US 20150013189A1

(19) United States

(12) Patent Application Publication

Hanak et al.

(10) Pub. No.: US 2015/0013189 A1

(43) Pub. Date: Jan. 15, 2015

(54) **SHOE WITH INSTEP ELASTIC INSERTION AND INSOLE WITH DEPRESSIONS**

(71) Applicants: **BOTY J HANAK R, s.r.o.**, Nemotice (CZ); **MASARYKOVA UNIVERZITA**, Bmo (CZ)

(72) Inventors: **Josef Hanak**, Nemotice (CZ); **Martin Zvonar**, Klobouky u Brna (CZ)

(73) Assignee: **BOTY J HANAK R, s.r.o.**, Nemotice (CZ)

(21) Appl. No.: **14/380,427**

(22) PCT Filed: **Feb. 23, 2013**

(86) PCT No.: **PCT/CZ2013/000021**

§ 371 (c)(1),
(2) Date: **Aug. 22, 2014**

(30) **Foreign Application Priority Data**

Feb. 24, 2012 (CZ) ..... PV 2012-132

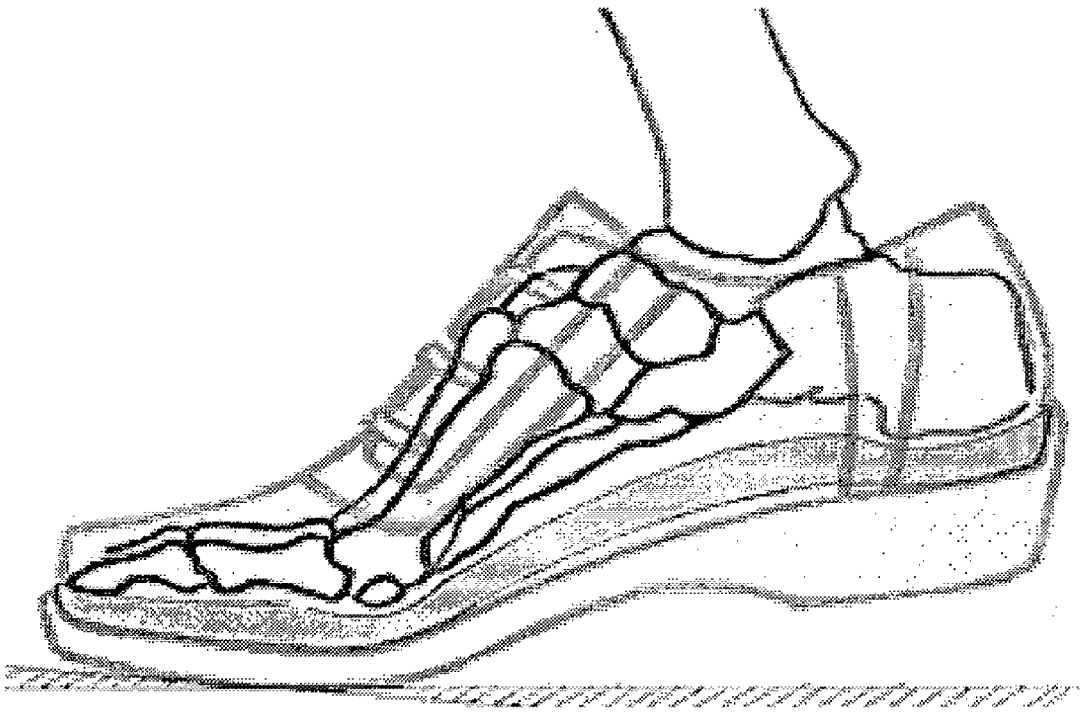
Publication Classification

(51) **Int. Cl.**
A43B 7/18 (2006.01)
A43B 13/40 (2006.01)

(52) **U.S. Cl.**
CPC .. ***A43B 7/18*** (2013.01); ***A43B 13/40*** (2013.01)
USPC **36/91**

(57) **ABSTRACT**

A shoe having a sole (**7**), to which an upper (**4**) of the shoe is attached, and on whose upper side there is mounted an insole, while the upper (**4**) of the shoe in area of instep of the foot comprises at least one instep elastic insertion (**41 1**), which reduces pressure of the upper (**4**) of the shoe on the instep of the foot, while the insole on its top side comprises at least a depression for big toe joint and a depression or lowering for heel bone.



