A sole (10) for foldable footwear has a plurality of defined fold lines (34-40) arranged such that the sole can be folded so as to have a folded length that is less than its unfolded length. A pair of foldable shoes provided with the foldable sole (10) can conveniently be packaged for sale from a vending machine.
FOLDABLE FOOTWEAR AND SOLES FOR FOLDABLE FOOTWEAR

FIELD OF THE INVENTION

[0001] The invention relates to foldable footwear, soles for foldable footwear and particularly, but not exclusively, to footwear that can be folded for packaging in a format suitable for sale from vending machines.

SUMMARY OF THE INVENTION

[0002] The invention provides a sole for foldable footwear, said sole having a plurality of defined fold lines arranged such that the sole can be folded so as to have a folded length that is less than its unfolded length.

[0003] The invention also includes a foldable shoe comprising a sole and an upper connected with the sole, the sole having a plurality of defined fold lines arranged such that the shoe can be folded so as to have a folded length that is less than its unfolded length.

[0004] The invention also includes a method of folding a foldable shoe, the foldable shoe having a plurality of defined fold lines and the method comprising folding the shoe along the fold lines such that the shoe has a folded length that is less than an unfolded length.

[0005] The invention also includes a package for a pair of foldable shoes, the package comprising a first receptacle for a foldable shoe, a second receptacle for a foldable shoe and a hinge connecting said receptacles.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] In order that the invention may be well understood, some embodiments thereof, which are given by way of example only, will now be described with reference to the drawings in which:

[0007] FIG. 1 is a plan view of the underside of a sole for foldable footwear;

[0008] FIG. 2 is a side elevation of the sole of FIG. 1;

[0009] FIG. 3 is an exploded perspective view of a foldable shoe comprising the sole of FIG. 1;

[0010] FIG. 4 is a perspective view showing the foldable shoe of FIG. 3 in a folded condition;

[0011] FIG. 5 is a perspective view showing another foldable shoe; and

[0012] FIG. 6 is a schematic perspective view of a package for the foldable shoes of FIGS. 3 and 5, with the package shown in an open condition.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

[0013] Referring to FIGS. 1 and 2, a sole 10 for foldable footwear comprises a generally planar moulding having a toe end 12, a heel end 14, an instep side 16 and an outer side 18 that is opposite the instep side. The sole 10 has an upper surface 20 and an underside 22 that in use faces the ground. The underside 22 is provided with a plurality of ground engaging projections in the form of respective sets of ribs 24-32. The sets of ribs 24-32 are separated by spaces that define respective fold lines 34-40 along which the sole 10 can be folded.

[0014] As can be seen in FIG. 1, the fold lines 34-40 extend in a widthways direction of the sole 10 and are inclined with respect to a notional lengthways extending line 42 that bisects the sole in the lengthways direction. The fold lines 34, 38 are inclined from the instep side 16 of the sole towards the toe end 12 and the fold lines 36, 40 are inclined from the instep side towards the heel end 14. It will be noted that the direction of inclination of the fold lines 34-40 alternates.

[0015] The first two sets of ribs 24, 26 starting at the toe end 12 and the set of ribs 32 at the heel end 14 extend in the lengthways direction of the sole generally parallel to the line 42. The two sets of ribs 28, 30 between the lengthways extending sets are inclined with respect to the line 42 from the instep side 16 towards the toe end 12. The arrangement of the sets of ribs 24-32 and fold lines 34-40 is such that when the sole 10 is folded, the sets of ribs on portions of the sole that face one another can mesh (i.e., the ribs on one of two facing portions enter the spaces between the ribs on the other of the two facing portions). This meshing arrangement minimises the thickness of the folded sole.

[0016] Referring to FIG. 3, a foldable shoe 50 comprises the foldable sole 10, a set of stiffening members in the form of shims 52-60 that lie on the upper surface 22 of the sole and a cushion (or insole) 62, which lies on top of the shims to complete the foot supporting portion of the shoe. The shims 52-60 are shaped to fit over the ribbed areas of the sole 10 and leave gaps between corresponding to the fold lines 34-40. Thus the configuration of the shims 52-60 is such as to maintain the foldability of the shoe 50. The sole 10, shims 52-60 and insole 62 are attached by any suitable means such as by the use of adhesives.

[0017] The foldable shoe 50 further comprises a two-part upper made up of a front upper 64 and a rear upper 66. A hook 68 is provided in the rear upper 66. The front and rear uppers 64, 66 are made of a fabric so as to be lightweight and flexible and are secured to the assembly of the sole 10, shims 52-60 and insole 62 by any suitable conventional means such as adhesives and/or stitching. In the illustrated arrangement, the lower edges 70 of the front and rear uppers 64, 66 are secured between the sole 10 and insole 62 by means of a suitable adhesive. If the shoe 50 is intended for indoor use, for example as a slipper, and particularly where it is intended for one-off use, the upper may simply be a lightweight fabric. Where the shoe 50 is intended for outdoor use, the material used may be a waterproof, or waterprooofed, material intended to make the shoe at least capable of withstanding light rainfall or exposure to similar levels of moisture.

