LACE GUIDE FOR FOOTWEAR

Applicant: The Burton Corporation, Burlington, VT (US)
Inventor: Shawn Gulla, Grand Isle, VT (US)
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ABSTRACT

Articles of footwear (e.g., soft snowboard boots) that include low-profile lace guides that may provide closer and/or tighter wrapping of the quarters about the tongue are disclosed. The lace guide may have a lace channel adapted to guide a force from the lace upon tightening to provide leverage on the lace guide such that the edge of a quarter dives toward the tongue upon tightening of the lace. The lace guide may have a dog-leg-shaped region such that a portion of the centerline running through an intermediate portion of the lace channel is disposed at a first height and a portion of the centerline running through the first end portion of the lace channel is disposed at a second height that is different from the first height. The lace guide may extend along a substantial length of a quarter, and thus, it may be beneficial for a single lace guide to have three or more openings configured to receive the lace. The lace guide may be configured and arranged on an article of footwear to protect the edges of the footwear quarters. The lace guide may also include one or more flex zones that increase the flexibility of the lace guide, and thus, the flexibility of the article of footwear.
LACE GUIDE FOR FOOTWEAR

BACKGROUND

[0001] 1. Field
[0002] Aspects described herein relate generally to a lace guide for articles of footwear, such as boots, including snowboard boots.
[0003] 2. Discussion of Related Art
[0004] Conventional boots such as soft snowboard boots include laces to draw the lateral and medial quarters over the boot tongue to secure the boot to the wearer. The lace typically runs across the tongue several times, with lace guides attached to the quarters routing the lace back and forth over the tongue.

SUMMARY

[0005] In an illustrative embodiment, a boot is provided. The boot includes medial and lateral sides. The boot also includes a first quarter disposed at the medial side and a second quarter disposed at the lateral side. The boot has a tongue opening positioned between the first and second quarters. The boot also includes a lace disposed within the tongue opening, and each quarter has an edge adjacent the tongue. The boot also includes a lace adapted to draw the first and second quarters together upon tightening of the lace. The boot also includes a lace guide that is disposed at the first quarter and guides the lace. The lace guide has a lace channel adapted to guide a force from the lace upon tightening to provide leverage on the lace guide such that the edge of the first quarter dives toward the tongue upon tightening of the lace.

[0006] In another illustrative embodiment, a lace guide is provided. The lace guide includes a lace channel comprising a first end portion, a second end portion and an intermediate portion connecting the first end portion to the second end portion. The lace channel also includes a first opening disposed at the first end portion and a second opening disposed at the second end portion. The lace channel also includes a top surface and a bottom surface. The lace guide has an imaginary centerline running through the lace channel from the first opening to the second opening and bisecting a distance between the top and bottom surfaces of the lace channel. The lace channel also includes a first dogleg-shaped region such that a portion of the centerline running through the intermediate portion is disposed at a first height and a portion of the centerline running through the first end portion is at a second height different from the first height. The first height and the second height extend in a direction perpendicular to the top and bottom surfaces of the intermediate portion of the lace channel.

[0007] In a further illustrative embodiment, a lace guide is provided. The lace guide includes first and second openings adapted to receive lace and a lace channel extending between the first and second openings. The lace guide also includes a third opening adapted to receive lace.

[0008] In yet another illustrative embodiment, a lace guide is provided. The lace guide includes an inlet, an outlet and a flex zone adapted to increase flexibility of the lace guide.

[0009] In another illustrative embodiment, a boot is provided. The boot includes a body with a quarter. The quarter has an edge. The boot also includes a lace guide disposed at the first quarter. The lace guide has an abutting surface that abuts the edge of the first quarter.

[0010] Various embodiments provide certain advantages. Not all embodiments of the present disclosure share the same advantages and those that do may not share them under all circumstances.

[0011] Further features and advantages of the present disclosure, as well as the structure of various embodiments are described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Various embodiments will now be described, by way of example, with reference to the accompanying drawings, in which:

[0013] FIG. 1 depicts a front view of an article of footwear with lace guides in accordance with an embodiment;

[0014] FIG. 2 depicts a perspective, right front view of the article of footwear of FIG. 1;

[0015] FIG. 3 depicts a perspective front view of a lace guide in accordance with an embodiment;

[0016] FIG. 4 depicts a perspective underside view of the lace guide of FIG. 3;

[0017] FIG. 5 depicts portions of the lace guide of FIG. 3 in phantom to reveal a lace channel;

[0018] FIG. 6 depicts a section view of the lace guide of FIG. 3 taken along the section line 6-6;

[0019] FIG. 7 depicts a section view of the lace guide of FIG. 3 taken along the section line 7-7;

[0020] FIG. 8 depicts an enlarged view of the lace guide and boot as viewed from line 8-8;

[0021] FIG. 9A depicts a section view of the lace guide and boot of FIG. 1 taken along the section line 8-8;

[0022] FIG. 9B depicts the section view of FIG. 9A with the lace guide and quarter edge diverging toward the tongue;

[0023] FIGS. 10A-10E depict schematic representations of different embodiments of a dogleg-shaped region for a lace channel of a lace guide;

[0024] FIG. 11A depicts a lace guide attachment arrangement where a lace guide is coupled to an intermediate material in accordance with an embodiment;

[0025] FIG. 11B depicts a lace guide attachment arrangement where two lace guides are coupled to an intermediate material in accordance with another embodiment; and

[0026] FIG. 12 depicts a lace guide comprising two pieces in accordance with an embodiment.

