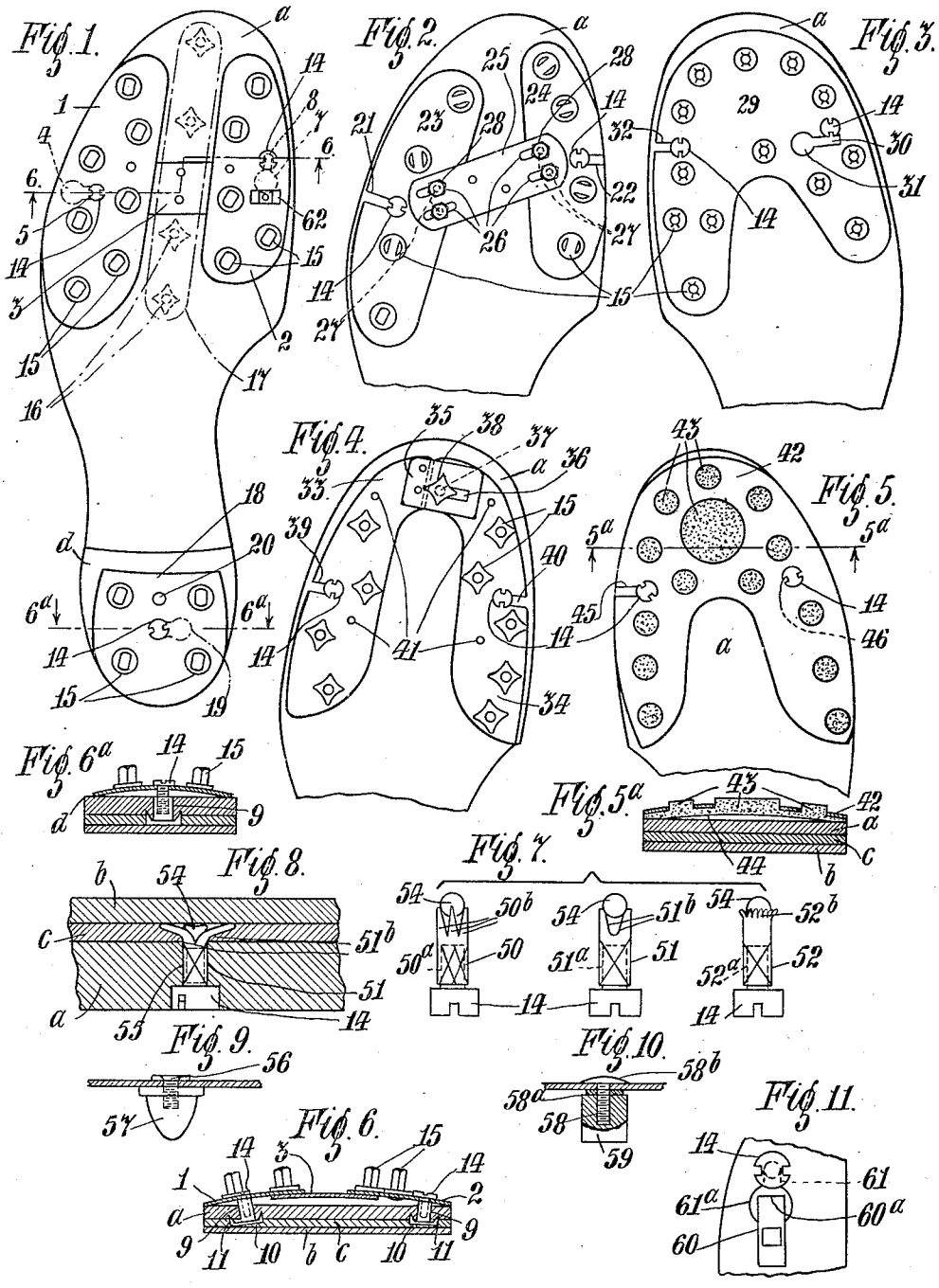
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ATHLETIC BOOT OR SHOE

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ATHLETIC BOOT OR SHOE

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This invention relates to athletic boots or shoes and has particular reference to detachable tread devices therefor of the type in which studs, spikes, bars or other foot grips are carried by a plate or plates adapted to be detachably secured to means let into the soles or heels of the boots or shoes.

