THE JOINT EXAMINATION BOARD

PAPER P4

AMENDMENT OF SPECIFICATIONS FOR UNITED KINGDOM PATENTS
IN REVOCATION PROCEEDINGS

22nd April, 1993

10.00 a.m. - 1.00 p.m.

Please read the following instructions carefully. This is a THREE HOUR paper.

1. In the appropriate boxes at the top of each sheet please enter the designation of the paper, the question number, and your Examination number. Write on one side of the paper only using BLACK ink. You must NOT staple pages together. You must NOT state your name anywhere in the answers.

2. NO printed matter or other written material may be taken into the examination room.

3. Answers MUST be legible. If the examiners cannot read a candidate's answer no marks will be awarded.

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AMENDMENT OF SPECIFICATIONS FOR UNITED KINGDOM PATENTS IN REVOCATION PROCEEDINGS

22nd April, 1993

10.00 a.m. - 1.00 p.m.

This paper comprises:

1. Instructions to candidates (1 page).

2. Specification of the application consisting of the description and claims (5 pages) and drawings (2 pages).

3. Official Letter (2 pages).

4. Letter from client regarding Official Letter (1 page).

5. Prior art Document A (1 page of text and one sheet of drawings).

6. Prior art Document B (1 page).

7. Prior art Document C (1 page of text and one sheet of drawings).

8 Prior art Document D (2 pages of text and one sheet of drawings).

INSTRUCTIONS TO CANDIDATES

In this paper, you should assume that a UK patent application comprising the attached specification has been filed in the name of Fitness Freaks PLC and that the UK Patent Office has provided the attached Official Letter.

You should accept the facts given in the paper and base your answer upon these facts.

You should not make use of any special knowledge that you may have of the subject matter of the invention, but you are to assume that the prior art referred to is in fact exhaustive.

Your task is to prepare the following:-

a) a draft letter to the UK Patent Office in response to the attached Official Letter including amended claims, if appropriate; and

b) a memorandum consisting of notes to provide the basis of a communication of advice and comment to your client. These notes should be restricted to patent matters. You are not required to consider any other matters such as copyright or design protection.

You should bear in mind, when drafting your response, that the claims should afford the maximum valid protection that is available.

If your memorandum contains a suggestion that any one or more claims may need to be pursued in one or more divisional applications, you should draft such claim(s) and indicate, where appropriate, your grounds for considering the claim(s) to be acceptable as well as any objections that you foresee may be raised by the UK Patent Office. You need not, however, propose an introduction for any divisional application(s).

PLEASE NOTE THAT, FOR THE PURPOSES OF THIS EXAMINATION QUESTION, YOU ARE NOT REQUIRED TO PROPOSE ANY AMENDMENTS TO THE DESCRIPTION OF THE PATENT APPLICATION.

PATENT APPLICATION 9011111

Description

Jogging Shoe

This invention relates to a jogging shoe with an adjustable shock absorbing system for the heel impact surface thereof.

Although jogging has attained wide popular acceptance, there are medical and other personnel who regard jogging as less than beneficial. These people point out that jogging may be too strenuous an exercise for some people and, for others, the trauma to the body caused by the constant impact with hard surfaces normally found in city and suburban streets, can do serious damage to the human body.

The usual jogging style, as opposed to running and normal walking, normally results in the weight of the jogger landing on 20 or 25 square centimetres of the heel surface of the shoe. The impact force has been estimated at about three to four times the weight of the jogger, which acts on this small heel surface. Considering the fact that each heel impacts the ground about 800 times per mile, it is easy to see why joggers can suffer from various ailments associated with impact which must be absorbed by the bones and muscles.

A number of different styles of jogging shoe have evolved in an attempt to absorb or mitigate the impact received by the jogger's heel, especially when a jogger is running on concrete or tarmac surfaces normally encountered in urban and suburban jogging.

Sponge rubber material for use on the heel and sole of jogging shoes has been found generally inadequate in that it is too soft to provide adequate shock resistance. The harder materials such as nylon and high density rubber are too hard and transmit too much of the impact to the heel of the jogger. Often a combination of crepe and gum rubber are used in forming the sole of the jogger's shoe.

One popular style uses a crepe sole lined with a rubber bottom layer having solid gum rubber pegs disposed downwardly from the harder rubber layer. The rubber pegs provide some resilience and comfort for the jogger. The pegs usually extend over the full extent of the heel portion of the sole in order to provide longitudinal and lateral stability for the jogger.

According to our invention improved comfort can be obtained for the jogger by incorporating an inflatable air chamber in the sole of the shoe in combination with downwardly extending projections, similar to the rubber pegs of the prior art, the air chamber being impacted by the projections as the jogger runs.

The present invention therefore provides a jogging shoe having a shock absorbing system, said jogging shoe having an upper body

portion, an outer sole with heel and toe portions and an inner sole, in which said outer sole has an air chamber covering a major portion thereof and a plurality of downwardly extending projections disposed spaced apart from each other and extending from the sole of the shoe, the air chamber consisting of one or more compartments.