DETAILED DESCRIPTION

[0027] The inventors have appreciated that it may be beneficial to provide one or more lace guides in an article of footwear, such as a boot (e.g., soft snowboard boot), that offers a low-profile configuration. In one embodiment, the lace guide provides a closer and/or tighter wrapping of the quarters about the tongue when the footware is tightened. Closer and/or tighter wrapping of the quarters about the tongue may lead to increased comfort, fit, securerness and/or performance for the wearer.

[0028] Boots typically have a boot body (also referred to as a boot upper) and a sole (typically formed of rubber). The boot body includes a lower region, which includes the vamp and toecap, and is adapted to cover the foot of a wearer. The boot body also includes an upper region, which includes the shaft of the boot, and is adapted to cover at least a portion of the wearer’s shin and calf. The boot has a lateral side and a medial side. At the lateral side, the boot body includes a
lateral quarter having a lower portion and an upper portion. At the medial side, the boot body includes a medial quarter having a lower portion and an upper portion. A tongue opening is positioned between the collective lateral quarters and the collective medial quarters, and a tongue is disposed within the tongue opening. The quarters typically include openings such as eyelets or lace guides that receive lace. The lace typically runs across the tongue several times, with the lace guides in the quarters routing the lace back and forth over the tongue. Tightening of the lace draws the lateral quarters closer toward the medial quarters (and vice versa) over the tongue. Lace guides are typically stitched to the underside of the quarters such that the lace guides are located between the quarter and the tongue.

[0029] The inventors have appreciated that conventional footwear, especially soft snowboard boots, tend to have gaps between the tongue and the edges of the quarters due to the use of bulky lace guides stitched to the underside of the quarters. The inventors recognized that continued tensioning of the lace does not necessarily draw the quarters closer down onto the tongue but instead may cause discomfort as the downward force of the quarter on the tongue may cause pinching or pressure against the wearer’s foot. This discomfort may be exacerbated by a bulky lace guide located at the underside of the quarter creating undesirable pressure points on the tongue and the foot of the wearer. The inventors have also recognized that snow and ice can enter and become lodged in these gaps between the quarter and the tongue, which may make it more difficult to tighten the foot fastening system, and/or create potential paths for snow, ice and/or water to leak into the boot.

[0030] According to one aspect, the lace guide is configured to have a low profile, which can promote closer and/or tighter wrapping of the quarters about the tongue by decreasing the occurrence of gaps that may otherwise be present between the underside of the boot quarters and the tongue.

[0031] According to another aspect, a lace guide has a lace channel adapted to guide a force from the lace upon tightening to provide leverage on the lace guide such that the edge of the footware quarter, which is attached to the guide, dives toward the tongue in response to rotational movement of the guide upon tightening of the lace. Such leverage may provide for closer and/or tighter wrapping of the quarters about the tongue for an enhanced fit of the boot around the foot of the wearer. In some embodiments, the lace guide includes a dog-leg-shaped region in the lace channel. This dog-leg shaped region provides a level change or height-transition for the lace which causes the lace guide and attached quarter to rotate upon tensioning the lace.

[0032] In some embodiments, the lace guide may be adapted and arranged such that a portion of the lace exiting the lace guide is in line with the plane of the quarter or the plane of the outermost layer of the quarter. In some cases, a portion of the lace guide may be coupled to the underside of the outermost layer of the quarter while a portion of the lace exiting/entering the lace guide is in line with the plane of the quarter or the plane of the outermost layer of the quarter. In some embodiments, one or more openings of the lace guide is/are in line with the plane of the quarter or the plane of the outermost layer of the quarter, facilitating the lace exiting/entering the guide to be in line with the plane of the quarter or the plane of the outermost layer of the quarter.

[0033] The inventors have also appreciated that, especially while riding a chairlift, snowboarders will often rest an edge of the snowboard on the front of the boot that is not secured to the snowboard. These quarters are often made of soft layers of material such as leather, fabric or other materials that are stitched together. The inventors have recognized that such a practice often causes damage and wear to the edges of the quarters due to the typically metal snowboard edge cutting into the quarter edges and/or stitching of the layers. This cutting or delamination of the layers can cause premature wear of the boot or cause the lace guide to be pulled out from the boot. According to a further aspect, a lace guide is configured and arranged on an article of footwear to protect the edges of the footwear quarters.

