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(54) **ZONAL DYNAMIC LACING SYSTEM**

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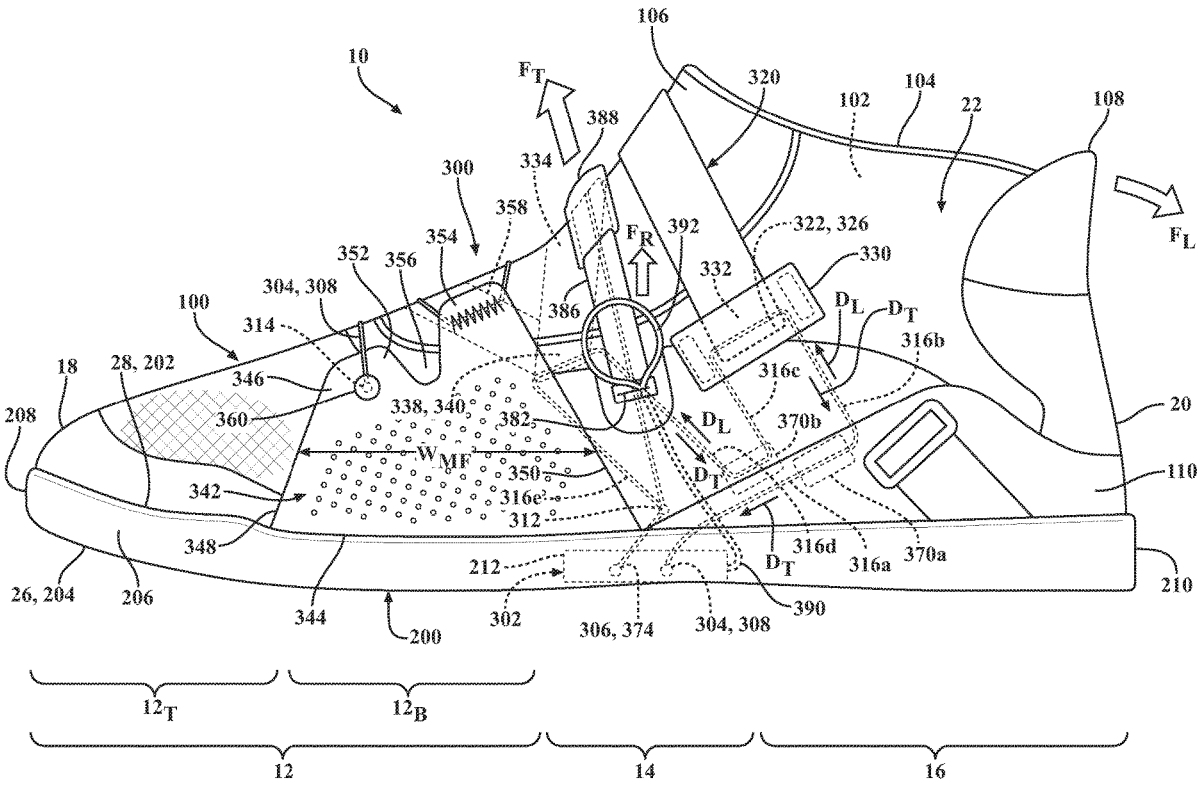
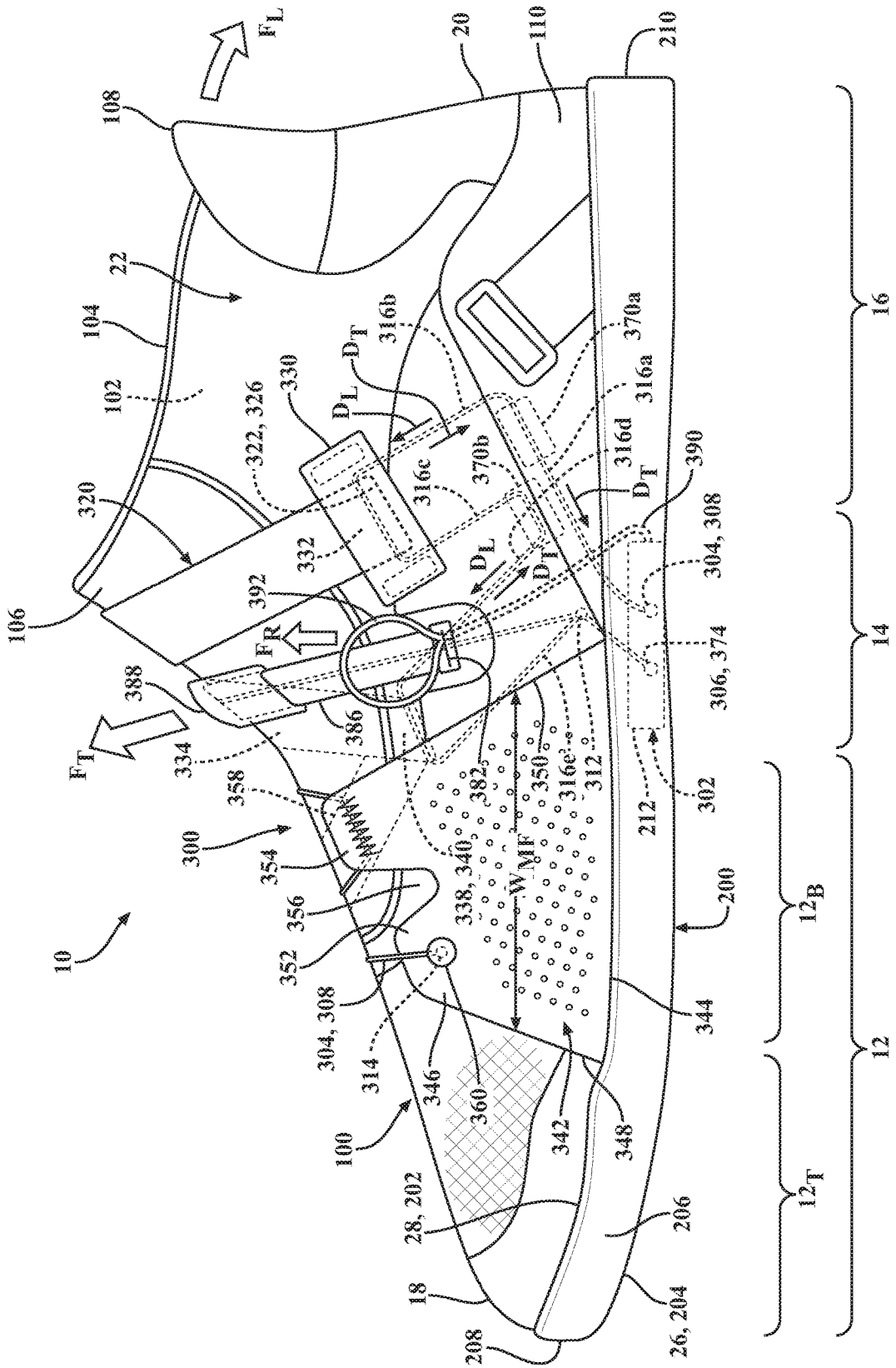
(57) **ABSTRACT**

An article of footwear includes an upper and a sole structure attached to the upper. The article of footwear also includes a cable lock disposed within the sole structure adjacent to a bottom surface of the sole structure. The article of footwear includes a first cable having a first section extending from the cable lock to a first anchor point on the upper and a second section extending from the cable lock to a second anchor point on the upper. The article of footwear further includes a second cable having a first section extending from the cable lock to a grip and a second section extending from the cable lock to the grip, whereby the cable lock is operable to retract the first section and the second section of the first cable when the first section and the second section of the second cable are extended.

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12
12B
12T
14
16
18
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22
26, 204
28, 202
100
102
104
106
108
110
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204
206
208
210
212
300
302
304, 308
306, 374
312
314
316a
316b
316c
316d
316e
320
322, 326
330
332
334
338, 340
342
344
346
348
350
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370a
370b
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FL
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FT
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WMF

FIG. 1

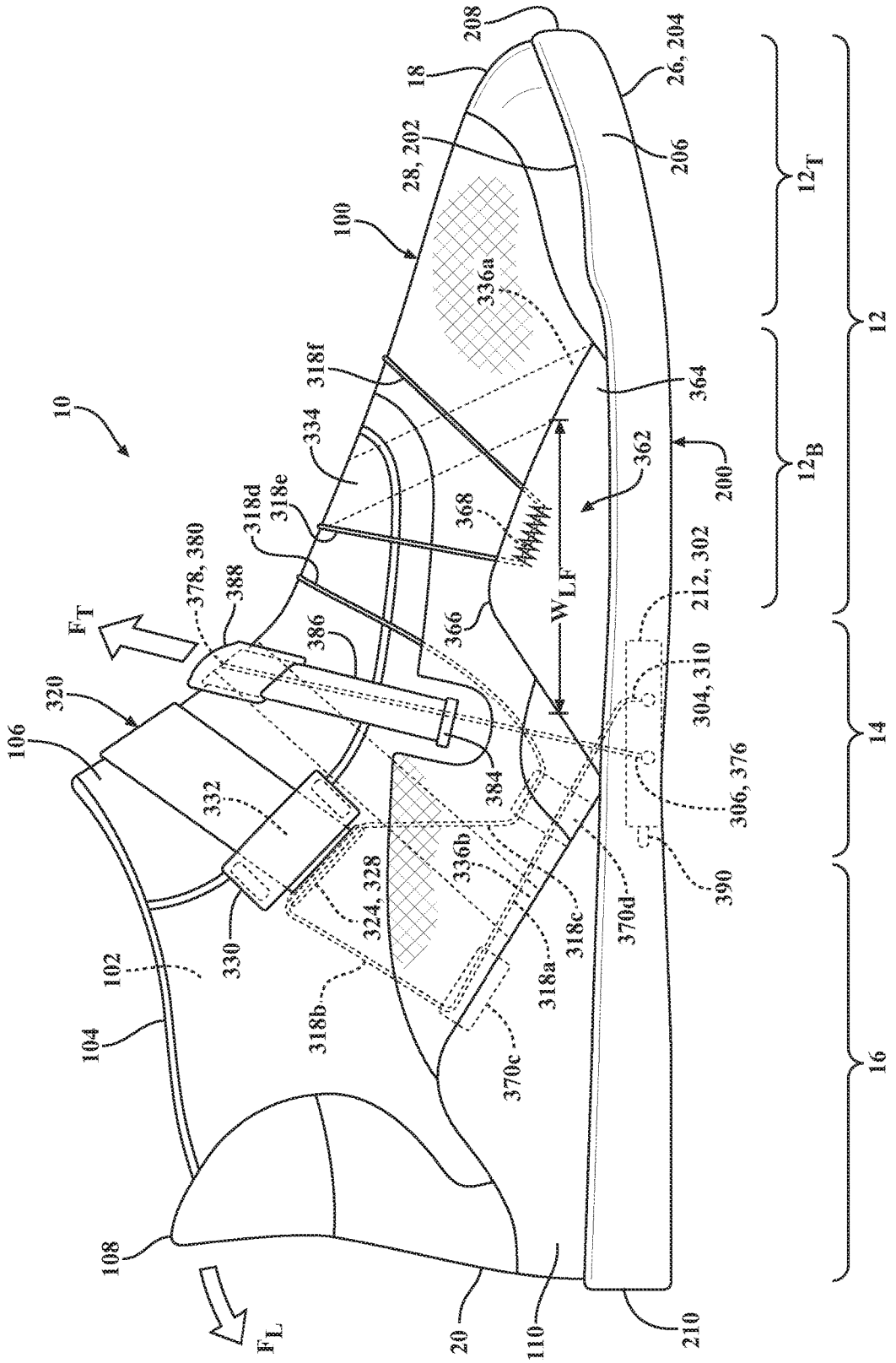
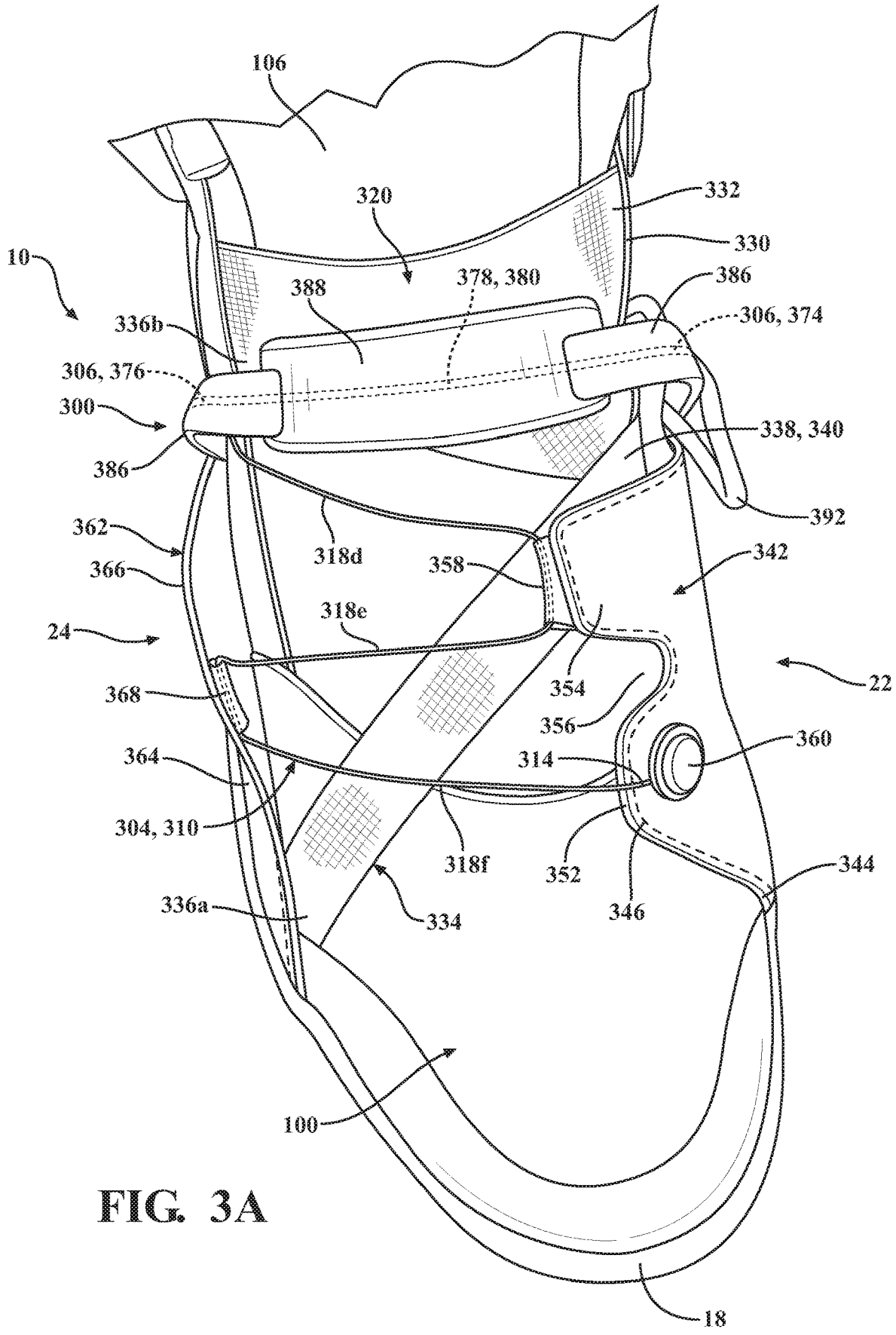

