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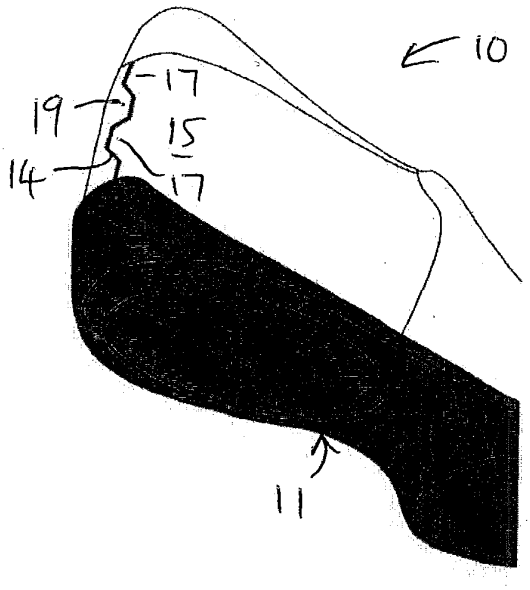
(54) An article of footwear

(57) There is provided an article of footwear 10, such as a shoe, sandal or boot, having an upper 12, a sole 11 and a primary fastening means 13 such as laces. The article of footwear also has an additional flexure system comprising an elasticated cord 14 which is held relative to a series of interlocking tabs 17, 19 formed alternately on adjacent first and second sections 15, 16 of the upper 12. This construction enables the two sections 15, 16 to flex relative to each other.

FIGURE 6



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Description

[0001] The present invention relates to articles of footwear.

[0002] According to the present invention there is provided an article of footwear comprising a sole and an upper, the article having a primary fastening means and a flexure system which is independent from the primary fastening means and which comprises an elongate, elasticated cord, a first section of the upper being secured relative to the cord and an adjacent second section being secured relative to the cord such that the elasticated cord allows said first and second sections to flex relative to each other.

[0003] In preferred arrangements said adjacent section is also constituted by said upper. Preferably said first section is secured relative to the cord by means of at least one first tab and said second section is secured relative to the cord by means of at least one oppositely disposed second tab disposed such that the first and second tabs alternate and usually the end of each tab of the first upper and second sections loops around the cord and is secured to the tab to form a sleeve around the cord.

[0004] Often there are at least two first tabs and there are at least two second tabs. In some embodiments the article of footwear is a sandal and the tabs are constituted by the end parts of straps.

[0005] A preferred feature is that the two ends of the cord are secured to the article of footwear or the cord is a continuous loop. More than one cord can be provided in each article of footwear.

[0006] With some articles of footwear, the first and second upper sections are secured to a flexible, stretchable inner material which is disposed behind the alternating tabs and sometimes the inner material lines the whole interior of the upper.

[0007] In some embodiments the cord extends along the main toe joint area of the upper and/or the cord extends along both sides of the article of footwear to below the ankle area of the upper and/or the cord extends around the heel of the upper.

[0008] With a further embodiment the cord extends in an upward direction at the heel or at the ankle of the article of footwear. In another embodiment the cord extends in a U-shape around or in two lines on either side of the primary fastening means, beginning and ending at the foot opening part of the article of footwear.

[0009] Conveniently the second section is secured to and extends from the sole. Sometimes the first and second sections are connected only by virtue of the cord interengagement.

[0010] Usually the primary fastening means is constituted by one of the following group: laces, Velcro (TM), buckle, zip, magnetic clasp, toggle, plastic moulded fastener.

[0011] It has been found that the flexure system creates a flexible expansion area within the upper of the shoe/boot or sandal that reduces pressure on to the foot. The elasticated cord also ensures that the separate upper portions are centered again after flex or distortion. With reduced pressure from the upper, the foot can move and expand more freely inside the shoe enhancing the user's perception of comfort. One benefit in some constructions is the ability to evenly distribute material around the foot rather than allowing the upper material to buckle randomly, as in a conventional shoe construction, resulting in an inverted crease which concentrates more pressure on the foot at the point of the flex.

[0012] The applicants have created an independent in-house comfort test, called D.P.M. (Dynamic Performance Measure), which utilises various laboratory equipment including advanced pressure sensing software and a digital shock absorption tester. This testing facility enables the applicant to record and improve comfort in their shoes as well as to bench mark "comfort" alongside other shoes. In tests of various embodiments of the present invention the use of the flexure system, together with conventional fastening means, has clearly improved comfort. In particular, in some embodiments of the present invention the pressure under the user's foot is reduced because the upper is able to expand, allowing no pressure on top of the foot and resulting in more comfortable footwear.

[0013] Various embodiments of the present invention will now be described in more detail. The description makes reference to the accompanying drawings in which:

Figure 1 is a front perspective view of a shoe according to the present invention,
Figure 2 is a detailed perspective view of a part of the figure 1 shoe,
Figure 3 is a cross section on line III-III of figure 2,
Figure 4 is a side view of an alternative shoe according to the present invention,
Figure 5 is a perspective view of part of another shoe according to the present invention,
Figure 6 is a rear perspective view of part of another shoe according to the present invention,
Figure 7 is a plan view of a further shoe according to the present invention,
Figure 8 is a plan view of a still further shoe according to the present invention,
Figure 9 is a side view of a further alternative shoe according to the present invention,
Figure 10 is a perspective view of a still further embodiment,
Figure 11 is a side view of a boot according to the present invention,
Figure 12 is a perspective view of another boot according to the present invention,
Figure 13 is a perspective view of a further boot according to the present invention, and
Figure 14 is a rear view of the figure 13 boot.