[0034] According to one aspect, flexibility of the lace guide may be particularly important where the lace guide extends along a large portion of the length of a quarter. In some embodiments, a lace guide includes one or more flex zones that increase the flexibility of the lace guide and thus, the flexibility of the quarter associated with the lace guide. Such flexibility can help to improve the fit and flexibility of the article of footwear.

[0035] According to another aspect, the lace guide may be coupled to the article of footwear in a variety of arrangements. The portion of the lace guide that is used to directly or indirectly couple to the footwear may be directly or indirectly coupled to the footwear via one or any combination of the following: stitching, adhesive, welding, physical interlock, or by any other suitable arrangement, as this aspect is not so limited.

[0036] The boot may include a lace that may be tightened and locked so as to retain its tension by employing any suitable mechanism. In some embodiments, the lace may be arranged so as to be graspable by a wearer or other device, pulled to a desirable tension and locked in an appropriate manner. For example, a free end of the lace may include a portion of lace that is looped back onto itself to create a handle (or a separate handle may be attached to the lace) to facilitate pulling of the lace by a wearer. Once a preferred tension is reached, the lace may be tied, or locked in place by a lace lock, so that the tension of the lace is preserved for a desired period of time, for example, until the lace is untied or unlocked. Or, in some embodiments, an optional tensioning member is coupled to the lace and used to pull one or more ends of the lace thereto. For example, a rotary closure system may be employed. Alternatively, the tensioning member may include a ratcheting and/or buckling device that is coupled to the lace and provides tension thereto. It should be appreciated that the present disclosure is not limited to the use of any particular type of closure device, as any mechanism that is capable of taking up slack in the lace can be used in connection with various aspects of the present disclosure. Of course, it should be appreciated that the lace can be tightened in a manner whereby a user simply draws on the lace to tension the lace and then ties the lace ends, as is conventional.

[0037] Various regions of the boot may be tightened independently from, or simultaneously with, one another. An example of a lace system may be found in U.S. Pat. No. 7,281,341, which is hereby incorporated herein by reference.

[0038] Aspects of the present disclosure may be employed in any suitable combination as aspects are not limited in this respect to a specific disclosed embodiment. Also, any or all of the above aspects may be employed in a soft snowboard boot; however, the present disclosure is not limited in this respect, as aspects described herein may be used on any type of footwear, including other types of boots, ski boots, hiking...
boots, non-soft snowboard boots, snow shoes, rain boots, shoes, skates or other suitable covering for the foot utilizing lace tightening. Various aspects and embodiments of the present disclosure will now be described in more detail with respect to the accompanying drawing figures. The present disclosure is not, however, limited to the aspects and embodiments shown.

In accordance with various embodiments of the present disclosure, some of the figures show a boot 1, configured for the right foot of a wearer, and constructed as a soft boot employing soft, flexible materials such as leather, fabrics, plastics (e.g., non-rigid plastics) or other suitable natural or manmade materials. Of course, aspects discussed are also applicable for the left foot of the wearer. As used herein, the term “lateral side” is used to refer to the side of a boot facing outward and away from the wearer, i.e., the left side of the left boot and the right side of the right boot, from the wearer’s perspective when worn by the wearer. The term “medial side” is used to refer to the side of a boot facing inward toward the wearer’s other foot, i.e., the right side of the left boot and the left side of the right boot, from the wearer’s perspective when worn by the wearer. Thus, as seen in FIG. 1, right boot 1 has a lateral side 93 and a medial side 95.

As discussed above, according to one aspect, a lace guide is configured to have a low profile that may promote closer and/or tighter wrapping of the quarters about the tongue by decreasing the occurrence of gaps that may otherwise exist between the quarters and the tongue in boots employing conventional lace guides when the footwear is tightened. FIGS. 1-2 depict a boot 1 for the right foot having a plurality of low profile lace guides. At the lateral side 93, the boot includes a lateral quarter 3 having a lower portion 4 and an upper portion 24. At the medial side 95, the boot includes a medial quarter 5 having a lower portion 6 and an upper portion 26. The upper and lower portions of each quarter may be fixed relative to one another or may be physically movable relative to one another. In some cases, where the upper and lower portions of a quarter are physically movable relative to one another, an articulating region may connect the two portions together but still permit relative movement between the two portions. In other cases, the upper and lower portions of the quarter are not connected to one another. A tongue opening is positioned between the lateral quarter 3 and the medial quarter 5 and a tongue 2 is disposed within the tongue opening. Each quarter has a corresponding attached lace guide 10, and lace 8 runs through the lace guides 10. The lace 8 runs across the tongue 2 several times, with the lace guides 10 in the quarters routing the lace 8 back and forth over the tongue 2. Tightening of the lace 8 draws the lateral quarter 3 closer to the medial quarter 5 (and vice versa) over and down onto the tongue 2. In some embodiments, lace 8 may be a single lace. In other embodiments, lace 8 may comprise at least two separate laces. While the embodiment shown in FIGS. 1-2 includes four lace guides (two at each quarter) with multiple entrance/exit openings, it should be appreciated that any suitable number of lace guides and openings is possible, as this aspect is not so limited.

