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(54) Footwear.

(57) The invention relates to footwear. The invention has for its purpose to design footwear of different types, such as walking shoes, boots, sport shoes and the like in such a way that the footwear dependent upon the situation and, if desired, controlled by the user, can produce signals that can be perceived by other persons. As an example reference is made to the use of sport shoes by a sportsman in twilight or darkness. In this situation it may be important, if his sport shoes e.g. at the rear side, can produce light that may have a varying position and/or intensity. Also an acoustic signalling is possible.

In order to realize the above purpose the invention provides footwear which is characterized by electrically energizable signal means, and
a source for electric energy for powering said signal means.

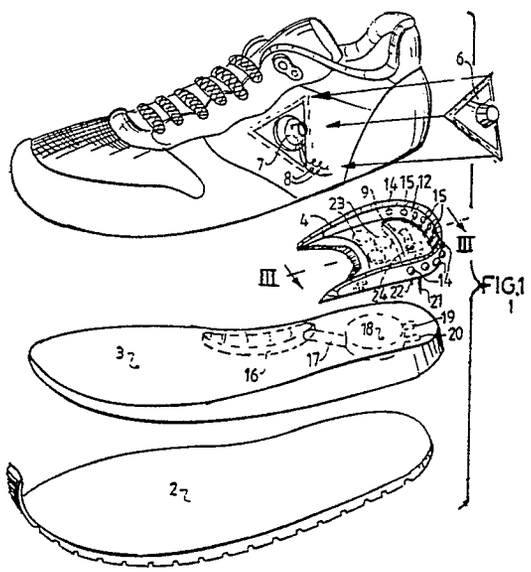


FIG.1

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Footwear

The invention relates to footwear. The invention has for its purpose to design footwear of different types, such as walking shoes, boots, sport shoes and the like in such a way that the footwear dependent upon the situation and, if desired, controlled by the user, can produce signals that can be perceived by other persons. As an example reference is made to the use of sport shoes by a sportsman in twilight or darkness. In this situation it may be important, if his sport shoes e.g. at the rear side, can produce light that may have a varying position and/or intensity. Also an acoustic signalling is possible.

In order to realize the above purpose the invention provides footwear which is characterized by electrically energizable signal means, and
a source for electric energy for powering said signal means.

In general one will give preference to an embodiment having control means connected between the source and the signal means for controlling the energization of the signal means.

The signal means can be adapted for producing sound and/or light.

In order to make the signalling by the footwear for third persons as clear as possible an embodiment may be used, in which the signal means comprise a plurality of signal elements and the control means are adapted for successively energizing the signal elements individually or groupwise. In case of loudspeakers e.g. use may be made of varying density and pitch, if desired intermitting. In case of light producing signal means, such as LEDs, these means may produce different colours and be controlled successively intermittently.

In order to use the available space as efficient as possible that embodiment may serve, in which the control means comprise an electronic assembly embedded in the sole of the footwear. In order to load the energy source as little as possible that embodiment is preferred, in which the control means comprise an on/off-switch.

In this last case e.g. use may be made of a pressure sensitive switch arranged in the soul of the footwear.

A very simple embodiment is that in which the source for electrical energy comprise a battery. Also, or if desired in combination therewith, an embodiment may serve, in which the source for electrical energy comprises a solar cell.

A solar cell can during the use by daylight serve for charging a rechargeable battery.

Also use may be made of a separate assembly to be fixed to footwear and provided with electrically energizable signal means and a source for electrical energy for energizing these signal means. Such an assembly is provided with fixing means for fixing to the footwear and may serve for assembling the footwear herein described before according to the invention.

The invention will now be explained with reference to the accompanying drawing of a number of embodiments. In the drawing:

Figure 1 is an exploded view of a sport shoe according to the invention;

Figure 2 is a perspective view of the shoe according to figure 1;

Figure 3 is the section III/III according to figure 1;

Figure 4 is a view of an alternative embodiment corresponding with figure 2;

Figure 5 is a limited exploded view of some parts in the same view as figure 1; and

Figure 6 a block-schematic diagram of the electric parts of the embodiments according to figures 4 and 5.

