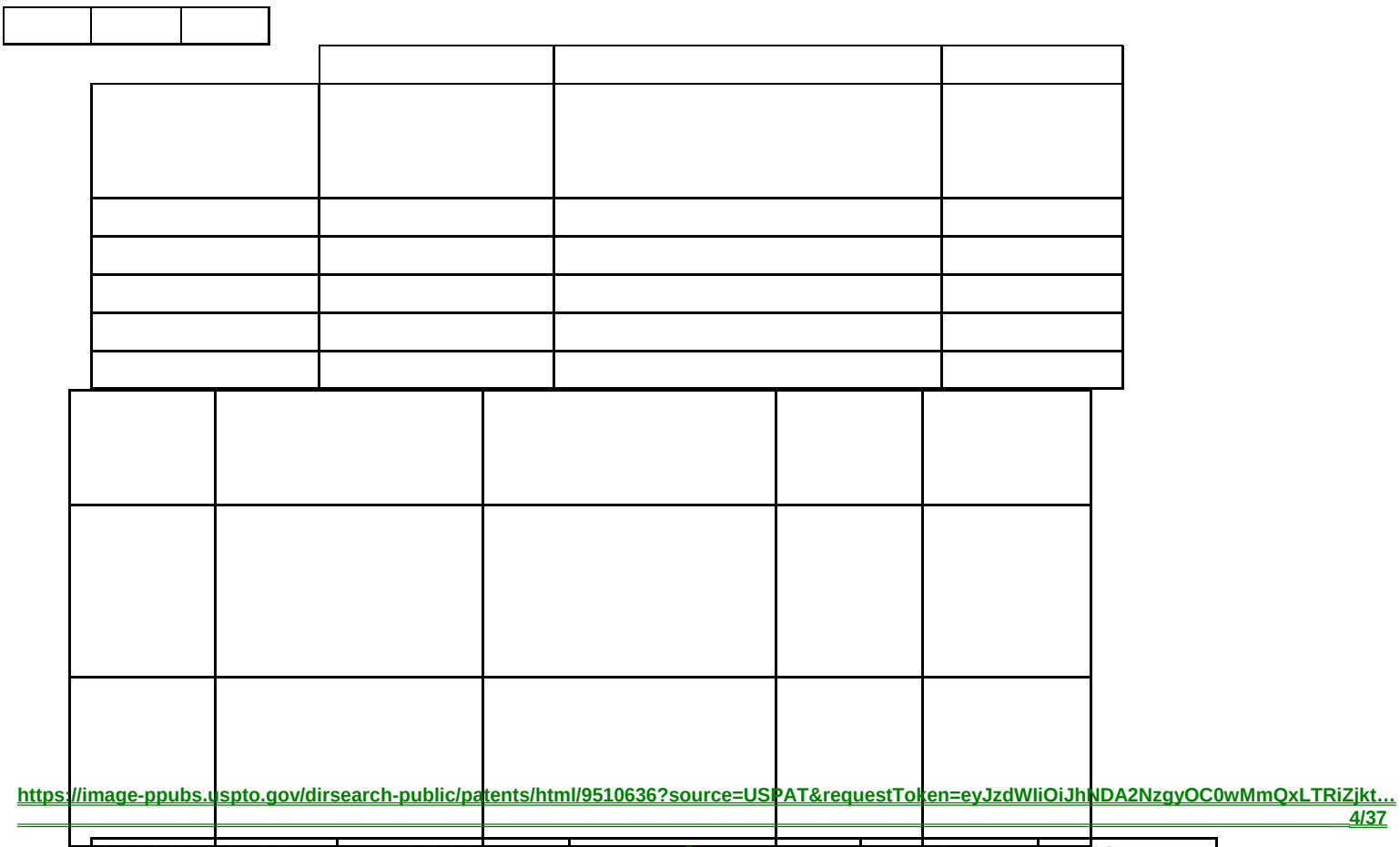
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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS (1) This application is a continuation-in-part of co-pending U.S. patent application Ser. No. 13/474,531, entitled “Article Of Footwear Incorporating A Knitted Component With A Tongue”, filed on May 17, 2012, which application is a continuation of U.S. patent application Ser. No. 13/400,511, entitled “Article Of Footwear Incorporating A Knitted Component With

A Tongue", filed on Feb. 20, 2012, which applications are hereby incorporated by reference in their entirety.

~~(1)~~BACKGROUND

(1) The present invention relates generally to articles of footwear, and, in particular, to an article of footwear incorporating a knitted component with an integral knit tongue.

(2) Conventional articles of footwear generally include two primary elements, an upper and a sole structure. The upper is secured to the sole structure and forms a void on the interior of the footwear for comfortably and securely receiving a foot. The sole structure is secured to a lower area of the upper, thereby being positioned between the upper and the ground. In athletic footwear, for example, the sole structure may include a midsole and an outsole. The midsole often includes a polymer foam material that attenuates ground reaction forces to lessen stresses upon the foot and leg during walking, running, and other ambulatory activities. Additionally, the midsole may include fluid-filled chambers, plates, moderators, or other elements that further attenuate forces, enhance stability, or influence the motions of the foot. The outsole is secured to a lower surface of the midsole and provides a ground-engaging portion of the sole structure formed from a durable and wear- resistant material, such as rubber. The sole structure may also include a sockliner positioned within the void and proximal a lower surface of the foot to enhance footwear comfort.

(3) The upper generally extends over the instep and toe areas of the foot, along the medial and lateral sides of the foot, under the foot, and around the heel area of the foot. In some articles of footwear, such as basketball footwear and boots, the upper may extend upward and around the ankle to provide support or protection for the ankle. Access to the void on the interior of the upper is generally provided by an ankle opening in a heel region of the footwear. A lacing system is often incorporated into the upper to adjust the fit of the upper, thereby permitting entry and removal of the foot from the void within the upper. The lacing system also permits the wearer to modify certain dimensions of the upper, particularly girth, to accommodate feet with varying dimensions. In addition, the upper may include a tongue that extends under the lacing system to enhance adjustability of the footwear, and the upper may incorporate a heel counter to limit movement of the heel.

(4) A variety of material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) are conventionally ~~utilized~~**used** in manufacturing the upper. In athletic footwear, for example, the upper may have multiple layers that each include a variety of joined material elements. As examples, the material elements may be selected to impart stretch-resistance, wear-resistance, flexibility, air-permeability, compressibility, comfort, and moisture-wicking to different areas of the upper. In order to impart the different properties to different areas of the upper, material elements are often cut to desired shapes and then joined together, usually with stitching or adhesive bonding. Moreover, the material elements are often joined in a layered configuration to impart multiple properties to the same areas. As the number and type of material elements incorporated into the upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase. Waste material from cutting and stitching

processes also accumulates to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements. By decreasing the number of material elements ~~utilized~~used in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper.

(5) Therefore, there exists a need for an article of footwear that incorporates a knitted component with an integral knit tongue.

~~(5)~~SUMMARY

(6) Various configurations of an article of footwear may have an upper and a sole structure secured to the upper. ~~The upper includes a~~**A knitted component including the upper and an integral knit tongue is incorporated into the article of footwear. The upper and the integral knit tongue are formed as a one-piece** knit element ~~and a tongue~~. The knit element defines a portion of an exterior surface of the upper and an opposite interior surface of the upper, with the interior surface defining a void for receiving a foot. The **integral knit** tongue is formed of unitary knit construction with the **upper as a one-piece** knit element and extends through a throat area of the upper.~~(7)Methods of manufacturing a knitted component for an article of footwear may include knitting a tongue with a knitting machine. The tongue is held on needles of the knitting machine. A first portion of a knit element is formed with the knitting machine while the tongue is held on the needles. The tongue is then joined to the first portion of the knit element. Additionally, a second portion of the knit element is formed with the knitting machine.(8)Methods of knitting may also include providing a knitting pattern with a modifiable field. The modifiable field is updated with data representing a first alphanumeric character. A first component with a knit structure of the first alphanumeric character is formed. The modifiable field is updated with data representing a second alphanumeric character, the second alphanumeric character being different than the first alphanumeric character. Additionally, a second component with a knit structure of the second alphanumeric character is formed.~~ **The integral knit tongue incorporates raised elements providing lace apertures for a lacing system.**

(7) In one aspect, the invention provides an article of footwear having an upper and a sole structure secured to the upper, the article of footwear incorporating a knitted component comprising: a portion of the knitted component defining the upper, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component, the interior surface defining a void for receiving a foot; and an integral knit tongue formed of unitary knit construction with the upper and extending through a throat area of the knitted component; and wherein the integral knit tongue is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

(8) In another aspect, the invention provides a knitted component for an article of footwear, the knitted component comprising: a portion of the knitted component

defining the upper, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component, the interior surface configured to define a void for receiving a foot; and an integral knit tongue formed of unitary knit construction with the upper and extending through a throat area of the knitted component; and wherein the integral knit tongue is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

(9) In another aspect, the invention provides a knitted component for an article of footwear, the knitted component comprising: an upper and an integral knit tongue formed of unitary knit construction with the upper and extending through a throat area of the knitted component; the knitted component comprising at least two knit element layers, including: a first knit element layer comprising a portion of an exterior surface of the knitted component; and a second knit element layer comprising a portion of an interior surface of the knitted component, the interior surface disposed opposite to the exterior surface and the interior surface being configured to define a void for receiving a foot; and wherein the integral knit tongue is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

(10) ~~(9)The~~Other systems, methods, features and advantages ~~and features of novelty characterizing aspects of the invention are pointed out with particularity in the appended claims. To gain an improved understanding of the advantages and features of novelty, however, reference may be made to the following descriptive matter and accompanying figures that describe and illustrate various configurations and concepts related to~~of the invention will be, or will become, apparent to one of ordinary skill in the art upon examination of the following figures and detailed description. It is intended that all such additional systems, methods, features and advantages be included within this description and this summary, be within the scope of the invention, and be protected by the following claims.

Description

~~(1)FIGURE DESCRIPTIONS~~

BRIEF DESCRIPTION OF THE DRAWINGS

(1) ~~(2)~~The ~~foregoing Summary and the following Detailed Description will be better understood when read in conjunction with the accompanying figures.~~invention can be better understood with reference to the following drawings and description. The components in the figures are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention. Moreover, in the figures, like reference numerals designate corresponding parts throughout the different views.

(2) ~~(3)~~FIG. 1 is ~~a perspective~~an isometric view of an exemplary embodiment of an article of

footwear.;

(3) (4)FIG. 2 is a lateral side elevational view of thean exemplary embodiment of an article of footwear.;

(4) (5)FIG. 3 is a medial side elevational view of the article of footwear.

(6)FIGS. 4A-4C are cross-sectional views of the article of footwear, as defined by section lines 4A-4C in FIGS. 2 and 3.(7)FIG. 5 is a top plan view of a first knitted component that forms a portion of an upperview of an exemplary embodiment of thean article of footwear.;

(5) (8)FIG. 6 is a bottom plan view of the first knitted component.(9)FIGS. 7A-7E are4A is a cross-sectional views of the first knitted componentview of the article of footwear, as defined by section lines 7A-7E4A in FIG. 5.

(10)FIGS. 8A and 8B are plan views showing knit structures of the first knitted component.(11)FIG. 9 is a top plan view of a second knitted component that may form a portion of the upper of the article of footwear.FIGS. 2 and 3;

(6) FIG. 4B is a cross-sectional view of the article of footwear, as defined by section lines 4B in FIGS. 2 and 3;

(7) FIG. 5 is a top plan view of an exemplary embodiment of a knitted component with an integral knit tongue;

(8) FIG. 6 is a cross-sectional view of the knitted component with the integral knit tongue, as defined by section line 6 in FIG. 5;

(9) FIG. 7 is an enlarged schematic view of the integral knit tongue of the knitted component;

(10) FIG. 8 is a top plan view of an alternate embodiment of a knitted component with an integral knit tongue;

(11) FIG. 9 is a cross-sectional view of the knitted component with the integral knit tongue, as defined by section line 9 in FIG. 8;

(12) FIG. 10 is a bottomtop plan view of the secondan alternate embodiment of a knitted component. with an integral knit tongue having a partially integral portion;

(13) FIG. 11 is aan enlarged schematic top plan view of the second knitted component showing knit zones.(14)FIGS. 12A-12E are cross-sectional views of the second knitted component, as defined by section lines 12A-12E in FIG. 9.view of the integral knit tongue of the knitted component having a partially integral portion;

(14) FIG. 12 is a cross-sectional view of the knitted component with the integral knit tongue having a partially integral portion, as defined by section line 12 in FIG. 11;

(15) FIG. 13 is a top plan view of an alternate embodiment of a knitted component with an integral knit tongue having partially decoupled knit elements;

(16) FIG. 14 is a cross-sectional view of the integral knit tongue of the knitted component having partially decoupled knit elements, as defined by section line 14 in FIG. 13;

(17) FIG. 15 is a cross-sectional view of the integral knit tongue of the knitted component having partially decoupled knit elements, as defined by section line 15 in FIG. 13;

(18) ~~(15)FIGS. 13A-13H are loop diagrams of the knit zones.~~

~~(16)FIGS. 14A-14C are top plan views corresponding with FIG. 5 and depicting further configurations of the first knitted component.(17)FIG. 15 is a perspective~~FIG. 16 is a loop diagram of an exemplary embodiment of an integral knit tongue;

(19) FIG. 17 is an isometric view of an exemplary embodiment of a knitting machine~~.~~;

(20) ~~(18)FIGS~~FIG. ~~16-18 are elevational views of a combination feeder from the knitting machine.(19)FIG. 19 is an elevational view corresponding with FIG. 16 and showing~~18 is a schematic view of internal components of the ~~combination feeder.~~knitting machine in operation;

(21) ~~(20)FIGS. 20A-20C are elevational views corresponding with FIG. 19 and showing the operation of the combination feeder.~~FIG. 19 is a schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue;

(22) FIG. 20 is a schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue;

(23) ~~(21)FIGS. 21A-21I are schematic perspective views of a knitting process utilizing the combination feeder and a conventional feeder.~~FIG. 21 is a schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue;

~~(22)FIGS. 22A-22C are schematic cross-sectional views of the knitting process showing positions of the combination feeder and the conventional feeder.~~

(24) FIG. 22 is a schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue having a partially integral portion;

(25) ~~(23)~~FIG. 23 is a schematic ~~perspective view showing another aspect of the knitting process.~~view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue having a partially integral portion;

(26) ~~(24)~~FIG. 24 is a ~~perspective~~schematic view of ~~another configuration~~internal components of the knitting machine~~.~~ in operation to manufacture a knitted component with an integral knit tongue having a partially integral portion;

(27) ~~(25)~~FIG. 25 is a ~~top plan view of the first~~schematic view of internal components of the knitting machine in operation to manufacture a knitted component with ~~a first knitted~~an integral knit tongue~~.~~ having a partially integral portion;

(28) ~~(26)~~FIG. 26 is a ~~partial top plan view of the first~~schematic view of internal components of the knitting machine in operation to manufacture a knitted component with ~~the first knitted tongue.~~an integral knit tongue having partially decoupled knit layers;

(29) ~~(27)~~FIG. 27 is a ~~cross-sectional view of the first knitted tongue, as defined by section line 27 in FIG. 26.~~schematic view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue having partially decoupled knit layers;

(30) ~~(28)~~FIG. 28 is a ~~top plan view of the second~~schematic view of internal components of the knitting machine in operation to manufacture a knitted component with ~~a second knitted tongue.~~an integral knit tongue having partially decoupled knit layers; and

(31) ~~(29)~~FIG. 29 is a ~~partial top plan view of the second knitted component with the second knitted tongue.~~

~~(30)FIG. 30 is a cross-sectional view of the second knitted tongue, as defined by section line 30 in FIG. 29.~~

~~(31)FIG. 31 is a top plan view of a third knitted component with a third knitted tongue.~~

~~(32)FIG. 32 is a partial top plan view of the third knitted component with the third knitted tongue.~~

~~(33)FIG. 33 is a cross-sectional view of the third knitted tongue, as defined by section line 33 in FIG. 32.~~

~~(34)FIG. 34 is a top plan view of a fourth knitted component with a fourth knitted tongue.~~

~~(35)FIG. 35 is a cross-sectional view of the fourth knitted component and fourth knitted tongue, as defined by section line 35 in FIG. 34.~~

~~(36)FIGS. 36A-36G are schematic elevational views of a knitting process for forming the first knitted component with the first knitted tongue.~~

~~(37)FIG. 37 is a schematic elevational view depicting a further example step of the knitting process.(38)FIG. 38 is a schematic block diagram of the knitting machine.(39)FIGS. 39A-39C are partial top plan views corresponding with FIG. 26 and depicting sequential variations in the first knitted tongue.~~schematic

view of internal components of the knitting machine in operation to manufacture a knitted component with an integral knit tongue having partially decoupled knit layers.

(40)DETAILED DESCRIPTION

(32) **(41)**The following discussion and accompanying figures disclose a variety of concepts relating to knitted components and the manufacture of knitted components. Although the knitted components may be **utilized**used in a variety of products, an article of footwear that incorporates one of the knitted components is disclosed below as an example. In addition to footwear, the knitted components may be **utilized**used in other types of apparel (e.g., shirts, pants, socks, jackets, undergarments), athletic equipment (e.g., golf bags, baseball and football gloves, soccer ball restriction structures), containers (e.g., backpacks, bags), and upholstery for furniture (e.g., chairs, couches, car seats). The knitted components may also be **utilized**used in bed coverings (e.g., sheets, blankets), table coverings, towels, flags, tents, sails, and parachutes. The knitted components may be **utilized**used as technical textiles for industrial purposes, including structures for automotive and aerospace applications, filter materials, medical textiles (e.g. bandages, swabs, implants), geotextiles for reinforcing embankments, agrotextiles for crop protection, and industrial apparel that protects or insulates against heat and radiation. Accordingly, the knitted components and other concepts disclosed herein may be incorporated into a variety of products for both personal and industrial purposes.

(33) **(42)**Footwear **Configuration**Configurations

(34) FIGS. 1 through 15 illustrate various footwear configurations according to the principles described and illustrated herein. In particular, FIGS. 1-4B illustrate an exemplary embodiment of an article of footwear incorporating a knitted component including an upper and an integral knit tongue.

(35) **(43)An**FIGS. 1 through 4B illustrate an exemplary embodiment of an article of footwear 100, also referred to simply as footwear 100. In some embodiments, article of footwear **100** **is depicted in FIGS. 1-4C as including**may include a sole structure **110** and an upper **120**. Although footwear **100** is illustrated as having a general configuration suitable for running, concepts associated with footwear **100** may also be applied to a variety of other athletic footwear types, including baseball shoes, basketball shoes, cycling shoes, football shoes, tennis shoes, soccer shoes, training shoes, walking shoes, and hiking boots, for example. The concepts may also be applied to footwear types that are generally considered to be non-athletic, including dress shoes, loafers, sandals, and work boots. Accordingly, the concepts disclosed with respect to footwear **100** **apply**may be applied to a wide variety of footwear types.

(36) **(44)**For reference purposes, footwear **100** may be divided into three general regions: a forefoot region **101**, a midfoot region **102**, and a heel region **103.**103, as shown in FIGS. 1, 2, and 3. Forefoot region **101** generally includes portions of footwear **100** corresponding with the toes and the joints connecting the metatarsals with the phalanges. Midfoot region **102** generally includes portions of footwear **100** corresponding with an arch area of the foot. Heel region **103** generally corresponds with rear portions of the foot, including the

calcaneus bone. Footwear **100** also includes a lateral side **104** and a medial side **105**, which extend through each of ~~regions 101~~ forefoot region **101**, midfoot region **102**, and heel region **103** and correspond with opposite sides of footwear **100**. More particularly, lateral side **104** corresponds with an outside area of the foot (i.e., the surface that faces away from the other foot), and medial side **105** corresponds with an inside area of the foot (i.e., the surface that faces toward the other foot). ~~Regions 101-103 and sides 104~~ Forefoot region **101**, midfoot region **102**, and heel region **103** and lateral side **104**, medial side **105** are not intended to demarcate precise areas of footwear **100**. Rather, ~~regions 101-103 and sides 104~~ forefoot region **101**, midfoot region **102**, and heel region **103** and lateral side **104**, medial side **105** are intended to represent general areas of footwear **100** to aid in the following discussion. In addition to footwear **100**, ~~regions 101-103 and sides 104~~ forefoot region **101**, midfoot region **102**, and heel region **103** and lateral side **104**, medial side **105** may also be applied to sole structure **110**, upper **120**, and individual elements thereof.

(37) ~~(45)Sole~~In an exemplary embodiment, sole structure **110** is secured to upper **120** and extends between the foot and the ground when footwear **100** is worn. ~~The~~In some embodiments, the primary elements of sole structure **110** are a midsole **111**, an outsole **112**, and a sockliner ~~113.~~113 (shown in FIGS. 4A and 4B). Midsole **111** is secured to a lower surface of upper **120** and may be formed from a compressible polymer foam element (e.g., a polyurethane or ethylvinylacetate foam) that attenuates ground reaction forces (i.e., provides cushioning) when compressed between the foot and the ground during walking, running, or other ambulatory activities. In ~~further configurations~~other embodiments, midsole **111** may incorporate plates, moderators, fluid-filled chambers, lasting elements, or motion control members that further attenuate forces, enhance stability, or influence the motions of the foot, or midsole ~~21~~111 may be primarily formed from a fluid-filled chamber. Outsole **112** is secured to a lower surface of midsole **111** and may be formed from a wear-resistant rubber material that is textured to impart traction. Sockliner **113** is located within upper **120** and is positioned to extend under a lower surface of the foot to enhance the comfort of footwear **100**. Although this configuration for sole structure **110** provides an example of a sole structure that may be used in connection with upper **120**, a variety of other conventional or nonconventional configurations for sole structure **110** may also be ~~utilized~~used. Accordingly, in other embodiments, the features of sole structure **110** or any sole structure ~~utilized~~used with upper **120** may vary ~~considerably~~.