FIG. 3 depicts an enlarged, perspective view of a lace guide 10. The lace guide includes front edge 14 and an engagement portion 12 that engages with a quarter of an article of footwear. The lace guide edge 14 includes an abutting surface 15 that abuts against the edge of a quarter when attached thereto. As seen in FIG. 1, in some embodiments, after the lace guide has been integrated into an article of footwear, the lace guide edge 14 remains exposed, while the engagement portion of the lace guide (that is, that portion of the lace guide used to attach the lace guide to the boot) is hidden beneath at least the top surface of a quarter. Also, the edge of the quarter facing the tongue opening is adjacent the abutting surface 15.

FIG. 4 depicts an enlarged, underside view of a lace guide 10. The lace guide includes a lace channel 30 having a first end portion 31, a second end portion 35 and an intermediate portion 33 connecting the first end portion and second end portion. A first opening 20 is disposed at the first end portion 31 and a second opening 21 is disposed at the second end portion 35. The first opening 20 may serve as an inlet while the second opening 21 may serve as an outlet, or vice versa. FIG. 5 is a top view of the lace guide and depicts portions of the lace guide in phantom to reveal the lace channel 30 which extends from a first opening 20 to a second opening 21. A lace 8 runs through the lace channel 30. A third opening 22 may lead to a lace anchor or to an opposing side of the boot body, as will be discussed below.

As will be illustrated using an embodiment below, a centerline runs through the lace channel from the inlet to the outlet. The lace channel has a top surface and a bottom surface. As used herein, the “centerline” of the lace channel is defined to be an imaginary line running through the lace channel from the inlet to the outlet that bisects the distance between the top and bottom surfaces of the lace channel.

FIG. 6 depicts a perspective sectional view of a lace guide 10, where the section line 6-6 (shown in FIG. 3) bisects the first opening 20 of the lace channel 30. Centerline 70 running through the lace channel 30, bisecting the distance between the top surface 71 and the bottom surface 72 of the lace channel 30. The sectional view depicted in FIG. 6 reveals that the lace channel 30 includes a first dogleg-shaped region 32. For clarity, FIGS. depict X, Y, Z axes associated with the height, length and width of the lace guide. As shown in FIG. 6, the height of the lace guide extends along the Z-axis, the length extends along the X-axis (into the page in FIG. 6) and the width extends along the Y-axis. The portion of the centerline 70 running through the intermediate portion 33 is disposed at a first level or height relative to the engagement portion 12, where the first height extends in a direction perpendicular to the top and bottom surfaces 71, 72 of the intermediate portion 33 of the lace channel. The portion of the centerline 70 running through the first end portion 31 is at a second height that is different and offset from the first height relative to the engagement portion 12, where the second height also extends in the direction perpendicular to the top and bottom surfaces 71, 72 of the intermediate portion 33 of the lace channel. The dogleg-shaped region may be any shape in which the centerline running through the region transitions from a first height to a different, second height relative to the engagement portion 12.

FIG. 7 depicts another sectional view of the lace guide 10, where the section line 7-7 (shown in FIG. 3) bisects the second opening 21 of the lace channel 30. Centerline 70 running through the intermediate portion 33 and through the second opening 21. The sectional view in FIG. 7 reveals that the lace channel includes a second dogleg-shaped region 34. The portion of the centerline 70 running through the intermediate portion 33 is disposed at a first height (along the Z-axis). The portion of the centerline 70 running through the second end portion 35 is at a third height that is offset from the first
height. In this embodiment, the portion of the centerline 70 running through the second end portion is at the same height as the portion of the centerline 70 running through the first end portion. However, in other embodiments, the portion of the centerline 70 running through the second end portion may be at a different height relative to the engagement portion 12 than that of the portion of the centerline 70 running through the first end portion.

[0046] FIG. 8 depicts a view of a lace guide 10 (along line 8-8 shown in FIG. 3) attached to a lateral quarter 3 and interacting with the top of the tongue 2 of the boot. The edge 7 of the lateral quarter abuts against the abutting surface 15 of the lace guide 10. In addition, an underside surface 11 of the lateral quarter 3 rests against the engagement portion 12 of the lace guide. As seen in FIG. 8, line 19 demarcates a top surface of the engagement portion 12 of the lace guide. The lace guide also includes a bottom surface 13, which is moved towards the tongue 2 upon tightening of the lace. In some embodiments, the bottom surface 13 of the medial portion of the lace guide (the right side as seen in FIG. 8) is sloped such that, as one moves from the lateral to the medial side of the lace guide (left to right as seen in FIG. 8), the distance between the top surface 19 of the engagement portion and the bottom surface 13 of the lace guide decreases from d1 to d2. Having a sloped bottom surface 13 at or near the medial portion of the lace guide reduces the thickness and the bulkiness of the lace guide and help to create a closer fit between the bottom surface 13 of the lace guide and the tongue 2, which may decrease the occurrence of gap formation between the quarter 3 and the tongue 2.