[0014] Figure 1 shows a shoe 10 embodying the present invention and figures 2 and 3 illustrate detailed

features. The shoe 10 has a sole 11, an upper 12 and a conventional shoe fastening means 13, utilisation of which enables the wearer to put on and take off the shoe. In the shoe of figure 1, the fastening means comprises laces but it will be appreciated that many other fastening means could be substituted, for example Velcro (TM) straps, buckles, clasps, zips, toggle fastenings, magnetic clasps, plastic moulded fastener.

[0015] Extending partially around the shoe 10 is an elongate, elasticated cord 14 which extends from below the ankle area, along one side of the shoe towards the toe area and then back along the other side of the shoe to below the ankle area on the other side of the shoe 10. Both ends of the cord 14 are secured to the shoe 10, for example by stitching to the upper 12 or to the sole 11. In the toe region, the cord 14 ideally follows a line corresponding to the main toe joints of the wearer (not shown) for reasons that will become apparent.

[0016] The fore part of the upper 12 is separated into two sections, a first or upper section 15 which in this embodiment incorporates the fastening means 13 and a second or lower section 16 which in this embodiment extends from the sole 11 of the shoe 10. The two sections 15, 16 are interconnected by means of the elasticated cord 14. The upper section 15 has a number of spaced first tabs 17 which extend towards the lower section 16. Each tab 17 is looped around the cord 14 and is secured to itself by means of stitching 18 to form a sleeve through which the cord extends. This is shown clearly in figure 3. Interposed between the first tabs 17 are a series of spaced second tabs 19 which extend from the lower section 16 towards the upper section 15. Again, each second tab 19 is looped around the cord 14 and is secured to itself by stitching 18 to form another cord receiving sleeve. It will be appreciated that the stitching could be replaced by some other securing means such as a rivet or glue or the cord receiving sleeve could take a different form and could be a separate element secured to the first or second sections 15, 16. Figure 8, described later, shows an alternative.

[0017] It will be seen from figure 1 that the first and second tabs 17, 19 alternate in an interlocking manner and precise machining can minimise the gaps between the first and second upper sections 15, 16. In some embodiments, and as shown in figures 1 to 3 the cord area at least is lined with a stretchable, flexible material 20 which is secured to the inside of the upper 12. The stretchable material 20 could be a backing just for the cord area of the shoe 10 or could be a backing for other areas, even a backing for the entire upper 12.

[0018] The two-section form of the fore part of the upper 12, coupled with the cord 14, enable an extra degree of flexing and expansion caused by relative movement between the first and second sections 15, 16. This relative movement is facilitated by the elasticated cord 14, the resilience of which tends to return the shoe 10 to its original shape after flexing. It will be appreciated that in the toe joint area, the relative movement of the two sections 15, 16 makes it easier to bend the shoe in this important area and can act to reduce the tendency for a section of creased leather to press against the wearer's foot during the walking action. The potential for relative movement also accommodates swelling of the feet due to temperature change or due to flying or due to size fluctuations throughout the day.

[0019] Figure 4 shows a shoe 10 which is similar in many respects to that shown in figure 1 except that the ends of the cord 14 extend rearwardly beyond the ankle to the heel region so as to provide a flexure line 360° around the shoe. The shoe 10 in figure 4 also shows an alternative fastening means 13 in the form of two straps 22 secured with Velcro (TM) for example.

[0020] In figure 5 the cord 14 extends in a generally upright direction from the sole 11 to the edge of the foot opening below the ankle. The first and second sections 15, 16 are therefore more like forward and rearward sections with interlocking tabs 17, 19 but again the arrangement provides an extra degree of flexing and expansion. Again, with this embodiment there is provided a conventional shoe fastening means at 13, such as laces, although no detail is shown.

[0021] Similarly, in figure 6 the cord 14 is provided in a generally vertical orientation at the rear heel seam of the shoe 10 such that the two sections 15, 16 could be regarded as left and right sections. It will be clear that again the shoe 10 benefits from an extra degree of flexibility and expansion. In this embodiment the fastening means 13 are not visible due to the angle of the view.

[0022] The arrangement of figure 7 is similar in some respects to that shown in figure 1 except that the U-shaped path of the cord 14 is much closer to the conventional shoe fastening means 13 so as to define the facing of the shoe 10. The shoe 10 of figure 8 is very similar to the shoe of figure 7 except that the flexure zone is not U-shaped but extends in two lines on either side of the fastening means 13.

[0023] The shoe 40 of figure 9 utilises the same general principles of the shoes described above except that the cord 14 is retained differently. In shoe 40, on both sides, there are two elasticated cords 14. Each cord 14 is in the form of an inverted V, the apex of the V being held in a stitched conduit 41 defined between the first section 15 of the upper and the stretchable backing material 20. Ideally the first section 15 is debossed to help the cord 14 move relative to the conduit 41. The two ends of each V-shaped cord 14 are secured relative to the second, or lower, section 16 of the upper or the sole 11. It will be apparent that the cords enable the upper and lower sections 15, 16 of the shoe 10 to move relative to each other, as with previously described embodiments.

