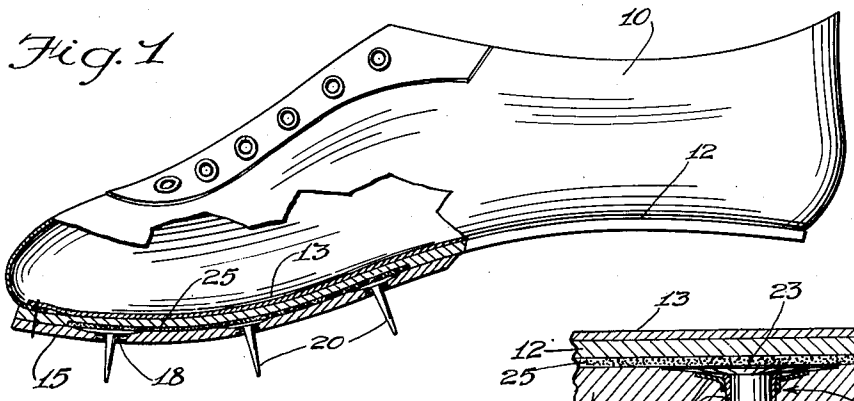
Aug. 26, 1952 I. SHAPIRO 2,608,007

RUNNING SHOE

Filed Dec. 8, 1949

Fig. 1



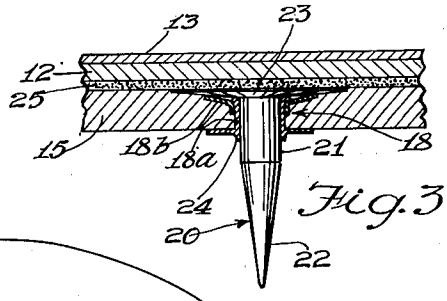
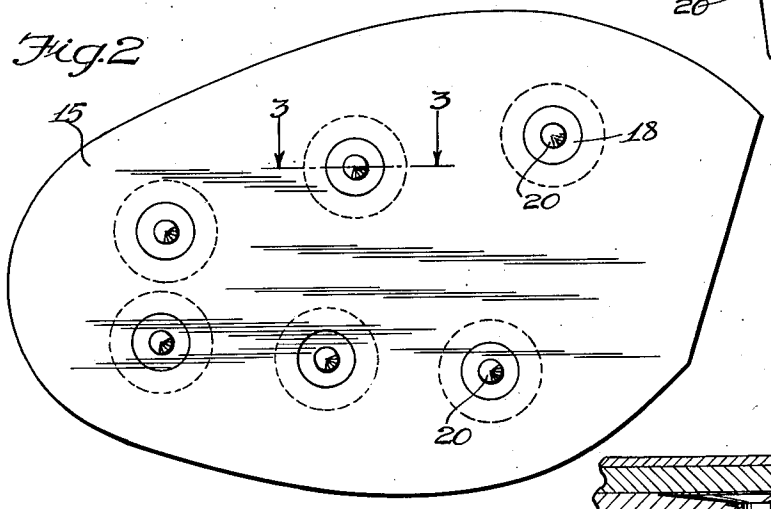


Fig. 3

Fig. 2



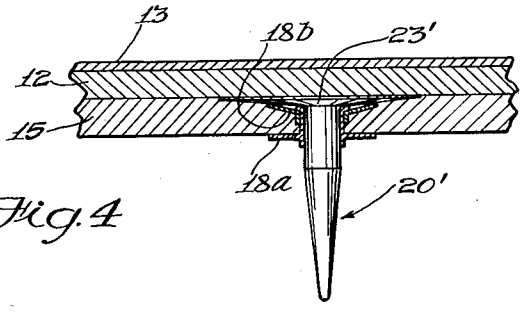


Fig. 4

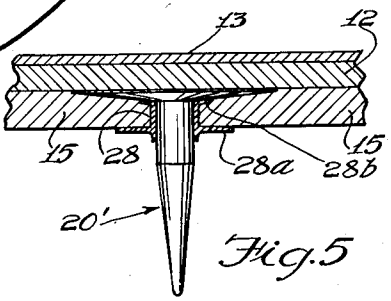


Fig. 5

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Patented Aug. 26, 1952 2,608,007

UNITED STATES PATENT OFFICE

2,608,007

RUNNING SHOE

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Application December 8, 1949, Serial No. 131,872

3 Claims. (Cl. 36—2.5)

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My invention relates to track or running shoes and has to do more particularly with an improvement in cleat or spike attachments therefor.

