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# (54) CUSHIONING COMPONENT FOR A WEARABLE ARTICLE

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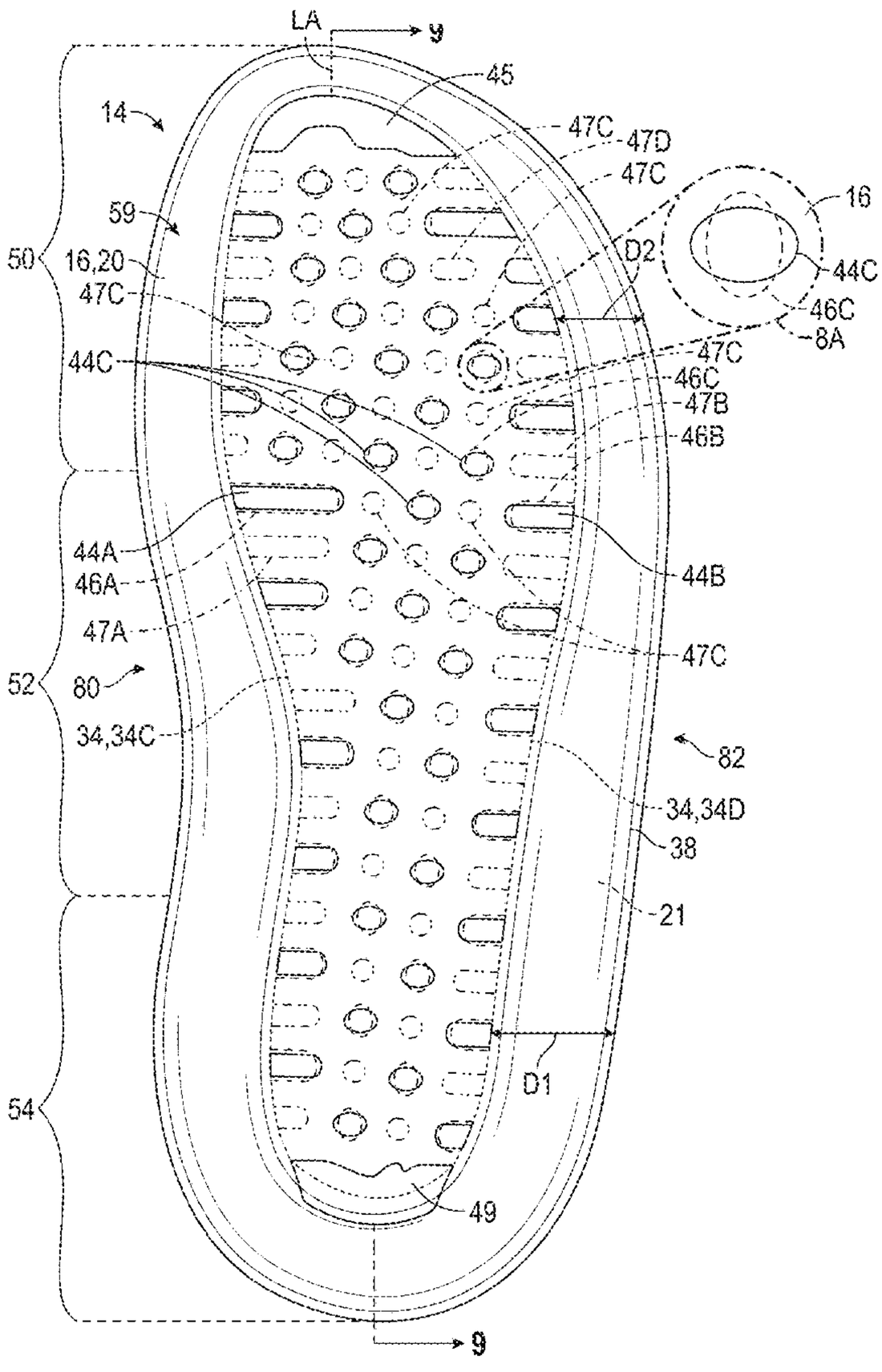
(57) **ABSTRACT**

An article of footwear includes a sole structure that has a cushioning component. The cushioning component includes a bladder and a multi-sheet core disposed in the bladder and bonded to inner sides of barrier sheets of the bladder to act as a tensile component. The barrier sheets define an interior cavity and are sealed to one another along a peripheral bond to enclose and retain a gas in the interior cavity. The multi-sheet core is spaced entirely inward of the peripheral bond and is directly bonded to the opposing inner surfaces of the first and second barrier sheets. The multi-sheet core does not create any sealed chambers within the bladder that are not in fluid communication with the interior cavity. No bonds securing the multi-sheet core to the opposing inner surfaces extend continuously from a medial edge of the multi-sheet core to a lateral edge of the multi-sheet core.



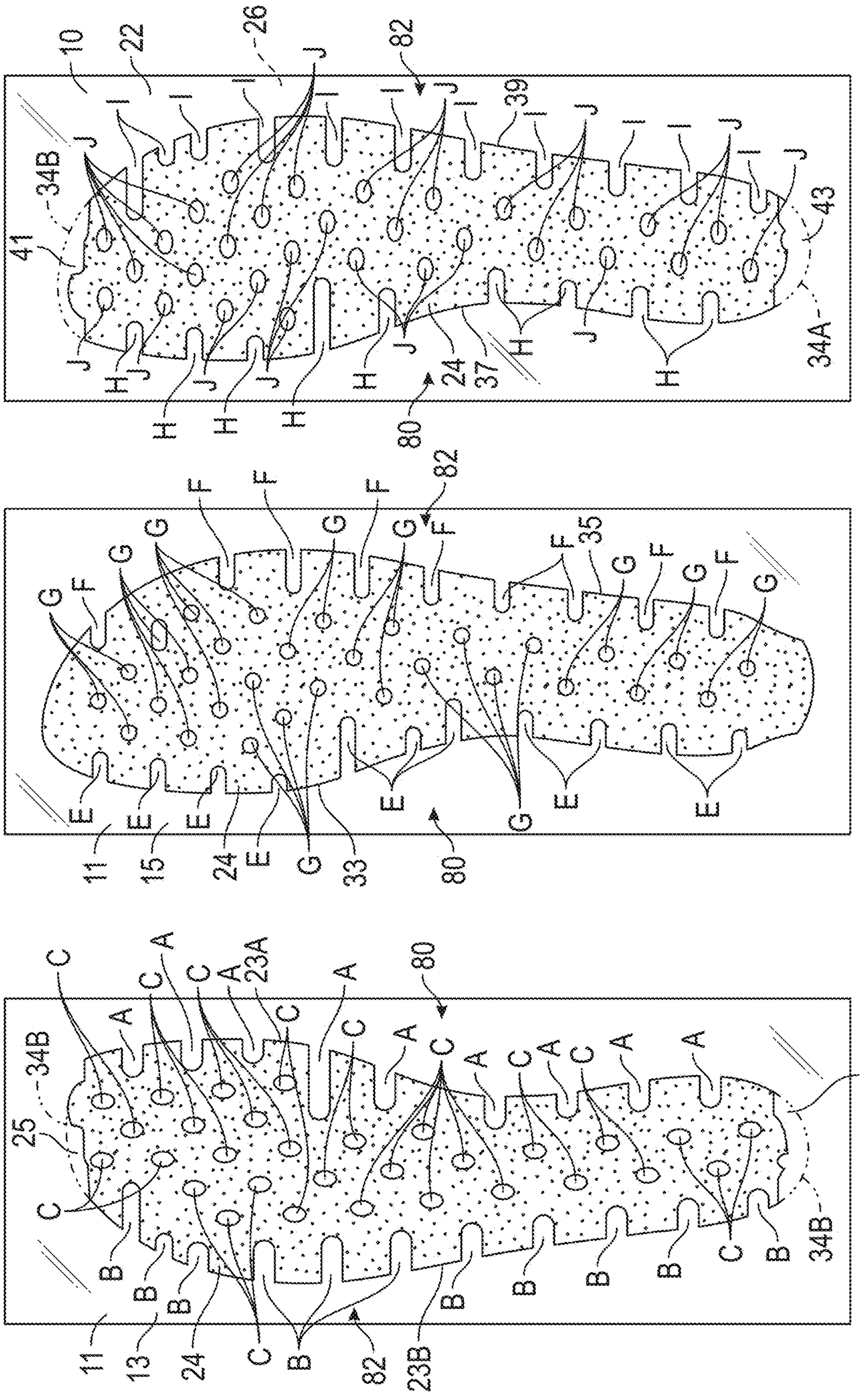
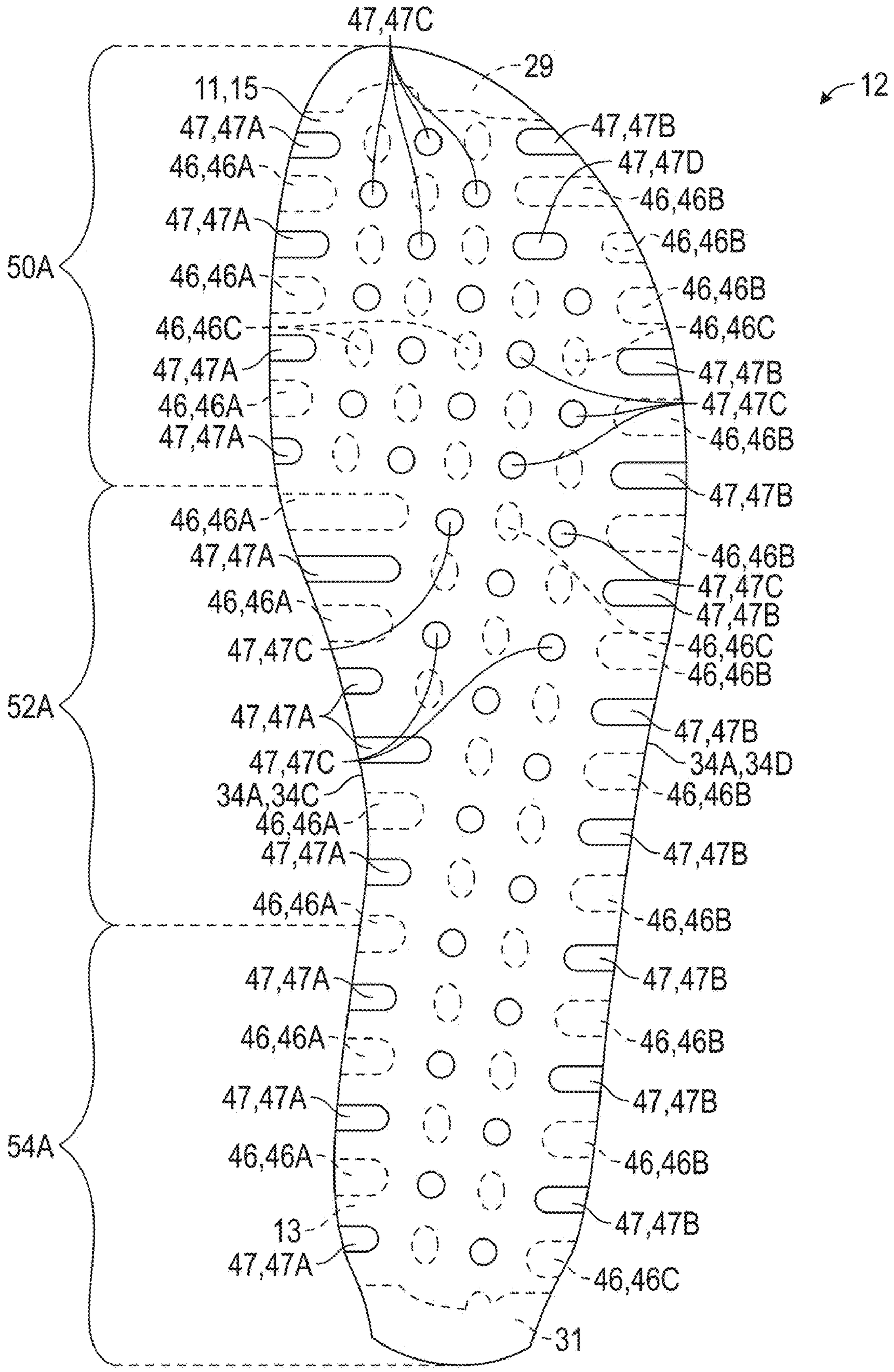