In a preferred embodiment the air pressure in the said air chamber can be adjusted by means of a valve. The valve is preferably of such a type that the air pressure can be adjusted by the user. This is advantageous since it allows the amount of shock absorption to be controlled by the user. In most prior art designs, in contrast, the amount of shock absorption built into the heel of a jogging shoe is controlled by the available materials and the design of the manufacturer. As a result, a lighter weight person having large feet may have to use a shoe designed to absorb the shock of a much heavier person, while a heavy weight person having small feet will have the opposite problem, assuming that the manufacturer of the shoe has used some logical design means to build different shock absorbing characteristics into their shoes. In any case, there is generally no provision for adjustment for control of the amount of shock absorption obtainable in any particular shoe, although the same shoe may be used by joggers of greatly varying weights on surfaces varying from concrete to dirt or grass.

Where a valve is included it is preferably formed through the heel or the side of the sole. It is preferably recessed to avoid accidental damage. The valve is a very important feature of the present invention since it allows different amounts of air, or other compressible fluid to be injected in the air chamber, or removed therefrom, depending on the amount of shock absorption necessary under the circumstances. Thus the weight of the jogger, the type of surface the jogger runs on, and to some extent, the jogger's style - that is the portion of the jogging shoe or the size of the area of the jogging shoe which contacts the running surface first for the particular jogger - can be accommodated.

Extra comfort may be provided, according to a preferred embodiment of the invention, by including hollow cavities in each of the downwardly extending projections. The air in the air chamber or compartment(s) thereof is preferably in communication with the air in each of the hollow cavities in the downwardly extending projections. In use, impact of the jogger's heel against the running surface is first absorbed by the relatively small area of the air in the hollow cavities in the downwardly extending projections, which are the first part of the shoe to contact the running surface. That air is compressed into the air chamber or compartment(s) thereof thereafter to be distributed across the extent of the chamber or compartment(s). If the impact is sufficiently great substantially to depress the downwardly extending projections, the air chamber itself or the compartment(s) themselves will partially compress to provide further shock absorption and to distribute the impact force. In this manner, a tremendous amount of shock impact can be absorbed and distributed by the shock absorbing system irrespective of the portion of the shoe heel which contacts the running surface

first. The downwardly extending projections containing air act, in this embodiment, as compressible air pumps.

In a preferred embodiment the air chamber is divided into smaller longitudinally spaced compartments. These are preferably formed by partitions extending across the air chamber, and bonded to the upper and lower surfaces of the air chamber. Each partition preferably includes a small orifice connecting each secondary air chamber to its neighbour. The orifices are appropriately sized to allow air to pass between the secondary air chambers when the jogger stands or walks, but substantially to prevent such air passage when the jogger runs. Valves may also be included in each orifice for added control.

In a further preferred embodiment the air chamber tapers downward towards the toe portion thereof. Preferably the air chamber is wedge-shaped, tapering from the heel to the toe. An enlarged air portion may therefore be provided in the heel. This provides enhanced impact or shock absorption capacity since a larger air chamber volume is available where the maximum impact forces are expected to occur.

Embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings, wherein:

Figure 1 is a perspective view, partially in section, of a jogging shoe according to the invention,

Figure 2 is a bottom view of the shoe of Figure 1,

Figure 3 is a sectional view along line 3-3 of Figure 1, and

Figure 4 is a perspective view, partially cut away of a preferred air chamber for use in the shoe of Figures 1 to 3.

Referring to the drawings, Figures 1 to 3 show a jogging shoe 10 with an upper body portion 12, an outer sole 14 and an inner sole 16.

The upper body portion 12 and the inner sole 16 may be of any usual construction for jogging shoes. As can be seen in Figure 1, the upper body portion has an upwardly open foot receiving entrance 18, which is adjustably closed about the foot using laces 20.

With reference to Figures 1 and 2, the outer sole 14 is preferably formed with pegs 22 covering a major portion of the bottom of the shoe 10. With reference to Figure 3 , the pegs 22 have a hollow cavity 24 communicating with air chamber 26. Air chamber 26 extends from the heel 28 throughout most of the outer sole 14 as shown by the dotted lines in Figure 2.

An air valve 30 communicates with the air chamber 26 to permit adjustable inflation of the air chamber 26. The valve 30 may be of any usual design, but should be recessed, as shown in Figure 2, to reduce the possibility of damage. In addition, mounting through the side of the heel will reduce the chance of impact

damage which might occur with a valve extending out of the rear of the heel.

The operation of the shoe of Figures 1 to 3 is as follows:

The shock absorbing system is first inflated to an initial pressure for use. This pressure will depend on the weight of the person using the shoe. The shoe will then need to be used to determine if sufficient and comfortable shock absorption or shock distribution is attained. If necessary, the amount of pressure within the shock absorbing system can be adjusted, by the jogger, through valve 30.