(38) ~~(46)Upper~~In some embodiments, upper **120** defines a void within footwear **100** for receiving and securing a foot relative to sole structure **110**. The void is shaped to accommodate the foot and extends along a lateral side of the foot, along a medial side of the foot, over the foot, around the heel, and under the foot. Access to the void is provided by an ankle opening **121** located in at least heel region **103**. In some embodiments, a throat area **123** extends from ankle opening **121** in heel region **103** over an area corresponding to an instep of the foot to an area adjacent to forefoot region **101**. In an exemplary embodiment, an integral knit tongue **140** is formed of unitary knit construction with upper **120** and extends through throat area **123** of upper **120** between lateral side **104** and medial side **105**.

(39) A lace **122** extends through various lace apertures ~~123 in upper 120~~143 in raised elements **142** of integral knit tongue **140** and permits the wearer to modify dimensions of

upper **120** to accommodate proportions of the foot. More particularly, lace **122** permits the wearer to tighten upper **120** around the foot, and lace **122** permits the wearer to loosen upper **120** to facilitate entry and removal of the foot from the void (i.e., through ankle opening **121**). In addition, integral knit tongue 140 of upper **120** ~~includes a tongue 124 that~~ extends under lace **122** ~~and lace apertures 123~~ to enhance the comfort of footwear **100**. In further configurations, upper **120** may include additional elements, such as (a) a heel counter in heel region **103** that enhances stability, ~~(b)~~ (b) a toe guard in forefoot region **101** that is formed of a wear-resistant material, and (c) logos, trademarks, and placards with care instructions and material information.

(40) ~~(47)~~Many conventional footwear uppers are formed from multiple material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) that are joined through stitching or bonding, for example. In contrast, a majority of upper **120** is formed from a knitted component **130**, which extends through each of ~~regions 101~~ forefoot region 101, midfoot region 102, and heel region **103**, along both lateral side **104** and medial side **105**, over forefoot region **101**, and around heel region **103**. In addition, knitted component **130** forms portions of both an exterior surface and an opposite interior surface of upper **120**. As such, knitted component **130** defines at least a portion of the void within upper **120**. In some configurations, knitted component **130** may also extend under the foot. Referring to FIGS. 4A~~-~~ and 4~~C~~B, however, a strobel sock **125** is secured to knitted component **130** and an upper surface of midsole **111**, thereby forming a portion of upper **120** that extends under sockliner **113**.

(41) In some embodiments, knitted component 130 may include upper 120 and integral knit tongue 140 formed of unitary knit construction. Knitted components that include upper 120 and integral knit tongue 140 may be formed with a relatively smaller number of material elements. As discussed in the Background section above, decreasing the number of material elements used in forming an upper may decrease waste, while also increasing the manufacturing efficiency and recyclability of the upper. The tongue and other portions, such as the collar, of conventional uppers are often formed from multiple separate material elements that are later joined together. As discussed in greater detail below, however, integral knit tongue element may be primarily formed through knitting processes (rather than stitch and turn methods) that decrease waste and increase manufacturing efficiency and recyclability. Additionally, the structure of integral knit tongue element 140 may incorporate smaller numbers of seams or other discontinuities, thereby enhancing the overall comfort of footwear 100.

(42) Additional advantages of constructing integral knit tongue 140 during the knitting process and of unitary knit construction with upper 120 include providing more efficient manufacture and common properties. More particularly, manufacturing efficiency may be increased by forming more of knitted component 130 during the knitting process and eliminating various steps (e.g., making a separate tongue, securing the tongue) that are often performed manually. Integral knit tongue 140 and upper 120 may also have common properties when formed from the same yarn (or type of yarn) or with similar knit structures. For example, using the same yarn in both of integral knit tongue 140 and upper 120 imparts similar durability, strength, stretch, wear-resistance, biodegradability, thermal, and hydrophobic properties. In addition to

physical properties, using the same yarn in both of integral knit tongue 140 and upper 120 may impart common aesthetic or tactile properties, such as color, sheen, and texture. Using the same knit structures in both of integral knit tongue 140 and upper 120 may also impart common physical properties and aesthetic properties. These advantages may also be present when at least a portion of integral knit tongue 140 and at least a portion of upper 120 are formed from a common yarn (or type of yarn) or with common knit structures.

(43) ~~(48)~~Knitted Component ~~Configuration~~Configurations

(44) ~~(49)Knitted component 130 is~~FIGS. 5 through 15 illustrate various embodiments of knitted components that may be incorporated into articles of footwear in a similar manner as the exemplary embodiment of FIGS. 1 through 4B. The knitted components illustrated in FIGS. 5 through 15 are depicted separate from a remainder of footwear ~~100 in FIGS. 5 and 6. Knitted component 130 is~~100. However, it should be understood that each of the embodiments of knitted components described herein may be combined with the elements of footwear 100, described above, to form an article of footwear incorporating the knitted component.

(45) Referring now to FIG. 5, an exemplary embodiment of a first knitted component 500 is shown in a top plan view. First knitted component 500 may be substantially similar to knitted component 130, described above. In some embodiments, first knitted component 500 includes a first portion defining an upper 502 and a second portion defining an integral knit tongue 512. In an exemplary embodiment, first knitted component 500 incorporates upper 502 and integral knit tongue element 512 formed of unitary knit construction. As ~~utilized~~used herein and in the claims, a knitted component (e.g., first knitted component ~~130~~500, or other knitted components described herein) is defined as being formed of ~~"~~“unitary knit construction~~"~~” when formed as a one-piece element through a knitting process. That is, the knitting process substantially forms the various features and structures of first knitted component ~~130~~500 without the need for significant additional manufacturing steps or processes. A unitary knit construction may be used to form a knitted component having structures or elements (including upper 502 and integral knit tongue 512) that include one or more courses of yarn or other knit material that are joined such that the structures or elements include at least one course in common (i.e., sharing a common yarn) and/or include courses that are substantially continuous between each of the structures or elements. With this arrangement, a one-piece element of unitary knit construction is provided.

(46) Although portions of first knitted component ~~130~~500 may be joined to each other (e.g., edges of first knitted component ~~130~~500 being joined together) following the knitting process, first knitted component ~~130~~500 remains formed of unitary knit construction because it is formed as a one-piece knit element. Moreover, first knitted component ~~130~~500 remains formed of unitary knit construction when other elements (e.g., a lace ~~122, tongue 124,~~ logos, trademarks, placards with care instructions and material information, structural elements) are added following the knitting process.

(47) ~~(50)The~~In an exemplary embodiment, the primary ~~elements~~element of first knitted component ~~130 are~~500 is a knit element ~~131 and an inlaid strand 132. Knit element 131 is~~forming upper 502 and integral knit tongue 512. A knit element may be formed from at least one yarn that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a variety of courses and wales. That is, the knit element ~~131~~forming first knitted component 500 has the structure of a knit textile. ~~Inlaid strand 132 extends through knit element 131 and passes between the various loops within knit element 131. Although inlaid strand 132 generally extends along courses within knit element 131, inlaid strand 132 may also extend along wales within knit element 131. Advantages of inlaid strand 132 include providing support, stability, and structure. For example, inlaid strand 132 assists with securing upper 120 around the foot, limits deformation in areas of upper 120 (e.g., imparts stretch-resistance) and operates in connection with lace 122 to enhance the fit of footwear 100.(51)Knit element 131~~Other embodiments of knitted components, including the embodiments described below, may include a knit element and at least one tensile element.

(48) First knitted component 500 has a generally U-shaped configuration that is outlined by ~~a perimeter edge 133, a pair of heel edges 134, and an inner edge 135.~~an outer perimeter and an inner perimeter. In this embodiment, the outer perimeter includes a front perimeter edge 503, a lateral perimeter edge 504, a medial perimeter edge 505, and a pair of heel edges, including a lateral heel edge 506 and a medial heel edge 507. The inner perimeter of first knitted component 500 includes a lateral inner edge 508, a medial inner edge 509, and a front inner edge 510. When incorporated into an article of footwear, including footwear **100**, front perimeter edge ~~133 lays against the~~503, lateral perimeter edge 504, medial perimeter edge 505, and at least a portion of lateral heel edge 506 and medial heel edge 507 lays against an upper surface of a midsole and is joined to a strobel sock (e.g., midsole **111** and ~~is joined to~~ strobel sock ~~125. Heel edges 134~~125, described above). In addition, lateral heel edge 506 and medial heel edge 507 are joined to each other and extend vertically in a heel region ~~103.~~. In some configurations of footwear ~~100,~~, a material element may cover a seam between lateral heel ~~edges 134~~edge 506 and medial heel edge 507 to reinforce the seam and enhance the aesthetic appeal of the footwear ~~100. Inner edge 135 forms~~. Taken together, lateral inner edge 508, medial inner edge 509, and front inner edge 510 form an ankle opening, including ankle opening **121** described above, and extends forward to ~~an~~a throat area 520 where ~~lace 122, lace apertures 123, and tongue 124 are located. In addition, knit element 131 has~~integral knit tongue 512 is located. Additionally, in some embodiments, throat area 520 may further include a lace and lace apertures for receiving the lace.

(49) In addition, first knitted component 500 may have a first surface ~~136~~530 and an

opposite second surface ~~137~~.532. First surface ~~136~~530 forms a portion of the exterior surface of upper ~~120~~,502, whereas second surface ~~137~~532 forms a portion of the interior surface of upper ~~120~~,502, thereby defining at least a portion of the void within upper ~~120~~.502.

~~(52)~~Inlaid strand 132, as noted above, extends through knit element 131 and passes between the various loops within knit element 131. More particularly, inlaid strand 132 is located within the knit structure of knit element 131, which may have the configuration of a single textile layer in the area of inlaid strand 132, and between surfaces 136 and 137, as depicted in FIGS. 7A-7D. When knitted component 130 is incorporated into footwear 100, therefore, inlaid strand 132 is located between the exterior surface and the interior surface of upper 120. In some configurations, portions of inlaid strand 132 may be visible or exposed on one or both of surfaces 136 and 137. For example, inlaid strand 132 may lay against one of surfaces 136 and 137, or knit element 131 may form indentations or apertures through which inlaid strand passes. An advantage of having inlaid strand 132 located between surfaces 136 and 137 is that knit element 131 protects inlaid strand 132 from abrasion and snagging.

~~(53)~~Referring to FIGS. 5 and 6, inlaid strand 132 repeatedly extends from perimeter edge 133 toward inner edge 135 and adjacent to a side of one lace aperture 123, at least partially around the lace aperture 123 to an opposite side, and back to perimeter edge 133. When knitted component 130 is incorporated into footwear 100, knit element 131 extends from a throat area of upper 120 (i.e., where lace 122, lace apertures 123, and tongue 124 are located) to a lower area of upper 120 (i.e., where knit element 131 joins with sole structure 110. In this configuration, inlaid strand 132 also extends from the throat area to the lower area. More particularly, inlaid strand repeatedly passes through knit element 131 from the throat area to the lower area.

~~(54)~~Although knit element 131 may be formed in a variety of ways, courses of the knit structure generally extend in the same direction as inlaid strands 132. That is, courses may extend in the direction extending between the throat area and the lower area. As such, a majority of inlaid strand 132 extends along the courses within knit element 131. In areas adjacent to lace apertures 123, however, inlaid strand 132 may also extend along wales within knit element 131. More particularly, sections of inlaid strand 132 that are parallel to inner edge 135 may extend along the wales.

~~(55)~~As discussed above, inlaid strand 132 passes back and forth through knit element 131. Referring to FIGS. 5 and 6, inlaid strand 132 also repeatedly exits knit element 131 at perimeter edge 133 and then re-enters knit element 131 at another location of perimeter edge 133, thereby forming loops along perimeter edge 133. An advantage to this configuration is that each section of inlaid strand 132 that extends between the throat area and the lower area may be independently tensioned, loosened, or otherwise adjusted during the manufacturing process of footwear 100. That is, prior to securing sole structure 110 to upper 120, sections of inlaid strand 132 may be independently adjusted to the proper tension.

~~(56)~~In comparison with knit element 131, inlaid strand 132 may exhibit greater stretch resistance. That is, inlaid strand 132 may stretch less than knit element 131. Given that numerous sections of inlaid strand 132 extend from the throat area of upper

~~120 to the lower area of upper 120, inlaid strand 132 imparts stretch resistance to the portion of upper 120 between the throat area and the lower area. Moreover, placing tension upon lace 122 may impart tension to inlaid strand 132, thereby inducing the portion of upper 120 between the throat area and the lower area to lay against the foot. As such, inlaid strand 132 operates in connection with lace 122 to enhance the fit of footwear 100.(57)Knit element 131~~**In various embodiments, a knitted component** may incorporate various types of yarn that impart different properties to separate areas of **the** upper~~ 120. That is~~**. For example**, one area of ~~knit element 131~~**first knitted component 500** may be formed from a first type of yarn that imparts a first set of properties, and another area of ~~knit element 131~~**first knitted component 500** may be formed from a second type of yarn that imparts a second set of properties. In this configuration, properties may vary throughout upper ~~120~~**502** by selecting specific yarns for different areas of ~~knit element 131.~~ **first knitted component 500.**

(51) The properties that a particular type of yarn will impart to an area of ~~knit element 131~~**a knitted component** partially depend upon the materials that form the various filaments and fibers within the yarn. Cotton, for example, provides a soft hand, natural aesthetics, and biodegradability. Elastane and stretch polyester each provide substantial stretch and recovery, with stretch polyester also providing recyclability. Rayon provides high luster and moisture absorption. Wool also provides high moisture absorption, in addition to insulating properties and biodegradability. Nylon is a durable and abrasion-resistant material with relatively high strength. Polyester is a hydrophobic material that also provides relatively high durability.

(52) In addition to materials, other aspects of the yarns selected for ~~knit element 131~~**a knitted component** may affect the properties of **the** upper ~~120.~~**.** For example, a yarn forming ~~knit element 131~~**first knitted component 500** may be a monofilament yarn or a multifilament yarn. The yarn may also include separate filaments that are each formed of different materials. In addition, the yarn may include filaments that are each formed of two or more different materials, such as a ~~bicomponent~~**bi-component** yarn with filaments having a sheath-core configuration or two halves formed of different materials. Different degrees of twist and crimping, as well as different deniers, may also affect the properties of upper ~~120.~~**502.** Accordingly, both the materials forming the yarn and other aspects of the yarn may be selected to impart a variety of properties to separate areas of upper ~~120.~~**502.**

(53) In some embodiments, integral knit tongue 512 may be centrally-located in throat area 520 of first knitted component 500 and may extend from an ankle opening in a heel region over an area corresponding to an instep of the foot to an area adjacent to a forefoot region, as well as extending between a lateral side and a medial side of first knitted component. In an exemplary embodiment, integral knit tongue 512 is formed of unitary knit construction with upper 502 at a forward portion of throat area 520 of first knitted component 500. That is, integral knit tongue 512 is joined through knitting to upper 502 at the forward portion of throat area 520 such that integral knit tongue 512 and upper 502 include at least one course in common and/or include courses that are substantially continuous between integral knit tongue 512 and upper 502 at the forward portion of throat area 520.

(54) In an exemplary embodiment, integral knit tongue 512 may be further formed of unitary knit construction with upper 502 along the sides of integral knit tongue 512 extending along a length of throat area 520 of first knitted component 500. Accordingly, integral knit tongue 512 is joined through knitting to upper 502 along each of a lateral side and a medial side of throat area 520 such that integral knit tongue 512 and upper 502 include at least one course in common and/or include courses that are substantially continuous between integral knit tongue 512 and upper 502 along the sides extending through throat area 520.

(55) ~~**(58)As with the yarns forming knit element 131, the configuration of inlaid strand 132 may also vary significantly. In addition to yarn, inlaid strand 132 may have the configurations of a filament (e.g., a monofilament), thread, rope, webbing, cable, or chain, for example. In comparison with the yarns forming knit element 131, the thickness of inlaid strand 132 may be greater. In some configurations, inlaid strand**~~

~~132 may have a significantly greater thickness than the yarns of knit element 131. Although the cross- sectional shape of inlaid strand 132 may be round, triangular, square, rectangular, elliptical, or irregular shapes may also be utilized. Moreover, the materials forming inlaid strand 132 may include any of the materials for the yarn within knit element 131, such as cotton, elastane, polyester, rayon, wool, and nylon. As noted above, inlaid strand 132 may exhibit greater stretch resistance than knit element 131. As such, suitable materials for inlaid strands 132 may include a variety of engineering filaments that are utilized for high tensile strength applications, including glass, aramids (e.g., para-aramid and meta- aramid), ultra-high molecular weight polyethylene, and liquid crystal polymer. As another example, a braided polyester thread may also be utilized as inlaid strand 132.(59)An example of a suitable configuration for a portion of knitted component 130 is depicted in FIG. 8A. In this configuration, knit element 131 includes a yarn 138 that forms a plurality of intermeshed loops defining multiple horizontal courses and vertical wales. Inlaid strand 132 extends along one of the courses and alternates between being located (a) behind loops formed from yarn 138 and (b) in front of loops formed from yarn~~In some embodiments, integral knit tongue 512 may include raised elements disposed on opposite sides of throat area 520 and extending along the length of integral knit tongue 512. Raised elements may be a portion of integral knit tongue 512 that are formed through the knitting process to be a flap or overhanging portion of integral knit tongue 512 that extends outward away from first surface 530 of upper 502. As shown in FIG. 5, integral knit tongue 512 includes a lateral raised element 514 and a medial raised element 515. In an exemplary embodiment, lateral raised element 514 and medial raised element 515 are formed of unitary knit construction with integral knit tongue 512 and upper 502 according to the method below. With this arrangement, lateral raised element 514 and medial raised element 515 include one or more common courses and/or courses that are substantially continuous with integral knit tongue 512 and upper 502.

(56) In some embodiments, raised elements associated with an integral knit tongue, including lateral raised element 514 and medial raised element 515 associated with integral knit tongue 512, may include one or more lace apertures disposed at various locations along the raised element for receiving a lace. In some cases, the lace apertures may be a void or opening within the knitted structure forming the raised element that is sufficient to allow a lace to pass through. In other cases, the lace apertures may be a hole or opening that is cut or removed from the material forming the raised elements. In still other cases, the lace apertures may include additional elements, including, but not limited to loops, grommets, eyelets, eye hooks, or other suitable lace receiving members.

(57) Referring now to FIG. 6, a cross-sectional view of integral knit tongue 512 is illustrated. In an exemplary embodiment, raised elements are formed of unitary knit construction with integral knit tongue 512 and upper 502 such that first knitted component 500 is a one-piece element. In this embodiment, lateral raised element 514 is joined with upper 502 at a first proximal end 600 and medial raised element 515 is joined with upper 502 at a second proximal end 601. Each raised element extends outward from first surface 530 of upper 502 in a flap-like arrangement to form an

overhanging portion of integral knit tongue 512. In this embodiment, lateral raised element 514 extends outward from first proximal end 600 to a first distal end 602 and includes a first outward facing side 604 and a first inward facing side 606. Similarly, medial raised element 515 extends outward from second proximal end 601 to a second distal end 603 and includes a second outward facing side 605 and a second inward facing side 607. In an exemplary embodiment, first outward facing side 604 and/or second outward facing side 605 may be oriented towards each side of first knitted component 500, while first inward facing side 606 and/or second inward facing side 607 may be oriented towards the center of first knitted component 500 where integral knit tongue 512 is located.

(58) In addition, as shown in FIG. 6, lateral raised element 514 and medial raised element 515 are shown in a flat configuration such that first inward facing side 606 and/or second inward facing side 607 is oriented towards first surface 530. In various embodiments, however, raised elements, including lateral raised element 514 and medial raised element 515, may be positioned in an upright configuration. Referring now to FIG. 7, lateral raised element 514 and medial raised element 515 are shown in an upright configuration such that first inward facing side 606 and/or second inward facing side 607 is oriented generally perpendicular to or at a raised angle with regard to first surface 530. In some embodiments, the process of pulling upper 502 tight on opposite sides of integral knit tongue 512 (for example, by joining first knitted component 500 with a sole structure to form an article of footwear) may cause each of lateral raised element 514 and medial raised element 515 to move from the flat configuration to the upright configuration.

(59) In an exemplary embodiment, lateral raised element 514 and medial raised element 515 of integral knit tongue 512 may extend a first height H1 above first surface 530 of first knitted component 500. In some embodiments, upright configuration of lateral raised element 514 and medial raised element 515 may be used to incorporate lace apertures into integral knit tongue 512. In this embodiment, a plurality of lace apertures 700 are shown disposed along the respective sides of lateral raised element 514 and medial raised element 515 and extending through from first outward facing side 604 to first inward facing side 606 and from second outward facing side 605 to second inward facing side 607. In some cases, plurality of lace apertures 700 may be a void or opening within the knitted structure of integral knit tongue 512 forming the raised elements. In other cases, plurality of lace apertures 700 may have a different structure, including any of the suitable structures for lace apertures described above.