FIG. 3

FIG. 2

FIG. 1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11,15
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47,47B
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47,47C
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47,47B
47,47C
46,46C
52A
46,46B
47,47A
47,47B
47,47C
34A,34D
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46,46B
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47,47B
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46,46A
46,46B
54A
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46,46B
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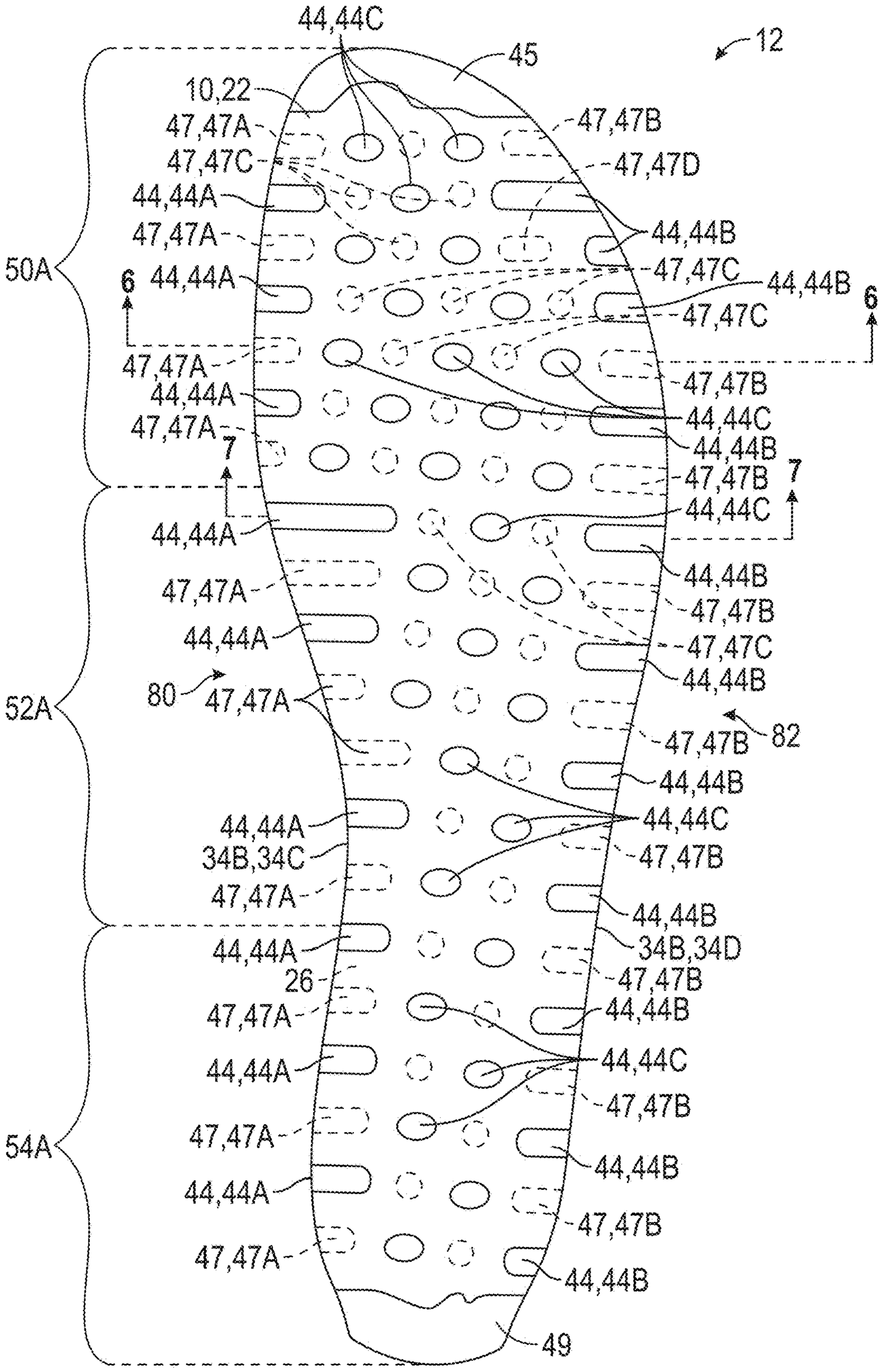
46,46C
31

FIG. 4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47,47B
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44,44C
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44,44B
7
47,47B
7
44,44C
44,44A
44,44B
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47,47B
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47,47C
44,44B
80
47,47A
52A
47,47B
82
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44,44A
44,44C
34B,34C
47,47B
47,47A
44,44B
44,44A
34B,34D
26
47,47B
47,47A
44,44B
44,44C
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44,44B
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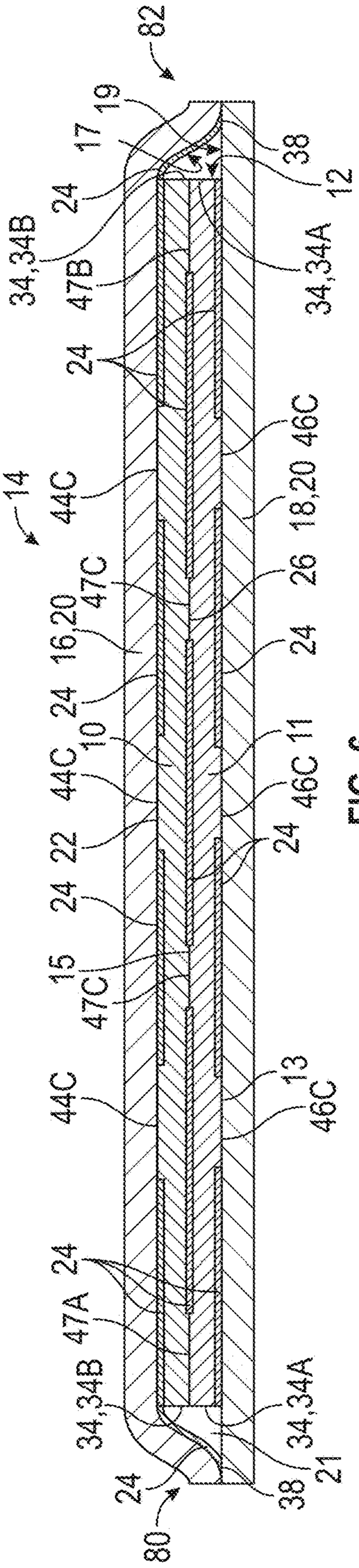
47,47A
44,44B
49

FIG. 5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6C
46C
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26
24
24
10
44C
11
46C
24
22
24
15
47C
44C
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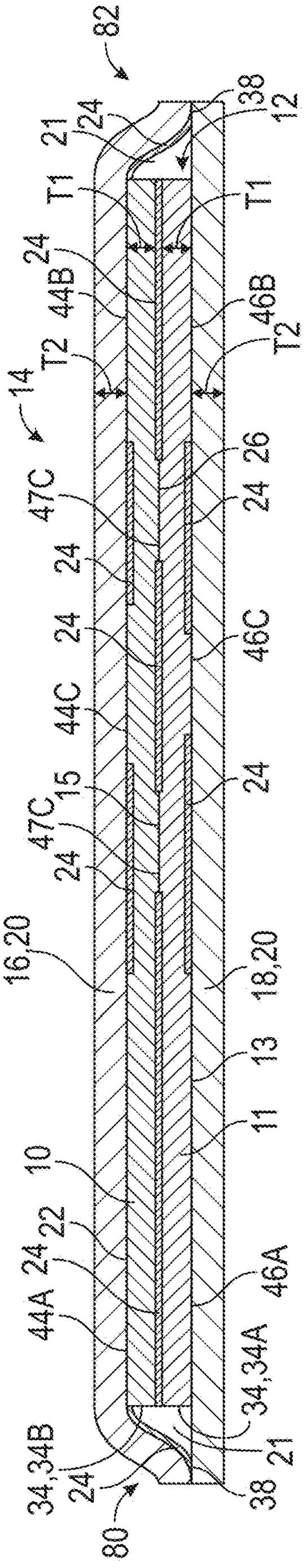
46C
24
47A
34,34B
34,34A
24
21
38
80

FIG. 6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T1
T1
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44B
46B
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44C
24
47C
15
24
24
16,20
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44A
46A
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34,34B
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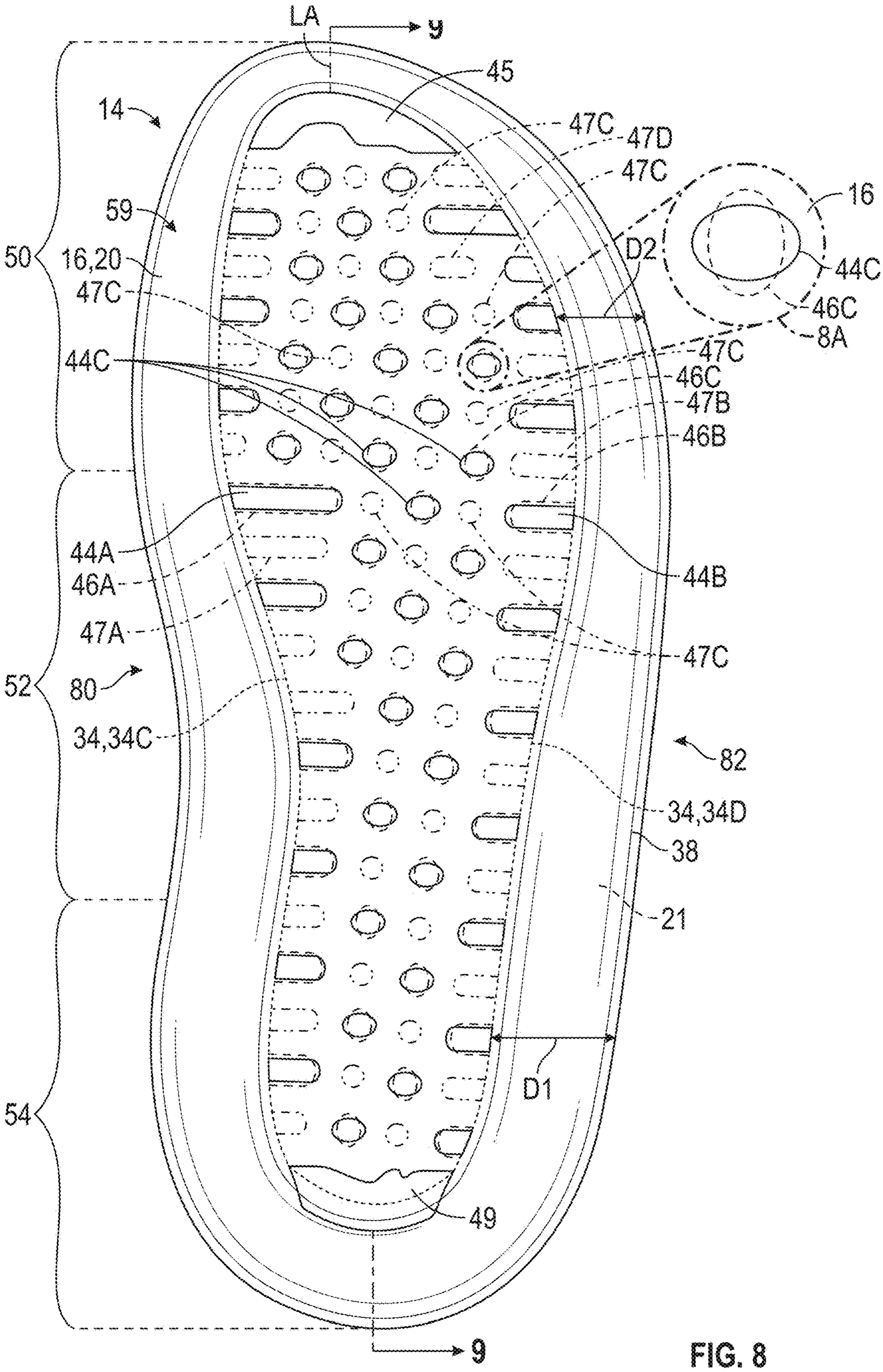
80

FIG. 7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16
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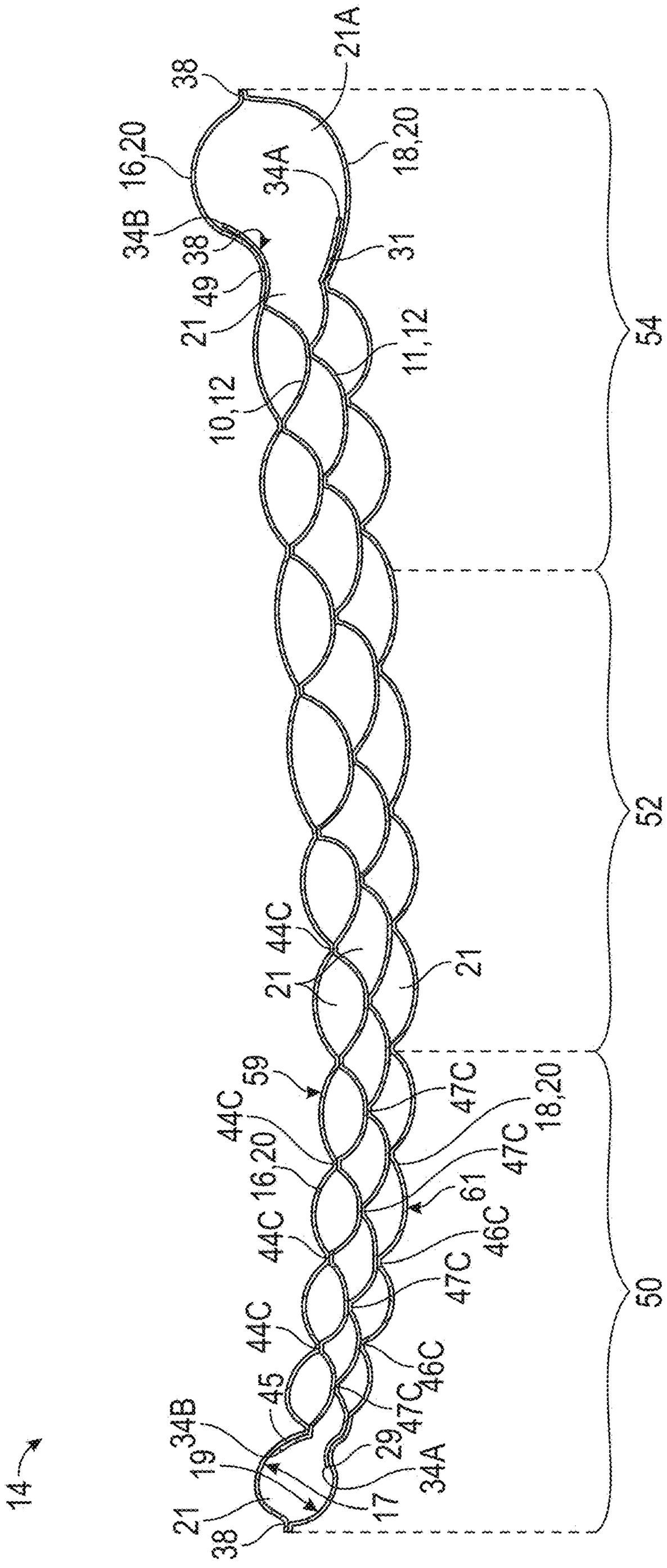
46C
47B
46B
44A
44B
46A
47A
47C
52
80
34,34C
82
34,34D
38
21
54
D1
49
9