10
100
102
104
106
108
110
18
20
26, 204
28, 202
318a
318b
318c
318d
318e
318f
320
324, 328
330
332
334
336a
336b
362
364
366
368
370c
370d
378, 380
384
386
388
390
200
206
208
210
212, 302
304, 310
306, 376
F_T
F_L
W_{LF}
12_T
12_B
12
14
16

FIG. 2


106
320
332
330
10
388
378, 380
386
306, 374
336b
306, 376
300
338, 340
386
392
362
318d
358
342
366
318e
24
354
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368
356
360
364
314
304, 310
318f
352
344
336a
334
346
100
18

FIG. 3A

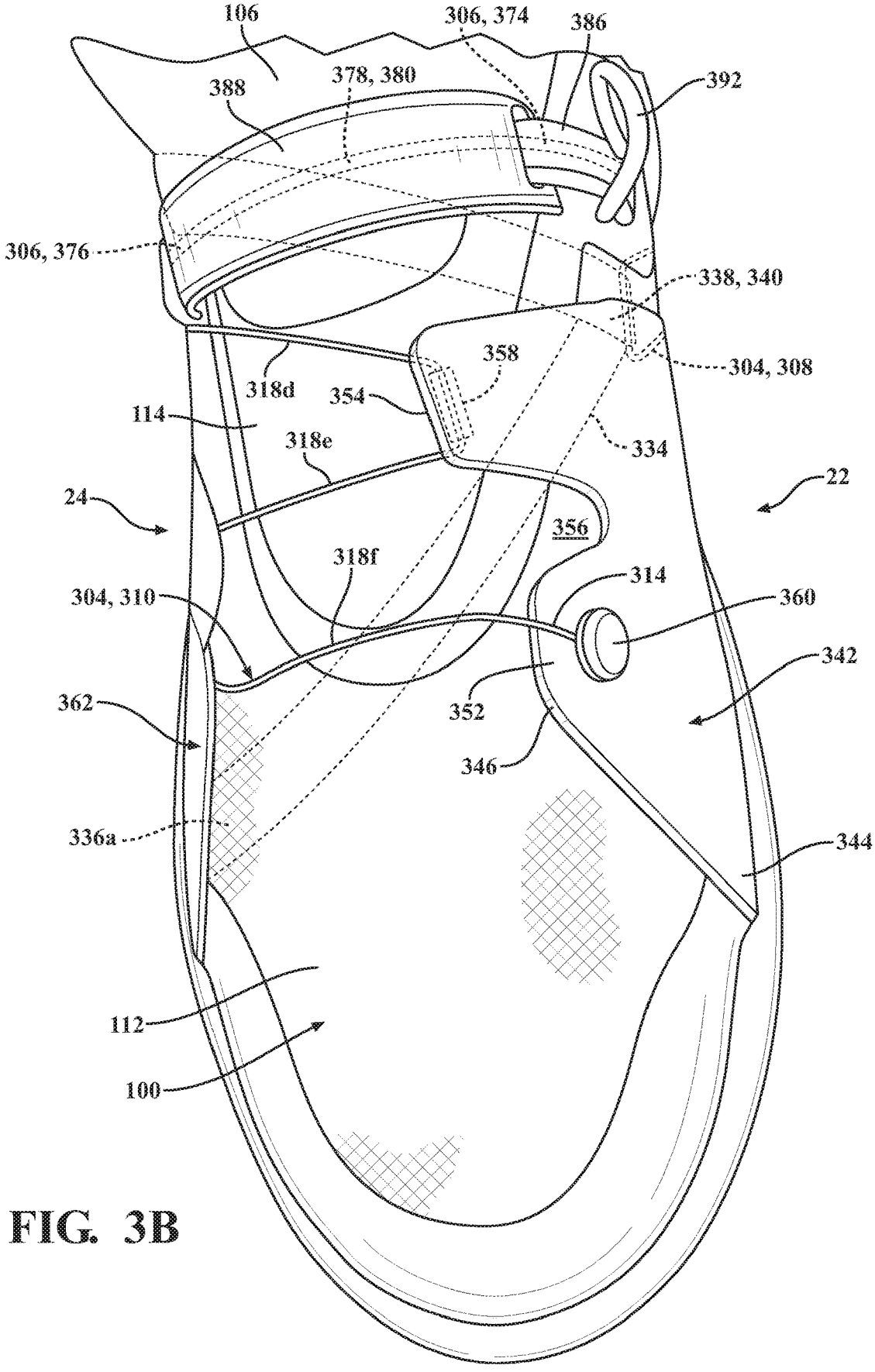
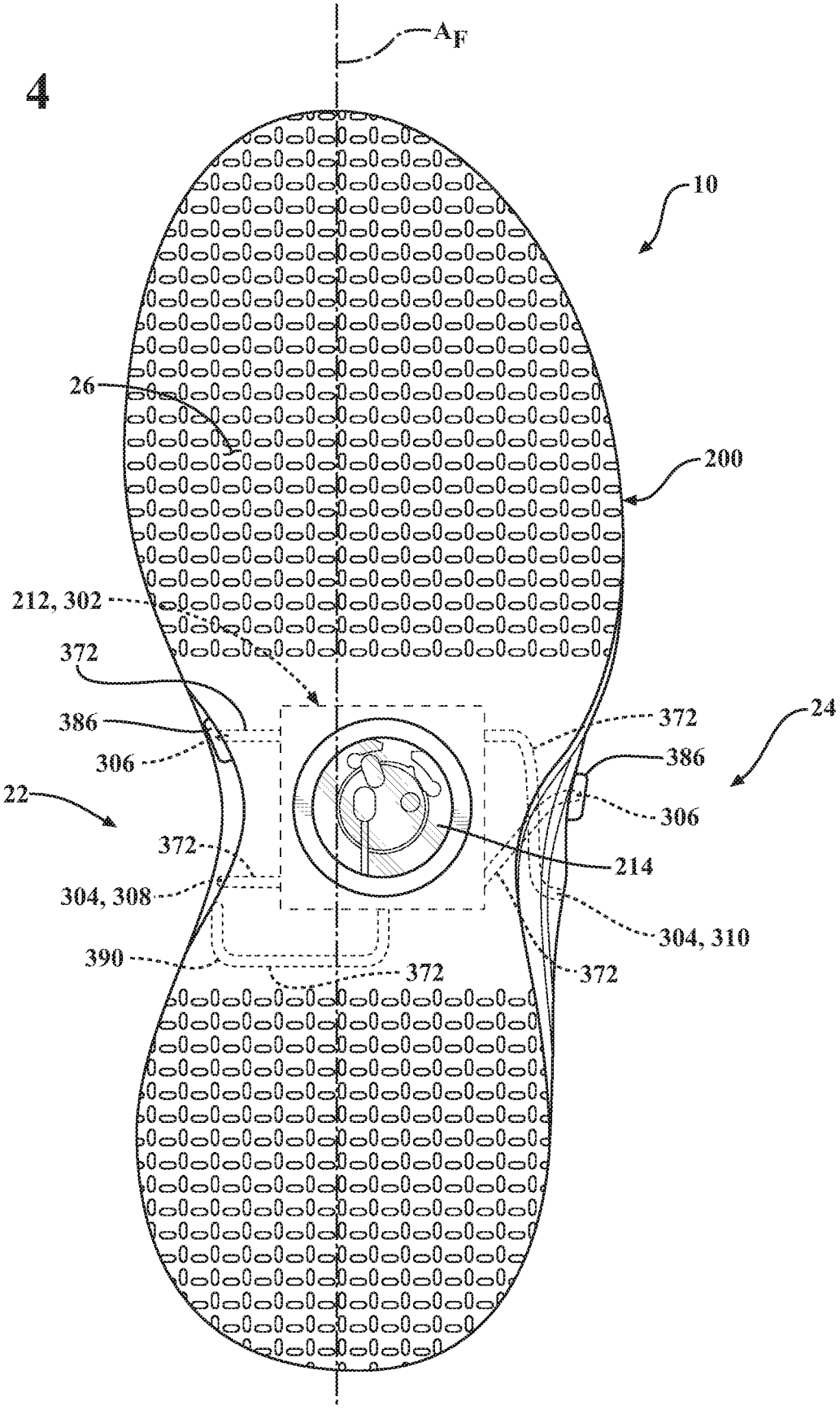
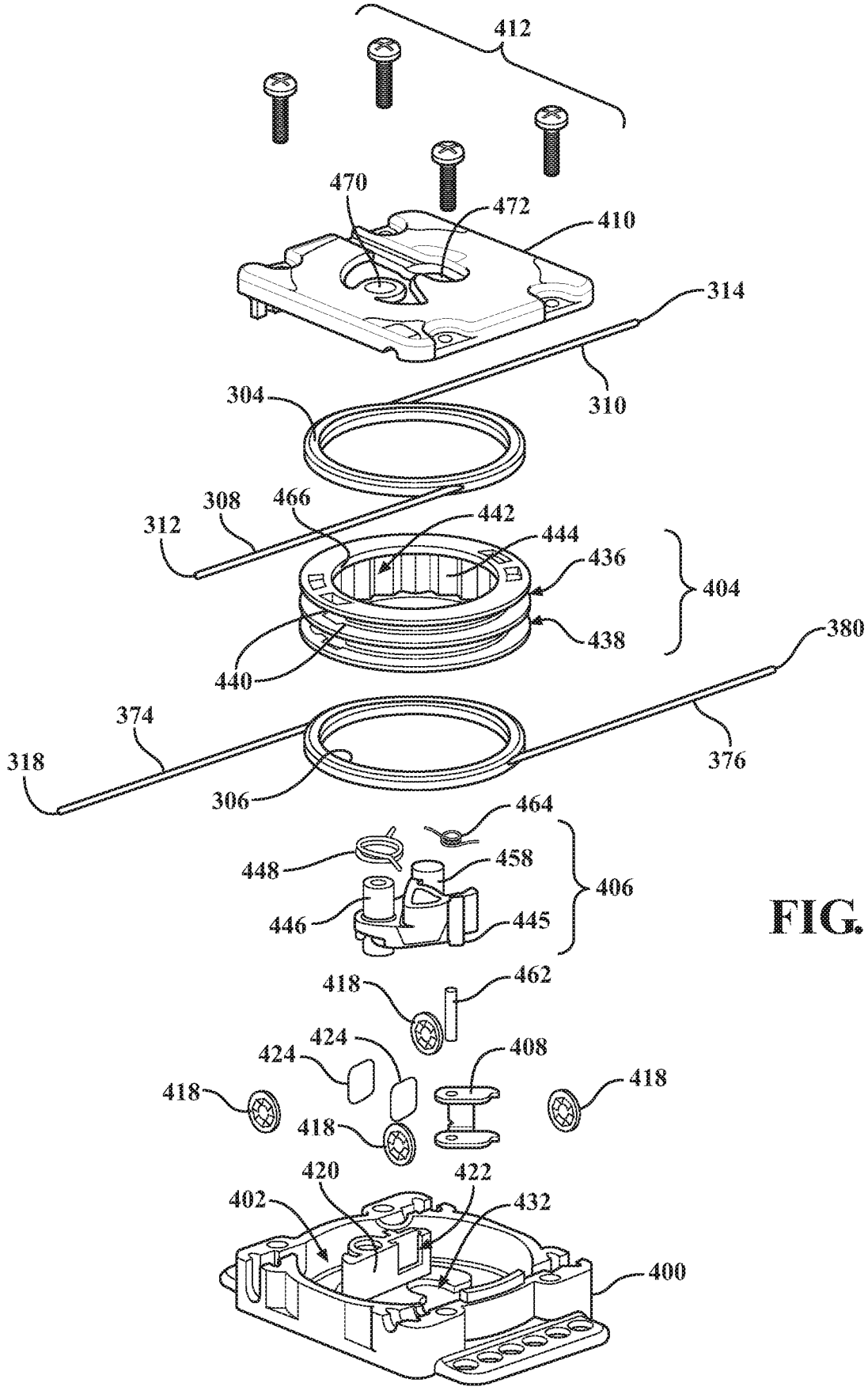