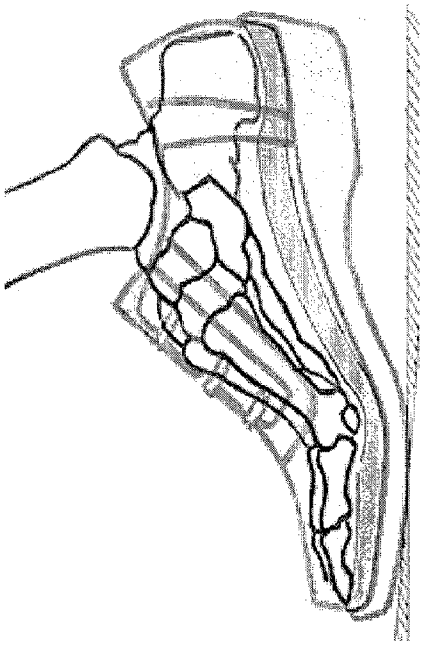


Fig. 1b

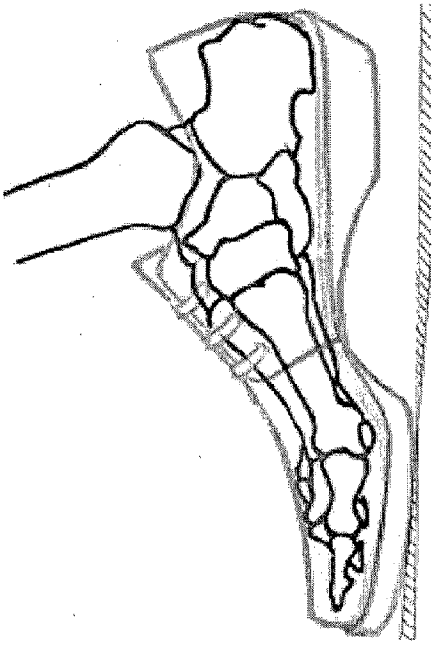


Fig. 2b

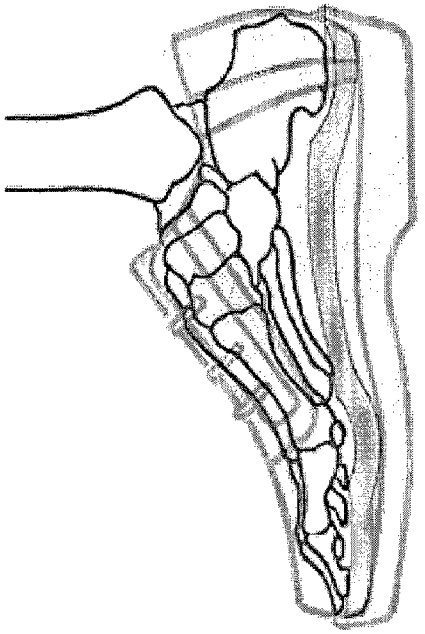


Fig. 1a

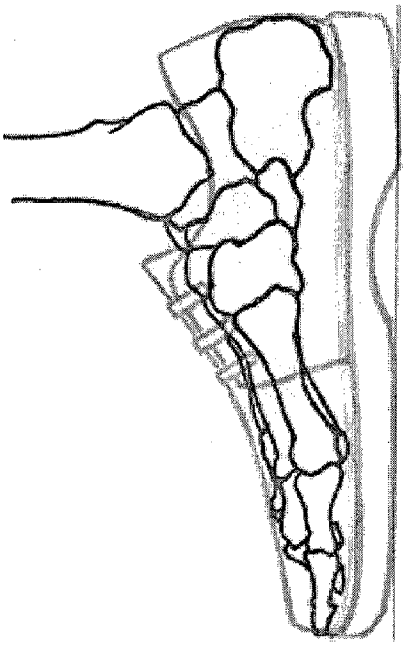


Fig. 2a

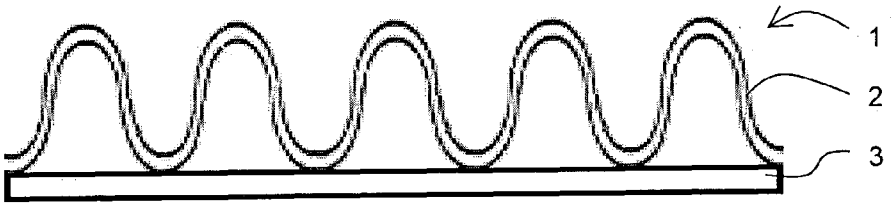


Fig. 3

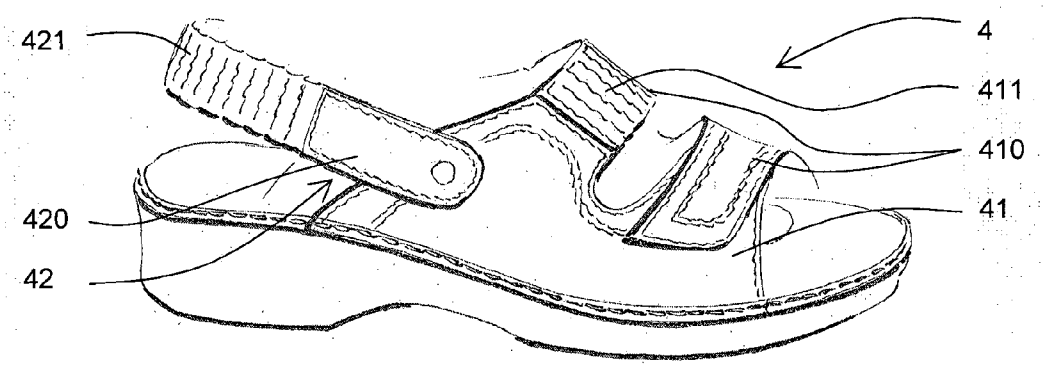


Fig. 4

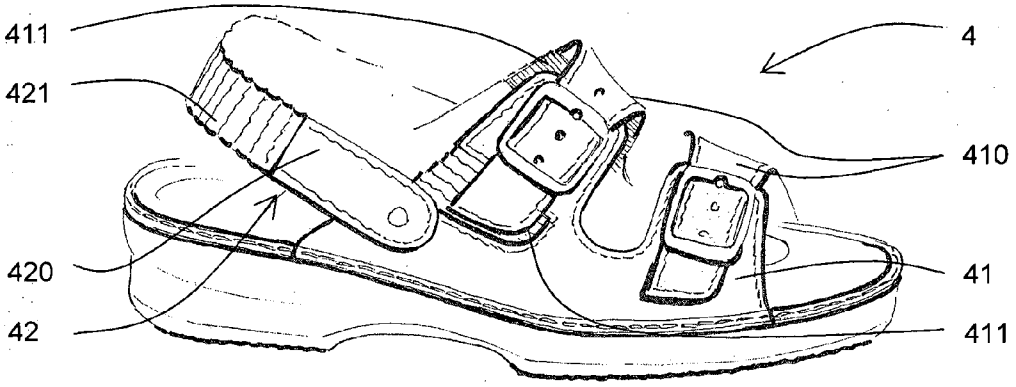


Fig. 5

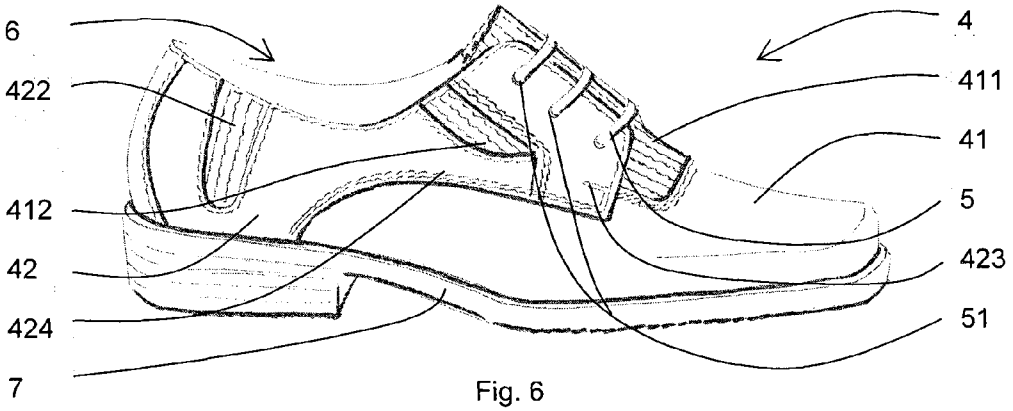


Fig. 6

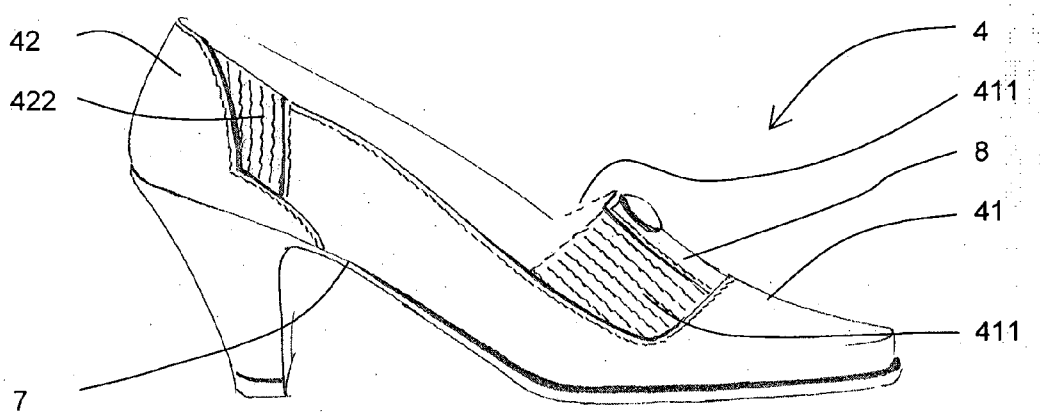


Fig. 7

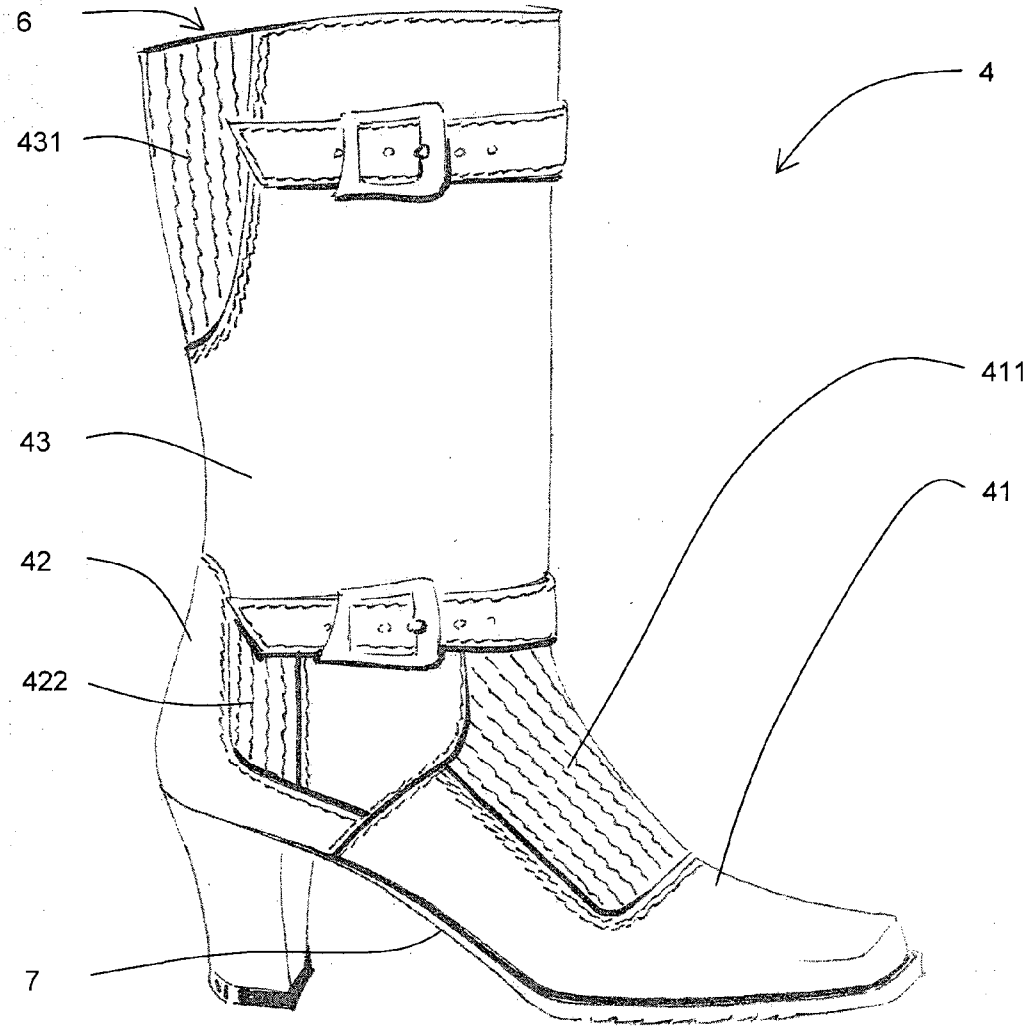


Fig. 8

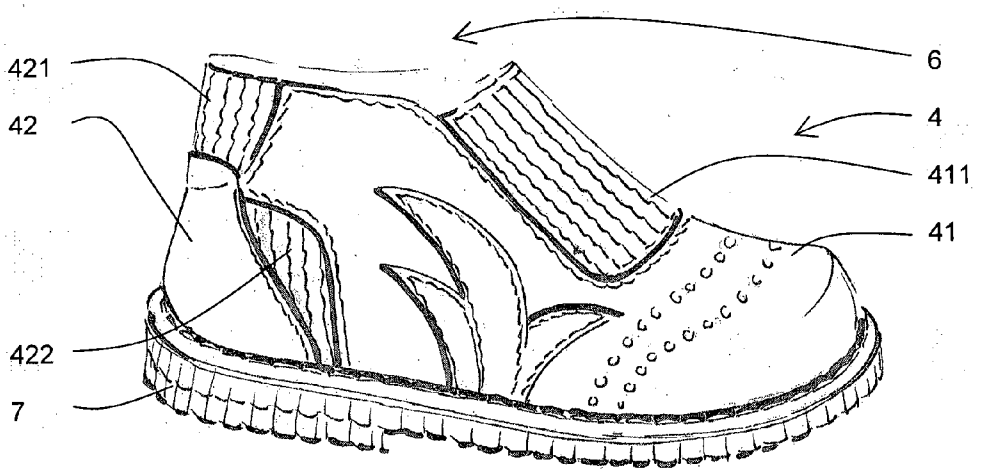


Fig. 9

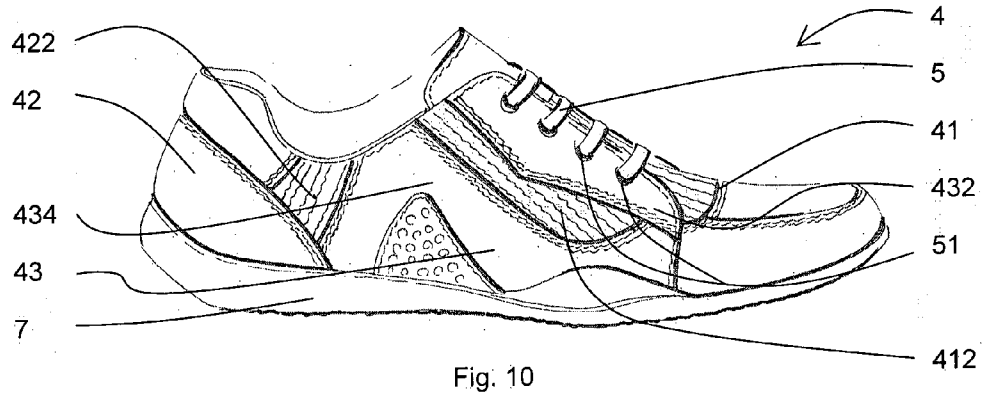


Fig. 10

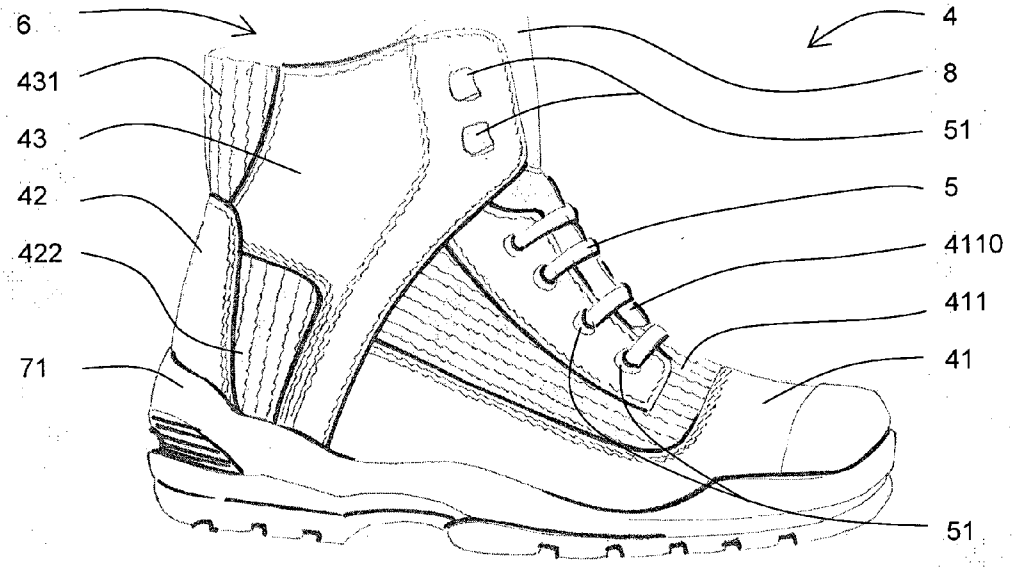


Fig. 11

Fig. 12

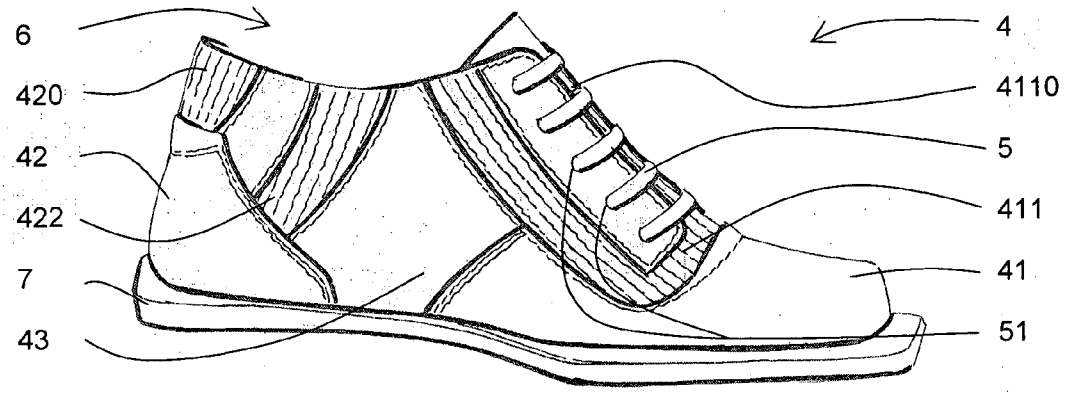


Fig. 13

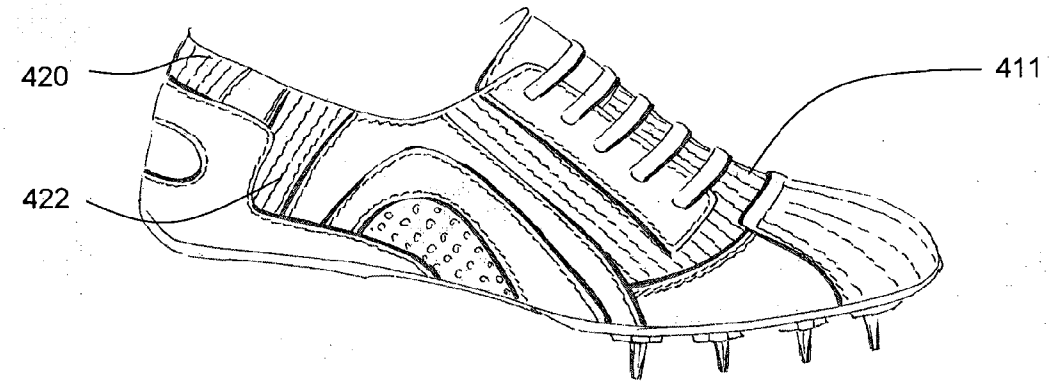


Fig. 14

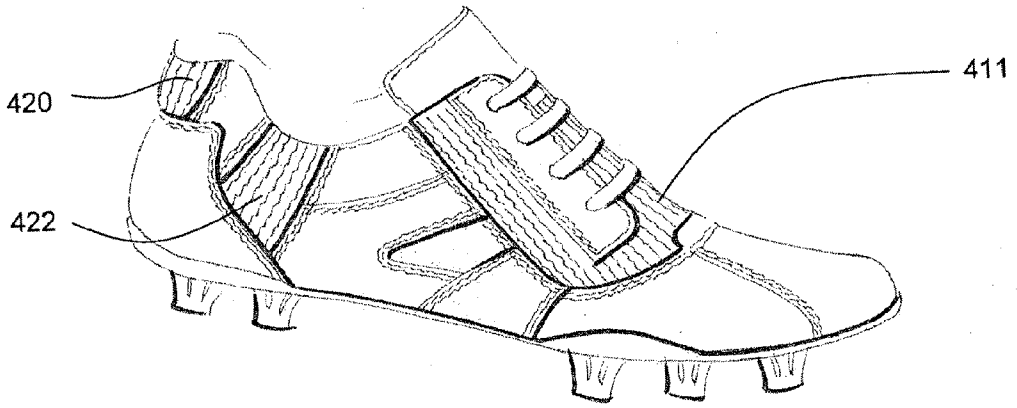


Fig. 15

Fig. 16

SHOE WITH INSTEP ELASTIC INSERTION AND INSOLE WITH DEPRESSIONS

TECHNICAL FIELD

[0001] The invention relates to a shoe comprising a sole on top side of which there is mounted an insole to which an upper of the shoe is attached.

BACKGROUND ART

