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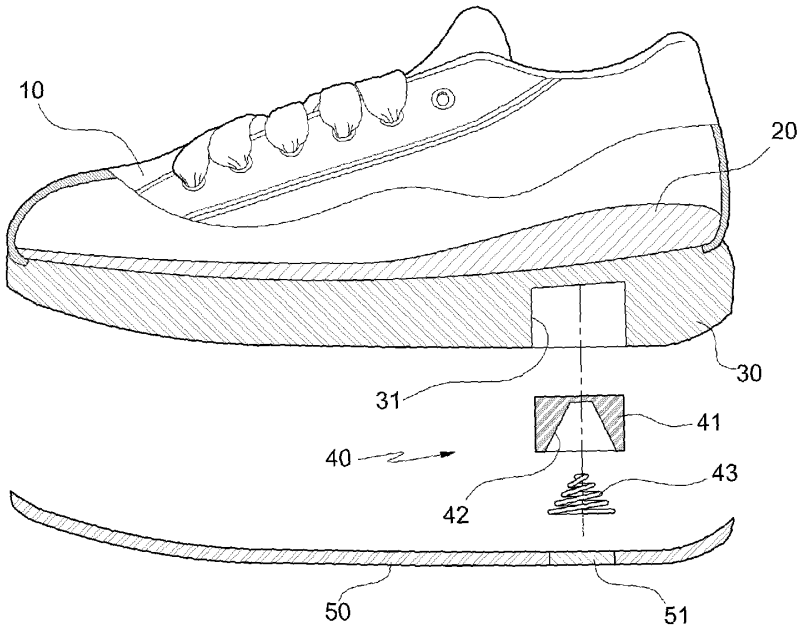
(54) SHOE WITH ELASTIC MEANS

(57) The present invention relates to a shoe with elastic means, and provides a shoe with elastic means, which can be manufactured with ease and has superior elastic performance. To accomplish the object of the present invention, a shoe is provided comprising: an elastic cap made of a material having an elasticity higher than that of the peripheral area around the elastic cap; a conical groove formed in the elastic cap; and a spring which is formed separately from the elastic cap, and which has a conical shape which is the same shape as the conical groove so that the spring can be inserted into said conical groove. Accordingly, the present invention can manufacture a shoe embedded with both a spring and an elastic block in a further easier manner, and can manufacture a superior quality shoe with no defects.

[Fig. 3]



EP 2 351 497 A2

Description

[Technical Field]

[0001] The present invention relates to a shoe with elastic members, in more detail a shoe provided with conical springs in conical seating groove in the bottom.

[Background Art]

[0002] Recently, various shoes with springs in the bottom to protect the wearers' joints such that they feel less fatigue by absorbing shock applied to the shoes while improving the cushion function have been developed.

[0003] A shoe with a spring around the heel which is a typical shoe in those shoes is showing in FIG. 1. The shoe is equipped with only springs that can absorb shock and provided with an upper plate 111 and a lower plate 114 that support both ends of the spring to install the springs 113 while both ends of the springs are fitted on protrusions 112 on the upper plate 111 and the lower plate 114. Springs having a large wire diameter of a plurality of springs are used to carry shock and load of the user walking, for the structural reasons of the springs, a configuration that guides the upper plate 111 and the lower plate 114 which are vertically moved when the springs repeatedly extended and compressed is required, and parts supporting both ends of the springs are required to install the springs; therefore, the entire structure becomes complicated and noise is made by the motion of the upper plate when the shoe is used for a long period of time. Further, since cylindrical springs are used, the springs have a predetermined height even if they are maximally compressed with the wound portions in close contact with each other, such that it is necessarily required to keep a predetermined height of the portion where the springs are embedded in the shoe in order to ensure the space for the motion of the springs.

[0004] A shoe shown in FIG. 2 has a configuration that removes some of the problems, in which elastic blocks 210 are embedded in the bottom of the shoe and springs 212 are embedded in the elastic blocks. According to this structure for installing the springs, a specific configuration for supporting the springs is not needed. Further, since the springs are embedded in the elastic blocks, it is possible to achieve both the feature of the elastic blocks which can carry large shock and prevent the springs from shaking and the feature of the spring, that is excellent restoring speed and force, such that it is possible to implement elastic bodies having excellent shock-absorbing performance, even without using large springs. Further, since the springs have a conical shape, the upper and lower wound portions do not hit against each other even though the springs are compressed, such that contact does not occur between the wound portions and it is not required for the shoe to have a large height for expansion and contraction of the springs. Therefore, the elastic members where the conical springs are embedded, as shown in FIG. 2, can be considered to be more suitable for shoes with thin bottom composed of an insole and a midsole than cylindrical springs.