106
306, 374
386
388
378, 380
392
306, 376
338, 340
358
304, 308
318d
354
114
318e
334
22
24
356
318f
314
304, 310
360
342
362
352
346
336a
344
112
100

FIG. 3B

FIG. 4


A_F
10
26
200
212, 302
372
386
306
22
372
304, 308
390
372
372
386
306
214
304, 310
372
24


412
470
472
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310
304
308
466
312
442
444
436
404
438
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380
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318
376
306
464
448
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424
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422
402
432
400

FIG. 5

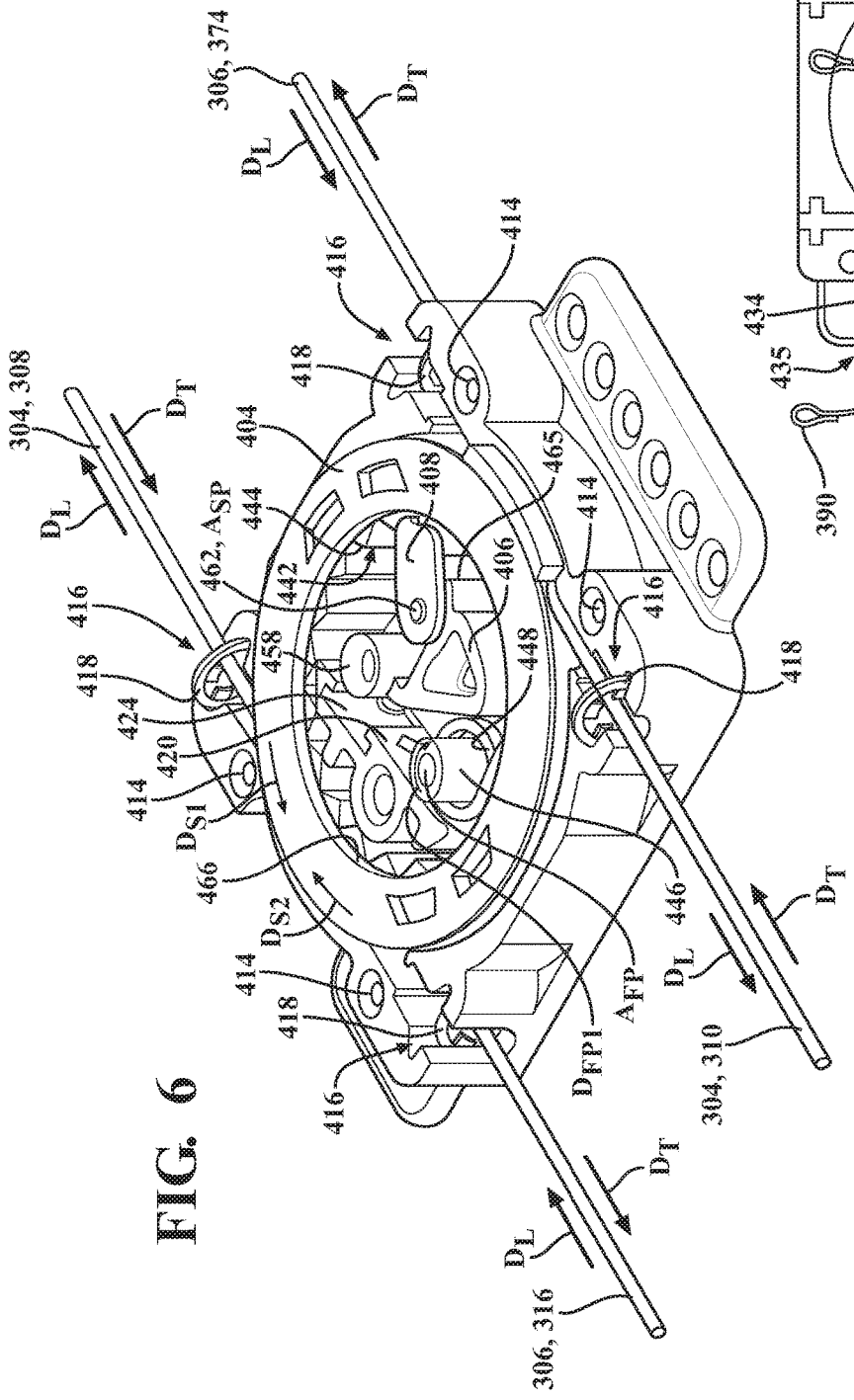
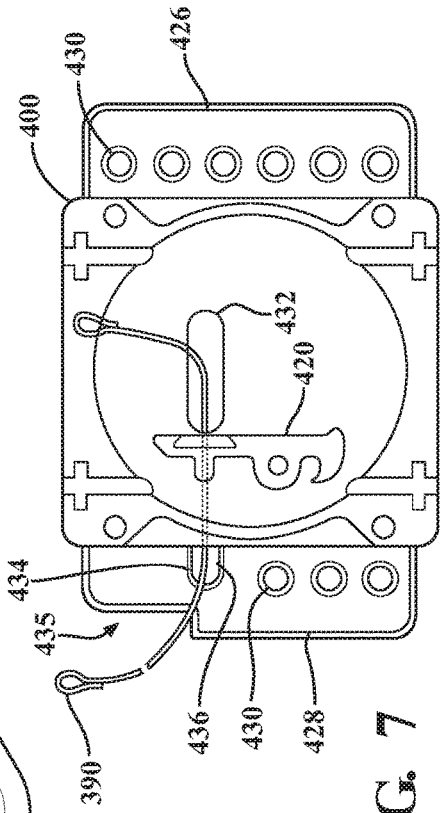

306, 374
D_T
D_L
414
416
418
304, 308
404
408
465
462, A_{SP}
444
442
406
458
448
424
420
D_{S1}
466
D_{S2}
A_{FP}
D_{FP1}
446
304, 310
306, 316

FIG. 6


400
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420
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436
428

FIG. 7

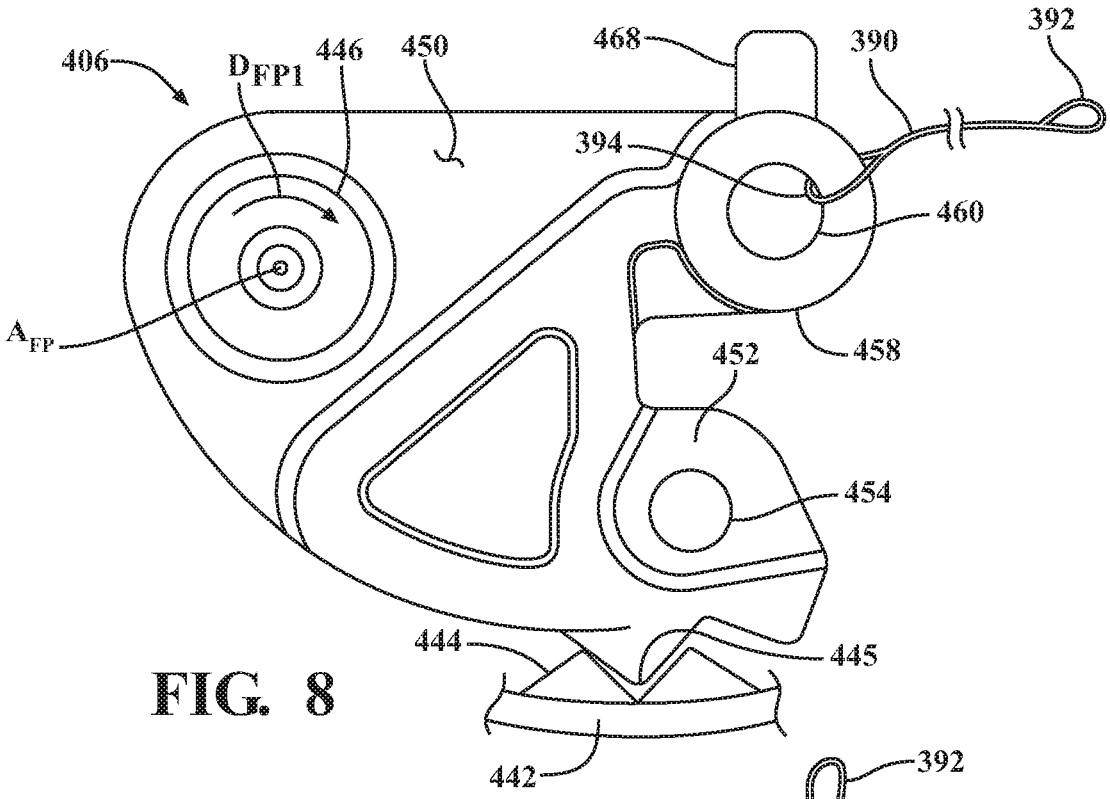
406
D_{FP1}
446
450
468
390
392
394
460
A_{FP}
458
452
454
444
445
442

FIG. 8

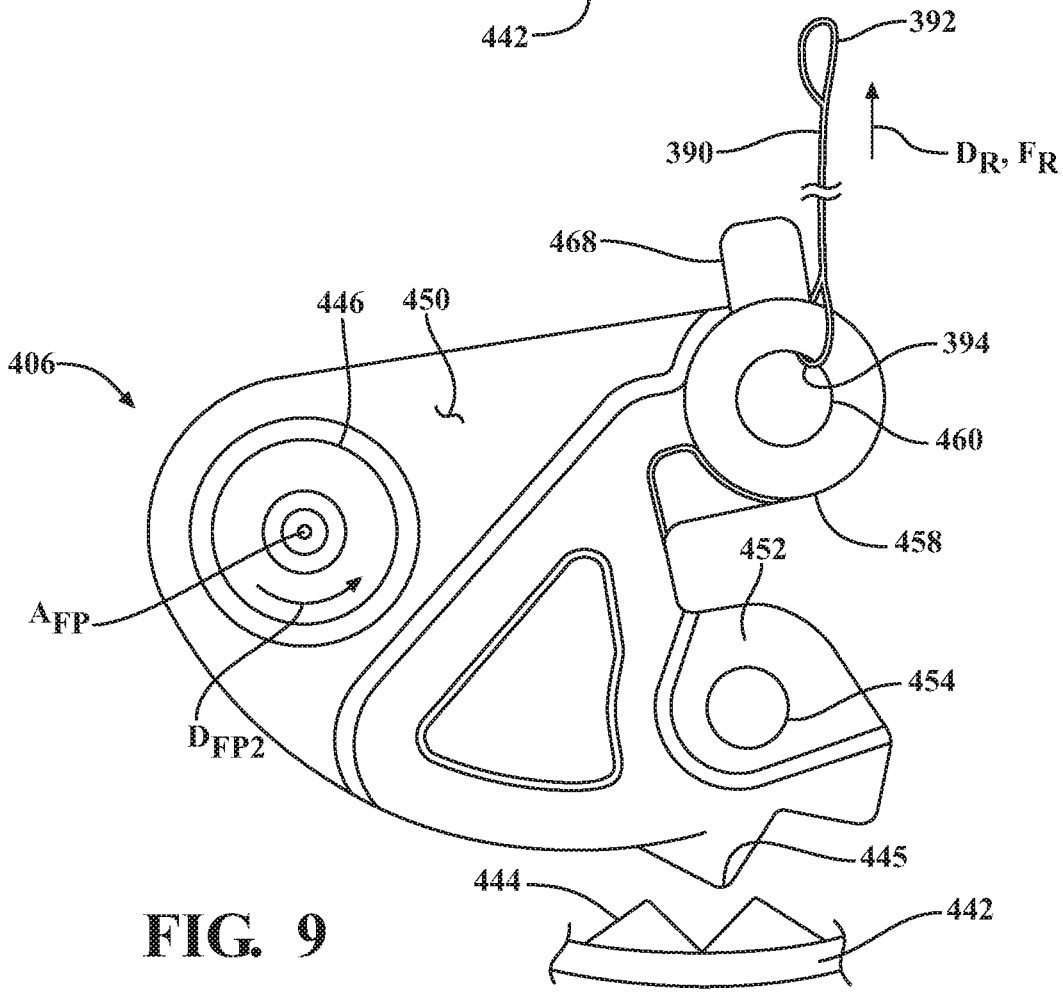
392
390
D_R, F_R
468
446
450
406
394
460
458
452
A_{FP}
454
D_{FP2}
445
444
442

FIG. 9

ZONAL DYNAMIC LACING SYSTEM

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This non-provisional U.S. Patent Application claims priority under 35 U.S.C. § 119(e) to U.S. Provisional Patent Application Ser. No. 62/733,411, filed Sep. 19, 2018, the disclosure of which is hereby incorporated by reference in its entirety.