[0002] At present number of various types and structures of shoes is known. Their common disadvantage is that tough upper (whose toughness is quite often increased by connecting element/elements), which is firmly attached to the sole of the shoe, causes during walking unnatural and extreme load of foot instep and consequently also of all muscles and ligaments of the foot. As a result of this, also by healthy human with normally shaped foot, next to others, callosities are created, function and load of Achilles tendon is changed, functioning of protractors (extensors) and flexors of toes, especially of big toe, is reduced, hammer toes are created, and gradually longitudinal arch of the foot may collapse, thus the flat foot may evolve, and its vascular, lymphatic or nerve system may be even damaged. These processes are moreover worsened when plane, possibly towards the toe cap lowered insole is used, which further contributes to unsuitable load of the foot through unnatural distribution of weight of human body into the whole surface of the foot, instead of its distribution among supporting parts of the foot—the big toe joint, toe joints and the heel bone. Next to physical pain, accompanying effects of these changes which gradually penetrate not only into the whole lower limb but also into the whole body, are an excessive fatigue and psychic problems, which lowers quality of life.

[0003] The goal of the invention is to design a shoe, which would remedy the drawbacks of shoes of present structures, would reduce load of instep and enable the most natural distribution of weight of human body to those parts of foot which are adapted to this purpose.

PRINCIPLE OF THE INVENTION

[0004] The goal of the invention is achieved by a shoe, which comprises a sole, to which there is attached an upper of the shoe, and on whose upper side an insole is mounted, whose principle consists in that, the upper of the shoe comprises in area of instep of the foot at least one instep elastic insertion, which reduces pressure of the upper of the shoe on the instep of the foot, while the insole on its upper side comprises at least a depression for big toe joint and a depression or lowering for heel bone. Synergetic action of these elements then ensures proper distribution of weight of human body among carrying elements of the foot, thus natural load of individual parts of the foot respecting its structure and biomechanics.