[0047] In some cases, it is the dogleg-shaped regions that permit this decreasing distance. FIGS. 9A-9B depict a cross-sectional view of a lace guide 10 taken along the section line 8-8 through first opening 28 as shown in FIG. 1. The lace guide 10 is coupled to the lateral quarter 3 via stitching 11, although any suitable attachment method may be used, as will be discussed. The edge 7 of the lateral quarter 3 abuts against the abutting surface 15 of the lace guide 10. As discussed previously, lace channel 30 of lace guide 10 includes a dogleg-shaped region 32 such that the portion of the lace channel centerline running through the intermediate portion 33 is at a first height and the portion of the centerline running through the first end portion 31 is at a second height that is different and offset from the first height relative to the engagement portion 12. Due to the dogleg shape, the portion of the lace channel running through the first end portion 31 is directed upward past the top surface 19 of the engagement portion (see FIG. 8), thereby resulting in a decrease in distance between the top surface 19 of the engagement portion and the bottom surface 13 of the lace guide.

[0048] In some embodiments, as seen in FIG. 8, the bottom surface 13 of the medial portion of the lace guide (the right side as seen in FIG. 8) may be curved as indicated at surface 17. This curved surface may generally correspond with a curvature of the tongue 2 to provide a closer fit between the bottom surface 13 of the lace guide with the top surface of the tongue 2 as the lace guide is rotated upon tightening the lace. In some embodiments, the top surface 19 of the engagement portion is angled at an angle 0. In some cases, the angle 0, which may be 5°-10°, more or less, may result in the lace guide having a shape that corresponds to the curvature of the tongue, which may help to form a closer fit to the tongue 2. A closer fit between the bottom surface 13 of the lace guide with the top surface of the tongue 2 may decrease the occurrence of gap formation between the quarter 3 and the tongue 2. It should be appreciated that the lace guide may have a greater or smaller angle 0 than that shown in FIG. 8. In some embodiments, top surface 19 of the engagement portion is not angled.

[0049] As noted above, according to one aspect, a lace guide has a lace channel adapted to guide force from the lace upon tightening to provide leverage on the lace guide such that the edge of the footwear quarter dives toward the tongue upon tightening of the lace. In one embodiment, the height-transition feature of the dogleg-shaped region in the lace channel of the lace guide causes the lace guide to rotate upon tensioning the lace. As seen in FIGS. 9A-9B, a tension force T applied to lace 8 during tightening of the lace causes the lace 8 to abut against an inner surface 36 of first end portion 31, which in turn causes the lace guide 10 and the edge 7 of the quarter 3 to rotate in direction R and dive toward the tongue 2. Without wishing to be bound by theory, tensioning of the lace tends to cause the lace to straighten. Accordingly, a downward force at the opening of the lace guide is applied by the lace and an upward force is applied at the intermediate portion, tending to lift the guide at the intermediate portion, causing the guide to rotate. As such, the lace channel guides a force from the lace upon tightening to provide leverage on the lace guide such that the edge of the quarter dives toward the tongue in response to movement of the guide upon tightening of the lace.

[0050] In some embodiments, the lace guide may be adapted and arranged such that the portion of the lace exiting the lace guide is generally in line with the plane of the quarter or the plane of the outermost layer of the quarter. As an example, the portion of the lace exiting the lace guide may be in line with a plane of the quarter that generally bisects the thickness of the quarter. As an illustrative example, FIG. 9A depicts a thickness Z of the quarter 3 and a plane 27 of the quarter 3. It should be appreciated that the portion of the lace exiting the lace guide may be in line with any portion of the thickness of the quarter to be in line with the plane of the quarter, such as above or below the plane that bisects the thickness of the quarter. It should also be appreciated that the entire thickness of the portion of the lace exiting the lace guide need not be in line with the plane of the quarter. In some embodiments, only a part of the portion of the lace exiting the lace guide is in line with the plane of the quarter. In some cases, a portion of the lace guide may be coupled to the underside of the quarter or to the underside of the outermost layer of the quarter while the portion of the lace exiting the lace guide is in line with the plane of the quarter or the plane of the outermost layer of the quarter. As seen in FIG. 9A, in one embodiment, the portion of the lace 8 exiting the lace guide 10 is in line with the plane or curvature 27 of quarter 3 while the engagement portion 12 of the lace guide 10 is coupled to the underside of the quarter 3.