FIELD

[0002] The present disclosure relates generally to articles of footwear having a dynamic lacing system for moving footwear between a tightened state and a loosened state.

BACKGROUND

[0003] This section provides background information related to the present disclosure which is not necessarily prior art.

[0004] Articles of footwear conventionally include an upper and a sole structure. The upper may be formed from any suitable material(s) to receive, secure and support a foot on the sole structure. A bottom portion of the upper, proximate to a bottom surface of the foot, attaches to the sole structure. Sole structures generally include a layered arrangement extending between an outsole providing abrasion-resistance and traction with a ground surface and a midsole disposed between the outsole and the upper for providing cushioning for the foot.

[0005] The upper may cooperate with laces, straps, or other fasteners to adjust the fit of the upper around the foot. For instance, laces may be tightened to close the upper around the foot and tied once a desired fit of the upper around the foot is attained. Care is required to ensure that the upper is not too loose or too tight around the foot each time the laces are tied. Moreover, the laces may loosen or become untied during wear of the footwear. While fasteners such as hook and loop fasteners are easier and quicker to operate than traditional laces, these fasteners have a propensity to wear out over time and require more attention to attain a desired tension when securing the upper to the foot.

[0006] Known automated tightening systems typically include a tightening mechanism, such as rotatable knob, that can be manipulated to apply tension to one or more cables that interact with the upper for closing the upper around that foot. While these automated tightening systems can incrementally increase the magnitude of tension of the one or more cables to achieve the desired fit of the upper around the foot, they require a time-consuming task of manipulating the tightening mechanism to properly tension the cables for securing the upper around the foot, and when it is desired to remove the footwear from the foot, the wearer is required to simultaneously depress a release mechanism and pull the upper away from the foot to release the tension of the cables. Furthermore, these automated tightening systems provide a constant tensioning along the lengths of the one or more cables, whereby rotation of the rotatable knob causes the entire cable to be tightened uniformly. In instances where it may be desirable to tighten a first region of the upper at a different rate than a second region of the upper, additional cables and tightening mechanisms must be incorporated and controlled separately.

[0007] Thus, known automated tightening systems lack suitable provisions for both quickly and variably adjusting the tension of the cables to close the upper around the foot and quickly releasing the tension applied to the cables so that the upper can be quickly loosened for removing the footwear from the foot. Moreover, the tightening mechanism employed by these known automated tightening systems is required to be incorporated onto an exterior of the upper so that the tightening mechanism is accessible to the wearer for adjusting the fit of the upper around the foot, thereby detracting from the general appearance and aesthetics of the footwear.

DRAWINGS

[0008] The drawings described herein are for illustrative purposes only of selected configurations and are not intended to limit the scope of the present disclosure.

[0009] FIG. **1** is a medial side elevation view of an article of footwear having a cable lock movable between a locked state to restrict movement of a cable and an unlocked state to permit movement of the cable in accordance with principles of the present disclosure;

[0010] FIG. **2** is a lateral side elevation view of the article of footwear of FIG. **1**;

[0011] FIG. **3**A is a fragmentary top perspective view of the article of footwear of FIG. **1**, where a shroud of the footwear is hidden to show internal components of the footwear;

[0012] FIG. **3**B is a partial, top perspective view of the article of footwear of FIG. **1**, where the shroud is shown and conceals the internal components of the footwear;

[0013] FIG. **4** is a bottom view of the article of footwear of FIG. **1**, showing the cable lock exposed through a sole structure of the footwear;

[0014] FIG. **5** is an exploded view of a cable lock in accordance with the principles of the present disclosure;

[0015] FIG. **6** is a perspective view of the cable lock of FIG. **5**;

[0016] FIG. **7** is a top view of the cable lock of FIG. **5**, where internal components of the cable lock are hidden to show a construction of a housing of the cable lock;

[0017] FIG. **8** is an enlarged fragmentary view of the cable lock of FIG. **6**, showing the cable lock in a locked position; and

[0018] FIG. **9** is an enlarged fragmentary view of the cable lock of FIG. **6**, showing the cable lock in an unlocked position.

[0019] Corresponding reference numerals indicate corresponding parts throughout the drawings.

DETAILED DESCRIPTION

[0020] Example configurations will now be described more fully with reference to the accompanying drawings. Example configurations are provided so that this disclosure will be thorough, and will fully convey the scope of the disclosure to those of ordinary skill in the art. Specific details are set forth such as examples of specific components, devices, and methods, to provide a thorough understanding of configurations of the present disclosure. It will be apparent to those of ordinary skill in the art that specific details need not be employed, that example configurations may be embodied in many different forms, and that the

specific details and the example configurations should not be construed to limit the scope of the disclosure.

[0021] The terminology used herein is for the purpose of describing particular exemplary configurations only and is not intended to be limiting. As used herein, the singular articles "a," "an," and "the" may be intended to include the plural forms as well, unless the context clearly indicates otherwise. The terms "comprises," "comprising," "including," and "having," are inclusive and therefore specify the presence of features, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, steps, operations, elements, components, and/or groups thereof. The method steps, processes, and operations described herein are not to be construed as necessarily requiring their performance in the particular order discussed or illustrated, unless specifically identified as an order of performance. Additional or alternative steps may be employed.

[0022] When an element or layer is referred to as being "on," "engaged to," "connected to," "attached to," or "coupled to" another element or layer, it may be directly on, engaged, connected, attached, or coupled to the other element or layer, or intervening elements or layers may be present. In contrast, when an element is referred to as being "directly on," "directly engaged to," "directly connected to," "directly attached to," or "directly coupled to" another element or layer, there may be no intervening elements or layers present. Other words used to describe the relationship between elements should be interpreted in a like fashion (e.g., "between" versus "directly between," "adjacent" versus "directly adjacent," etc.). As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0023] The terms first, second, third, etc. may be used herein to describe various elements, components, regions, layers and/or sections. These elements, components, regions, layers and/or sections should not be limited by these terms. These terms may be only used to distinguish one element, component, region, layer or section from another region, layer or section. Terms such as "first," "second," and other numerical terms do not imply a sequence or order unless clearly indicated by the context. Thus, a first element, component, region, layer or section discussed below could be termed a second element, component, region, layer or section without departing from the teachings of the example configurations.

[0024] One aspect of the disclosure provides an article of footwear. The article of footwear includes an upper defining an interior void and a sole structure attached to the upper and having a top surface facing toward the interior void and a ground-engaging bottom surface formed on an opposite side of the sole structure from the top surface. The article of footwear also includes a cable lock disposed within the sole structure adjacent to the bottom surface. The article of footwear further includes a first cable having a first section extending from the cable lock to a first anchor point on the upper and a second section extending from the cable lock to a second anchor point on the upper. The article of footwear also includes a second cable having a first section extending from the cable lock to a grip and a second section extending from the cable lock to the grip, the cable lock being operable to retract the first section and the second section of the first cable when the first section and the second section of the second cable are extended.

[0025] Implementations of the disclosure may include one or more of the following optional features. In some implementations, the cable lock is exposed to view through a viewing port disposed at the bottom surface of the sole structure. The viewing port includes an aperture extending at least partially through at least one of an outsole portion and a midsole portion of the sole structure. Here, the viewing port also includes a window comprising a transparent barrier extending across the aperture. In some examples, internal components of the cable lock are visible through the bottom surface of the sole structure.

[0026] In some configurations, the article of footwear includes a first strap extending from a first end on a medial side of the upper to a second end on a lateral side of the upper, the first end of the first strap may receive the first section of the first cable and the second end of the first strap receiving the second section of the first cable. Here, the article of footwear may also include a second strap extending from a first end at a bite line of the footwear on the lateral side to a second end on the medial side of the upper, the second end defining a loop and receiving the first section of the first cable.

[0027] In some examples, the cable lock includes a spool, the first cable being wound in a first direction around the spool and the second cable being wound in a second direction around the spool, the second direction being opposite the first direction. The first section of the first cable may include a first plurality of segments extending along a medial side of the upper to the first anchor point on the medial side of the upper, and the second section of the first cable may include a second plurality of segments extending between a lateral side of the upper and the medial side of the upper to the second anchor point on the medial side of the upper.

[0028] In some implementations, the first anchor point is disposed on a medial side of the upper in a midfoot region adjacent to a bite line of the upper and the sole structure, and the second anchor point is disposed at a distal end of a flap disposed on the medial side of the upper in a forefoot region. The flap may extend from a proximal end attached at the bite line to the distal end adjacent to an instep region of the upper. The flap may include a loop for receiving the second section of the first cable, the loop receiving a first segment and a second segment of the second section, and the second anchor point receiving a third segment of the second section.

[0029] Another aspect of the disclosure provides an article of footwear. The article of footwear includes an upper defining an interior void and a sole structure attached to the upper and having a top surface facing toward the interior void and a ground-engaging bottom surface formed on an opposite side of the sole structure from the top surface. The article of footwear also includes a cable lock disposed within the sole structure and a first cable having a first section extending in a first direction from the cable lock and a second section extending in a second direction from the cable lock, the first section including a first plurality of segments routed along a medial side of the upper through at least one strap and the second section including a second plurality of segments routed along a lateral side of the upper through the at least one strap. The article of footwear further includes a second cable extending from the cable lock and operable to move the first cable toward a retracted state when a tensile force applied to the second cable causes the second cable to pay out from the cable lock.

[0030] Implementations of the disclosure may include one or more of the following optional features. In some configurations, the cable lock is exposed to view through the bottom surface of the sole structure. The viewing port may include an aperture extending at least partially through at least one of an outsole portion and a midsole portion of the sole structure. The viewing port may also include a window comprising a transparent barrier extending across the aperture. The internal components of the cable lock may be visible through the bottom surface of the sole structure.

[0031] In some examples, the at least one strap includes a first strap extending from a first end disposed on a medial side of the upper to a second end disposed on the lateral side of the upper, the first end of the first strap receiving the first section of the first cable and the second end of the first strap receiving the second section of the first cable. Here, the at least one strap may include a second strap extending from a first end attached to the lateral side the footwear on the lateral side to a second end on the medial side of the upper, the second end defining a loop and a receiving the first section of the first cable. In other examples, the cable lock includes a spool, the first cable being wound in a first direction around the spool and the second cable being wound in a second direction around the spool, the second direction being opposite the first direction.

[0032] In some implementations, the first section of the first cable extends to a first anchor point on the medial side of the upper and the second section of the first cable extends a second anchor point on the medial side of the upper. The first anchor point may be disposed on a medial side of the upper in a midfoot region adjacent to a bite line of the upper and the sole structure and the second anchor point may be disposed at a distal end of a flap disposed on the medial side of the upper in a forefoot region. The flap may extend from a proximal end attached at the bite line to the distal end adjacent to an instep region of the upper. The flap may include a loop for receiving the second section of the first cable, the loop receiving a first segment and a second segment of the second section, and the second anchor point receiving a third segment of the second section.

[0033] The details of one or more implementations of the disclosure are set forth in the accompanying drawings and the description below. Other aspects, features, and advantages will be apparent from the description and drawings, and from the claims.

[0034] Referring to FIG. **1**, an example of an article of footwear **10** including a system providing for variable tension is disclosed. In some implementations, the article of footwear **10** includes an upper **100** and a sole structure **200** attached to the upper **100**. The article of footwear **10** further includes a tensioning system **300** integrated into at least one of the upper **100** and the sole structure **200**. The tensioning system **300** includes a cable lock **302** and a pair of cables **304**, **306** that cooperate with the cable lock **302** to move the article of footwear **10** between a tightened state and a loosened state, as detailed below. Particularly, the cables **304**, **306** are movable in a tightening direction D_T to move the article of footwear **10** into the tightened state. In some implementations, the upper **100** and the sole structure **200** cooperate to provide passages and guides for routing portions of the cables **304**, **306** through the cable lock **302**. The cable lock **302** is configured to selectively secure the cables **304**, **306** in the tightened state.