Shock or impact is absorbed and distributed by the system as a result of the air pump action of the hollow pegs 22. Impact on a hard surface will cause pegs 22 at the impact point to depress and compress the air contained therein into chamber 26. This will distribute the impact across the sole and partially absorb the impact by the compression of air. Because the pegs only display about 20 square centimetres, depending on the point of impact, the impact may be sufficient to depress them significantly. If the pegs 22 are significantly depressed, the larger surface area then displayed by the bottom of the air chamber 26 will be compressed and absorb the excess impact. Thus shock absorption and distribution throughout the air chamber area is in a two stage form. Initially, and depending on the pressure within the shock absorbing system, the small surface area displayed by the pegs absorbs the main impact and depresses in doing so. Thereafter, the main body of air chamber 26 is impacted and compressed to absorb the remaining force.

In the preferred construction, as shown in Figure 1, the sole is wedge-shaped and tapers toward the front of the shoe. This provides a larger air chamber volume at the heel 28 of the sole where the maximum impact forces are expected to occur. Enhanced impact or shock absorption capacity is thereby imparted to the shoe.

Figure 4 shows a preferred embodiment of air chamber 26', that can be used in the shoe shown in Figures 1 to 3 in place of chamber 26. The chamber 26' is divided by partitions 32, extending across the chamber 26', into four longitudinally spaced compartments 34. The partitions 32 are bonded by adhesive to the upper and lower surfaces of the air chamber 26', so that each of the compartments 34 is air tight. The valve 30 enters chamber 26' in the heelmost compartment 34. Each of the partitions 32 contains a small orifice 36 at its centre, and these orifices 36 allow air introduced by the valve 30 into the heelmost compartment to pass slowly into the other compartments 34. Preferably a valve (not shown) is incorporated within each orifice 36 to enhance control of the slow air flow.

When the air chamber 26' shown in Fig 4 is used in the shoe, and the pegs 22 depress and compress the air contained therein into the chamber 26', the chamber 26' deforms in the areas of maximum pressure and forces air through the orifices 36 in the partitions 32 to conform the air chamber 26' to the bottom of the foot. When the jogger stands still over a long period of time, the air

chamber 26' adopts a shape according to the bottom of the jogger's foot, and to the pressure on various parts of the foot. As the jogger walks, air leaks very slowly through the orifices 36 to the compartments on opposite sides of the partitions 32. When the jogger runs, very little air is permitted to transfer between the compartments because of the rapid movement of the shoe sole and the slow transfer by the orifices 36. The jogger therefore has the feeling of a soft but stable sole. The preferred air chamber 26' thereby provides added comfort for the jogger when standing or walking.

Claims

1. A jogging shoe having a shock absorbing system, said jogging shoe having an upper body portion, an outer sole with heel and toe portions and an inner sole, in which said outer sole has an air chamber covering a major portion thereof and a plurality of downwardly extending projections disposed spaced apart from each other and extending from the sole of the shoe, the air chamber consisting of one or more compartments.

2. A jogging shoe according to claim 1 wherein the air pressure in the air chamber or in one or more of the compartments can be adjusted by means of a valve.

3. A jogging shoe according to claim 2 wherein said valve is disposed through and fully recessed into the side of said heel to avoid impact when the shoe is used.

4. A jogging shoe according to any one of the preceding claims wherein the downwardly extending projections each have a hollow cavity, the arrangement being such that impact against said projections causes air contained therein to be compressed whereby to provide shock absorption.

5. A jogging shoe according to any one of the preceding claims wherein the air chamber consists of two or more compartments in communication with each other.

6. A jogging shoe according to any one of the preceding claims wherein the outer sole comprises a plurality of downwardly extending projections disposed spaced apart from each other and extending over substantially the full extent of the heel portion.

7. A jogging shoe according to any one of the preceding claims wherein the air chamber tapers downward towards the toe portion thereof.

8. A jogging shoe according to any one of the preceding claims wherein a forward portion of said outer sole is free of said projections.

FIG. 1.