[0005] However, the elastic body may have elastic unbalance when the spring is biased to one side due to injection pressure or problems, such as support defect, in the manufacturing process, when the elastic block where the spring is embedded is formed. Therefore, it is required to accurately adjust the position of the spring such that the spring is positioned at the right center in manufacturing the elastic block, for example, by injection molding, in order to preclude the problems, which makes the manufacturing process difficult. Further, since the elastic body is usually made of a porous material to embed the spring in the elastic body, it is difficult to use a transparent material, such that it is difficult to implement a configuration that allows the spring to be seen from the outside.

[Disclosure]

[Technical Problem]

[0006] The present invention has been made in an effort to solve the problems and it is an object of the present invention to provide a shoe that is equipped with springs having excellent elastic performance and easily manufactured.

[0007] Further, it is another object of the present invention to provide a shoe having a structure that allows the spring to be seen from the outside.

[Technical Solution]

[0008] In order to achieve the objects of the present invention, a shoe is provided with an elastic member in the bottom, in which the elastic member includes an elastic cap made of a material that is more elastic than the other portions around where the elastic cap is installed, a conical seating groove that is formed in the elastic cap, and a spring that is formed separately from the elastic cap in a conical shape the same as the conical shape of the seating groove and inserted in the seating groove of the elastic cap.

[0009] The shoe according to the present invention is a shoe with a heel, and the heel may have a space therein, such that a sub-heel that moves inward/outward from the bottom of the heel may be inserted in the space and the elastic member that is compressed by the sub-heel may be positioned on the sub-heel.

[0010] According to another aspect of the present invention, a shoe is provided with an elastic member in the bottom, in which the elastic member includes conical seating grooves formed in any one of an insole, a midsole, and an outsole of the shoe, and a spring formed in a conical shape the same as the conical shape of the seating grooves to be seated in the seating grooves and inserted in the seating grooves.

[0011] In the shoe according to the present invention, it is preferable that an air channel that connects the inside of the shoe where a fool is positioned, or the outside of the shoe with the seating grooves is formed in the bottom of the shoe.

[0012] Further, it is preferable that in the shoe a transparent window is formed such that the spring in the seating grooves is seen from the outside of the shoe.

[Advantageous Effect]

[0013] The present invention described above has the following effects.

[0014] First, since the elastic cap and the spring are separately manufactured and assembled, the relative positions of the elastic cap and the spring are naturally determined only by simply assembling the elastic cap with the spring. That is, it is possible to manufacture with accurate and uniform quality without unbalance of the elastic force in the elastic body due to non-matching of the relative position of the spring in an elastic member, which is generated in the related art, as shown in FIG. 2.

[0015] Second, the present invention can achieve free elastic deformation and increase the deformed amount and the shock-absorbing amount, because the wound portions of the spring do no interfere with each other and an elastic block body is not inserted between the wound portions. Therefore, it is possible to increase the deformed amount and the shock-absorbing amount even if the height of the spring is reduced, such that the present invention can be used in the types of shoes which has a relatively thin bottom.

[0016] Third, since the elastic spring and the elastic cap are simultaneously compressed and restored when load or shock is applied, the restoring force and restoring speed are more excellent than when only an elastic block is used, and the elastic cap prevents the elastic spring from shaking, such that wearing sensation of the shoe can be improved.

[0017] Fourth, since the spring is not embedded in the elastic cap, it is possible to check the embedded state of the spring by forming a transparent portion at a position where the spring can be seen, such as the bottom of the shoe, such that it is easy for the manufacturer to find defects in manufacturing, and for the customers to ascertain the elastic performance of the shoe.

[Brief Descriptoin of Drawings]

[0018] FIG. 1 is a cross-sectional view of a shoe with springs in the related art.

[0019] FIG. 2 is a cross-sectional view of a shoe with an elastic block including springs in the related art.

[0020] FIG. 3 is an exploded view of a shoe with an elastic member in the midsole according to the present invention.