[0035] The article of footwear **10** may be divided into one or more regions. The regions may include a forefoot region **12**, a mid-foot region **14** and a heel region **16**. The forefoot region **12** may correspond with toes and joints connecting metatarsal bones with phalanx bones of a foot. The forefoot region **12** may be subdivided into a toe portion 12_T corresponding with phalanges and a ball portion 12_B associated with metatarsal bones of a foot. The mid-foot region **14** may correspond with an arch area of the foot, and the heel region **16** may correspond with rear regions of the foot, including a calcaneus bone. The footwear **10** may further include an anterior end **18** associated with a forward-most point of the forefoot region **12**, and a posterior end **20** corresponding to a rearward-most point of the heel region **16**. As shown in FIG. **4**, a longitudinal axis A_F of the footwear **10** extends along a length of the footwear **10** from the anterior end **18** to the posterior end **20**, and generally divides the footwear **10** into a lateral side **24** and a medial side **22**. Accordingly, the lateral side **24** and the medial side **22** respectively correspond with opposite sides of the footwear **10** and extend through the regions **12**, **14**, **16**.

[0036] The upper **100** includes interior surfaces that define an interior void **102** configured to receive and secure a foot for support on the sole structure **200**. An ankle opening **104** in the heel region **16** may provide access to the interior void **102**. For example, the ankle opening **104** may receive a foot to secure the foot within the void **102** and facilitate entry and removal of the foot to and from the interior void **102**. The upper **100** may include a tongue portion **106** that extends between the lateral side **24** and the medial side **22** and covers the interior void **102**. The upper **100** may include one or more grip features **108** formed adjacent the ankle opening **104** for pulling the footwear **10** onto and off of the foot. The upper further includes a heel counter **110** extending from the medial side **22** to the lateral side **24** around the posterior end **20** of the upper **100**.

[0037] The upper **100** may be formed from one or more materials that are stitched or adhesively bonded together to define the interior void **102**. Suitable materials of the upper **100** may include, but are not limited, textiles, foam, leather, and synthetic leather. The example upper **100** may be formed from a combination of one or more substantially inelastic or non-stretchable materials and one or more substantially elastic or stretchable materials disposed in different regions of the upper **100** to facilitate movement of the upper **100** between the tightened state and the loosened state. The one or more elastic materials may include any combination of one or more elastic fabrics such as, without limitation, spandex, elastane, rubber or neoprene. The one or more inelastic materials may include any combination of one or more of thermoplastic polyurethanes, nylon, leather, vinyl, or another material/fabric that does not impart properties of elasticity. As illustrated best in FIGS. **3**A and **3**B, the upper may be provided with one or more shrouds **112** and/or covers **114** for concealing the various components of the tensioning system **300**. For example, in FIG. **3**A, the upper **100** is shown without the shrouds **112** and covers **114**, whereby at least one of the straps of the tensioning system **300** exposed. In contrast, FIG. **3**B shows a mesh shroud **112** covering the forefoot region **12** of the upper **100**, while the tongue portion **106** of the upper **100** may be provided with a cover **114**. In some examples, the cover **114** may be removable by the user to expose the tensioning system **300**.

[0038] As provided above, the sole structure **200** is attached to the upper **100** and defines a ground-engaging surface **26** of the footwear **10**. The sole structure **200** includes a top surface **202** and a bottom surface **204** formed on an opposite side of the sole structure **200** from the top surface **202**. The bottom surface **204** of the sole structure **200** may define the ground-engaging surface **26** of the footwear. The sole structure **200** further includes a peripheral side surface **206** extending between the top surface **202** and the bottom surface **204**, such that the peripheral side surface **206** defines an outer perimeter of the sole structure **200**. The sole structure **200** extends continuously from a first end **208** at the anterior end **18** of the footwear **10** to a second end **210** at the posterior end **20** of the footwear **10**. As referred to throughout the application and the accompanying claims, the sole structure **200** and the upper **100** define a 'bite line' **28** where the peripheral side surface **206** and the upper **100** intersect when the footwear **10** is assembled. The bite line **28** can extend along the footwear **10** entirely from the first end **208** to the second end **210** on either or both of the lateral side and the medial side, and can also extend around the first end **208**, the second end **210**, or both.

[0039] As described in greater detail below, the sole structure **200** is configured to receive a portion of the tensioning system **300** therein, and may include one or more cavities or conduits formed therein. In the illustrated example, the sole structure **200** includes an aperture or cavity **212** formed in the bottom surface **204**. The cavity **212** is configured to receive the cable lock **302** within the sole structure **200**. In some examples, the cable lock **302** may be encapsulated within the sole structure **200**. As shown in the example of FIG. **4**, the cavity **212** may be configured to receive the cable lock **302** such that a portion of the cable lock **302** is exposed or visible through the bottom surface **204** of the sole structure **200**. For example, the cable lock **302** may be recessed from the bottom surface **204** of the sole structure **200**, such that a portion of the cavity **212** formed between the cable lock **302** and the bottom surface **204** defines a view port through which the cable lock is exposed. Here, the cavity **212** or the cable lock **302** may include a transparent barrier **214** providing a window **214** into an interior of the cable lock **302**. Accordingly, internal components of the cable lock **302** may be visible through the barrier **214** so that operation of the cable lock **302** can be observed by the user.

[0040] As introduced above, the tensioning system **300** generally includes a first cable **304** and a second cable **306**, which cooperate with each other via the cable lock **302** to selectively transition the upper **100** between a tightened state and a relaxed state. As shown, the first cable **304** is routed along the upper **100** through a plurality of guides and straps, whereby a tightening force F_T applied to the second cable **306** by the user is transmitted to the first cable **304** through the cable lock **302**, and is distributed along the upper **100** by the first cable **304** to tighten the upper **100** along the foot. As shown, the first cable **304** may be described as including a first section **308** and a second section **310** that are connected to each other through the cable lock **302**. The first section **308** extends from the cable lock **302** to a terminal end **312** anchored to the upper **100** in the mid-foot region **14**. Likewise, the second section **310** extends from the cable lock **302** to a terminal end **314** anchored to the upper **100** in the forefoot region **12**. As discussed below, the first section **308** of the first cable **304** may be described as comprising a first plurality of segments **316***a*-**316***e* routed along the upper **100** between the cable lock **302** and the terminal end **312** of the first section **308**. Similarly, the second section **310** may be described as including a second plurality of segments **318***a*-**318***f* routed along the upper **100** between the cable lock **302** and the terminal end **314** of the second section **310**.

[0041] As provided above, the tensioning system **300** includes a plurality of guides, loops, and straps through which the first and second sections **308**, **310** of the first cable **304** are routed to translate a tensional force of the first cable **304** into a tightening force along the upper **100**. A first strap **320** extends across the tongue portion **106** adjacent to the ankle opening **104**, from a first end **322** on the medial side **22** of the upper **100** to a second end **324** on the lateral side **24** of the upper **100**. More particularly, the first end **322** of the first strap **320** is positioned on the medial side **22** of the upper **100** adjacent to the tongue portion **106**, and between the mid-foot region **14** and the heel region **16**. Similarly, the second end **324** of the first strap **320** is positioned on the lateral side **24** of the upper **100**, adjacent to the tongue portion **106**, and between the mid-foot region **14** and the heel region **16**. The first end **322** of the first strap **320** defines a first loop **326**, which receives a portion of the first section **308** of the first cable **304** on the medial side **22**, and the second end **324** of the first strap **320** defines a second loop **328**, which receives a portion of the second section **310** of the first cable **304** on the lateral side **24**. As described below, when the first cable **304** is tightened, the loops **326**, **328** of the first strap **320** are drawn towards the sole structure **200** to tighten the first strap **320** over the tongue portion **106**.

[0042] Aside from having the first and second sections **308**, **310** of the first cable **304** routed through the loops **326**, **328**, the first strap **320** is completely detached from the upper **100**. As such, the first strap **320** can be drawn tight over the upper **100** by the first and second sections **308**, **310** of the first cable **304** to tighten the upper **100**. The upper **100** may include one or more guides **330** for maintaining an orientation and position of the first strap **320** across the upper **100**. In the illustrated example, the upper **100** includes a pair of the guides **330**, whereby one of the guides **330** is disposed at the first end **322** of the first strap **320** and the second one of the guides **330** is disposed at the second end **324** of the first strap. Accordingly, the guides **330** receive the ends **322**, **324** of the first strap **320**. In one example, the guides **330** are each formed by stitching opposing ends of a fabric strap to the upper **100** to form a passage **332** between the strap and the upper **100**. However, in other examples, the guides **330** may be formed of rigid materials and/or may wholly define the passage **332**.

[0043] The tensioning system **300** further includes a second strap **334** extending from at least one proximal end **336** to a distal end **338**. As best shown in FIG. **3**A, the second strap **334** extends from a first proximal end **336***a* attached to the bite line **28** on the lateral side **24** in the forefoot region **12**, up to a free-hanging distal end **338** adjacent to the tongue portion **106** on the medial side **22** in the mid-foot region **14**, and back down to a second proximal end **336***b* attached to the bite line **28** on the lateral side **24** in the heel region **16**. Accordingly, the second strap **334** is turned from the first proximal end **336***a* to the second proximal end **336***b* at the distal end **338** to form a loop **340** at the distal end **338**. As discussed in greater detail below, a portion of the first section **308** of the first cable **304** is routed through the loop **340** of the second strap **334** such that when the first section

308 of the first cable **304** is pulled in the tightening direction D_T, the loop **340** of the second strap **334** is drawn down the medial side **22** to tighten around the upper **100**.

[0044] Referring to FIG. **1**, the tensioning system **300** includes a medial flap **342** having a proximal end **344** attached at the bite line **28** and a free-hanging distal end **346** adjacent to the tongue portion **106** of the upper **100** on the medial side **22**. As shown, the proximal end **344** of the medial flap **342** extends along the bite line **28** from the toe portion 12_T to the mid-foot region **14**. A width W_{MF} of the medial flap **342** tapers from the proximal end **344** to the distal end **346**, whereby the width W_{MF} of the medial flap **342** at the distal end **346** is less than the width W_{MF} of the medial flap **342** at the proximal end **344**.

[0045] The distal end **346** of the medial flap **342** may include a pair of tabs **352**, **354** that are separated from each other by a gap **356**. Specifically, the distal end **346** includes an anterior tab **352** disposed adjacent an anterior-facing edge of the medial flap **342** and a posterior tab **354** disposed adjacent to a posterior-facing edge of the medial flap **342**. The tabs **352**, **354** are independently moveable relative to each other. As shown, the posterior tab **354** includes a cable guide **358** configured to receive a portion of the first section **308** of the first cable **304**, while the terminal end **312** of the first section **308** of the first cable **304** is fixed to the anterior tab **352** at a first anchor **360**.

[0046] Referring to FIG. **2**, the lateral side **24** of the footwear **10** includes a lateral flap **362** having a proximal end **364** attached at the bite line **28** and a free-hanging distal end **366** adjacent to the tongue portion **106** in the ball portion 12_B of the forefoot region **12**. As with the medial flap **342**, a width W_{LF} of the lateral flap **362** tapers from the proximal end **364** to the distal end **366**. The lateral flap **362** includes a cable guide **368** disposed proximate to the distal end **366**. As discussed below, the second section **310** of the first cable **304** is routed through the cable guide **368** of the lateral flap **362**. Accordingly, because the distal end **366** is independent of the upper **100**, the distal end **366** can be drawn along the upper **100** towards the medial side **22** when the first cable **304** is moved in the tightening direction D_T.

[0047] As described in greater detail below with respect to the routings of the first and second sections **308**, **310** of the first cable **304**, the tensioning system **300** includes a plurality of cable guides **370** disposed in locations along the upper **100** for routing the first cable **304** between the aforementioned straps **320**, **334** and flaps **342**, **362**. In the illustrated example, the cable guides **370** are formed by fabric or mesh loops defining a passage for slidably receiving the first cable **304** therethrough. In some examples, the inner surfaces of the cable guides **370** are lined or coated with a low-friction material, such as a lubricous polymer (e.g., polytetrafluoroethylene), that facilitates movement of the first cable **304** therein.

[0048] Furthermore, the tensioning system **300** may include one or more conduits **372** formed through the sole structure **200** for routing ends of the first cable **304** and the second cable **306** between the cable lock **302** and the upper **100**, as best shown in FIG. **4**.

[0049] Referring to FIG. **1**, the first section **308** of the first cable **304** is generally routed along the medial side **22** of the upper **100**. More particularly, the first section **308** of the first cable **304** extends from the cable lock **302** in the sole structure **200**, up through the bite line **28** on the medial side **22**, and is routed through each of the first loop **326** of the first strap **320** and the loop **340** of the second strap **334** via a series of the cable guides **370**. The first section **308** of the first cable **304** terminates at the terminal end **312**, which is anchored to the medial side **22** of the upper **100**, adjacent to the bite line **28** in the mid-foot region **14**.

