

INTELLECTUAL PROPERTY OFFICE OF SINGAPORE
PATENT AGENTS QUALIFYING EXAMINATION 2020

PAPER C: INFRINGEMENT AND VALIDITY OF SINGAPORE PATENT
9 December 2020, Wednesday
1330 – 1730 hrs

Maximum Time: 4 Hours (includes reading time)

Maximum Marks: 100



INSTRUCTIONS TO CANDIDATES

1. This Question Paper consists of 22 pages, including the cover pages.
2. Type your answers in English. Answers in any other language will not be marked.
3. You are given one hard copy of the Question Paper. The soft copy of the Question Paper is also provided in the given laptop.
4. Only answers and/or drawings typed or indicated in the Answer Script template provided by the Examination Secretariat will be considered. Candidates should not change the given format of the Answer Script or type in the margin.
5. The information provided in the Question Paper may be obtained from actual situations or modified therefrom for the purpose of this examination. You should accept the facts given in the paper and assume that the prior art given is exhaustive.
6. You are to advise the client on the infringement and validity of the relevant patent(s), and on the other questions posed by the client. Your advice can be in the form of notes or a letter to the client, but in either case, you should provide the reasons for your advice. Marks are awarded more for the points selected for discussion and the reasoning displayed, rather than for the conclusions reached.

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7. The maximum mark allocation for each category is as follows.

S/N	Category	Marks
1	Construction	25.5 marks
2	Infringement	21.5 marks
3	Validity – Novelty	26.5 marks
4	Validity – Inventive Step	8.5 marks
5	Advice and Miscellaneous Issues	18 marks
		100 marks

8. The documents provided in this Question Paper are:

- a. Cover Page (2 pages);
- b. Client Letter Dated 9 December 2020 including questions and notes (2 pages);
- c. Document A: MightyBoost® Footwear (4 pages);
- d. Document B: SG Patent SG11 (8 pages including drawings);
- e. Document C: US Patent US33 (3 pages including drawings); and
- f. Document D: Technical brochure of Easy Footware (3 pages including drawings).

END

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Client Letter Dated 9 December 2020 (1/2)

9 December 2020

5 Dear Patent Attorney

I need your urgent advice.

For years, we have manufactured and sold running shoes within Asia, including in Singapore.
10 We have been very successful in our business, especially in mature markets like Singapore, Japan and Korea where we were able to achieve double-digit revenue growth year-on-year in the past four years. We attribute the phenomenal growth in our business to a higher propensity of the demographics in these markets to being healthy and thus more inclined towards sports activities like running, which thereby drives demand for our shoes.

15

Therefore, it came as a bit of shock when I returned from a recent business trip to China to find that our sales in Singapore had plummeted. The general feedback from our local customers is that they now prefer a product line from Mikes Footwear, the 'MightyBoost', which is described in **Document A**.

20

We are very concerned about the present situation, as we believe that the core idea behind the MightyBoost footwear is very similar to our proprietary technology that provides users of our shoes with a powerful 'kick' while running. Fortunately, we protected our proprietary technology via a PCT patent application that we filed several years ago. We have obtained grant of a
25 Singapore patent SG Patent SG11 based on the PCT application (**Document B**), although our several national phase applications of the PCT application in China, Japan, Korea, Europe and the US are still pending.

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Client Letter Dated 9 December 2020 (2/2)

About a month ago, I was informed by my US patent agent that the US Patent Office had cited a patent document US Patent US33 (**Document C**) against the pending US national phase application of our PCT application. I only managed a brief look at the document, but the drawings look very different to me so I do not understand why the US Patent Office cited this document. If the shoe in Document C is regarded to be similar to our product, then another of my competitors, Easy Footwear, is selling a shoe which I would say is even more similar. I attach a technical brochure (**Document D**) which I managed to pull up from their website. The document is undated and I cannot remember when this shoe was first launched - it may have been before or after we filed our PCT application. In any event, I don't think we need to be concerned about these documents since our Singapore patent has already been granted.