[0005] Especially at boots it is then advantageous, if the instep elastic insertion is on section of its length provided with longitudinal opening, which further reduces its toughness, possibly if in the area of the instep of the foot it comprises two side by side arranged instep elastic insertions.

[0006] To increase the effect of the instep elastic insertion, the upper of the shoe may further on at least one side of the shoe in the area of the instep of the foot comprise an auxiliary instep elastic insertion.

[0007] For further increasing of effect of the shoe its upper preferably comprises in area of an ankle of the foot an ankle elastic insertion and/or in area of the heel, or above the heel a heel elastic insertion, which reduce overall toughness of the shoe, and especially upon full treading also load of the heel, or more precisely of Achilles tendon.

[0008] The heel elastic insertion then may be especially at boots with advantage substituted by a calf elastic insertion, which reduces load of the calf and of calf muscles.

[0009] At all variants the highest effect is achieved upon usage of an insole which on its lower side in heel section comprises a heel protrusion arranged under a heel depression on its upper side, which is from outside delimited by a deflection of cuboid bone arranged under a support of cuboid bone on upper side of the insole, and on which ties together a protrusion of longitudinal splint bone arranged under a depression of longitudinal splint bone on upper side of the insole. On the protrusion of longitudinal splint bone then ties together a protrusion of little toe joints arranged under a depression of little toe joints on upper side of the insole, which runs via a deflection of support of transverse arch towards inner section of the insole into a protrusion of big toe joint arranged under a depression of big toe joint on upper side of the insole, while the support of transverse arch creates a flexible bridge between section of insole under big toe joint and under little toe joints, and towards the heel of the insole on this support ties together a support of longitudinal arch of the foot, which from lower side of insole is formed of a deflection of support of longitudinal arch arranged under the protrusion of support of longitudinal arch of the foot on upper side of the insole. This insole secures the most suitable distribution of body weight between the carrying elements of the foot, and thus natural load of its individual parts.

DESCRIPTION OF THE DRAWING

[0010] In the enclosed drawings the FIG. **1***a* schematically represents a skeleton of human foot when standing and wearing the shoe according to the invention, the FIG. **1***b* a skeleton of human foot when walking and wearing the shoe according to the invention,

[0011] the FIG. **2***a* a skeleton of human foot when standing and wearing present types of shoes, the FIG. **2***b* a skeleton of human foot when walking and wearing present types of shoes,

[0012] the FIG. **3** cross-section of biomechanical elastic insertion of the shoe according to the invention,

[0013] the FIG. **4** sandal according to the invention,

[0014] the FIG. **5** another embodiment of sandal according to the invention,

[0015] the FIG. **6** men's formal shoe according to the invention,

[0016] the FIG. **7** ladies' formal shoe on high heel according to the invention,

[0017] the FIG. **8** ladies' boot according to the invention,

[0018] the FIG. **9** child's shoe according to the invention,

[0019] the FIG. **10** sports shoe according to the invention,

[0020] the FIG. **11** winter shoe according to the invention,

[0021] the FIG. **12** working shoe according to the invention,

[0022] the FIG. **13** ski running shoe according to the invention,

[0023] the FIG. **14** athletic track shoe according to the invention,

[0024] the FIG. **15** football shoe according to the invention,

[0025] and the FIG. **16** shoe for skate according to the invention.

EXAMPLES OF EMBODIMENT

[0026] The shoe according to the invention with its structure and properties fully respects morphology of human foot and its biomechanics, while it enables its natural poise and proper load of all its parts. As it is apparent from the FIGS. **1***a* and **1***b*, which schematically represent the foot skeleton when standing or during walking wearing the shoe according to the invention, the instep is not loaded excessively and the transverse arch does not collapse, like at usage of present types of shoes—FIGS. **2***a* and **2***b*, thanks to which the protractors (extensors) and flexors of toes as well as the Achilles tendon and further muscles or ligaments of foot are fully functioning and they are properly and naturally loaded. Wearing of the shoe according to the invention helps to prevent number of health problems, affecting not only the foot itself, but they may consequently affect also other parts of the body, especially other parts of legs, the spine, etc.

[0027] The shoe according to the invention is based on synergetic joint action of several elements. The first of them is the insole, which is in the shoe mounted according to requirements in a fixed manner (innersole) or in a removable manner (sock lining), and which on its upper side comprises at least a depression for big toe joint and a depression for heel bone. Thanks to these depressions this insole maintains the foot in its natural position and facilitates proper distribution of weight of human body among its main supporting points formed of big toe joint, toe joints and heel bone. Lowering of heel bone simultaneously helps to achieve proper position of the whole leg, which brings relief not only for its so far extremely stressed parts, especially ligaments and joints, but also for spine, thus uprights human body and transfers its centre of gravity into natural position. In various variants of embodiment the insole next to the depression for big toe joint and the depression for heel bone may be provided with further elements like e.g. a protrusion for support of longitudinal arch, etc.

[0028] At single layer insole the depression for big toe joint and for heel bone is performed either through suitable shaping, e.g. depression and/or change of thickness of insole in places of these recessions and/or openings performed in the body of the insole. At multilayer insole these recessions may be also formed through suitable shaping of insole or its carrying layer and/or openings performed at least in any of its layers.

[0029] The most suitable insole, which brings the best results, is the insole known e.g. from the CZ patent 298894, or analogic EP patent application 1854371, which from the lower side features a shape of bottom part of human foot (the sole) and from the upper side a shape of impression of bottom part of human foot. The lower side of insole then in the heel section comprises a heel protrusion arranged under a heel depression on upper side of the insole, which is from outside delimited by a deflection of cuboid bone arranged under a support of cuboid bone on upper side of the insole, and on which ties together a protrusion of longitudinal splint bone arranged under a depression of longitudinal splint bone on upper side of the insole. On the protrusion of longitudinal splint bone ties together a protrusion of little toe joints arranged under depression of little toe joints on upper side of the insole, which runs via deflection of a support of transverse arch towards inner section of insole into a protrusion of big toe joint, arranged under a depression of big toe joint on upper side of the insole. Simultaneously the support of transverse arch creates a flexible bridge between a section of insole under big toe joint and under little toe joints. Towards heel of insole on this support ties together a support of longitudinal arch of foot, which is from the lower side of insole formed of a deflection of the support of longitudinal arch arranged under a protrusion of support of longitudinal arch of foot on upper side of insole. In embodiment according to the CZ patent application 2009-580, or analogic international patent application WO 2011023148, the heel part of this insole with heel dimple is further lowered towards its middle section by means of recession or lowering.

[0030] Another element of the shoe according to the invention, which jointly cooperates with the insole is at least one biomechanical elastic insertion **1** (a spring) created from elastic material, which is incorporated in the upper of the shoe in area, which is in contact with instep of the foot, while it extends, as per the type of the shoe, up to the edge of the instep or to the opening in the shoe, or to transition of instep of the shoe into middle or rear portion of the upper of the shoe. This insertion with advantage is performed as multilayered one, when it from outer side contains folded layer **2** of material from which the upper of the shoe (e.g. leather) is produced, this being firmly attached for example sewn together with under it arranged elastic layer **3** (e.g. a textile rubber), that renders to it suitable elastic properties—see the FIG. **3**. In preferred example of embodiment designed especially for enclosed shoes, on surface of the elastic layer **3** adjacent to the inner space of the shoe there is further positioned a layer of hydrophobic or waterproof material, e.g. neoprene, etc. Another applicable structures of biomechanic elastic insertion **1** are, based on the above mentioned facts, apparent to an average person skilled in the art, and that is why they will not be described hereinafter.