[0051] In some embodiments, one or more openings of the lace guide are in line with the plane of the quarter or the plane of the outermost layer of the quarter. As an example, the opening(s) may be in line with a plane of the quarter that generally bisects the thickness of the quarter. It should be appreciated that the opening(s) of the lace guide may be in line with any portion of the thickness of the quarter to be in line with the plane of the quarter, such as above or below the plane that bisects the thickness of the quarter. It should also be appreciated that the entire area of the opening(s) of the lace guide need not be in line with the plane of the quarter. In some embodiments, only a part of the opening(s) of the lace guide
is in line with the plane of the quarter. The opening(s) may be an inlet, an outlet, and/or an independent opening that is not connected to a lace channel located within a lace guide. In some cases, a portion of the lace guide may be coupled to the underside of the quarter or to the underside of the outermost layer of the quarter while one or more openings of the lace guide are in line with the plane of the quarter or the plane of the outermost layer of the quarter. As seen in FIG. 9A, in one embodiment, opening 20 of the lace guide 10 is in line with the plane 27 of quarter 3 while the engagement portion 12 of the lace guide 10 is coupled to the underside of the quarter 3.

0052] It should be appreciated that other shapes for the dogleg-shaped regions other that shown in FIGS. 9A-9B are possible, as this aspect is not so limited. For example, the dogleg-shaped region may be more S-shaped, zigzagged, may have sharper or more gradual curves, or may have any other suitable shape, as this aspect is not so limited. FIGS. 10A-10E depict several illustrative, non-limiting examples of different possible dogleg-shaped regions, with FIG. 10A having the sharpest curves and FIG. 10D having the gentlest curves. FIG. 10E is a schematic of the dogleg-shaped region of the embodiments of FIGS. 1-9.

0053] According to one aspect, in some embodiments, a lace guide may extend along a substantial length of a quarter, and thus, it may be beneficial for a single lace guide to have three or more openings configured to receive the lace. In other embodiments, a lace guide may also extend along the majority of the length of the quarter. In still other embodiments, a lace guide may only extend along the quarter. Conventional lace guides typically include one or two openings for receiving the lace. As seen in FIG. 3, lace guide 10 includes three openings: first opening 20, second opening 21 and third opening 22. The lace guide may include 3, 4, 5, 6, 7 or more openings, as this aspect is not so limited. Lace guides with four or more openings may have two or more lace channels.

0054] In some embodiments, the lace may have two opposing ends where one of the ends is anchored at a suitable location of the footwear and the other is manually tensioned (e.g., by pulling.) The third opening 22 of the lace guide may lead to a lace anchor region where an end of the lace is anchored to the footwear, such as shown in phantom in FIG. 2. In other embodiments, however, the third opening 22 does not lead to a lace anchor region. Instead, the third opening may, for example, lead to an opposing side of the boot body. For example, if the third opening is disposed on the lateral side of the boot body, the third opening may lead the lace towards the medial side of the boot body.

0055] Of course, it should be appreciated that, in other embodiments, the lace guide may have only two openings, as the lace guide described herein is not limited to this one aspect.

0056] As discussed above, according to one aspect, a lace guide is configured and arranged on an article of footwear to protect the edges of the footwear quarters. As seen in FIG. 1, in some embodiments, the lace guide edge (element 14 seen in FIG. 3) remains exposed after the lace guide is incorporated into footwear. As seen in FIGS. 9A-9B, the lace guide 10 has an abutting surface 15 that abuts against the edge 7 of the lateral quarter 3. The top visible surface 17 of the lace guide edge 14 may be coplanar with or slightly above the top visible surface 23 of the quarter 3. In this manner, the lace guide may serve as an extension of the quarter. The lace guide may help to shield the edge of the quarter such that objects such as snowboards that are rested upon the front of the boot will contact and slide against the edge of the lace guide rather than the quarter edge. The boot may then slide along the lace guide edge rather than the boot body itself.

0057] In some embodiments, the edge of the lace guide may be formed of a durable material that is able to resist damage from an applied load such as a snowboard edge. In some embodiments, the edge of the lace guide may be formed of a flexible and/or soft material that can yield under the pressure of an applied load such as a snowboard edge to avoid damage.

0058] As noted above, according to one aspect, flexibility of the lace guide may be particularly important where the lace guide extends along a large portion of the length of a quarter. In some embodiments, a lace guide includes one or more flex zones that increase the flexibility of the lace guide and thus, the flexibility of the article of footwear. In some embodiments, the flex zones may be in the form of reliefs that increase the flexibility of the lace guide. For example, as seen in FIG. 3, the lace guide 10 has a plurality of reliefs 50. The reliefs 50 shown in FIG. 3 are linear grooves. It should be appreciated that reliefs may be in the form of grooves, cutouts, etchings, slots, may be stamped, or may be any other suitable arrangement.