FIG. 8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11,12
10,12
21A
34A
34B
38
21 44C
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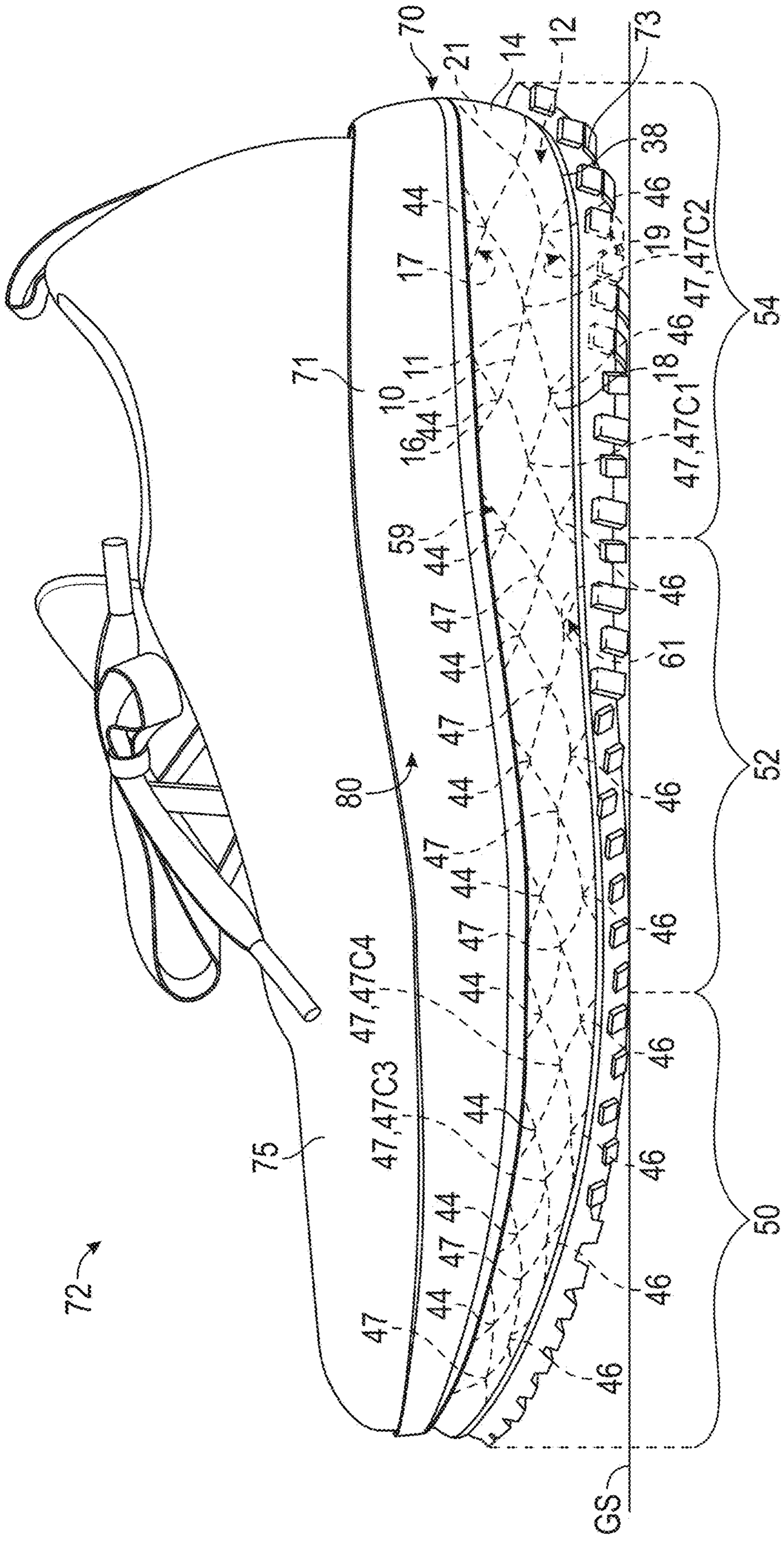
52
54

FIG. 9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61
46
80
52
47,47C4
47
44
47
44
46
47,47C3
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46
75
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44
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50
72
GS

FIG. 10

# CUSHIONING COMPONENT FOR A WEARABLE ARTICLE

## CROSS-REFERENCE TO RELATED APPLICATION

**[0001]** This application claims the benefit of priority to U.S. Provisional Application No. 63/610,448, filed Dec. 15, 2023 which is incorporated by reference in its entirety.

## TECHNICAL FIELD

**[0002]** The present disclosure generally relates to a cushioning component for a wearable article that includes a bladder and a core of at least one polymeric sheet disposed in the bladder.

## BACKGROUND

**[0003]** Wearable articles, such as articles of footwear, often include cushioning components. Some cushioning components are configured as fluid-filled bladders that enclose an interior cavity to retain a gas in the interior cavity, providing cushioning when loaded.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0004]** The drawings described herein are for illustrative purposes only, are schematic in nature, and are intended to be exemplary rather than to limit the scope of the disclosure.

**[0005]** FIG. **1** is a plan view of a bottom side of a polymeric sheet with anti-weld material disposed thereon.

**[0006]** FIG. **2** is a plan view of an opposing top side of the polymeric sheet of FIG. **1** with anti-weld material disposed thereon in a different pattern than on the side shown in FIG. **1**.

**[0007]** FIG. **3** is a plan view of a top side of another polymeric sheet with anti-weld material disposed thereon and with an opposite second side not having any anti-weld material disposed thereon.

**[0008]** FIG. **4** is a plan view of a portion of a core formed from the polymeric sheets of FIGS. **1-3**, showing the polymeric sheet of FIGS. **1-2** as a lower core sheet, and representing bonded areas at the top side of the polymeric sheet of FIG. **2** in solid and bonded areas at the bottom side of the polymeric sheet of FIG. **2** in dashed lines.

**[0009]** FIG. **5** is a plan view of a portion of the core formed from the polymeric sheets of FIGS. **1-3** showing the polymeric sheet of FIG. **3** as an upper core sheet and representing bonded areas at the top side of the upper core sheet in solid and bonded areas at the bottom side of the upper core sheet in dashed lines.

**[0010]** FIG. **6** is a cross-sectional view of a cushioning component including the core of FIG. **5** at a cross-section taken at lines **6-6** in FIG. **5** and including a bladder having first and second barrier sheets, with the cushioning component in an uninflated state.

**[0011]** FIG. **7** is a cross-sectional view of a cushioning component including the core of FIG. **5** at a cross-section taken at lines **7-7** in FIG. **5** and including a bladder having first and second barrier sheets, with the cushioning component in an uninflated state.

**[0012]** FIG. **8** is a plan view of the cushioning component of FIGS. **6-7** in an inflated state.

**[0013]** FIG. **9** is a cross-sectional view of the cushioning component of FIG. **8** taken at lines **9-9** in FIG. **8**.

**[0014]** FIG. **10** is a medial side view of an article of footwear including the cushioning component of FIG. **8**.

## DESCRIPTION

**[0015]** The present disclosure generally relates to an article of footwear that includes a sole structure that has a cushioning component. The cushioning component includes a bladder and a multi-sheet core disposed in the bladder and bonded to inner sides of barrier sheets of the bladder to act as a tensile component. Providing a tensile component within a bladder may be useful in restraining the bladder when inflated, preventing it from adopting a ball-like shape. A tensile component such as the multi-sheet core according to the present disclosure enables bonding the at least one polymeric sheet of the core to the barrier sheets at bonds having patterns that result in technical advantages both in performance aspects of the cushioning component and ease of manufacturing the cushioning component.

**[0016]** More specifically, the bladder includes a first barrier sheet and a second barrier sheet that together define an interior cavity between opposing inner surfaces of the first and second barrier sheets. The first barrier sheet and the second barrier sheet are sealed to one another along a peripheral bond to enclose the interior cavity and retain a gas in the interior cavity. The multi-sheet core is disposed in the interior cavity, is spaced entirely inward of the peripheral bond, and directly bonded to the opposing inner surfaces of the first and second barrier sheets. The multi-sheet core is displaced from the opposing inner surfaces at unbonded areas of the multi-sheet core such that the gas in the interior cavity is in fluid communication around the multi-sheet core without the multi-sheet core creating any sealed chambers within the bladder that are not in fluid communication with the interior cavity. In other words, the at least one polymeric sheet does not subdivide the interior cavity into separate, sealed chambers. No bonds securing the multi-sheet core to the opposing inner surfaces extend continuously from a medial edge of the multi-sheet core to a lateral edge of the multi-sheet core.

**[0017]** In one or more implementations, anti-weld material is disposed on the multi-sheet core at the unbonded areas. By utilizing anti-weld material disposed on the polymeric sheets, the patterns of bonds of the multi-sheet core to the inner surfaces of the barrier sheets are controlled to determine the final geometry of the completed cushioning component, including height differentials in different regions of an article of footwear, toe spring, etc.

**[0018]** Moreover, utilizing anti-weld material enables ease in manufacturing. For example, when the anti-weld material is blocker ink, patterns may be digitally implemented relatively easily in comparison to other tensile components that require specific molds or mold inserts to control bond formation of barrier sheets to internally placed polymeric sheets. By disposing the anti-weld material so that it extends to an outer perimeter of the multi-sheet core at the inner surfaces of the barrier sheets, and by ensuring that the outer perimeter of the multi-sheet core is entirely inward of the peripheral bond of the barrier sheets, the patterns of bonds of the multi-sheet core do not result in any sealed chambers within the bladder that are not in fluid communication with the interior cavity. In this way, the multi-sheet core itself controls the final geometry of the inflated cushioning component but does not affect the cushioning response of the cushioning component under dynamic loading. Additionally,

by utilizing anti-weld material, the cushioning component may be relatively flat prior to inflation. Stated differently, the multi-sheet core may lay flat within the bladder with unbonded areas contacting the opposing inner surfaces of the first and second barrier sheets (or adjacent surfaces of the polymeric sheets) when the interior cavity of the bladder is uninflated.

**[0019]** In an example, a thickness of each polymeric sheet of the core is not greater than (e.g., is less than or equal to) a thickness of the first barrier sheet and is not greater than a thickness of the second barrier sheet.

**[0020]** In one or more configurations, the multi-sheet core may include a first polymeric sheet and a second polymeric sheet. The opposing inner surfaces of the first and second barrier sheets include a first inner surface of the first barrier sheet and a second inner surface of the second barrier sheet. The first polymeric sheet may be disposed between the first barrier sheet and the second polymeric sheet, and the second polymeric sheet may be disposed between the first polymeric sheet and the second barrier sheet such that a first side of the first polymeric sheet faces the first inner surface of the first barrier sheet, a second side of the first polymeric sheet faces a first side of the second polymeric sheet, and a second side of the second polymeric sheet faces the second inner surface of the second barrier sheet. The first side of the first polymeric may be directly bonded to the first inner surface of the first barrier sheet at a first set of bonds, the second side of the second polymeric sheet may be directly bonded to the second inner surface of the second barrier sheet at a second set of bonds, and the second side of the first polymeric sheet may be directly bonded to the first side of the second polymeric sheet at a third set of bonds. When the bladder is inflated, the first polymeric sheet may be displaced from the first inner surface of the first barrier sheet by the gas at unbonded areas of the first side of the first polymeric sheet, and the second polymeric sheet may be displaced from the second inner surface of the second polymeric sheet by unbonded areas of the second side of the second polymeric sheet. The second side of the first polymeric sheet is displaced from the first side of the second polymeric sheet at unbonded areas of the first side of the second polymeric sheet. None of the bonds of the first set of bonds, none of the bonds of the second set of bonds, and none of the bonds of the third set of bonds extend continuously from the medial edge of the multi-sheet core to the lateral edge of the multi-sheet core.

**[0021]** In an aspect, a thickness of the first polymeric sheet is not greater than (e.g., is less than or equal to) a thickness of the first barrier sheet and is not greater than a thickness of the second barrier sheet, and a thickness of the second polymeric sheet is not greater than a thickness of the first barrier sheet and is not greater than a thickness of the second barrier sheet.

**[0022]** In another aspect, at least some of the bonds of the second set may be aligned with at least some of the bonds of the first set in a fore-aft direction of the cushioning component when the cushioning component is in an uninflated state and may be wider in the fore-aft direction of the cushioning component than the bonds of the first set with which the at least some of the bonds of the second set are aligned. In such an implementation, the at least some of the bonds of the second set may be in a forefoot region of the cushioning component and/or may be in a heel region of the cushioning component.

**[0023]** As used herein, bonds are aligned with one another in a fore-aft direction of the cushioning component when a vertical plane perpendicular to a longitudinal axis of the cushioning component intersects the bonds. Accordingly, only a portion of a bond needs to be stacked over another bond in order for the two bonds to be considered aligned. As used herein, wider in the fore-aft direction of the cushioning component may also be referred to as longer, and narrower in the fore-aft direction of the cushioning component may also be referred to as shorter. As used herein, the fore-aft direction of the cushioning component is also the fore-aft direction of the article of footwear, and the longitudinal axis of the cushioning component is also the longitudinal axis of the article of footwear.

**[0024]** By providing wider bonds in the fore-aft direction of the cushioning component that will be disposed closer to the ground surface when the cushioning component is incorporated into an article of footwear, when inflated, the side with the narrower (e.g., shorter) bonds (e.g., the foot-facing side of the cushioning component) will allow for more pillowing of the cushioning component between the bonds of the first set than between the bonds of the second set when inflated. The side with more pillowing (the foot-facing side) will contract more in overall length as the path of the material of the first barrier sheet at the foot-facing side (e.g., the footbed side) is distributed vertically and horizontally. Accordingly, the foot-facing side with narrower bonds may become more concave in overall shape from the forefoot region to the heel region after inflation while the ground-facing side will become more convex. Providing the narrower bonds of the first set on the footbed side and the wider bonds on the ground-facing side thus helps to shape the inflated cushioning component to promote toe spring.

**[0025]** In one or more configurations, all of the bonds of the second set may be aligned with the bonds of the first set in the fore-aft direction of the cushioning component, and each bond of the second set disposed along the medial edge or the lateral edge of the multi-sheet core may be wider in the fore-aft direction of the cushioning component than a respective bond of the first set disposed along the medial edge or the lateral edge of the multi-sheet core and with which the bond of the second set is aligned.

**[0026]** In one or more implementations, the first set of bonds, the second set of bonds, and the third set of bonds may each include rows of bonds extending in a transverse direction of the cushioning component, each of the rows of bonds having a medial end bond extending to the medial edge of the multi-sheet core, a lateral end bond extending to the lateral edge of the multi-sheet core, and at least one interior bond disposed between the medial end bond and the lateral end bond. Furthermore, in each of the rows of bonds, each of the at least one interior bonds may be shorter in the transverse direction of the multi-sheet core than the medial end bond and may be shorter in the transverse direction of the multi-sheet core than the lateral end bond.

**[0027]** In an aspect, in at least some of the rows of bonds of the second set of bonds, the lateral end bond may be aligned with and may be wider in the fore-aft direction of the cushioning component than a corresponding lateral end bond of the first set of bonds and the medial end bond may be aligned with and may be wider in a fore-aft direction of the cushioning component than a corresponding medial end bond of the first set of bonds.