In any case, I really wish to stop Mikes Footwear in their activities, which are seriously hurting our business. I also want to inform them that we will commence infringement proceedings against them immediately if they don't cease the sales of their MightyBoost footwear within a week from today. In this way, I can start rebuilding our revenue again. I also have plans to expand my range of footwear that incorporates our proprietary technology, to include slippers and sandals as well to drive our declining revenue. Can you advise if our Singapore patent covers slippers and sandals? If not, please suggest what we can do.

Can you help? I am off again in a week, so I expect a detailed note from you tomorrow setting out all of the relevant points.

Yours faithfully

Gary Angst

MD, Garry's Footwear Pte. Ltd.

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Document A: MightyBoost® Footwear (1/4)

Technical Product Description

5 Singapore, January 2020

GET YOUR BOOST FROM MIKES' MIGHTYBOOST® FOOTWEAR!

[1] Mikes Footwear is pleased to announce the launch of our new and innovative line of
10 footwear called MightyBoost®, which includes athletics shoes, walking shoes, slippers and
sandals, and is available from all major footwear retail outlets around Singapore.

[2] FIG. 1 depicts the sole of our MightyBoost® footwear. The sole has an energy-
restoring device 10 that has a bent flat spring structure. Device 10 includes a first support
15 structure 12, a front support structure 24, which supports the ball of the foot, and a heel support
structure 28, which supports the heel. First support structure 12 connects to the front support
structure 24 and the heel support structure 28 to define an interrelated system of bent flat
spring structures for the absorption, distribution, storage and release of energy delivered by
the bones of a user's foot during a gait cycle.

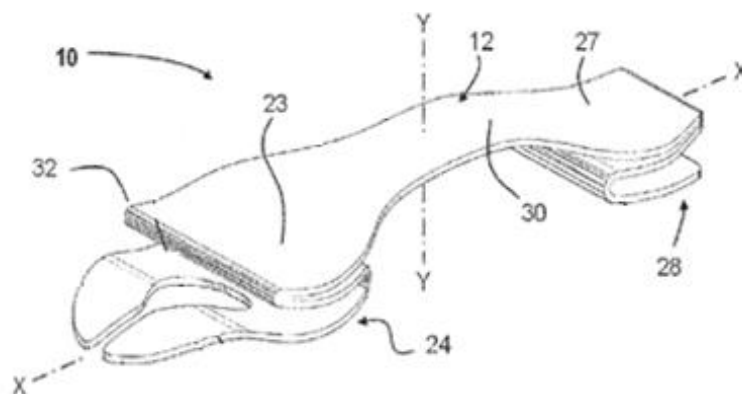


FIG. 1

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Document A: MightyBoost® Footwear (2/4)

[3] As shown in FIG. 2, front support structure 24 is a compound opposed dual hinged structure. A first pivot 32 connects to anterior end portion 23 and a first anterior support beam 34. A second pivot 36 is proximally located relative to first pivot 32, connected to first anterior support beam 34 and a second anterior support beam 38. Hinges 32 and 36 are flexible pivots that provide load transfer by dampening and providing energy storage associated with impact of the metatarsal bones (in the ball of the foot). In addition, hinges 32 and 36 provide load distribution to first support structure 12 and heel support structure 28.