[0021] FIG. 4 is an exploded view of a shoe having a spring-seating groove in the insole or the midsole according to another embodiment of the present invention.

[0022] FIG. 5 is a cross-sectional view of a shoe having an air channel according to the present invention.

[0023] FIGS. 6 and 7 are cross-sectional views of a shoe with an elastic member in the heel according to another embodiment of the present invention.

<Reference Numerals>

[0024]

10: the uppers of lather	20, 20': insole
22, 32, 42: seating groove	30: midsole
31: space	34: air channel
36: air hole	40: elastic member
41: elastic cap	43: elastic spring
50, 50': outsole	51: transparent window
52: connecting groove	60: heel
61: communicating space	62: sub-heel
63: support plate	

[Best Mode]

[0025] Hereinafter, the configuration and operation of the present invention are described in detail with reference to the accompanying drawings.

[0026] FIG. 3 is an exploded view showing a shoe according to an embodiment of the present invention, in which an elastic member 40 is installed in the midsole of the shoe. A space 31 where an elastic cap 41 is inserted is formed in the midsole of the shoe, such that the elastic cap 41 is inserted therein. The elastic cap 41 is made of a material having higher elasticity than the other portion around it, that is, the midsole, and functions as an elastic member. A seating groove 42 having the same shape as a conical elastic spring 43 is formed in the elastic cap 41 and the elastic spring 43 is seated in the seating groove 42. The elastic spring 43 is formed in the same shape as the seating groove and has size and shape such that the outer surface of the spring fits to the seating groove, when the elastic spring 43 is pushed in the seating groove 42, or the elastic spring 43 may be slightly smaller than the seating groove 42 such that it is inserted not tightly in the seating groove 42. Further, it may be possible that the elastic spring 43 is formed slightly larger than the seating groove to be forcibly fitted in the seating groove 42 when the elastic spring is forcibly pushed in the seating groove 42 such that the elastic spring 42 and the elastic cap 41 can be combined and held, even without a specific combining member. A specific fixing member, such as an adhesive, may be used to more firmly hold the elastic spring in the seating groove.

[0027] Although the elastic spring is formed in a conical shape, it may be formed in any shape, such as a circular cone, a rectangular cone, and a polygonal cone, but the circular cone would be the most preferable. The reason that the spring is formed in a conical shape is because a cylindrical spring is limited in the compression distance because the upper and lower wound portions of the spring contact or hit against each other when the spring is compressed; however, the upper and lower wound portions of the conical spring do not interfere with each other even if the spring is maximally compressed, such that the spring can be maximally compressed until the upper and lower ends are positioned close to the same height, and the spring can be installed even if the space where the spring is installed has a small height. The wound portion of the spring is wound in a cylindrical or conical shape and implies one wound shape formed every time it is wound in manufacturing the spring; therefore, it a cylindrical spring is formed by winding ten times, it has ten wound portions.

[0028] The elastic cap 41 may be made of well-known elastic materials in a hexahedron or a cylinder and has the seating groove 42 where the elastic spring 43 is seated, such that the elastic spring is seated therein.

[0029] The midsole is exemplified for the position of the inserted elastic cap in FIG. 3, but the elastic cap 41 is not necessarily inserted in the midsole and a space 31 may be formed in the insole 20 or the outsole 50, if necessary, in a depth for inserting the elastic cap 41. Further, the space 31 and the elastic cap 41 are formed to face down, but a space may be formed to insert the elastic cap 41 upside down from above and the elastic cap 41 may be installed with the top and bottom exposed by boring the insole, midsole, or outsole where the space 31 is formed. Further, a plurality of spaces 31 may be formed to install a plurality of elastic caps 41 with the elastic spring 43 in the bottom of the shoe.

[0030] Meanwhile, support plates slight wider than the elastic cap 41 may be attached to the top and bottom of the elastic cap 41 such that the load is uniformly distributed in the wide area. Further, when the conical spring fitted in the elastic cap is embedded in the bottom of the shoe, it is preferable that a transparent window made of a transparent material may be partially formed such that the spring can be seen from the outside.