**[0028]** In one or more implementations, in each of the rows of bonds of the second set of bonds, the lateral end bond may be aligned with and may be wider in the fore-aft direction of the cushioning component than a corresponding lateral end bond of the first set of bonds and the medial end bond may be aligned with and may be wider in the fore-aft direction of the cushioning component than a corresponding medial end bond of the first set of bonds.

**[0029]** In another aspect, at least some of the rows of bonds of the second set of bonds may be in a forefoot region of the cushioning component and/or at least some of the rows of bonds of the second set of bonds may be in a heel region of the cushioning component.

**[0030]** In one or more configurations, the rows of bonds of the third set of bonds may include lateral end bonds and medial end bonds that are offset from the lateral end bonds and the medial end bonds of the rows of bonds of the second set of bonds, respectively and are offset from the lateral end bonds and the medial end bonds of the rows of bonds of the first set of bonds, respectively. Each of the lateral end bonds of the rows of bonds of the second set of bonds may be wider in the fore-aft direction of the cushioning component than adjacent lateral end bonds of the rows of bonds of the third set of bonds, and each of the medial end bonds of the rows of bonds of the second set of bonds may be wider in the fore-aft direction of the cushioning component than adjacent medial end bonds of the rows of bonds of the third set of bonds.

**[0031]** In one or more configurations, the at least one interior bond of each of the rows of the first set of bonds may be elongated in one of a transverse direction of the cushioning component or a fore-aft direction of the cushioning component, and the at least one interior bond of each of the rows of the second set of bonds may be elongated in the other of the transverse direction of the cushioning component or the fore-aft direction of the cushioning component.

**[0032]** In an aspect, the rows of the second set of bonds may be aligned with the rows of the first set of bonds in the fore-aft direction of the cushioning component when the cushioning component is in an uninflated state such that the at least one interior bond of each of the rows of the second set of bonds is aligned with the at least one interior bond of a corresponding row of the first set of bonds.

**[0033]** In another aspect, the third set of bonds may include rows of interior bonds that are shorter in the transverse direction of the cushioning component than the at least one interior bond of adjacent rows of the first set of bonds and are shorter in the fore-aft direction of the cushioning component than the at least one interior bond of adjacent rows of the second set of bonds.

**[0034]** In one or more implementations, an outer perimeter of the first polymeric sheet and an outer perimeter of the second polymeric sheet may be spaced further inward of the peripheral bond in a heel region of the cushioning component than in a forefoot region of the cushioning component.

**[0035]** In an example, an article of footwear may include a sole structure having a cushioning component. The cushioning component may include a bladder and a multi-sheet core. The bladder may include a first barrier sheet and a second barrier sheet defining an interior cavity between a first inner surface of the first barrier sheet and a second inner surface of the second barrier sheet that opposes the first inner surface, the first barrier sheet and the second barrier sheet may be sealed to one another along a peripheral bond to enclose the interior cavity and retain a gas in the interior cavity. The core may be disposed in the interior cavity and spaced entirely inward of the peripheral bond. The core may include a first polymeric sheet and a second polymeric sheet, the first polymeric sheet disposed between the first barrier sheet and the second polymeric sheet, and the second polymeric sheet disposed between the first polymeric sheet and the second barrier sheet such that a first side of the first polymeric sheet faces the first inner surface of the first barrier sheet, a second side of the first polymeric sheet faces a first side of the second polymeric sheet, and a second side of the second polymeric sheet faces the second inner surface of the second barrier sheet. The first side of the first polymeric sheet may be directly bonded to the first inner surface of the first barrier sheet at a first set of bonds, the second side of the second polymeric sheet may be directly bonded to the second inner surface of the second barrier sheet at a second set of bonds, and the second side of the first polymeric sheet may be directly bonded to the first side of the second polymeric sheet at a third set of bonds. When the cushioning component is inflated, the first polymeric sheet may be displaced from the first inner surfaces of the first barrier sheet by the gas at unbonded areas of the first side of the first polymeric sheet, the second polymeric sheet displaced from the second inner surface of the second polymeric sheet by unbonded areas of the second side of the second polymeric sheet. The first, second, and third sets of bonds may be configured such that the gas in the interior cavity is in fluid communication around the core without the core creating any sealed chambers within the bladder that are not in fluid communication with the interior cavity. The first set of bonds may include interior bonds that are elongated in one of a transverse direction of the cushioning component or a fore-aft direction of the cushioning component, and the second set of bonds may include interior bonds that are aligned with the interior bonds of the first set of bonds in the fore-aft direction of the cushioning component when the cushioning component is in an uninflated state and are elongated in the other of the transverse direction or the fore-aft direction.

**[0036]** The interior bonds of the first set of bonds may be longer than the interior bonds of the second set of bonds in the one of the transverse direction or the fore-aft direction, and the interior bonds of the second set of bonds are longer than the interior bonds of the first set of bonds in the other of the transverse direction or the fore-aft direction.

**[0037]** In an aspect, the third set of bonds may include rows of interior bonds disposed between adjacent rows of the first set of bonds and between adjacent rows of the second set of bonds, and the interior bonds of the rows of the third set of bonds may be shorter in the transverse direction of the cushioning component than the interior bonds of the adjacent rows of the first set of bonds and may be shorter in the fore-aft direction of the cushioning component than the interior bonds of the adjacent rows of the second set of bonds.

**[0038]** The above features and advantages and other features and advantages of the present teachings are readily apparent from the following detailed description of the modes for carrying out the present teachings when taken in connection with the accompanying drawings. It should be understood that even though in the following Figures embodiments may be separately described, single features thereof may be combined to additional embodiments.

**[0039]** FIGS. **1-3** show polymeric sheets **10** and **11** used to form a core **12** shown in FIGS. **6-7**, for example. The core **12** is included in a cushioning component **14** shown in FIGS. **6-10**. More specifically, the cushioning component **14** is included in a sole structure **70** of an article of footwear **72** as shown in FIG. **10**. As further explained herein with respect to FIGS. **6-10**, the cushioning component **14** includes a bladder **20** and the core **12** is disposed in the bladder **20** and bonded to inner surfaces **17**, **19** of barrier sheets **16**, **18** of the bladder **20** to act as a tensile component. Providing a tensile component within a bladder may be useful in restraining the bladder when inflated, preventing it from adopting a ball-like shape. A tensile component such as the core **12** according to the present disclosure enables bonding the polymeric sheets **10**, **11** to the barrier sheets **16**, **18** at bonds having patterns that result in technical advantages both in performance aspects of the cushioning component **14** and ease of manufacturing the cushioning component **14**.

**[0040]** FIG. **1** is a plan view of a bottom side of the polymeric sheet **11** with anti-weld material **24** disposed thereon. The polymeric sheet **11** is referred to herein as a second polymeric sheet. The side of the polymeric sheet shown in FIG. **1** is a second side **13** and is also referred to as a bottom side or distal side as it is disposed further from the foot when the core **12** is incorporated in the sole structure **70** of the article of footwear **72**. The second side **13** interfaces with and is bonded to the inner surface **19** of the second barrier sheet **18** as shown in FIG. **6** and discussed herein.

**[0041]** FIG. **2** is a plan view of an opposing first side **15** of the second polymeric sheet **11** with anti-weld material **24** disposed thereon in a different pattern than on the second side **13** shown in FIG. **1**. The first side **15** is also referred to as the top side or the proximal side of the second polymeric sheet **11** as it is disposed closer to the foot when the core **12** is incorporated in the sole structure **70** of the article of footwear **72**.

**[0042]** As best shown in FIGS. **4-10**, each of the core **12**, the cushioning component **14**, and the article of footwear **72** includes a forefoot region, a heel region, and a midfoot region. These regions are referred to as a forefoot region **50**, a midfoot region **52**, and a heel region **54** with respect to the cushioning component **14**, the sole structure **70**, and the article of footwear **72**. However, because the core **12** is of a shorter length than each of the cushioning component **14**, the sole structure **70**, and the article of footwear **72**, the forefoot region, midfoot region, and heel region of the core **12** are referred to as **50**A, **52**A, and **54**A, respectively. The forefoot region **50** and **50**A generally includes portions of the article of footwear **72** or the core **12** corresponding with the toes and the joints connecting the metatarsals with the phalanges of a wearer's foot. The midfoot region **52** and **52**A generally includes portions of the article of footwear **72** or the core **12** corresponding with the arch area of the foot, and the heel region **54** and **54**A corresponds with rear portions of the foot, including the calcaneus bone. Each of the core **12**, the cushioning component **14**, the sole structure **70**, and the article of footwear **72** include a medial side **80** and a lateral side **82** that extend through each of forefoot region **50** and **50**A, the midfoot region **52** and **52**A, and the heel region **54** and **54**A and fall on opposite sides of a longitudinal midline (e.g., longitudinal axis LA) of the cushioning component **14** in FIG. **8**. The forefoot region **50** and **50**A, the midfoot region **52** and **52**A, the heel region **54** and **54**A, the medial side **80**, and the lateral side **82** are not intended to demarcate precise areas of footwear **72**, the core **12**, the cushioning component **14**, or the sole structure **70**, but are instead intended to represent general areas of the article of footwear **72**, the core **12**, the cushioning component **14**, and the sole structure **70** to aid in the following discussion.

**[0043]** FIG. **3** is a plan view of a first side **22** of the first polymeric sheet **10** with anti-weld material **24** disposed thereon. The opposite second side **26** does not have any anti-weld material **24** disposed thereon. The first polymeric sheet **10** is stacked on the second polymeric sheet **11** when the core **12** is assembled such that the second side **26** interfaces with and is bonded to the first side **15** of the second polymeric sheet **11** and the first side **22** interfaces with and is bonded to the inner surface **17** of the first barrier sheet **16** as shown in FIG. **6** and discussed herein.

**[0044]** The anti-weld material **24** is disposed on the polymeric sheets **10**, **11** of the core **12** at areas that will be unbonded areas when the core **12** is thermally processed. By utilizing anti-weld material **24** disposed on the polymeric sheets **10**, **11**, the patterns of bonds of the core **12** to the inner surfaces **17**, **19** of the barrier sheets **16**, **18** (and the bonds of the second side **26** of the first polymeric sheet **10** to the first side **15** of the second polymeric sheet **11**) are controlled to determine the final geometry of the completed cushioning component **14**, including height differentials in different regions (e.g., forefoot region **50** and heel region **54**) of the article of footwear **72**, toe spring, etc. As shown in FIG. **6**, portions of one or both of the inner surfaces **17**, **19** that are outward of the outer perimeter **34** of the core **12** and inward of where the peripheral bond **38** is formed may also be preprinted with anti-weld material **24** or otherwise processed so that these portions of the inner surfaces **17**, **19** will not bond to one another.

**[0045]** The anti-weld material **24** may be disposed on the polymeric sheets **10** and **11** (and on the portions of the inner surfaces **17**, **19** of the first barrier sheet **16** and/or second barrier sheet **18** shown in FIG. **6**) via a computer-controlled printer head or heads (not shown) according to a stored algorithm representing a predetermined printing pattern. As used herein, the anti-weld material **24** may be blocker ink, and may also be referred to as anti-weld ink. For example, when the anti-weld material is blocker ink, it may be printed according to a different predetermined programmed pattern for the first side **22** of the first polymeric sheet **10**, the first side **15** of the second polymeric sheet **11** and the second side **13** of the second polymeric sheet **11** at all selected locations where bonds of the polymeric sheets **10**, **11** of the core **12** to one another or to the barrier sheets **16**, **18** are not desired. After trimming the sheets **10**, **11** to establish the outer perimeters **34**A, **34**B and when bonded to one another such as by thermal processing, adjacent surfaces of the stacked, flat polymeric sheets **10**, **11** and barrier sheets **16**, **18** are bonded to one another except where the anti-weld material **24** is disposed. Accordingly, the patterns of anti-weld material **24** determine corresponding patterns of resulting bonds in the finished cushioning component **14**.

**[0046]** The predetermined pattern of anti-weld material **24** on the second side **13** of the second polymeric sheet **11** in FIG. **1** is referred to as a second predetermined pattern and results in a second set of bonds **46** discussed with respect to FIGS. **4** and **6-10**. The predetermined pattern of anti-weld material **24** on the first side **15** of the second polymeric sheet

**11** in FIG. **2** is referred to as a third predetermined pattern and results in a third set of bonds **47** discussed with respect to FIGS. **4-10**. The predetermined pattern of anti-weld material **24** on the first side **22** of the first polymeric sheet **10** is referred to as a first predetermined pattern and results in a first set of bonds **44** discussed with respect to FIGS. **5-10**.

**[0047]** With reference to FIG. **1**, the anti-weld material **24** is disposed on the second side **13** of the second polymeric sheet **11** in the second predetermined pattern with areas A along a medial edge **23**A of the second predetermined pattern of the anti-weld material **24**, areas B along a lateral edge **23**B of the second predetermined pattern of the anti-weld material **24**, and areas C surrounded by the anti-weld material **24** in the second predetermined pattern. Areas A, B, and C are free from any deposited anti-weld material **24**. An area **25** just above the deposited anti-weld material **24** in FIG. **1** that will be part of the core **12** once the polymeric sheet **11** is trimmed (see the outer perimeter **34**B after trimming represented in phantom at the top and bottom of the second predetermined pattern in FIG. **1**) is also free from anti-weld material **24**, as is an area **27** just below the deposited anti-weld material **24**. The areas A, B, and C will become a second set of bonds **46** indicated with dashed lines in FIG. **4**, each corresponding with one of the areas. More specifically, areas A will become medial end bonds **46**A, areas B will become lateral end bonds **46**B, and areas C will become interior bonds **46**C disposed between the medial end bonds **46**A and the lateral end bonds **46**B. Only some of the interior bonds **46**C are labeled in FIG. **4**. The bonds **46**A, **46**B, and **46**C may be collectively referred to with reference number **46**. The areas **25** and **27** will become a foremost bond **29** and a rearmost bond **31**. The foremost bond **29** and the rearmost bond **31** are not included in the bonds **46** referred to herein as the second set of bonds.

