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(54) Title: INTERCHANGEABLE FOOTWEAR COMPRISING MULTIPLE SHOE INSERTS

(57) Abstract: An article of footwear of interchangeable nature allowing different use, appearance and configuration; comprising an outer sole of unitary construction having a united toe, central and heel portion. The central portion unites toe and heel portion by an arch supporter. The top sole sits upon the toe, central and heel portion making it one unit. This outer sole can be used as a shoe itself (sandal) or as the sole for other transformations. Two bands can attach around the toe and ankle portion. The ankle portion is also attached to a heel supporter that curves around the shoe's upper back. Various types of footwear elements can be inserted into/ver the outer sole, allowing conversion of the footwear into a sports', formal, sandal, water, slipper, dress, ornamented shoe or other footwear. This invention features heels whose height may be adjusted pursuant to its intended use and for comfort, firmness or softness.

**ROLAND SANTA ANA****DESCRIPTION OF THE INVENTION**

**TITLE: INTERCHANGEABLE FOOTWEAR  
COMPRISING MULTIPLE SHOE INSERTS**

**TECHNICAL FIELD**

This invention relates in general to footwear and, more particularly to a shoe of a selectively versatile character, which is uniquely constructed for interchangeability of use.

**BACKGROUND ART**

Heretofore, numerous efforts have been undertaken to develop shoes for men and women that range in appearance through facile alteration by the wearer. Prior art is extensive with examples of footwear having changeable components to achieve a variety of purposes.

Most of such earlier attempts have been directed to what might be considered ornamental effects to increase the style of the shoe, such as shown in Smith U.S. Patent 4,267,649. Other efforts have been directed toward alteration in components for style purposes of color and design shown by Bailey et al U.S. Pat. No. 4,887,369, Smith U.S. Pat. No. 4,267,649, Halford U.S. Patent No. 5,083,385, Blakey U.S. Pat. Pub. No. 2001/0052195 A1, Dupree et al. US. Pat. No. 5,848,484, and Dupree U.S. Pat. No. 4,958,447.

Additionally, various efforts have been made to create a versatile shoe for athletic purposes. Most of such attempts have been for one specific athletic purpose or another (roller skating or bowling respectively), such as Clementi U.S. Pat. No. 6,343,800, Clementi U.S. Pat. No. 6,120,039 and Yang U.S. Pat. No. 4,706,392. Other interchangeable shoes focused on creating a sole suitable for the insertion of tools to practice various sports as shown by Schaefer U.S. Pat. No. 4,114,295 and Aveni U.S. Pat. No. 5,459,948.

There has been some focus in creating a versatile water shoe, although not interchangeable, serving many purposes as shown by Merk, Sr. U.S. Pat. No. 5,802,740, Lochbaum U.S. Pat. 5,960,565, Nötzold U.S. Pat. No. 5,732,480, McDonald U.S. Pat. No. 5,771,610 and Smjekal U.S. Pat. 5,737,853.

Yet other inventions have focused on making a comfortable, affordable, easy to use versatile shoe. For example a footwear system that includes a sock specifically made for the shoe, Throneburg et al., U.S. Pat. No. 5,724,753. Others just slippers and sandals that are lightweight and affordable for beach use, Huard et al. U.S. Des. Pat. No. D450,179 S.

## DISCLOSURE OF THE INVENTION

The present invention embodies an interchangeable article of footwear with elements to be used or not used at wearer's preference. The elements of this invention are:

(a) An outer sole of unitary construction having a united toe, central and heel portion. The top sole sits upon the toe, central and heel portion of the shoe making it a single unit. This outer sole unit can be used as a shoe itself as a sandal for men, women or children, or as the sole for other transformations of footwear for men, women or children.

The central portion of this outer sole unites toe and heel portion by an arch supporter which made be covered with materials such as but not limited to Kevlar or composite materials. Two bands of materials such as but not limited to Velcro can attach by a variety of means around the toe and ankle portion of the shoe. The ankle portion is also attached to a heel supporter that curves around the upper back heel of the shoe. The abovementioned increased arch support permits sliding of wearer's arch. It also permits ready flexing and bending of the shoe within a zone intermediate to the heel and sole to provide increased walking comfort and natural flexing.

The outer sole shall have a mechanism to adjust the height of the same or the softness/firmness level of the shoe. This mechanism includes but is not limited to a dial, a switch mechanism and may include a magnetic fluid (or MR fluid) that may serve as a shock absorber and to adjust the softness/firmness of the footwear. This mechanism may be placed at different locations of the outer sole.

The sandal is the bottom sole of the interchangeable article of footwear invention, wherein diverse interchangeable inner shoes (also referred to as inner soles) may be inserted at user's preference. Wearer according to his or her specific needs or intended use can combine this inner shoe style and outer shoe type. Therefore, this outer sole may include variations of this invention by inserting one of the components or inner shoes/soles mentioned herein under, but it may also be worn as a sandal on its own.

(b) An inner footwear (inner shoe or inner sole) or interchangeable component such as shoe, sports' shoe or sneaker.

This component may be used without being attached to the outer sole or sandal. Moreover, this component may be inserted into the outer sole or sandal and used as a sneaker, amongst other uses. The sports' shoe or sneaker can be removed and the sandal worn on its own.

(c) An inner sole or component of interchangeable nature such as a water permeable shoe also referred herein simply as "water sock" or "water shoe."

This element of the invention may be used as an entity to which the outer sole can be attached and the footwear worn as a beach sandal.

(d) An inner sole or interchangeable component referred to herein as "sock insole." This element is comprised of a sock and a sole and may be used as a slipper.

This sole shall comprise a two unit padding, one unit to be attached to the upper portion of the sock's heel and the other for the lower portion of the sock's heel. Padding in two units enables the sole to be attachable to socks of different sizes. In addition, the sock shall have an elastic strap at the middle of the sock, providing wearer with massages in his or her foot. This elastic strap shall also help wearer relieve pain and serve as an extra foot support.

#### **OBJECTS AND ADVANTAGES OF THE INVENTION**

The present invention constitutes a significant improvement in several aspects over such previously identified efforts of the prior art. Although the above-mentioned patent examples are suitable for the particular purposes that they address, they are not suitable for the purposes of the present invention heretofore described.

Accordingly, an object of the present invention is to provide a shoe designed for men, women and children and having components of an interchangeable nature which are uniquely independent to provide greatly improved quick and simple alteration of the shoe to effect numerous uses permitted by said components.

Another object of the invention is to provide a shoe of the character stated which will accommodate various foot sizes and yet, for all such sizes in not only comfortable to the wearer but also retains "imperative usefulness."

A further object of the invention is the provision of a shoe of the character stated which comprises elements which permit ready flexing and bending of the shoe within a

zone intermediate the heel and sole to provide increased walking comfort and natural flexing.

A still further object of the present invention is to provide a shoe of character stated which has increased arch support for the wearer to enhance walking comfort. In the junior version (for children or teenagers) the increased arch support is particularly important given low friction materials used for said arch support, such as but not limited to Kevlar, carbon fiber, Teflon, or any man made plastic. This band surface would permit sliding of wearer's arch.

Another object of the invention is to provide a shoe of the character stated which provides a stable and mechanically secure structural nature with the independent component of the sandal footwear and which should become even more stable and mechanically secure when the components of the shoe are in their various states of assembly.

Yet another object of the invention is to provide a shoe of the character stated which embodies cooperative elements that are selectively configured by easy manipulation to provide quick and easy alteration of the utility and appearance of the shoe.

It is a further object of the present invention to provide a shoe of the character stated which comprehends a multiplicity of interchangeable constituents which may be easily disposed into chosen activity without resort to extrinsic tools and without requiring advance skill on the part of the wearer so that the average individual can quite simply and rapidly bring about the desired use within the range provided.