[0031] According to the type of shoe the elastic insertion/insertions **1** positioned in area of instep of the shoe may be added by another ones, as to the structure identical or similar elastic insertions **1**, positioned in other parts of the shoe, as it further will be described and illustrated on several particular types of shoes. As it is apparent from the below mentioned exemplary embodiments of the shoe according to the invention, the shape, size and individual positioning of any of the elastic insertions **1** are given by the structure and design of the shoe, shape of its parts, its size and purpose, though in various examples of embodiment they may differ.

[0032] The FIG. **4** represents a sandal in embodiment according to the invention. The **4** upper of the sandal at the same time contains opened instep **41** as common types of similar footwear formed of straps **410** of material, in represented example of embodiment of two straps **410** running over instep of the foot, and a rear part **42** formed of a strap **420** running around the heel or above the heel of the foot. The middle section of the strap **410** of instep **41** closer to ankle of the foot, which during walking is in a close contact with instep of the foot, is along the whole width formed of an instep elastic insertion **411** of the above described structure. This elastic insertion **411** when stepping out or more precisely in the first phase of step gets into close contact with instep of the foot, and thanks to its elastic properties it adjusts to its shape and motion, so it does not exert unproportionally high pressure on it, as it is by present types of shoes. The second of straps **410** of instep **41** being without elastic insertion **411** then ensures sufficient stability of sandal on the foot. The heel

elastic insertion **421** of the same structure then in the represented example of embodiment creates section of the strap **420** running over the heel or above the heel, through which not only an overall toughness of sandal is reduced and proper effect of the instep elastic insertion **411** is supported, but simultaneously based on the same principle, loading of the heel or more precisely of Achilles tendon is reduced upon full treading. In the not represented examples of embodiment of sandal the sandal does not comprise the heel elastic insertion **421**, possibly does not comprise the rear part **42** of the upper **4** at all thus it is performed as a slipper, and/or comprises another at least one instep elastic insertion **411** positioned in the second of the straps **410** of instep **41**. Sandal or slipper comprises the sock lining comprising on its upper side at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0033] As it is obvious from embodiment of a sandal according to the invention represented in the FIG. **5**, initially one instep elastic insertion **411** may be, e.g. due to functional or decorative elements of sandal, positioned outside the upper section of its instep **41**, possibly may be replaced by at least two otherwise positioned instep elastic insertions **411**. In the represented variant of embodiment one of the instep elastic insertions **411** is positioned in vicinity of upper section of the strap **410**, along its whole width, while the second, approximately in a shape of rectangle, is positioned lower in the instep **41** of sandal. In other not represented examples of embodiment of sandal the sandal does not comprise the heel elastic insertion **421**, possibly does not comprise the rear part **42** of the upper **4** at all, thus it is performed as a slipper, and/or comprises another at least one instep elastic insertion **411** positioned in the second of the straps **410** of instep **41**. Sandal comprises the sock lining comprising on its upper side at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0034] The FIG. **6** represents a formal shoe in embodiment according to the invention. The upper **4** of the shoe comprises the same enclosed instep **41** as existing types of similar shoes, which however in area of instep of the foot under the closing element—bootlace **5** and its guidance **51** is provided with approximately rectangular instep elastic insertion **411**. This insertion **411** then in cooperation with approximately trapezoidal auxiliary instep elastic insertion **412** positioned at least on one side of the shoe in transition between the front and rear section **423** and **424** of the rear part **42** of the upper **4** of the shoe reduces pressure acting when stepping out or more precisely in the first phase of step on instep of the foot. To reduce pressure acting on the heel or Achilles tendon especially upon full treading then rear part **42** of the upper **4** of the shoe approximately in area of ankle is provided at least on one side of the shoe with an ankle elastic insertion **422**, which extends from edge of opening **6** of the shoe nearly to its sole **7**. In not represented variant of embodiment the ankle elastic insertion **422** extends up to the sole **7** of the shoe. The shoe comprises the sock lining on its upper side comprising at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0035] The FIG. **7** represents a ladies' formal shoe on high heel in embodiment according to the invention. The upper **4** of the shoe comprises identical enclosed instep **41** as present types of similar shoes, which however in area of instep of the foot along both sides of a tongue **8** is provided with approximately rectangular instep elastic insertions **411** for reduction of pressure on the instep of the foot. For reduction of pressure acting on the heel or Achilles tendon especially upon full treading, approximately under ankle of the foot in area of transition of the instep **41** of the shoe and the rear part **42** of the upper **4** at least on one side of the shoe is positioned approximately trapezoidal ankle elastic insertion **422**. In not represented variants of embodiment the tongue **8** of the shoe and both instep elastic insertions **411** may be replaced by one instep elastic insertion **411**, and/or the ankle elastic insertion **422** may extend up to the sole **7** of the shoe, while it passes through the rear part **42** of the upper **4** and/or it creates at least a portion of transition between this rear part and the instep **41** of the shoe. The shoe comprises the innersole on its upper side comprising at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0036] Variant of a ladies' boot on high heel in embodiment according to the invention is represented in the FIG. **8**. The upper **4** of the shoe between the enclosed instep **41** and the middle part **43** is provided with approximately rectangular instep elastic insertion **411** to reduce pressure on instep of the foot. On at least one side of the shoe approximately in the place under the ankle of the foot in transition between the middle part **43** of the upper **4** and the rear part **42** of the upper **4** there is arranged approximately rectangular ankle elastic insertion **422** to reduce pressure on heel of the foot or on Achilles tendon. In upper section of the middle part **43** of the upper **4** from behind is positioned approximately triangular calf elastic insertion **431**, which extends up to opening **6** of the shoe. This calf elastic insertion **431** contributes to reduction of toughness of the whole shoe, through which it supports the effect of other elastic insertions **411** and **422** and it itself at the same time reduces pressure of the shoe on the calf and calf muscles. In not represented variant of embodiment this calf elastic insertion **431** may be replaced or added by an opening or lowering. Next to this, the ankle elastic insertion **431** may extend up to the sole **7** of the shoe, while it passes through the rear part **42** of the upper **4** of the shoe and/or it creates at least a portion of transition between this rear part and the middle part **43** of the upper **4** and/or the instep **41** of the shoe. The shoe comprises the innersole or sock lining comprising on its upper side at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0037] The FIG. **9** represents a child's shoe in embodiment according to the invention. The upper **4** of the shoe comprises identical enclosed instep **41** as present types of similar shoes, which however in area of instep of the foot is provided with approximately rectangular instep elastic insertion **411** to reduce pressure on instep of the foot. At least on one side of the shoe approximately under ankle of the foot in transition between the instep **41** and the rear part **42** of the upper **4** is positioned approximately triangular ankle elastic insertion **422**, which in the represented embodiment extends up to the sole **7**, and which reduces pressure acting on the heel or Achilles tendon upon full treading. To further reduce this pressure and to prevent callosities in place of Achilles tendon the instep **41** of the shoe is further in area above the rear part **42** of the upper **4** provided with approximately trapezoidal heel elastic insertion **421**, which is connected with the rear part **42** of the upper **4** and extends up to the opening **6** of the shoe. In not represented variants of embodiment the ankle