**[0048]** With reference to FIGS. **4** and **5**, none of the bonds of the second set of bonds **46** extend continuously from the medial edge **34**C of the multi-sheet core **12** to the lateral edge **34**D of the multi-sheet core **12**. Instead, the second set of bonds **46** is arranged in rows, each row including a medial end bond **46**A extending to the medial edge **34**C of the multi-sheet core **12** (e.g., at the outer perimeter **34**B of the second sheet **11** of the multi-sheet core), a lateral end bond **46**B extending to the lateral edge **34**D of the multi-sheet core **12**, and at least one interior bond **46**C disposed between the medial end bond **46**A and the lateral end bond **46**B. Furthermore, in each row of the bonds **46**, each of the at least one interior bonds **46**C is shorter in the transverse direction of the multi-sheet core **12** (e.g., a direction from the medial edge **34**C to the lateral edge **34**D) than the medial end bond **46**A and is shorter in the transverse direction of the multi-sheet core **12** than the lateral end bond **46**B. Additionally, the interior bonds **46**C are elongated in the longitudinal direction (e.g., a direction from a forefoot region **50**A to a heel region **54**A of the second polymeric sheet **11** of the multi-sheet core **12**). Stated differently, the interior bonds **46**C are longer in the longitudinal direction than in the transverse direction, and, as such, may be referred to as oval or ovalized bonds.

**[0049]** With reference to FIG. **2**, the anti-weld material **24** is disposed on the first side **15** of the second polymeric sheet **11** in the third predetermined pattern with areas E along a medial edge **33** of the third predetermined pattern of the anti-weld material **24**, areas F along a lateral edge **35** of the third predetermined pattern of the anti-weld material **24**, and areas G surrounded by the anti-weld material **24** in the third predetermined pattern free from any deposited anti-weld material **24**. The areas E, F, and G will become a third set of bonds **47** shown in FIGS. **4** and **5**, each corresponding with one of the areas. More specifically, areas E will become medial end bonds **47**A, areas F will become lateral end bonds **47**B, and areas G will become interior bonds **47**C disposed between the medial end bonds **47**A and the lateral end bonds **47**B. The bonds **47**A, **47**B, and **47**C may be collectively referred to with reference number **47**.

**[0050]** With reference to FIGS. **4** and **5**, none of the bonds of the third set of bonds **47** extend continuously from the medial edge **34**C of the multi-sheet core **12** to the lateral edge **34**D of the multi-sheet core **12**. Instead, the third set of bonds **47** are arranged in rows, each row including a medial end bond **47**A extending to the medial edge **34**C of the multi-sheet core **12**, a lateral end bond **47**B extending to the lateral edge **34**D of the multi-sheet core **12**, and at least one interior bond **47**C disposed between the medial end bond **47**A and the lateral end bond **47**B. Furthermore, in each row of the bonds **47**, each of the at least one interior bonds **47**C is shorter in the transverse direction of the multi-sheet core **12** (e.g., a direction from the medial edge **34**C to the lateral edge **34**D) than the medial end bond **47**A and is shorter in the transverse direction of the multi-sheet core **12** than the lateral end bond **47**B. Each of the interior bonds **47**C is approximately the same length in the longitudinal direction as the medial end bond **47**A and the lateral end bond **47**B in the particular row of bonds **47**. Additionally, the majority of the interior bonds **47**C are circular rather than elongated. Stated differently, the length of each interior bond **47**C in the longitudinal direction is the same as the width of the interior bond **47**C in the transverse direction.

**[0051]** With reference to FIG. **3**, the anti-weld material **24** is disposed on the first side **22** of the first polymeric sheet **10** in the first predetermined pattern with areas H along a medial edge **37** of the first predetermined pattern of the anti-weld material **24**, areas I along a lateral edge **39** of the first predetermined pattern of the anti-weld material **24**, and areas J surrounded by the anti-weld material **24** in the first predetermined pattern free from any deposited anti-weld material **24**. An area **41** just above the deposited anti-weld material **24** in FIG. **3** that will be part of the core **12** once the first polymeric sheet **10** is trimmed (see the outer perimeter **34**A after trimming represented in phantom at the top and bottom of the first predetermined pattern in FIG. **3**) is also free from anti-weld material **24**, as is an area **43** just below the deposited anti-weld material **24**. The areas H, I, and J will become a first set of bonds **44** shown in FIG. **5**, each corresponding with one of the areas. More specifically, areas H will become medial end bonds **44**A, areas I will become lateral end bonds **44**B, and areas J will become interior bonds **44**C disposed between the medial end bonds **44**A and the lateral end bonds **44**B. The bonds **44**A, **44**B, and **44**C may be collectively referred to with reference number **44**. The areas **41** and **43** will become a foremost bond **45** and a rearmost bond **49**, respectively. The foremost bond **45** and the rearmost bond **49** are not included in the bonds **44** referred to herein as the first set of bonds.

**[0052]** With reference to FIG. **5**, none of the bonds of the first set of bonds **44** extend continuously from the medial edge **34**C of the multi-sheet core **12** to the lateral edge **34**D of the multi-sheet core **12**. Instead, the first set of bonds **44**

are arranged in rows, each row including a medial end bond **44**A extending to the medial edge **34**C of the multi-sheet core **12** (e.g., at the outer perimeter **34**A of the first polymeric sheet **10** of the multi-sheet core **12**), a lateral end bond **44**B extending to the lateral edge **34**D of the multi-sheet core **12**, and at least one interior bond **44**C disposed between the medial end bond **44**A and the lateral end bond **44**B. Furthermore, in each row of the bonds **44**, each of the at least one interior bonds **44**C is shorter in the transverse direction of the multi-sheet core **12** (e.g., a direction from the medial edge **34**C to the lateral edge **34**D) than the medial end bond **44**A and is shorter in the transverse direction of the multi-sheet core **12** than the lateral end bond **44**B. Additionally, the interior bonds **44**C are elongated in the transverse direction. Stated differently, the interior bonds **44**C are longer in the transverse direction than in the longitudinal direction, and, as such, may be referred to as oval or ovalized bonds.

**[0053]** FIG. **4** is a plan view of the top side of a portion of the core **12** formed from the polymeric sheets of FIGS. **1-3**, not showing the first polymeric sheet **10** or the barrier sheets **16**, **18** to which the core **12** is bonded, but showing only the second polymeric sheet **11** as the lower core sheet when the core **12** is assembled in order to illustrate the relative locations of the third set of bonds **47** and the second set of bonds **46**. The bonded areas at the top side (first side **15**) are the third set of bonds **47** where the first side **15** of the second polymeric sheet **11** of the core **12** bonds to the bottom side (second side **26**) of the first polymeric sheet **10** (not shown in FIG. **4**) and are represented in solid, and the bonded areas at the opposite bottom side **13** (second side) of the second polymeric sheet **11** are represented with dashed lines and are the second set of bonds **46** wherein the second side **13** of the second polymeric sheet **11** is bonded to the inner surface **19** of the second barrier sheet **18**.

**[0054]** FIG. **4** shows that the medial end bonds **47**A of the third set of bonds are offset from the medial end bonds **46**A of the second set of bonds in the longitudinal direction of the core **12** (e.g., from a forefoot region **50**A of the core **12** to a heel region **54**A of the core **12**). Additionally, the lateral end bonds **47**B are offset from the lateral end bonds **46**B in the longitudinal direction. Stated differently, each medial end bond **47**A of the third set of bonds is disposed between two adjacent medial end bonds **46**A of the second set of bonds without overlapping with the medial end bonds **46**A. Each lateral end bond **47**B of the third set of bonds is disposed between two adjacent lateral end bonds **46**B of the second set of bonds without overlapping with the lateral end bond **46**B. While some rows of bonds **46** of the second set of bonds have both a medial end bond **46**A and a lateral end bond **46**B, especially where the core **12** is wider in the forefoot region **50**A, other rows of bonds **46** have only a medial end bond **46**A and not a lateral end bond **46**B or vice versa, such as in the heel region **54**A. The same is true for the bonds **47** of the third set of bonds. That is, some rows of bonds **47** of the third set of bonds have both a medial end bond **47**A and a lateral end bond **47**B, especially where the core **12** is wider in the forefoot region **50**A, and other rows of bonds **47** have only a medial end bond **476**A and not a lateral end bond **47**B or vice versa, such as in the heel region **54**A.

**[0055]** The interior bonds **46**C of the second set of bonds alternate with the interior bonds **47**C of the third set of bonds in both the transverse direction (e.g., within a row of the bonds **46** aligned with a row of the bonds **47**), and in the longitudinal direction. Each row of the second set of bonds **46** is aligned with a row of the third set of bonds **47** in the transverse direction. Accordingly, beginning at the medial edge **34**C and moving in a transverse direction toward the lateral edge **34**D, a row may begin with a medial end bond **47**A on the first side **15**, followed by an interior bond **46**C on the second side **13**, then an interior bond **47**C on the first side **15**, etc. A row that begins with a medial end bond **46**A on the second side **13** will be followed by an interior bond **47**C on the first side **15**, then an interior bond **46**C on the second side **13**, etc.

**[0056]** FIG. **5** is a plan view of the top side of a portion of the core **12** formed from the polymeric sheets of FIGS. **1-3**, not showing the barrier sheets **16**, **18** to which the core **12** is bonded, but showing only the first polymeric sheet **10** as the upper core sheet when the core **12** is assembled in order to illustrate the relative locations of the first set of bonds **44** and the third set of bonds **47**. The bonded areas at the top side (first side **22**) are the first set of bonds **44** where the first side **22** of the first polymeric sheet **10** of the core **12** bonds to the inner surface **17** of the first barrier sheet **16** (not shown in FIG. **5**) and are represented in solid, and the bonded areas at the opposite bottom side **26** (second side) of the first polymeric sheet **10** are represented with dashed lines and are the third set of bonds **47** wherein the second side **26** of the first polymeric sheet **10** is bonded to the first side **15** of the second polymeric sheet **11** (not shown in FIG. **5**).

**[0057]** FIG. **5** shows that the medial end bonds **44**A of the first set of bonds are offset from the medial end bonds **47**A of the third set of bonds in the longitudinal direction of the core **12** (e.g., from a forefoot region **50**A of the core **12** to a heel region **54**A of the core **12**). Additionally, the lateral end bonds **44**B are offset from the lateral end bonds **47**B in the longitudinal direction. Stated differently, each medial end bond **44**A of the first set of bonds is disposed between two adjacent medial end bonds **47**A of the third set of bonds without overlapping with the medial end bonds **47**A. Each lateral end bond **44**B of the first set of bonds is disposed between two adjacent lateral end bond **47**B of the third set of bonds without overlapping with the lateral end bonds **47**B. While some rows of bonds **44** of the first set of bonds have both a medial end bond **44**A and a lateral end bond **44**B, especially where the core **12** is wider in the forefoot region **50**A, other rows of bonds **44** have only a medial end bond **44**A and not a lateral end bond **44**B or vice versa, such as in the heel region **54**A. The same is true for the bonds **47** of the third set of bonds as discussed above.

**[0058]** The interior bonds **44**C of the first set of bonds alternate with the interior bonds **47**C of the third set of bonds in both the transverse direction (e.g., within a row of the bonds **44** aligned with a row of the bonds **47**), and in the longitudinal direction. Each row of the first set of bonds **44** is aligned with a row of the third set of bonds **47** in the transverse direction. Accordingly, beginning at the medial edge **34**C and moving in a transverse direction toward the lateral edge **34**D, a row may begin with a medial end bond **44**A on the first side **22**, followed by an interior bond **47**C on the second side **26**, then an interior bond **44**C on the first side **22**, etc. A row that begins with a medial end bond **47**A on the second side **26** will be followed by an interior bond **44**C on the first side **22**, then an interior bond **47**C on the second side **26**, etc. A review of FIGS. **4** and **5** shows that none of the bonds **44** of the first set, none of the bonds **46** of the second set, and none of the bonds **47** of the third set

extend continuously from the medial edge **34**C to the lateral edge **34**D of the multi-sheet core **12**. In this manner, when the interior cavity **21** of the bladder **20** is inflated, the first polymeric sheet **10** will extend in the vertical direction as shown in FIGS. **9** and **10** between adjacent bonds **44** and **47** tethering the first polymeric sheet **10** to the first barrier sheet **16**, and the second polymeric sheet **11** will extend in the vertical direction as shown in FIGS. **9** and **10** between adjacent bonds **46** and **47** tethering the second barrier sheet **18** to the first polymeric sheet **10**.

**[0059]** Referring again to FIG. **6**, after trimming the first polymeric sheet **10** and the second polymeric sheet **11** to establish the respective outer perimeters **34**A, **34**B of the core **12**, the first polymeric sheet **10** is stacked on the second polymeric sheet **11** with the second side **13** of the second polymeric sheet **11** adjacent to the inner surface **19** of the second barrier sheet **18** and the first side **22** of the first polymeric sheet **10** adjacent to the inner surface **17** of the first barrier sheet **16**. The aligned outer perimeters **34**A and **34**B of the stacked polymeric sheets **10** and **11** establish and may together be referred to as the outer perimeter **34** of the core **12**. In this relative positioning, the barrier sheets **16**, **18** and the polymeric sheets **10**, **11** are thermally processed to form the bonds **29**, **31**, **38**, **44**, **45**, **46**, **47**, and **49** discussed herein. The first barrier sheet **16** and the second barrier sheet **18** together define the interior cavity **21** between the opposing inner surfaces **17**, **19** of the first barrier sheet **16** and the second barrier sheet **18**.

**[0060]** As shown in FIGS. **6** and **7**, the cushioning component **14** is relatively flat prior to inflation. Stated differently, the core **12** lays flat within the bladder **20** with the unbonded areas of the first side **22** of the first polymeric sheet **10** and on the second side **13** of the second polymeric sheet **11** (areas with anti-weld material **24** deposited thereon) contacting the opposing inner surfaces **17**, **19** when the interior cavity **21** of the bladder **20** is uninflated. The unbonded areas are as discussed with respect to FIGS. **1-5** and are where anti-weld material **24** is shown in FIGS. **6** and **7**, for example.

**[0061]** Traditional tensile components may include a first polymeric sheet bonded only to the inner surface of the first barrier sheet, a second polymeric sheet bonded only to the inner surface of the second barrier sheet, and a plurality of tethers extending from the first polymeric sheet to the second polymeric sheet. Due to this configuration, such traditional tensile components are not relatively flat or sheet-like prior to inflating the interior cavity of a bladder in which they are disposed and are not amendable to heat pressing either to create a core of multiple polymeric sheets or to bond a core of a single polymeric sheet or multiple polymeric sheets to the inner surfaces of the barrier sheets.