(60) Referring to FIGS. 8 and 9, an exemplary embodiment of a second knitted component 800 is shown in a top plan view. Second knitted component 800 may be substantially similar to knitted component 130 and/or first knitted component 500, described above. In some embodiments, second knitted component 800 includes a first portion defining an upper 802 and a second portion defining an integral knit tongue 812. In an exemplary embodiment, second knitted component 800 incorporates upper 802 and integral knit tongue 812 formed of unitary knit construction.

(61) As with first knitted component 500, second knitted component 800 has a generally U-shaped configuration that is outlined by an outer perimeter and an inner perimeter. In this embodiment, the outer perimeter includes a front perimeter edge 803, a lateral perimeter edge 804, a medial perimeter edge 805, and a pair of heel edges, including a lateral heel edge 806 and a medial heel edge 807. The inner perimeter of second knitted component 800 includes a lateral inner edge 808 and a medial inner edge 809 which may form an ankle opening. In addition, second knitted component 800 may have a first surface 830 forming a portion of the exterior surface of upper 802 and an opposite second surface 832 forming a portion of the interior surface of upper 802.

(62) In an exemplary embodiment, second knitted component 800 may include integral knit tongue 812 that includes a top end 814 that extends into the portion of second knitted component 800 that is associated with an ankle opening. Top end 814 may be generally free from other portions of second knitted component 800. Integral knit tongue 812 may be formed of unitary knit construction with upper 802 at a forward portion of a throat area 820 of second knitted component 800 and along the sides of integral knit tongue 812 extending along a length of throat area 820. In an exemplary embodiment, integral tongue 812 of second knitted component 800 does not include raised elements. Accordingly, in contrast with first knitted component 500, second knitted component 800 includes a portion of upper 802 that extends over integral knit tongue 812 to form a lateral inner edge 816 and a medial inner edge 817. More particularly, edges of integral knit tongue 812 are knit to an area of second knitted component 800 that is spaced outward from lateral inner edge 816 and medial inner edge 817.

(63) Referring now to FIG. 9, a cross-sectional view of integral knit tongue 812 is illustrated. In an exemplary embodiment, edges of integral knit tongue 812 are formed of unitary knit construction with upper 802 such that second knitted component 800 is a one- piece element. In this embodiment, first edge 900 and second edge 902 of integral knit tongue 812 are joined with second surface 832 of upper 802 such that integral knit tongue 812 extends below lateral inner edge 816 and medial inner edge 817 of upper 802. With this arrangement, a top surface of integral knit tongue 812 may be oriented facing towards second surface 832 of second knitted component 800 disposed on the portion of upper 802 extending out to lateral inner edge 816 and medial inner edge 817. In an exemplary embodiment, the configuration of integral knit tongue 812 included in second knitted component 800 may be provided to lay in a substantially flat condition.

(64) In various embodiments, provisions may be made within a knitted component to assist a wearer with inserting and/or removing a foot from an ankle opening of an article of footwear. In some embodiments, an integral knit tongue of a knitted component may be modified to allow for a larger ankle opening. FIGS. 10 through 15 illustrate alternate embodiments of knitted components that have been provided with mechanisms to allow a larger ankle opening when incorporated into an article of footwear.

(65) FIGS. 10 through 12 illustrate an alternate embodiment of a knitted component that includes a mechanism to allow a larger ankle opening when incorporated into an article of footwear. Referring now to FIG. 10, a top plan view of an alternate embodiment of a knitted component with an integral knit tongue having a partially integral portion is illustrated. In some embodiments, a third knitted component 1000 may include a first portion defining an upper 1002 and a second portion defining an integral knit tongue 1010. Third knitted component 1000 may be substantially similar to knitted component 130, first knitted component 500, and/or second knitted component 800, described above. As with first knitted component 500 and/or second knitted component 800, third knitted component 1000 may have a generally U-shaped configuration that is outlined by an outer perimeter and an inner perimeter. In this embodiment, the outer perimeter includes a front perimeter edge 1003, a lateral perimeter edge 1004, a medial perimeter edge 1005, and a pair of heel edges, including a lateral heel edge 1006 and a medial heel edge 1007. The inner perimeter of third knitted component 1000 includes a lateral inner edge 1008 and a medial inner edge 1009 which may form an ankle opening. In addition, third knitted component 1000 may have a first surface 1030 forming a portion of the exterior surface of upper 1002 and an opposite second surface 1032 forming a portion of the interior surface of upper 1002.

(66) In some embodiments, third knitted component 1000 may further include additional structures. In an exemplary embodiment, third knitted component 1000 may include at least one tensile element 1040 that is inlaid within the knit structure of third knitted component 1000. Suitable materials for tensile element 1040 may include, but is not limited to, yarn or an inlaid strand in the configuration of a filament (e.g., a monofilament), thread, rope, webbing, cable, or chain. Tensile element 1040 extends through third knitted component 1000 and passes between the various loops within a knit structure 1042 formed within third knitted component 1000. Although tensile element 1040 generally extends along courses within knit structure 1042, tensile element 1040 may also extend along wales within knit structure 1042. Advantages of tensile element 1040 include providing support, stability, and structure. For example, tensile element 1040 assists with securing upper 1002 around the foot, limits deformation in areas of upper 1002 (e.g., imparts stretch-resistance) and operates in connection with a lace to enhance the fit of the article of footwear incorporating third knitted component.

(67) A tensile element in the form of an inlaid strand or other suitable element, as well as the method of manufacturing a knitted component incorporating an inlaid strand and knit structures, for use in the embodiments described herein is disclosed in one or more of commonly-owned U.S. patent application Ser. No. 12/338,726 to Dua et al., entitled “Article of Footwear Having An Upper Incorporating A Knitted Component”, filed on Dec. 18, 2008 and published as U.S. Patent Application Publication Number 2010/0154256 on Jun. 24, 2010, and U.S. patent application Ser. No. 13/048,514 to Huffa et al., entitled “Article Of Footwear Incorporating A Knitted Component”, filed on Mar. 15, 2011 and published as U.S. Patent Application Publication Number 2012/0233882 on Sep. 20, 2012, both of which applications are hereby incorporated by reference in their entirety (collectively referred to herein as

the “Inlaid Strand cases”).

(68) 138.In effect, inlaid strand 132 weaves through the structure formed by knit element 131. Although yarn 138 forms each of the courses in this configuration, additional yarns may form one or more of the courses or may form a portion of one or more of the courses.(60)Another example of a suitable configuration for a portion of knitted component 130 is depicted in FIG. 8B. In this configuration, knit element 131 includes yarn 138 and another yarn 139. Yarns 138 and 139 are plated and cooperatively form a plurality of intermeshed loops defining multiple horizontal courses and vertical wales. That is, yarns 138 and 139 run parallel to each other. As with the configuration in FIG. 8A, inlaid strand 132 extends along one of the courses and alternates between being located (a) behind loops formed from yarns 138 and 139 and (b) in front of loops formed from yarns 138 andan exemplary embodiment, third knitted component 1000 incorporates upper 1002 and integral knit tongue 1010 formed of unitary knit construction such that at least a portion of upper 1002 and a portion of integral knit tongue 1010 are a one-piece element. In one embodiment, integral knit tongue 1010 may further include a first portion that is formed of unitary knit construction with upper 1002 along the sides of integral knit tongue 1010 and a second portion that is formed of unitary knit construction with the first portion, but is otherwise free from upper 1002. In this embodiment, third knitted component 1000 includes integral knit tongue 1010 having a partially integral portion 1012 and a free portion 1014.

(69) In an exemplary embodiment, partially integral portion 1012 may be centrally-located in a throat area 1020 of third knitted component 1000 and may extend from a distance D1 adjacent to an ankle opening in a heel region over an area corresponding to an instep of the foot to an area adjacent to a forefoot region, as well as extending between a lateral side and a medial side of third knitted component 1000. In one embodiment, partially integral portion 1012 is formed of unitary knit construction with upper 1002 at a forward portion of throat area 1020 as well as along the sides extending along a length of throat area 1020 of third knitted component 1000. Accordingly, partially integral portion 1012 is joined through knitting to upper 1002 along the forward portion and each of a lateral side and a medial side of throat area 1020 such that partially integral portion 1012 and upper 1002 include at least one course in common and/or include courses that are substantially continuous.

139.An advantage of this configuration is that the properties of each of yarns 138 and 139 may be present in this area of knitted component 130. For example, yarns 138 and 139 may have different colors, with the color of yarn 138 being primarily present on a face of the various stitches in knit element 131 and the color of yarn 139 being primarily present on a reverse of the various stitches in knit element 131. As another example, yarn 139 may be formed from a yarn that is softer and more comfortable against the foot than yarn 138, with yarn 138 being primarily present on first surface 136 and yarn 139 being primarily present on second surface 137.

(61)Continuing with the configuration of FIG. 8B, yarn 138 may be formed from at least one of a thermoset polymer material and natural fibers (e.g., cotton, wool, silk), whereas yarn 139 may be formed from a thermoplastic polymer material. In general, a thermoplastic polymer material melts when heated and returns to a solid state when

cooled. More particularly, the thermoplastic polymer material transitions from a solid state to a softened or liquid state when subjected to sufficient heat, and then the thermoplastic polymer material transitions from the softened or liquid state to the solid state when sufficiently cooled. As such, thermoplastic polymer materials are often used to join two objects or elements together. In this case, yarn 139 may be utilized to join (a) one portion of yarn 138 to another portion of yarn 138, (b) yarn 138 and inlaid strand 132 to each other, or (c) another element (e.g., logos, trademarks, and placards with care instructions and material information) to knitted component 130, for example. As such, yarn 139 may be considered a fusible yarn given that it may be used to fuse or otherwise join portions of knitted component 130 to each other. Moreover, yarn 138 may be considered a non-fusible yarn given that it is not formed from materials that are generally capable of fusing or otherwise joining portions of knitted component 130 to each other. That is, yarn 138 may be a non-fusible yarn, whereas yarn 139 may be a fusible yarn. In some configurations of knitted component 130, yarn 138 (i.e., the non-fusible yarn) may be substantially formed from a thermoset polyester material and yarn 139 (i.e., the fusible yarn) may be at least partially formed from a thermoplastic polyester material.

(62) The use of plated yarns may impart advantages to knitted component 130. When yarn 139 is heated and fused to yarn 138 and inlaid strand 132, this process may have the effect of stiffening or rigidifying the structure of knitted component 130. Moreover, joining (a) one portion of yarn 138 to another portion of yarn 138 or (b) yarn 138 and inlaid strand 132 to each other has the effect of securing or locking the relative positions of yarn 138 and inlaid strand 132, thereby imparting stretch-resistance and stiffness. That is, portions of yarn 138 may not slide relative to each other when fused with yarn 139, thereby preventing warping or permanent stretching of knit element 131 due to relative movement of the knit structure. Another benefit relates to limiting unraveling if a portion of knitted component 130 becomes damaged or one of yarns 138 is severed. Also, inlaid strand 132 may not slide relative to knit element 131, thereby preventing portions of inlaid strand 132 from pulling outward from knit element 131. Accordingly, areas of knitted component 130 may benefit from the use of both fusible and non-fusible yarns within knit element 131.

(63) Another aspect of knitted component 130 relates to a padded area adjacent to ankle opening 121 and extending at least partially around ankle opening 121. Referring to FIG. 7E, the padded area is formed by two overlapping and at least partially coextensive knitted layers 140, which may be formed of unitary knit construction, and a plurality of floating yarns 141 extending between knitted layers 140. Although the sides or edges of knitted layers 140 are secured to each other, a central area is generally unsecured. As such, knitted layers 140 effectively form a tube or tubular structure, and floating yarns 141 may be located or inlaid between knitted layers 140 to pass through the tubular structure. That is, floating yarns 141 extend between knitted layers 140, are generally parallel to surfaces of knitted layers 140, and also pass through and fill an interior volume between knitted layers 140. Whereas a majority of knit element 131 is formed from yarns that are mechanically manipulated to form intermeshed loops, floating yarns 141 are generally free or otherwise inlaid within the interior volume between knitted layers 140. As an additional matter, knitted layers 140 may be at least partially formed from a stretch yarn. An advantage of this

configuration is that knitted layers will effectively compress floating yarns 141 and provide an elastic aspect to the padded area adjacent to ankle opening 121. That is, the stretch yarn within knitted layers 140 may be placed in tension during the knitting process that forms knitted component 130, thereby inducing knitted layers 140 to compress floating yarns 141. Although the degree of stretch in the stretch yarn may vary significantly, the stretch yarn may stretch at least one-hundred percent in many configurations of knitted component 130.

(70) In an exemplary embodiment, integral knit tongue 1010 may include raised elements disposed on opposite sides of throat area 1020 and extending along the length of integral knit tongue 1010. Raised elements may be a portion of integral knit tongue 1010 that are formed through the knitting process to be a flap or overhanging portion of integral knit tongue 1010 that extends outward away from first surface 1030 of upper 1002. As shown in FIGS. 10 and 11, integral knit tongue 1010 includes a lateral raised element 1016 and a medial raised element 1015 that are formed of unitary knit construction with upper 1002 and partially integral portion 1012 of integral knit tongue 1010. Lateral raised element

1016 and/or medial raised element 1015 may be substantially similar to, and similarly formed as lateral raised element 514 and medial raised element 515, described above.

(71) ~~(64)The presence of floating yarns 141 imparts a compressible aspect to the padded area adjacent to ankle opening 121, thereby enhancing the comfort of footwear 100 in the area of ankle opening 121. Many conventional articles of footwear incorporate polymer foam elements or other compressible materials into areas adjacent to an ankle opening. In contrast with the conventional articles of footwear, portions of knitted component 130 formed of unitary knit construction with a remainder of knitted component 130 may form the padded area adjacent to ankle opening 121. In further configurations of footwear 100, similar padded areas may be located in other areas of knitted component 130. For example, similar padded areas may be located as an area corresponding with joints between the metatarsals and proximal phalanges to impart padding to the joints. As an alternative, a terry loop structure may also be utilized to impart some degree of padding to areas of upper 120.~~Referring now to FIG. 11, in an exemplary embodiment, free portion 1014 may be disposed at a top end of throat area 1020 of third knitted component 1000 adjacent to the ankle opening. In one embodiment, free portion 1014 is formed of a unitary knit construction with partially integral portion 1012 at a rearward portion 1100 of throat area 1020, but is otherwise not joined or attached to other portions of upper 1002 and/or third knitted component 1000. With this arrangement, an ankle opening may be provided with a larger opening corresponding to the location of rearward portion 1100 of partially integral portion 1012 of integral knit tongue 1010 that extends distance D1 from the ankle opening along throat area 1020 of third knitted component 1000. Free portion 1014 of integral knit tongue 1010 may serve to cover a foot of a wearer disposed within the ankle opening to enhance the comfort of the article of footwear incorporating third knitted component 1000.

(72) In some embodiments, partially integral portion 1012 of integral knit tongue 1010 may include multiple knit structures, including knit structures of different types. For example, partially integral portion 1012 may include a first knit structure 1102 and a second knit structure 1104. First knit structure 1102 may be associated with a first knit type and may be centrally located and extending along integral knit tongue 1010 from rearward portion 1100 to the forward portion of throat area 1020. Second knit structure 1104 may be associated with a second knit type and may be located along peripheral sides of integral knit tongue 1010 between first knit structure 1102 and each of lateral raised element 1016 and medial raised element 1015 extending similarly from rearward portion 1100 to the forward portion of throat area 1020. In one embodiment, first knit structure 1102 and second knit structure 1104 may be different knit structures or different types of knit structures. For example, in some cases, first knit structure 1102 may be a mesh or similar knit type and second knit structure 1104 may be a jersey or similar knit type. In other cases, first knit structure 1102 may be a double-knit jersey structure and second knit structure 1104 may be a single-knit jersey structure. As shown in FIG. 12, first knit structure 1102 may have a greater thickness than second knit structure 1104 disposed on either peripheral side of first knit structure 1102 extending along the length of partially integral portion 1012

of integral knit tongue 1010.

(73) In some embodiments, lace apertures for receiving a lace may be provided by tensile element 1040. In an exemplary embodiment, a plurality of lace loops 1110 may be disposed at portions of tensile element 1040 that extend out from knit structure 1042 adjacent to lateral raised element 1016 and medial raised element 1015 on opposite sides of throat area 1020 of third knitted component 1000. With this configuration, a lace (not shown) may be disposed through plurality of lace loops 1110 to assist with securing an article of footwear incorporating third knitted component 1000 onto a foot of a wearer. In other embodiments, lace apertures may have a different structure, including any of the suitable structures for lace apertures described above.

(74) ~~(65)Based upon the above discussion, knitted component 130 imparts a variety of features to upper 120. Moreover, knitted component 130 provides a variety of advantages over some conventional upper configurations. As noted above, conventional footwear uppers are formed from multiple material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) that are joined through stitching or bonding, for example. As the number and type of material elements incorporated into an upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase. Waste material from cutting and stitching processes also accumulates to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements. By decreasing the number of material elements utilized in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper. To this end, knitted component 130 forms a substantial portion of upper 120, while increasing manufacturing efficiency, decreasing waste, and simplifying recyclability.~~

~~(66)Further Knitted Component Configurations~~

~~(67)A knitted component 150 is depicted in FIGS. 9 and 10 and may be utilized in place of knitted component 130 in footwear 100. The primary elements of knitted component 150 are a knit element 151 and an inlaid strand 152. Knit element 151 is formed from at least one yarn that is manipulated (e.g., with a knitting machine) to form a plurality of intermeshed loops that define a variety of courses and wales. That is, knit element 151 has the structure of a knit textile. Inlaid strand 152 extends through knit element 151 and passes between the various loops within knit element 151. Although inlaid strand 152 generally extends along courses within knit element 151, inlaid strand 152 may also extend along wales within knit element 151. As with inlaid strand 132, inlaid strand 152 imparts stretch-resistance and, when incorporated into footwear 100, operates in connection with lace 122 to enhance the fit of footwear 100.(68)Knit element 151 has a generally U-shaped configuration that is outlined by a perimeter edge 153, a pair of heel edges 154, and an inner edge 155. In addition, knit element 151 has a first surface 156 and an opposite second surface 157. First surface 156 may form a portion of the exterior surface of upper 120, whereas second surface 157 may form a~~

portion of the interior surface of upper 120, thereby defining at least a portion of the void within upper 120. In many configurations, knit element 151 may have the configuration of a single textile layer in the area of inlaid strand 152. That is, knit element 151 may be a single textile layer between surfaces 156 and 157. In addition, knit element 151 defines a plurality of lace apertures 158.FIGS. 13 through 15 illustrate another alternate embodiment of a knitted component with a mechanism to allow a larger ankle opening when incorporated into an article of footwear. Referring now to FIG. 13, a top plan view of an alternate embodiment of a knitted component with an integral knit tongue having partially decoupled knit elements is illustrated. In some embodiments, a fourth knitted component 1300 may include a first portion defining an upper 1302 and a second portion defining an integral knit tongue 1310. Fourth knitted component 1300 may share one or more substantially similar features with knitted component 130, first knitted component 500, second knitted component 800, and/or third knitted component 1000, described above. As with the previous embodiments of knitted components, fourth knitted component 1300 may similarly have a generally U-shaped configuration that is outlined by an outer perimeter and an inner perimeter. In this embodiment, the outer perimeter includes a front perimeter edge 1303, a lateral perimeter edge 1304, a medial perimeter edge 1305, and a pair of heel edges, including a lateral heel edge 1306 and a medial heel edge 1307. The inner perimeter of fourth knitted component 1300 includes a lateral inner edge 1308 and a medial inner edge 1309 which may form an ankle opening. In addition, fourth knitted component 1300 may have a first surface 1330 forming a portion of the exterior surface of upper 1302 and an opposite second surface 1332 forming a portion of the interior surface of upper 1302.

(69)Similar to inlaid strand 132, inlaid strand 152 repeatedly extends from perimeter edge 153 toward inner edge 155, at least partially around one of lace apertures 158, and back to perimeter edge 153. In contrast with inlaid strand 132, however, some portions of inlaid strand 152 angle rearwards and extend to heel edges 154. More particularly, the portions of inlaid strand 152 associated with the most rearward lace apertures 158 extend from one of heel edges 154 toward inner edge 155, at least partially around one of the most rearward lace apertures 158, and back to one of heel edges 154. Additionally, some portions of inlaid strand 152 do not extend around one of lace apertures 158. More particularly, some sections of inlaid strand 152 extend toward inner edge 155, turn in areas adjacent to one of lace apertures 158, and extend back toward perimeter edge 153 or one of heel edges 154.

(70)Although knit element 151 may be formed in a variety of ways, courses of the knit structure generally extend in the same direction as inlaid strands 152. In areas adjacent to lace apertures 158, however, inlaid strand 152 may also extend along wales within knit element 151. More particularly, sections of inlaid strand 152 that are parallel to inner edge 155 may extend along wales.

(71)In comparison with knit element 151, inlaid strand 152 may exhibit greater stretch resistance. That is, inlaid strand 152 may stretch less than knit element 151. Given that numerous sections of inlaid strand 152 extend through knit element 151, inlaid strand 152 may impart stretch resistance to portions of upper 120 between the throat area and the lower area. Moreover, placing tension upon lace 122 may impart tension to

inlaid strand 152, thereby inducing the portions of upper 120 between the throat area and the lower area to lay against the foot. Additionally, given that numerous sections of inlaid strand 152 extend toward heel edges 154, inlaid strand 152 may impart stretch-resistance to portions of upper 120 in heel region 103. Moreover, placing tension upon lace 122 may induce the portions of upper 120 in heel region 103 to lay against the foot. As such, inlaid strand 152 operates in connection with lace 122 to enhance the fit of footwear 100.