It is a still further object of the present invention to provide a shoe of the character stated which is adapted for supporting various uses corresponding to particular activities through the attachment or detachment of a particular shoe to the outer sole.

An additional object of this invention is to provide an article of footwear whose height or firmness/softness may be adjusted by wearer.

Another object of this invention is to provide an article of footwear that may be accommodated as a sock insole or sock slipper including elastic that provides increased firmness of the sock and massages wearer's foot. This sock insole or sock slipper shall also help wearer relieve pain and serve as an extra foot support.

It is yet another object of the present invention to provide a shoe of the character stated which may be most economically manufactured; which is extremely durable in usage; and which in and of itself serves the purpose of several pairs of shoes so as to bring about a substantial savings to the user.

**BRIEF DESCRIPTION OF DRAWINGS**

FIG.1A to 1D are side elevation views of the embodiments of the footwear, from right to left, as an outer sole or sandal (FIG. 1A), sports' shoe (FIG. 1B), water shoe (FIG. 1C), and sock insole/slipper shoe (FIG. 1D).

FIGS. 2 to 5 are side views of independent components or embodiments of the invention.

FIG. 2 Is a side view of the footwear as an outer sole or sandal.

FIG.3 Is a side view of the footwear as a water shoe without the outer sole or sandal attached. The dotted lines represent an outer sole. This component may be used as a shoe to be used in water, for driving, for leisure or as an indoor shoe. This insertable shoe component is used as the main body or "uppers" of a regular shoe or boot as one unit, or as a complete single shoe, or as a one-construction component.

FIG.4 Is a side view of the invention comprising the sandal or outer sole with a sports shoe as the inner sole/shoe inserted into the outer sole. This embodiment may be used as a hiking shoe, cross training shoe, sneaker or as a formal shoe.

FIG.5 Is a side view of another embodiment of the footwear without the outer sole or sandal attached. This is a sock insole including a gel/rubber/leather sole attached to its heel section. In this particular figure and embodiment, the sock has a 2 unit sole. In addition, this sock has an elastic device placed at its middle section, providing firmness to the sock and massages to wearer. It also shall help relieve heel pain and serve as extra foot support.

FIG. 6A and FIG. 6B are side elevation views of, from left to right, the sports shoe without the outer sole attached (FIG. 6A) and of the outer sole/sandal (FIG. 6B).

FIG. 7 Is a side elevation view of the sports shoe and the outer sole or sandal. This figure displays the sports shoe entering the sandal or outer sole while the straps of the sandal are open.

FIG. 8 Is a side view of the interchangeable shoe, constructed in accordance with and embodying the present invention as a sports shoe inserted into the outer sole and that may be used as a such as a sneaker, hiking shoe or cross training shoe. Here, the sports shoe is secured or attached to the outer sole/sandal with the sandal's straps.

FIG. 9 Is a side view of one embodiment of the outer sole or sandal of the invention which comprises a mechanism including but not limited to a dial control used to manually adjust the height or firmness/softness of the outer sole, such mechanism being located at the lower end section of the outer sole.

FIG. 10 Is a side view of the one embodiment of the outer sole or sandal of the invention including a mechanism to manually adjust the height or firmness/softness of the outer sole, such mechanism being located at the rear end section of the outer sole.

FIG. 11 Is a front view of one embodiment of the outer sole or sandal of the invention, including a mechanism to manually adjust the height or firmness/softness of the outer sole, such mechanism being a dial control located at the rear end section of the heel.

Fig. 12 Is a side view of the one embodiment of the invention intended for use by ladies, including an outer sole, an inner sole/shoe with glitzy ornamentation, and a mechanism to manually adjust the height of the outer sole's heel.

FIG. 13 Is a side view of an independent component of the interchangeable shoe, being such component a water impermeable shoe.

FIG. 14 Is a side view of one of the independent elements or inner soles of the invention, the sock insole. This figure illustrates the sock insole with a two unit padding at its sole and elastic at the middle section of the sock. The soles of this article of footwear may be made of rubber, plastic, gel, or padding, and in the latter case, such padding may be made of rubber, plastic or gel. In addition, this article of footwear may be used as a sock slipper.

FIG. 15 Is a side view of an inner sole or inner shoe with glitzy ornamentation and without being inserted into an outer sole.

#### **DESCRIPTION OF PREFERRED EMBODIMENT/ BEST MODE**

The present invention embodies an interchangeable article of footwear with elements to be used or not used at wearer's preference. The elements of this invention are: (a) An outer sole of unitary construction having a united toe, central and heel portion. The top sole sits upon the toe, central and heel portion of the shoe making it a single unit. This outer sole unit can be used as a shoe itself as a sandal for men, women or children, or as the sole for other transformations of footwear for men, women or children.

The central portion of this outer sole unites toe and heel portion by an arch supporter. In the preferred embodiment of the invention, this arch supporter may be covered with materials such as but not limited to Kevlar or composite materials.

Two bands of materials such as but not limited to Velcro can attach by a variety of means around the toe and ankle portion of the shoe. The ankle portion is also attached to a heel supporter that curves around the upper back heel of the shoe. The abovementioned increased arch support permits sliding of wearer's arch. It also permits ready flexing and

bending of the shoe within a zone intermediate to the heel and sole to provide increased walking comfort and natural flexing.

The outer sole shall have a mechanism to adjust the height of the same or the softness/firmness level of the shoe. This mechanism includes but is not limited to a dial and to a switch mechanism. The mechanism may also include a magnetic fluid (or MR fluid) that may serve as a shock absorber and to adjust the softness/firmness of the footwear. This mechanism may be placed at different locations of the outer sole, such as but not limited to the rear end section of the sole or on a lower end section of the sole. The preferred embodiment of the invention shall have a dial mechanism including the magnetic fluid to adjust these characteristics at user's preference. In the preferred embodiment, this dial mechanism shall be placed on the rear end section of the sole, as per Figures 10 and 11. In addition, this mechanism may be adjusted manually, mechanically, or electronically. In the preferred embodiment, this mechanism shall be adjusted manually.

Generally designated in Figures 2 and 9 is a man, woman or child's shoe of the sandal configuration. This shoe is the bottom sole of the interchangeable article of footwear invention, wherein diverse interchangeable inner shoes (also referred to as inner soles) may be inserted at user's preference. Wearer according to his or her specific needs or intended use can combine this inner shoe style and outer shoe type. Therefore, this outer sole may include variations of this invention by inserting one of the components or inner shoes/soles mentioned herein under, but it may also be worn as a sandal on its own.

The preferred embodiment of this element of the invention shall be of leather and/or any man made materials. The outer sole cannot be altered.

(b) An inner footwear (inner shoe or inner sole) or interchangeable component such as shoe, sports' shoe or sneaker. This component may have other uses. The preferred embodiment of this element of the invention shall be made of leather and/or any man made material.

This component may be used without being attached to the outer sole or sandal. Moreover, this component may be inserted into the outer sole or sandal and used as a sneaker, amongst other uses. The sports' shoe or sneaker can be removed and the sandal worn on its own.

Figures 1B and 6A illustrate this component as a sports' shoe.

Figures 4 and 8 illustrate the preferred embodiment of the footwear as a sports' shoe or sneaker. Here, this component has been strapped and secured to the outer sole and are both worn in conjunction.



(c) An inner sole or component of interchangeable nature such as a water permeable shoe also referred herein simply as "water sock" or "water shoe." The preferred embodiment of this component shall be made of rubber and/or any man made materials.

Figures 1C and 3 illustrate the water shoe. This is a water impermeable shoe and may have alternative uses to that of an article of footwear to be used in or with water.