According to the present invention, athletic boots or shoes are provided with detachable tread devices of the type stated, in which the plate or plates with the foot grips is or are provided with a slot or slots, and in which the means let into the sole or heel comprises a screwed member or members having, or each having, an enlarged head, and an internally threaded socket embedded or secured in a relatively permanent manner in the sole or heel or forming an integral part thereof, the slot or each slot being so made that the tread device can, with or without the subsequent application or prior removal of an auxiliary holding device, be fastened or unfastened, and manipulated into or out of position, by tightening up or easing outwards the corresponding screwed member or members into or out of the socket or sockets therefor.

The slot or slots in the plate or plates of the tread device is or are of the keyhole or other kind having a wide end and a narrow extension of straight, curved or angular shape. Alternatively, the said slot or slots may be of the same, or substantially the same breadth throughout and extend in from the sides of the plate or plates so as to form an open-ended recess or recesses which, as in the case of the extension of the keyhole or like slots, may also be either of straight, curved or angular shape.

The aforesaid socket or each of the said sockets may comprise a part of the sole or heel itself, in which case a wood screw is preferably employed as the screwed member, the latter being screwed direct into the said part of the sole or heel or into a hole or recess previously provided therein. Alternatively, the said socket or sockets may comprise a base formed with a number of turned-up pointed projections adapted to bite into the outer sole or other sole adjacent to the insole, and to be fitted between the insole and the outer or other adjacent sole during the manufacture or repair of the boot or shoe. The socket, or each socket, on the other hand, may be formed or provided with an inner end of bifurcated, pronged, tubular or other open formation, a lead or like ball or wedge being arranged in the open part of the said end, so that, when the socket is driven through a hole provided therefor in the outer sole, or the outer sole and the other sole or soles over the insole, the bifurcated or equivalent parts of the said end are expanded or splayed outwards on reaching the insole.

The plate or plates of the tread device may be provided with a rubber, leather, fabric or like facing or backing, on which studs, or a studded, ribbed or similarly formed sole or heel, of crepe rubber or the like is formed or secured by rubber solution or otherwise.

In the case of detachable studs or like foot grips, the plate or plates may be provided with holes at different places thereon, a stud in one hole being adapted to be exchanged into any of the other holes vacant. A preferred form of detachable stud comprises a flat-headed screw adapted to be inserted through a hole in the plate from below, the head or stud proper being internally threaded so that it can be secured on or off the said screw. Alternatively, screw members may be riveted or otherwise permanently secured to the plate or plates at different places thereon, and the internally threaded head of a stud or foot grip adapted to be screwed on or off the permanently secured screwed member. Preferably, the said member comprises a screw provided a short distance above its lower end with a collar, so that the said lower end may be inserted through a hole in the plate from the top thereof and riveted over on the underside.

When the detachable tread device comprises two or more plates, such plates may be provided with sets of perforations, so that, by bringing different perforations on adjacent plates into register, the said plates can be secured together in different relative positions and the shape or size of the device thereby altered. If desired the said plates

may be connected together so as to be adjustable relatively to one another by sliding and (or) swivelling movement. The aforesaid perforations may serve, or other perforations may be provided, for the attachment to the normal tread device of an additional central or other plate or strip, as may be necessary or desirable where it is important to obtain maximum gripping power, as, for example, in mountaineering.

In order that the tread device may be positively retained in position on the sole or heel, means may be provided comprising a retaining element carried by the plate or plates of the device in adjacency to one or more of the keyhole or equivalent slots so as to engage behind or over the corresponding screwed member or members when the plate or plates is or are pressed home into position on the sole or heel.

A number of embodiments of the invention will now be described, by way of example, with reference to the annexed drawings, in which:—

Fig. 1 is a view looking on the sole of a boot or shoe equipped on the sole proper and heel with improved tread devices;

Figs. 2 to 5 are similar views showing different forms of tread device for the sole proper, the heel in each case being broken away;

Fig. 5^a is a cross-sectional view on the line 5^a—5^a (Fig. 5);

Figs. 6 and 6^a are cross-sectional views on the lines 6—6, and 6^a—6^a (Fig. 1);

Fig. 7 is a view of three forms of socket; and Fig. 8 is a cross-sectional view of the middle socket driven into a sole;

Figs. 9 and 10 are detail views of two forms of detachable studs;

Fig. 11 is a plan view of a locking device for holding the plates of the tread device in position.