elastic insertion **422** does not extend up to the sole **7** of the shoe, and/or is joined with the heel elastic insertion **421** into one elastic insertion. Next to this, e.g. the instep elastic insertion **411** may be replaced by two instep elastic insertions **411** positioned lower in the instep **41** of the shoe. The shoe comprises a sock lining comprising on its upper side at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0038] The FIG. **10** represents a sports shoe in embodiment according to the invention. The upper **4** of the shoe comprises identical enclosed instep **41** as present types of similar shoes, which however in area of instep of the foot under the bootlace **5** and lower section of its guidance **51** is provided with approximately rectangular instep elastic insertion **411**. This insertion **411** then in cooperation with auxiliary instep insertion **412** positioned on at least one side of the shoe in transition between the front section **431** and the rear section **432** of the middle part **43** of the upper **4** of the shoe reduces pressure acting upon stepping out or more precisely in the first phase of step on the instep of the foot. To reduce pressure acting on the heel or Achilles tendon upon full treading, the middle part **43** of the upper **4** of the shoe approximately in area of ankle of the foot is provided on at least one side of the shoe with approximately trapezoidal ankle elastic insertion **422**, that is running from opening of the shoe **6** to the rear part **42** of the upper **4**. In not represented variant of embodiment this elastic insertion **422** may extend up to the sole **7** of the shoe, while it either passes via the rear part **42** of the upper **4** and/or creates at least a portion of transition between this part and the middle part **43** of the upper **4** of the shoe, or it is running only in the middle part **43** of the upper **4** of the shoe without contact with its rear part **42**. The shoe comprises a sock lining comprising on its upper side at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0039] The FIG. **11** represents a winter shoe in embodiment according to the invention. The upper **4** of the shoe comprises enclosed instep **41**, as present types of similar shoes, which however in area of instep of the foot under the bootlace **5** and lower section of its guidance **51** is provided with approximately trapezoidal instep elastic insertion **411**, which is running up to place of transition of the instep **41** into the middle part **43** of the upper **4**, and which reduces pressure acting upon stepping out or more precisely in the first phase of step on the instep of the foot. To reduce an overall toughness, the instep insertion **411** in area of the tongue **8** of the shoe or of the instep of the foot, is provided along a portion of its length with longitudinal opening **4110**, with advantage with rounded end. In the place of transition of the middle part **43** of the upper **4** into the rear part **42** of the upper **4**, on at least one side of the shoe approximately under ankle of the foot there is positioned approximately rectangular ankle elastic insertion **422**, which reduces pressure acting on the heel or on Achilles tendon upon full treading, and which in the represented example of embodiment extends up to the decorative frame **71** of the shoe. In the upper section of the middle part **43** of the upper **4** from behind is positioned approximately triangle calf elastic insertion **431**, which extends up to opening **6** of the shoe. This calf elastic insertion **431** contributes to reduction of toughness of the shoe as a whole, through which it supports effect of other elastic insertions **411** and **422**, and it itself simultaneously reduces pressure of the shoe on the lower portion of the calf and the calf muscles. In not represented variant of embodiment this calf elastic insertion **431** may be replaced or added by opening or lowering. In other not represented variant of embodiment the ankle elastic insertion **422** may extend up to the sole **7** of the shoe, possibly it may be joined with the calf elastic insertion **431** into one elastic insertion creating at least a part of transition between the middle part **43** of the upper **4** and rear part **42** of the upper **4**. The shoe comprises a sock lining comprising on its top side at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0040] The FIG. **12** represents a working shoe in embodiment according to the invention. The upper **4** of the shoe comprises enclosed instep **41**, as present types of similar shoes, which however in area of instep of the foot under the bootlace **5** and lower section of its guidance **51** on each side of the shoe is provided with approximately trapezoidal instep elastic insertion **411**, which along side of the instep **41** is running up to the opening of the shoe **6**, and which reduces pressure acting upon stepping out or more precisely in the first phase of step on the instep of the foot. In the rear part **42** of the upper **4** on at least one side of the shoe approximately under the ankle is positioned approximately rectangular ankle elastic insertion **422**, which reduces pressure acting on the heel or on Achilles tendon upon full treading. In the represented example of embodiment this ankle elastic insertion **422** runs over the whole height of the rear part **42** and extends up to the decorative frame **71** of the shoe. In the upper section of the instep **4**, which is in contact with the calf, from behind is positioned approximately triangular calf elastic insertion **431**, which extends to opening **6** of the shoe. This calf elastic insertion **431** contributes to reduction of toughness of the whole shoe, hereby it supports effect of other elastic insertions **411** and **422**, and it itself simultaneously reduces pressure of the shoe on the lower portion of the calf and the calf muscles. In not represented variant of embodiment this calf elastic insertion **431** may be replaced or added by opening or lowering. In other not represented variant of embodiment the ankle elastic insertion **422** may extend up to the sole **7** of the shoe, possibly it may be joined with the calf elastic insertion **431** into one ankle elastic insertion **422** creating at least a portion of transition between the instep **41** and the rear part **42** of the upper **4**. In other not represented variant of embodiment two instep elastic insertions **411** may be replaced by one instep elastic insertion **411** along a section of its length provided with longitudinal opening **4110**, advantageously with rounded end. The shoe comprises a sock lining comprising on its top side at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0041] The FIG. **13** represents a ski running shoe in embodiment according to the invention. The upper **4** of the shoe comprises enclosed instep **41**, as present types of similar shoes, which however in area of instep of the foot under the bootlace **5** and its guidance **51** is provided with approximately rectangular instep elastic insertion **411**, which extends up to the opening **6** of the shoe and simultaneously creates a portion of transition between the instep **41** and the middle part **43** of the upper. For reduction of overall toughness this elastic insertion **411** is provided in place of the tongue **8** of the shoe along a portion of its length with longitudinal opening **4110**, preferably with rounded end. At least on one side of the shoe approximately in place of ankle of the foot in transition between the middle part **43** of the upper **4** and the rear part **42**