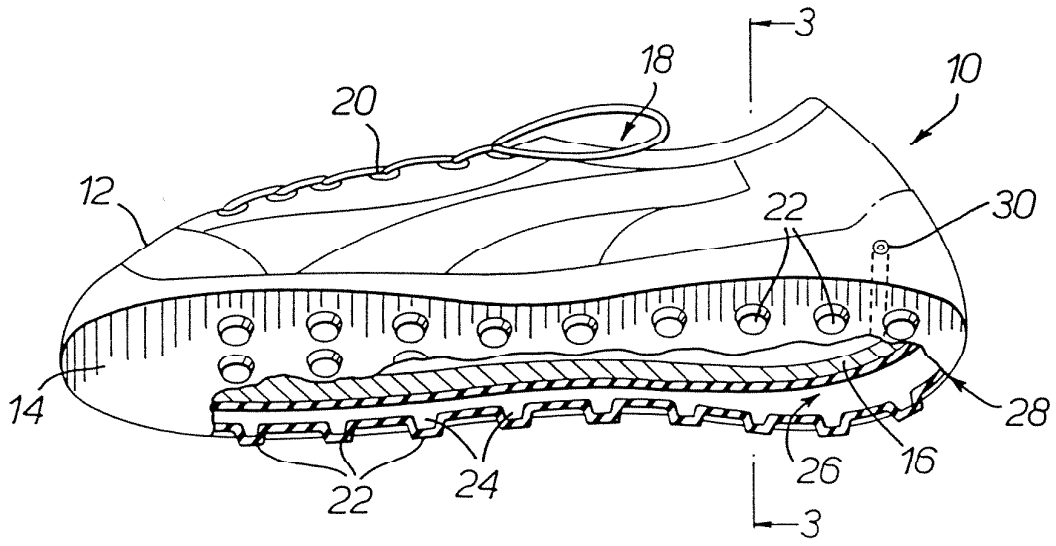


FIG. 2.

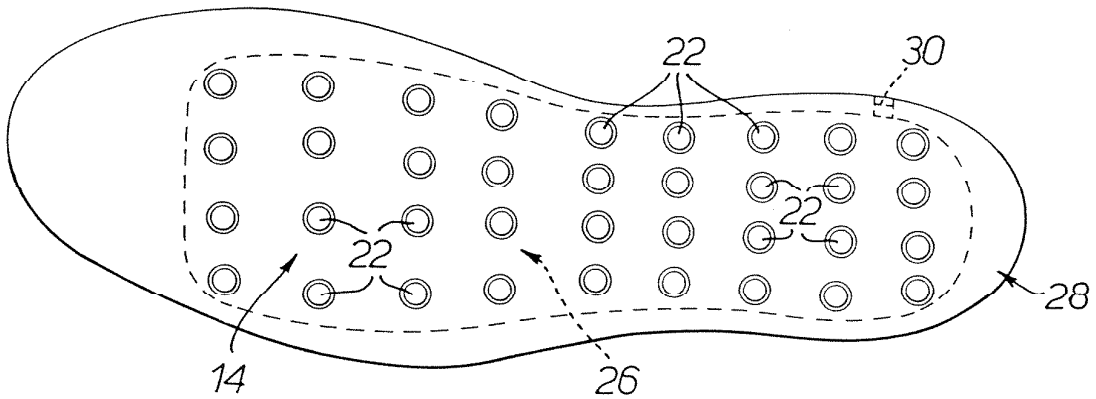


FIG. 3.

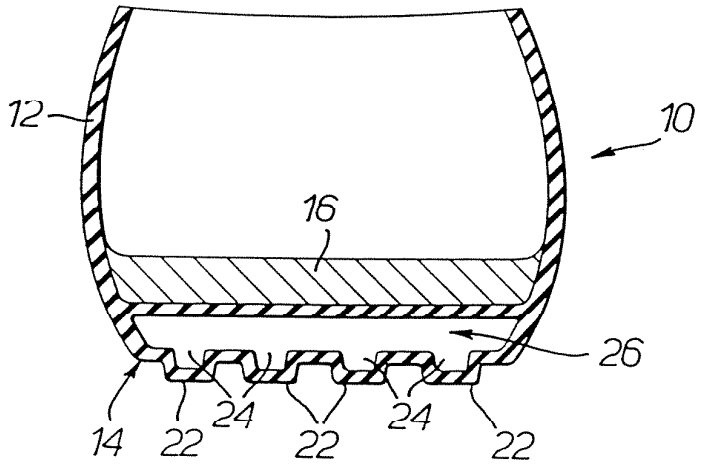
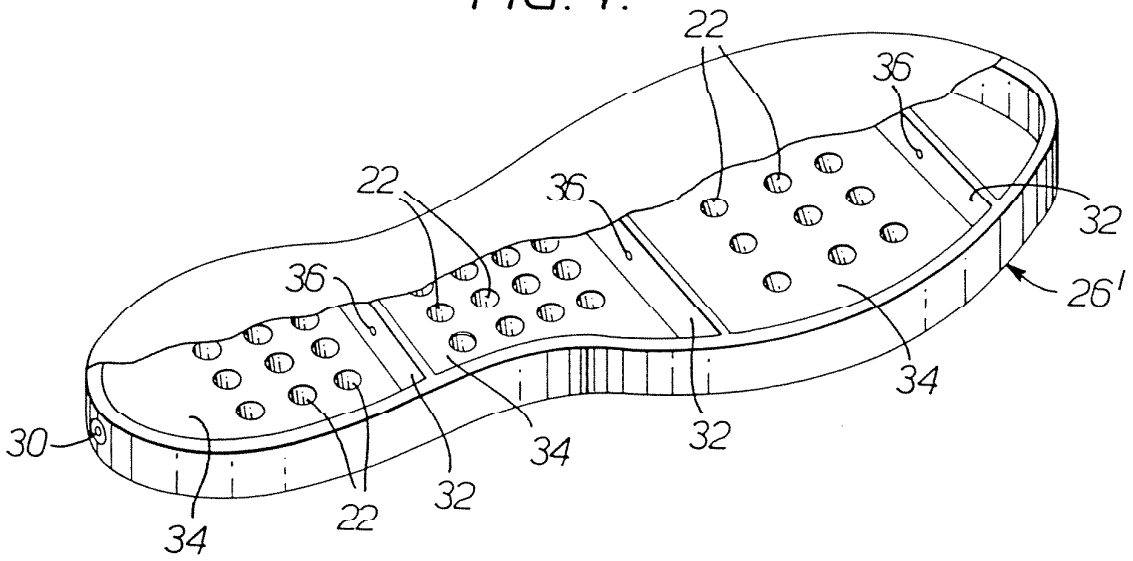