**[0062]** As indicated in FIG. **7**, the polymeric sheets **10** and **11** are each shown as having the same thickness T**1**. The barrier sheets **16** and **18** are each shown as having the same thickness T**2**. The thickness T**1** is not greater than the thickness T**2**. Maintaining a sheet thickness of each polymeric sheet **10** and **11** not greater than that of each of the barrier sheets **16** and **18** helps to ensure the flexibility of the core **12** to function as a tether that collapses back toward the relatively flat state of FIG. **7** easily under compressive loading.

**[0063]** As shown in FIGS. **6-10**, the first barrier sheet **16** and the second barrier sheet **18** are sealed to one another along the peripheral bond **38** to enclose the interior cavity **21** and retain a gas in the interior cavity. The barrier sheets **16**, **18** of the bladder **20** can be formed from a variety of materials including various polymers that can resiliently retain a fluid such as air or another gas. The polymeric sheets **10** and **11** may be formed of the same material or materials as the barrier sheets **16**, **18** as described herein, or may be formed of a polymeric material that does not necessarily retain fluid, as, unlike the barrier sheets **16**, **18**, the polymeric sheets **10** and **11** function as tethers but do not seal any interior cavity as do the barrier sheets **16**, **18**. Examples of polymeric materials for the barrier sheets **16**, **18** and the polymeric sheets **10** and **11** can include thermoplastic urethane, polyurethane, polyester, polyester polyurethane, and polyether polyurethane. Moreover, the barrier sheets **16**, **18** and the polymeric sheets **10** and **11** can be formed of layers of different materials. In one embodiment, the barrier sheets **16**, **18** and/or the polymeric sheets **10** and **11** are formed from thin films having one or more thermoplastic polyurethane layers with one or more barrier layers of a copolymer of ethylene and vinyl alcohol (EVOH) that is impermeable to the pressurized fluid contained therein as disclosed in U.S. Pat. No. 6,082,025, which is incorporated by reference in its entirety. The barrier sheets **16**, **18** and the polymeric sheets **10** and **11** may also be formed from a material that includes alternating layers of thermoplastic polyurethane and ethylene-vinyl alcohol copolymer, as disclosed in U.S. Pat. Nos. 5,713,141 and 5,952,065 to Mitchell et al. which are incorporated by reference in their entireties. Alternatively, the layers may include ethylene-vinyl alcohol copolymer, thermoplastic polyurethane, and a regrind material of the ethylene-vinyl alcohol copolymer and thermoplastic polyurethane. The barrier sheets **16**, **18** and the polymeric sheets **10** and **11** may also each be a flexible microlayer membrane that includes alternating layers of a gas barrier material and an elastomeric material, as disclosed in U.S. Pat. Nos. 6,082,025 and 6,127,026 to Bonk et al. which are incorporated by reference in their entireties. Additional suitable materials for the barrier sheets **16**, **18** and the polymeric sheets **10** and **11** are disclosed in U.S. Pat. Nos. 4,183,156 and 4,219,945 to Rudy which are incorporated by reference in their entireties. Further suitable materials for the barrier sheets **16**, **18** and the polymeric sheets **10** and **11** include thermoplastic films containing a crystalline material, as disclosed in U.S. Pat. Nos. 4,936,029 and 5,042,176 to Rudy, and polyurethane including a polyester polyol, as disclosed in U.S. Pat. Nos. 6,013,340, 6,203,868, and 6,321,465 to Bonk et al. which are incorporated by reference in their entireties. In selecting materials for the barrier sheets **16** and **18** and the polymeric sheets **10** and **11**, engineering properties such as tensile strength, stretch properties, fatigue characteristics, dynamic modulus, and loss tangent can be considered. The thickness of the barrier sheets **16** and **18** and the polymeric sheets **10** and **11** can be selected to provide these characteristics.

**[0064]** As is apparent from FIGS. **5-8**, none of the bonds **44**, **46**, or **47** extends continuously from the medial edge **34**C to the lateral edge **34**D of the multi-sheet core **12**. Additionally, because anti-weld material **24** extends continuously from the medial edge **34**C to the lateral edge **34**D between adjacent rows and columns of bonds **44** (where rows are in the transverse direction and columns are in the fore-aft direction), between adjacent rows of bonds **46**, and between rows of adjacent bonds **47**. The medial edge **34**C is a portion of the outer perimeter **34** at the medial side **80** of the longitudinal axis LA. The longitudinal axis LA is also

referred to herein as a longitudinal midline. The lateral edge **34**D is a portion of the outer perimeter **34** at the lateral side **82** of the longitudinal axis LA. By disposing the anti-weld material **24** so that it extends to an outer perimeter **34** of the core **12** at the inner surfaces **17**, **19** of the barrier sheets **16**, **18** and between the polymeric sheets **10**, **11** (on the first side **15** of the second polymeric sheet **11**), and by ensuring that the outer perimeter **34** of the core **12** is entirely inward of the peripheral bond **38** of the barrier sheets **16**, **18** as shown in FIG. **7**, for example, the resulting pattern of bonds **44**, **46**, and **47** of the multi-sheet core **12** does not result in any sealed chambers within the bladder **20** that are not in fluid communication with the interior cavity **21**. In this way, the multi-sheet core **12** itself controls the final geometry of the inflated cushioning component **14** but does not affect the cushioning response of the cushioning component **14** under dynamic loading.

**[0065]** FIGS. **6-8** best illustrate the relative alignment of the sets of bonds **44**, **46**, and **47** afforded by the precise predetermined patterns of the anti-weld material **24** disposed on the first side **22** of the first polymeric sheet **10**, on the second side **13** of the second polymeric sheet **11**, and on the first side **15** of the second polymeric sheet **11**, respectively. In FIG. **8**, the bonds **44** of the first set (**44**A, **44**B, and **44**C) are indicated with solid lines. The bonds **46** of the second set (**46**A, **46**B, and **46**C) are indicated with dashed lines. The bonds **47** of the third set (**47**A, **47**B, and **47**C) are indicated with a combination of dashed and dotted lines. Only some of the bonds are labeled in FIG. **8** for clarity in the drawings. It is clear from the FIG. **8** that the bonds **47** of the third set alternate with the bonds **44** of the first set along a length of the core **12** (e.g., along a length of the first polymeric sheet **10** of the core **12**) and hence along a length of the resulting cushioning component **14**. It is also clear from FIG. **8** that the bonds **47** of the third set alternate with the bonds **46** of the second set both transversely and along a length of the core **12** (e.g., along a length of the second polymeric sheet **11** of the core **12**) and hence along a length of the resulting cushioning component **14**. With this configuration, as best indicated in FIGS. **5**, **8**, and **9**, at least some of the bonds **46** of the second set are aligned with the at least some of the bonds **44** of the first set. More specifically, the bonds **44** of the first set are disposed vertically above the bonds **46** of the second set with a bond **47** of the third set offset from and vertically at a height between that of bond **44**, **46** of each vertically-stacked set of bonds **44**, **46**.

**[0066]** Additionally, as best shown in FIG. **8**, at least some of the bonds **46** of the second set are wider in a fore-aft direction of the core **12**, of the cushioning component **14**, and of the article of footwear **72** than the bonds **44** of the first set with which the at least some of the bonds **46** of the second set are aligned. In the example shown, all of the bonds **46** of the second set are aligned with the bonds **44** of the first set, and each bond **46** of the second set is wider than the respective bond **44** of the first set with which the bond **46** of the second set is aligned. The bonds **46** of the second set that are wider than the bonds **44** of the first set are thus in both the forefoot region **50** and the heel region **54** as well as in the midfoot region **52** of the article of footwear **72**. In other examples, the bonds **46** of the second set may be wider than the bonds **44** of the first set only in the forefoot region **50** or only in the heel region **54**, for example.

**[0067]** By providing wider bonds **46** that are disposed closer to the ground surface GS when the cushioning component **14** is incorporated into the article of footwear **72** as shown in FIG. **10**, the side with the narrower (e.g., shorter) bonds (e.g., the second barrier sheet **18** at the outer surface **59** of the foot-facing side of the cushioning component **14**) will allow for more pillowing between the bonds **44** of the first set than between the bonds **46** of the second set when inflated. The side with more pillowing (e.g., the first barrier sheet **16** at the foot-facing side) will contract more in overall length as the path of the material of the barrier sheet **16** at the foot-facing side (e.g., the footbed side) is distributed vertically and horizontally. Accordingly, the first barrier sheet **16** at the foot-facing side with narrower bonds **44** will become more concave after inflation than the second barrier sheet **18** with the wider bonds **46** and may cause the overall shape of the cushioning component **14** to curve upwards at the forefoot region **50** and at the heel region **54** at the ground-facing side (e.g., at the second barrier sheet **18**). Providing the narrower bonds **44** of the first set on the footbed side and the wider bonds **46** of the second set on the ground-facing side (e.g., the exterior surface **61**) thus helps to shape the inflated cushioning component **14** to promote toe spring.

**[0068]** Each of the lateral end bonds **46**B of the rows of bonds of the second set of bonds are wider than adjacent lateral end bonds **47**B of the rows of bonds of the third set of bonds, and each of the medial end bonds **46**A of the rows of bonds of the second set of bonds are wider than adjacent medial end bonds **47**A of the rows of bonds of the third set of bonds. This further enhances the ability of the relatively wide lateral end bonds **46**B and the medial end bonds **46**A closest to the ground-facing exterior surface **61** to promote toe spring.

**[0069]** By placing the anti-weld material **24** such that the medial end bonds **44**A, **46**A, and **47**A and the lateral end bonds **44**B, **46**B, and **47**B are at the edges **34**B and **34**C and are longer in the transverse direction than the interior bonds **44**C, **46**C, and **47**C, a more distinct height differential between the peripheral portion **21**A of the interior cavity **21** outward of the outer perimeter **34** of the core **12** and inward of the peripheral bond **38** is maintained along the footbed (e.g., the foot-facing side at the exterior surface **59** of the first barrier sheet **16**). A similar height differential is maintained at the ground-facing side or exterior surface **61** of the second barrier sheet **18**. The forward bond **45** and the rearmost bond **49** help to maintain the height differential between the peripheral portion **21**A and a footbed portion over the core **12** at the front and rear of the core **12**.

**[0070]** As shown in FIGS. **6** and **7**, the rows of the second set of bonds **46** are aligned with the rows of the first set of bonds **44** when the cushioning component is in an uninflated state such that at least one interior bond **46**C of each of the rows of the second set of bonds is aligned with at least one interior bond **44**C of a corresponding rows of the first set of bonds. This is also shown in the inflated state of the cushioning component **14** in FIGS. **8** and **9**, for example. As previously discussed, the interior bonds **44**C of the first set are elongated in the transverse direction while the interior bonds **46**C of the second set are elongated in the longitudinal direction. By elongating the interior bonds **44**C in the transverse direction at the exterior surface **59** of the first barrier sheet **16**, the interior bonds **44**C further complement the medial and lateral end bonds **44**A, **46**A, and **44**B, **46**B to encourage the depressed footbed. As is also apparent in FIGS. **6-8**, the interior bonds **44**C are stacked vertically

above the interior bonds **46**C at least in the uninflated state. In the inflated state, due to curvature of the cushioning component **14** resulting from tensioning of the polymeric sheets **10**, **11** and the barrier sheets **16**, **18** as discussed herein, the alignment of some of the interior bonds **44**C over the interior bonds **46**C may be tipped slightly from vertical.

**[0071]** A closeup view of portion of the cushioning component **14** is shown at circle **8**A in FIG. **8** and shows one of the interior bonds **44**C aligned with (e.g., stacked vertically over) one of the interior bonds **46**C. Elongating the interior bonds **44**C in the transverse direction may create greater pillowing between adjacent interior bonds **44**C in the longitudinal direction than between adjacent interior bonds **44**C in the transverse direction (e.g., in the same row) or transversely adjacent to an interior bond **44**C when there is only one interior bond **44**C in a particular row. In contrast, elongating the interior bonds **46**C in the longitudinal direction may create greater pillowing between adjacent interior bonds **46**C in the transverse direction (e.g., in the same row) in the same row or transversely adjacent an interior bond **46**C when there is only one interior bond **46**C in a particular row in the longitudinal direction. Given that the interior bonds **47**C are disposed at a height vertically between that of the interior bonds **44**C and the interior bonds **46**C and are circular, they do not skew pillowing in any particular direction. By placing the interior bonds **44**C vertically stacked over the interior bonds **46**C, an area of greater pillowing at the first barrier sheet **16** will be opposite an area of relatively lesser pillowing at the second barrier sheet **18** and vice versa, which may help to maintain a more consistent overall height of the cushioning component at the area of the core **12** that includes the interior bonds **44**C, **46**C, and **47**C. Additionally, the circular interior bonds **47**C are shorter in the transverse direction than at least one interior bond **44**C of adjacent rows of the first set of bonds and are shorter in the fore-aft direction than at least one interior bond **46**C of the adjacent rows of the second set of bonds. Stated differently, the diameter of the circle of the interior bond **47**C is less than the elongated axis (the major axis) of the adjacent interior bonds **46**C and less than the elongated axis (the major axis) of the adjacent interior bonds **44**C.

**[0072]** Alternatively, the interior bonds **44**C could be elongated in the longitudinal (fore-aft) direction and the interior bonds **46**C could be elongated in the transverse direction. Stated differently, the at least one interior bond **44**C of each of the rows of the first set of bonds may be elongated in one of a transverse direction or a fore-aft direction of the cushioning component **14**, and the at least one interior bond **46**C of each of the rows of the second set of bonds may be elongated in the other of the transverse direction or the fore-aft direction of the cushioning component **14**.

**[0073]** FIGS. **9** and **10** show that the tension created in the bonded polymeric sheets **10**, **11** of the core **12** by the inflation of the interior cavity **21** causes portions of the first barrier sheet **16** inward of the outer perimeter **34** of the core **12** to be pulled downward at the bonds **44**, as also indicated by the contoured exterior surface **59** of the first barrier sheet **16** in FIG. **9**. Because the outer perimeter **34** of the core **12** is entirely inward of the peripheral bond **38**, the barrier sheets **16**, **18** will not be tethered together at a peripheral portion **21**A of the interior cavity **21** outward of the outer perimeter **34** of the core **12** and inward of the peripheral bond **38**. The distance between the inner surfaces **17** and **19** and the resulting height of the cushioning component **14** may thus be greatest outward of the core **12**. The top exterior surface **59** is only partly shown and is represented with hidden lines in FIG. **10** where the first barrier sheet **16** is pulled downward by the first polymeric sheet **10** at the bonds **44**. Only some of the area of the interior cavity **21** and only some of the bonds **44**, **46**, and **47** are labeled in FIG. **9**.