[0018] The hook 68 comprises a length of suitable cord that runs within seams (not shown) that run along the inside of the upper edge 72 of the rear upper 66 and have respective ends that are trapped between the sole 10 and insole 62.

[0019] In order to fold the shoe 50 to achieve the folded condition shown in FIG. 4, the user first folds the shoe along the fold line 36 in the direction of the heel end 14 to bring the rib set 26 into meshing contact with the rib set 28. The shoe is then folded along the fold line 40 to bring the rib set 32 into mesh with the rib set 30. The shoe is then folded along the fold line 38 to move the rear upper 66 into engagement with the rearward end of the front upper 64. The folding process is completed by folding the shoe along the fold line 34 such as to fold the toe end of the front upper back towards the rearward end of the front upper. Once the folding process is complete, the shoe 50 has a generally triangular configuration as shown in FIG. 4. The folded length of the shoe 50 is approximately 40% of its unfolded length.

[0020] It should be noted that the order of folding described above does not represent the only way in which the foldable shoe 50 can be folded to achieve the folded shape shown in...
The package 150 may be made of any suitable packaging material and could, for example, be made of cardboard printed with information relating to the shoe size and/or folding instructions.

The relatively small size of the packaged shoes 50, 100 makes them particularly suitable for sale from vending machines, which might, for example, be provided in hotels or clubs, or at transport locations such as airports. The small packaged size makes it possible to provide a reasonable range of sizes of shoe in a relatively compact vending machine.

The foldable sole is typically a one-piece moulding and can be made of any suitable natural or synthetic polymer.

It will be appreciated that it is not essential to have four fold lines as in the embodiments. A smaller number may be provided. This would reduce the extent to which the length of the sole could be reduced by folding, but should result in a thinner folded shoe. Alternatively, a greater number of folds could be provided. This allows the possibility of an increase in the extent to which the length of the sole is reduced by folding, but with an increased complexity in the folding arrangement and a potentially thicker folded shoe.

It will be appreciated that the fold lines do not have to be in the form of spaces separating sets of ribs as in the embodiments. A foldable sole could instead comprise a generally smooth or dimpled ground engaging surface with fold lines defined as grooves in the ground engaging surface.

It will be understood that while it is preferable that the foldable sole has a substantially constant thickness throughout its length, the portion between the heel end and the fold line closest to the heel end could be of increased thickness to define a raised heel.

It will be appreciated that the sole of the foldable shoe does not have to be a one-piece moulding as illustrated in the drawings. Instead, a series of pads corresponding, for example, in shape to the shims could be secured to the underside of a relatively soft material with spaces provided to define fold lines corresponding to the illustrated fold lines or any other suitable arrangement.

It will be understood that while the upper of the foldable shoes conveniently comprises two parts as illustrated in the drawings, that is not essential. The upper could be a one-piece construction with, for example, an overall shape similar to that of the illustrated two-part upper. Alternatively, the shoe may have an upper just at the toe end, in which case, the upper may have a shape similar to the illustrated front upper 66. Yet another alternative would be to have a system of strapping providing a sandal type structure. Such strapping might take the form of an elasticated band at the toe end of the shoe or one, or more, releasable straps that are secureable, for example, by a hook and eye type fastener such as Velcro®.

It will be appreciated that while the foldable shoe is particularly suitable for packaging and sale in a folded condition, this is not essential. It could be sold unfolded. This would still give the purchaser the benefit of a shoe that could be conveniently folded when required.

1. (canceled)
2. A sole for foldable footwear as claimed in claim 3, wherein the folded length is less than half the unfolded length.
3. A sole for foldable footwear:

said sole having a folded length and an unfolded length and being provided with a plurality of defined fold lines arranged such that said sole can be folded such that said folded length is less than said unfolded length,
said fold lines comprising inclined fold lines that extend in a widthways direction of said sole and are inclined with respect to a notional line that bisects said sole in a lengthways direction thereof, and
said inclined fold lines including at least one fold line that is inclined in a first direction and at least one fold line that is inclined in a second direction, said first direction being from an instep side of said sole towards a first end of said sole and said second direction being from said instep side towards a second end of said sole.

4. (canceled)

5. A sole for foldable footwear as claimed in claim 3, comprising a plurality of said inclined fold lines in said first direction and at least one said inclined fold line inclined in said second direction, said inclined fold lines inclined in said first direction alternating with said at least one inclined fold line inclined in said second direction.

6. (canceled)

7. A sole for foldable footwear as claimed in claim 3, wherein said sole comprises an underside having a plurality of ground contacting projections projecting therefrom, said fold lines being defined by spaces between the projections.

8. A sole for foldable footwear as claimed in claim 7, wherein said projections are ribs.

9. A sole for foldable footwear as claimed in claim 7, wherein respective sets of the ribs disposed on each side of a said fold line extend in at least one direction that is transverse to the fold line.