This element of the invention may be used as an entity to which the outer sole can be attached and the footwear worn as a beach sandal.

(d) An inner sole or interchangeable component referred to herein as "sock insole." This element is comprised of a sock and a sole and may be used as a slipper.

The preferred embodiment of this component shall have a sock made of fabrics and a sole made of man made materials.

This sole shall comprise a two unit padding, one unit to be attached to the upper portion of the sock's heel and the other for the lower portion of the sock's heel. Padding in two units enables the sole to be attachable to socks of different sizes. In addition, the sock shall have an elastic strap at the middle of the sock, providing wearer with massages in his or her foot. This elastic strap shall also help wearer relieve pain and serve as an extra foot support.

#### **DESCRIPTION OF ALTERNATE EMBODIMENTS**

The present invention embodies an interchangeable article of footwear with elements to be used or not used at user's preference. The elements of this invention are:

(a) An outer sole of unitary construction having a united toe, central and heel portion. The top sole sits upon the toe, central and heel portion of the shoe making it a single unit. This outer sole unit can be used as a shoe itself as a sandal for men, women or children, or as the outer sole for other transformations of footwear for men, women or children.

This outer sole may be made of various materials such as but not limited to wood, rubber, plastic, metal, leather, fabric or any man made materials.

The central portion of this outer sole unites toe and heel portion by an arch supporter. This arch supporter may be covered with materials such as but not limited to Kevlar or composite materials.

Two bands of materials such as but not limited to Velcro can attach by a variety of means around the toe and ankle portion of the shoe. The ankle portion is also attached to a heel supporter that curves around the upper back heel of the shoe. The abovementioned

increased arch support permits sliding of wearer's arch. It also permits ready flexing and bending of the shoe within a zone intermediate to the heel and sole to provide increased walking comfort and natural flexing.

The outer sole may also have a curved toe portion for increased firmness of wearer's foot inside the outer sole.

The outer sole shall have a mechanism to adjust the height of the same or the softness/firmness level of the shoe. This mechanism includes but is not limited to a dial or to a switch mechanism, which may in turn be made of materials such as but not limited to metal and plastic. The mechanism may also include a magnetic fluid (or MR fluid) that may serve as a shock absorber and to adjust the softness/firmness of the footwear. This mechanism may be placed at different locations of the outer sole, such as but not limited to the rear end section of the sole or on a lower end section of the sole or central arch portion. In addition, this mechanism may be operated manually, mechanically or electrically.

Another embodiment of this invention includes the outer sole with a heel with adjustable height. In addition, this heel may have diverse shapes, such as but not limited to being a rod, a rectangular shape with a flat bottom, rectangular, tubular with a round bottom, telescopic, "machine turn" shape, screw type design, mill turn design, molded decorative design, and pointy shape.

Referring now to the drawings, Figure 12 depicts an embodiment of the invention with high heels for ladies' use. The outer sole includes a heel of adjustable height at wearer's preference. In this particular embodiment, the heel comprises two units: the first unit being attached to the outer sole and having various perforations, and the second unit secured to the first one at user's preferred height. In addition, the shape of the heel is rectangular and flat on its bottom; and the heel's height may be adjusted by inserting an element such as but not limited to a screw into small perforations within the heel's units.

In another embodiment of the invention, the lady's shoe's heel shall be a tube, making the heel of tubular shape and round at its bottom. The height of this heel may also be adjustable.

In yet another embodiment of this invention, the lady's shoe's heel may be shaped as a screw. Therefore, its height may be adjusted by being screwed at wearer's preference into the outer sole.

In an alternate embodiment, the heel may be hollow, housing a mechanism to adjust the heel's height that is hidden to viewer's eyes. In this embodiment the heel may be made

of materials such as but not limited to metal, covering an inside mechanism to adjust the heel's height, which includes but is not limited to a screw.

In an alternative embodiment, the inner sole may have a heel with adjustable height and for self-defense of wearer. This heel may be of materials such as but not limited to metal, may be of a pointy shape which wearer may use for self-defense against any attacker.

(b) An inner sole or interchangeable component such as shoe, sports shoe or sneaker which may be attached to the outer sole and used in conjunction with such outer sole or that may be used independently of said outer sole.

This component may have diverse uses, such as but not limited to a shoe, sports shoe, sneaker, cross training shoe, hiking shoe, or a formal shoe, golf, cycling, mountain climbing, roller blade, roller skate, ski, or snow board shoe. This element of the invention may be made of materials such as but not limited to plastic, rubber, leather, fabric, man made materials, etc.

In an alternative embodiment, this component may have ornamentation, such as but not limited to the glitzy ornamentation depicted in the inner sole of Figures 12 and 15.

(c) An inner sole or component of interchangeable nature such as a water shoe. This water shoe may be attached to the outer sole or used independently of such outer sole. This component may be made of distinct materials such as but not limited to plastic, rubber, man made materials, etc.

This element may have uses other than a water shoe, such as but not limited to shoes for driving a vehicle, as a leisure shoe or indoor shoe, slip on shoe, flat shoe, walking, running, formal, ballet, comfort, and therapy shoes.

(d) An inner sole or interchangeable component referred to herein as "sock insole." This element is comprised of a sock and a sole. The sock may be made of materials such as but not limited to cotton, nylon, etc.; the sole may be made of materials such as but not limited to plastic, gel, rubber, or leather.

This component shall have a sole attached to the sock. This may be a one-unit sole made of materials such as but not limited to plastic, built-in gel, rubber or leather.

The sole may also be comprised of a two unit padding, made of materials such as but not limited to plastic, rubber or leather.

In addition, the sock shall have an elastic strap at the middle of the sock, providing wearer with massages in his or her foot. This elastic strap shall also help user relieve pain and shall serve as an extra foot support.

This interchangeable element may be inserted and attached into the outer sole or be used independently of the same. In the latter case, this element may be used as an indoor shoe or slipper.

**CLAIMS**

Having described my invention, what I claim is:

1. An interchangeable article of footwear selectively reconfigurable as a sandal, shoe or sports shoe, water shoe, sock insole or slipper character, said article of footwear comprising any or all of the following:
  - a) An outer sole of unitary construction having a toe portion, a central portion and a heel portion; such article also having an attaching stay or strap extending upwardly from the arch portion of said outer sole further accompanied by an attaching strap extending upwardly from the toe portion of said outer sole; both said straps as means for detachably securing said outer sole to the foot in a comfortable position.
  - b) An inner sole or independent article of footwear which may be inserted into and secured to the said outer sole or used independent of the same; said inner sole being another shoe or a sports shoe, including but not limited to a slipper, flat, formal, driving, indoor, walking or comfort/therapy shoe.
  - c) An inner sole or independent article of footwear which may be inserted into and secured to the said outer sole or used independent of the same; said inner sole being a water permeable shoe and referred to as a "water shoe."
  - d) An inner sole or independent article of footwear which may be inserted into and secured to the said outer sole or used independent of the same; said inner sole being a sock with an attached sole, and referred to as a "sock insole" or slipper.
2. An article of footwear as defined in claim 1, said outer sole being of substantially constant thickness whose outer sole functions include rigidity required for sports or hiking shoe and the comfort of a sandal; and said outer sole comprising a curved toe portion for increased firmness and increased sole contact with the ground during foot acceleration.
3. An article of footwear as defined in claim 1, various inner soles being provided with a plurality, and variability each such inner soles thus effectively fitting securely into the outer sole sandal.
4. An article of footwear such as defined claim 1, the inner sole being liftably detachable from said sandal or outer sole by movement upward relative to said sandal outer sole about said first hinge-defining means.
5. An article of footwear such as defined in claim 1, wherein the interchangeable element of the sports' or hiking shoe is inserted and secured to the outer sole, being comprised

of all requirements for a sports' shoe or sneaker in respect to ankle and arch support with a highly pliable sole intended to slip into the outer sole or sandal.