**[0074]** Similarly, tension created in the bonded polymeric sheets **10**, **11** of the core **12** by the inflation of the interior cavity **21** causes portions of the second barrier sheet **18** inward of the outer perimeter **34** of the core **12** to be pulled upward at the bonds **46**, as indicated by the contoured exterior surface **61** of the second barrier sheet **18** in FIGS. **9** and **10**. The pattern of anti-weld material **24** disposed on the polymeric sheets **10** and **11** the resulting patterns of bonds **44**, **46**, and **47** of the polymeric sheets **10** and **11**, respectively, of the core **12** to the barrier sheets **16**, **18** and of the polymeric sheets **10** and **11** to one another at the bonds **47** can be selected to control the resulting contours of the exterior surfaces **59**, **61** of the barrier sheets **16**, **18**.

**[0075]** FIG. **10** shows the sole structure **70** also includes another midsole layer **71**, such as a foam midsole layer, that is secured to and overlies the cushioning component **14** (e.g., secured to the first barrier sheet **16**). The sole structure **70** also includes an outsole **73** secured to the bottom of the cushioning component **14** (e.g., to the second barrier sheet **18**). A footwear upper **75** is secured to the sole structure **70** to support a foot over the cushioning component **14**. The article of footwear **72** and the sole structure **70** are non-limiting examples, and the cushioning component **14** may be used in a sole structure and/or an article of footwear with a different configuration than in FIG. **10**.

**[0076]** Additionally, FIGS. **8-10** best show that the bonds **47** of the third set are offset from the bonds **46** of the second set and from the bonds **44** of the first set. In one example, some or all of the bonds **44** and **46** may progressively decrease in fore-aft width from the heel region **54** to the forefoot region **50** of the article of footwear **72**. Moreover, as best shown in FIG. **10**, adjacent rows of the bonds **44** (as well as adjacent rows of bonds **46** and adjacent rows of bonds **47**) are spaced closer to one another in the forefoot region **50** than in the heel region **54**. For example, a first group of bonds **47** (e.g., adjacent bonds **47**C**3** and **47**C**4**) are in the forefoot region **50** and a second group of bonds **47** (e.g., adjacent bonds **47**C**1** and **47**C**2**) are in the heel region **54**. Spacing between the adjacent bonds **47**C**3** and **47**C**4** of the first group of bonds is less than spacing between the adjacent bonds **47**C**1** and **47**C**2** of the second group of bonds such that the opposing inner surfaces **17**, **19** of the barrier sheets **16**, **18** are held closer to one another in the forefoot region **50** than in the heel region **54**. This configuration also results in toe spring, which is the gradual increasing elevation of the second barrier sheet **18** away from the ground surface GS in the forefoot region **50** in a forward direction when the sole structure **70** is in a steady state position (e.g., unloaded or at least not under a dynamic compressive load) as shown in FIG. **10**. This pre-shaping of the cushioning component **14** with a toe spring via the bond placement helps to create a forward foot roll and easier toe-off during a forward motion of the wearer.

**[0077]** Referring to FIG. **8**, in addition to bond placement to promote toe spring, the outer perimeter **34** of the core **12** is spaced further inward of the peripheral bond **38** in the heel region **54** than in the forefoot region **50**. This is best shown

in FIG. **8** where a distance D**1** from the outer perimeter **34** of the core **12** to the peripheral bond **38** in the heel region **54** is greater than a distance D**2** from the outer perimeter **34** of the core **12** to the peripheral bond **38** in the forefoot region **50**. This creates a larger and taller peripheral portion of the interior cavity **21** around the core **12** in the heel region **54** than in the forefoot region **50**, as best shown in FIG. **10**, which causes the cushioning component **14** to nest around the heel where the bonds **44** on the first barrier sheet **16** tend to pull the barrier sheet **16** down inward of peripheral portion **21**A of the interior cavity **21** that is disposed outward of the core **12**. Stated differently, the first barrier sheet **16** may recess slightly downward between the medial side **80** and the lateral side **82** above the core **12** in the heel region **54**, helping to cup the heel.

**[0078]** The following Clauses provide example configurations of an article of footwear disclosed herein.

**[0079]** Clause 1. An article of footwear comprising: a sole structure having a cushioning component, the cushioning component including: a bladder including a first barrier sheet and a second barrier sheet, the first barrier sheet and the second barrier sheet together defining an interior cavity between opposing inner surface of the first and second barrier sheets, and the first barrier sheet and the second barrier sheet sealed to one another along a peripheral bond to enclose the interior cavity and retain a gas in the interior cavity; and a multi-sheet core disposed in the interior cavity, spaced entirely inward of the peripheral bond, and directly bonded to the opposing inner surfaces of the first and second barrier sheets; wherein the multi-sheet core is displaced from the opposing inner surfaces at unbonded areas of the multi-sheet core such that the gas in the interior cavity is in fluid communication around the multi-sheet core without the multi-sheet core creating any sealed chambers within the bladder that are not in fluid communication with the interior cavity; and wherein no bonds securing the multi-sheet core to the opposing inner surfaces extend continuously from a medial edge of the multi-sheet core to a lateral edge of the multi-sheet core.

**[0080]** Clause 2. The article of footwear of clause 1, wherein anti-weld material is disposed on the multi-sheet core at the unbonded areas.

**[0081]** Clause 3. The article of footwear of any of clauses 1-2, wherein the multi-sheet core lays flat within the bladder with the unbonded areas contacting the opposing inner surfaces of the first and second barrier sheets when the interior cavity of the bladder is uninflated.

**[0082]** Clause 4. The article of footwear of any of clauses 1-2, wherein: the opposing inner surfaces include a first inner surface of the first barrier sheet and a second inner surface of the second barrier sheet opposing the first inner surface; the multi-sheet core includes a first polymeric sheet and a second polymeric sheet, the first polymeric sheet disposed between the first barrier sheet and the second polymeric sheet, and the second polymeric sheet disposed between the first polymeric sheet and the second barrier sheet such that a first side of the first polymeric sheet faces the first inner surface of the first barrier sheet, a second side of the first polymeric sheet faces a first side of the second polymeric sheet, and a second side of the second polymeric sheet faces the second inner surface of the second barrier sheet; the first side of the first polymeric sheet is directly bonded to the first inner surface of the first barrier sheet at a first set of bonds, the second side of the second polymeric sheet is directly bonded to the second inner surface of the second barrier sheet at a second set of bonds, and the second side of the first polymeric sheet is directly bonded to the first side of the second polymeric sheet at a third set of bonds; the first polymeric sheet is displaced from the first inner surface of the first barrier sheet by the gas at unbonded areas of the first side of the first polymeric sheet, the second polymeric sheet is displaced from the second inner surface of the second polymeric sheet by unbonded areas of the second side of the second polymeric sheet; and none of the bonds of the first set of bonds, none of the bonds of the second set of bonds, and none of the bonds of the third set of bonds extend continuously from the medial edge of the multi-sheet core to the lateral edge of the multi-sheet core.

**[0083]** Clause 5. The article of footwear of clause 4, wherein: a thickness of the first polymeric sheet is less than or equal to a thickness of the first barrier sheet and is less than or equal to a thickness of the second barrier sheet; and a thickness of the second polymeric sheet is less than or equal to a thickness of the first barrier sheet and is less than or equal to a thickness of the second barrier sheet.

**[0084]** Clause 6. The article of footwear of clause 4, wherein at least some of the bonds of the second set are aligned with at least some of the bonds of the first set in a fore-aft direction of the cushioning component when the interior cavity is uninflated and are wider in the fore-aft direction of the cushioning component than the bonds of the first set with which the at least some of the bonds of the second set are aligned.

**[0085]** Clause 7. The article of footwear of clause 6, wherein the at least some of the bonds of the second set are in a forefoot region of the cushioning component.

**[0086]** Clause 8. The article of footwear of clause 6, wherein the at least some of the bonds of the second set are in a heel region of the cushioning component.

**[0087]** Clause 9. The article of footwear of clause 6, wherein: all of the bonds of the second set are aligned with the bonds of the first set in the fore-aft direction of the cushioning component; and each bond of the second set disposed along the medial edge or the lateral edge of the multi-sheet core is wider in the fore-aft direction of the cushioning component than a respective bond of the first set disposed along the medial edge or the lateral edge of the multi-sheet core and with which the bond of the second set is aligned.

**[0088]** Clause 10. The article of footwear of clause 4, wherein: the first set of bonds, the second set of bonds, and the third set of bonds each include rows of bonds extending in a transverse direction of the multi-sheet core, each of the rows of bonds having a medial end bond extending to the medial edge of the multi-sheet core, a lateral end bond extending to the lateral edge of the multi-sheet core, and at least one interior bond disposed between the medial end bond and the lateral end bond; and in each of the rows of bonds, each of the at least one interior bonds is shorter in the transverse direction of the multi-sheet core than the medial end bond and is shorter in the transverse direction of the multi-sheet core than the lateral end bond.

**[0089]** Clause 11. The article of footwear of clause 10, wherein in at least some of the rows of bonds of the second set of bonds, the lateral end bond is aligned with and is wider in a fore-aft direction of the cushioning component than a corresponding lateral end bond of the first set of bonds when the interior cavity is uninflated and the medial end bond is

aligned with and is wider in the fore-aft direction of the cushioning component than a corresponding medial end bond of the first set of bonds when the interior cavity is uninflated.

**[0090]** Clause 12. The article of footwear of clause 11, wherein the at least some of the rows of bonds of the second set of bonds are in a forefoot region of the cushioning component.

**[0091]** Clause 13. The article of footwear of clause 11, wherein the at least some of the rows of bonds of the second set of bonds are in a heel region of the cushioning component.

**[0092]** Clause 14. The article of footwear of clause 11, wherein: in each of the rows of bonds of the second set of bonds, the lateral end bond is aligned with and is wider in the fore-aft direction of the article of footwear than a corresponding lateral end bond of the first set of bonds and the medial end bond is aligned with and is wider in the fore-aft direction of the article of footwear than a corresponding medial end bond of the first set of bonds.

**[0093]** Clause 15. The article of footwear of clause 14, wherein: the rows of bonds of the third set of bonds include lateral end bonds and medial end bonds that are offset from the lateral end bonds and the medial end bonds of the rows of bonds of the second set of bonds, respectively and are offset from the lateral end bonds and the medial end bonds of the rows of bonds of the first set of bonds, respectively; each of the lateral end bonds of the rows of bonds of the second set of bonds is wider than adjacent lateral end bonds of the rows of bonds of the third set of bonds; and each of the medial end bonds of the rows of bonds of the second set of bonds is wider than adjacent medial end bonds of the rows of bonds of the third set of bonds.

**[0094]** Clause 16. The article of footwear of clause 10, wherein: the at least one interior bond of each of the rows of the first set of bonds is elongated in one of a transverse direction of the cushioning component or a fore-aft direction of the cushioning component; and the at least one interior bond of each of the rows of the second set of bonds is elongated in the other of the transverse direction of the cushioning component or the fore-aft direction of the cushioning component.

**[0095]** Clause 17. The article of footwear of clause 16, wherein the rows of the second set of bonds are aligned with the rows of the first set of bonds such that the at least one interior bond of each of the rows of the second set of bonds is aligned with the at least one interior bond of a corresponding row of the first set of bonds when the interior cavity is uninflated.

**[0096]** Clause 18. The article of footwear of clause 16, wherein the third set of bonds includes rows of interior bonds that are shorter in the transverse direction of the cushioning component than the at least one interior bond of adjacent rows of the first set of bonds and are shorter in the fore-aft direction of the cushioning component than the at least one interior bond of adjacent rows of the second set of bonds.

**[0097]** Clause 19. The cushioning component of clause 4, wherein an outer perimeter of the first polymeric sheet and an outer perimeter of the second polymeric sheet is spaced further inward of the peripheral bond in a heel region of the cushioning component than in a forefoot region of the cushioning component.

**[0098]** Clause 20. An article of footwear comprising: a sole structure having a cushioning component, the cushioning component including: a bladder including a first barrier sheet and a second barrier sheet defining an interior cavity between a first inner surface of the first barrier sheet and a second inner surface of the second barrier sheet that opposes the first inner surface, the first barrier sheet and the second barrier sheet sealed to one another along a peripheral bond to enclose the interior cavity and retain a gas in the interior cavity; and a core disposed in the interior cavity and spaced entirely inward of the peripheral bond, the core including a first polymeric sheet and a second polymeric sheet, the first polymeric sheet disposed between the first barrier sheet and the second polymeric sheet, and the second polymeric sheet disposed between the first polymeric sheet and the second barrier sheet such that a first side of the first polymeric sheet faces the first inner surface of the first barrier sheet, a second side of the first polymeric sheet faces a first side of the second polymeric sheet, and a second side of the second polymeric sheet faces the second inner surface of the second barrier sheet; wherein the first side of the first polymeric sheet is directly bonded to the first inner surface of the first barrier sheet at a first set of bonds, the second side of the second polymeric sheet is directly bonded to the second inner surface of the second barrier sheet at a second set of bonds, and the second side of the first polymeric sheet is directly bonded to the first side of the second polymeric sheet at a third set of bonds; wherein gas in the interior cavity is in fluid communication around the core without the core creating any sealed chambers within the bladder that are not in fluid communication with the interior cavity; wherein the first set of bonds includes interior bonds that are elongated in one of a transverse direction of the cushioning component or a fore-aft direction of the cushioning component; and wherein the second set of bonds includes interior bonds that are aligned with the interior bonds of the first set of bonds in the fore-aft direction of the cushioning component when the interior cavity is uninflated and are elongated in the other of the transverse direction of the cushioning component or the fore-aft direction of the cushioning component.

**[0099]** Clause 21. The article of footwear of clause 20, wherein the interior bonds of the first set of bonds are longer than the interior bonds of the second set of bonds in the one of the transverse direction of the cushioning component or the fore-aft direction of the cushioning component, and the interior bonds of the second set of bonds are longer than the interior bonds of the first set of bonds in the other of the transverse direction of the cushioning component or the fore-aft direction of the cushioning component.