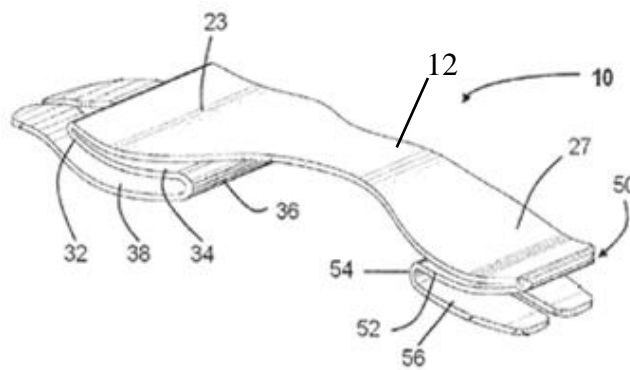


FIG. 2

[4] As shown in FIG. 2, and FIG. 3 which shows a side view of the energy restoring device 10, heel support structure 28 is a compound opposed dual hinged structure that includes a posterior end portion 27 of first support structure 12. A first pivot 50 connects to posterior end portion 27 of first support structure 12 and a first posterior support beam 52. A second pivot 54 is located anterior to first pivot 50 and connects to first posterior support beam 52 and a second posterior support beam 56. Pivots 50 and 54 are flexible curvilinear hinges that provide load transfer by dampening and providing energy storage associated with impact of the heel and providing load distribution to first support structure 12 and front support structure 24.

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Document A: MightyBoost® Footwear (3/4)

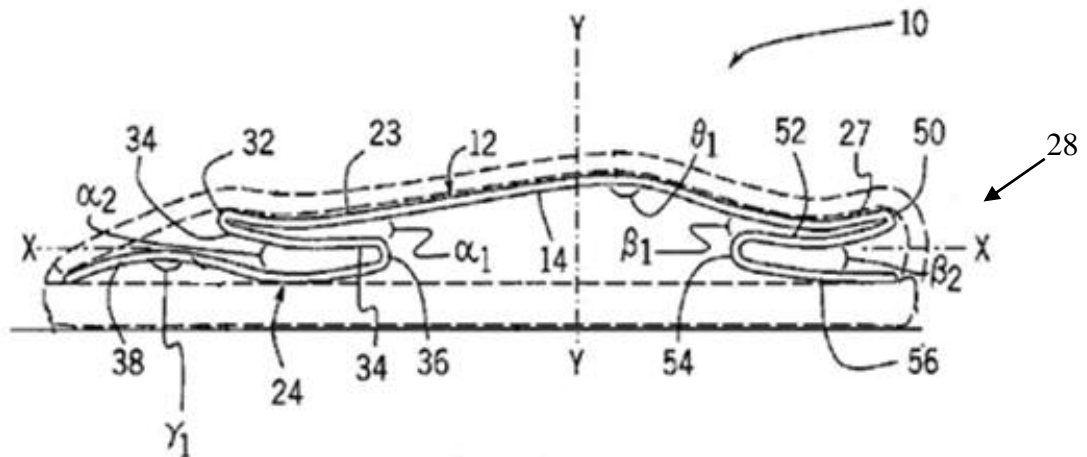


FIG. 3

- 5 [5] As shown in FIG. 3, the heel support structure 28 defines two opposing angles β_1 and β_2 . Angle β_1 of the first flexible curvilinear pivot 50 has an anterior direction and is defined between posterior end portion 27 and first posterior support beam 52. Posterior end portion 27 and first posterior support beam 52 are joined at pivot 50 with a predetermined first posterior fixed spaced separation. As described previously, portion 27 and beam 52 can flex
- 10 independently relative to pivot 50 to a limited extent, but the continuous ribbon structure of device 10 is purposefully constructed for pivot 50 to provide a first bias in a first direction that is approximately aligned with a vertical axis-Y, which extends through a midfoot arch of the first support structure 12.
- 15 [6] Angle β_2 of heel support structure 28 is defined between first posterior support beam 52 and a second posterior support beam 56 of a flexible curvilinear pivot 54. Angle β_2 of pivot 54 has a posterior direction. First posterior support beam 52 and second posterior support beam 56 are joined at pivot 54 with a predetermined second fixed spaced posterior separation that is larger than the first spaced posterior separation of pivot 50. Beam 52 and beam 56 can
- 20 flex independently relative to pivot 54 to a limited extent.