[0024] Figure 10 shows a sandal 50 which utilises the same basic principles of the shoes described. The lower straps 51 of the sandal effectively constitute the second section 16 and the upper straps 52 constitute the first section 15 of the upper, the straps 51, 52 terminating with the tabs 17, 19 which loop around the elasticated cord

14. Again, conventional fastening means 13 is provided in the form of a Velcro (TM) strap which enables insertion and removal of the foot.

[0025] Figure 11 shows a boot 60 which utilises similar principles to some of the other articles of footwear described above. The boot 60 has a conventional primary fastening means which is not shown, such as a zip or lacing on the opposite side of the boot to that shown. The side shown incorporates a generally vertical flexure system comprising an elasticated cord captured by interlocking forward and rearward tabs 17, 19 projecting from the first and second sections 15, 16 of the upper 12. The cord 14 is fixed at its upper and lower ends and the flexure system is particularly suited to expanding to accommodate variable calf sizes.

[0026] Similarly, figure 12 shows a flexure system similar to that shown in figure 11, which flexure system is again provided in addition to a primary fastening (again not shown). In this embodiment, however, the flexure system describes a serpentine path instead of the vertical path of figure 11. It will be appreciated that other shaped paths for the flexure system would also be possible and the extent in the vertical direction could also be varied. By way of example, in figures 13 and 14 the flexure system extends downwardly from the top outside edge of the boot 60, curves rearwardly at its lower end and then curves back up to the top inside edge of the boot 60. This results in a panel in the calf area which is able to flex. A primary fastening means such as a zip (not visible however) is also provided on the inside part of the boot upper 12 In other arrangements the flexure system could extend only in a horizontal direction, for example around the ankle region.

[0027] It will be apparent to the reader that other articles of footwear could incorporate similar flexure systems in one or more different locations whilst still being covered by the attached claims. Also, it should be understood that the term 'cord' used throughout could be constituted by any flexible, elasticated elongate element to which the sections of shoe can be attached.

Claims

1. An article of footwear comprising a sole and an upper, the article having a primary fastening means and a flexure system which is independent from the primary fastening means and which comprises an elongate, elasticated cord, a first section of the upper being secured relative to the cord and an adjacent second section being secured relative to the cord such that the elasticated cord allows said first and second sections to flex relative to each other.

2. An article of footwear as claimed in claim 1 wherein said adjacent section is also constituted by said upper.

3. An article of footwear as claimed in claim 2 wherein said first section is secured relative to the cord by means of at least one first tab and said second section is secured relative to the cord by means of at least one oppositely disposed second tab disposed such that the first and second tabs alternate.

4. An article of footwear as claimed in claim 3 wherein the end of each tab of the first upper and second sections loops around the cord and is secured to the tab to form a sleeve around the cord.

5. An article of footwear as claimed in claim 3 or claim 4 wherein there are at least two first tabs.

6. An article of footwear as claimed in any one of claims 3 to 5 wherein there are at least two second tabs.

7. An article of footwear as claimed in any one of claims 3 to 6 wherein the article of footwear is a sandal and the tabs are constituted by the end parts of straps.

8. An article of footwear as claimed in any one of claims 1 to 7 wherein the two ends of the cord are secured to the article of footwear.

9. An article of footwear as claimed in any one of claims 1 to 7 wherein the cord is a continuous loop.

10. An article of footwear as claimed in any one of claims 1 to 9 wherein the first and second upper sections are secured to a flexible, stretchable inner material which is disposed behind the alternating tabs.

11. An article of footwear as claimed in claim 10 wherein the inner material lines the whole interior of the upper.

12. An article of footwear as claimed in any one of claims 1 to 11 wherein the cord extends along the main toe joint area of the upper.

13. An article of footwear as claimed in any one of claims 1 to 12 wherein the cord extends along both sides of the article of footwear to below the ankle area of the upper.

14. An article of footwear as claimed in any one of claims 1 to 13 wherein the cord extends around the heel of the upper.

15. An article of footwear as claimed in any one of claims 1 to 14 wherein the cord extends in an upward direction at the heel or at the ankle of the article of footwear.