[0050] As provided above, the first section **308** of the first cable **304** may be described as comprising a plurality of segments **316**. As best shown in FIG. **1**, a first segment **316***a* of the first section **308** is routed from a first end at the bite line **28** in the mid-foot region **14** to a second end in the heel region **16**, spaced apart from the bite line **28**. As shown, the second end of the first segment **316***a* is defined where the first section **308** of the first cable **304** passes through a first one of the cable guides **370***a*. A second segment **316***b* of the first cable **304** extends from the first one of the cable guides **370***a* to the first loop **326** of the first strap **320**, where the first section **308** is routed through the first loop **326** to a third segment **316***c*. The third segment **316***c* then extends from the first loop **326** of the first strap **320** to a second one of the cable guides **370***b* attached to the upper **100** above the first segment **316***a* and forward of the first one of the cable guides **370***a*. The first section **308** is then routed through the second one of the cable guides **370***b* to a fourth segment **316***d*, which extends up the upper **100** from the second cable guide **370***b* to the loop **340** of the second strap **334**, adjacent to the tongue portion **106** in the mid-foot region **14**. The first section **308** is then routed through the loop **340** of the second strap **334** to a fifth segment **316***e*, which extends from the loop **340** to the terminal end **312** of the first section **308** adjacent to the bite line **28**.

[0051] As shown, each of the first cable guide **370***a*, the second cable guide **370***b*, and the terminal end **312** may be fixed to the upper **100** adjacent to an edge of the heel counter **110**. Because the cable guides **370***a*, **370***b* and the terminal end **312** are fixed to the upper **100**, the segments **316***a*-**316***e* of the first section **308** will draw the first loop **326** of the first strap **320** and the loop **340** of the second strap **334** down towards the heel counter **110** when the first cable **304** is moved in the tightening direction D_T, as described in greater detail below.

[0052] Referring to FIG. **2**, the second section **310** of the first cable **304** is generally routed along the lateral side **24** and a lower region of the tongue portion **106** of the upper **100**. More particularly, the second section **310** of the first cable **304** extends from the cable lock **302** in the sole structure **200**, up through the bite line **28** on the lateral side, and is routed through each of the second loop **328** of the first strap **320**, the cable guide **358** of the medial flap **342**, and the cable guide **368** of the lateral flap **362** via a series of the cable guides **370**. The second section **310** of the first cable **304** terminates at the terminal end **314**, which is anchored to the anterior tab **352** at the distal end **346** of the medial flap **342**.

[0053] As provided above, the second section **310** of the first cable **304** may be described as comprising a plurality of segments **318**. As best shown in FIG. **2**, a first segment **318***a* of the second section **310** is routed from a first end at the bite line **28** in the mid-foot region **14** to a second end in the heel region **16**, spaced apart from the bite line **28**. As shown, the second end of the first segment **318***a* is defined where the second section **310** of the first cable **304** passes through a third one of the cable guides **370***c*. A second segment **318***b* of the second section **310** extends from the third one of the cable guides **370***c* to the second loop **328** of the first strap

320, where the second section **310** is routed through the second loop **328** to a third segment **318***c*. The third segment **318***c* then extends from the second loop **328** of the first strap **320** to a fourth one of the cable guides **370***d* attached to the upper **100** above the first segment **318***a* and forward of the third one of the cable guides **370***c*. The second section **310** is then routed through the fourth one of the cable guides **370***d* to a fourth segment **318***d*, which extends from the fourth cable guide **370***d* on the lateral side **24** and across the tongue portion **106** to the cable guide **358** on the posterior tab **354** of the medial flap **342**. The second section **310** is then routed through the cable guide **358** of the posterior tab **350** to a fifth segment **318***e*, which extends from the cable guide **358** of the posterior tab **350** and across the tongue portion **106** to the cable guide **368** of the lateral flap **362**. The second section **310** is routed through the cable guide **368** of the lateral flap **362** to a sixth segment **318***f*, which extends from the cable guide **368** and across a vamp of the upper **100** to the terminal end **314**. The routing of the fourth segment **318***d*, the fifth segment **318***e*, and the sixth segment **318***f* can be clearly seen in FIG. **3**A. As shown, the terminal end **314** of the second section **310** is anchored to the anterior tab **352** by the anchor point **360**.

[0054] As shown, each of the third cable guide **370***c* and the fourth cable guide **370***d* may be fixed to the upper **100** adjacent to an edge of the heel counter **110**. Because the cable guides **370***c*, **370***d* are fixed to the upper **100**, the second and third segments **318***c*, **318***d* of the second section **310** will draw the second loop **328** down towards the heel counter **110** when the first cable **304** is moved in the tightening direction D_T, as described in greater detail below. Simultaneously, when the first cable is moved in the tightening direction, the fourth segment **318***d*, the fifth segment **318***e*, and the sixth segment **318***f* will tighten over the top of the upper **100** and will draw the distal ends **346**, **366** of the flaps **342**, **362** towards each other to tighten the interior void **102** around the foot.

[0055] Like the first cable **304**, the second cable **306** may be described as including a first section **374** extending from a first side of the cable lock **302** to the medial side **22** of the footwear **10** and a second section **376** extending from a second side of the cable lock **302** to the lateral side **24** of the footwear **10**. In the illustrated example, the first section **374** and the second section **376** cooperate to define a continuous loop extending around the upper **100**, and more particularly, over the tongue portion **106** of the upper **100**. Although substantially continuous, the first section **374** may be described as extending to a first end **378** and the second section **376** may be described as extending to a second end **380**. Here, the first end **378** and the second end **380** are coincident with each other to form a continuous second cable **306**. However, in other examples, the first end **378** and the second end **380** can be separated from each other, and/or may be connected to each other by an intermediate member.

[0056] As best shown in FIG. **3**A, the second cable **306** extends around the tongue portion **106** proximate to the ankle opening **104** (i.e., proximate to an area above an instep of a wearer's foot). As shown in FIG. **1**, a portion of the first section **374** of the second cable **306** may be routed through a first passage **382** formed through the medial side **22** of the upper **100**. Likewise, a portion of the second section **376** of the second cable may be routed through a second passage **384** formed through the lateral side **24** of the upper **100**.

[0057] The portions of the second cable **306** that extend around the tongue portion **106** may be enclosed within one or more sheaths **386**. Each sheath **386** may additionally be formed from a material and/or a weave that allows the sheath **386** and each section **374**, **376** of the second cable **306** to move from a relaxed state to a stretched or expanded state when the second cable **306** is moved in a direction away from the upper **100** by way of the tightening force F_T (i.e., when the second cable **306** is moved in the tightening direction D_T). When the tightening force F_T is removed, the material and/or weave of the sheath **386** automatically causes the sheath **36** to contract to the relaxed state and accommodate bunching by the second cable **306** therein.

[0058] In the example shown, a separate tightening grip **388** operatively connects to the sheath **386** at an attachment location proximate to the tongue portion **106** to allow a user to apply the tightening force F_T to pull the second cable **306** away from the upper **100**, thereby causing each of the second cable **306** and the first cable **304** to move in the tightening direction D_T. Other configurations may include operatively connecting one or more tightening grips **388** to other portions of the sheath **386** along the length of the second cable **306**. In some implementations, the tightening grip **388** is omitted and the sheath **386** is gripped directly by the user.

[0059] Referring again to FIG. **1**, the cable lock **302** may further include a release mechanism **390** operable to transition the cable lock **302** from a locked state to an unlocked state to permit the cables **304**, **306** to move in both directions D_T, D_F. For instance, the release mechanism **390** may include a release cord or cable **390** operable to transition the cable lock **302** from the locked state to the unlocked state when the release cord **390** is pulled. The release cord **390** may extend through one of the passages **382**, **384** formed by the upper **100** from a first end attached to the cable lock **302** to a distal end exposed from the upper **100**, thereby permitting a user to grip and pull the release cord **390** for moving the locking device **350***b* from the locked state to the unlocked state. In some examples, the distal end of the release cord **390** includes a loop **392** and/or gripping feature located remotely from the cable lock **302** to allow a user to grip and pull the release cord **390** when it is desirable to move the cable lock **302** into the unlocked state and/or release the cable lock **302** from the unlocked state. FIG. **1** shows the loop **392** of the release cord **390** extending from the first passage **382** on the medial side **22** of the upper **100**.

[0060] As discussed above, the locking device or cable lock **302** may be disposed within sole structure **200** of the footwear **10** and may be biased to a locked state to restrict movement of the cables **304**, **306** in the their respective loosening directions D_L. The sole structure **200** supports the cable lock **302** in some examples. The first cable **304** and the second cable **306** each approach and pass through a housing **400** of the cable lock **302** from opposite directions. In one configuration, the housing **400** includes a substantially square shape that is approximately three inches (3 in.) long by three inches (3 in.) wide and includes a thickness that is approximately one inch (1 in.). In some configurations, the cable lock **302** permits movement of the cables **304**, **306** in the tightening directions D_T while in the locked state. The release cord **390** may transition the cable lock **302** from the locked state to an unlocked state to thereby permit the cables **304**, **306** to move in both directions D_T, D_F.

[0061] FIG. **5** provides an exploded view of the cable lock **302**, showing the housing **400** defining a cavity **402** configured to rotatably receive a spool **404**, a first pawl **406**, and a second pawl **408**. The cable lock **302** may include a lid **410** releasably fastened to the housing **400** to prevent access to the cavity **402** when the lid **410** is fastened to the housing **400** and to allow access to the cavity **402** when the lid **410** is removed from the housing **400**. One or more fasteners **412** may extend through the lid **410** and fasten with threaded holes **414** in the housing **400** to secure the lid **410** to the housing **400**.

[0062] The housing **400** defines a plurality of retainer slots **416** each configured to receive and support a respective cable retainer **418** through which the cables **304**, **306** are routed into the cavity **402** of the housing **400**. The housing **400** may support a plurality of the cable retainers **418** such that the ends of the cables **304**, **306** each extend through a respective one of the cable retainers **418**.

[0063] As described in greater detail below, the housing **400** may further include a retaining wall **420** disposed within the cavity **402**. The retaining wall **420** is configured to cooperate with the first pawl **406**. The retaining wall **420** may further include a tactile slot **422** configured to receive one or more tactile domes **424**. Described in greater detail below with reference to FIGS. **6-9**, the first pawl **406** may engage the tactile dome(s) **424** to provide a click or other sound that indicates the spool **404** has changed positions relative to the housing **400** and/or the cable lock **302** has transitioned from the locked state to the unlocked state.

[0064] FIG. **7** provides a top view of the housing **400** showing a pair of mounting flanges **426**, **428** disposed on opposite sides of the housing **400**. The mounting flanges **426**, **428** may rest upon an inner surface of the cavity **212** of the sole structure **200** to mount the cable lock **302** within the sole structure **200**. Alternatively, the flanges may attach to a strobel of the upper **100**. The strobel can be any support structure forming an underfoot portion of the footwear **10** that is at least disposed between the sole structure **200** and the void **102**. In some examples, bonding agents, such as adhesives and/or epoxies, may be applied to the contact surfaces of the flanges **426**, **428** and/or the inner surface of the cavity **212** of the sole structure **200** for attaching the housing **400** within the cavity **212**. Additionally or alternatively, the mounting flanges **426**, **428** may define one or more mounting holes **430** formed therethrough and configured to receive a fastener (not shown) for mounting the housing **400** to the sole structure **200**.

[0065] FIG. **7** shows the housing **400** with the pawls **406**, **408**, cables **304**, **306**, and other components of the cable lock **302** removed to expose an elongate channel **432** formed through the housing **400**. As discussed in greater detail below, the elongate channel **432** aligns with an attachment point of the first pawl **406** and permits the release cord **390** to pass underneath the housing **400** and up through a feed slot **434** defined by the mounting flange **428**. The mounting flange **428** also defines a cut-out region **435** proximate to the feed slot **434** to provide more clearance for the release cord **390** (and/or a conduit **372** enclosing the release cord **390**) to extend from the housing **400**. The mounting flanges **426**, **428** may define a lip around the perimeter of the housing **400** so that the housing **400** is spaced apart from the mounting surface of the cavity **212** or the strobel, allowing the release cord **390** to be routed between the housing **400** and the mounting surface of the cavity **212** or strobel. Thus, the release cord **390** may freely extend underneath the housing **400** between the elongate channel **432** and the feed slot **434**. In some examples, the feed slot **434** has a curved edge to prevent the release cord **390** from catching or being restricted by the housing **400**.