Figures 1 and 2 show a sport shoe 1. This shoe comprises a sole 2, a resilient intermediate layer 3, a more or less tray-shaped heel-part 4 and a textile envelope 5. The envelope 5 carries a loudspeaker 7 covered by a hood 6, said loudspeaker 7 by means of wires 8 being connected with a printed circuit board 9 fixed in the tray-shaped heel part 4.

As appears from figure 3 the heel-part 4 is at its lower side provided of four recessed parts 10, in which button-shapes batteries can be received. Through a through-hole 11 these batteries may be connected with the electronic circuit arranged on the printed circuit board 9.

The heel-part 4 also comprises, in its vertical wall 12, nine through-holes 13 for receiving LEDs. These LEDs are alternately coloured red and green. The red-coloured LEDs are for the sake of convenience all indicated with 14, whilst the green LEDs are indicated with 15.

In the resilient layer 3 an air reservoir 16 is arranged, which connects by means of a pressure conduit 17 with a pressure sensitive switch 18. The external connections 19, 20 of this pressure sensitive switch 18 are in the assembled condition of the shoe 1 connected with the printed circuit board 9 by means of pointed conductors 21, 22 sticked into the layer 3.

Four batteries 23 received in the recesses 10 serve for powering of the electronic circuit 24 carried by the printed circuit board 9.

When a wearer of the shoe 1 pushes with his

weight on the resilient layer 3, as a result of the compression of the air present in the air reservoir 16 switch 18 will be closed. Through the connections 19, 20 and the pointed conductors 21, 22 by means of the batteries 23 energization of the circuit 24 takes place. As a result hereof the loudspeaker 7 can produce an amplified sound generated by an oscillator, giving a constant, or, if desired, varying pitch, a mixture of different tones and/or intermittent sound. Also LEDs 14, 15 can be caused to emit light by operation of the circuit 24, as will be hereinafter described with reference to figure 6.

Figure 4 shows a shoe 25 having a compartment 26 for receiving an elongate battery 27. This compartment 26 can be closed by means of a zipper 28. In this embodiment the loudspeaker 7 is missing, but exclusively use is made of LEDs 14, 15.

Figure 5 shows a resilient layer 29 of an alternative embodiment. This resilient layer exhibits a recess 30 for receiving two elongate batteries 31. At the end of the more or less half-cylindrical recess 30 resilient conduction plates 32, 33 are arranged, which are connected to terminals 19, 20 by means of the wires 34, 35 embedded in layer 29.

The heel-part 36 in the embodiment according to figure 5 is different from the heel-part 4 according to figures 1, 2 and 3, as the recesses 10 are missing and an hand-operated on/off-switch 37 is present, which is arranged in the vertical wall 12 of the heel-part 36.

Figure 6 shows a block-schematic diagram of the circuit used in the embodiments according to figures 4 and 5. Through the wires 34, 35 the two elongate batteries 31 can supply current to a control assembly drawn as a turning switch 38, with which the first terminals of LEDs 14, 15 are connected, whilst the second terminals thereof are connected with batteries 31 through wire 35.

As soon as a trigger unit 39 receives current from batteries 31 as a result of the closing of the switch 37, a first mono-stable multivibrator 40 is energized, which in this temporary energizing condition closes a second switch 41, in such a way that during a time interval determined by multivibrator 40 the switch 41 remains in its closed condition, so that through turning switch 38 LEDs 14, 15 can receive current. Trigger unit 39 also controls a second mono-stable multivibrator 42 having an active period such that controlled by turning switch 38 the multivibrator 42 controls this turning switch 38 during exactly one full cycle of the movable contact 43. In the condition shown the movable contact is in its rest position. As soon as the second multivibrator 42 controls switch 38 the movable contact 43 moves with a previously determined speed in the direction indicated with an arrow 44 along the nine contacts connected with the LEDs 14, 15 in the manner shown in figure 6. If consequently for the sake of convenience the LEDs are referred to with 1, 2, 3, 4, 5, 6, 7, 8, 9 from the lower one to the upper one, then the order in which the LEDs are energized is: 5, 6, 4, 7, 3, 8, 2, 9, 1. After this full cycle, dependent upon the adjustment of the mono-stable multivibrator 42, either the cycle is stopped, or one additional full cycle may be performed. From the rear side a spectator then sees a flickering bright light moving towards the sides of the shoe, the light having the following successive colours: red, green, green, red, red, green, green, red, red.