[0031] In the shoe with the embedded conical spring 43 fitted in the elastic cap 41, as described above, the elastic spring 43 and the elastic cap 41 are simultaneously compressed when load from the foot or shock is applied, and they are simultaneously restored. Therefore, the restoring force and restoring speed are more excellent than block-shaped elastic bodies and the elastic cap 41 prevents the elastic spring 43 from shaking, such that it is possible to improve wearing sensation. Further, the elastic cap 41 and the elastic spring 43 simultaneously receive the load, deform in the same expansion and contraction amount, and carry the load, even if strong shock or load is applied, such that it is possible to achieve the same shock-absorbing performance as a large-capacity spring, with a small-capacity spring.

[0032] FIG. 4 shows a shoe according to another embodiment of the present invention. In the shoe shown in FIG. 4, the elastic cap 41 is not specifically installed, while the insole 20, midsole 30, or outsole 50 functions as the elastic cap. The shoe has conical seating portions 22, 32 to insert the spring 43 in the insole, midsole, or outsole, which functions as the elastic cap 41, and the elastic spring 43 is inserted in the seating portions 22, 32. Further, the seating portions 22, 32 may be selectively formed in the insole, midsole, or outsole, the elastic springs 43 may be installed in a plurality of seating portions 22, 32, and the transparent window 51 made of a transparent material may be partially formed such that the spring can be seen from the outside. Further, it is possible to uniformly distribute the load applied to the spring in a wide area by attaching support plates slightly wider than the seating portions 22, 32 to the top and bottom where the elastic spring 43 is installed. Since the elastic spring 43 is also compressed and restored with the other portions around the seating portions 22, 32 for the elastic spring in the embodiment described above, the restoring force and restoring speed are more excellent than insoles or midsoles which are made of only an elastic body, and the elastic bodies prevent the elastic spring from shaking, such that the wearing sensation of the shoe is improved.

[0033] In the embodiments described above, when the elastic body is formed by inserting the elastic spring in the elastic cap 41, or the seating portions 22, 32 of the insole, midsole, or outsole which functions as the elastic cap, the elastic cap and the elastic spring simultaneously receive the load and deform in the same expansion and contraction amount, even if strong shock or load is applied, such that it is possible to achieve the same shock-absorbing performance as a large spring, with a small spring, as compared with when only an elastic spring is installed, and smooth shock-absorbing becomes possible due to the operation of the spring with excellent restoring force and restoring speed, as compared with when only an elastic body is installed. Further, a specific member for fixing the spring is not needed and the parts can be simply assembled without a specific work for accurately adjusting the position of the spring in manufacturing, such that it is possible to easily manufacture the shoe with a simple configuration.

[0034] Meanwhile, when the elastic spring 43 is embedded in the seating grooves 22, 32, 42, as described above, the spaces in the seating grooves 22, 32, 42 are filled with air and all of the sides are sealed to function as an air cushion in compression, such that it is required to discharge the compressed air therein to the outside in compression to achieve more smooth elastic operation. FIG. 5 shows the configuration, in which an air channel 34 for discharging the air from the seating grooves 22, 32, 42 is formed to discharge the air into or outside the shoe. When the elastic cap 41 is fitted on the elastic spring 43, an individual air channel connected with the air channel 34 may be formed in the elastic cap 41; however, a channel for air flow which is connected to the bottom of the seating groove 22, 32, 42 is separately formed such that the air is discharged through the bottom of the seating groove 42 in order to prevent the elastic performance from decreasing by means of installation of the air channel in the elastic cap 41.

[0035] FIG. 5B shows when a connection groove 52 is formed on the outsole such that the seating grooves 22, 32, 42 formed in the midsole can be connected with the air channel 34. Since the connection groove 52 is formed on the outsole 50 to be connected with the bottom of the midsole, it functions as a connection channel that connects the air channel 34 formed in the midsole with the spaces in the seating grooves 22, 32, 42, and when the elastic cap 41 is installed, it does not need to form a specific connection hole in the elastic cap 41, such that it is possible to allow the air from flowing without reducing the elastic performance of the elastic cap 41.

[0036] The air channel 34 functions as an intake channel of air when the seating groove 42 compressed is restored, in addition to the exhaust channel of air, and the air channel 34 is connected with the inside of the shoe where the sole of a foot is positioned by an air hole 36 and contributes to air flow, such that it can be expected to remove moisture or smell. Further, it is possible to continuously supply fresh air into the shoe by forming a specific air channel connecting the outside of the shoe with the seating grooves 22, 32, 42, in addition to the air channel connected with the inside of the shoe, and installing a check valve in the air channels such that air can be supplied or discharged only in one direction in the shoe, when the air is pumped by expansion and contraction of the seating grooves.