FIG. 4.



The Patent Office
Cardiff Road
Newport
Gwent
NP9 1RH

26 November 1992

Fitness Freaks PLC
c/o A,B & C
123 High Street
Anytown

Dear Sirs

PATENTS ACT 1977
REPORT UNDER SECTION 18(3) - Application No. 9011111

Period for reply: **6 months** from the date of this letter

The examiner has reported that it appears to him that your application does not comply with the requirements of the Act and Rules made thereunder for the reasons set out below. A reply to this letter setting out your observations and/or any amendment should be filed within the period specified above. Any amendments to the application should be effected by filing replacement pages which comply with Rule 20. The Comptroller may refuse your application, after giving you an opportunity to be heard, if you do not make an attempt, within the period specified above, either to satisfy him that these requirements are complied with, or to amend the application so as to comply with them.

1. It appears to the examiner, as a result of a search under Section 17, that your application does not comply with the requirements of Section 1(1).

Document A discloses a shoe, the outer sole of which has an air chamber covering a major portion of the sole and a plurality of downwardly extending projections disposed spaced apart from each other and extending from the sole of the shoe. Document A thus discloses the features specified in claims 1 and 4. The product claimed in these claims therefore lacks novelty.

Furthermore, the features of claims 2, 3, 5, 6, 7 and 8 do not involve an inventive step having regard to Document A.

Document B discloses a shoe having multiple air chambers, the air pressure within each chamber being adjustable by means of a valve. Claims 2, 3 and 5 do not therefore involve an inventive step in view of Document B alone or in view of a combination of Documents A and B.

Document C discloses a shoe, the outer sole of which has an air chamber covering a major portion of the sole and a valve for adjusting the air pressure within the air chamber. The features of claims 2, 3 and 5-8 do not therefore involve an inventive step in view of Document C alone or in view of a combination of Documents A and C.

Document D discloses a shoe in which the outer sole comprises a plurality downwardly extending projections each having a hollow cavity. Moreover, a plurality of such projections are disclosed extending over substantially the full extent of the heel portion. Thus claim 6 at least does not involve an inventive step in view of a combination of Documents A and D.

Yours faithfully

Fitness Freaks PLC
23 Upper Sole Street
Lacey

16 March 1993

A, B & C
123 High Street
Anytown

Dear Mr Smith

UK Patent Application No 9011111-Jogging Shoes

I refer to your letter of November 26, 1992 reporting the issue of an Official Letter on my Patent Application. I note that a response to the Letter is due by May 26, 1993.

I would be grateful for your advice as to the response that should be filed to the Official Letter. As you know, my whole business is built around this patent application and it is therefore vital for me to obtain whatever protection I can.

I am particularly worried regarding this Official Letter because I have recently returned from a Trade Fair which was attended by most of my competitors. They all seem to be aware of the contents of this Official Letter and the word appears to have spread that my patent application is not worth the paper its written on. Many of my competitors frankly acknowledged that I had made an important invention, but said that in view of the comments of the Patent Office they had already started to develop new jogging shoes based on the description in my patent application. Not surprisingly, they refused to give any details of the new shoes they were developing. I must therefore expect to face competition from a whole range of different designs all of which will be based on my invention.

Please may I have your urgent advice as to how I might best respond to the Patent Office in order to prevent my competitors from taking the fruits of my invention.

Yours sincerely

Peter Lightfoot
C.E.O. Fitness Freaks PLC

DOCUMENT A

IMPROVED SHOES

We have developed an improved shoe which gives assistance in walking, running or jumping and may be used with benefit for other athletic purposes.

My improved shoe is illustrated in the attached drawings in which Fig 1 is a longitudinal section of a sole and a portion of the upper and Fig 2 is a plan of the sole. Figs 3 and 4 are each detached sectional views.