[0066] Referring now to FIG. **6**, the spool **404** is supported within the cavity **402** of the housing **400** and may rotate relative to the housing **400**. In some examples, the spool **404** rotates relative to the housing **400** in a first direction D_{S1} when the cables **304**, **306** move in the tightening direction D_T and in an opposite second direction D_{S2} when the cables **304**, **306** move in the loosening direction D_L. The spool **404** includes a first channel or annular groove **436** configured to collect portions of the first cable **304** and a second channel or annular groove **438** configured to collect portions of the second cable **306**. The spool **404** may include one or more anchor slots **440** formed through a divider wall separating the channels **436**, **438** for fixing a rotational position of each of the cables **304**, **306** relative to the spool **404**.

[0067] The cable lock **302** also includes a ratchet mechanism **442** associated with the spool **404** and having a plurality of teeth **444** positioned circumferentially around an axis of the ratchet mechanism **442** and protruding radially inward therefrom. In some implementations, the ratchet mechanism **442** is integrally formed upon an inner circumferential wall of the spool **404** such that the plurality of teeth **444** protrude radially inward from the channels **436**, **438**. In other examples, the ratchet mechanism **442** is supported for common rotation with the spool **404**.

[0068] The first pawl **406** is disposed within the cavity **402** of the housing **400** and is configured to cooperate with the ratchet mechanism **442** to selectively prevent and allow rotation of the spool **404**, and consequently, movement of the cables **304**, **306**. In some examples, the first pawl **406** includes one or more teeth **445** configured to selectively and meshingly engage with the plurality of teeth **444** of the ratchet mechanism **442**. In some implementations, the first pawl **406** includes a first pawl axle **448** configured to support the first pawl **406** within the housing **400** to permit the first pawl **406** to rotate relative to the housing **400** about a first pawl axis of rotation A_{FP}.

[0069] A first pawl spring **450** may operably connect to the first pawl axle **448** and the retaining wall **420** disposed within the cavity **402** of the housing **400** to bias the first pawl **406** in a first direction D_{FP1} about the pawl axis of rotation A_{FP}. The first pawl axis of rotation A_{FP} may be substantially parallel to an axis of rotation of the spool **404** when the spool **404** is received by the cavity **402** to enclose the first pawl **406** and the retaining wall **420** of the housing **400**. Accordingly, the first pawl spring **450** may interact with the retaining wall **420** and the first pawl **464** to exert a biasing force that causes the first pawl **406** to pivot about the pawl axis of rotation A_{FP} in the first direction D_{FP1} and into engagement with the plurality of teeth **444** of the ratchet mechanism **442**, thereby causing the cable lock **302** to operate in the locked state to restrict movement by the cables **304**, **306** in the loosening directions D_L.

[0070] FIGS. **8** and **9** each show a top view of the first pawl **406** of the cable lock **302**. The first pawl **406** defines a first receiving surface **452** configured to support the first pawl spring **450**. The first pawl axle **448** protrudes from the first receiving surface **452** in a direction substantially perpendicular to the first receiving surface **452**. The first pawl axle **448** may be integrally formed with the first pawl **406**.

The first pawl **406** also defines a second receiving surface **454** configured to support a second pawl spring **464**. An aperture **456** is formed through the second receiving surface **454** and is configured to receive a second pawl axle **462**. An anchor post **458** may protrude away from the receiving surfaces **452**, **454** in a direction substantially parallel to the first pawl axle **448**. The anchor post **458** may define an aperture **460** to provide an attachment location for attaching the first end **354***d* of the release cord **390** to the anchor post **458**. The anchor post **458** may be integrally formed with the first pawl **406**.

[0071] With reference to FIG. **6**, the second pawl axle **462** rotatably attaches the second pawl **408** to the first pawl **406** to permit the second pawl **408** to rotate relative to both the first pawl **406** and the housing **400** about a second pawl axis of rotation A_{SP}. The second pawl axis of rotation A_{SP} may extend substantially parallel to the first pawl axis of rotation A_{FP} and the axis of rotation of the spool **404**. In some examples, the second pawl **408** is associated with the second pawl spring **464**, which is configured to bias the second pawl **408** into engagement with a control surface **466** associated with an inner periphery of the spool **404** when the first pawl **406** is disengaged from the teeth **444** of the ratchet mechanism **442** to permit the spool **404** to rotate in the second direction D_{S2}.

[0072] FIG. **6** provides a perspective view of the cable lock **302** while in the locked state with the first pawl teeth **445** of the first pawl **406** engaging the teeth **444** of the ratchet mechanism **442** to selectively restrict the spool **404** from rotating in the second direction D_{S2} and thereby restrict the cables **304**, **306** from moving in their respective loosening directions D_L. In some examples, the plurality of the teeth **444** are sloped to permit the spool **404** to rotate in the first direction D_{S1} when the teeth **445** of the first pawl **406** are engaged with the teeth **444** of the ratchet mechanism **442**, thereby permitting the first cable **304** to move in the tightening direction D_T and the second cable **306** to move in the tightening direction D_T responsive to the tightening force F_T being applied to the tightening grip **388**.

[0073] When the spool **404** rotates in the first direction D_{S1}, the second cable **306** is unreeled from the second channel **438** of the spool **404** while the first channel **436** of the spool **404** simultaneously retracts the first cable **304** as the spool **404** rotates in the first direction D_{S1}. Accordingly, movement by the cables **304**, **306** in their respective tightening directions D_T causes an effective length of the second cable **306** to increase, while simultaneously causing an effective length of the first cable **304** to decrease, thereby moving the upper **100** into a tightened state for closing the interior void **102** around a foot of a user. Here, the second cable **306** incrementally moves in the tightening direction D_T during each successive engagement between the first pawl **406** (e.g., first pawl teeth **445**) and the teeth **444** of the ratchet mechanism **442** to thereby incrementally increase the tension applied to first and second sections **308**, **310** of the first cable **304** for tightening the fit of the interior void **102** around the foot as the upper **100** moves into the tightened state. More particularly, because each of the first section **308** and the second section **310** of the first cable **304** are connected to and disposed within the first channel **436** of the spool **404**, each of the sections **308**, **310** will be wound and unwound by the spool **404** at the same rate, providing substantially uniform tightness of the upper **100** around the foot.

[0074] In some examples, the release cord **390** operably connects to the anchor post **458** of the first pawl **406** to selectively disengage the first pawl **406** from the teeth **444** of the ratchet mechanism **442** when a predetermined release for F_R is applied to the release cord **390**. When the second pawl **408** is engaged with the control surface **466**, the second pawl **408** is operative to control the rotational speed of the spool **404** in the second direction D_{S2} such that the cables **304**, **306** do not become tangled when collected (e.g., wound) or released (e.g., unwound) from respective ones of the first channel **436** and the second channel **438** of the spool **404** during rotation in the second direction D_{S2}. In some configurations, the second pawl **408** includes two cam surfaces that remain engaged with respective ones of two control surfaces **466** when the first pawl **406** remains disengaged from the teeth **444** (i.e., when the cable lock **302** is operable in the unlocked state). Each control surface **466** may be axially disposed on an opposite side of the ratchet mechanism **442** such that the teeth **444** are disposed between the control surfaces **466** and protrude radially inward therefrom.

[0075] Referring to FIG. **8**, the first pawl **406** is biased into engagement with the plurality of teeth **444** of the ratchet mechanism **442** when the cable lock **302** is in the locked state. Here, the first pawl **406** pivots and rotates about the first pawl axis of rotation A_{FP} in the first direction D_{FP1} such that the teeth **445** of the first pawl **406** engage with the teeth **444** of the ratchet mechanism **442**. In some examples, the first pawl **406** includes a tactile protrusion **468** configured to engage with the tactile domes **424** to provide the "click" indicating the incremental change of position in the spool **404** during each successive engagement between the first pawl **406** and the teeth **444**.

[0076] Referring to FIG. **9**, an end **394** of the release cord **390** is attached to the anchor post **458** of the first pawl **406** to allow the release cord **390** to selectively disengage the first pawl **406** from the teeth **444** of the ratchet mechanism **442** when the predetermined release force F_R is applied to the release cord **390**. For example, a user may grasp the loop **392** of the release cord **390** and apply the predetermined force F_R to disengage the first pawl **406** from the teeth **444** of the ratchet mechanism **442**. Here, the predetermined force F_R overcomes the biasing force of the first pawl spring **450** to allow the first pawl **406** to rotate about the first pawl axis of rotation A_{FP} in a second direction D_{FP2}. Additionally, the tactile protrusion **468** may engage with the tactile dome **424** to provide the "click" when the predetermined force F_R moves to the first pawl **406** out of engagement with the teeth **444** to transition the cable lock **302** to the unlocked state.

[0077] FIG. **9** shows the cable lock **302** in the unlocked state responsive to the release cord **390** selectively disengaging the first pawl **406** from the teeth **444** of the ratchet mechanism **442** when the predetermined force F_R is applied to the release cord **390**. While the cable lock **302** is in the unlocked state with the first pawl **406** disengaged from the teeth **444** of the ratchet mechanism **442**, the spool **404** is permitted to rotate in the second direction D_{S2} to allow the first cable **304** to move in the loosening direction D_L when the loosening force F_L is applied to the first cable **304**. In some examples, the first channel **436** of the spool **404** collects the first cable **304** while the second channel **438** of the spool **404** simultaneously releases the second cable **306** as the spool **404** rotates in the second direction D_{S2}. Accordingly, movement of the second cable **306** in the loosening

direction D_L allows an effective length of the first cable **304** to increase to allow segments **316***a*-**316***e*, **318***a*-**318***f* to relax and thereby facilitate a transition of the upper **100** from the tightened state to the loosened state such that a foot can be removed from the interior void **102**.

[0078] Referring back to FIG. **5**, the lid **410** and the housing **400** of the cable lock **302** may each include a hub **470** configured to support the first pawl axle **448** of the first pawl **406**. The lid **410** may also each include an elongate channel **472** that cooperates with the elongate channel **432** of the housing **400** to allow the anchor post **458** of the first pawl **406** to freely rotate relative to the housing **400** and the lid **410** when the first pawl **406** pivots about the first pawl axis of rotation A_{FP} in either the first direction D_{FP1} or the second direction D_{FP2}.

[0079] In use, the article of footwear **10** can be selectively moved between a tightened state and a relaxed state using the tensioning system **300**. With the footwear **10** initially provided in a relaxed state, an effective length of the first cable **304** will be maximized, such that the first cable is in a relaxed state about the upper **100**, while an effective length of the second cable **306** is minimized as the second cable **306** is wound about the spool **404** of the cable lock **302**. Accordingly, a foot of a user can be inserted into the interior void **102** of the footwear **10**, whereby the materials of the upper **100** allow the upper **100** to stretch to accommodate the foot therein.

[0080] With the foot of the user inserted within the interior void **102** of the upper **100**, the tensioning system **300** can be moved to a tightened state by the user to secure the footwear **10** to the foot. As discussed above, the tensioning system **300** is moved to the tightened state by applying a tightening force F_T to the tightening grip **388**, thereby causing the second cable **306** to move in the tightening direction D_T. As the second cable **306** moves in the tightening direction D_T, the spool **404** rotates in the first direction D_{S1} and the second cable **306** is unwound from the second channel **438**. Simultaneously, the first cable **304** is wound up within the first channel **436**, thereby causing the first cable **304** to be retracted within the cable lock **302**. Accordingly, an effective length of the first cable **304** is minimized around the upper **100** to move the upper **100** to a tightened state around the foot.

[0081] As discussed above, when the first cable **304** is moved in the tightening direction D_T, the segments **316***a*-**316***e* of the first section **308** distribute the tightening force F_T to the ends **322**, **338** of the first strap **320** and the second strap **334** to draw the first strap **320** and the second strap **334** tight over the tongue portion **106**. Simultaneously, the segments **318***a*-**318***e* of the second section **310** distribute the tightening force F_T to the second end **324** of the first strap **320**, the cable guides **358**, **368** of the medial and lateral flaps **342**, **362**, and the anchor point **360** of the medial flap **342** to constrict a lower region of the tongue portion **106**. Simultaneously, the effective length of the second cable **306** may be increased when the tensioning system **300** is moved to the tightened state. However, the second cable **306** may be maintained in a tightened position against the upper **100** by the elasticity of the sheath **386**.

[0082] Prior to, during, or after movement of the tensioning system **300** to the tightened state, the biasing force of the first pawl spring **450** may move the first pawl **406** to the locked position when the release force F_R applied to the release cord **390** is overcome by the first pawl spring **450**. When the cable lock **302** is in the locked state, the teeth **444** of the spool **404** are engaged by the teeth **445** of the first pawl **406** to prevent the spool **404** from rotating in the second direction D_{S2} (i.e., the loosening direction D_L). Accordingly, the cable lock **302** maintains the tensioning system **300** in the tightened state as long as the cable lock **302** remains in the locked position.

[0083] When a user desires to remove the article of footwear **10** from the foot, the tensioning system **300** may be moved to the loosed state to allow the upper **100** to be relaxed around the foot. Initially, the cable lock **302** must be moved to the unlocked state by applying a sufficient release force F_R to overcome the biasing force of the first pawl spring **450**. When the release force F_R overcomes the biasing force, the teeth **445** of the first pawl **406** will disengage from the teeth **444** of the spool **404**, thereby allowing the spool **404** to rotate in the second direction D_{S2}.