[0037] FIGS. 6 and 7 show other embodiments including an elastic member according to the present invention. The embodiments are used for shoes with heels, such as men's shoes and high-heeled shoes).

[0038] Referring to FIG. 6, a communicating space 61 that communicates with the upper and lower portions is formed in the heel of a men's shoe. The communicating space 61 is open to communicate with the bottom and the top of the heel and an insole 20' covers the top of the communicating space 61. In this embodiment, the elastic member of the present invention is positioned on the top of the communicating space 61, and the elastic member and the insole are in direct contact in FIG. 6 in order for the wearer to feel the elastic member with the sole of a foot. Meanwhile, it is possible to close the top of the communicating space 61, with the elastic member inserted, in order to structurally separate the elastic member from the insole 20'.

[0039] A step is formed in the communicating space 61 to hold a support plate 63 of a sub-heel 62 and the sub-heel 62 is inserted in the lower portion of the communicating space 61 to move in/out from the bottom of the heel of the shoe. The support plate 63 wider than the sub-heel is disposed on the top of the sub-heel 62 to be held on the step. The elastic member according to the present invention is disposed on the support plate 63 of the sub-heel 62. The elastic member includes an elastic cap 41 made of a material that is more elastic than the heel 60, and a conical spring 43 inserted in a conical seating groove 42 formed in the elastic cap 41.

[0040] Meanwhile, it is preferable to form an air hole in the insole 20' to allow air to flow in the communicating space 61. Further, it is preferable to firmly fix the insole 20' on the outsole 50' and the heel 60' of the shoe with an adhesive, with the elastic cover covered, because the insole 20' should be fixed to be able to receive the elastic force of the elastic member.

[0041] When a wearer walks with the shoes according to the embodiment on, the sub-heel 62 comes in contact to the ground and moves inside, such that as the sub-heel 62 moves inside, the elastic member of the present invention is compressed between the sub-heel 62 and the sole of the foot of the wearer. Further, when the sub-heel 62 gets off the ground, the compressed elastic member pushes the sub-heel 62, such that the sub-heel 62 protrudes outside again. It is possible to absorb shock in walking by the in-out movement of the sub-heel 62 and the elastic operation of the elastic member.

[0042] On the other hand, FIG. 7 shows a structure in which the elastic member according to the present invention is inserted in a high-heeled shoe. The high-heeled shown in FIG. 7 is different only in the type from the men's shoe shown

in FIG. 6 and the structure and operation are substantially the same as those of the structure shown in FIG. 6.

[0043] The embodiments described above are examples of the spirit of the present invention and it should be understood that various modifications can be achieved by those skilled in the art within the spirit of the present invention.

[Industrial Applicability]

[0044] The present invention described above can be widely used in manufacturing shoes, because an elastic member formed by combining a block-shaped elastic body with a conical spring in the bottom of the shoes to improve elastic performance and make it easy to manufacture the shoes.

Claims

1. A shoe with an elastic member in the bottom, wherein the elastic member includes an elastic cap 41 made of a material that is more elastic than the other portions around where the elastic cap is installed, a conical seating groove 42 that is formed in the elastic cap 41, and a spring that is formed separately from the elastic cap 41 in a conical shape the same as the conical shape of the seating groove 42 and inserted in the seating groove 42 of the elastic cap 41.

