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C. COONEY

BOOT AND SHOE HAVING INFLATED AIR CUSHION INSERTED IN THE SOLE AND HEEL THEREOF

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Fig. 1.

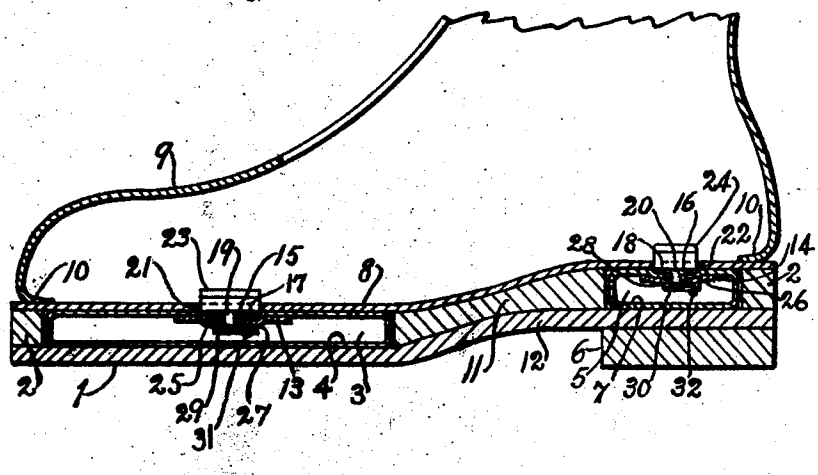
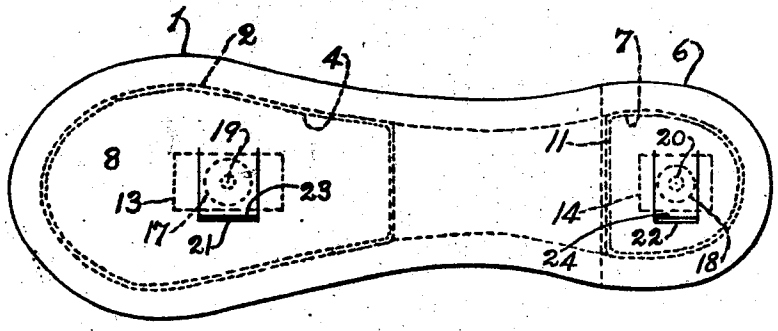


Fig. 2.



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CHARLES COONEY, OF DUBLIN, IRELAND.

BOOT AND SHOE HAVING INFLATED AIR CUSHION INSERTED IN THE SOLE AND HEEL THEREOF.

Application filed August 21, 1922. Serial No. 583,301.

To all whom it may concern:

Be it known that I, CHARLES COONEY, a subject of the King of Great Britain, residing at 1 Metcalfe Terrace, Harolds Cross, Dublin Co., Dublin, Ireland, have invented certain new and useful Improvements in Boots and Shoes Having Inflated Air Cushions Inserted in the Soles and Heels Thereof, of which the following is a specification.

This invention relates to boots and shoes having inflated air cushions inserted in the soles and heels thereof, the objects being to make walking easier and more comfortable, to reduce foot fatigue by absorbing the shocks hitherto experienced in non-inflated soles and heels and to enable boots and shoes to be made lighter in weight and to wear longer owing to minimum shocks on the tread surfaces of said soles and heels; and the invention may be worn in the form of overshoes, if desired.

The invention broadly consists in boots and shoes having inflated air cushions in the soles and heels thereof. For this purpose, a compartment is formed inside the sole and inside the heel to receive in each case said inflatable air cushion or chamber; and over these air cushions or chambers there is positioned a thin flexible insole bearing on top of each air cushion or chamber so that when in use the pneumatic effect is imparted to the heel and the sole of the foot of the wearer. Between each inflated air cushion aforesaid there is an intermediate and resilient member adapted to form an arched support for the arch of the foot of the wearer, this resilient member being also covered by said thin flexible insole, and so forming a comfortable and resilient and waterproof support for the foot arch without interfering with the functioning of the inflated air cushions aforesaid. Means are also provided for inflating the air cushions or chambers in situ, means being also provided for inserting these air cushions or chambers into their respective compartments and for withdrawing them from their respective compartments.

My said invention is more fully described hereinafter and an example of its application is illustrated in the accompanying explanatory drawing in which Fig. 1 shows a longitudinal sectional elevation of the invention as applied to a boot or shoe or overshoe in which closing flaps are shown in their partly raised positions for the sake of clearness. Fig. 2 shows a plan view of Fig. 1 with the upper removed.