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Document A: MightyBoost® Footwear (4/4)

[7] MightyBoost® is a registered trademark of Mikes Footwear and our line of MightyBoost® footwear is subject to numerous patents granted in Singapore, Europe and the US, where our

5 MightyBoost® footwear are sold

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Document B: SG Patent SG11 (1/8)

SG Patent SG11 granted on 1 May 2020, based on International (PCT) Patent Application filed on 15 January 2015

5

Proprietor: Garry's Footwear Pte. Ltd.

RUNNING SHOE

10 **FIELD**

- [1] The present invention relates to a running shoe that converts the impact of landing into propulsion during the kick phase.

15 **BACKGROUND**

- [2] Conventional running shoes use a mid sole composed of a shock absorbing material that provides extensive cushioning to disperse and alleviate the impact during landing.

- 20 [3] However, during running, the force applied to the heel is said to be at least three times the bodyweight of the runner. Conventional running shoes have not been able to efficiently convert the impact during landing into energy during the kick phase. Designers have therefore faced the technical problem of how to store the impact during landing as energy and release such energy to the forefoot during the kick phase to
25 make running and walking more efficient.

DESCRIPTION OF EMBODIMENT(S)

- 30 [4] Typically, conventional constructions of a shoe comprise a plate spring and/or coil spring provided at a part of the shoe, such as at the heel or at the toe, and therefore it has not been possible to convert the impact received by the heel during running and walking to energy when kicking at the toe while running or walking. That is, even

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Document B: SG Patent SG11 (2/8)

though it is possible with such constructions to supplement lift of the heel or the toes, it is not possible to achieve efficient running and walking using the entire foot.

5

[5] FIG. 1 is a side view of a running shoe according to an embodiment of the present invention. The running shoe includes a shoe main body 10 constructed so that the foot can be inserted, and a plate spring 5 formed below the shoe main body 10 so as to extend along the entire length of the shoe main body 10. The plate spring 5 is provided in place of a conventional midsole, and functions to absorb impact during landing and to release energy during the kick phase.

10

[6] The plate spring 5 includes a stepping plate 1 that extends from a heel-end portion to a toe-end portion of the shoe main body 10 and a ground-side plate 2 that also extends from the heel-end portion to the toe-end portion of the shoe main body 10, with the stepping plate 1 and the ground-side plate 2 being connected by a joint portion 4 at the heel-end portion of the shoe main body 10. The joint portion 4 may be a member that acts as a spring with an energizing force that energizes the connected stepping plate 1 and the ground-side plate 2 in a direction where the stepping plate 1 and the ground-side plate 2 move apart.

15

20

[7] The plate spring 5 is attached to a lower surface of the shoe main body 10 at a position on the toe portion of the shoe main body 10 (see FIG. 4). Accordingly, the stepping plate 1 of the plate spring 5 moves away from the shoe main body 10 at the heel during the kick phase. By using this construction, it is possible to prevent a loss in curvature of the shoe main body 10 during the kick.

25

[8] In one embodiment, the plate spring may be made of a flexible, lightweight material. In other embodiments, reinforced plastic, carbon fiber, or the like that is resistant to twisting, resistant to flexing are also suited for use as the material of the plate spring 5.

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Document B: SG Patent SG11 (3/8)

- 5 [9] To achieve a smooth transfer of weight between landing on the heel and kicking off the toe, the form of the ground-side plate 2 should not be flat with respect to the ground but instead should be formed so as to be upwardly convex in a central part thereof and therefore curved when seen from the side. By having the central part curved into a convex, it is possible to make movement of the center of gravity more rapid. That is, since the convex part will contact a position that corresponds to the plantar arch of the sole of the human foot, it is possible to rapidly move the center of gravity during movement of the center of gravity to the toe after landing on the heel.
- 10 [10] Note that in the same way as the ground-side plate 2, the stepping plate 1 may be formed so as to be upwardly convex in a central part thereof and therefore curved when seen from the side.
- 15 [11] By also forming the ground-side plate 2 in this shape, it is possible to prevent the central part of the foot from sinking and thereby increase forward propulsion.
- 20 [12] The joint portion 4 may be integrally molded of the same material as the stepping plate 1 and the ground-side plate 2. In such case, a bent-over part of the stepping plate 1 and the ground-side plate 2 that are integrally constructed functions as the joint portion 4.
- 25 [13] The joint portion 4 of the present embodiment is provided so as to protrude outward beyond the end of the shoe main body 10. By disposing the joint portion 4 in this way outside the shoe main body 10, or at least at the farthest back end of the shoe main body, it becomes possible to effectively use the energy stored at the heel during landing.
- 30 [14] Also, when the joint portion 4 on its own provides insufficient cushioning and joint strength as a plate spring, an energizing member 6 may be provided in a gap between the stepping plate 1 and the ground-side plate 2 that construct the plate spring 5 so as