16. An article of footwear as claimed in any one of claims 1 to 15 wherein the cord extends in a U-shape around

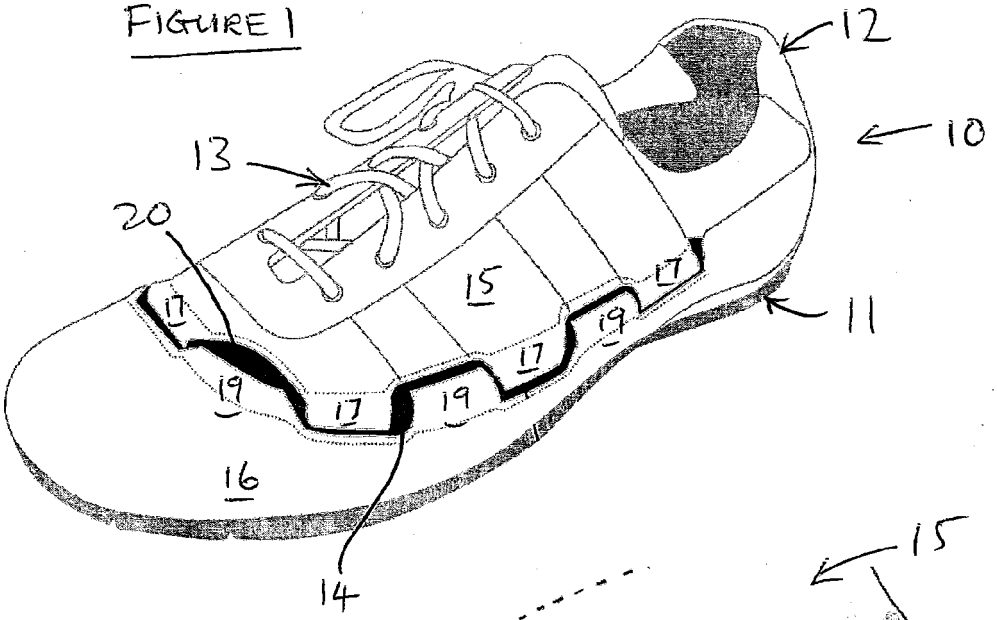
or in two lines on either side of the primary fastening means, beginning and ending at the foot opening part of the article of footwear.

17. An article of footwear as claimed in any one of claims 1 to 16 wherein the second section is secured to and extends from the sole.

18. An article of footwear as claimed in any one of claims 1 to 17 wherein the first and second sections are connected only by virtue of the cord interengagement.

19. An article of footwear as claimed in any one of claims 1 to 18 wherein the primary fastening means is constituted by one of the following group: laces, Velcro (TM), buckle, zip, magnetic clasp, toggle, plastic moulded fastener.

FIGURE 1



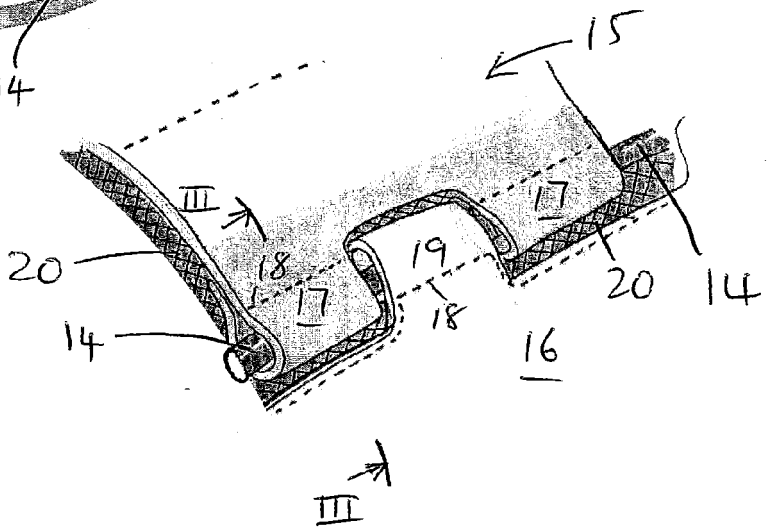


FIGURE 2

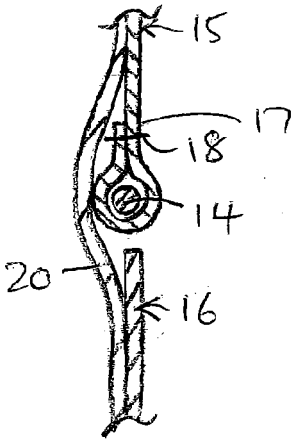


FIGURE 3

FIGURE 6

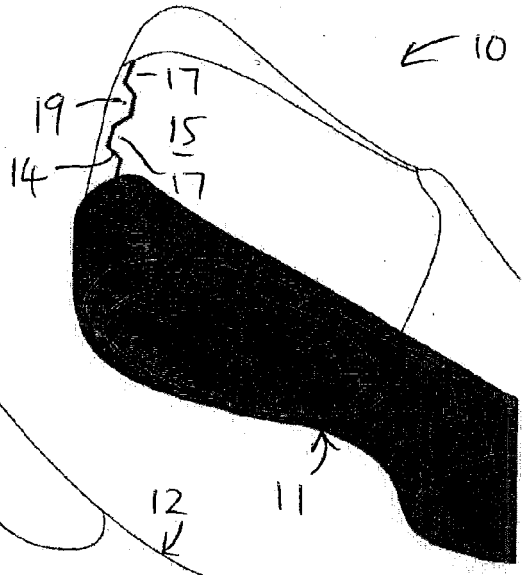
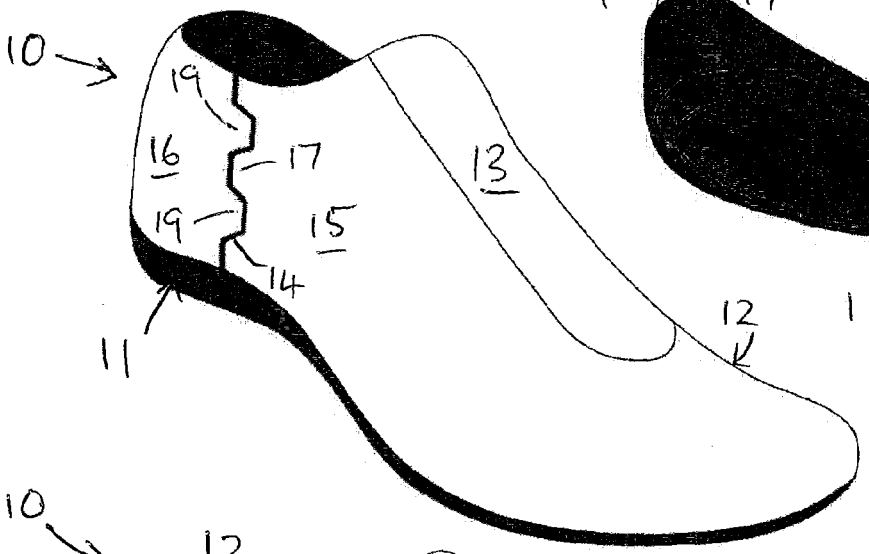