The sole 1 is bounded by a raised border 2 which serves to form a compartment 3 inside the sole 1, to receive an inflatable air cushion or chamber 4; and which similarly serves to form a compartment 5 inside the heel 6 for receiving an inflatable air cushion or chamber 7. Over the air chambers 4 and 7 there is positioned a thin flexible insole 8 which is secured to the top of the border 2 by sewing or nailing thereto, and in turn the upper 9 is turned in in the usual manner at the last 10 and is firmly secured in any known and approved manner to the insole 8, to the border 2 and to the sole 1; but before this operation is performed the resilient member 11 is inserted as an intermediate member between the compartments 3 and 5 and may be nailed or sewn or stuck on to the arched portion 12 of the sole so forming an arched support for the arch of the foot, the resilient or rubber member 11 being also covered by the thin flexible insole 8. The means for inflating the air chambers 4 and 7 in situ, consist of stiffening reinforcement plates 13 and 14 respectively each provided with air pump attachments 15 and 16 respectively attached to each respective air chamber 4 and 7 by screwing into the respective plates 13 and 14, the attachments or nipples 15 and 16 being provided with washers 17 and 18 screwed or riveted thereto and superimposed on the respective air cushions 4 and 7 to make an air-tight junction. The nipples 15 and 16 are internally bored and threaded at 19 and 20 to receive the nozzle end of an air pump for pumping up the air chambers 4 and 7. The plates 13 and 14 form bridge-pieces as more fully set forth hereinafter. In the insole 8 there is an opening 21 for insertion of withdrawal of the air chamber 4, and another opening 22 for insertion or withdrawal of the air chamber 7, the openings 21 and 22 being flap-closed by respective flaps 23 and 24 which for the sake of clearness are shown partly opened in Fig. 1 but which normally lie level or flush with the top of the insole 8 out of which they are formed integral by slitting out of the

insole 8 as shown in Fig. 2. The openings 21 and 22 are bridged on their undersides by means of the respective bridge-pieces 13 and 14 and thus upward displacement of the air chambers 4 and 7 through the openings 21 and 22 is prevented when under air pressure. The bridge-pieces 13 and 14 are indented at 25 and 26 directly under corresponding flaps 23 and 24 so as to allow the latter to lie flat and fill in the openings 21 and 22. The bridge-pieces 13 and 14 are each provided with a flap-closing valve 27 and 28 respectively, preferably formed out of rubber and preferably backed by means of a thin spring steel plate 29 and 30 respectively, the whole being suitably secured to the respective plates 13 and 14 by means of rivets 31 and 32, the steel plates 29 and 30 tending to keep each valve closed over the respective openings at 19 and 20 while permitting of temporary valve displacement on each stroke of the air pump. Any other suitable type of valve might be used if found convenient. The air chambers 4 and 7 are formed out of rubber or other suitable flexible material; and in operation the flaps 23 and 24 are raised up and the air cushions 4 and 7 are inserted through the openings 21 and 22 into the respective compartments 3 and 5, the plates or bridge-pieces 13 and 14 being inserted at the top portion of each respective air chamber directly under and straddling the openings 21 and 22. A suitable air pump is now connected in turn to the respective nipples at 19 and 20 and air is pumped into each air chamber until the insole 8 is under pressure or slightly raised when the air pump is disconnected. The footwear is now ready to be worn and might be provided with the known kind of insole over the insole 8, if desired. The sole 1, the border 2, the heel 6, the arch 12, the insole 8 and the upper 9 may be manufactured out of leather, or other suitable material might be used. In addition to the advantages of my invention, as already enumerated, the air chambers 4 and 7 will prevent damp or water from reaching the foot of the wearer through the sole 1, and on account of the air spaces will act as non-conductors of heat and will thus serve to preserve the normal temperature of the feet of the wearer even under cold weather conditions. Another advantage of my invention is that in case the footwear happens to be somewhat too large or too small in the vertical plane dimensions when under air pressure, the air pressure may be increased or decreased to arrive at the most comfortable size of footwear to suit the wearer, something which cannot be accomplished with ordinary footwear without the addition of one or more insoles or their subtraction if already fitted.

Having described my invention, I claim:—

1. A boot or shoe having a compartment inside its sole, in said compartment an inflatable air cushion, a compartment inside said heel, in the last stated compartment an inflatable air cushion, and over said air cushions a thin flexible insole attached to the sole proper and to the shoe, spaced between said inflatable air cushions an intermediate and resilient member under said flexible insole and forming an arched support for the arch of the foot, means to permit inflating said inflatable air cushions in situ, consisting of a stiffening reinforcement plate attached to each inflatable air cushion and being provided with an air pump attachment, said reinforcement plate being adapted to form a bridge-piece under said insole, and means to permit said inflatable air cushions into their respective compartments and withdrawal therefrom, consisting of a flap-closed opening in said flexible insole over each compartment aforesaid, each opening aforesaid being bridged on its underside by means of a bridge-piece aforesaid and so preventing displacement of said inflatable air cushions through each respective opening in said insole when under air pressure.

2. A boot or shoe having a compartment inside its sole, in said compartment an inflatable air cushion, a compartment inside said heel, in the last stated compartment an inflatable air cushion, and over said air cushions a thin flexible insole attached to the sole proper and to the shoe, spaced between said inflatable air cushions an intermediate and resilient member under said flexible insole and forming an arched support for the arch of the foot, means to permit inflating said inflatable air cushions in situ, consisting of a stiffening reinforcement plate attached to each inflatable air cushion and being provided with an air pump attachment, said reinforcement plate being adapted to form a bridge-piece under said insole, and means to permit said inflatable air cushions into their respective compartments and withdrawal therefrom, consisting of a flap-closed opening in said flexible insole over each compartment aforesaid, each opening aforesaid being bridged on its underside by means of a bridge-piece aforesaid and so preventing displacement of said inflatable air cushions through each respective opening in said insole when under air pressure, in each bridge-piece aforesaid an indent directly under its corresponding flap aforesaid, on the under side of each bridge-piece aforesaid a flap-closing valve.

Signed by me this 9th day of August, 1922.

CHARLES COONEY.

Witnesses:

W. E. DOYLE,

O. M. MCCRYSTAL.