An india rubber or leather base (a) is employed in the form or shape of a boot or shoe bottom having on the outer edge of the under face a projecting rim (b) of a thickness or depth sufficient to provide a space (c) between the india rubber base (a) and the inner sole (d) of the boot or shoe, the outer or top face of the india rubber or leather base (a) having hollow projections (e). The latter may receive air or retain a rubber ball (see Figs 3 and 4).

In order to manufacture our new shoe, we make the foot receiving portion of the shoe in the conventional way. We then prepare the inner sole (d) and cover it with an adhesive solution. We then place a layer of gutta percha (g) in its soft or boiled condition over the whole inner sole (d) and while it is in its adhesive state, press the rim (b) surrounding the india rubber base (a) into the layer of gutta percha securing the whole into position and making the whole airtight and waterproof. The space (c) intervening between the inner sole (d) and the india rubber or leather base (a) is then inflated with air by attachment of a tube (h) in a seat of the heel of the shoe. The whole may be secured together in the ordinary way by stitching through the outer edge of the india rubber base (a). The hollow projections may be provided as separate attachable pieces (see Fig 3) which are surrounded by a flange (e') of india rubber or leather to enable the same to be secured to the india rubber or leather base (a) by a suitable adhesive solution.

Instead of constructing the hollow projections (e) as separate attachable pieces, the projections (e) may form one piece with and all rise from one india rubber or leather base (a), each projection being wholly filled by a rubber ball (see Fig 4).

DOCUMENT A

Fig. 1.

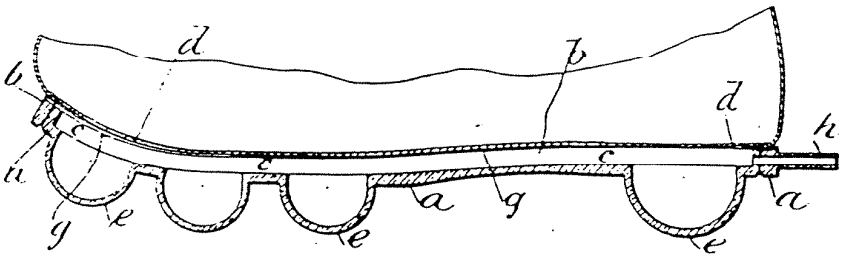


Fig. 2.

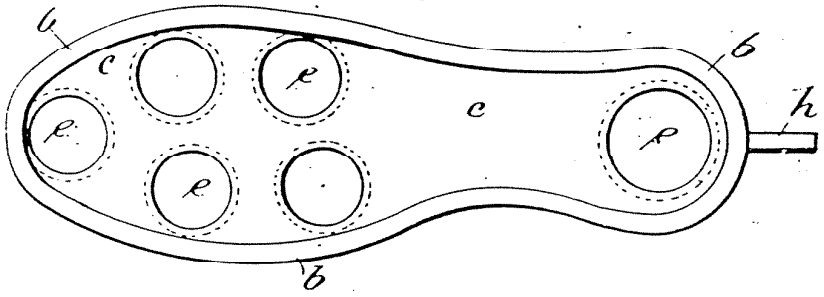


Fig. 3

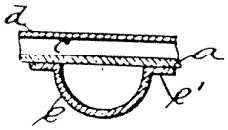
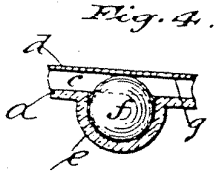


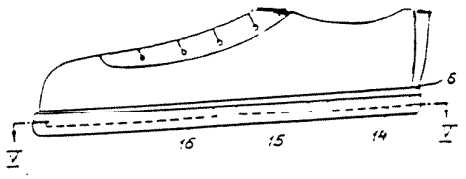
Fig. 4.

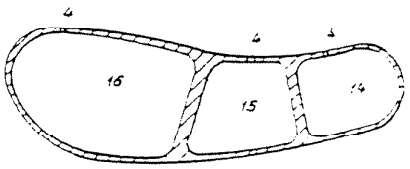


DOCUMENT B

SPORTS SHOE WITH PNEUMATIC RESILIENT SOLE

Our new sports shoe is shown in the drawings. The sole 6 of the sports shoe has gas or air cushion chambers 14, 15, 16 fully airtight and closed by valves 4 so that air or any gas or gas mixture can be used to fill the sole to form shock absorbing cushions. The air or gas pressure can be regulated by the valves so that the weight of the wearer and the use of the shoe (e.g. on hard or soft ground, for running or jumping etc.) can be taken into account. The multi-chamber design has advantages over a single chamber design, since with a single chamber some shock absorption may be lost as the gas may escape to the unstressed areas. Also, by providing several air chambers, only those required for the particular sporting purpose need be filled with air.





DOCUMENT C

ATHLETICS SHOE

This invention relates to a shoe for athletic purposes and has as its primary object the provision of a pneumatic cushion and supporting means so that the arch of the foot of a person will be sufficiently supported to prevent injury to the arch and will provide a cushion to the entire tread portions of the foot to prevent blisters, bruises and the like.