In the construction of a track shoe several desiderata are considered. A major objective is lightness of weight, in order than the runner may not be unduly handicapped, as it is found that every ounce of weight carried by the runner's foot tends to reduce his speed. A further objective is that of securely attaching the spikes to the shoe sole, in order that they will not be forced up against the runner's foot, causing him discomfort and thus producing a mental handicap, and also to prevent cocking of the spikes at various angles, reducing tractive efficiency.

With these objectives in mind, track shoes have been constructed in various ways, the manufacturer giving more or less consideration to one desideratum or another, but never, so far as I am aware, have they been able to accomplish all of the desired advantages in a single structure. Furthermore, the manufacturer must always bear in mind the element of cost, inasmuch as certain institutions which support track teams are able to afford a larger expenditure of money for equipment than others.

In a common construction of shoe the spikes, made of metal with a comparatively large, integral flat head, are forced through the sole of the shoe and the insole is then secured over the heads of the spikes. While such a construction obviously has the advantages of lightness of weight together with relatively low cost, it is subject to important major objections. Foremost among these is the fact that, even after a moderate amount of use in running, the spikes quickly tend to become cocked at various angles, inasmuch as they are subject only to the relatively low resistance of the leather in which they are imbedded, and thus the shoe loses so much of its tractive efficiency that it is practically worthless.

In more expensive shoes, a wide variety of expedients has been introduced to overcome the disadvantages of the simplest and cheapest construction mentioned above. Most of these involve the use of screw threaded spikes secured to female threaded studs which are imbedded in the sole of the shoe. These constructions, which have been known and used for a long time, are not ideal for a number of reasons. For one thing, they add considerably to the cost of a shoe, especially in the time and labor required to assemble the various parts. From a functional standpoint, furthermore, such constructions are subject to the same criticism as the cruder construction with the spike driven through the leather, unless there is added to the assembly a spring steel plate interposed between the sole and insole or between the sole and the tap, where a tap is used. It can be readily seen that the addition of such a steel plate adds greatly to the weight of a shoe as well as considerably to the cost thereof.

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An object of my invention is to provide a track shoe construction which will accomplish practically all of the above mentioned desiderata, avoiding the disadvantages mentioned.

Briefly outlined, my invention contemplates attaching a spike to the sole or sole tap by means of a tubular element imbedded in and preferably clamped to the sole or sole tap, the spike having a firm drive fit with said tubular element so as to be rigidly secured to the sole. Furthermore, I prefer to use a standard spike having a relatively large head, thus providing considerable bearing surface which will resist cocking of the spike to a much greater extent than where a spike is threaded into a female stud.

In a preferred embodiment of my invention I also may insert above the spikes and between the sole elements a thin sheet of lightweight material having high flexibility and high shearing strength and hardness.

My invention will be best understood by reference to the drawings forming a part of this application and illustrating certain preferred embodiments of my invention, wherein:

Fig. 1 is a side elevational view of a track shoe embodying my invention, portions being shown cut away and in section;

Fig. 2 is a bottom plan view of the shoe shown in Fig. 1;

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 2 on an enlarged scale; and

Figs. 4 and 5 are similar sectional views showing other modifications of the invention.

Referring first to Fig. 1, numeral 10 indicates the upper of a track shoe having secured thereto, as by stitching, a sole 12, an insole 13 and a sole tap 15. As regards the parts so far mentioned, the construction may be more or less standard.

Imbedded in the tap 15 is a plurality of tubular elements 18. These tubular elements are preferably of a non-threaded type and may conveniently be devices commonly known as grommets which are commonly used in the shoe and clothing industry. These grommets are formed of a relatively soft metal, such as brass or thin,

unhardened steel, and comprising a pair of interengaging tubular female members 18a and 18b, as best seen in Fig. 3, which are secured in openings provided in the sole or sole tap 15 in such manner that the members 18a and 18b interlock and clampingly engage the sole so as to be rigidly secured thereto.

A plurality of cleats or spikes 20 such as are commonly used in track shoes or of other suitable design are driven through the tubular elements 18 so as to form a firm drive fit therewith.

The spikes 20 used in connection with my invention have an upper portion which is approximately of uniform diameter, as indicated by the numeral 21, the lower portion 22 tapering more or less to a blunt point so as readily to pierce the ground, and a flat head 23. The diameter of the uniform portion 21 will be at least as great as the diameter of the tubular members 18 and preferably slightly greater, so that when the spike is driven through the tubular member 18 a small portion of the soft metal will be forced outwardly to provide a collar 24 which closely grips the spike 20.