0059] It should be appreciated that other flex zone arrangements are possible. For example, a flex zone may be in the form of an area of flexible material, an area of thinner material, an accordion-like arrangement, a sliding mechanism, may be stamped, may be bendable, may be hinged, or any other suitable arrangement, as this aspect is not so limited.

0060] As discussed earlier, according to one aspect, the lace guide may be coupled to the article of footwear in a variety of arrangements. The engagement portion of the lace guide may be directly or indirectly coupled to the footwear via one or any combination of the following: stitching, adhesive, welding, physical interlock, or by any other suitable arrangement, as this aspect is not so limited.

0061] In some embodiments, the lace guide may be indirectly coupled to the footwear via an intermediate material. For example, in one embodiment, one or more lace guides may be coupled to an intermediate material first, and then the intermediate material may be coupled to the article of footwear thereupon. As a non-limiting, illustrative example, FIG. 11A depicts a lace guide 10 coupled to an intermediate material 60. After coupling the lace guide to the intermediate material, the intermediate material 60 is then coupled to an article of footwear. In some embodiments, more than one lace guide may be coupled to an intermediate material. As seen in FIG. 11B, two lace guides 10 are first coupled to an intermediate material 60, and afterwards, the intermediate material 60 is coupled to an article of footwear.

0062] The lace guide may be directly or indirectly coupled to the intermediate material via one or any combination of the following: stitching, adhesive, welding, physical interlock, or by any other suitable arrangement, as this aspect is not so limited.

0063] The intermediate material may be webbing, may be made from fabric, leather, a plastic, a polymer, a metal, an alloy, carbon fiber, synthetic fiber, a composite, or any other suitable material, as this aspect is not so limited.

0064] In some embodiments, the engagement portion of the lace guide may be sandwiched between two layers of material forming the boot. In other embodiments, the engagement portion of the lace guide may be located beneath the
quarter such that the lace guide is sandwiched between the quarter and the tongue. In the embodiment shown in FIGS. 9A-9B, the abutting surface 15 of the lace guide 10 abuts against the edge 7 of the quarter 3. The engagement portion 12 of the lace guide is coupled to the quarter 3. A portion of the lace guide 10 is sandwiched between the quarter 3 and the tongue 2, while the edge 14 of the lace guide 10 remains visible.

[0065] The lace guide may be made from a plastic, a polymer, a metal, an alloy, carbon fiber, synthetic fiber, a composite, or any other suitable material, as this aspect is not so limited.

[0066] In some embodiments, the lace guide comprises two pieces that are joined together (e.g., slide together) to form a single body. For example, in one embodiment, as seen in FIG. 12, lace guide 10 comprises a first piece 80 and a second piece 82. The second piece 80 slides into grooves 83 in the first piece 80, and the two pieces are coupled together. The pieces of the lace guide may be coupled together to form a single body via welding, adhesive, physical interlock, interference fit, or by any other suitable process, as this aspect is not so limited.

[0067] In other embodiments, the lace guide may comprise more than two pieces.

[0068] In yet other embodiments, the lace guide may comprise a monolithic structure where the lace guide is formed out of one piece of material.

[0069] The lace guide or lace guide pieces may be formed via injection molding, die casting, additive manufacturing, machining, or by any other suitable process, as this aspect is not so limited.

[0070] The lace can be implemented in any of numerous ways, and the present invention is not limited to any particular implementation. The lace should be sufficiently strong to resist the substantial forces that can be encountered when snowboarding, and in this respect may require greater strength than the laces employed in conventional footwear such as athletic shoes. The lace can be formed from a monofilament or a multifilament strand. In accordance with an illustrative embodiment of the invention, the lace is formed of a low-friction material capable of resisting a high tensile force without elongation to minimize frictional engagement between the lace and the lace guides. While not limited to any particular material or any particular form (i.e., woven, braided, monofilament, etc.), examples of materials that can be used for the lace include various types of fabrics, plastics, metals, KEVLAR and/or SPECTRA cord.

[0071] It should be understood that the foregoing description is intended merely to be illustrative thereof and that other embodiments, modifications, and equivalents are within the scope of the present disclosure recited in the claims appended hereto. Further, although each embodiment described above includes certain features, the present disclosure is not limited in this respect. Thus, one or more of the above-described or other features of the boot or methods of use, may be employed singularly or in any suitable combination, as the present disclosure and the claims are not limited to a specific embodiment.

What is claimed is:

1. A boot comprising:
a medial side and a lateral side;
a first quarter disposed at the medial side and a second quarter disposed at the lateral side;
a tongue opening positioned between the first and second quarters;
a tongue disposed within the tongue opening, each quarter having an edge adjacent the tongue;
a lace adapted to draw the first and second quarters together upon tightening of the lace; and
a lace guide disposed at the first quarter and guiding the lace, the lace guide having a lace channel adapted to guide a force from the lace upon tightening of the lace to provide leverage on the lace guide such that the edge of the first quarter dives toward the tongue upon tightening of the lace.