(72)Knit element 151 may incorporate any of the various types of yarn discussed above for knit element 131. Inlaid strand 152 may also be formed from any of the configurations and materials discussed above for inlaid strand 132. Additionally, the various knit configurations discussed relative to FIGS. 8A and 8B may also be utilized in knitted component 150. More particularly, knit element 151 may have areas formed from a single yarn, two plated yarns, or a fusible yarn and a non-fusible yarn, with the fusible yarn joining (a) one portion of the non-fusible yarn to another portion of the non-fusible yarn or (b) the non-fusible yarn and inlaid strand 152 to each other.

(75) In some embodiments, fourth knitted component 1300 may further include additional structures, including at least one tensile element 1340 that is inlaid within a knit structure 1342 of fourth knitted component 1300. Tensile element 1340 may be substantially similar to tensile element 1040, described above, including suitable materials and methods of manufacturing a knitted component incorporating tensile elements and knit structures disclosed in the Inlaid Strand cases. In an exemplary embodiment, tensile element 1340 may further include a plurality of lace loops 1344 that may be configured to receive a lace. Plurality of lace loops 1344 may be disposed at portions of tensile element 1340 that extend out from knit structure 1342 and may have a substantially similar structure as lace loops 1110, described above. In some cases, lace loops 1344 may serve as lace apertures for receiving a lace. In other cases, lace loops 1344 may coordinate with one or more lace apertures disposed within raised elements of integral knit tongue 1310 to receive a lace. In still other cases, lace loops 1344 may be disposed through lace apertures disposed within raised elements and may receive a lace that extends through a throat area 1320 of upper 1302.

(76) In an exemplary embodiment, fourth knitted component 1300 incorporates upper 1302 and integral knit tongue 1310 formed of unitary knit construction such that at least a portion of upper 1302 and a portion of integral knit tongue 1310 are a one-piece element. In one embodiment, portions of upper 1302 may be formed from multiple knit element layers. Accordingly, integral knit tongue 1310 may be formed of unitary knit construction with at least one of the knit element layers.

(77) In some embodiments, integral knit tongue 1310 may be centrally-located in throat area 1320 of fourth knitted component 1300 and may extend from a top end 1314 adjacent to an ankle opening in a heel region over an area corresponding to an instep of the foot to an area adjacent to a forefoot region, as well as extending between a lateral side and a medial side of upper 1302. In an exemplary embodiment, integral knit tongue 1310 is formed of unitary knit construction with at least one knit element layer associated with upper 1302 at a forward portion of throat area 1320 and along the sides extending along a length of throat area 1320 of fourth knitted component

1300.

(78) In an exemplary embodiment, fourth knitted component 1300 may further include raised elements disposed on opposite sides of throat area 1320 and extending along the length of integral knit tongue 1310. As shown in FIGS. 13 through 15, fourth knitted component 1300 includes a lateral raised element 1312 and a medial raised element 1313 that are formed of unitary knit construction with at least one knit element layer of upper 1302. Lateral raised element 1312 and/or medial raised element 1313 may be substantially similar to, and similarly formed as lateral raised elements 514, 1016 and/or medial raised elements 515, 1015, described above.

(79) In some embodiments, the portion of fourth knitted component 1300 forming integral knit tongue 1310 may made from a different material than the remaining portion of fourth knitted component 1300. In an exemplary embodiment, integral knit tongue 1310 may be made from an elastic yarn that has a large degree of elasticity, while the remaining portions of fourth knitted component 1300 may be made from a regular yarn that is substantially inelastic or that has a smaller degree of elasticity compared with the elastic yarn. With this arrangement, integral knit tongue portion 1310 of fourth knitted component 1300 may be configured with throat area 1320 that is allowed to stretch to accommodate a foot of a wearer inserted through an ankle opening of an article of footwear incorporating fourth knitted component 1300.

(80) Additionally, in some embodiments, by forming integral knit tongue 1310 of unitary knit construction with a first knit element layer of fourth knitted component 1300 that is partially decoupled from a second knit element layer, the throat area 1320 may further be permitted to stretch to allow a larger ankle opening for an article of footwear incorporating fourth knitted component 1300. The partial decoupling of the first knit element layer and the second knit element layer may be shown in FIGS. 14 and 15.

(81) Referring now to FIGS. 14 and 15, in this embodiment, upper 1302 may include a first knit element layer 1400 associated with first surface 1330 of fourth knitted component 1300 and a second knit element layer 1402 associated with second surface 1332 of fourth knitted component 1300. In an exemplary embodiment, first knit element layer 1400 and second knit element layer 1402 may be partially decoupled at the portion of fourth knitted component 1300 associated with integral knit tongue 1310. That is, while other portions of fourth knitted component 1300 may include a single knit element having first surface 1330 on one side and second surface 1332 on the opposite side, the partially decoupled portion of fourth knitted component 1300 includes separate first knit element layer 1400 and second knit element layer 1402 disposed adjacent to one another, but not joined along the entirety of their surfaces. Accordingly, first surface 1330 is disposed on one side of first knit element layer 1400 and second surface 1332 is disposed on one side of second knit element layer 1402. At other portions of fourth knitted component 1300, first knit element layer 1400 and second knit element layer 1402 may be rejoined with one another through the knitting process so as to form a single knit element extending through the remaining portion of fourth knitted component 1300.

(82) In an exemplary embodiment, integral knit tongue 1310 may be formed of

unitary knit construction with at least one knit element layer. In one embodiment, integral knit tongue 1310 is formed of unitary knit construction with second knit element layer 1402. As shown in FIGS. 14 and 15, integral knit tongue 1310 is joined through knitting to second knit element layer 1402 of upper 1302 along each of a lateral side and a medial side of throat area 1320 such that integral knit tongue 1310 and second knit element layer 1402 include at least one course in common and/or include courses that are substantially continuous between integral knit tongue 1310 and second knit element layer 1402 along the sides of upper 1302 extending through throat area 1320. Similarly, in an exemplary embodiment, raised elements, including lateral raised element 1312 and medial raised element 1313, may be formed of unitary knit construction with first knit element layer 1400.

(83) In some embodiments, integral knit tongue 1310 may include multiple knit structures, including knit structures of different types, as described above. For example, integral knit tongue 1310 may include a first knit structure 1410 and a second knit structure 1412. First knit structure 1410 may be associated with a first knit type and may be centrally located and extending along integral knit tongue 1310 from a rearward portion to the forward portion of throat area 1320. Second knit structure 1412 may be associated with a second knit type and may be located along peripheral sides of integral knit tongue 1310 between first knit structure 1410 and each of lateral raised element 1312 and medial raised element 1313 extending similarly from the rearward portion to the forward portion of throat area 1320. In this embodiment, first knit structure 1410 and second knit structure 1412 may be similar made of an elastic yarn, however, first knit structure 1410 may be a double-knit jersey structure and second knit structure 1412 may be a single-knit jersey structure. As shown in FIGS. 14 and 15, first knit structure 1410 may have a greater thickness than second knit structure 1412.

(84) In some embodiments, portions of first knit element layer 1400 and second knit element layer 1402 may be joined to secure first knit element layer 1400 and second knit element layer 1402 at desired locations along integral knit tongue 1310. As shown in FIG. 14, a first yarn 1404 may be used to join first knit element layer 1400 to second knit element layer 1402 at a first end 1406 where lateral raised element 1312 begins to extend outward over integral knit tongue 1310. Similarly, a second yarn 1403 may be used to join first knit element layer 1400 to second knit element layer 1402 at a second end 1405 where medial raised element 1313 begins to extend outward over integral knit tongue 1310. In some cases, first yarn 1404 and/or second yarn 1403 may include a single yarn or a plurality of yarns from fourth knitted component 1300 that join first knit element layer 1400 to second knit element layer 1402 during the knitting process. In other cases, first yarn 1404 and/or second yarn 1403 may include a stitch or a plurality of stitches that are used to join first knit element layer 1400 to second knit element layer 1402 after the knitting process.

(85) ~~(73)A majority of knit element 131 is depicted as being formed from a relatively untextured textile and a common or single knit structure (e.g., a tubular knit structure). In contrast, knit element 151 incorporates various knit structures that impart specific properties and advantages to different areas of knitted component 150. Moreover, by combining various yarn types with the knit structures, knitted~~

~~component 150 may impart a range of properties to different areas of upper 120. Referring to FIG. 11, a schematic view of knitted component 150 shows various zones 160-169 having different knit structures, each of which will now be discussed in detail. For purposes of reference, each of regions 101-103 and sides 104 and 105 are shown in FIG. 11 to provide a reference for the locations of knit zones 160-169 when knitted component 150 is incorporated into footwear 100.(74)A tubular knit zone 160 extends along a majority of perimeter edge 153 and through each of regions 101-103 on both of sides 104 and 105. Tubular knit zone 160 also extends inward from each of sides 104 and 105 in an area approximately located at an interface regions 101 and 102 to form a forward portion of inner edge 155. Tubular knit zone 160 forms a relatively untextured knit configuration. Referring to FIG. 12A, a cross-section through an area of tubular knit zone 160 is depicted, and surfaces 156 and 157 are substantially parallel to each other. Tubular knit zone 160 imparts various advantages to footwear 100. For example, tubular knit zone 160 has greater durability and wear resistance than some other knit structures, especially when the yarn in tubular knit zone 160 is plated with a fusible yarn. In addition, the relatively untextured aspect of tubular knit zone 160 simplifies the process of joining strobel sock 125 to perimeter edge 153. That is, the portion of tubular knit zone 160 located along perimeter edge 153 facilitates the lasting process of footwear 100.~~**In one embodiment, the location of first yarn 1404 and/or second yarn 1403 may be chosen to coincide with one or more of lace loops 1344 of tensile element 1340. With this arrangement, first knit element layer 1400 and second knit element layer 1402 may be secured to each other at the location that corresponds to where a lace may be used to secure throat area 1320 of upper 1302 to fit onto a foot of a wearer of an article of footwear incorporating fourth knitted component 1300. In contrast, the partially decoupled portion of fourth knitted component 1300 shown in FIG. 15 does not include first yarn 1404 and/or second yarn 1403 joining first knit element layer 1400 to second knit element layer 1402. Accordingly, at the partially decoupled portion, first knit element layer 1400 and second knit element layer 1402 may be allowed to move independently of one another. This arrangement, together with the use of an elastic yarn to form one or more portions of second knit element layer forming integral knit tongue 1310, allows throat area 1320 to stretch to allow a larger ankle opening for an article of footwear incorporating fourth knitted component 1300.**

(86) Knitting Process for a Knitted Component

(87) FIGS. 16 through 29 illustrate various knitting processes that may be used to manufacture a knitted component in accordance with the principles described herein. In various embodiments described herein, the different knit structures of a particular knitted component may be made using various types of knit structures, including knit types and yarn types.

(88) In an exemplary embodiment, the integral knit tongue of a knitted component that includes raised elements along a medial side and a lateral side may be formed using a specific knitting process. For purposes of reference, FIG. ~~13A~~**16** depicts a loop diagram of the manner in which ~~tubular knit zone 160~~**raised elements associated with an integral knit tongue, including, for example, any of raised elements 142, raised**

elements 514, 515, raised elements 1015, 1016, and/or raised elements 1312, 1313 is formed with a knitting process. 1600.

(89) (75)Two stretch knit zones 161 extend inward from perimeter edge 153 and are located to correspond with a location of joints between metatarsals and proximal phalanges of the foot. That is, stretch zones extend inward from perimeter edge in the area approximately located at the interface regions 101 and 102. As with tubular knit zone 160, the knit configuration in stretch knit zones 161 may be a tubular knit structure. In contrast with tubular knit zone 160, however, stretch knit zones 161 are formed from a stretch yarn that imparts stretch and recovery properties to knitted component 150. Although the degree of stretch in the stretch yarn may vary significantly, the stretch yarn may stretch at least one- hundred percent in many configurations of knitted component 150.As shown in FIG. 16, knitting process 1600 for an integral knit tongue having raised elements may include loop diagrams indicating the direction and type of knitting operation being performed to make the integral knit tongue. It should be understood that the remaining portion of a knitted component may be made according to any suitable knitting process, knitting process 1600 details an exemplary knitting process for an integral knit tongue portion of the overall knitted component. Accordingly, in a first step 1601, yarn is transferred to a back bed of a knitting machine. Next, in a second step 1602, the yarn is knit along a first direction as shown, then back along a second, opposite direction in a third step 1603. Next, in a fourth step 1604, the yarn is transferred to a front bed of the knitting machine and the yarn is knit along the first direction in a fifth step 1605. With this process, a raised element along one side of the integral knit tongue is formed. While an exemplary knit type is illustrated for fifth step 1605 which may form the central portion of an integral knit tongue, any suitable knit type may be used to make a central portion of the integral knit tongue having any desired knit structure.

(76)A tubular and interlock tuck knit zone 162 extends along a portion of inner edge 155 in at least midfoot region 102. Tubular and interlock tuck knit zone 162 also forms a relatively untextured knit configuration, but has greater thickness than tubular knit zone 160. In cross-section, tubular and interlock tuck knit zone 162 is similar to FIG. 12A, in which surfaces 156 and 157 are substantially parallel to each other. Tubular and interlock tuck knit zone 162 imparts various advantages to footwear 100. For example, tubular and interlock tuck knit zone 162 has greater stretch resistance than some other knit structures, which is beneficial when lace 122 places tubular and interlock tuck knit zone 162 and inlaid strands 152 in tension. For purposes of reference, FIG. 13B depicts a loop diagram of the manner in which tubular and interlock tuck knit zone 162 is formed with a knitting process.

(77)A 1.times.1 mesh knit zone 163 is located in forefoot region 101 and spaced inward from perimeter edge 153. 1.times.1 mesh knit zone has a C-shaped configuration and forms a plurality of apertures that extend through knit element 151 and from first surface 156 to second surface 157, as depicted in FIG. 12B. The apertures enhance the permeability of knitted component 150, which allows air to enter upper 120 and moisture to escape from upper 120. For purposes of reference, FIG. 13C depicts a loop diagram of the manner in which 1.times.1 mesh knit zone 163 is formed with a knitting process.

(78)A 2.times.2 mesh knit zone 164 extends adjacent to 1.times.1 mesh knit zone 163. In comparison with 1.times.1 mesh knit zone 163, 2.times.2 mesh knit zone 164 forms larger apertures, which may further enhance the permeability of knitted component 150. For purposes of reference, FIG. 13D depicts a loop diagram of the manner in which 2.times.2 mesh knit zone 164 is formed with a knitting process.

(79)A 3.times.2 mesh knit zone 165 is located within 2.times.2 mesh knit zone 164, and another 3.times.2 mesh knit zone 165 is located adjacent to one of stretch zones 161. In comparison with 1.times.1 mesh knit zone 163 and 2.times.2 mesh knit zone 164, 3.times.2 mesh knit zone 165 forms even larger apertures, which may further enhance the permeability of knitted component 150. For purposes of reference, FIG. 13E depicts a loop diagram of the manner in which 3.times.2 mesh knit zone 165 is formed with a knitting process.

(90) (80)A 1.times.1 mock mesh knit zone 166 is located in forefoot region 101 and extends around 1.times.1 mesh knit zone 163. In contrast with mesh knit zones 163-165, which form apertures through knit element 151, 1.times.1 mock mesh knit zone 166 forms indentations in first surface 156, as depicted in FIG. 12C. In addition to enhancing the aesthetics of footwear 100, 1.times.1 mock mesh knit zone 166 may enhance flexibility and decrease the overall mass of knitted component 150. For purposes of reference, FIG. 13F depicts a loop diagram of the manner in which 1.times.1 mock mesh knit zone 166 is formed with a knitting process.Similarly, from fifth step 1605, a raised element disposed on the opposite side of the integral knit tongue may also be formed. As shown in FIG. 16, after completing knitting associated with fifth step 1605, the yarn may be transferred to the back bed of the knitting machine at a sixth step 1606 and the yarn is knit along the second direction as shown in a seventh step 1607, then back along in the opposite, first direction in an eighth step 1608. The yarn may then be transferred back to the front bed of the knitting machine at a ninth step 1609 and the yarn is knit along the second direction in a tenth step 1610 along the entirety of the width of the integral knit tongue. The exemplary knitting process 1600 may be repeated multiple times to make an integral knit tongue with raised elements having the desired length along the knitted component. Similarly, portions of the integral knit tongue may be made wider or narrower by changing a number of needles that are associated with knitting process 1600. For example, portions of knitting process 1600, including fifth step 1605 and/or tenth step 1610, may be varied to include a larger or smaller number of needles to correspondingly increase or decrease the width of the integral knit tongue. In addition, as noted above, other knitting processes not shown here may be used to make the remaining portions of the knitted component.

(81)Two 2.times.2 mock mesh knit zones 167 are located in heel region 103 and adjacent to heel edges 154. In comparison with 1.times.1 mock mesh knit zone 166, 2.times.2 mock mesh knit zones 167 forms larger indentations in first surface 156. In areas where inlaid strands 152 extend through indentations in 2.times.2 mock mesh knit zones 167, as depicted in FIG. 12D, inlaid strands 152 may be visible and exposed in a lower area of the indentations. For purposes of reference, FIG. 13G depicts a loop diagram of the manner in which 2.times.2 mock mesh knit zones 167 are formed with

a knitting process.

(82)Two 2.times.2 hybrid knit zones 168 are located in midfoot region 102 and forward of 2.times.2 mock mesh knit zones 167. 2.times.2 hybrid knit zones 168 share characteristics of 2.times.2 mesh knit zone 164 and 2.times.2 mock mesh knit zones 167. More particularly, 2.times.2 hybrid knit zones 168 form apertures having the size and configuration of 2.times.2 mesh knit zone 164, and 2.times.2 hybrid knit zones 168 form indentations having the size and configuration of 2.times.2 mock mesh knit zones 167. In areas where inlaid strands 152 extend through indentations in 2.times.2 hybrid knit zones 168, as depicted in FIG. 12E, inlaid strands 152 are visible and exposed. For purposes of reference, FIG. 13H depicts a loop diagram of the manner in which 2.times.2 hybrid knit zones 168 are formed with a knitting process.

(83)Knitted component 150 also includes two padded zones 169 having the general configuration of the padded area adjacent to ankle opening 121 and extending at least partially around ankle opening 121, which was discussed above for knitted component 130. As such, padded zones 169 are formed by two overlapping and at least partially coextensive knitted layers, which may be formed of unitary knit construction, and a plurality of floating yarns extending between the knitted layers.

(84)A comparison between FIGS. 9 and 10 reveals that a majority of the texturing in knit element 151 is located on first surface 156, rather than second surface 157. That is, the indentations formed by mock mesh knit zones 166 and 167, as well as the indentations in 2.times.2 hybrid knit zones 168, are formed in first surface 156. This configuration has an advantage of enhancing the comfort of footwear 100. More particularly, this configuration places the relatively untextured configuration of second surface 157 against the foot. A further comparison between FIGS. 9 and 10 reveals that portions of inlaid strand 152 are exposed on first surface 156, but not on second surface 157. This configuration also has an advantage of enhancing the comfort of footwear 100. More particularly, by spacing inlaid strand 152 from the foot by a portion of knit element 151, inlaid strands 152 will not contact the foot.

(91) (85)Additional configurations of knitted component 130 are depicted in FIGS. 14A-14C. Although discussed in relation to knitted component 130, concepts associated with each of these configurations may also be utilized with knitted component 150. Referring to FIG. 14A, inlaid strands 132 are absent from knitted component 130. Although inlaid strands 132 impart stretch-resistance to areas of knitted component 130, some configurations may not require the stretch-resistance from inlaid strands 132. Moreover, some configurations may benefit from greater stretch in upper 120. Referring to FIG. 14B, knit element 131 includes two flaps 142 that are formed of unitary knit construction with a remainder of knit element 131 and extend along the length of knitted component 130 at perimeter edge 133. When incorporated into footwear 100, flaps 142 may replace strobel sock 125. That is, flaps 142 may cooperatively form a portion of upper 120 that extends under sockliner 113 and is secured to the upper surface of midsole 111. Referring to FIG. 14C, knitted component 130 has a configuration that is limited to midfoot region 102. In this

~~configuration, other material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) may be joined to knitted component 130 through stitching or bonding, for example, to form upper 120.(86)Based upon the above discussion, each of knitted components 130 and 150 may have various configurations that impart features and advantages to upper 120. More particularly, knit elements 131 and 151 may incorporate various knit structures and yarn types that impart specific properties to different areas of upper 120, and inlaid strands 132 and 152 may extend through the knit structures to impart stretch resistance to areas of upper 120 and operate in connection with lace 122 to enhance the fit of footwear 100.~~Additionally, the knit types illustrated in FIG. 16 are exemplary and in different embodiments may be varied. For example, as shown in knitting process 1600, each raised element is made from a double-jersey half-gauge knit, whereas the central portion of the integral knit tongue is made from a single-jersey half-gauge knit. However, in other embodiments, one or more knit types may vary. For example, in some cases, the central portion of the integral knit tongue may include one or more portions of full-gauge (or "all- needle") single or double-jersey knit. In other cases, the width of various knit types along the central portion of the integral tongue may be varied repeatedly, for example, by using different numbers of needles, as noted above. Still other cases may include a combination of knit types and/or knit structures employing various combinations of knit, tuck, or float stitches.