6. An article of footwear such as defined in claim 1, being the water shoe comprised of a slipper made of water impermeable material which can be worn without the outer sole to protect the wearer when feet are in the water, or on a sandy or soft surface, wherein such slipper can enter into the outer sole to be worn as a beach sandal.
7. An article of footwear as defined in claim 4, and further comprising a front upper, means for providing detachable inter-engagement of said front upper with the toe portion of said inner sole, said inner sole and upper providing selective removal and replacement as a single unit upon said outer sole, said front upper comprising at least one securing portion of strap-like character oriented fore extending transversely of said article of footwear interposed between the toe portion of said outer sole and the toe portion of said inner sole, said unit being capable of extrinsic separation of said inner sole and upper, whereby replacement or reconfiguring of said front upper is made convenient and easy for the user.
8. An article of footwear as defined in claim 5, said upper being defined by at least two straps of material adapted to extend across the forepart of the foot of the user for use as sandal footwear or to secure interchangeable shoes; said upper may also be fastened by means such as but not limited to buckle, snap-on, lace, Velcro or any other method involving fabric with a zipper.
9. An article of footwear as defined in claim 1, said upper being constituted by material adapted to extend across the forepart of the foot of the user, said material having marginal portions passing under said inner sole at the sides thereof.
10. An article of footwear as defined in claim 1, the rear surface of said heel being provided with a vertically extending recess for securing interchangeable shoe or providing stability for said sandal.
11. An article of footwear as defined in claim 1, said inner sole being provided with an aperture proximate its rearward end, said securing strap passing through said aperture, said means detachably securing said strap to interchangeable shoe.
12. An article of footwear as defined in claim 1, said upper defining means comprising a rear quarter, said rear quarter having strap portions extending downwardly therefrom and thence under the heel portion of said top sole, and means for detachably securing said strap portions.

13. An article of footwear as defined in claim 1, wherein the arch of said sole is lined or made with materials such as but not limited to Kevlar or carbon composite so as to provide a smooth surface for low friction sliding on a curved surface, such as but not limited to a pole as in teen sports/recreation.
14. An article of footwear as defined in claim 1, wherein said outer sole includes a mechanism for manually, mechanically or electrically adjusting the height of such sole or heel of said sole; such mechanism being located under the heel and arch or extending to the toe as a whole.
15. An article of footwear as defined in claim 14, wherein said mechanism includes but is not limited to dial, switch mechanism, magnetic fluid (or MR fluid), hydraulic, air pressure, gas pressure, and spring elements to partially adjust the height of the sole bed or entirely adjust the height of the footwear and for the purpose of changing the performance of the footwear.
16. An article of footwear as described in claim 1 wherein the outer sole includes a mechanism for manually, mechanically or electrically adjusting the firmness or softness of such article of footwear; such mechanism being located at the toe and heel area, or extended from the heel to the toe as a whole for the purpose of comfort and performance of the footwear.
17. An article of footwear as described in claim 16 wherein such mechanism includes but is not limited to a dial, switch mechanism, magnetic fluid (or MR fluid), hydraulic, air pressure, gas pressure, and spring elements to partially adjust the height of the sole bed or entirely adjust the height of the footwear.
18. An article of footwear such as defined in claim 1, wherein the interchangeable element of a shoe is inserted into and secured to the outer sole, and said outer sole includes a heel with adjustable height; such article of footwear may include a scissor type jack of foldable shoring/support method.
19. An article of footwear such as defined in claim 18 wherein said adjustable heel is comprised of two units, the first unit having a hollow chamber which is attached to the outer sole and the second unit having perforations being securely sliding in and out of the first unit which is fastened by means such as but not limited to a screw or pin at wearer's preference or desired height.
20. An article of footwear such as defined in claim 19 wherein the adjustable extending heel section is of shapes including but not limited to a rod, screw type design, a rectangular shape, a rectangular shape with a flat bottom, a mill turn design, a molded decorative

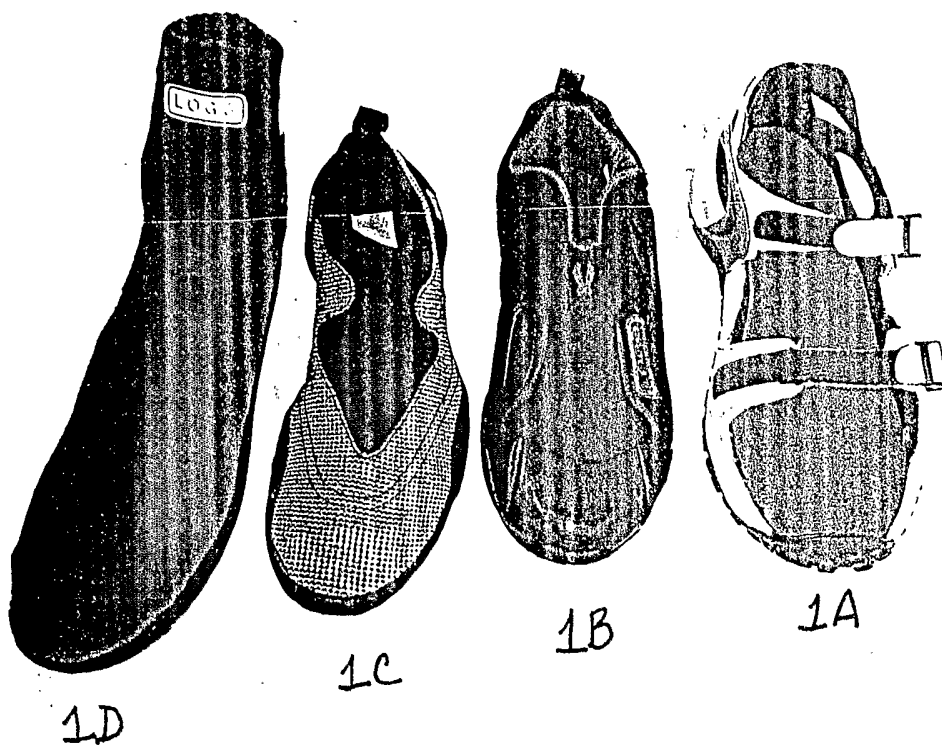
- type, a telescopic design, a tubular shape with a round bottom, a "machine turn" shape, and pointy shape, that slide in and out of the main chamber which is secured to the footwear.
21. An article of footwear such as defined in claim 18 wherein the heel is comprised of a hollow chamber made of materials such as but not limited to metals, containing inside the chamber an element of adjustable height such as but not limited to a hydraulic, spring, air or gas pressure, screw type, being said element covered by the chamber material.
  22. An article of footwear such as defined in claim 1, wherein the sock insole element comprises a sock made of materials such as but not limited to cotton or man made fabrics with a built-in insole or an outer sole; said sock comprising an elastic material around the arch of the foot to fit and for grip of the sock to wearer's foot, and said built-in insole or outer sole made of materials such as but not limited to gel, rubber, leather, plastic and man made materials.
  23. An article of footwear such as defined in claim 22 wherein said sock insole includes a one unit insole or sole for partially or totally covering wearer's foot.
  24. An article of footwear such as defined in claim 22 wherein said sock insole has a two unit or more sole including but not limited to a two unit padding made of materials such as but not limited to rubber, leather, plastic or man made materials.
  25. An article of footwear such as defined in Claim 22 wherein said sock insole is comprised of divisional patterns of an insole in order to stretch the fabric to fit wearer's foot.
  26. An article of footwear such as defined in Claim 22 wherein said sock insole includes an insole which is applied, coated, printed on, sprayed on, stuck on, dipped on or padded on to the sock.
  27. An article of footwear such as defined in Claim 22 wherein said sock has a built-in insole to protect the foot of the wearer from shock, impact, slip and change in temperatures specially when worn by itself.
  28. An article of footwear such as defined in Claim 22 wherein said sock has a built-in insole for therapy when used in conjunction with an ill-fitted or improper shoe; being the effect of this insole therapy to give extra-soothing cushioning from pain obtained from inferior fitted footwear.
  29. An article of footwear such as defined in Claim 1 including an interlocking design sole for interchangeable footwear wherein the "inner" insert shoe sole edges interlock with