[0084] A loosening force F_L may be applied to the first cable **304** by the user to move the first cable in the loosening direction D_L, thereby maximizing the effective length of the first cable **304** to allow the upper **100** to be relaxed. In the illustrated example, the loosening force F_L may be applied indirectly to the first cable **304** by pulling the anterior end **18** of the upper **100** in a downward direction, whereby the interior void **102** is forced open to remove the foot. Alternatively, the first cable **304** may be provided with one or more loosening grips (not shown) to allow the user to apply the loosening force F_T directly to the first cable **304**.

[0085] As the first cable **304** moves in the loosening direction D_L, the spool **404** rotates in the second direction D_{S2}, whereby the first cable **304** is unwound from the first channel **436**. As the first cable **304** is unwound, the effective length of the first cable **304** increases and the segments **316***a*-**316***e*, **318***a*-**318***f* of the first and second sections **308**, **310** are relaxed, allowing the first strap **320**, the second strap **334**, the medial flap **342**, and the lateral flap **362** to relax about the upper **100**. Simultaneously, the second cable **306** is wound up within the second channel **438**, thereby causing the second cable **306** to be retracted within the cable lock **302**. Accordingly, an effective length of the second cable **306** is minimized.

[0086] The following Clauses provide exemplary configurations for an article of footwear and a cable lock in accordance with the principles of the present disclosure.

[0087] Clause 1: An article of footwear comprising: an upper defining an interior void; a sole structure attached to the upper and having a top surface facing toward the interior void and a ground-engaging bottom surface formed on an opposite side of the sole structure from the top surface; a cable lock disposed within the sole structure adjacent to the bottom surface; a first cable having a first section extending from the cable lock to a first anchor point on the upper and a second section extending from the cable lock to a second anchor point on the upper; and a second cable having a first section extending from the cable lock to a grip and a second section extending from the cable lock to the grip, the cable lock being operable to retract the first section and the second section of the first cable when the first section and the second section of the second cable are extended.

[0088] Clause 2: The article of footwear of Clause 1, wherein the cable lock is exposed to view through a viewing port disposed at the bottom surface of the sole structure.

[0089] Clause 3: The article of footwear of Clause 2, wherein the viewing port comprises an aperture extending at

least partially through at least one of an outsole portion and a midsole portion of the sole structure.

[0090] Clause 4: The article of footwear of Clause 3, wherein the viewing port includes a window comprising a transparent barrier extending across the aperture.

[0091] Clause 5: The article of footwear of any of the preceding clauses, further comprising a first strap extending from a first end on a medial side of the upper to a second end on a lateral side of the upper, the first end of the first strap receiving the first section of the first cable and the second end of the first strap receiving the second section of the first cable.

[0092] Clause 6: The article of footwear of Clause 5, further comprising a second strap extending from a first end at a bite line of the footwear on the lateral side to a second end on the medial side of the upper, the second end defining a loop and receiving the first section of the first cable.

[0093] Clause 7: The article of footwear of any of the preceding clauses, wherein the cable lock includes a spool, the first cable being wound in a first direction around the spool and the second cable being wound in a second direction around the spool, the second direction being opposite the first direction.

[0094] Clause 8: The article of footwear of any of the preceding clauses, wherein the first section of the first cable includes a first plurality of segments extending along a medial side of the upper to the first anchor point on the medial side of the upper, and the second section of the first cable includes a second plurality of segments extending between a lateral side of the upper and the medial side of the upper to the second anchor point on the medial side of the upper.

[0095] Clause 9: The article of footwear of any of the preceding clauses, wherein the first anchor point is disposed on a medial side of the upper in a midfoot region adjacent to a bite line of the upper and the sole structure, and the second anchor point is disposed at a distal end of a flap disposed on the medial side of the upper in a forefoot region.

[0096] Clause 10: The article of footwear of Clause 9, wherein the flap extends from a proximal end attached at the bite line to the distal end adjacent to an instep region of the upper.

[0097] Clause 11: The article of footwear of Clause 9 or Clause 10, wherein the flap further includes a loop for receiving the second section of the first cable, the loop receiving a first segment and a second segment of the second section, and the second anchor point receiving a third segment of the second section.

[0098] Clause 12: The article of footwear of any of the preceding clauses, wherein internal components of the cable lock are visible through the bottom surface of the sole structure.

[0099] Clause 13: An article of footwear comprising: an upper defining an interior void, a sole structure attached to the upper and having a top surface facing toward the interior void and a ground-engaging bottom surface formed on an opposite side of the sole structure from the top surface; a cable lock disposed within the sole structure; a first cable having a first section extending in a first direction from the cable lock and a second section extending in a second direction from the cable lock, the first section including a first plurality of segments routed along a medial side of the upper through at least one strap and the second section including a second plurality of segments routed along a lateral side of the upper through the at least one strap; and a second cable extending from the cable lock and operable to move the first cable toward a retracted state when a tensile force applied to the second cable causes the second cable to pay out from the cable lock.

[0100] Clause 14: The article of footwear of Clause 13, wherein the cable lock is exposed to view through the bottom surface of the sole structure.

[0101] Clause 15: The article of footwear of Clause 14, wherein the cable lock is exposed to view through the bottom surface of the sole structure at an aperture extending at least partially through at least one of an outsole portion and a midsole portion of the sole structure.

[0102] Clause 16: The article of footwear of Clause 15, further comprising a window including a transparent barrier extending across the aperture.

[0103] Clause 17: The article of footwear of any of the preceding clauses, wherein the at least one strap includes a first strap extending from a first end disposed on a medial side of the upper to a second end disposed on the lateral side of the upper, the first end of the first strap receiving the first section of the first cable and the second end of the first strap receiving the second section of the first cable.

[0104] Clause 18: The article of footwear of Clause 17, wherein the at least one strap includes a second strap extending from a first end attached to the lateral side the footwear on the lateral side to a second end on the medial side of the upper, the second end defining a loop and a receiving the first section of the first cable.

[0105] Clause 19: The article of footwear of any of the preceding clauses, wherein the cable lock includes a spool, the first cable being wound in a first direction around the spool and the second cable being wound in a second direction around the spool, the second direction being opposite the first direction.

[0106] Clause 20: The article of footwear of any of the preceding clauses, wherein the first section of the first cable extends to a first anchor point on the medial side of the upper and the second section of the first cable extends a second anchor point on the medial side of the upper.

[0107] Clause 21: The article of footwear of Clause 20, wherein the first anchor point is disposed on a medial side of the upper in a midfoot region adjacent to a bite line of the upper and the sole structure and the second anchor point is disposed at a distal end of a flap disposed on the medial side of the upper in a forefoot region.

[0108] Clause 22: The article of footwear of Clause 21, wherein the flap extends from a proximal end attached at the bite line to the distal end adjacent to an instep region of the upper.

[0109] Clause 23: The article of footwear of Clause 21 or Clause 22, wherein the flap includes a loop for receiving the second section of the first cable, the loop receiving a first segment and a second segment of the second section, and the second anchor point receiving a third segment of the second section.

[0110] Clause 24: The article of footwear of any of the preceding clauses, wherein internal components of the cable lock are visible through the bottom surface of the sole structure.

[0111] The foregoing description has been provided for purposes of illustration and description. It is not intended to be exhaustive or to limit the disclosure. Individual elements or features of a particular configuration are generally not

limited to that particular configuration, but, where applicable, are interchangeable and can be used in a selected configuration, even if not specifically shown or described. The same may also be varied in many ways. Such variations are not to be regarded as a departure from the disclosure, and all such modifications are intended to be included within the scope of the disclosure.

What is claimed is:

1. An article of footwear comprising:

an upper defining an interior void;

a sole structure attached to the upper and having a top surface facing toward the interior void and a ground-engaging bottom surface formed on an opposite side of the sole structure from the top surface;

a cable lock disposed within the sole structure adjacent to the bottom surface;

a first cable having a first section extending from the cable lock to a first anchor point on the upper and a second section extending from the cable lock to a second anchor point on the upper; and

a second cable having a first section extending from the cable lock to a grip and a second section extending from the cable lock to the grip, the cable lock being operable to retract the first section and the second section of the first cable when the first section and the second section of the second cable are extended.

2. The article of footwear of claim **1**, wherein the cable lock is exposed to view through a viewing port disposed at the bottom surface of the sole structure.

3. The article of footwear of claim **2**, wherein the viewing port comprises an aperture extending at least partially through at least one of an outsole portion and a midsole portion of the sole structure.

4. The article of footwear of claim **3**, wherein the viewing port includes a window comprising a transparent barrier extending across the aperture.

5. The article of footwear of claim **1**, further comprising a first strap extending from a first end on a medial side of the upper to a second end on a lateral side of the upper, the first end of the first strap receiving the first section of the first cable and the second end of the first strap receiving the second section of the first cable.

6. The article of footwear of claim **5**, further comprising a second strap extending from a first end at a bite line of the footwear on the lateral side to a second end on the medial side of the upper, the second end defining a loop and receiving the first section of the first cable.

7. The article of footwear of claim **1**, wherein the cable lock includes a spool, the first cable being wound in a first direction around the spool and the second cable being wound in a second direction around the spool, the second direction being opposite the first direction.

8. The article of footwear of claim **1**, wherein the first section of the first cable includes a first plurality of segments extending along a medial side of the upper to the first anchor point on the medial side of the upper, and the second section of the first cable includes a second plurality of segments extending between a lateral side of the upper and the medial side of the upper to the second anchor point on the medial side of the upper.

9. The article of footwear of claim **1**, wherein the first anchor point is disposed on a medial side of the upper in a midfoot region adjacent to a bite line of the upper and the sole structure, and the second anchor point is disposed at a distal end of a flap disposed on the medial side of the upper in a forefoot region.

10. The article of footwear of claim **9**, wherein the flap extends from a proximal end attached at the bite line to the distal end adjacent to an instep region of the upper.

11. The article of footwear of claim **9**, wherein the flap further includes a loop for receiving the second section of the first cable, the loop receiving a first segment and a second segment of the second section, and the second anchor point receiving a third segment of the second section.

12. The article of footwear of claim **1**, wherein internal components of the cable lock are visible through the bottom surface of the sole structure.

13. An article of footwear comprising:

an upper defining an interior void;

a sole structure attached to the upper and having a top surface facing toward the interior void and a ground-engaging bottom surface formed on an opposite side of the sole structure from the top surface;

a cable lock disposed within the sole structure;

a first cable having a first section extending in a first direction from the cable lock and a second section extending in a second direction from the cable lock, the first section including a first plurality of segments routed along a medial side of the upper through at least one strap and the second section including a second plurality of segments routed along a lateral side of the upper through the at least one strap; and

a second cable extending from the cable lock and operable to move the first cable toward a retracted state when a tensile force applied to the second cable causes the second cable to pay out from the cable lock.

14. The article of footwear of claim **13**, wherein the cable lock is exposed to view through the bottom surface of the sole structure.

15. The article of footwear of claim **14**, wherein the cable lock is exposed to view through the bottom surface of the sole structure at an aperture extending at least partially through at least one of an outsole portion and a midsole portion of the sole structure.

16. The article of footwear of claim **15**, further comprising a window including a transparent barrier extending across the aperture.

17. The article of footwear of claim **13**, wherein the at least one strap includes a first strap extending from a first end disposed on a medial side of the upper to a second end disposed on the lateral side of the upper, the first end of the first strap receiving the first section of the first cable and the second end of the first strap receiving the second section of the first cable.

18. The article of footwear of claim **17**, wherein the at least one strap includes a second strap extending from a first end attached to the lateral side the footwear on the lateral side to a second end on the medial side of the upper, the second end defining a loop and a receiving the first section of the first cable.

19. The article of footwear of claim **13**, wherein the cable lock includes a spool, the first cable being wound in a first direction around the spool and the second cable being wound in a second direction around the spool, the second direction being opposite the first direction.

20. The article of footwear of claim **13**, wherein the first section of the first cable extends to a first anchor point on the

medial side of the upper and the second section of the first cable extends a second anchor point on the medial side of the upper.

21. The article of footwear of claim **20**, wherein the first anchor point is disposed on a medial side of the upper in a midfoot region adjacent to a bite line of the upper and the sole structure and the second anchor point is disposed at a distal end of a flap disposed on the medial side of the upper in a forefoot region.

22. The article of footwear of claim **21**, wherein the flap extends from a proximal end attached at the bite line to the distal end adjacent to an instep region of the upper.

23. The article of footwear of claim **21**, wherein the flap includes a loop for receiving the second section of the first cable, the loop receiving a first segment and a second segment of the second section, and the second anchor point receiving a third segment of the second section.

24. The article of footwear of claim **13**, wherein internal components of the cable lock are visible through the bottom surface of the sole structure.

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