~~(87)Knitting Machine And Feeder Configurations~~

(92) ~~(88)~~Although knitting may be performed by hand, the commercial manufacture of knitted components is generally performed by knitting machines. ~~An example~~FIG. 17 illustrates an exemplary embodiment of a knitting machine ~~200~~1700 that is suitable for producing ~~either~~any of the knitted components ~~130 and 150 is depicted in FIG. 15. Knitting machine 200~~described in the previous embodiments, including knitted component 130, first knitted component 500, second knitted component 800, third knitted component 1000, and/or fourth knitted component 1300, as well as other configurations of knitted components not explicitly illustrated or described but made according to the principles described herein. In this embodiment, knitting machine 1700 has a configuration of a V- bed flat knitting machine for purposes of example, but ~~either~~any of the knitted components ~~130 and 150~~ or ~~aspects~~portions of knitted components ~~130 and 150~~ may be produced on other types of knitting machines.

(93) ~~(89)Knitting~~In an exemplary embodiment, knitting machine ~~200 includes~~1700 may include two needle beds ~~201~~, including a front needle bed 1701 and a back needle bed 1702, that are angled with respect to each other, thereby forming a V-bed. Each of front needle ~~beds 201~~bed 1701 and back needle bed 1702 include a plurality of individual needles ~~202~~ that lay on a common plane~~.~~, including needles 1703 associated with front bed 1701 and needles 1704 associated with back bed 1702. That is, needles ~~202~~1703 from ~~one~~front needle bed ~~201~~1701 lay on a first plane, and needles ~~202~~1704 from ~~the other~~back needle bed ~~201~~1702 lay on a second plane. The first plane and the second plane (i.e., the two needle beds ~~201~~1701, 1702) are angled relative to each other and meet to form an intersection that extends along a majority of a width of knitting machine ~~200.~~1700. As described in greater detail below, needles ~~202~~1703, 1704 each have a first

position where they are retracted and a second position where they are extended. In the first position, needles ~~202~~1703, 1704 are spaced from the intersection where the first plane and the second plane meet. In the second position, however, needles ~~202~~1703, 1704 pass through the intersection where the first plane and the second plane meet.

(94) ~~(90)~~A pair of rails ~~203 extend~~, including a forward rail 1710 and a rear rail 1711, extends above and parallel to the intersection of needle beds ~~201~~1701, 1702 and provide attachment points for multiple standard feeders ~~204~~1720 and combination feeders ~~220.~~1722. Each rail ~~203~~1710, 1711 has two sides, each of which accommodates either one standard feeder ~~204~~1720 or one combination feeder ~~220.~~1722. In this embodiment, rails 1710, 1711 include a front side 1712 and a back side 1714. As such, knitting machine ~~200~~1700 may include a total of four feeders ~~204~~1720 and ~~220.~~1722. As depicted, the forward-most rail ~~203~~, forward rail 1710, includes one combination feeder ~~220~~1722 and one standard feeder ~~204~~1720 on opposite sides, and the rearward- most rail ~~203~~, rear rail 1711, includes two standard feeders ~~204~~1720 on opposite sides. Although two rails ~~203~~1710, 1711 are depicted, further configurations of knitting machine ~~200~~1700 may incorporate additional rails ~~203~~ to provide attachment points for more standard feeders ~~204 and 220.~~1720 and/or combination feeders 1722.

(95) ~~(91)~~Due to the action of a carriage ~~205,~~1730, feeders ~~204~~1720 and ~~220~~1722 move along rails ~~203~~1710, 1711 and needle beds ~~201,~~1701, 1702, thereby supplying yarns to needles ~~202. In~~1703, 1704. As shown in FIG. ~~15,~~17, a yarn ~~206~~1724 is provided to combination feeder ~~220~~1722 by a spool ~~207.~~1726. More particularly, yarn ~~206~~1724 extends from spool ~~207~~1726 to various yarn guides ~~208,~~1728, a yarn take-back spring ~~209,~~, and a yarn tensioner ~~210~~ before entering combination feeder ~~220.~~1722. Although not depicted, additional spools ~~207~~ may be ~~utilized~~used to provide yarns to feeders ~~204.~~1720 in a substantially similar manner as spool 1726.

(96) ~~(92)~~Standard feeders ~~204~~1720 are conventionally-~~utilized~~used for a V-bed flat knitting machine, such as knitting machine ~~200.~~1700. That is, existing knitting machines incorporate standard feeders ~~204.~~1720. Each standard feeder ~~204~~1720 has the ability to supply a yarn that needles ~~202~~1703, 1704 manipulate to knit, tuck, and float. As a comparison, combination feeder ~~220~~1722 has the ability to supply a yarn (e.g., yarn ~~206~~1724) that needles ~~202~~1703, 1704 knit, tuck, and float, and combination feeder ~~220~~1722 further has the ability to inlay the yarn. Moreover, combination feeder ~~220~~1722 has the ability to inlay a variety of different tensile elements, including yarn or other types of strands (e.g., filament, thread, rope, webbing, cable, or chain~~, or yarn~~). Accordingly, combination feeder ~~220~~1722 exhibits greater versatility than each standard feeder ~~204.~~1720.

~~(93)As noted above, combination feeder 220 may be utilized when inlaying a yarn or other strand, in addition to knitting, tucking, and floating the yarn. Conventional knitting machines, which do not incorporate combination feeder 220, may also inlay a yarn. More particularly, conventional knitting machines that are supplied with an inlay feeder may also inlay a yarn. A conventional inlay feeder for a V-bed flat knitting machine includes two components that operate in conjunction to inlay the yarn. Each of the components of the inlay feeder are secured to separate attachment~~

points on two adjacent rails, thereby occupying two attachment points. Whereas an individual standard feeder 204 only occupies one attachment point, two attachment points are generally occupied when an inlay feeder is utilized to inlay a yarn into a knitted component. Moreover, whereas combination feeder 220 only occupies one attachment point, a conventional inlay feeder occupies two attachment points.

(94)Given that knitting machine 200 includes two rails 203, four attachment points are available in knitting machine 200. If a conventional inlay feeder were utilized with knitting machine 200, only two attachment points would be available for standard feeders 204. When using combination feeder 220 in knitting machine 200, however, three attachment points are available for standard feeders 204. Accordingly, combination feeder 220 may be utilized when inlaying a yarn or other strand, and combination feeder 220 has an advantage of only occupying one attachment point.

(95)Combination feeder 220 is depicted individually in FIGS. 16-19 as including a carrier 230, a feeder arm 240, and a pair of actuation members 250. Although a majority of combination feeder 220 may be formed from metal materials (e.g., steel, aluminum, titanium), portions of carrier 230, feeder arm 240, and actuation members 250 may be formed from polymer, ceramic, or composite materials, for example. As discussed above, combination feeder 220 may be utilized when inlaying a yarn or other strand, in addition to knitting, tucking, and floating a yarn. Referring to FIG. 16 specifically, a portion of yarn 206 is depicted to illustrate the manner in which a strand interfaces with combination feeder 220.

(96)Carrier 230 has a generally rectangular configuration and includes a first cover member 231 and a second cover member 232 that are joined by four bolts 233. Cover members 231 and 232 define an interior cavity in which portions of feeder arm 240 and actuation members 250 are located. Carrier 230 also includes an attachment element 234 that extends outward from first cover member 231 for securing feeder 220 to one of rails 203. Although the configuration of attachment element 234 may vary, attachment element 234 is depicted as including two spaced protruding areas that form a dovetail shape, as depicted in FIG. 17. A reverse dovetail configuration on one of rails 203 may extend into the dovetail shape of attachment element 234 to effectively join combination feeder 220 to knitting machine 200. It should also be noted that second cover member 234 forms a centrally-located and elongate slot 235, as depicted in FIG. 18.

(97)Feeder arm 240 has a generally elongate configuration that extends through carrier 230 (i.e., the cavity between cover members 231 and 232) and outward from a lower side of carrier 230. In addition to other elements, feeder arm 240 includes an actuation bolt 241, a spring 242, a pulley 243, a loop 244, and a dispensing area 245. Actuation bolt 241 extends outward from feeder arm 240 and is located within the cavity between cover members 231 and 232. One side of actuation bolt 241 is also located within slot 235 in second cover member 232, as depicted in FIG. 18. Spring 242 is secured to carrier 230 and feeder arm 240. More particularly, one end of spring 242 is secured to carrier 230, and an opposite end of spring 242 is secured to feeder arm 240. Pulley 243, loop 244, and dispensing area 245 are present on feeder arm 240 to interface with yarn 206 or another strand. Moreover, pulley 243, loop 244, and dispensing area 245 are

configured to ensure that yarn 206 or another strand smoothly passes through combination feeder 220, thereby being reliably supplied to needles 202. Referring again to FIG. 16, yarn 206 extends around pulley 243, through loop 244, and into dispensing area 245. In addition, yarn 206

extends out of a dispensing tip 246, which is an end region of feeder arm 240, to then supply needles 202.

(97) (98)Each of actuation members 250 includes an arm 251 and a plate 252. In many configurations of actuation members 250, each arm 251 is formed as a one-piece element with one of plates 252. Whereas arms 251 are located outside of carrier 230 and at an upper side of carrier 230, plates 252 are located within carrier 250. Each of arms 251 has an elongate configuration that defines an outside end 253 and an opposite inside end 254, and arms 251 are positioned to define a space 255 between both of inside ends 254. That is, arms 251 are spaced from each other. Plates 252 have a generally planar configuration. Referring to FIG. 19, each of plates 252 define an aperture 256 with an inclined edge 257. Moreover, actuation bolt 241 of feeder arm 240 extends into each aperture 256.(99)The configuration of combination feeder 220 discussed above provides a structure that facilitates a translating movement of feeder arm 240. As discussed in greater detail below, the translating movement of feeder arm 240 selectively positions dispensing tip 246 at a location that is above or below the intersection of needle beds 201. That is, dispensing tip 246 has the ability to reciprocate through the intersection of needle beds 201. An advantage to the translating movement of feeder arm 240 is that combination feeder 220 (a) supplies yarn 206 for knitting, tucking, and floating when dispensing tip 246 is positioned above the intersection of needle beds 201 and (b) supplies yarn 206 or another strand for inlaying when dispensing tip 246 is positioned below the intersection of needle beds 201. Moreover, feeder arm 240 reciprocates between the two positions depending upon the manner in which combination feeder 220 is being utilized.

(100)In reciprocating through the intersection of needle beds 201, feeder arm 240 translates from a retracted position to an extended position. When in the retracted position, dispensing tip 246 is positioned above the intersection of needle beds 201. When in the extended position, dispensing tip 246 is positioned below the intersection of needle beds 201. Dispensing tip 246 is closer to carrier 230 when feeder arm 240 is in the retracted position than when feeder arm 240 is in the extended position. Similarly, dispensing tip 246 is further from carrier 230 when feeder arm 240 is in the extended position than when feeder arm 240 is in the retracted position. In other words, dispensing tip 246 moves away from carrier 230 when in the extended position, and dispensing tip 246 moves closer to carrier 230 when in the retracted position.(101)For purposes of reference in FIGS. 16-20C, as well as further figures discussed later, an arrow 221 is positioned adjacent to dispensing area 245. When arrow 221 points upward or toward carrier 230, feeder arm 240 is in the retracted position. When arrow 221 points downward or away from carrier 230, feeder arm 240 is in the extended position. Accordingly, by referencing the position of arrow 221, the position of feeder arm 240 may be readily ascertained.Standard feeders 1720 and combination feeder 1722 may have substantially similar configurations as the structure of standard feeders and the combination feeder described in

U.S. patent application Ser. No. 13/474,931, entitled "Article Of Footwear Incorporating A Knitted Component With A Tongue", filed on May 17, 2012, and U.S. patent application Ser. No. 13/400,511, entitled "Article Of Footwear Incorporating A Knitted Component With A Tongue", filed on Feb. 20, 2012, the disclosures of which have been incorporated by reference above.

(102)The natural state of feeder arm 240 is the retracted position. That is, when no significant forces are applied to areas of combination feeder 220, feeder arm remains in the retracted position. Referring to FIGS. 16-19, for example, no forces or other influences are shown as interacting with combination feeder 220, and feeder arm 240 is in the retracted position. The translating movement of feeder arm 240 may occur, however, when a sufficient force is applied to one of arms 251. More particularly, the translating movement of feeder arm 240 occurs when a sufficient force is applied to one of outside ends 253 and is directed toward space 255. Referring to FIGS. 20A and 20B, a force 222 is acting upon one of outside ends 253 and is directed toward space 255, and feeder arm 240 is shown as having translated to the extended position. Upon removal of force 222, however, feeder arm 240 will return to the retracted position. It should also be noted that FIG. 20C depicts force 222 as acting upon inside ends 254 and being directed outward, and feeder arm 240 remains in the retracted position.

(103)As discussed above, feeders 204 and 220 move along rails 203 and needle beds 201 due to the action of carriage 205. More particularly, a drive bolt within carriage 205 contacts feeders 204 and 220 to push feeders 204 and 220 along needle beds 201. With respect to combination feeder 220, the drive bolt may either contact one of outside ends 253 or one of inside ends 254 to push combination feeder 220 along needle beds 201. When the drive bolt contacts one of outside ends 253, feeder arm 240 translates to the extended position and dispensing tip 246 passes below the intersection of needle beds 201. When the drive bolt contacts one of inside ends 254 and is located within space 255, feeder arm 240 remains in the retracted position and dispensing tip 246 is above the intersection of needle beds 201. Accordingly, the area where carriage 205 contacts combination feeder 220 determines whether feeder arm 240 is in the retracted position or the extended position.

(104)The mechanical action of combination feeder 220 will now be discussed. FIGS. 19-20B depict combination feeder 220 with first cover member 231 removed, thereby exposing the elements within the cavity in carrier 230. By comparing FIG. 19 with FIGS. 20A and 20B, the manner in which force 222 induces feeder arm 240 to translate may be apparent. When force 222 acts upon one of outside ends 253, one of actuation members 250 slides in a direction that is perpendicular to the length of feeder arm 240. That is, one of actuation members 250 slides horizontally in FIGS. 19-20B. The movement of one of actuation members 250 causes actuation bolt 241 to engage one of inclined edges 257. Given that the movement of actuation members 250 is constrained to the direction that is perpendicular to the length of feeder arm 240, actuation bolt 241 rolls or slides against inclined edge 257 and induces feeder arm 240 to translate to the extended position. Upon removal of force 222, spring 242 pulls feeder arm 240 from the extended position to the retracted position.

(105)Based upon the above discussion, combination feeder 220 reciprocates between the

retracted position and the extended position depending upon whether a yarn or other strand is being utilized for knitting, tucking, or floating or being utilized for inlaying. Combination feeder 220 has a configuration wherein the application of force 222 induces feeder arm 240 to translate from the retracted position to the extended position, and removal of force 222 induces feeder arm 240 to translate from the extended position to the retracted position. That is, combination feeder 220 has a configuration wherein the application and removal of force 222 causes feeder arm 240 to reciprocate between opposite sides of needle beds 201. In general, outside ends 253 may be considered actuation areas, which induce movement in feeder arm 240. In further configurations of combination feeder 220, the actuation areas may be in other locations or may respond to other stimuli to induce movement in feeder arm 240. For example, the actuation areas may be electrical inputs coupled to servomechanisms that control movement of feeder arm 240. Accordingly, combination feeder 220 may have a variety of structures that operate in the same general manner as the configuration discussed above.

(106)Knitting Process

(98) (107)The manner in which knitting machine 200 operates to manufacture a knitted component will now be discussed in detail. Moreover, the following discussion will demonstrate the operation of combination feeder 220 during a knitting process. Referring to FIG. 21A, a portion of knitting machine 200 that includes various needles 202, rail 203, standard feeder 204, and combination feeder 220 is depicted. Whereas combination feeder 220 is secured to a front side of rail 203, standard feeder 204 is secured to a rear side of rail 203. Yarn 206 passes through combination feeder 220, and an end of yarn 206 extends outward from dispensing tip 246. Although yarn 206 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through combination feeder 220. Another yarn 211 passes through standard feeder 204 and forms a portion of a knitted component 260, and loops of yarn 211 forming an uppermost course in knitted component 260 are held by hooks located on ends of needles 202.(108)The knitting process discussed herein relates to the formation of knitted component 260, which may be any knitted component, including knitted components that are similar to knitted components 130 and 150. For purposes of the discussion, only a relatively small section of knitted component 260 is shown in the figures in order to permit the knit structure to be illustrated. Moreover, the scale or proportions of the various elements of knitting machine 200 and knitted component 260 may be enhanced to better illustrate the knitting process.(109)Standard feeder 204 includes a feeder arm 212 with a dispensing tip 213. Feeder arm 212 is angled to position dispensing tip 213 in a location that is (a) centered between needles 202 and (b) above an intersection of needle beds 201. FIG. 22A depicts a schematic cross-sectional view of this configuration. Note that needles 202 lay on different planes, which are angled relative to each other. That is, needles 202 from needle beds 201 lay on the different planes. Needles 202 each have a first position and a second position. In the first position, which is shown in solid line, needles 202 are retracted. In the second position, which is shown in dashed line, needles 202 are extended. In the first position, needles 202 are spaced from the intersection where the planes upon which needle beds 201 lay meet. In the second position, however, needles 202 are

extended and pass through the intersection where the planes upon which needle beds 201 meet. That is, needles 202 cross each other when extended to the second position. It should be noted that dispensing tip 213 is located above the intersection of the planes. In this position, dispensing tip 213 supplies yarn 211 to needles 202 for purposes of knitting, tucking, and floating.

(110)Combination feeder 220 is in the retracted position, as evidenced by the orientation of arrow 221. Feeder arm 240 extends downward from carrier 230 to position dispensing tip 246 in a location that is (a) centered between needles 202 and (b) above the intersection of needle beds 201. FIG. 22B depicts a schematic cross-sectional view of this configuration. Note that dispensing tip 246 is positioned in the same relative location as dispensing tip 213 in FIG. 22A.

(111)Referring now to FIG. 21B, standard feeder 204 moves along rail 203 and a new course is formed in knitted component 260 from yarn 211. More particularly, needles 202 pulled sections of yarn 211 through the loops of the prior course, thereby forming the new course. Accordingly, courses may be added to knitted component 260 by moving standard feeder 204 along needles 202, thereby permitting needles 202 to manipulate yarn 211 and form additional loops from yarn 211.

(112)Continuing with the knitting process, feeder arm 240 now translates from the retracted position to the extended position, as depicted in FIG. 21C. In the extended position, feeder arm 240 extends downward from carrier 230 to position dispensing tip 246 in a location that is (a) centered between needles 202 and (b) below the intersection of needle beds 201. FIG. 22C depicts a schematic cross-sectional view of this configuration. Note that dispensing tip 246 is positioned below the location of dispensing tip 246 in FIG. 22B due to the translating movement of feeder arm 240.

(113)Referring now to FIG. 21D, combination feeder 220 moves along rail 203 and yarn 206 is placed between loops of knitted component 260. That is, yarn 206 is located in front of some loops and behind other loops in an alternating pattern. Moreover, yarn 206 is placed in front of loops being held by needles 202 from one needle bed 201, and yarn 206 is placed behind loops being held by needles 202 from the other needle bed 201. Note that feeder arm 240 remains in the extended position in order to lay yarn 206 in the area below the intersection of needle beds 201. This effectively places yarn 206 within the course recently formed by standard feeder 204 in FIG. 21B.

(114)In order to complete inlaying yarn 206 into knitted component 260, standard feeder 204 moves along rail 203 to form a new course from yarn 211, as depicted in FIG. 21E. By forming the new course, yarn 206 is effectively knit within or otherwise integrated into the structure of knitted component 260. At this stage, feeder arm 240 may also translate from the extended position to the retracted position.

(115)FIGS. 21D and 21E show separate movements of feeders 204 and 220 along rail 203. That is, FIG. 21D shows a first movement of combination feeder 220 along rail 203, and FIG. 21E shows a second and subsequent movement of standard feeder 204 along rail 203. In many knitting processes, feeders 204 and 220 may effectively move simultaneously to inlay yarn 206 and form a new course from yarn 211.

Combination feeder 220, however, moves ahead or in front of standard feeder 204 in order to position yarn 206 prior to the formation of the new course from yarn 211.

(116)The general knitting process outlined in the above discussion provides an example of the manner in which inlaid strands 132 and 152 may be located in knit elements 131 and 151. More particularly, knitted components 130 and 150 may be formed by utilizing combination feeder 220 to effectively insert inlaid strands 132 and 152 into knit elements 131. Given the reciprocating action of feeder arm 240, inlaid strands may be located within a previously formed course prior to the formation of a new course.

(117)Continuing with the knitting process, feeder arm 240 now translates from the retracted position to the extended position, as depicted in FIG. 21F. Combination feeder 220 then moves along rail 203 and yarn 206 is placed between loops of knitted component 260, as depicted in FIG. 21G. This effectively places yarn 206 within the course formed by standard feeder 204 in FIG. 21E. In order to complete inlaying yarn 206 into knitted component 260, standard feeder 204 moves along rail 203 to form a new course from yarn 211, as depicted in FIG. 21H. By forming the new course, yarn 206 is effectively knit within or otherwise integrated into the structure of knitted component 260. At this stage, feeder arm 240 may also translate from the extended position to the retracted position.

(118)Referring to FIG. 21H, yarn 206 forms a loop 214 between the two inlaid sections. In the discussion of knitted component 130 above, it was noted that inlaid strand 132 repeatedly exits knit element 131 at perimeter edge 133 and then re-enters knit element 131 at another location of perimeter edge 133, thereby forming loops along perimeter edge 133, as seen in FIGS. 5 and 6. Loop 214 is formed in a similar manner. That is, loop 214 is formed where yarn 206 exits the knit structure of knitted component 260 and then re-enters the knit structure.