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Document B: SG Patent SG11 (4/8)

to energize the gap in a direction where the gap widens. A spring or the like can be used as the energizing member 6.

5

[15] By disposing the energizing member 6 in the gap of the plate spring 5, it is possible to improve the action of the repulsive force of the plate spring 5 and to also improve durability. When the energizing force of the energizing member 6 is sufficiently large, it is possible to use a member with hardly any springiness, like a hinge, as the joint portion 4.

10

[16] Also, a connecting member 7 that permits movement in the up-down direction and suppresses movement in the left-right direction may be provided in the gap between the stepping plate 1 and the ground-side plate 2 that construct the plate spring 5. The connecting member 7 can be composed of a material such as rubber or sponge.

15

[17] By providing the connecting member 7 in the gap of the plate spring 5, it is possible to prevent horizontal wobbling and resonance of the plate spring 5, thereby increasing stability. By using rubber or the like that has high elasticity as the connecting member 7, it is also possible to provide the connecting member 7 with the functions of the energizing member 6.

20

[18] An elastic body such as rubber formed with protrusions is provided on a ground-contacting surface of the ground-side plate 2 as an outsole 8. By doing so, it is possible to increase grip on the ground and to efficiently transfer energy to the ground during the kick phase.

25

[19] FIG. 2 is a side view of the running shoe during landing. During landing, due to the gap 3 between the stepping plate 1 and the ground-side plate 2 narrowing, the plate spring 5 acts as a cushion that absorbs the impact and also transmits the energy applied to the heel to the toe portion of the plate spring 5.

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Document B: SG Patent SG11 (5/8)

[20] FIG. 3 is a side view of the running shoe during weight transfer. As the body weight moves, energy is stored due to the gap 3 narrowing further.

5

[21] FIG. 4 is a side view of the running shoe during the kick phase. During the kick phase, since the heel of the shoe main body 10 becomes separated from the stepping plate 1, it is possible to achieve a smooth kick with no loss in the curvature of the shoe. By releasing the energy stored due to the gap 3 narrowing via the restoring force of the plate spring 5, it is possible to generate a powerful kick.

10

[22] FIG. 5 is a side view of the running shoe after the kick phase. After the kick phase, the gap 3 is restored due to the restoring force of the plate spring 5 and becomes ready for the next landing.

15

Claims:

1. A running shoe comprising:
a shoe main body into which a foot is insertable; and
a plate spring that is large enough to cover a length of the shoe main body, is attached to a lower portion of the shoe main body, and is closed at a heel end portion thereof,

20

wherein the plate spring is attached to a lower surface of the shoe main body at a toe portion of the shoe main body.

25

2. A running shoe according to claim 1, wherein the plate spring includes a stepping plate and a ground-side plate with a gap in between, the stepping plate and the ground-side plate being joined together via a joint portion.

30

3. A running shoe according to claim 2, further comprising an energizing member provided at the toe portion of the gap that energizes the gap between the stepping plate and the ground-side plate so as to widen the gap.