of the upper **4** there is arranged approximately rectangular ankle elastic insertion **422** for reduction of pressure on heel of the foot or on Achilles tendon. In upper section of the middle part **43** of the upper **4** from behind above the rear part **42** of the upper **4** is positioned approximately rectangular heel elastic insertion **421**, which is joined with this part, and which extends up to the opening **6** of the shoe. This heel elastic insertion **421** contributes to reduction of toughness of the whole shoe, through which it supports effect of other elastic insertions **411** and **422** and it itself further reduces pressure of the shoe on the heel or Achilles tendon. In not represented variant of embodiment this heel elastic insertion **421** may be replaced or added by an opening or lowering. In other not represented variant of embodiment the ankle elastic insertion **422** may extend up to the sole of the shoe **7**, while it runs via the rear part **42** of the upper **4**, or creates at least a portion of transition between it and the middle part **43** of the upper **4**. In other not represented variant the ankle elastic insertion **422** may be totally omitted from structure of the shoe. The shoe comprises a sock lining or an innersole comprising on its upper side at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0042] In principle identical layout of similar instep, ankle and heel elastic insertion **411**, **422** and **421** as at the ski running shoe is applicable for example also at athletic track shoe (FIG. **14**) or at football shoe (FIG. **15**), possibly also at other not represented types of shoes. Also these types of shoes in various embodiments may be adjusted to requirements of the user and/or manner of their utilisation, e.g. by omitting the ankle elastic insertion **422**, etc. The shoes comprising a sock lining or an innersole comprising on its upper side at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0043] The FIG. **16** further represents shoe of a skate in embodiment according to the invention. The upper **4** of the shoe comprises enclosed instep **41**, as present types of similar shoes, which however in area of instep of the foot under the bootlace **5** and its guidance **51** is provided with approximately rectangular instep elastic insertion **411**, which extends up to the opening **6** of the shoe. For overall reduction of toughness this elastic insertion **411** is provided along a portion of its length with longitudinal opening **4110**, preferably with rounded end. On at least one side of the shoe approximately in place under the ankle in transition between the instep **41** and the rear part **42** of the upper **4** there is arranged approximately triangular ankle elastic insertion **422** for reduction of pressure on the heel of the foot or Achilles tendon. In the upper section of the rear part **42** of the upper **4** from behind is positioned approximately triangular calf elastic insertion **431**, which extends up to opening **6** of the shoe. This calf elastic insertion **431** contributes to reduction of toughness of the whole shoe, through which supports effect of other elastic insertions **411** and **422**, and it itself further reduces pressure of the shoe on the calf or the calf muscles. In not represented variant of embodiment this calf elastic insertion **431** may be replaced or added by opening or lowering. In other not represented variant of embodiment the ankle elastic insertion **422** may extend up to the sole **7** of the shoe, while it is running over the decorative frame **71** of the shoe and/or creates at least a portion of transition between this frame and the rear part **42** of the upper **4**. The shoe comprises a sock lining or an innersole containing on its upper side at least a depression for big toe joint and a depression for heel bone, in preferred embodiment the insole according to EP 1854371 or WO 2011023148.

[0044] In all above described types of shoes is positioned a sock lining or an insole, which on its top side comprises at least a depression for big toe joint and a depression for heel bone, and which in synergetic combination with elastic insertions **411**, **422**, **431**, or **421** positioned in the upper **4** of the shoe or with at least one instep elastic insertion **411** considerably reduces till this time unproportional load of individual parts of the foot, while it respects its natural structure and biomechanics.

[0045] The above described embodiments of the shoe according to the invention are illustrative only and they serve to explain the principle of the invention. In structurally different embodiments of the same types of shoes then individual elastic insertions **411**, **422**, **431**, or **421** may be positioned between another portions of the upper **4** of the shoe and/or they may be created in other shapes as per individual shapes of these portions, or their transitions, possibly some of these elastic insertions **411**, **422**, **431**, or **421** may be omitted, or contrariwise may be replaced by higher number of elastic insertion with the same or similar effect, possibly provided with longitudinal opening. Based on the above mentioned facts, these modifications are obvious to an average person skilled in the art, therefore they will not be described here in detail. In any case, the principle of the invention is the shoe, comprising the insole provided on its top side at least by a depression for big toe joint and a depression for heel bone, whose upper **4** at least in place of instep of the foot is provided with at least one instep elastic insertion **411** for reduction of pressure on the instep of the foot, possibly as the need may be with at least one ankle elastic insertion **422** and/or calf elastic insertion **431**, or heel elastic insertion **421** for reduction of pressure on further parts of the foot or the leg. The instep elastic insertion **411** in case of need, may also be added by at least one auxiliary instep elastic insertion **412**, and it may be running totally outside the tongue **8** of the shoe, or it may extend into it, possibly it may create the whole tongue.

[0046] Next to the above described benefits, when wearing the shoe according to the invention, the biopolarity of magnetic field of user's body is changed, which means that the shoe according to the invention in its all embodiments supports and maintains natural biomagnetic field of user's body and in case of its impairment it creates and/or restores the same.

LIST OF REFERENTIAL MARKINGS

[0047] **1** elastic insertion
[0048] **2** folded layer
[0049] **3** elastic layer
[0050] **4** upper
[0051] **41** instep
[0052] **410** strap
[0053] **411** instep elastic insertion
[0054] **412** auxiliary instep elastic insertion
[0055] **42** rear part of the upper
[0056] **420** strap
[0057] **421** heel elastic insertion
[0058] **422** ankle elastic insertion
[0059] **423** front section of rear part of the upper
[0060] **424** rear section of rear part of the upper
[0061] **43** middle part of the upper
[0062] **431** calf elastic insertion
[0063] **432** front section of middle part of the upper

[0064] **433** rear section of middle part of the upper
[0065] **5** bootlace
[0066] **51** bootlace guidance
[0067] **6** opening of the shoe
[0068] **7** sole
[0069] **71** decorative frame
[0070] **8** tongue

1. A shoe comprising a sole, to which an upper of the shoe is attached, and on whose upper side there is mounted an insole, wherein the upper of the shoe in area of instep of the foot comprises at least one instep elastic insertion, which reduces pressure of the upper of the shoe on the instep of the foot, and the insole on its top side comprises at least a depression for big toe joint and a depression or lowering for heel bone.

2. The shoe according to the claim **1**, wherein the instep elastic insertion on a portion of its length is provided with longitudinal opening.

3. The shoe according to the claim **1**, wherein the upper of the shoe in area of instep of the foot comprises two side by side arranged instep elastic insertions.

4. The shoe according to claim **1**, wherein the upper of the shoe at least on one side of the shoe in area of instep of the foot comprises an auxiliary instep elastic insertion.

5. The shoe according to claim **1**, wherein the upper of the shoe at least on one side of the shoe in area of ankle of the foot further comprises an ankle elastic insertion.

6. The shoe according to claim **1**, wherein the upper of the shoe in area of Achilles tendon of the foot further comprises a heel elastic insertion.

7. The shoe according to claim **1**, wherein the upper of the shoe in area of calf of the leg comprises a calf elastic insertion.

8. The shoe according to claim **1**, wherein the insole on its lower side in heel section comprises a heel protrusion arranged under a heel depression on its upper side, which is from outside delimited by a deflection of cuboid bone arranged under support of cuboid bone on upper side of the insole, and on which ties together a protrusion of longitudinal splint bone arranged under a depression of longitudinal splint bone on upper side of the insole, while on the protrusion of longitudinal splint bone then ties together a protrusion of little toe joints arranged under a depression of little toe joints on upper side of insole, which runs via deflection of support of transverse arch towards inner section of the insole into a protrusion of big toe joint being arranged under the depression of big toe joint on upper side of the insole, while the support of transverse arch creates a flexible bridge between the section of insole under big toe joint and under little toe joints, and towards the heel of the insole on this support ties together a support of longitudinal arch of the foot, which from lower side of insole is formed of a deflection of support of longitudinal arch arranged under protrusion of support of longitudinal arch of the foot on upper side of the insole.

* * * * *