(119)As discussed above, standard feeder 204 has the ability to supply a yarn (e.g., yarn 211) that needles 202 manipulate to knit, tuck, and float. Combination feeder 220, however, has the ability to supply a yarn (e.g., yarn 206) that needles 202 knit, tuck, or float, as well as inlaying the yarn. The above discussion of the knitting process describes the manner in which combination feeder 220 inlays a yarn while in the extended position. Combination feeder 220 may also supply the yarn for knitting, tucking, and floating while in the retracted position. Referring to FIG. 21I, for example, combination feeder 220 moves along rail 203 while in the retracted position and forms a course of knitted component 260 while in the retracted position. Accordingly, by reciprocating feeder arm 240 between the retracted position and the extended position, combination feeder 220 may supply yarn 206 for purposes of knitting, tucking, floating, and inlaying. An advantage to combination feeder 220 relates, therefore, to its versatility in supplying a yarn that may be utilized for a greater number of functions than standard feeder 204

(120)The ability of combination feeder 220 to supply yarn for knitting, tucking, floating, and inlaying is based upon the reciprocating action of feeder arm 240. Referring to FIGS. 22A and 22B, dispensing tips 213 and 246 are at identical positions relative to

needles 220. As such, both feeders 204 and 220 may supply a yarn for knitting, tucking, and floating. Referring to FIG. 22C, dispensing tip 246 is at a different position. As such, combination feeder 220 may supply a yarn or other strand for inlaying. An advantage to combination feeder 220 relates, therefore, to its versatility in supplying a yarn that may be utilized for knitting, tucking, floating, and inlaying.

(121)Further Knitting Process Considerations

(122)Additional aspects relating to the knitting process will now be discussed. Referring to FIG. 23, the upper course of knitted component 260 is formed from both of yarns 206 and 211. More particularly, a left side of the course is formed from yarn 211, whereas a right side of the course is formed from yarn 206. Additionally, yarn 206 is inlaid into the left side of the course. In order to form this configuration, standard feeder 204 may initially form the left side of the course from yarn 211. Combination feeder 220 then lays yarn 206 into the right side of the course while feeder arm 240 is in the extended position. Subsequently, feeder arm 240 moves from the extended position to the retracted position and forms the right side of the course. Accordingly, combination feeder may inlay a yarn into one portion of a course and then supply the yarn for purposes of knitting a remainder of the course.

(123)FIG. 24 depicts a configuration of knitting machine 200 that includes four combination feeders 220. As discussed above, combination feeder 220 has the ability to supply a yarn (e.g., yarn 206) for knitting, tucking, floating, and inlaying. Given this versatility, standard feeders 204 may be replaced by multiple combination feeders 220 in knitting machine 200 or in various conventional knitting machines.

(124)FIG. 8B depicts a configuration of knitted component 130 where two yarns 138 and 139 are plated to form knit element 131, and inlaid strand 132 extends through knit element 131. The general knitting process discussed above may also be utilized to form this configuration. As depicted in FIG. 15, knitting machine 200 includes multiple standard feeders 204, and two of standard feeders 204 may be utilized to form knit element 131, with combination feeder 220 depositing inlaid strand 132. Accordingly, the knitting process discussed above in FIGS. 21A-21I may be modified by adding another standard feeder 204 to supply an additional yarn. In configurations where yarn 138 is a non-fusible yarn and yarn 139 is a fusible yarn, knitted component 130 may be heated following the knitting process to fuse knitted component 130.

(125)The portion of knitted component 260 depicted in FIGS. 21A-21I has the configuration of a rib knit textile with regular and uninterrupted courses and wales. That is, the portion of knitted component 260 does not have, for example, any mesh areas similar to mesh knit zones 163-165 or mock mesh areas similar to mock mesh knit zones 166 and 167. In order to form mesh knit zones 163-165 in either of knitted components 150 and 260, a combination of a racked needle bed 201 and a transfer of stitch loops from front to back needle beds 201 and back to front needle beds 201 in different racked positions is utilized. In order to form mock mesh areas similar to mock mesh knit zones 166 and 167, a combination of a racked needle bed and a transfer of stitch loops from front to back needle beds 201 is utilized.

~~(126)Courses within a knitted component are generally parallel to each other. Given that a majority of inlaid strand 152 follows courses within knit element 151, it may be suggested that the various sections of inlaid strand 152 should be parallel to each other. Referring to FIG. 9, for example, some sections of inlaid strand 152 extend between edges 153 and 155 and other sections extend between edges 153 and 154. Various sections of inlaid strand 152 are, therefore, not parallel. The concept of forming darts may be utilized to impart this non-parallel configuration to inlaid strand 152. More particularly, courses of varying length may be formed to effectively insert wedge-shaped structures between sections of inlaid strand 152. The structure formed in knitted component 150, therefore, where various sections of inlaid strand 152 are not parallel, may be accomplished through the process of darting.(127)Although a majority of inlaid strands 152 follow courses within knit element 151, some sections of inlaid strand 152 follow wales. For example, sections of inlaid strand 152 that are adjacent to and parallel to inner edge 155 follow wales. This may be accomplished by first inserting a section of inlaid strand 152 along a portion of a course and to a point where inlaid strand 152 is intended to follow a wale. Inlaid strand 152 is then kicked back to move inlaid strand 152 out of the way, and the course is finished. As the subsequent course is being formed, inlay strand 152 is again kicked back to move inlaid strand 152 out of the way at the point where inlaid strand 152 is intended to follow the wale, and the course is finished. This process is repeated until inlaid strand 152 extends a desired distance along the wale. Similar concepts may be utilized for portions of inlaid strand 132 in knitted component 130.~~1700 operates to manufacture a knitted component will now be discussed in detail. Moreover, the following discussion will demonstrate the operation of one or more standard feeders 1720 and/or combination feeders 1722 during a knitting process. The knitting process discussed herein relates to the formation of various knitted components, which may be any knitted component, including knitted components that are similar to knitted components in the embodiments described above. For purposes of the discussion, only a relatively small section of a knitted component may be shown in the figures in order to permit the knit structure to be illustrated. Moreover, the scale or proportions of the various elements of knitting machine 1700 and a knitted component may be enhanced to better illustrate the knitting process. It should be understood that although a knitted component is formed between needle beds 1701, 1702, for purposes of illustration in FIGS. 18 through 29, a knitted component is shown adjacent to needle beds 1701, 1702 to (a) be more visible during discussion of the knitting process and (b) show the position of portions of the knitted component relative to each other and needle beds 1701, 1702. Also, although one rail, and limited numbers of standard feeders and combination feeders are depicted, additional rails, standard feeders, and combination feeders may be used. Accordingly, the general structure of knitting machine 1700 is simplified for purposes of explaining the knitting process.

(99) FIGS. 18 through 21 illustrate an exemplary process of knitting a knitted component in the form of first knitted component 500, described above. Referring to FIG. 18, a portion of knitting machine 1700 that includes needles 1703 associated with front needle bed 1701, needles 1704 associated with back needle bed 1702, and forward rail 1710 is shown. Additionally, in this embodiment, knitting machine 1700

may include a first standard feeder 1800 and a second standard feeder 1802 that are substantially similar to standard feeder 1720, described above. First standard feeder 1800 may be secured to a front side of front rail 1710 and second standard feeder 1802 may be secured to a rear side of front rail 1710. In other embodiments, additional feeders may be used and may be located on the front or rear side of front rail 1710 and/or rear rail 1711.

(100) In this embodiment, a first yarn 1801 from a spool (not shown) passes through first standard feeder 1800 and an end of yarn 1801 extends outward from a dispensing tip at the end of first standard feeder 1800. Although yarn 1801 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through first standard feeder 1800. A second yarn 1803 similarly passes through second standard feeder 1802 and extends outward from a dispensing tip. In an exemplary embodiment, first yarn 1801 and second yarn 1803 may be used to form portions of first knitted component 500. In this embodiment, loops of first yarn 1801 are shown forming an uppermost course of medial heel edge 507 of first knitted component 500 and are held by hooks located on ends of needles 1703 and needles 1704. Similarly, loops of second yarn 1803 may be used to form lateral heel edge 506 of first knitted component 500.

(101) Next, as shown in FIG. 19, knitting machine 1700 may use a similar process to add additional courses to the material forming first knitted component 500 to form further portions, including lateral perimeter edge 504, medial perimeter edge 505, lateral inner edge 508, medial inner edge 509, and front inner edge 510 of integral knit tongue 512. In this embodiment, first standard feeder 1800 and second standard feeder 1802 may form integral knit tongue 512 according to the loop diagram illustrated in FIG. 16, above. FIG. 20 illustrates knitting machine 1700 completing the courses associated with knitting integral knit tongue 512, lateral raised element 514, medial raised element 515, and a portion of the rest of first knitted component 500 forming upper 502. FIG. 21 illustrates knitting machine 1700 nearly completing the knitting process of forming first knitted component 500. By adding additional courses using a similar process, first knitted component 500 may be completed.

(102) FIGS. 22 through 25 illustrate an exemplary process of knitting a knitted component in the form of third knitted component 1000, described above. Referring to FIG. 22, a portion of knitting machine 1700 that includes needles 1703 associated with front needle bed 1701, needles 1704 associated with back needle bed 1702, and forward rail 1710 is shown. Additionally, in this embodiment, knitting machine 1700 may include a first standard feeder 2200 and a second standard feeder 2204 that are substantially similar to standard feeder 1720, described above and a combination feeder 2202 that is substantially similar to combination feeder 1722, described above. First standard feeder 1800 and combination feeder 2202 may be secured to a front side of front rail 1710 and second standard feeder 2204 may be secured to a rear side of front rail 1710. In other embodiments, additional feeders may be used and may be located on the front or rear side of front rail 1710 and/or rear rail 1711.

(103) In this embodiment, a first yarn 2201 from a spool (not shown) passes through first standard feeder 2200 and an end of yarn 2201 extends outward from a dispensing

tip at the end of first standard feeder 2200. Although yarn 2201 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through first standard feeder 2200. A second yarn 2205 similarly passes through second standard feeder 2204 and extends outward from a dispensing tip. A third yarn 2203 passes through combination feeder 2202 to a dispensing tip. In an exemplary embodiment, third yarn 2203 may be a different type of yarn than first yarn 2201 and/or second yarn 2205. In this embodiment, third yarn 2203 may be a tensile element or other inlaid strand. In an exemplary embodiment, first yarn 2201 and second yarn 2205 may be used to form portions of a knit element of third knitted component 1000, whereas third yarn 2203 may be inlaid within the knit element as a tensile element of third knitted component 1000. In other embodiments, however, third yarn 2203 may be used to form portions of a knit element of third knitted component 1000.

(104) ~~(128)A variety of procedures may be utilized to reduce relative movement between (a) knit element 131 and inlaid strand 132 or (b) knit element 151 and inlaid strand 152. That is, various procedures may be utilized to prevent inlaid strands 132 and 152 from slipping, moving through, pulling out, or otherwise becoming displaced from knit elements 131 and 151. For example, fusing one or more yarns that are formed from thermoplastic polymer materials to inlaid strands 132 and 152 may prevent movement between inlaid strands 132 and 152 and knit elements 131 and 151. Additionally, inlaid strands 132 and 152 may be fixed to knit elements 131 and 151 when periodically fed to knitting needles as a tuck element. That is, inlaid strands 132 and 152 may be formed into tuck stitches at points along their lengths (e.g., once per centimeter) in order to secure inlaid strands 132 and 152 to knit elements 131 and 151 and prevent movement of inlaid strands 132 and 152.~~In this embodiment, loops of first yarn 2201 and loops of second yarn 2205 are shown forming free portion 1014 of integral knit tongue 1010 of third knitted component 1000 and are held by hooks located on ends of needles 1703 and needles 1704. Additionally, FIG. 23 illustrates knitting machine 1700 completing the courses forming free portion 1014. In some embodiments, at least the final course of free portion 1014 may include cross-tuck stitches with a relatively tight or dense knit to ensure that free portion 1014 of integral knit tongue 1010 remains properly positioned on needles 1701, 1702 during later stages of the knitting process to be joined with the remaining portion of integral knit tongue 1010.

(105) Knitting machine 1700 now begins the process of forming the remaining portion of the knit element forming third knitted component 1000, in accordance with a similar knitting process discussed above. In an exemplary embodiment, loops of first yarn 2201 may then begin to form an uppermost course of medial heel edge 1007 of third knitted component 1000 and loops of second yarn 2205 may be used to form lateral heel edge 1006 of third knitted component 1000.

(106) Referring now to FIG. 24, as the knitting process continues, first standard feeder 2200 and second standard feeder 2204 may continue adding courses to third knitting component 1000, including lateral perimeter edge 1004, medial perimeter edge 1005, lateral inner edge 1008, medial inner edge 1009, and partially integral portion 1012 of integral knit tongue 1010. In this embodiment, first standard feeder 2200 and second

standard feeder 2204 may form partially integral portion 1012 of integral knit tongue 1010 according to the loop diagram illustrated in FIG. 16, above. Additionally, in this embodiment, combination feeder 2202 inlays third yarn 2203 to form tensile element 1040, as depicted in FIG. 24, also in accordance with the knitting process discussed in the Inlaid Strand cases.

(107) (129)Following the knitting process described above, various operations may be performed to enhance the properties of either of knitted components 130 and 150. For example, a water-repellant coating or other water-resisting treatment may be applied to limit the ability of the knit structures to absorb and retain water. As another example, knitted components 130 and 150 may be steamed to improve loft and induce fusing of the yarns. As discussed above with respect to FIG. 8B, yarn 138 may be a non-fusible yarn and yarn 139 may be a fusible yarn. When steamed, yarn 139 may melt or otherwise soften so as to transition from a solid state to a softened or liquid state, and then transition from the softened or liquid state to the solid state when sufficiently cooled. As such, yarn 139 may be utilized to join (a) one portion of yarn 138 to another portion of yarn 138, (b) yarn 138 and inlaid strand 132 to each other, or (c) another element (e.g., logos, trademarks, and placards with care instructions and material information) to knitted component 130, for example. Accordingly, a steaming process may be utilized to induce fusing of yarns in knitted components 130 and 150.(130)Although procedures associated with the steaming process may vary greatly, one method involves pinning one of knitted components 130 and 150 to a jig during steaming. An advantage of pinning one of knitted components 130 and 150 to a jig is that the resulting dimensions of specific areas of knitted components 130 and 150 may be controlled. For example, pins on the jig may be located to hold areas corresponding to perimeter edge 133 of knitted component 130. By retaining specific dimensions for perimeter edge 133, perimeter edge 133 will have the correct length for a portion of the lasting process that joins upper 120 to sole structure 110. Accordingly, pinning areas of knitted components 130 and 150 may be utilized to control the resulting dimensions of knitted components 130 and 150 following the steaming process.(131)The knitting process described above for forming knitted component 260 may be applied to the manufacture of knitted components 130 and 150 for footwear 100. The knitting process may also be applied to the manufacture of a variety of other knitted components. That is, knitting processes utilizing one or more combination feeders or other reciprocating feeders may be utilized to form a variety of knitted components. As such, knitted components formed through the knitting process described above, or a similar process, may also be utilized in other types of apparel (e.g., shirts, pants, socks, jackets, undergarments), athletic equipment (e.g., golf bags, baseball and football gloves, soccer ball restriction structures), containers (e.g., backpacks, bags), and upholstery for furniture (e.g., chairs, couches, car seats). The knitted components may also be utilized in bed coverings (e.g., sheets, blankets), table coverings, towels, flags, tents, sails, and parachutes. The knitted components may be utilized as technical textiles for industrial purposes, including structures for automotive and aerospace applications, filter materials, medical textiles (e.g. bandages, swabs, implants), geotextiles for reinforcing embankments, agrotextiles for crop protection, and industrial apparel that protects or insulates against heat and radiation. Accordingly, knitted components formed through the knitting process

described above, or a similar process, may be incorporated into a variety of products for both personal and industrial purposes.(132)Knitted Components With TonguesIn an exemplary embodiment, during the knitting process depicted between FIG. 23 and FIG. 24, free portion 1014 of integral knit tongue 1010 may remain stationary relative to needle beds 1701, 1702, as the portions of third knitted component 1000 move downward and may overlap free portion 1014 as successive courses are formed in third knitted component 1000. This continues until a course is formed that is intended to join free portion 1014 to the partially integral portion 1012 of integral knit tongue 1010 formed with the rest of third knitted component 1000. FIG. 25 illustrates knitting machine 1700 nearly completing the knitting process of forming third knitted component 1000. By adding additional courses using a similar process, third knitted component 1000 may be completed.

(108) Additionally, in the knitting process depicted in FIGS. 22 through 25, the relative position of the various feeders on first rail 1710 may restrict the portions of third knitted component 1000 that may be formed by each respective feeder. For example, because of the placement of combination feeder 2202, first standard feeder 2200 may be permitted to form both a front and back portion (associated with first surface 1030 and second surface 1032, respectively) of third knitted component 1000 along a medial side and across partially integral portion 1012 of integral knit tongue 1010, but be restricted from forming a portion of third knitted component 1000 along a lateral side. Similarly, second standard feeder 2204 may be permitted to form both the front and back portion of third knitted component 1000 along the lateral side and across partially integral portion 1012 of integral knit tongue 1010, but be restricted from forming a portion of third knitted component 1000 along the medial side. With this arrangement, the knitting process depicted in FIGS. 22-25 may require that specific feeders are used to form specific portions of third knitted component 1000.

(133)In footwear 100, tongue 124 is separate from knitted component 130 and joined to knitted component 130, possibly with stitching, an adhesive, or thermal bonding. Moreover, tongue 124 is discussed as being added to knitted component 130 following the knitting process. As depicted in FIGS. 25 and 26, however, knitted component 130 includes a knitted tongue 170 that is formed of unitary knit construction with knit element 131. That is, knit element 131 and tongue 170 are formed as a one-piece element through a knitting process, which will be discussed in greater detail below. Although tongue 124 or another tongue may be joined to knit element 131 after knitted component 130 is formed, tongue 170 or another knitted tongue may be formed during the knitting process and of unitary knit construction with a portion of knitted component 130.

(134)Tongue 170 is located within a throat area (i.e., where lace 122 and lace apertures 123 are located) of knitted component 130 and extends along the throat area. When incorporated into footwear 100, for example, tongue 170 extends from a forward portion of the throat area to ankle opening 121. As with knit element 131, tongue 170 is depicted as being formed from a relatively untextured textile and a common or single knit structure. Tongue 170 is also depicted in FIG. 27 as having a generally planar configuration. Examples of knit structures that may impart this configuration for tongue 170, as well as knit element 131, are any of the various knit structures in

knit zones 160- 162 discussed above. In further configurations, however, apertures may be formed in areas of tongue 170 by utilizing the knit structures of mesh knit zones 163-165, indentations may be formed in areas of tongue 170 by utilizing the knit structures of mock mesh knit zones 166 or 167, or a combination of apertures and indentations may be formed in areas of tongue 170 by utilizing the knit structure of hybrid knit zone 168.

(109) FIGS. 26 through 29 illustrate an exemplary process of knitting a knitted component similar to fourth knitted component 1300, described above. Referring to FIG. 26, a portion of knitting machine 1700 that includes needles 1703 associated with front needle bed 1701, needles 1704 associated with back needle bed 1702, and forward rail 1710 is shown. Additionally, in this embodiment, knitting machine 1700 may include a first standard feeder 2600, a second standard feeder 2602, and a third standard feeder 2604 that are substantially similar to standard feeder 1720, described above. In addition, in embodiments where fourth knitted component 1300 includes tensile elements, a combination feeder (not shown) that is substantially similar to combination feeder 1722, described above, may be included to form tensile element 1340 according to the process described above with regard to the knitting process of third knitted component 1000 and as described in the Inlaid Strand cases. For the purposes of ease of illustration, therefore, fourth knitted component 1300 will be illustrated in FIGS. 26 through 29 without tensile element 1340.

(110) Referring again to FIG. 26, first standard feeder 2600 and second standard feeder 2602 may be secured to a front side of front rail 1710 and third standard feeder 2604 may be secured to a rear side of front rail 1710. In other embodiments, additional feeders may be used and may be located on the front or rear side of front rail 1710 and/or rear rail 1711.

(111) In this embodiment, a first yarn 2601 from a spool (not shown) passes through first standard feeder 2600 and an end of yarn 2601 extends outward from a dispensing tip at the end of first standard feeder 2600. Although yarn 2601 is depicted, any other strand (e.g., filament, thread, rope, webbing, cable, chain, or yarn) may pass through first standard feeder 2600. A second yarn 2603 similarly passes through second standard feeder 2602 and extends outward from a dispensing tip. A third yarn 2605 also passes through third standard feeder 2604 to a dispensing tip in a similar manner. In an exemplary embodiment, second yarn 2603 may be a different type of yarn than first yarn 2601 and/or third yarn 2605. In this embodiment, second yarn 2603 may be an elastic yarn that has a larger amount or degree of elasticity than first yarn 2601 and/or third yarn 2605, which may be a substantially inelastic yarn or a yarn with a small amount or degree of elasticity. In an exemplary embodiment, first yarn 2601 and third yarn 2605 may be used to form lateral and medial portions of a knit element forming fourth knitted component 1300, whereas second yarn 2603 may be used to form the elastic portion of integral knit tongue 1310 that is centrally-located within throat area 1320 of fourth knitted component 1300. In other embodiments, however, second yarn 2603 may be further used to form other portions of the knit element of fourth knitted component 1300.