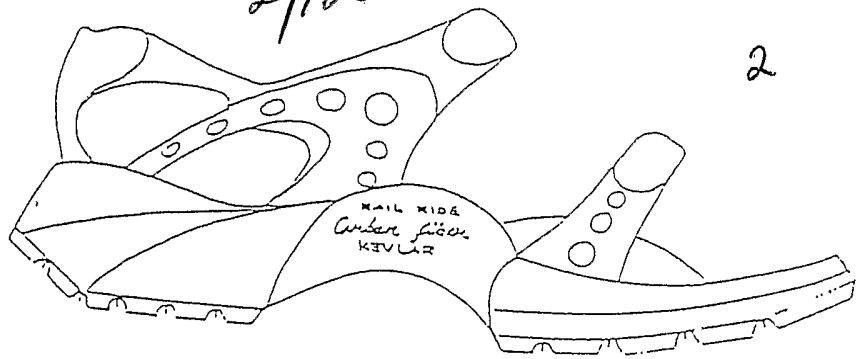
the other main outer sole inside its own sole or undercut; such design comprises but is not limited to a v-shape, u-shape, or square shape interlocking inside and outside soles together.

30. An article of footwear as defined in claim 1, wherein the arch of said sole is lined or made with materials such as but not limited to Kevlar, plastic, metal or carbon composite so as to provide a smooth surface for low friction sliding on a curved surface, providing a benefit to cyclists without the shoe cleat to comfortably step on the pedals of a bicycle or similar pedal device.
31. An article of footwear as defined in Claim 22 wherein said band is built in around the arch portion of the sock, providing an extra foot support to the ligaments and tendons of wearer's foot; therefore having therapeutic value.

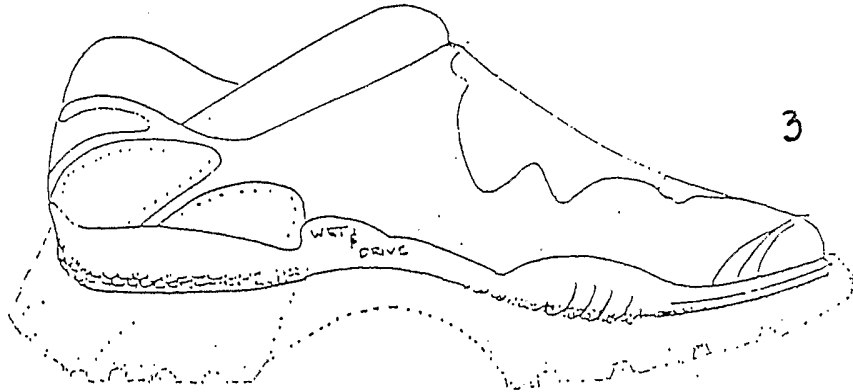
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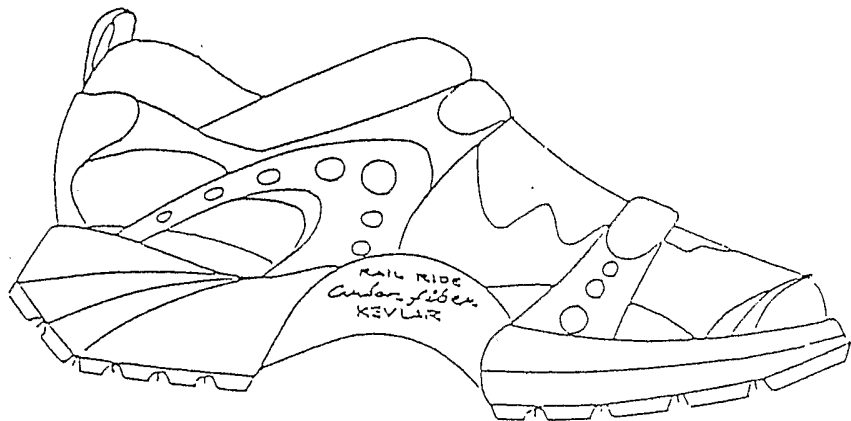
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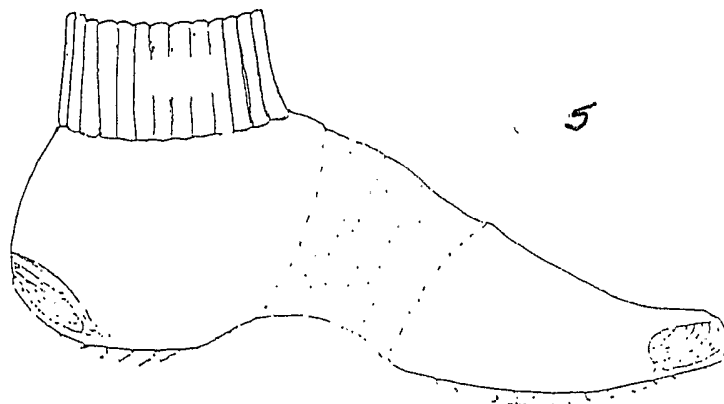
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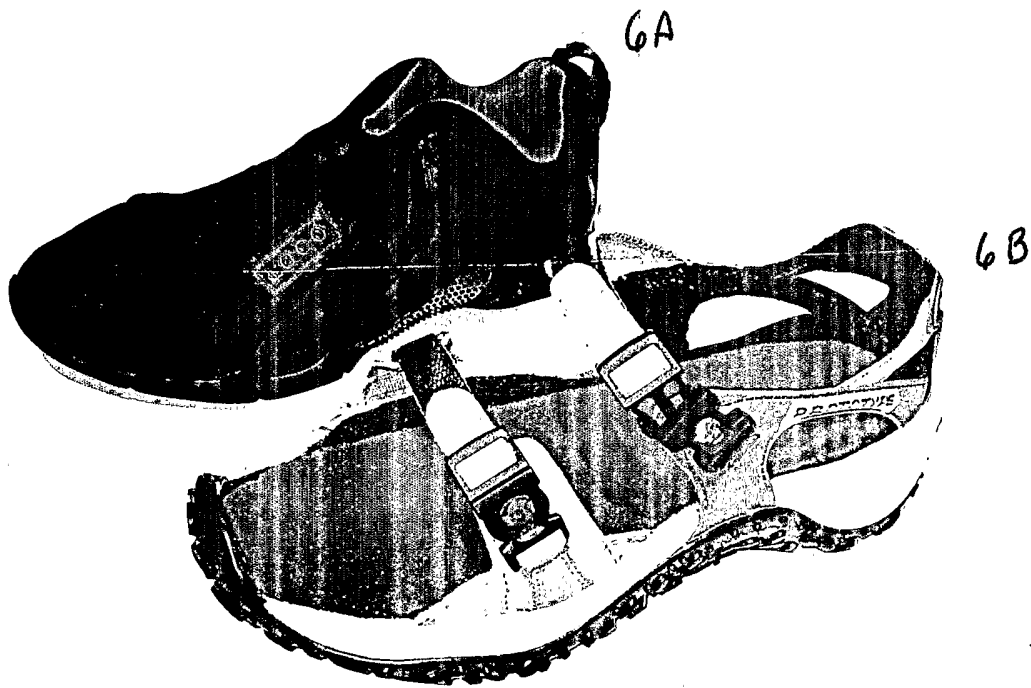