By means of this construction, the spikes 20 are fixedly attached to the shoe sole since they are positively secured to the tubular elements 18 which, in turn, permanently clamp the sole. Hence, the spikes are secure not only against sliding upwardly into the interior of the shoe, but are rigidly positioned to extend in a perpendicular direction from the sole and are not likely to become cocked out of such direction in the course of use.

In order to provide an additional factor of safety against cocking and displacement, I provide, in the embodiment shown in Fig. 1, inserted between the sole 12 and the sole tap 15, a relatively thin sheet 25 of a material which will have certain desirable qualities. Thus, it is light in weight and highly flexible, so that it will readily bend with the shoe as it is flexed by the runner, and has a hardness and shearing strength of a high order. Numerous synthetic materials now available on the market meet these requirements, and it is within the contemplation of my invention that any such materials may be used for this purpose. One such sheet material which is well known for a variety of other applications, such as electrical insulation, is known in the industry under the name or trademark "Formica." I do not consider it necessary for me to describe the precise chemical character of such materials as they are commonly available in the trade, some being formed of various synthetic resins, sometimes having incorporated therein various fibrous materials. In many respects certain of these substances, including the one mentioned by name, are nearly comparable in hardness and flexibility to spring steel, at least for the purposes of my invention.

Thus, it will be seen that the construction shown in Fig. 1 is extremely light in weight, the inserted sheet 25 adding very little to the weight of the shoe and does not materially reduce the flexibility of the sole, although it contributes greatly to the permanent positioning of the studs or spikes.

Obviously, the shoe shown in Fig. 1 may be manufactured quickly and cheaply with a minimum of labor. The tubular members are of a standard type which are extremely inexpensive and may be quickly applied to the shoe by automatic machinery. Furthermore, the driving of the spikes through the tubular members may also be accomplished mechanically in a minimum of time since no threading operation is required.

The collars 24 which are automatically forced out around the spikes 20 contribute to the rigidity thereof, not only against axial displacement but also against wobbling.

Fig. 4 illustrates an embodiment of my invention which is slightly different from that shown in Figs. 1 and 3 in that I dispense with the interposed sheet 25. It will be seen that I employ here a tubular member clampingly engaging the sole member 15 as in the first embodiment. However, in the absence of a reinforcing or stiffening sheet, I preferably employ a spike 20' having a head 23' of somewhat enlarged diameter as compared with the spike 20, shown in Figs. 1 and 3. Such an enlarged head provides additional bearing surface cooperating with the sole member 15 to insure against wobbling of the cleat.

Fig. 5 is substantially similar to Fig. 4 except that I show here a different type of tubular element 28. This element may be likewise of a substantially standard form and consisting of a single element known as an eyelet in the shoe and clothing industry, instead of the two-piece grommets shown in the other figures. These eyelets are driven into the sole, having a flange 28a gripping the under face thereof, and then upset on the opposite side to form clamping prongs 28b.

Other forms of inexpensive tubular rivets or the like may be substituted for the grommets and eyelets shown.

Furthermore, while I have shown a substantially standard form of track spike, it will be readily understood that my invention is applicable to the use of other ground engaging cleats.

Various changes coming within the spirit of my invention are susceptible of being incorporated without departing from the essential spirit or scope thereof. I do not wish, therefore, to be limited to the particulars of the accompanying illustrations and drawings nor by the language chosen in the foregoing description, except to the extent indicated in the appended claims.

I claim:

1. In a running shoe, a sole member, a tubular soft metal member having a transverse flange on opposite ends thereof clampingly engaging the sole member, and a spike driven through the tubular member, said tubular member having an integral extension of extruded metal beyond the outer flange and gripping said spike, and a non-metallic sheet disposed over said spike, said sheet being formed of lightweight material having high flexibility, hardness and puncture and shearing strength so as to resist upward movement of the spike.

2. A combination as defined in claim 1, wherein said sheet is formed of a composition including a synthetic resin plastic.

3. A combination as defined in claim 1, wherein the sole member comprises a pair of elements having therebetween a non-metallic sheet of lightweight material of high flexibility, hardness and puncture and shearing strength, said spike having a relatively large, flat-topped head disposed under said non-metallic sheet, the latter substantially resisting upward movement of the spike.

ISADORE SHAPIRO.

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