10. A sole for foldable footwear as claimed in claim 7, wherein said projections are arranged such that when the sole is folded, the projections on one portion of two facing portions of the sole are received in spaces between the projections on the second of said two facing portions.

11. A sole for foldable footwear as claimed in claim 3, wherein the sole has a relaxed condition in which it is partially folded along each fold line, the sole being moveable from said relaxed condition to a fully folded condition and to an unfolded use condition in which it has substantially no folds.

12. A sole for foldable footwear as claimed in claim 11, wherein said fold lines are arranged such that the sole can be moved from said relaxed condition to said fully folded condition by applying a twisting force to a toe end region of the sole and a twisting force to a heel end region of the sole, said twisting forces being applied in opposite directions.

13. A foldable shoe comprising a foldable sole, said sole having a folded length and an unfolded length and being provided with a plurality of defined fold lines arranged such that said sole can be folded such that said folded length is less than said unfolded length,
said fold lines comprising inclined fold lines that extend in a widthways direction of said sole and are inclined with respect to a notional line that bisects said sole in a lengthways direction thereof, and
said inclined fold lines including at least one fold line that is inclined in a first direction and at least one fold line that is inclined in a second direction, said first direction being from an instep side of said sole towards a first end of said sole and said second direction being from said instep side towards a second end of said sole.

14-23. (canceled)

24. A foldable shoe as claimed in claim 13, wherein said fold lines are arranged such that when folded said shoe has a generally triangular outline.

25. A foldable shoe as claimed in claim 13, wherein said sole is a one-piece construction.

26-28. (canceled)

29. A foldable shoe as claimed in claim 13, further comprising an insole and an intermediate layer between the sole and the insole, the intermediate layer comprising a plurality of stiffening members arranged in series and separated by spaces arranged to coincide with the fold lines.

30. A package containing a pair of foldable shoes, each said foldable shoe comprising a foldable sole,
each said sole having a folded length and an unfolded length and being provided with a plurality of defined fold lines arranged such that said sole can be folded such that said folded length is less than said unfolded length,
said fold lines comprising inclined fold lines that extend in a widthways direction of said sole and are inclined with respect to a notional line that bisects said sole in a lengthways direction thereof,
said inclined fold lines including at least one fold line that is inclined in a first direction and at least one fold line that is inclined in a second direction, said first direction being from an instep side of said sole towards a first end of said sole and said second direction being from said instep side towards a second end of said sole.

31. (canceled)

32. A method of folding a foldable shoe having an unfolded length and a folded length that is less than said unfolded length, the foldable shoe having a sole having a plurality of defined fold lines that extend in a widthways direction of said sole and are inclined with respect to a notional line that bisects said sole in a lengthways direction thereof and including at least one said fold line that is inclined in a first direction and at least one said fold line that is inclined in a second direction, said first direction being from an instep side of said sole towards a first end of said sole and said second direction being from said instep side towards a second end of said sole, the method comprising folding the shoe along the fold lines.

33. A method as claimed in claim 32 comprising folding the shoe by applying oppositely directed twisting forces to a toe end region and heel end region of the shoe.

34. A method as claimed in claim 33, wherein said oppositely directed twisting forces are applied simultaneously.

35. A method as claimed in claim 32, wherein the said fold lines are spaced apart in said lengthways direction, the method comprising alternately folding the shoe in generally opposite directions at successive said fold lines.

36. A package as claimed in claim 30, wherein said package comprises a first receptacle for a first of said foldable shoes, a second receptacle for a second of said foldable shoes and a hinge connecting said receptacles.

37. A package as claimed in claim 36, wherein each said receptacle is generally triangular.

38. A package as claimed in claim 37, wherein an imaginary line extending perpendicularly from a base of the triangular receptacle to an apex of the triangular receptacle has a length that is less than half said unfolded length.

39. A sole for foldable footwear, said sole having an unfolded length and a folded length that is less than said unfolded length and being provided with a plurality of defined fold lines arranged such that the sole can be folded,
said sole comprising an underside having a plurality of ground contacting projections projecting therefrom,
said fold lines being defined by spaces between said projections and being configured such that when folded said sole comprises a plurality of overlying portions, and said projections being configured such that when the sole is folded, the projections on a first said overlying portion are received in spaces between the projections of a second said overlying portion that faces said first overlying portion.

40. A sole for foldable footwear, said sole having an unfolded length and a folded length that is less than said unfolded length and being provided with a plurality of defined fold lines arranged such that the sole can be folded, said fold lines comprising inclined fold lines that extend in a widthways direction of said sole and are inclined with respect to a notional line that bisects said sole in a lengthways direction thereof,

said inclined fold lines including at least one first direction fold line that is inclined in a first direction and at least one second direction fold line that is inclined in a second direction, said first direction being from an instep side of said sole towards a first end of said sole and said second direction being from said instep side towards a second end of said sole, and said first and second direction fold lines being such that said sole can be folded by applying a twisting force to said first end of the sole and a twisting force to said second end the sole, said twisting forces being applied in opposite directions.

* * * * *