It will be clear that many other configurations are possible within the framework of the invention. It should be noted that in case of shoes in which Velcro is used as fastening, this Velcro can also comprise switch means or control such means, as a result of which only in case of fastened Velcro the circuit is activated.

The assembly 38 is an active switching assembly, that may comprise integrated circuits.

Finally it should be noted that application of the footwear according to the invention is not limited to safety-footwear, but that an acoustical and/or optical signalling can also serve aesthetic purposes.

Claims

1. Footwear, characterized by
electrically energizable signal means, and
a source for electric energy for powering said signal means.

2. Footwear according to claim 1, characterized by control means connected between the source and the signal means for controlling the energization of the signal means.

3. Footwear according to claim 1, characterized in that the signal means are adapted to produce sound.

4. Footwear according to claim 1, characterized in that the signal means are adapted to produce light.

5. Footwear according to claim 2, characterized in that the signal means comprise a plurality of signal elements and the control means being adapted for successively, individuelly or groupwise, energizing the signal elements.

6. Footwear according to claim 5, characterized in that the signal means comprise a plurality of lamps, such as LEDs, arranged in a selected pattern.

7. Footwear according to claim 6, characterized in that the lamps are adapted to produce light of different colours.

8. Footwear according to claim 6, characterized by a plurality of lamps arranged at the rear end of the footwear.

9. Footwear according to claim 2, characterized in that the control means comprise an electronic assembly embedded in the sole of the footwear.