The invention is described in the accompanying drawings, wherein

Figure 1 is a vertical sectional view illustrating a shoe constructed in accordance with the invention.

Figure 2 is a sectional view taken on the line 2-2 of Figure 1.

Figure 3 is a sectional view taken on the line 3-3 of Figure 1.

Figure 4 is an enlarged detail sectional view illustrating the inflating valve for the pneumatic means.

In the drawings a shoe upper 1 is secured to a sole 2. The sole 2 is constructed from a single piece of material, preferably of rubber, and has formed integrally with the edges thereof upstanding flanges 3 which engage and embrace a portion of the shoe upper. The flanges may be cemented or otherwise secured to the shoe upper. Formed integrally with the sole 2 and arranged within the upper 1 is a wall 4 defining between itself and the inner face of the sole a pneumatic chamber 5 adapted to receive air through an inflating valve 6 having a removable cap 7 arranged exteriorly of the shoe upper. One wall of the chamber 5 is thickened, as shown at 8, and apertured to receive the inflating valve 6, which extends through the shoe upper and one of the flanges of the sole. The pneumatic chamber 5 extends the full length and width of the sole so that the entire portion of a person's foot rests upon a pneumatic cushion. The wall 4 is provided with a convexed offset portion 6' to fit the arch of the foot and provides a support for the arch. The offset portion 6' of the wall 4 tapers towards the toe and heel portions of the upper and also towards one side of the upper so that it will conform to and snugly grip the arch of the foot. The foot resting upon the wall 4 will be supported throughout by an air cushion so as to absorb shocks and jars to the foot as well as supporting the arch to prevent injury thereto. The foot being cushioned by the pneumatic means will prevent shocks and jars from being received by the ankle and leg of the foot.

Shoes constructed in accordance with the foregoing and when worn by athletes will permit them to perform on hard surfaces without liability of injury to the feet and legs and will provide shoes that are extremely comfortable.

DOCUMENT C

Fig. 1.

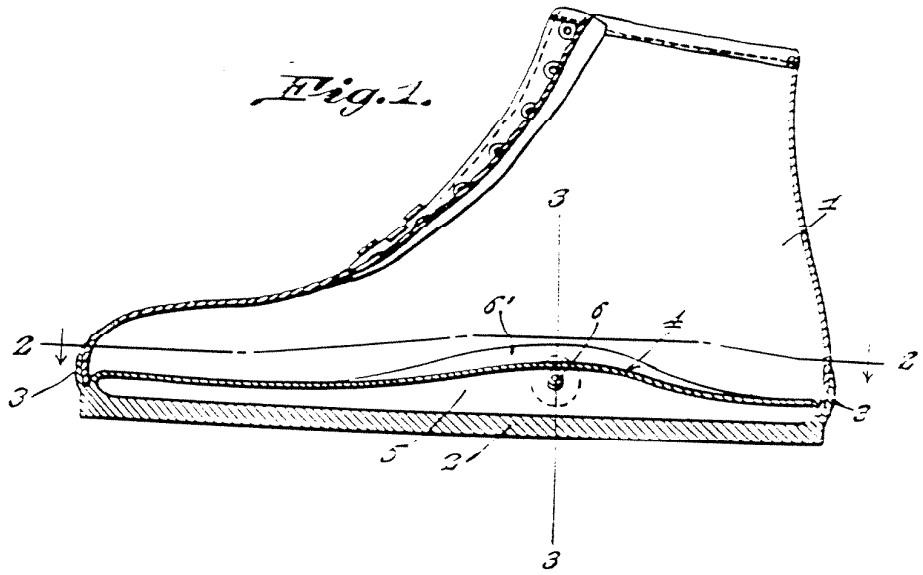


Fig. 2.

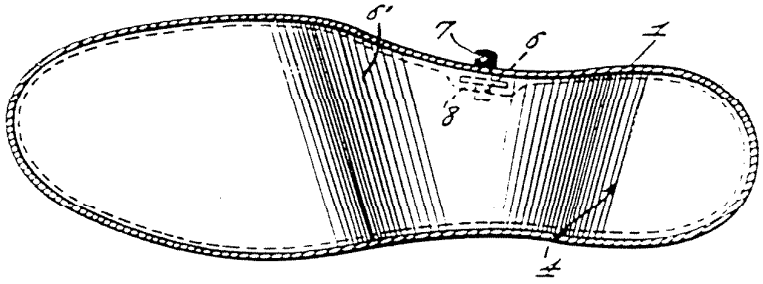


Fig. 3.

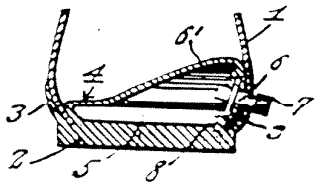
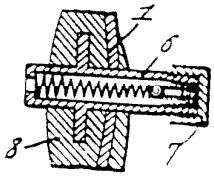


Fig. 4.