Referring to the drawings:—

In Fig. 1, the sole *a* is provided with an H-shaped tread device comprising a pair of side plates 1, 2 and a bridge plate 3 rigidly connected therewith. The plate 1 is formed with a keyhole slot 4, the extension 5 of which projects inwards across the sole *a*, whilst the plate 2 is formed with a key-hole slot 7, of which the extension 8 projects forwardly.

As shown in the sectional view, Fig. 6, the sockets 9 are let into the sole *a*, each socket comprising, in known manner, a base 10 formed with turned-up pointed projections 11. The sockets 9 are inserted in position during the manufacture or repair of the boot or shoe so that, as illustrated, the base 10 of each socket rests on the insole *b* while the projections 11 bite into the ply sole *c*.

The sockets 9 are disposed on the sole *a* in such position (Fig. 1) that the inner ends of the keyhole extensions 5, 8 of the plates 1, 2 can be engaged by screwed members 14 (see also Fig. 2) simply by laying the tread device on the sole *a* with the wide or circular end of the slots 4, 7 over the screwed members 14, and thereafter giving the device, as a whole, a short turn (clockwise, in Fig. 1).

On the side plates 1 and 2, studs 15 are secured by riveting, and, where it is necessary or desirable to obtain greater gripping power than is given by the studs 15, such additional power may be obtained by affixing studs to the bridge plate 3 or by studs 16 affixed to a strip 17 (see chain dotted lines, Fig. 1) secured on the plate 3 detachably.

A tread device comprising a plate 18 is also fitted to the heel *d*, Fig. 1, the said plate being formed with a transverse keyhole slot 19, which is engaged by a screwed member 14. As shown in the sectional view, Fig. 6^a, the screwed member 14 engages, in turn, with a threaded socket 9, the construction and fitment of which is similar to the sockets 9 of the sole *a*.

As will be seen from Figs. 6 and 6^a, the plates 1 to 3 and 18 are cambered or arched so that, at the outside edges of the tread devices, the said plates bear closely down on the leather of the sole *a* or heel *d*. Such arrangement also ensures that the detachable tread devices, as a whole, grip the sole or heel more firmly and are less liable to shift about in use, the resilient upward pressure of the plates 1 to 3 or plate 18 on the heads of the screwed members 14 resisting any tendency of the members to slacken backwards out of their sockets. As an additional safeguard against shifting of the device, a short spike or spikes may be provided on the lower surface of the plate or plates. A spike of this kind is indicated in plan at 20 in Fig. 1, the point of the spike penetrating a short distance into the leather of the heel *d* when the plate 18 is secured by the screwed member 14.

The tread device shown in Fig. 2 differs from that described above in so far as the slots 21, 22 of the plates 23, 24 are of the open-ended type, being formed respectively in the outside edges of the said plates. Moreover, the plates 23, 24 are connected together adjustably, instead of rigidly. The adjustable connection is effected by a bridge plate 25 formed at each end with a pair of substantially parallel slots 26, each slot 26 being engaged by a screw pin 27, the bottom of which is fixed rigidly in the plate 23 or 24 and the top of which is fitted with an internally threaded head 28.

In order to fit the tread device shown in Fig. 2 on the sole *a*, the side plates 23 and 24 are first drawn inwards towards each other, then laid on the sole so that the outer ends of the slots 21, 22 lie adjacent to the heads of the screwed members 14, and afterwards forced outwards so as to bring the in-

ner ends of the slots 21, 22 under the heads of the screwed member 14 (as shown), following which the heads 28 of the screw pins 27 are tightened up.

As will be understood, the adjustable bridge plate 25 can be replaced by a plate connecting the side plates together rigidly. For example, in a rigid tread device comprising two oppositely disposed keyhole or like slots, these slots are spaced at such a distance from one another that, when the device is laid on the sole or heel, the narrow or inner ends of the slots lie immediately above the screwed members corresponding therewith. By this arrangement, the device can be fitted in position simply by bending it so as to bring the wide or outer ends of the said slots over the heads of the said screwed members, whereafter the sides of the device are allowed to spring outwards into normal position, and the screwed members thereupon engage with the inner or narrow ends of the said slots in which position the device is prevented from displacement by the double security arising from the spring fit aforesaid and from the tightening-up of the screwed members.