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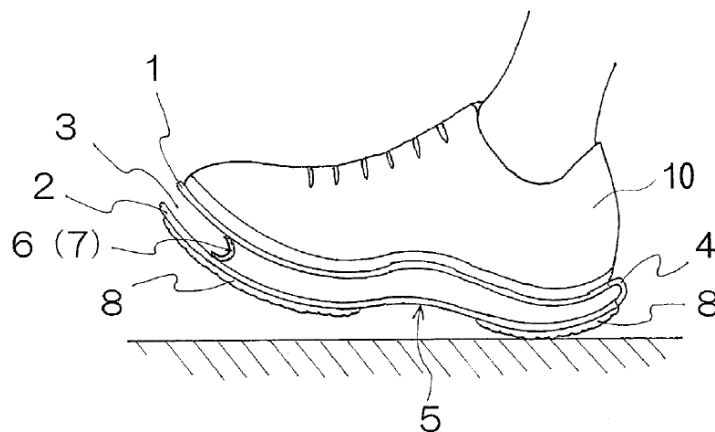
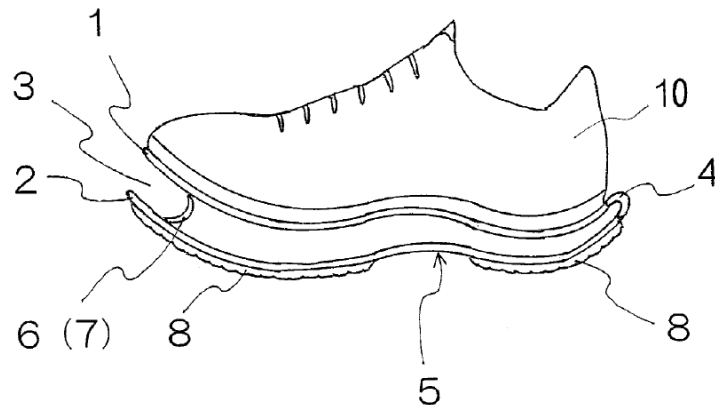
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Maximum Marks: 100

Document B: SG Patent SG11 (6/8)

4. A running shoe according to claim 2, further comprising a connecting member that is provided at the toe portion of the gap between the stepping plate and the ground-side plate and connects the stepping plate and the ground-side plate so as to prevent the stepping plate and the ground-side plate from becoming horizontally displaced.

5. A running shoe according to claim 1, wherein the plate spring is formed so as to be curved in an up-down direction in accordance with the shape of the sole of a human foot.



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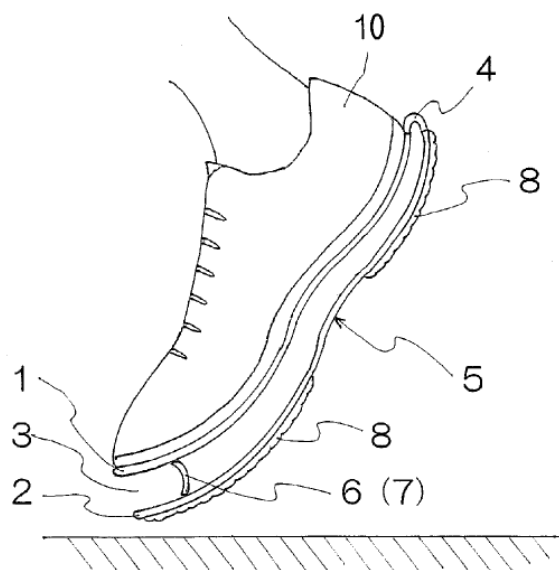


FIG. 5

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Document C: US Patent US33 (1/3)

US Patent US33

Publication date: 22 February 2012

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Spring athletic shoe

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

10 [1] Although the heel construction of this invention may be used on any of a wide variety
of footwear, it is particularly useful when employed on footwear utilized in the area of
sports, and especially in the area of running or jogging. The shoe sole construction of
this invention is accordingly described with respect to a shoe used for running or
jogging. However, it is not meant to be limited thereto and may also be used on any of
15 a wide variety of footwear.