DOCUMENT D

RUBBER SHOE SOLES

We have developed a novel sole construction for shoes which has as its principal object the provision of a cushioned sole in which air will be entrapped so as to provide an air cushion for the foot.

A further aspect of our novel sole construction is the provision of a method of making shoe soles whereby air will be automatically entrapped within the sole during the manufacture thereof.

A still further aspect is to provide a shoe sole which will have non-skid qualities combined with a soft, yielding quality which will enable the sole to conform to the supporting surface without tiring or injuring the foot of the user.

Other features and advantages of our development reside in the construction of the shoe sole, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description reference is made to the accompanying drawings.

In the drawings:
Fig. 1: is a bottom view, looking upwardly, of the improved cushioned shoe sole;
Fig. 2: is a cross-section therethrough, taken on the line 2-2 in Fig. 1; and
Fig. 3: is a longitudinal section through the heel thereof, taken on the line 3-3 in Fig. 1.

The improved sole comprises a flexible sole plate 10 cut or stamped to the desired sole outline. The plate 10 may be formed from any suitable, flexible, waterproof, air-tight material. It is preferably formed from a sheet of rubber cord stock consisting of a relatively thin rubber sheet into which reinforcing fabric or cords 11 are embedded.

A molded sole member 12 is cemented to, or vulcanised on, the half-sole portion of the sole plate 10, and a molded heel member 13 is similarly secured to the heel portion of the sole plate 10.

The sole member 12 is molded from tough, flexible rubber, such as automobile tire tread stock. It is molded with a plurality of spaced-apart hobs 14 projecting downwardly from the bottom thereof. An indentation is formed in the top of the sole member over each of the hobs to form a hollow air chamber 15 therein. The air is sealed in the chambers 15 by the sole plate 10, which is cemented over the entire upper surface of the sole member 12.

The heel member 13 is similarly molded from flexible rubber tread stock and is provided with a plurality of ridged members 16,

each of which is hollow throughout its entire length, as shown at 17, so as to form a sealed air chamber when cemented or otherwise sealed to the sole plate 10.

It can be readily seen that the above-described advantages are attained by the above construction. A skid-resisting surface is provided by means of the projecting hobs 14 and the ridges 16. The hobs and ridges, however, are not solid, for each contains a sealed air chamber which provides a cushioning effect and allows the hobs to compress to irregular surfaces without injuring or tiring the feet of the wearer.

DOCUMENT D

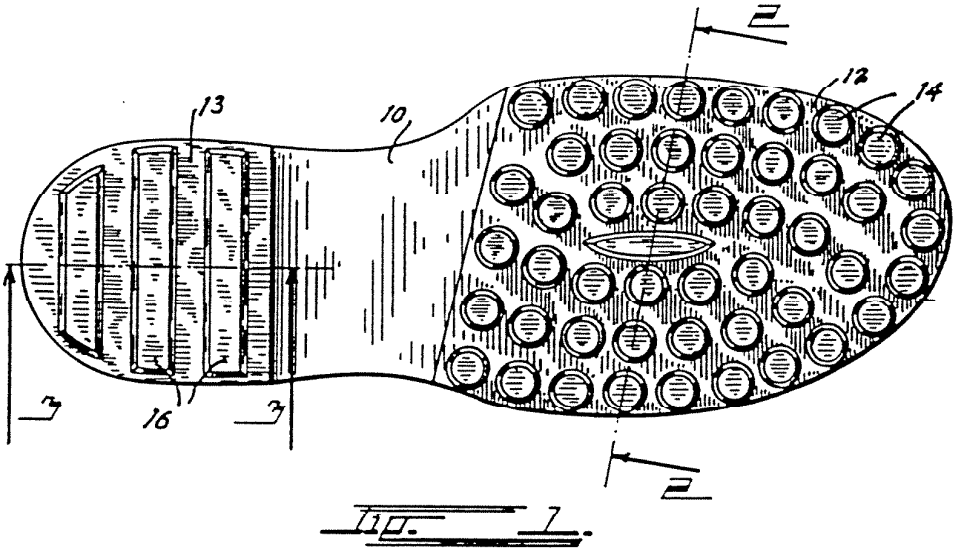


Fig. 1.

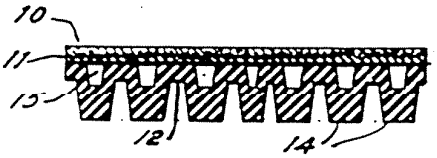


Fig. 2.

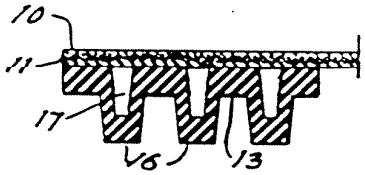


Fig. 3.