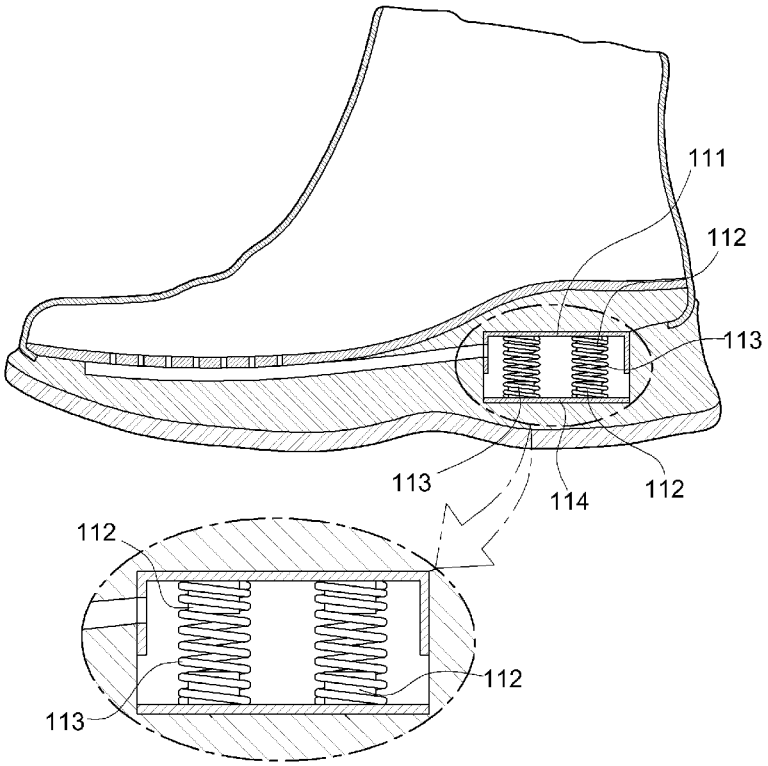
2. The shoe with an elastic member according to claim 1, wherein the shoe is a shoe with a heel 60, the heel 61 has a space 61 therein, such that a sub-heel 62 that moves inward/outward from the bottom of the heel is inserted in the space 61 and the elastic member that is compressed by the sub-heel 62 is positioned on the sub-heel 62.

3. A shoe with an elastic member in the bottom, wherein the elastic member includes conical seating grooves 22, 32 formed in any one of an insole, a midsole, and an outsole of the shoe, and a spring 43 formed in a conical shape the same as the conical shape of the seating grooves to be seated in the seating grooves 22, 32, and inserted in the seating grooves.

4. The shoe with an elastic member according to any one of claims 1 to 3, wherein an air channel 34 that connects the inside of the shoe where a fool is positioned, or the outside of the shoe with the seating grooves is formed in the bottom of the shoe.

5. The shoe with an elastic member according to any one of claims 1 to 3, wherein a transparent window 51 is formed such that the spring in the seating grooves is seen from the outside of the shoe.