FIGURE 5



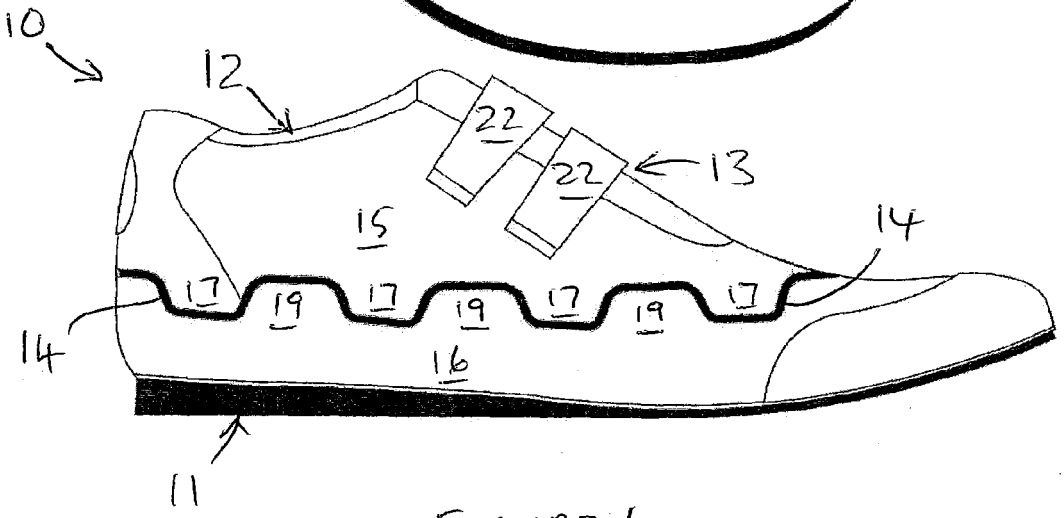


FIGURE 4

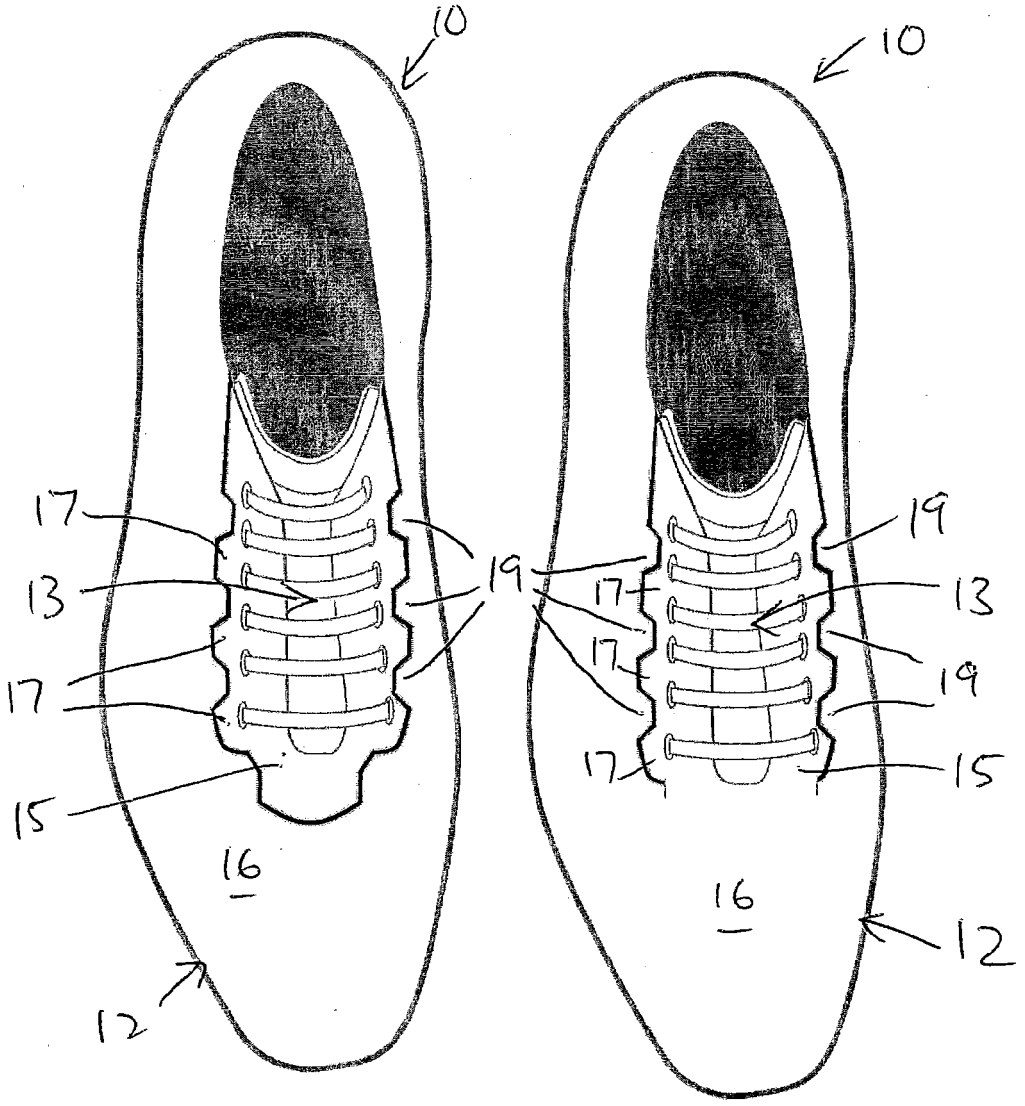


FIGURE 7

FIGURE 8

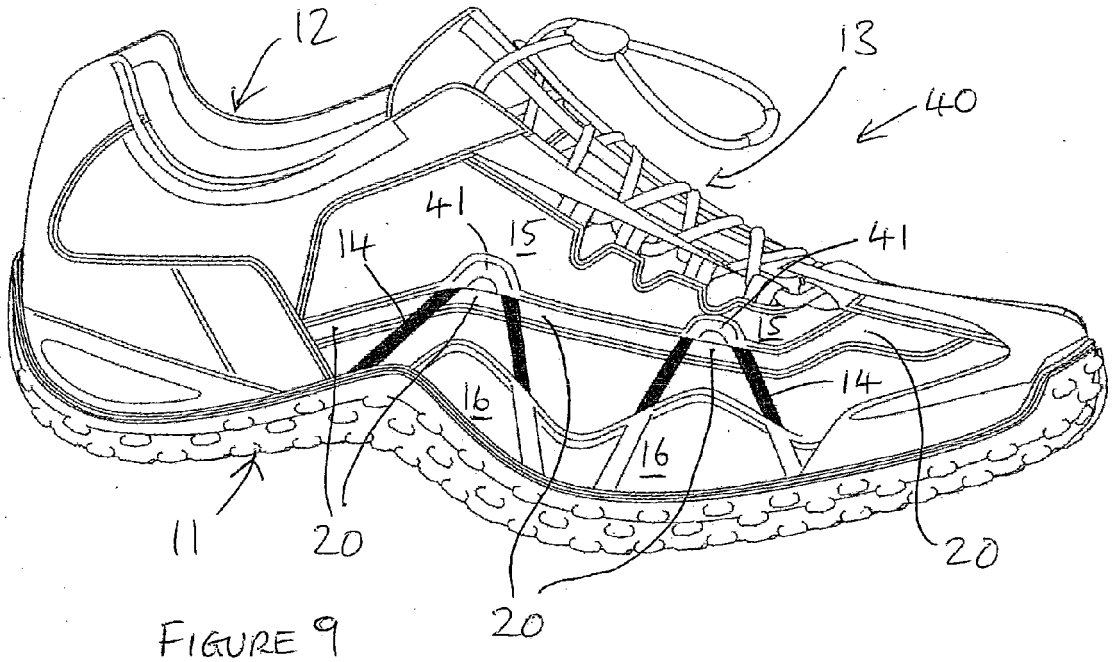


FIGURE 9

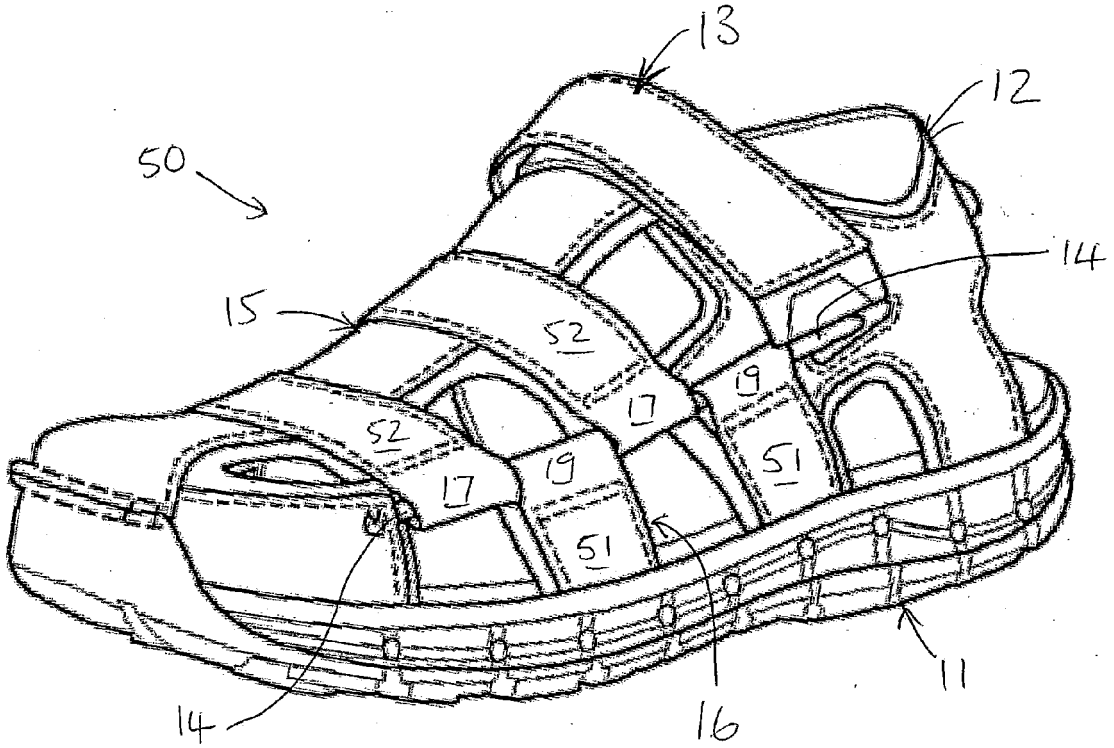