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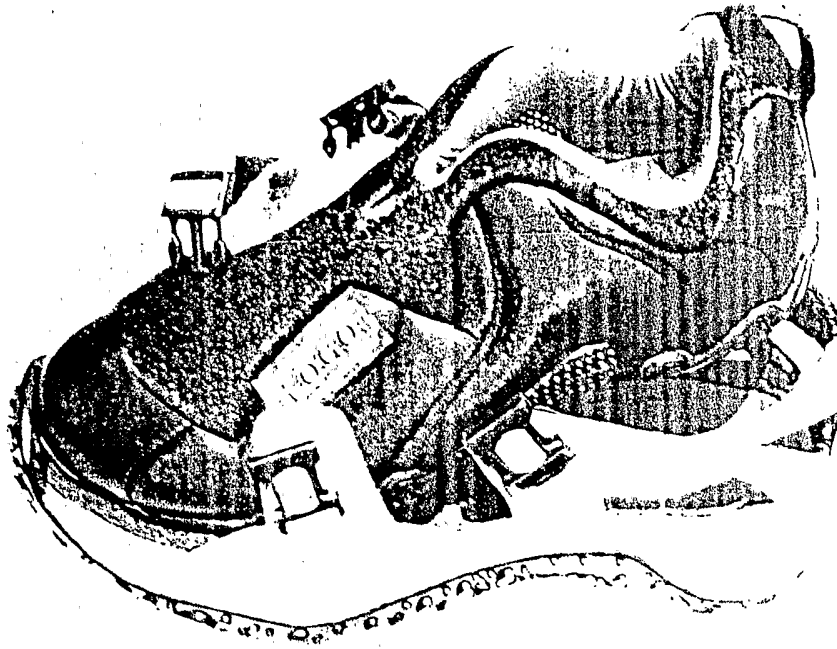


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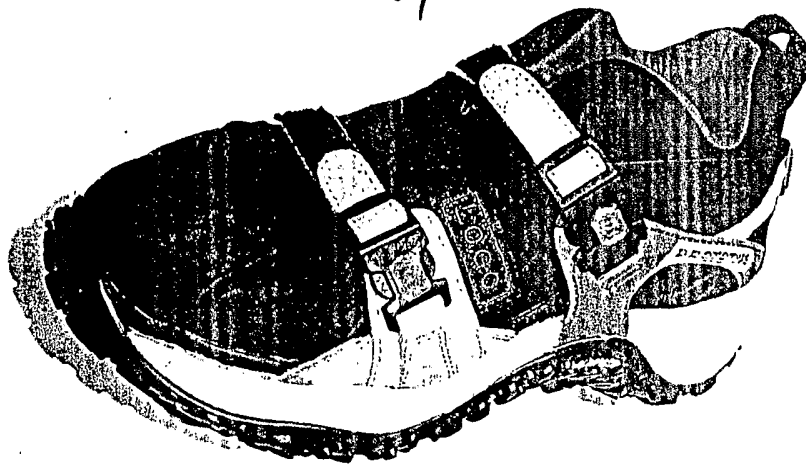