10. Footwear according to claim 2, characterized in that the control means comprise an on/off-switch.

11. Footwear according to claim 10, characterized by a pressure sensitive switch arranged in the sole of the footwear.

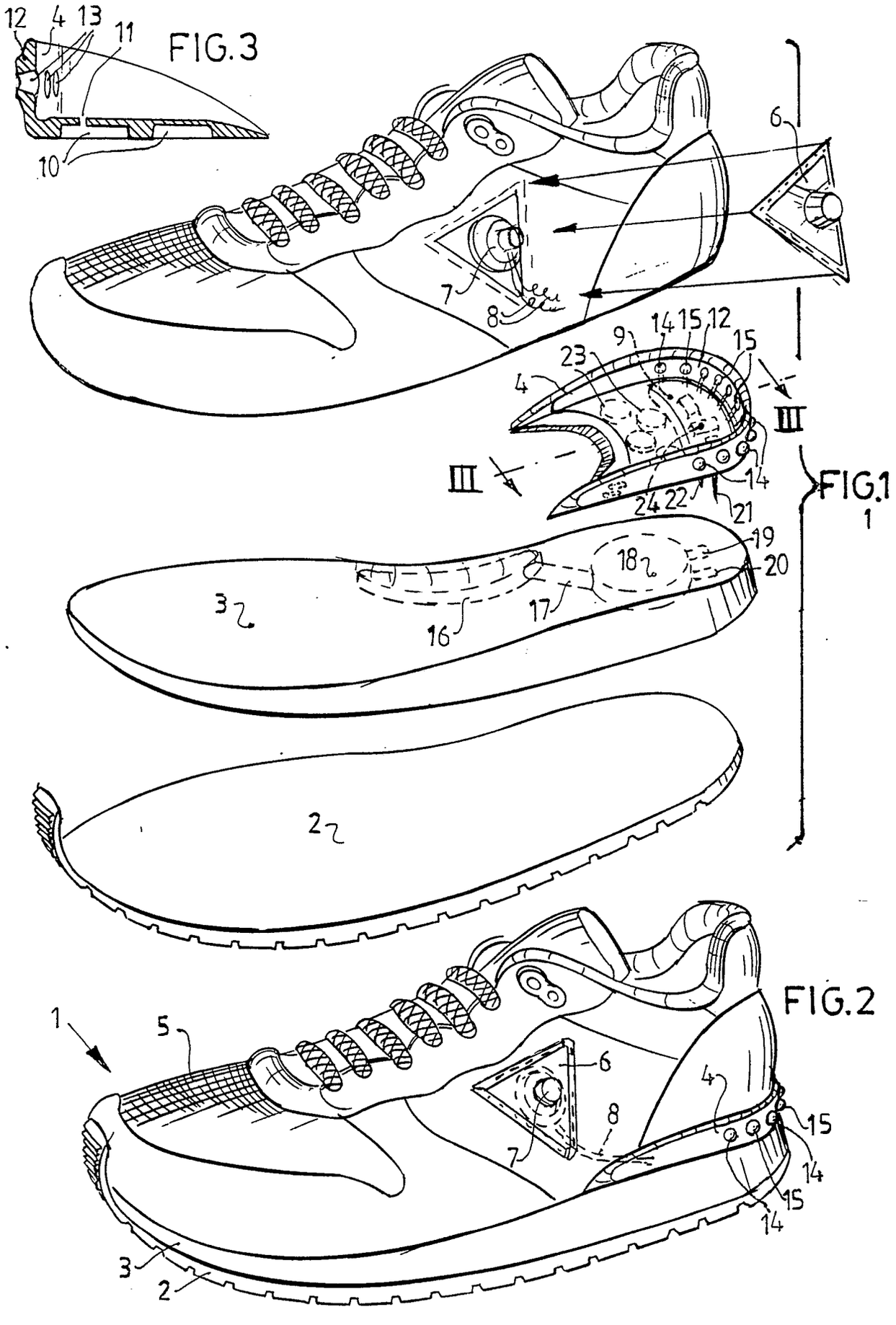


FIG.3

FIG.1

FIG.2

FIG.4

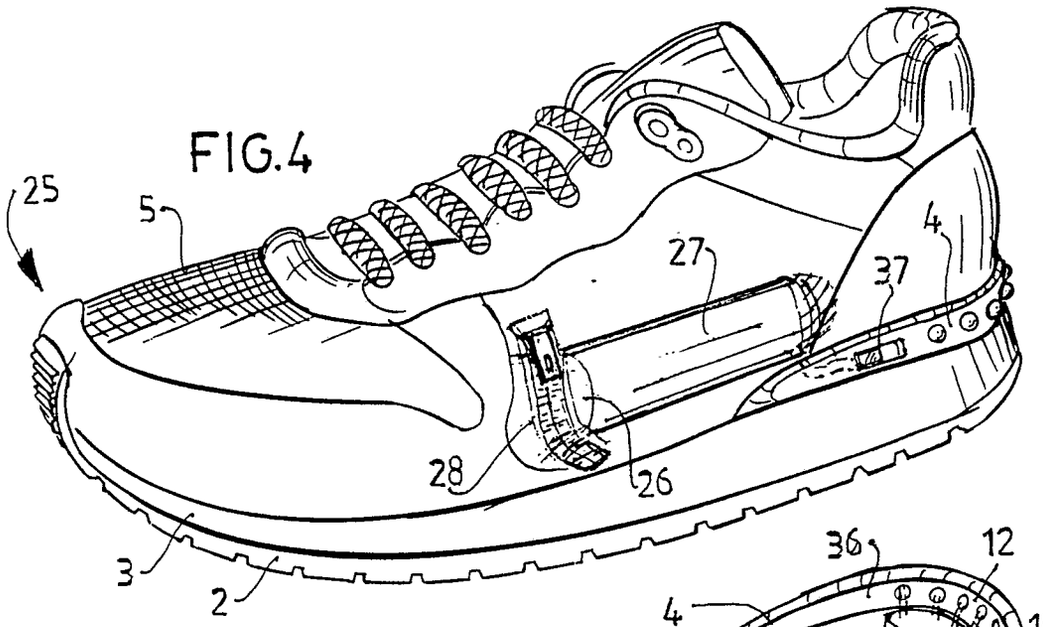


FIG.5

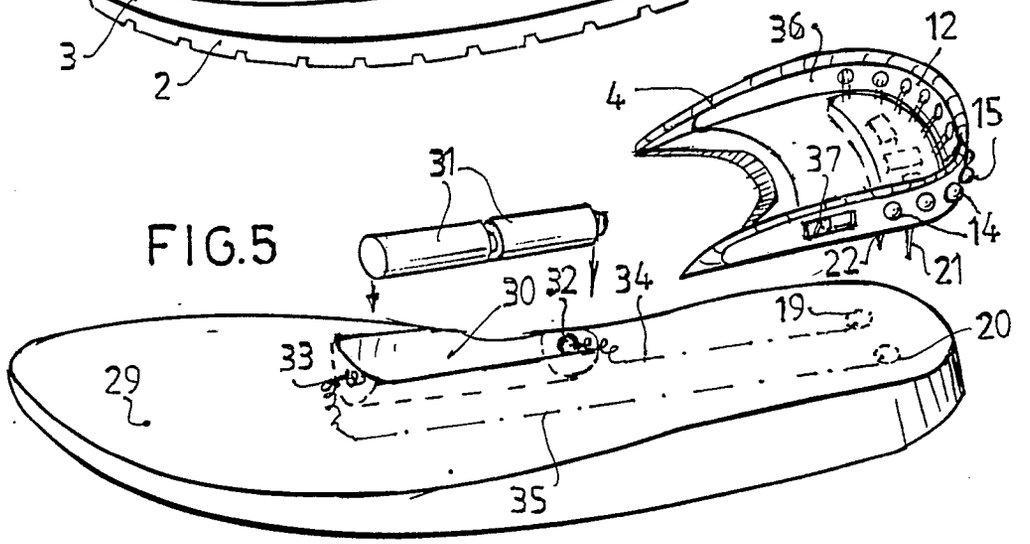
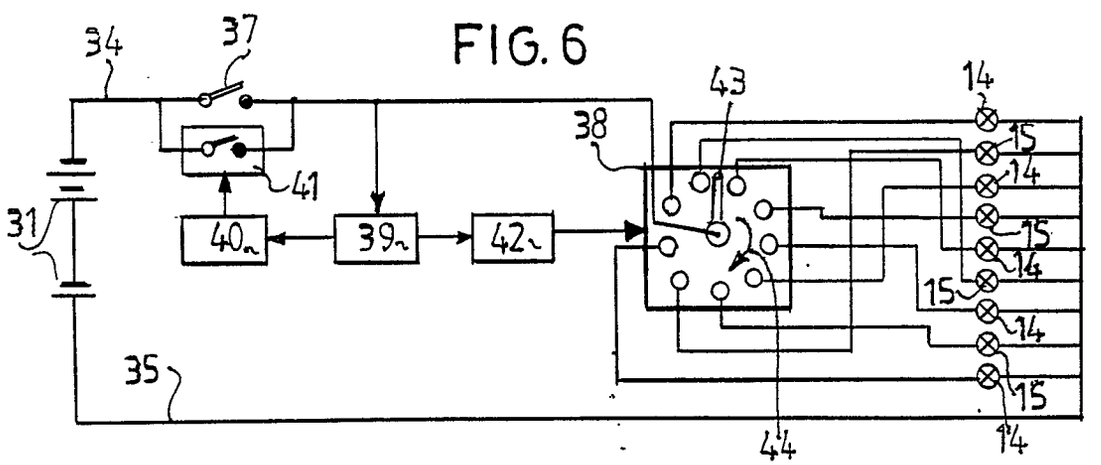


FIG.6



European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 20 0784

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	EP-A-0 121 026 (A. DANA)	1-11	A 43 B 3/00
X	GB-A-2 121 219 (CHYUAN-JONG WU)	1-11	
X	NL-A-8 005 050 (J. DE NIJS)	1-11	
A	US-A-4 020 572 (G. CHIARAMONTE)	1	
A	US-A-3 893 247 (A. DANA)	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

A 43 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	07-06-1989	DECLERCK J.T.

CATEGORY OF CITED DOCUMENTS

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