[Fig. 1]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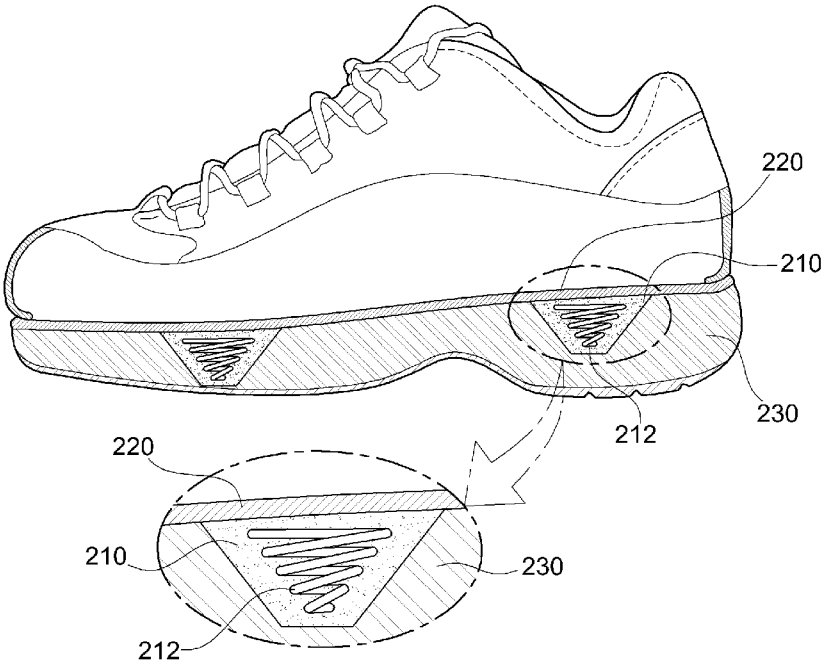
[Fig. 2]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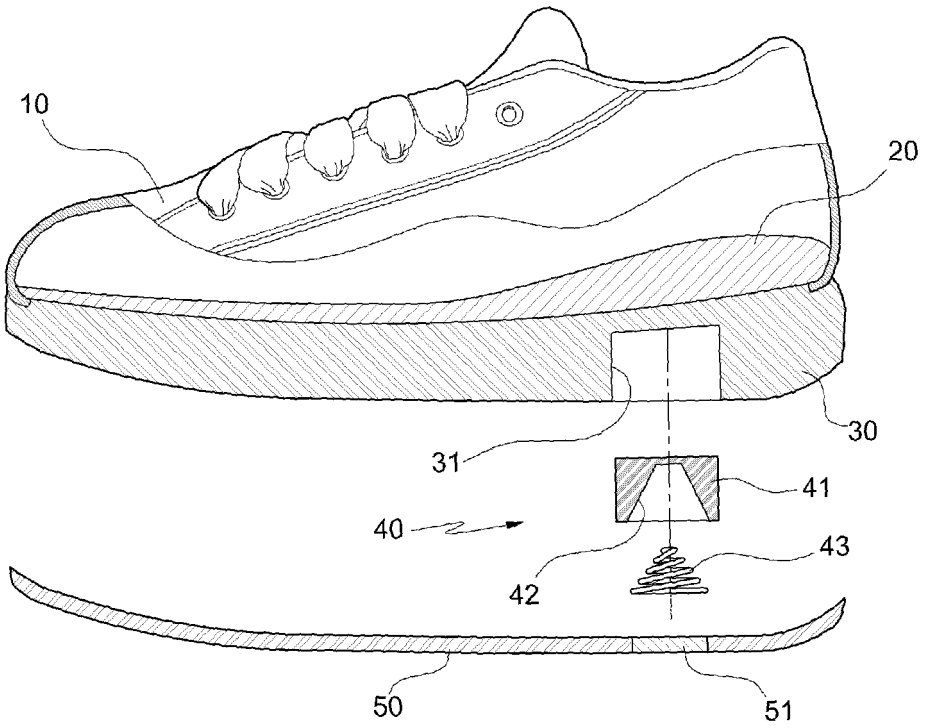
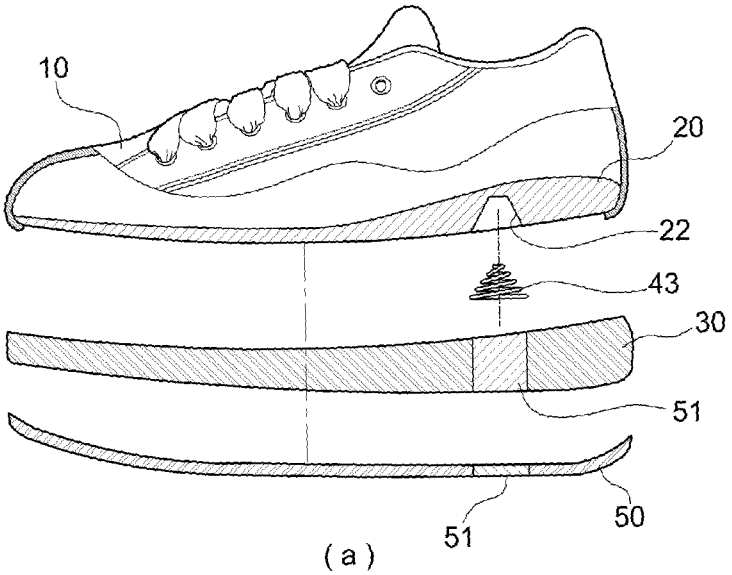
[Fig. 3]



[Fig. 4]