(112) Referring now to FIG. 27, loops of first yarn 2601 are shown forming an

uppermost course of medial heel edge 1307 of fourth knitted component 1300 and loops of third yarn 2605 may be used to form lateral heel edge 1306 of fourth knitted component 1300. Second yarn 2603 may not yet be used to form any portion of fourth knitted component 1300. Next, as shown in FIG. 28, knitting machine 1700 may use a similar process to add additional courses to the material forming fourth knitted component 1300 to form further portions, including lateral perimeter edge 1304, medial perimeter edge 1305, lateral inner edge 1308, and medial inner edge 1309. In addition, at this point, second standard feeder 2602 may have begun to use second yarn 2603 to form portions of fourth knitted component 1300, including integral knit tongue 1312, which extends from needles 1701, 1702 to the completed top end 1314.

(113) In this embodiment, second standard feeder 2602 may form integral knit tongue 1310 using an elastic yarn so as to permit throat area 1320 of fourth knitted component 1300 to stretch. In addition, fourth knitted component 1300 may be formed with one or more decoupled knit layers, as described above. FIG. 29 illustrates knitting machine 1700 completing the courses associated with knitting integral knit tongue 1310 and the rest of fourth knitted component 1300 forming upper 1302. By adding additional courses using a similar process, fourth knitted component 1300 may be completed.

(114) Additionally, ~~areas of tongue 170 may have a padded aspect when formed to have layers and floating yarns, for example, that are similar to padded zone 169. Accordingly, the untextured and planar aspect of tongue 170 is shown for purposes of example, and various features may be imparted through the use of different knit structures.(135)Referring to FIGS. 28 and 29, a knitted tongue 175 is depicted as being formed of unitary knit construction with knit element 151 of knitted component 150. Tongue 175 has the same general shape as tongue 170, but may have a padded aspect with greater thickness. More particularly, tongue 175 is depicted in FIG. 30 as including two overlapping and at least partially coextensive knitted layers 176, which may be formed of unitary knit construction, and a plurality of yarn loops 177 located between layers 176. Although the sides or edges of layers 176 are secured or knit to each other, a central area is generally unsecured. As such, layers 176 effectively form a tube or tubular structure, and yarn loops 177 are located between and extend outward from one of layers 176. In effect, yarn loops 177 fill an interior volume between layers 176 and impart a compressible or padded aspect to tongue 175. It should also be noted that each of layers 176 and yarn loops 177 may be formed of unitary knit construction during the knitting process that forms knitted component 150.~~

~~(136)Another knitted component 180 is depicted in FIG. 31 as including a knit element 181, an inlaid strand 182, and a knitted tongue 183. With the exception of the presence of tongue 183, knitted component 180 has a general structure of a knitted component disclosed in U.S. Patent Application Publication 2010/0154256 to Dua, which is incorporated herein by reference. Tongue 183 is formed of unitary knit construction with knit element 181 and includes various knit structures. Referring to FIG. 32, for example, peripheral areas of tongue 183 exhibit an untextured configuration that may have any of the various knit structures in knit zones 160-162. At least two areas of tongue 183 incorporate apertures and may have any of the various knit structures in mesh knit zones 163-165. Referring to FIG. 33, a central area of tongue 183 has a~~

compressible or padded aspect that includes two overlapping and at least partially coextensive knitted layers 184, which may be formed of unitary knit construction, and a plurality of floating yarns 185 extending between layers 184. The central area of tongue 183 may exhibit, therefore, the knit structure of padded zone 169. Although the sides or edges of layers 184 are secured to each other, a central area is generally unsecured. As such, layers 184 effectively form a tube or tubular structure, and floating yarns 185 may be located or inlaid between layers 184 to pass through the tubular structure. That is, floating yarns 185 extend between layers 184, are generally parallel to surfaces of layers 184, and also pass through and fill an interior volume between layers 184. Whereas a majority of tongue 183 is formed from yarns that are mechanically manipulated to form intermeshed loops, floating yarns 185 are generally free or otherwise inlaid within the interior volume between layers 184. As an additional matter, layers 184 may be at least partially formed from a stretch yarn to impart the advantages discussed above for knitted layers 140 and floating yarns 141.

(137)Tongue 183 provides an example of the manner in which various knit structures may be utilized. As discussed above, the peripheral areas of tongue 183 exhibit an untextured configuration, two areas of tongue 183 incorporate apertures, and the central area of tongue 183 includes knitted layers 184 and floating yarns 185 to provide a compressible or padded aspect. Mock mesh knit structures and hybrid knit structures may also be utilized. Accordingly, various knit structures may be incorporated into tongue 183 or any other knitted tongue (e.g., tongues 170 and 175) to impart different properties or aesthetics.

(138)Tongue 170 is secured to a forward portion of the throat area of knit element 131. That is, tongue 170 is joined through knitting to knit element 131 in a portion of the throat area that is closest to forefoot region 101 in footwear 100. Each of tongues 175 and 183 are respectively secured or knit to a similar position in knitted components 150 and 180. Referring to FIGS. 34 and 35, however, a knitted tongue 190 is secured along a length of the throat area of a configuration of knitted component 131 that does not include inlaid strand 132 or lace apertures 123. More particularly, edges of tongue 190 are knit to an area of knit element 131 that is spaced outward from inner edge 135. Accordingly, any of the configurations of tongues 170, 175, 183, and 190 may be secured (e.g., through unitary knit construction) to various locations in the throat areas of knitted components 130, 150, and 180.

(139)Advantages of constructing tongue 170 during the knitting process and of unitary knit construction are more efficient manufacture and common properties. More particularly, manufacturing efficiency may be increased by forming more of knitted component 130 during the knitting process and eliminating various steps (e.g., making a separate tongue, securing the tongue) that are often performed manually. Tongue 170 and knit element 131 may also have common properties when formed from the same yarn (or type of yarn) or with similar knit structures. For example, utilizing the same yarn in both of tongue 170 and knit element 131 imparts similar durability, strength, stretch, wear- resistance, biodegradability, thermal, and hydrophobic properties. In addition to physical properties, utilizing the same yarn in both of tongue 170 and knit element 131 may impart common aesthetic or tactile properties, such as color, sheen, and texture. Utilizing the same knit structures in both of tongue

170 and knit element 131 may also impart common physical properties and aesthetic properties. These advantages may also be present when at least a portion of knit element 131 and at least a portion of tongue 170 are formed from a common yarn (or type of yarn) or with common knit structures.

(140)Tongue 175 includes yarn loops 177 between layers 176, and tongue 183 includes floating yarns 185 between layers 184. A benefit of yarn loops 177 and floating yarns 185 is that compressible or padded areas are formed. In addition to yarn loops 177 and floating yarns 185, other types of free yarn sections may be utilized. For purposes of the present application, "free yarn sections" or variants thereof is defined as segments or portions of yarns that are not directly forming intermeshed loops (e.g., that define courses and wales) of a knit structure, such as floating yarns, inlaid yarns, terry loops, ends of yarns, and cut segments of yarn, for example. Moreover, it should be noted that free yarn sections may be one portion of an individual yarn, with other portions of the yarn forming intermeshed loops of the knit structure, For example, the portion of a yarn forming terry loops (e.g., the free yarn sections) may be between portions of the yarn forming intermeshed loops of a knit structure. As an alternative to free yarn sections, foam materials or other types of compressible materials may be utilized within either of tongues 175 and 183.(141)As a final matter, although tongue 170 is disclosed in combination with knitted component 130, tongue 170 may also be utilized with knitted components 150 and 180, as well as other knitted components. Similarly, tongues 175, 183, and 190 may be utilized with any of knitted components 130, 150, and 180, as well as other knitted components. The combinations disclosed herein are, therefore, for purposes of example and other combinations may also be utilized. Moreover, the specific configurations of tongues 170, 175, 183, and 190 are also meant to provide examples and may also vary significantly. For example, the position of layers 184 and floating yarns 185 may be enlarged, moved to a periphery of tongue 183, or removed from tongue 183. Accordingly, the various combinations and configurations are intended to provide examples, and other combinations and configurations may also be utilized.in the knitting process depicted in FIGS. 26 through 29, the relative position of the various feeders on first rail 1710 may restrict the portions of fourth knitted component 1300 that may be formed by each respective feeder. For example, because the placement of second standard feeder 2602 is needed to form integral knit tongue 1310 with an elastic second yarn 2603, first standard feeder 2600 may be permitted to form both a front and back portion (associated with first surface 1330 and second surface 1332, respectively) of fourth knitted component 1300 along only a medial side of fourth knitted component 1300. Similarly, third standard feeder 2604 may be permitted to form both the front and back portion of fourth knitted component 1300 along only a lateral side of fourth knitted component 1300. Accordingly, second standard feeder 2602 may be used to form integral knit tongue 1310 spanning between the lateral side and the medial side of fourth knitted component 1300. With this arrangement, the knitting process depicted in FIGS. 26-29 may require that specific feeders are used to form specific portions of fourth knitted component 1300.

(115) The processes and methods for knitting a knitted component described above and illustrated in FIGS. 16 through 29 are exemplary and are not meant to be

exhaustive. Therefore, it should be understood that additional knitted components including the features of the embodiments described herein, as well as similar knitted components not explicitly described herein, may be made using one or more knitting processes that are substantially similar to the knitting methods for knitted components described above and/or in the Inlaid Strands cases.

(142)Tongue Knitting Process

(143)The manner in which knitting machine 200 operates to manufacture a knitted component with a tongue will now be discussed in detail. Moreover, the following discussion will demonstrate the manner in which knit element 131 and tongue 170 are formed of unitary knit construction, but similar processes may be utilized for other knitted components and tongues. Referring to FIGS. 36A-36G, a portion of knitting machine 200 is schematically depicted as including needle beds 201, one rail 203, one standard feeder 204, and one combination feeder 220. It should be understood that although knitted component 130 is formed between needle beds 201, knitted component 130 is shown adjacent to needle beds 201 to (a) be more visible during discussion of the knitting process and (b) show the position of portions of knitted component 130 relative to each other and needle beds 201. Also, although one rail 203, one standard feeder 204, and one combination feeder 220 are depicted, additional rails 203, standard feeders 204, and combination feeders 220 may be utilized. Accordingly, the general structure of knitting machine 200 is simplified for purposes of explaining the knitting process.

(144)Initially, a portion of tongue 170 is formed by knitting machine 200, as depicted in FIG. 36A. In forming this portion of tongue 170, standard feeder 204 repeatedly moves along rail 203 and various courses are formed from at least yarn 211. More particularly, needles 202 pull sections of yarn 211 through loops of a prior course, thereby forming another course. This action continues until tongue 170 is substantially formed, as depicted in FIG. 36B. It should be noted at this stage that although tongue 170 is depicted as being formed from one yarn 211, additional yarns may be incorporated into tongue 170 from further standard feeders 204. For example, a fusible yarn may be incorporated into at least the upper or final course of tongue 170 to assist with ensuring that tongue 170 is properly joined or knitted with knit element 131. Additionally, at least the final course of tongue 170 may include cross-tuck stitches with a relatively tight or dense knit to ensure that tongue 170 remains properly positioned on needles 202 during later stages of the knitting process.

(145)Knitting machine 200 now begins the process of forming knit element 131, as depicted in FIG. 36C, in accordance with the knitting process discussed previously. As the knitting process continues, combination feeder 220 inlays yarn 206 to form inlaid strand 132, as depicted in FIG. 36D, also in accordance with the knitting process discussed previously. Through a comparison of FIGS. 36C and 36D, tongue 170 remains stationary relative to needle beds 201, but knit element 131 moves downward and may overlap tongue 170 as successive courses are formed in knit element 131. This continues until a course is formed that is intended to join tongue 170 to knit element 131. More particularly, tongue 170 remains stationary relative to needle beds 201 as portions of knitted component 131 are formed. At the point depicted in FIG.

36E, however, a course is formed that (a) extends across the final course of tongue 170, which includes the cross- tuck stitches, and (b) joins with the final course of tongue 170. In effect, this course joins tongue 170 to knit element 131. At this stage, therefore, knit element 131 and tongue 170 are effectively formed of unitary knit construction.

(146)Once tongue 170 is joined to knit element 131, knitting machine 200 continues the process of forming courses, thereby forming more of knit element 131, as depicted in FIG. 36F. Given that tongue 170 is now joined to knit element 131, tongue 170 moves downward with knit element 131 as successive courses are formed, as seen through a comparison of FIGS. 36E and 36F. Moving forward, knitting machine 200 continues the process of forming courses in knit element 131 until knitted component 130 is substantially formed, as depicted in FIG. 36G.

(147)Now that the general process associated with forming knitted component 130 to include tongue 170 is presented, additional aspects of the knitting process will be discussed. As noted above, a fusible yarn may be incorporated into at least the final course of tongue 170 to assist with ensuring that tongue 170 is properly joined or knitted with knit element 131. In some knitting processes, the yarn forming the final course of tongue 170 is cut. By incorporating the fusible yarn into the final course of tongue 170, the knit structure at the interface of tongue 170 with knit element 131 may be strengthened. That is, melting of the fusible yarn will fuse or otherwise join the sections of yarn at the interface and prevent unraveling of the cut yarn.

(148)Also as noted above, at least the final course of tongue 170 may include cross-tuck stitches with a relatively tight or dense knit to ensure that tongue 170 remains properly positioned on needles 202 during later stages of the knitting process. During a majority of the knitting process that forms knit element 131, tongue 170 remains stationary relative to needle beds 201. Movement, vibration, or other actions of knitting machine 200 may, however, dislodge portions of the final course from needles 202, thereby forming dropped stitches. By forming cross-tuck stitches with a relatively tight or dense knit, fewer dropped stitches are formed. Moreover, if dropped stitches are formed, the fusible yarn within the final course will fuse or otherwise join the dropped stitches within the knit structure.

(116) (149)Once tongue 170 is knit, various needles 202 hold tongue 170 in position while knit element 131 is formed. In effect, the needles 202 that hold tongue 170 are unavailable for further knitting until tongue 170 is joined with knit element 131. As a result, only those needles 202 located beyond the edges (i.e., to the right and to the left) of tongue 170 are available for forming knit element 131. The final course of tongue 170 should, therefore, have equal or less width than the distance between opposite sides of inner edge 135 in the area where tongue 170 is joined with knit element 131. In other words, the design of knitted component 130 should account for (a) the length of the final course of tongue 170 and (b) the number of needles 202 that are reserved for holding tongue 170 while knit element 131 is formed.

(150)In the knitting process discussed above, both tongue 170 and knit element 131 are formed from yarn 211. Whereas tongue 170 remains stationary relative to needle beds

201 through a portion of the knitting process, portions of knit element 131 move downward as successive courses are formed. Given that a segment of yarn 211 may extend from the final course of tongue 170 to the first course of knit element 131 (i.e., the bottom edges of knit element 131), this segment of yarn should have sufficient length to account for the downward movement of the first course of knit element 131. In effect, a comparison of FIGS. 36C-36E, demonstrates that the first course of knit element 131 moves downward and away from the final course of tongue 170 as knit element 131 is formed. Accordingly, if a segment of yarn 211 extends from the final course of tongue 170 to the first course of knit element 131, this segment of yarn should have sufficient length to account for the growing distance between the final course of tongue 170 and the first course of knit element 131.

(151)Although various methods may be employed to account for the growing distance between the final course of tongue 170 and the first course of knit element 131, FIG. 37 depicts an expansion section 195 as being formed following the formation of tongue 170. Expansion section 195 may then be cast off of needles 202. As the distance between the final course of tongue 170 and the first course of knit element 131 increases, expansion section 195 may unravel and lengthen. That is, unraveling of expansion section 195 may be used to effectively lengthen the section of yarn 211 between the final course of tongue 170 and the first course of knit element 131. In some configurations, expansion section 195 may be formed as a jersey fabric to facilitate unraveling.

(152)The various FIGS. 36A-36G show knitted component 130 as being formed independently. In some knitting processes, however, a waste element is knit prior to forming knitted component 130. The waste element engages various rollers that provide a downward force upon knitted component 130. The downward force ensures that courses move away from needles 202 as later courses are formed.

(153)Based upon the above discussion, knit element 131 and tongue 170 may be formed of unitary knit construction through a single knitting process. As described, tongue 170 is formed first and remains stationary upon needle beds 201 as knit element 131 is formed. After a course is formed that joins knit element 131 and tongue 170, knit element 131 and tongue 170 move downward together as further portions of knit element 131 are formed.

(154)Sequential Alterations(155)Knitting machine 200 includes, among other elements, a knitting mechanism 270, a pattern 280, and a computing device 290, as schematically depicted in FIG. 38. Knitting mechanism 270 includes many of the mechanical components of knitting machine 200 (e.g., needles 202, feeders 204 and 220, carriage 205) that mechanically manipulate yarns 206 and 211 to form a knitted component (e.g., knitted component 130). Pattern 280 includes data on the knitted component, including the yarns that are utilized for each stitch, the type of knit structures formed by each stitch, and the specific needles 202 and feeders 204 and 220 that are used for each stitch, for example. The operation of knitting machine 200 is governed by computing device 290, which reads data from pattern 280 and directs the corresponding operation of knitting mechanism 270.

(156)Multiple and substantially identical knitted components may be formed by knitting machine 200. More particularly, computing device 290 may repeatedly read pattern 280 and direct knitting mechanism 270 to form substantially identical knitted components. In general, therefore, each knitted component that is formed will be substantially identical to other knitted components that are formed based upon a particular pattern 280. Referring to FIGS. 39A-39C, however, three versions of tongue 170 are shown. Whereas FIG. 39A depicts tongue 170 as including a knit structure (e.g., yarns with different colors) with alphanumeric characters that form "1 OF 100," FIGS. 39B and 39C respectively depict tongue 170 as including knit structures with alphanumeric characters that form "2 OF 100" and "3 OF 100."

(157)One manner of accomplishing the sequential alterations of the type shown in FIGS. 39A-39C is to create multiple patterns. In effect, each of the configurations of tongue 170 shown in FIGS. 39A-39C may have a different pattern. As an alternative, an application (e.g., software) run by computing device 290 may alter pattern 280 while each successive tongue 170 is formed to provide sequential alterations. For example, pattern 280 may include a modifiable field 281, which is an area of pattern 280 that can be updated or changed by computing device 290. For purposes of reference, portions of pattern 280 that correspond with "1," "2," and "3" in FIGS. 39A-39C may be governed by modifiable field 281. Computing device 290 may include a counter, for example, that updates modifiable field 281 with each successive knitted component that is formed. Accordingly, sequential alterations of pattern 280 may be automated through the use of an application run by computing device 290, thereby rectifying the need for different patterns 280 for each sequential variation of tongue 170.

(158)In operation, pattern 280 with modifiable field 281 is provided by an operator, designer, or manufacturer, for example. Computing device 290 may either form a first knitted component with a default setting for modifiable field 281 or may update modifiable field 281 according to other instructions or data. As such, for example, tongue 170 of FIG. 39A may be knitted with "1 OF 100." Computing device 290 now updates modifiable field 281 with data representing another alphanumeric character, possibly a sequential alphanumeric character when computing device 290 includes a counter, and tongue 170 of FIG. 39B may be knitted with "2 OF 100." The procedure repeats and computing device 290 updates modifiable field 281 with data representing another alphanumeric character and tongue 170 of FIG. 39C may be knitted with "3 OF 100." Accordingly, modifiable field of pattern 280 may be repeatedly updated with data representing different alphanumeric characters, possibly sequential alphanumeric characters.(159)The invention is disclosed above and in the accompanying figures with reference to a variety of configurations. The purpose served by the disclosure, however, is to provide an example of the various features and concepts related to the invention, not to limit the scope of the invention. One skilled in the relevant art will recognize that numerous variations and modifications may be made to the configurations described above without departing from the scope of the present invention, as defined by the appended claims.While various embodiments of the invention have been described, the description is intended to be exemplary, rather than limiting and it will be apparent to those of

ordinary skill in the art that many more embodiments and implementations are possible that are within the scope of the invention. Accordingly, the invention is not to be restricted except in light of the attached claims and their equivalents. Also, various modifications and changes may be made within the scope of the attached claims.

Claims

1. ~~A method of manufacturing a knitted component for an article of footwear, the method comprising: knitting a tongue with a knitting machine; holding the tongue on needles of the knitting machine; knitting a first portion of a knit element with the knitting machine while the tongue is held on the needles; joining the tongue to the first portion of the knit element; and knitting a second portion of the knit element with the knitting machine.~~

~~2.The method recited in claim 1, further including a step of selecting the knitting machine to be a flat knitting machine.~~

~~3.The method recited in claim 1, further including a step of knitting an expansion section following the step of knitting the tongue, and wherein the step of knitting the first portion of the knit element includes unraveling the expansion section.4.The method recited in claim 1, wherein the step of knitting the tongue includes forming a course of the tongue to include at least one of (a) a fusible yarn and (b) cross-tuck stitches.5.The method recited in claim 1, wherein the step of joining the tongue includes forming a course with the knitting machine that joins the tongue to the knit element.6.A method of manufacturing a knitted component for an article of footwear, the method comprising: knitting a tongue with a knitting machine; knitting a first portion of a knit element with the knitting machine, the tongue being stationary with respect to a needle bed of the knitting machine during knitting of the first portion of the knit element, and the first portion of the knit element moving with respect to the tongue during knitting of the first portion of the knit element; forming a course with the knitting machine that joins the tongue to the knit element; and knitting a second portion of the knit element with the knitting machine, the tongue and the first portion of the knit element moving together during knitting of the second portion of the knit element.~~An article of footwear having an upper and a sole structure secured to the upper, the article of footwear incorporating a knitted component comprising: a portion of the knitted component defining the upper, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component, the interior surface defining a void for receiving a foot; and an integral knit tongue formed with the upper and extending through a throat area of the knitted component; and at least one raised element extending a height above the exterior surface of the knitted component, wherein the integral knit tongue is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

2. The article of footwear recited in claim 1, wherein at least a portion of the integral knit tongue and a portion of the upper include at least one course having a common

yarn.