[2] FIGS. 1-3 illustrate the energy return and shock absorption system of the present
invention. Referring to FIGS. 1-3, the shoe includes a foot support portion 10 and a
sole 12. A ground impacting surface 14 of sole 12 is formed of any suitable durable
20 material such as ethyl vinyl acetate (EVA) or polyurethane. Sole 12 is bifurcated into
two portions 16, 18. A rigid support plate 20 is fixed to portion 16 and serves to provide
a rigid support member for the user. An upper spacer 22 is integral with plate 20. Plate
20 and upper spacer 22 are fixed to portion 16 by any suitable means, such as glue
and are preferably formed of a durable plastics material such as LEXAN™ or an
25 equivalent thereof.

[3] A coil spring 26 is fixedly attached to upper spacer 22 such that its upper end is spaced
from support plate 20 and portion 16. In a preferred embodiment, spring 26 increases
in diameter from top to bottom such that the end fixed to upper spacer 22 can fit inside
30 of its lower end.

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Document C: US Patent US33 (2/3)

- [4] Lower portion 18 of sole 12 includes a stepped hollowed portion defining a spring support shelf 28 that supports the lower end of spring 26, which is fixed to spring support shelf 28 in a manner similar to that as to upper spacer 22. The stepped hollowed portion further defines a space 30 beneath spring support shelf 28. During compression, upper spacer 22 causes the top end of spring 26 to be driven through its lower end and into space 30. As a result, bottoming out of spring 26 is prevented.

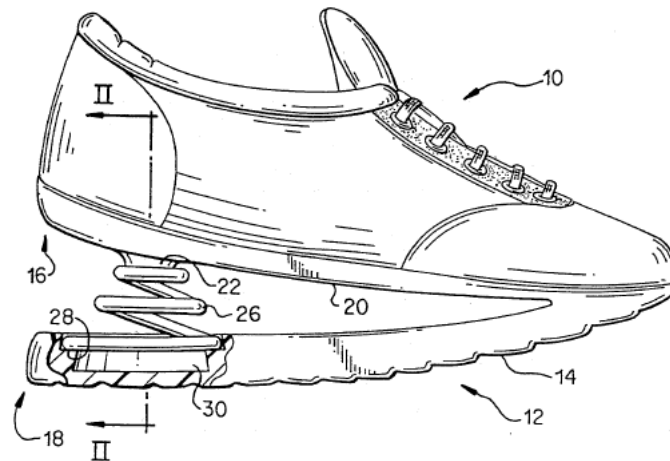


FIG. 1

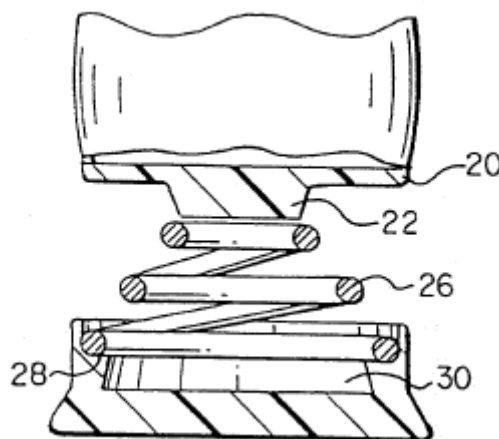


FIG. 2

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Document C: US Patent US33 (3/3)

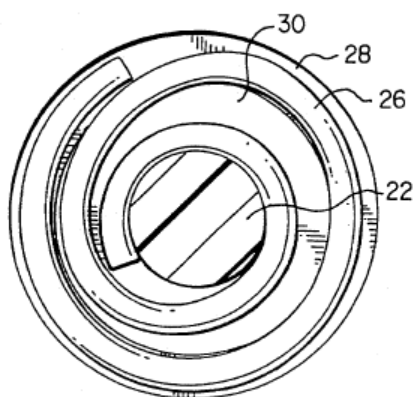


FIG. 3

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Document D: Technical brochure of Easy Footware (2/3)

[4] In principle, conditions do not change if the one end of the leaf spring 4 is connected to the rear part of the upper sole 1 and the other end of the leaf spring 4 is connected to the front part of the lower sole 3. A shoe which is constructed in this manner is one according to the invention and functions in exactly the same way as the one shown in FIG. 1.