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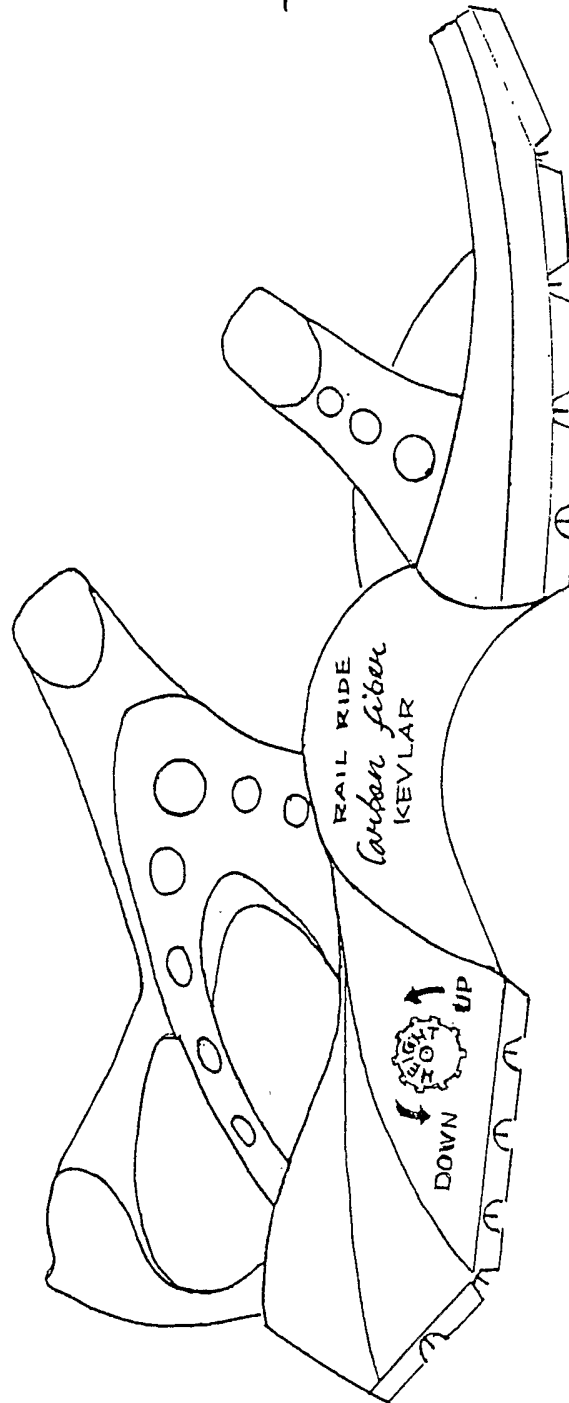
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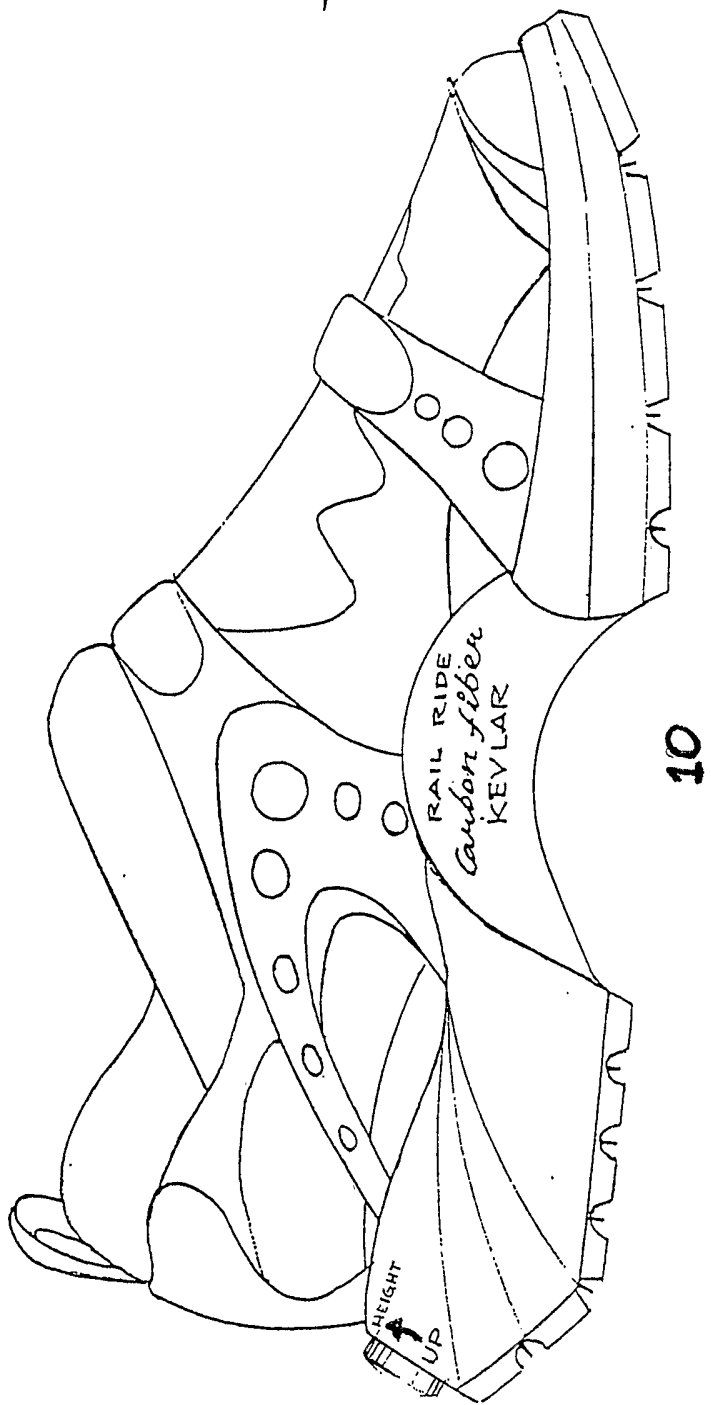
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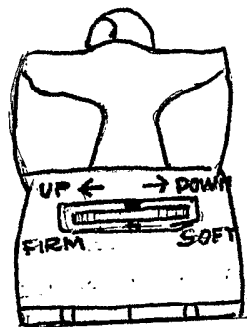
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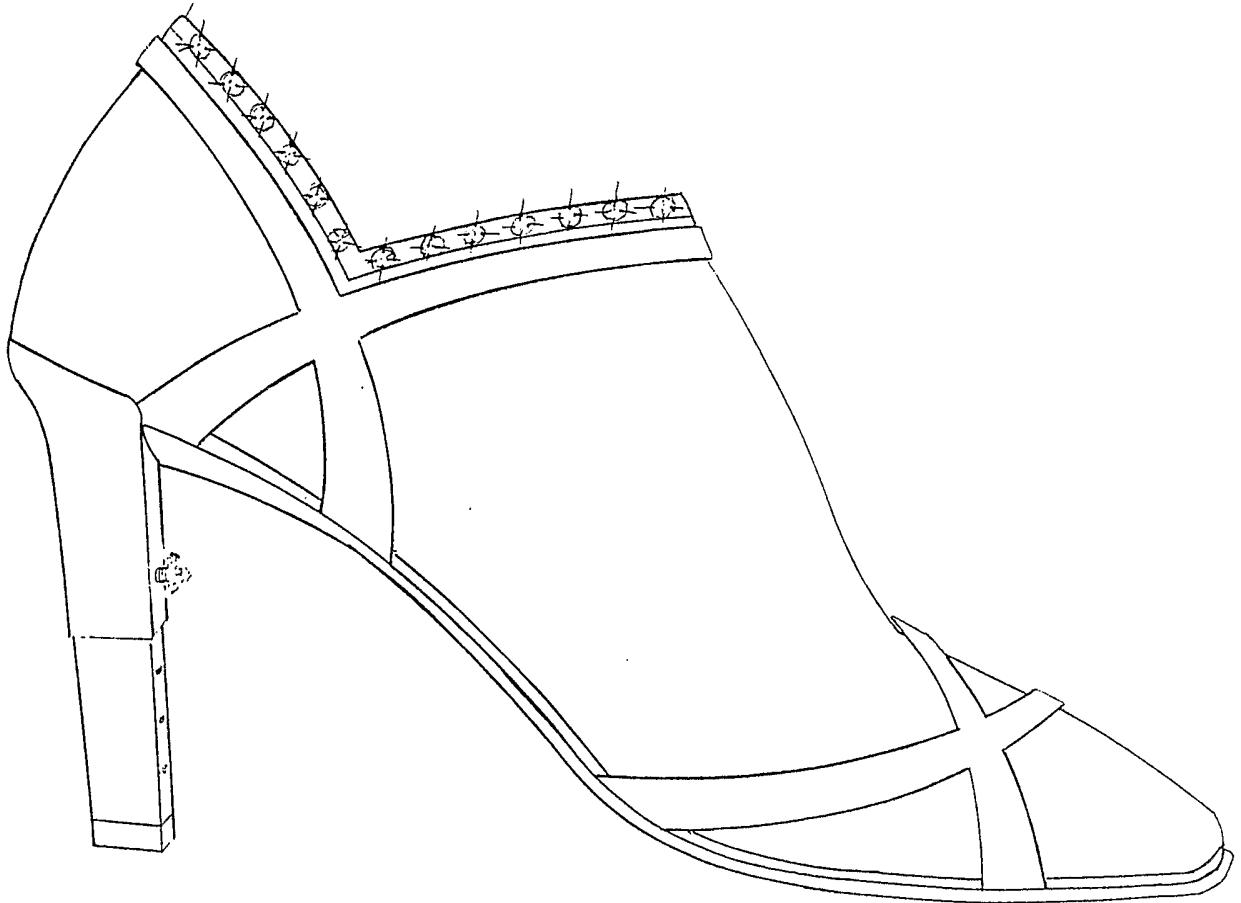