FIGURE 10

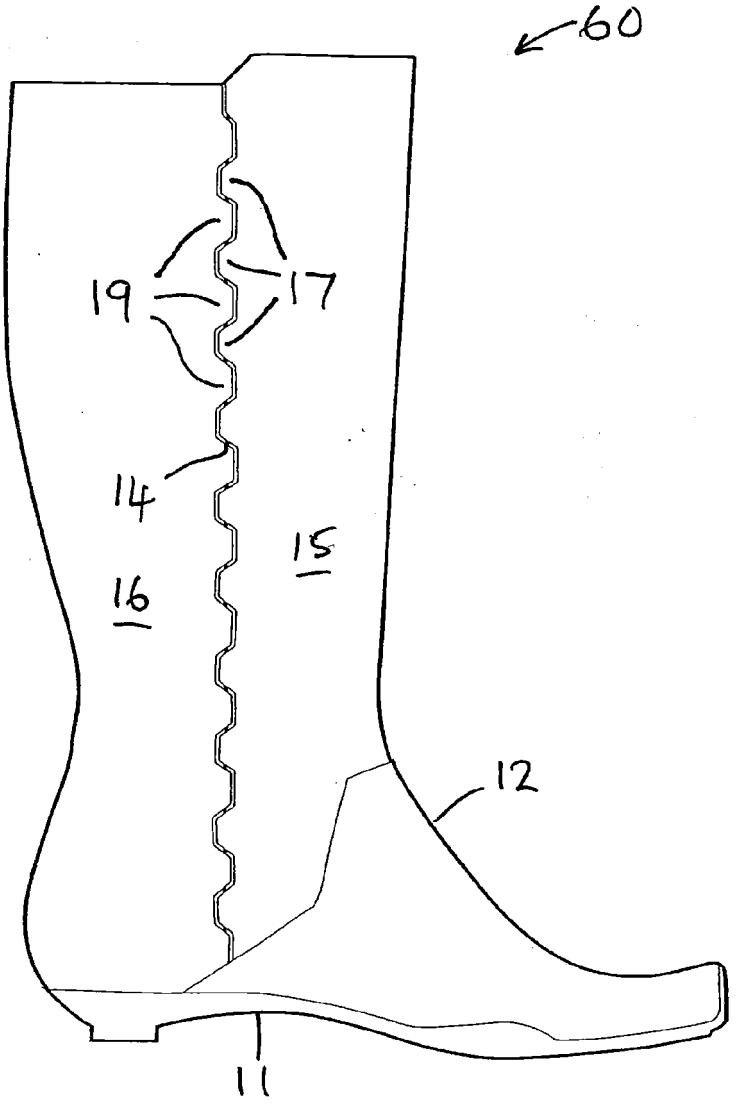


FIGURE 11

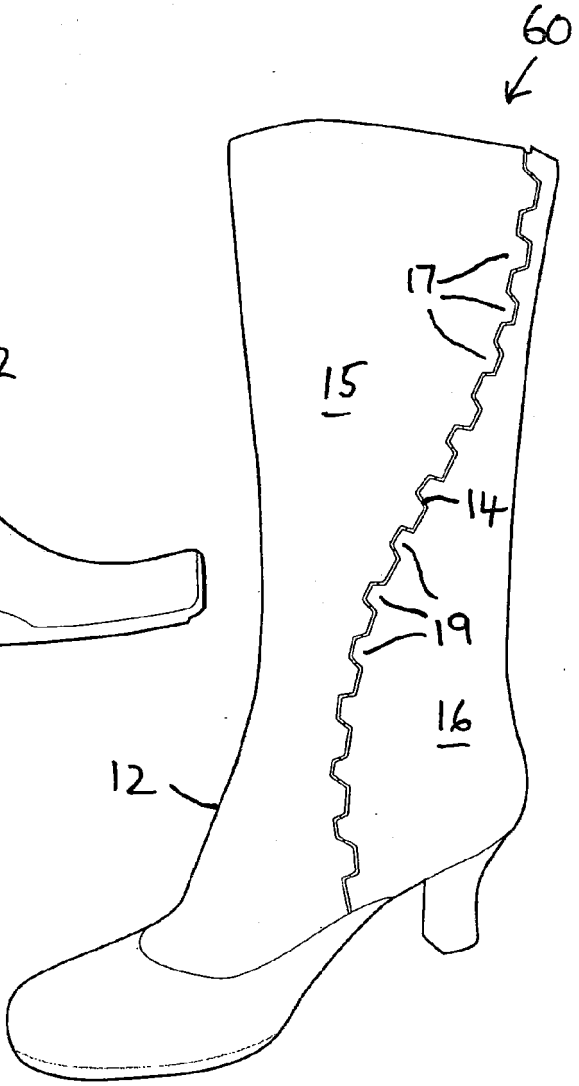


FIGURE 12

FIGURE 14

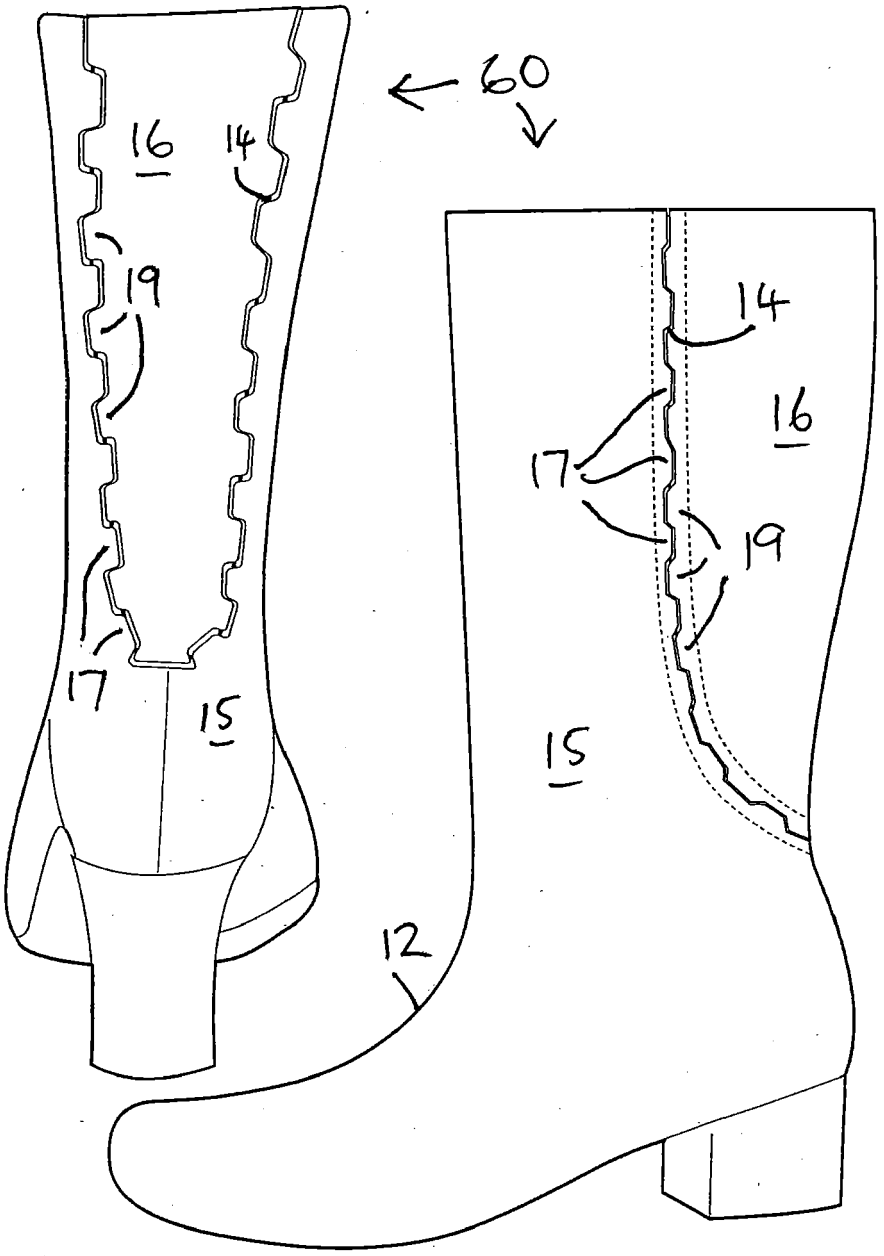


FIGURE 13

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EUROPEAN SEARCH REPORT

Application Number
EP 08 15 5953

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TECHNICAL FIELDS SEARCHED (IPC)

A43B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	30 May 2008	Cianci, Sabino

CATEGORY OF CITED DOCUMENTS

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30-05-2008

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