[5] In a running and jumping shoe according to the invention, both soles 1 and 3, or one of them, may also be elastic. If the lower sole 3, for instance, is developed as a leaf spring, it will bend in the opposite direction to the leaf spring 4 upon application of load on the foot tip, as shown in FIG. 4. Upon application of load on the heel, an elastic lower sole 3 has no effect in the case of a running and jumping shoe according to FIG. 1. The conditions are reversed if, as described in the alternative above, the leaf spring 4 is attached the other way around.

[6] Additional springs of another type may also be used. For example, it is advantageous to use separate additional pneumatic springs in the front and rear parts of the shoe. If the pneumatic springs are inflatable by means of a valve, the spring force can be adapted to the estimated stresses by different degrees of inflation.

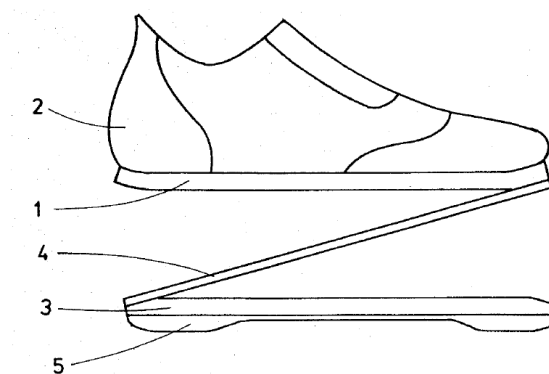


FIG. 1

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Document D: Technical brochure of Easy Footware (3/3)

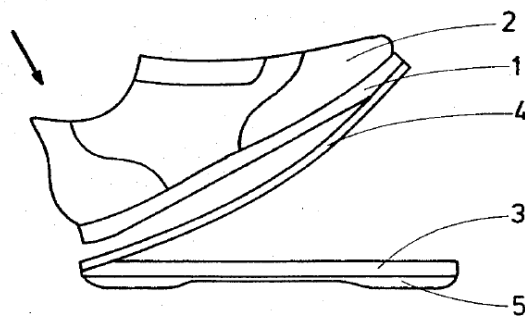


FIG. 2

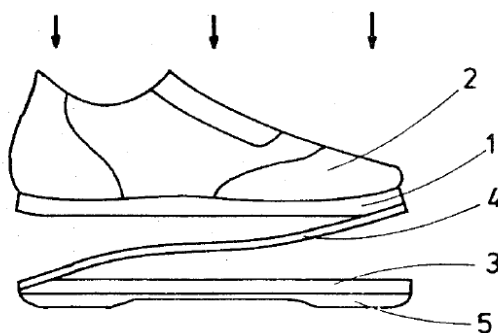


FIG. 3

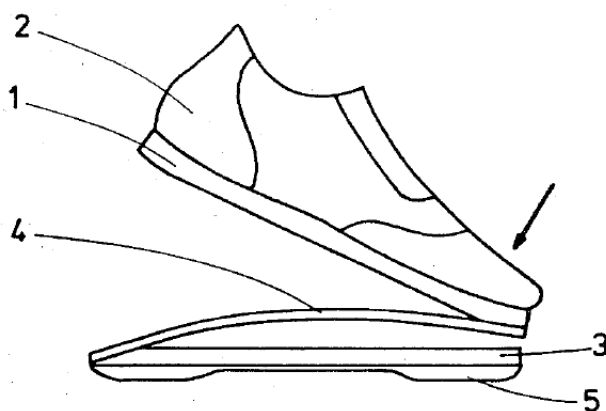


FIG. 4

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