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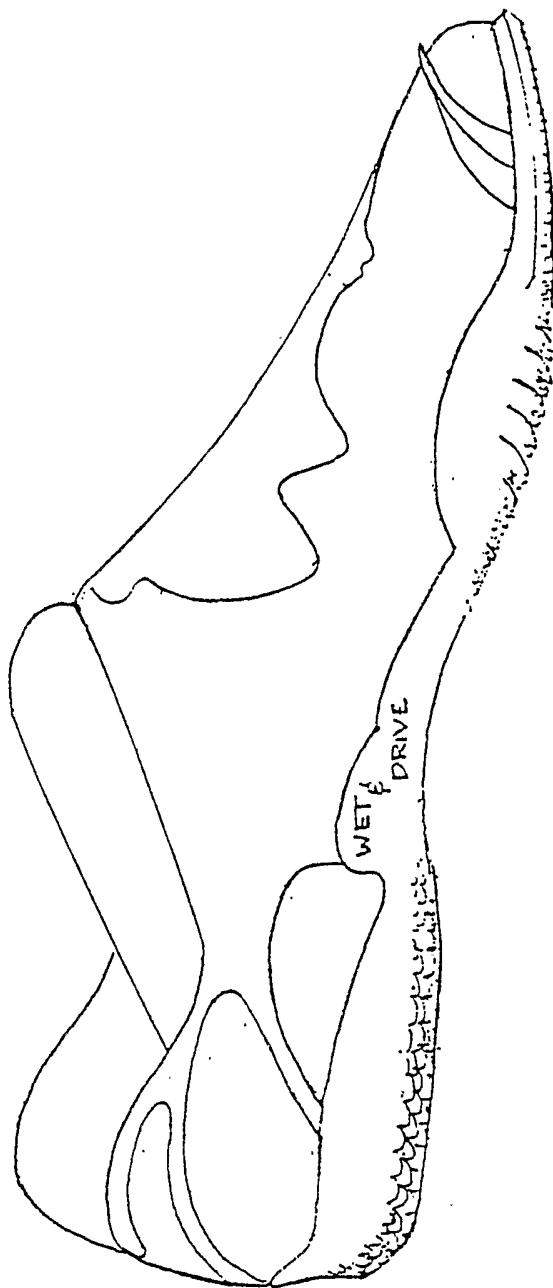
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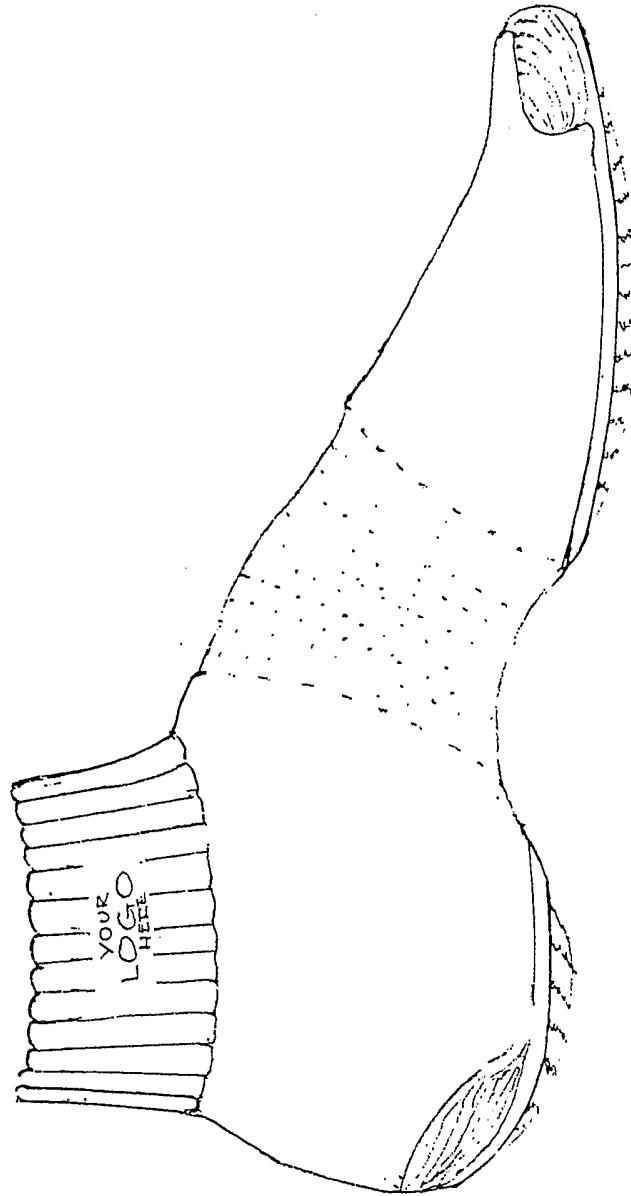
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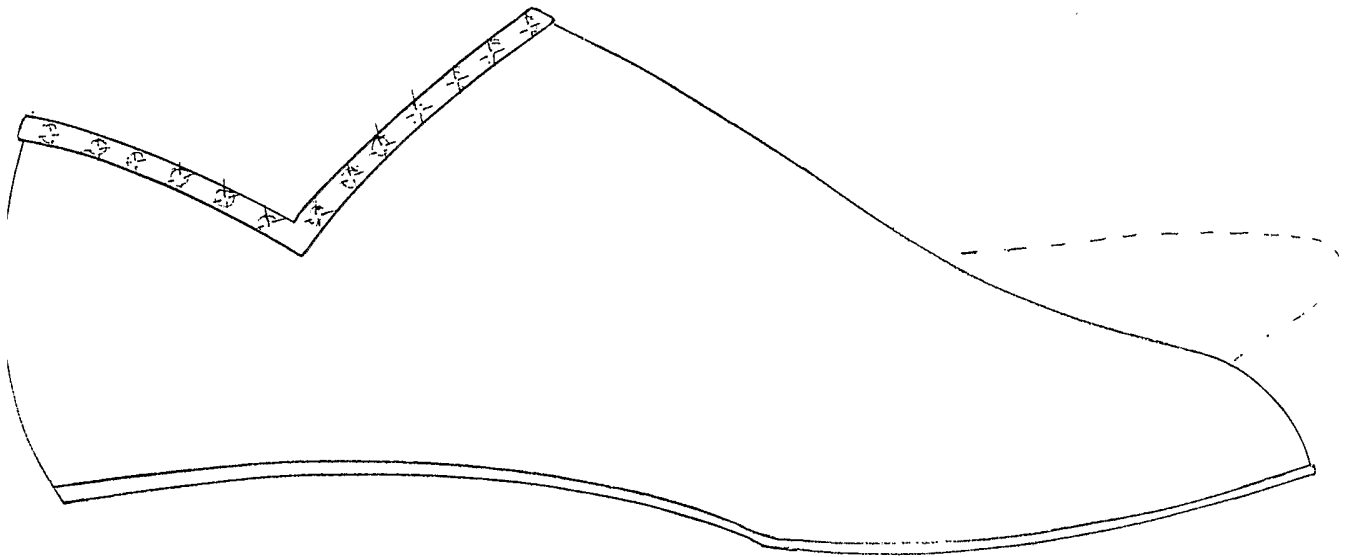
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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/30045

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC(7) : A43B 3/12, 3/10, 17/00, 19/00, 23/26  
 US CL : 36/11.5, 7.5, 10, 54, 7.1R  
 According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**  
 Minimum documentation searched (classification system followed by classification symbols)  
 U.S. : 36/11.5, 7.5, 10, 54, 7.1R, 8.1, 114, 7.4  
 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,256,906 B1 (MATIS et al.) 10 July 2001, See whole document	1-12
Y	US 5,325,541 A (WILLARD) 05 July 1994, See Whole document	1-12
Y, P	US 6,434,858 B2 (PAN) 20 August 2002, See whole document	1-12
Y	US 5,964,047 A (COVATCH) 12 October 1999, See whole document	1-12
Y	US RE. 34,890 E (SACRE) 04 April 1995, See whole document	1-12
Y	US 5,499,459 A (TOMARO) 19 March 1996, See whole document	1-12
Y	US 5,595,005 A (THRONEBURG et al.) 21 January 1997, See whole document	1-12
Y	US 4,094,081 A (REINER et al.) 13 June 1978, See whole document	1-12
Y	US 5,794,360 A (BELL et al.) 18 August 1998, See whole document	1-12

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search: 05 February 2003 (05.02.2003)  
 Date of mailing of the international search report: 25 FEB 2003

Name and mailing address of the ISA/US: Commissioner of Patents and Trademarks, Box PCT, Washington, D.C. 20231, Facsimile No. (703)305-3230  
 Authorized officer: Anthony D Stashick, Telephone No. 703-308-1148  
 Paralegal Specialist: Sheila Veney, Group 3700

## INTERNATIONAL SEARCH REPORT

## C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 94/08478 A1 (CORNELIUS et al.) 28 April 1994, See whole document	1
Y		----- 2-12

**BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING**

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

- Species I, claims 1-12, an inner shoe interchangeable with an outer shoe.
- Species II, claims 13 and 30, an arch support for a shoe.
- Species III, claims 14-15 and 18-21, a height adjustable shoe.
- Species IV, claims 16-17, a shoe with adjustable firmness of the outer sole.
- Species V, claims 22-28 and 31, a sock to be used within a shoe.
- Species VI, claim 29, a shoe with a lock for the insole.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: an outsole with an insole slipper or boot is not inventive as this arrangement is typical in ski boots. See US class 36, subclasses 10 and 117.1 for boots with inner boots. Since the boot within a boot is already known to exist, there is no special technical feature that would link all of the species to one single inventive concept.



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/30045

## Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claim Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claim Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3.  Claim Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-12

**Remark on Protest**  The additional search fees were accompanied by the applicant's protest.  
 No protest accompanied the payment of additional search fees.