**[0100]** Clause 22. The article of footwear of clause 20, wherein: the third set of bonds includes rows of interior bonds disposed between adjacent rows of the first set of bonds and between adjacent rows of the second set of bonds; and the interior bonds of the rows of the third set of bonds are shorter in the transverse direction of the cushioning component than the interior bonds of the adjacent rows of the first set of bonds and are shorter in the fore-aft direction of the cushioning component than the interior bonds of the adjacent rows of the second set of bonds.

**[0101]** Clause 23. The article of footwear of any of clauses 20-22, wherein: the first polymeric sheet is displaced from the first inner surface of the first barrier sheet by the gas at unbonded areas of the first side of the first polymeric sheet,

the second polymeric sheet is displaced from the second inner surface of the second polymeric sheet at unbonded areas of the second side of the second polymeric sheet; and anti-weld material is disposed on the core at the unbonded areas of the first side of the first polymeric sheet and at the unbonded areas of the second side of the second polymeric sheet.

**[0102]** Clause 24. The article of footwear of clause 23, wherein the core lays flat within the bladder with the unbonded areas contacting the opposing first and second inner surfaces of the first and second barrier sheets when the interior cavity of the bladder is uninflated.

**[0103]** Clause 25. The article of footwear of any of clauses 20-22, wherein: a thickness of the first polymeric sheet is less than or equal to a thickness of the first barrier sheet and is less than or equal to a thickness of the second barrier sheet; and a thickness of the second polymeric sheet is less than or equal to a thickness of the first barrier sheet and is less than or equal to a thickness of the second barrier sheet.

**[0104]** Clause 26. The article of footwear of any of clauses 20-22, wherein at least some of the bonds of the second set are aligned with at least some of the bonds of the first set when the interior cavity of the bladder is uninflated and are wider in a fore-aft direction of the cushioning component than the bonds of the first set with which the at least some of the bonds of the second set are aligned.

**[0105]** Clause 27. The article of footwear of clause 26, wherein the at least some of the bonds of the second set are in a forefoot region of the cushioning component.

**[0106]** Clause 28. The article of footwear of clause 26, wherein the at least some of the bonds of the second set are in a heel region of the cushioning component.

**[0107]** To assist and clarify the description of various embodiments, various terms are defined herein. Unless otherwise indicated, the following definitions apply throughout this specification (including the claims). Additionally, all references referred to are incorporated herein in their entirety.

**[0108]** An "article of footwear", a "footwear article of manufacture", and "footwear" may be considered to be both a machine and a manufacture. Assembled, ready to wear footwear articles (e.g., shoes, sandals, boots, etc.), as well as discrete components of footwear articles (such as a midsole, an outsole, an upper component, etc.) prior to final assembly into ready-to-wear footwear articles, are considered and alternatively referred to herein in either the singular or plural as "article(s) of footwear".

**[0109]** "A", "an", "the", "at least one", and "one or more" are used interchangeably to indicate that at least one of the items is present. A plurality of such items may 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.

**[0110]** 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.

**[0111]** For consistency and convenience, directional adjectives may be employed throughout this detailed description corresponding to the illustrated embodiments. Those having ordinary skill in the art 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.

**[0112]** The term "longitudinal" particularly 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 particularly refer to the general direction from a heel region toward a forefoot region, and the term "rearward" or "posterior" is used to particularly 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.

**[0113]** The term "transverse" particularly 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.

**[0114]** The term "vertical" particularly 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" particularly refers to the vertical direction pointing towards a top of the component, which may include an in step, a fastening region and/or a throat of an upper. The term "downward" or "downwards" particularly 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.

**[0115]** The "interior" of an article of footwear, such as a shoe, particularly 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 particularly 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 particularly 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" particularly refer to the direction toward the interior of the component or article of footwear, such as a shoe, and the terms "outward" and "outwardly" particularly refer to the direction toward the exterior of the component or article of footwear, such as the shoe. In addition, the term "proximal" particularly 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" particularly 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.

**[0116]** While various embodiments 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 embodiments. Any feature of any embodiment may be used in combination with or substituted for any other feature or element in any other embodiment unless specifically restricted. Accordingly, the embodiments are 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.

**[0117]** While several modes for carrying out the many aspects of the present teachings have been described in detail, those familiar with the art to which these teachings relate will recognize various alternative aspects for practicing the present teachings that are within the scope of the appended claims. It is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and exemplary of the entire range of alternative embodiments that an ordinarily skilled artisan would recognize as implied by, structurally and/or functionally equivalent to, or otherwise rendered obvious based upon the included content, and not as limited solely to those explicitly depicted and/or described embodiments.

What is claimed is:

**1**. An article of footwear comprising:

a sole structure having a cushioning component, the cushioning component including:

a bladder including a first barrier sheet and a second barrier sheet, the first barrier sheet and the second barrier sheet together defining an interior cavity between opposing inner surface of the first and second barrier sheets, and the first barrier sheet and the second barrier sheet sealed to one another along a peripheral bond to enclose the interior cavity and retain a gas in the interior cavity; and

a multi-sheet core disposed in the interior cavity, spaced entirely inward of the peripheral bond, and directly bonded to the opposing inner surfaces of the first and second barrier sheets;

wherein the multi-sheet core is displaced from the opposing inner surfaces at unbonded areas of the multi-sheet core such that the gas in the interior cavity is in fluid communication around the multi-sheet core without the multi-sheet core creating any sealed chambers within the bladder that are not in fluid communication with the interior cavity; and

wherein no bonds securing the multi-sheet core to the opposing inner surfaces extend continuously from a medial edge of the multi-sheet core to a lateral edge of the multi-sheet core.

**2**. The article of footwear of claim **1**, wherein anti-weld material is disposed on the multi-sheet core at the unbonded areas.

**3**. The article of footwear of claim **1**, wherein the multi-sheet core lays flat within the bladder with the unbonded areas contacting the opposing inner surfaces of the first and second barrier sheets when the interior cavity of the bladder is uninflated.

**4**. The article of footwear of claim **1**, wherein:

the opposing inner surfaces include a first inner surface of the first barrier sheet and a second inner surface of the second barrier sheet opposing the first inner surface;

the multi-sheet core includes a first polymeric sheet and a second polymeric sheet, the first polymeric sheet disposed between the first barrier sheet and the second polymeric sheet, and the second polymeric sheet disposed between the first polymeric sheet and the second barrier sheet such that a first side of the first polymeric sheet faces the first inner surface of the first barrier sheet, a second side of the first polymeric sheet faces a first side of the second polymeric sheet, and a second side of the second polymeric sheet faces the second inner surface of the second barrier sheet;

the first side of the first polymeric sheet is directly bonded to the first inner surface of the first barrier sheet at a first set of bonds, the second side of the second polymeric sheet is directly bonded to the second inner surface of the second barrier sheet at a second set of bonds, and the second side of the first polymeric sheet is directly bonded to the first side of the second polymeric sheet at a third set of bonds;

the first polymeric sheet is displaced from the first inner surface of the first barrier sheet by the gas at unbonded areas of the first side of the first polymeric sheet, the second polymeric sheet is displaced from the second inner surface of the second polymeric sheet by unbonded areas of the second side of the second polymeric sheet; and

none of the bonds of the first set of bonds, none of the bonds of the second set of bonds, and none of the bonds of the third set of bonds extend continuously from the medial edge of the multi-sheet core to the lateral edge of the multi-sheet core.

**5**. The article of footwear of claim **4**, wherein:

a thickness of the first polymeric sheet is less than or equal to a thickness of the first barrier sheet and is less than or equal to a thickness of the second barrier sheet; and

a thickness of the second polymeric sheet is less than or equal to a thickness of the first barrier sheet and is less than or equal to a thickness of the second barrier sheet.

**6**. The article of footwear of claim **4**, wherein at least some of the bonds of the second set are aligned with at least some of the bonds of the first set in a fore-aft direction of the cushioning component when the interior cavity is uninflated and are wider in the fore-aft direction of the cushioning component than the bonds of the first set with which the at least some of the bonds of the second set are aligned.

**7**. The article of footwear of claim **4**, wherein:

the first set of bonds, the second set of bonds, and the third set of bonds each include rows of bonds extending in a transverse direction of the multi-sheet core, each of the rows of bonds having a medial end bond extending to the medial edge of the multi-sheet core, a lateral end bond extending to the lateral edge of the multi-sheet core, and at least one interior bond disposed between the medial end bond and the lateral end bond; and

in each of the rows of bonds, each of the at least one interior bonds is shorter in the transverse direction of the multi-sheet core than the medial end bond and is shorter in the transverse direction of the multi-sheet core than the lateral end bond.

**8**. The article of footwear of claim **7**, wherein in at least some of the rows of bonds of the second set of bonds, the lateral end bond is aligned with and is wider in a fore-aft direction of the cushioning component than a corresponding lateral end bond of the first set of bonds when the interior cavity is uninflated and the medial end bond is aligned with and is wider in a fore-aft direction of the cushioning component than a corresponding medial end bond of the first set of bonds when the interior cavity is uninflated.

**9**. The article of footwear of claim **7**, wherein, in each of the rows of bonds of the second set of bonds, the lateral end bond is aligned with and is wider in the fore-aft direction of the cushioning component than a corresponding lateral end bond of the first set of bonds and the medial end bond is aligned with and is wider in the fore-aft direction of the cushioning component than a corresponding medial end bond of the first set of bonds.

**10**. The article of footwear of claim **7**, wherein:

the at least one interior bond of each of the rows of the first set of bonds is elongated in one of a transverse direction of the cushioning component or a fore-aft direction of the cushioning component; and

the at least one interior bond of each of the rows of the second set of bonds is elongated in the other of the transverse direction of the cushioning component or the fore-aft direction of the cushioning component.

**11**. The article of footwear of claim **10**, wherein the rows of the second set of bonds are aligned with the rows of the first set of bonds in the fore-aft direction of the cushioning component such that the at least one interior bond of each of the rows of the second set of bonds is aligned with the at least one interior bond of a corresponding row of the first set of bonds when the interior cavity is uninflated.

**12**. The article of footwear of claim **10**, wherein the third set of bonds includes rows of interior bonds that are shorter in the transverse direction of the cushioning component than the at least one interior bond of adjacent rows of the first set of bonds and are shorter in the fore-aft direction of the cushioning component than the at least one interior bond of adjacent rows of the second set of bonds.

**13**. The cushioning component of claim **4**, wherein an outer perimeter of the first polymeric sheet and an outer perimeter of the second polymeric sheet is spaced further inward of the peripheral bond in a heel region of the cushioning component than in a forefoot region of the cushioning component.

**14**. An article of footwear comprising:

a sole structure having a cushioning component, the cushioning component including:

a bladder including a first barrier sheet and a second barrier sheet defining an interior cavity between a first inner surface of the first barrier sheet and a second inner surface of the second barrier sheet that opposes the first inner surface, the first barrier sheet and the second barrier sheet sealed to one another along a peripheral bond to enclose the interior cavity and retain a gas in the interior cavity; and

a core disposed in the interior cavity and spaced entirely inward of the peripheral bond, the core including a first polymeric sheet and a second polymeric sheet, the first polymeric sheet disposed between the first barrier sheet and the second polymeric sheet, and the second polymeric sheet disposed between the first polymeric sheet and the second barrier sheet such that a first side of the first polymeric sheet faces the first inner surface of the first barrier sheet, a second side of the first polymeric sheet faces a first side of the second polymeric sheet, and a second side of the second polymeric sheet faces the second inner surface of the second barrier sheet;

wherein the first side of the first polymeric sheet is directly bonded to the first inner surface of the first barrier sheet at a first set of bonds, the second side of the second polymeric sheet is directly bonded to the second inner surface of the second barrier sheet at a second set of bonds, and the second side of the first polymeric sheet is directly bonded to the first side of the second polymeric sheet at a third set of bonds;

wherein gas in the interior cavity is in fluid communication around the core without the core creating any sealed chambers within the bladder that are not in fluid communication with the interior cavity;

wherein the first set of bonds includes interior bonds that are elongated in one of a transverse direction of the cushioning component or a fore-aft direction of the cushioning component; and

wherein the second set of bonds includes interior bonds that are aligned with the interior bonds of the first set of bonds in the fore-aft direction of the cushioning component when the interior cavity is uninflated and are elongated in the other of the transverse direction of the cushioning component or the fore-aft direction of the cushioning component.

**15**. The article of footwear of claim **14**, wherein the interior bonds of the first set of bonds are longer than the interior bonds of the second set of bonds in the one of the transverse direction of the cushioning component or the fore-aft direction of the cushioning component, and the interior bonds of the second set of bonds are longer than the interior bonds of the first set of bonds in the other of the transverse direction of the cushioning component or the fore-aft direction of the cushioning component.

**16**. The article of footwear of claim **14**, wherein:

the third set of bonds includes rows of interior bonds disposed between adjacent rows of the first set of bonds and between adjacent rows of the second set of bonds; and

the interior bonds of the rows of the third set of bonds are shorter in the transverse direction of the article of footwear than the interior bonds of the adjacent rows of the first set of bonds and are shorter in the fore-aft direction of the cushioning component than the interior bonds of the adjacent rows of the second set of bonds.

**17**. The article of footwear of claim **14**, wherein:

the first polymeric sheet is displaced from the first inner surface of the first barrier sheet by the gas at unbonded areas of the first side of the first polymeric sheet, the second polymeric sheet is displaced from the second inner surface of the second polymeric sheet at unbonded areas of the second side of the second polymeric sheet; and

anti-weld material is disposed on the core at the unbonded areas of the first side of the first polymeric sheet and at the unbonded areas of the second side of the second polymeric sheet.

**18**. The article of footwear of claim **17**, wherein the core lays flat within the bladder with the unbonded areas contacting the opposing first and second inner surfaces of the first and second barrier sheets when the interior cavity of the bladder is uninflated.

**19**. The article of footwear of claim **14**, wherein:

a thickness of the first polymeric sheet is less than or equal to a thickness of the first barrier sheet and is less than or equal to a thickness of the second barrier sheet; and

a thickness of the second polymeric sheet is less than or equal to a thickness of the first barrier sheet and is less than or equal to a thickness of the second barrier sheet.

**20**. The article of footwear of claim **14**, wherein at least some of the bonds of the second set are aligned with at least some of the bonds of the first set when the interior cavity of the bladder is uninflated and are wider in a fore-aft direction of the cushioning component than the bonds of the first set with which the at least some of the bonds of the second set are aligned.

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