3. The article of footwear recited in claim 1, wherein at least a portion of the upper and a portion of the integral knit tongue are formed from a common knit structure.

4. The article of footwear recited in claim 1, wherein the at least one raised element is formed of unitary knit construction with the upper and the integral knit tongue.

5. The article of footwear recited in claim 4, wherein the knitted component includes at least two raised elements disposed on each of the lateral side and the medial side of the throat area of the upper and extending a height above the exterior surface of the knitted component.

6. The article of footwear recited in claim 4, wherein the at least one raised element further comprises at least one lace aperture configured to receive a lace.

7. The article of footwear recited in claim 1, wherein the integral knit tongue comprises at least a partially integral portion and a free portion; the partially integral portion being of unitary knit construction with the upper at the forward portion of the throat area and at least along the portion of the lateral side and the medial side of the throat area of the knitted component; and the free portion being of unitary knit construction with the partially integral portion at a rearward portion of the integral knit tongue and remaining unattached to the remaining portions of the knitted component.

8. The article of footwear recited in claim 1, wherein the upper comprises a first type of yarn; and wherein the integral knit tongue comprises a second type of yarn, the second type of yarn being different from the first type of yarn.

9. The article of footwear recited in claim 8, wherein the second type of yarn is an elastic yarn.

10. The article of footwear recited in claim 1, wherein the knitted component comprises at least two knit element layers, the at least two knit element layers including: a first knit element layer comprising a portion of the knitted component associated with the exterior surface; and a second knit element layer comprising a portion of the knitted component associated with the interior surface; and wherein the second knit element layer further includes the integral knit tongue.

11. The article of footwear recited in claim 10, wherein at least a first portion of the first knit element layer and the second knit element layer are decoupled along the throat area of the knitted component.

12. The article of footwear recited in claim 11, wherein at least a second portion of the first knit element layer and the second knit element layer are joined along the throat area of the knitted component.

13. A knitted component for an article of footwear, the knitted component

comprising: a portion of the knitted component defining an upper, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component, the interior surface configured to define a void for receiving a foot; and an integral knit tongue with the upper and extending through a throat area of the knitted component; and at least one raised element having at least one lace aperture configured to receive a lace, wherein the integral knit tongue is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

14. The knitted component recited in claim 13, wherein at least a portion of the integral knit tongue and a portion of the upper include at least one course having a common yarn.

15. The knitted component recited in claim 13, wherein at least a portion of the upper and a portion of the integral knit tongue are formed from a common knit structure.

16. The knitted component recited in claim 13, wherein the at least one raised element is formed of unitary knit construction with the upper and the integral knit tongue.

17. The knitted component recited in claim 16, comprising at least two raised elements disposed on each of a lateral side and a medial side of the upper and extending a height above the exterior surface of the knitted component.

18. The knitted component recited in claim 13, wherein the integral knit tongue comprises at least a partially integral portion and a free portion; the partially integral portion being of unitary knit construction with the upper at the forward portion of the throat area and at least along the portion of the lateral side and the medial side of the throat area of the knitted component; and the free portion being of unitary knit construction with the partially integral portion at a rearward portion of the integral knit tongue and remaining unattached to the remaining portions of the knitted component.

19. The knitted component recited in claim 13, wherein the upper comprises a first type of yarn; and wherein the integral knit tongue comprises a second type of yarn, the second type of yarn being different from the first type of yarn.

20. The knitted component recited in claim 19, wherein the second type of yarn is an elastic yarn.

21. A knitted component for an article of footwear, the knitted component comprising: an upper and an integral knit tongue formed of unitary knit construction with the upper and extending through a throat area of the knitted component; the knitted component comprising at least two knit element layers, including: a first knit element layer comprising a portion of an exterior surface of the knitted component; and a second knit element layer comprising a portion of an interior surface of the knitted component, the interior surface disposed opposite to the exterior surface and the interior surface being configured to define a void for

receiving a foot; and wherein the integral knit tongue is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

22. The knitted component recited in claim 21, wherein the second knit element comprises the integral knit tongue.

23. The knitted component recited in claim 21, wherein at least a first portion of the first knit element layer and the second knit element layer are decoupled along the throat area of the knitted component.

24. The knitted component recited in claim 23, wherein at least a second portion of the first knit element layer and the second knit element layer are joined along the throat area of the knitted component.

25. The knitted component recited in claim 21, wherein at least a portion of the integral knit tongue and a portion of the upper include at least one course having a common yarn.

26. The knitted component recited in claim 21, further comprising at least one raised element that is formed of unitary knit construction with the upper and the integral knit tongue.

~~7.The method recited in claim 6, further including a step of selecting the knitting machine to be a flat knitting machine.~~

~~8.The method recited in claim 6, further including a step of knitting an expansion section following the step of knitting the tongue, and wherein the step of knitting the first portion of the knit element includes unraveling the expansion section.~~

27. ~~9.~~The ~~method~~knitted component recited in claim ~~6,~~26, wherein the ~~step of knitting the tongue includes forming a final course of the tongue to include~~first knit element layer comprises the at least one ~~of (a) a fusible yarn and (b) cross-tuck stitches~~raised element.

Document comparison by Workshare 9.5 on Sunday, September 29, 2024 5:14:57 PM

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Statistics:	
	Count
Insertions	1316
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Moved from	0
Moved to	0
Style change	0
Format changed	0

Total changes	1939

Exhibit JJ

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I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: January 7, 2016 Name: Christopher J. Gerardot, Reg. No. 73,644 Signature: /Christopher J. Gerardot/

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Our Case No. 15571-75
Client Ref. No. 130056US01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Bhupesh Dua et al.		
Appln. No.:	13/781,525	Examiner:	Worrell Jr., Larry D.
Filed:	February 28, 2013	Art Unit:	3765
For:	ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH AN INTEGRAL KNIT TONGUE	Conf. No.:	7689

AMENDMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

In response to the Office Action mailed October 8, 2015, and in view of the following remarks and amendments, the Applicant kindly requests reconsideration of the rejections.

Amendments to the Claims begin on page **2** of this paper.

Remarks begin on page **8** of this paper.

Amendments to the Claims

The following listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) An article of footwear having an upper and a sole structure secured to the upper, the article of footwear incorporating a knitted component comprising:

a portion of the knitted component defining the upper, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component, the interior surface defining a void for receiving a foot; and

an integral knit tongue formed ~~of unitary knit construction~~ with the upper and extending through a throat area of the knitted component; and

at least one raised element extending a height above the exterior surface of the knitted component, [[and]]

wherein the integral knit tongue is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

2. (Original) The article of footwear recited in claim 1, wherein at least a portion of the integral knit tongue and a portion of the upper include at least one course having a common yarn.

3. (Original) The article of footwear recited in claim 1, wherein at least a portion of the upper and a portion of the integral knit tongue are formed from a common knit structure.

4. (Currently Amended) The article of footwear recited in claim 1, wherein the ~~knitted component further comprises~~ at least one raised element ~~that~~ is formed of unitary knit construction with the upper and the integral knit tongue.

NIKE-SKX_0520177

5. (Original) The article of footwear recited in claim 4, wherein the knitted component includes at least two raised elements disposed on each of the lateral side and the medial side of the throat area of the upper and extending a height above the exterior surface of the knitted component.

6. (Original) The article of footwear recited in claim 4, wherein the at least one raised element further comprises at least one lace aperture configured to receive a lace.

7. (Original) The article of footwear recited in claim 1, wherein the integral knit tongue comprises at least a partially integral portion and a free portion;

the partially integral portion being of unitary knit construction with the upper at the forward portion of the throat area and at least along the portion of the lateral side and the medial side of the throat area of the knitted component; and

the free portion being of unitary knit construction with the partially integral portion at a rearward portion of the integral knit tongue and remaining unattached to the remaining portions of the knitted component.

8. (Original) The article of footwear recited in claim 1, wherein the upper comprises a first type of yarn; and

wherein the integral knit tongue comprises a second type of yarn, the second type of yarn being different from the first type of yarn.

9. (Original) The article of footwear recited in claim 8, wherein the second type of yarn is an elastic yarn.

10. (Original) The article of footwear recited in claim 1, wherein the knitted component comprises at least two knit element layers, the at least two knit element layers including:

a first knit element layer comprising a portion of the knitted component associated with the exterior surface; and

a second knit element layer comprising a portion of the knitted component associated with the interior surface; and

wherein the second knit element layer further includes the integral knit tongue.

11. (Original) The article of footwear recited in claim 10, wherein at least a first portion of the first knit element layer and the second knit element layer are decoupled along the throat area of the knitted component.

12. (Original) The article of footwear recited in claim 11, wherein at least a second portion of the first knit element layer and the second knit element layer are joined along the throat area of the knitted component.

13. (Currently Amended) A knitted component for an article of footwear, the knitted component comprising:

a portion of the knitted component defining ~~the~~ an upper, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component, the interior surface configured to define a void for receiving a foot; and

an integral knit tongue ~~formed of unitary knit construction~~ with the upper and extending through a throat area of the knitted component; and

at least one raised element having at least one lace aperture configured to receive a lace,

wherein the integral knit tongue is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

14. (Original) The knitted component recited in claim 13, wherein at least a portion of the integral knit tongue and a portion of the upper include at least one course having a common yarn.

15. (Original) The knitted component recited in claim 13, wherein at least a portion of the upper and a portion of the integral knit tongue are formed from a common knit structure.

16. (Currently Amended) The knitted component recited in claim 13, ~~further comprising~~ wherein the at least one raised element ~~that~~ is formed of unitary knit construction with the upper and the integral knit tongue.

17. (Original) The knitted component recited in claim 16, comprising at least two raised elements disposed on each of a lateral side and a medial side of the upper and extending a height above the exterior surface of the knitted component.

18. (Original) The knitted component recited in claim 13, wherein the integral knit tongue comprises at least a partially integral portion and a free portion;

the partially integral portion being of unitary knit construction with the upper at the forward portion of the throat area and at least along the portion of the lateral side and the medial side of the throat area of the knitted component; and

the free portion being of unitary knit construction with the partially integral portion at a rearward portion of the integral knit tongue and remaining unattached to the remaining portions of the knitted component.

19. (Original) The knitted component recited in claim 13, wherein the upper comprises a first type of yarn; and

wherein the integral knit tongue comprises a second type of yarn, the second type of yarn being different from the first type of yarn.

20. (Original) The knitted component recited in claim 19, wherein the second type of yarn is an elastic yarn.

21. (Original) A knitted component for an article of footwear, the knitted component comprising:

an upper and an integral knit tongue formed of unitary knit construction with the upper and extending through a throat area of the knitted component;

the knitted component comprising at least two knit element layers, including:

a first knit element layer comprising a portion of an exterior surface of the knitted component; and

a second knit element layer comprising a portion of an interior surface of the knitted component, the interior surface disposed opposite to the exterior surface and the interior surface being configured to define a void for receiving a foot; and

wherein the integral knit tongue is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

22. (Original) The knitted component recited in claim 21, wherein the second knit element comprises the integral knit tongue.

23. (Original) The knitted component recited in claim 21, wherein at least a first portion of the first knit element layer and the second knit element layer are decoupled along the throat area of the knitted component.

24. (Original) The knitted component recited in claim 23, wherein at least a second portion of the first knit element layer and the second knit element layer are joined along the throat area of the knitted component.

25. (Original) The knitted component recited in claim 21, wherein at least a portion of the integral knit tongue and a portion of the upper include at least one course having a common yarn.

26. (Original) The knitted component recited in claim 21, further comprising at least one raised element that is formed of unitary knit construction with the upper and the integral knit tongue.

27. (Original) The knitted component recited in claim 26, wherein the first knit element layer comprises the at least one raised element.

REMARKS

Claims 1-27 are pending. Independent claims 1 and 13 are currently amended. Dependent claims 4 and 16 are also currently amended to provide proper antecedent basis in view of the amendments to the independent claims. No new matter has been introduced. The Applicant respectfully requests reconsideration and withdrawal of the rejections in view of the following remarks.

I. REJECTIONS UNDER § 102

Claims 1, 3, 4, 8, 9, 13, 15, 16, 19, and 20 stand rejected under 35 U.S.C. § 102 as being anticipated by Dua (US 2005/0115284).

Independent Claim 1: Claim 1 is currently amended to recite a knitted component comprising "at least one raised element extending a height above the exterior surface of the knitted component." This amendment is supported by at least paragraph [0071] and FIGS. 6-7 of the published version of the application. Dua does not anticipate this recitation. The Applicant notes that claim 5, which has been deemed allowable by the Examiner if amended to be rewritten in independent form, recites "at least two raised elements … extending a height above the exterior surface of the knitted component." Amended claim 1 is believed to be allowable over Dua for similar reasons that the Examiner has expressly deemed claim 5 to be allowable over Dua.

Accordingly, the Applicant respectfully submits that claim 1 is allowable in its current form, and claims 2-12 are allowable for at least their dependence on claim 1.

Independent Claim 13: Claim 13 is currently amended to recite a knitted component with "at least one raised element having at least one lace aperture configured to receive a lace." This amendment is supported by at least paragraph [0071] and FIG. 7 of the published version of the application. Dua does not anticipate

this recitation. The Applicant notes that claim 6, which also recites "at least one raised element having at least one lace aperture configured to receive a lace," was deemed allowable in the Office Action if rewritten in independent form.

Accordingly, claim 13 and its dependent claims 14-20 are allowable.

II. ALLOWABLE SUBJECT MATTER

The Office Action states that claims 5-7, 10-12, 17, 18, and 21-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. It is noted that claim 21 is an independent claim. Claim 21 and its dependent claims 22-27 are therefore allowable. Further, based on the remarks above, independent claims 1 and 13, upon which each of claims 5-7, 10-12, 17, and 18 depends, are allowable in their currently amended state. The Applicant therefore respectfully requests withdrawal of the objections to the above-mentioned claims.

III. CONCLUSION

In view of the foregoing remarks and amendments, the Applicant respectfully submits that the present application is in condition for allowance. The Applicant respectfully requests reconsideration and withdrawal of the pending rejections and objections. If the Examiner has any questions, the Examiner is invited to contact the undersigned attorney at (312) 840-3268.

DATED: January 7, 2016

Respectfully submitted,

/Christopher J. Gerardot/
Christopher J. Gerardot
Registration No. 73,644
Attorney for Applicant

BRINKS GILSON & LIONE
P.O. BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200

Electronic Acknowledgement Receipt

EFS ID:	24558237
Application Number:	13781525
International Application Number:	
Confirmation Number:	7689
Title of Invention:	Article Of Footwear Incorporating A Knitted Component With An Integral Knit Tongue
First Named Inventor/Applicant Name:	Bhupesh Dua
Customer Number:	133691
Filer:	Christopher J. Gerardot/Jeff Skinner
Filer Authorized By:	Christopher J. Gerardot
Attorney Docket Number:	15571/75
Receipt Date:	07-JAN-2016
Filing Date:	28-FEB-2013
Time Stamp:	18:06:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	1557175TL.pdf	44660 48fb14003d502b5869c382f9059193af863070ae	no	1

Warnings:	
Information:	

2		1557175rsp.pdf	62120 8d0d72df8508cd5843fdb911747d6d96f0c28fbc	yes	10

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	7
Applicant Arguments/Remarks Made in an Amendment	8	10

Warnings:	
Information:	
Total Files Size (in bytes):	106780

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
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CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: January 7, 2016 Name: Christopher J. Gerardot, Reg. No. 73,644 Signature: /Christopher J. Gerardot/

BRINKS GILSON & LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	DUA et al.		
Appln. No.:	13/781,525	Examiner:	Worrell, Larry D., Jr.
Filed:	February 28, 2013	Art Unit:	3765
For:	ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH AN INTEGRAL KNIT TONGUE	Conf. No.:	7689
Attorney Docket No.:	15571/75 (130056US01)		

TRANSMITTAL

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached are:

☒ Transmittal; Amendment.

Fee calculation:

☒ No additional fee is required.

☐ Per 37 CFR §1.27, ☐ Applicant is small entity ☐ Applicant is micro entity.

☐ An extension fee in an amount of $_____ for a _____-month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(_____).

☐ An additional filing fee has been calculated as shown below:

					Fee		Small Entity Fee		Micro Entity Fee	
	Claims Remaining After Amendment		Highest No. Previously Paid	Present Extra	Rate	Add'l Fee	Rate	Add'l Fee	Rate	Add'l Fee
Total		Minus			x $ 80 =	$	x $ 40 =	$	x $20 =	$
Independent		Minus			x $420 =	$	x $210 =	$	x $105 =	$
First Presentation of Multiple Dep. Claim					+ $780 =	$	+ $390 =	$	+ $195 =	$
					Total	$	Total	$	Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

January 7, 2016
Date

/Christopher J. Gerardot/
Christopher J. Gerardot (Reg. No. 73,644)

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/781,525	Filing Date 02/28/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT	01/07/2016	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 27	Minus	** 27	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/FLORENCE PATTERSON/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
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NOTICE OF ALLOWANCE AND FEE(S) DUE

133691 7590 04/21/2016

NIKE, Inc./BGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER
WORRELL JR, LARRY D

ART UNIT	PAPER NUMBER
3765	

DATE MAILED: 04/21/2016

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/781,525	02/28/2013	Bhupesh Dua	130056US01/15571-75	7689

TITLE OF INVENTION: Article Of Footwear Incorporating A Knitted Component With An Integral Knit Tongue

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	07/21/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

133691 7590 04/21/2016
NIKE, Inc./BGL
P.O. Box 10395
Chicago, IL 60610

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/781,525	02/28/2013	Bhupesh Dua	130056US01/15571-75	7689

TITLE OF INVENTION: Article Of Footwear Incorporating A Knitted Component With An Integral Knit Tongue

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	07/21/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
WORRELL JR, LARRY D	3765	066-170000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/781,525	02/28/2013	Bhupesh Dua	130056US01/15571-75	7689

133691 7590 04/21/2016

NIKE, Inc./BGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
WORRELL JR, LARRY D	

ART UNIT	PAPER NUMBER
3765	

DATE MAILED: 04/21/2016

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/781,525	Applicant(s) DUA ET AL.	
	Examiner DANNY WORRELL	Art Unit 3765	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the amendment filed 1/7/16*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-27*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/DANNY WORRELL/
Primary Examiner, Art Unit 3765

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13781525	DUA ET AL.
	Examiner	**Art Unit**
	LARRY WORRELL JR	3765

CPC						
Symbol					**Type**	**Version**
A43B		1	/	04	F	2013-01-01
A43B		23	/	0245	I	2013-01-01
A43B		23	/	0265	I	2013-01-01
A43B		23	/	26	I	2013-01-01
D04B		1	/	22	I	2013-01-01
D04B		15	/	56	I	2013-01-01
D10B		2403	/	02411	A	2013-01-01
D10B		2403	/	032	A	2013-01-01
D10B		2501	/	043	A	2013-01-01
A43B		23	/	0205	I	2013-01-01
D04B		1	/	24	I	2013-01-01
D04B		7	/	28	I	2013-01-01
D10B		2403	/	0113	A	2013-01-01
D10B		2403	/	0243	A	2013-01-01
			/			

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	27	
/DANNY WORRELL/ Primary Examiner.Art Unit 3765	04/19/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	16

U.S. Patent and Trademark Office

Part of Paper No. 20160417

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13781525	DUA ET AL.
	Examiner	**Art Unit**
	LARRY WORRELL JR	3765

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
		D 0 4 B 1 / 22 (2006.01.01)	

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	27	
/DANNY WORRELL/ Primary Examiner.Art Unit 3765	04/19/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	16

U.S. Patent and Trademark Office

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	LARRY WORRELL JR	3765

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	27	
/DANNY WORRELL/ Primary Examiner.Art Unit 3765	04/19/2016	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	16

U.S. Patent and Trademark Office

Part of Paper No. 20160417

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13781525	DUA ET AL.
	Examiner	Art Unit
	LARRY WORRELL JR	3765

CPC- SEARCHED		
Symbol	Date	Examiner
D04B 1/126, 1/22, 1/24, 7/24, 15/56	9/30/2015	/dw/

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
Review related appications	9/30/2015	/dw/
update search	4/17/2016	/dw/

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
D04B	D04B 1/126, 1/22, 1/24, 7/24, 15/56	4/17/2016	/dw/

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 7689

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/781,525	02/28/2013 RULE	066	3765	130056US01/15571-75

APPLICANTS
NIKE, INC., Beaverton, OR

INVENTORS
Bhupesh Dua, Portland, OR;
Bruce Huffa, Encino, CA;
Adrian Meir, Portland, OR;
Benjamin A. Shaffer, Portland, OR;

**** CONTINUING DATA ***************************
This application is a CIP of 13/474,531 05/17/2012 PAT 8621891
which is a CON of 13/400,511 02/20/2012 PAT 8448474

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
03/27/2013

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /LARRY D WORRELL JR/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		OR	28	27	3

ADDRESS
NIKE, Inc./BGL
P.O. Box 10395
Chicago, IL 60610
UNITED STATES

TITLE
Article Of Footwear Incorporating A Knitted Component With An Integral Knit Tongue

FILING FEE RECEIVED		
2300	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13781525	DUA ET AL.
	Examiner	Art Unit
	LARRY WORRELL JR	3765

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	04/17/2016								
	1	=								
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