2. The boot of claim 1, wherein the lace channel comprises a first end portion, a second end portion and an intermediate portion connecting the first end portion to the second end portion, a first opening being disposed at the first end portion, a second opening being disposed at the second end portion, the lace channel including a top surface and a bottom surface; and
an imaginary centerline running through the lace channel from the first opening to the second opening and bisecting a distance between the top and bottom surfaces of the lace channel, wherein the lace channel includes a first dogleg-shaped region such that a portion of the centerline running through the intermediate portion is disposed at a first height and a portion of the centerline running through the first end portion is at a second height different from the first height.

3. The boot of claim 2, wherein the lace channel comprises a second dogleg-shaped region such that a portion of the centerline running through the second end portion is at a third height that is different from the first height.

4. The boot of claim 3, wherein the second and third heights are the same.

5. The boot of claim 1, wherein the lace guide comprises two pieces coupled together.

6. The boot of claim 1, wherein the lace guide further comprises a flex zone adapted to increase flexibility of the lace guide.

7. The boot of claim 6, wherein the flex zone comprises one or more reliefs.

8. The boot of claim 1, wherein the lace guide comprises an abutting surface that abuts against the edge of the first quarter.

9. The boot of claim 1, wherein a first portion of the lace guide is positioned below a visible surface of the first quarter and a second portion of the lace guide is flush with or above the visible surface of the first quarter.

10. The boot of claim 2, wherein a portion of the lace exiting the lace guide is in line with a plane of the first quarter.

11. The boot of claim 2, wherein the first opening of the lace guide is in line with a plane of the first quarter.

12. The boot of claim 2, wherein the lace guide further comprises an engagement portion that is coupled to an underside of the first quarter.

13. The boot of claim 10, wherein the lace guide further comprises an engagement portion that is coupled to an underside of the first quarter.

14. A lace guide for an article of footwear, the lace guide comprising:
a lace channel comprising a first end portion, a second end portion and an intermediate portion connecting the first end portion to the second end portion, a first opening being disposed at the first end portion, a second opening
being disposed at the second end portion, the lace channel including a top surface and a bottom surface; and an imaginary centerline running through the lace channel from the first opening to the second opening and bisecting a distance between the top and bottom surfaces of the lace channel,

wherein the lace channel includes a first dogleg-shaped region such that a portion of the centerline running through the intermediate portion is disposed at a first height and a portion of the centerline running through the first end portion is at a second height different from the first height,

wherein the first height and the second height extend in a direction perpendicular to the top and bottom surfaces of the intermediate portion of the lace channel.

15. The lace guide of claim 14, wherein a portion of the centerline running through the second end portion is at a third height that is different from the first height.

16. The lace guide of claim 15, wherein the second and third heights are the same.

17. The lace guide of claim 14, wherein the first dogleg-shaped region is adapted to guide a force from the lace upon tightening to provide leverage on the lace guide such that the edge of the first quarter dives toward the tongue upon tightening of the lace.

18. The lace guide of claim 14, further comprising an engagement portion adapted to engage with a boot, wherein a vertical distance between a top surface of the engagement portion and a bottom surface of the lace guide decreases along at least part of the first end portion.

19. The lace guide of claim 18, wherein the bottom surface is curved along the at least part of the first end portion.

20. The lace guide of claim 14, wherein the lace guide comprises two pieces coupled together.

21. The lace guide of claim 14, further comprising a flex zone adapted to increase flexibility of the lace guide.

22. The lace guide of claim 21, wherein the flex zone comprises one or more reliefs.

23. The lace guide of claim 14, in combination with a boot, the boot comprising:

- a medial side and a lateral side;
- a first quarter disposed at the medial side and a second quarter disposed at the lateral side, each quarter having an edge;
- a tongue opening positioned between the first and second quarters;
- a tongue disposed within the tongue opening; and
- a lace adapted to draw the first and second quarters together upon tightening of the lace.

24. The lace guide and boot combination of claim 23, wherein the first dogleg-shaped region is adapted to guide a force from the lace upon tightening to provide leverage on the lace guide such that the edge of the first quarter dives toward the tongue upon tightening of the lace.

25. The lace guide and boot combination of claim 23, wherein the portion of the centerline running through the intermediate portion is located between the first quarter and the tongue.

26. The lace and boot combination of claim 23, wherein a portion of the lace exiting the lace guide is in line with a plane of the first quarter.

27. The lace guide and boot combination of claim 23, wherein the first opening is in line with a plane of the first quarter.

28. The lace guide and boot combination of claim 26, wherein the lace guide further comprises an engagement portion that is coupled to an underside of the first quarter.

29-48. (canceled)

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