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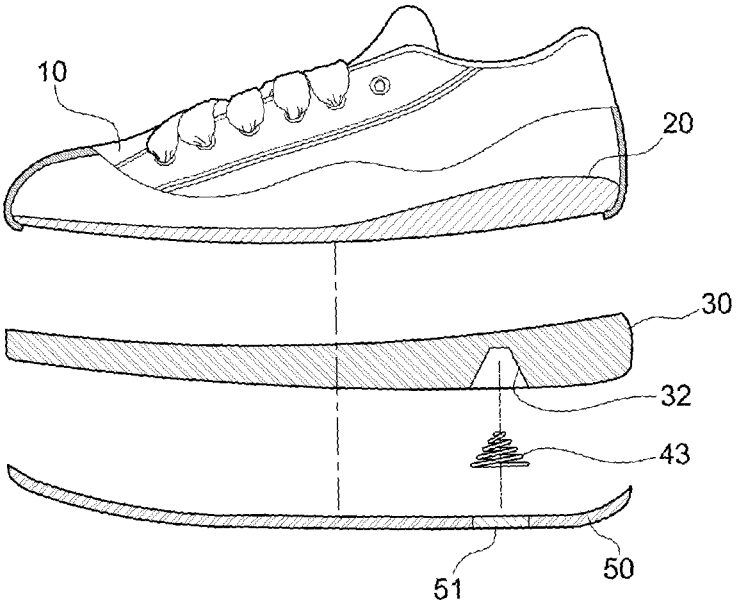
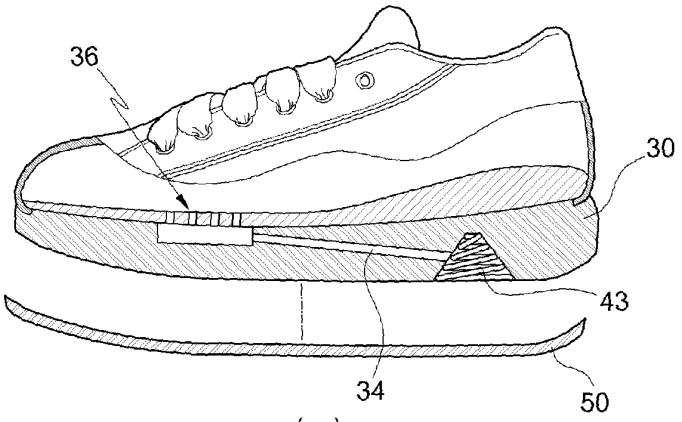


(b)

[Fig. 5]



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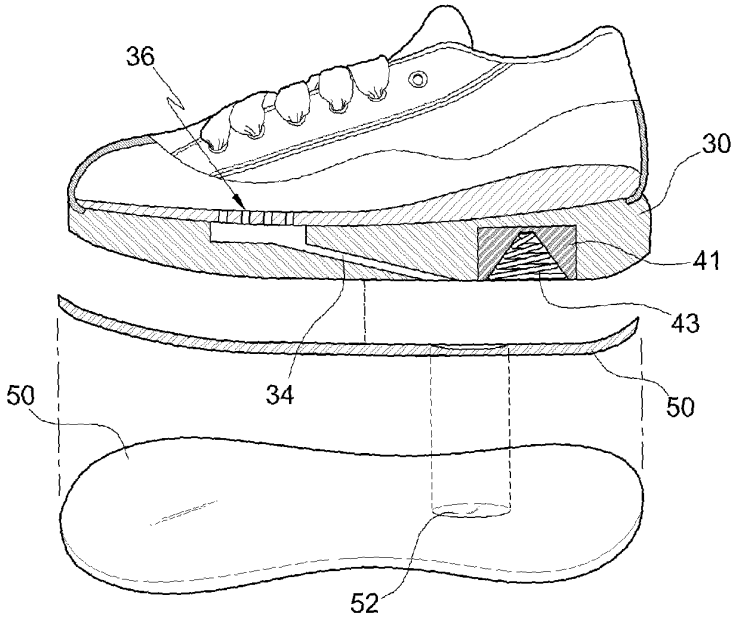

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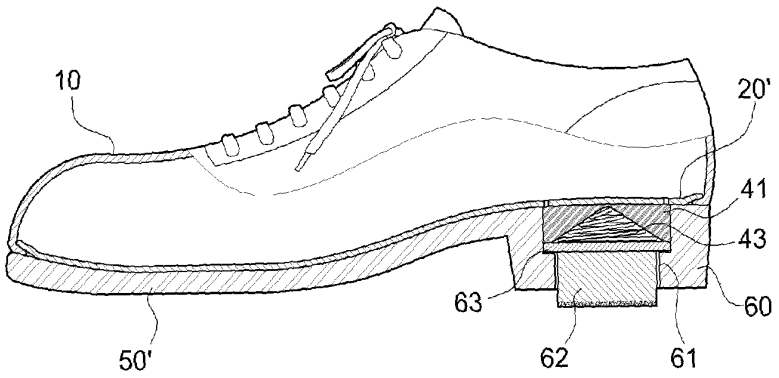
[Fig. 6]



[Fig. 7]