In Fig. 3, a tread device is shown which comprises a single plate 29 of inverted **U** shape. This plate is formed in the right-hand portion thereof with a bayonet slot 30 having a keyhole opening 31, and an open-ended slot 32 is cut in the left-hand edge of the plate, directly opposite the bayonet slot 30. The tread device is fitted to the sole *a* by first laying the plate 29 thereon so that the open end of the slot 32 and the keyhole opening 31 both lie adjacent to the screwed members 14, and then causing the inner ends of the slots 30, 32 to register with the member 14 by a transverse movement of the whole plate 29 towards the left and by a short turn of the said plate about the screwed member 14 on the left, so as to cause the right-hand member 14 to engage with the right-angled extension of the bayonet slot 32. As will be apparent from Fig. 3, the bayonet slot 32 gives a more secure connection than an ordinary or straight slot, because, with the right-hand member 14 in the right-angled extension, the plate 29 is positively held against transverse displacement.

The tread device shown in Fig. 4 is similar to that shown in Fig. 2, with the exception that the side plates 33, 34 are adjustably connected at their forward ends instead of at the middle. The connection comprises a cross-piece 35 riveted to the plate 33 and formed with a slot 36. A screw-pin 37 which is riveted at its bottom end to the plate 34 projects upward through the slot 36 and is engaged by an internally threaded head 38, which also serves as a stud or foot-grip. As will be apparent, the pin and slot connection 36, 37 permits both sliding and pivotal movement of the plates 33, 34 relatively to each other. In order to fit the tread device to the sole *a*, the plates 33, 34 are manipulated so as to cause the screwed members 14 to engage with the open-ended slots 39, 40, after which the plates are forced outwards from each other, as will be seen, any forces or shocks on the forward end of the device merely have the effect of pressing the plates 33, 34 more tightly into their proper position.

The plates 33, 34 (Fig. 4) are shown formed with separate apertures 41, so that, when necessary or desirable, the tread device can be fitted permanently on the sole *a* by screws or nails. Any of the tread devices herein referred to may be similarly apertured and fitted.

In Figs. 5 and 5ª, a tread device is illustrated which comprises a metal plate 42 of inverted **U** shape and a number of studs 43 of crepe rubber or vulcanized rubber. These studs project upwards through correspondingly arranged apertures in the plate 42 and are formed integral with a rubber base or backing 44 (Fig. 5ª), of which the shape corresponds to that of the plate 42. If desired, the studs 43 may be made separately and secured to the base 44 by rubber solution.

The complete tread device (Fig. 5) is secured to the sole *a* by a pair of screwed members 14, the one engaging with an open-ended slot 45 formed in one edge of the plate 42 and rubber base 44, and the other engaging with a hole 46 formed in the portion of the plate 42 and base 44 opposite the slots 45. For the attachment or removal of the tread device to or from the sole *a*, the screwed member 14 engaging with the slot 45 need only be slackened or eased off, whilst the member 14 engaging the hole 46, is, of course, completely removed.

As will be apparent from a consideration of Figs. 1 to 4, the attachment and removal of each of the tread devices therein shown only involves the slackening or easing off of the screwed members 14 and in none of these cases is the complete removal of the screwed members 14 from their sockets 9 necessary. The enlarged head of each screwed member 14 may be of any desired shape, and, as illustrated in the drawings, the grooves or notches for driving the screw are preferably formed in the sides of the head instead of, as usual across the top. This arrangement, it is found, ensures that the utility of the grooves or notches for driving by means of a screw key or driver is not impaired by use of the boots or shoes by the wearer.

In Figs. 7 and 8, a type of socket is shown which, in contrast to the sockets 9 above described, can be fitted in place without removing the outer sole *a* and ply sole *c*. Three sockets 50, 51 and 52 of this type are illustrated in Fig. 7. The body portion of each of these sockets is of square section and is

formed with a screwed recess 50^a, 51^a and 52^a respectively. The top end of the socket 50^a comprises four prongs 50^b adapted to receive therebetween a small ball 54 of lead. The socket 51 is bifurcated at the top, and a similar ball 54 is adapted to be received between the two prongs 51^b. In the socket 52, the top end 52^b is made tubular and provided with slits or incisions all round and is slightly expanded to receive a lead ball 54 in the same fashion as the sockets 50 and 51.

The action and use of the sockets described in the foregoing paragraph are illustrated in Fig. 8, with particular reference to the socket 51. In order to fit the socket to the sole, the boot or shoe is placed on a last and the socket is inserted in a hole 55 made therefor in the outer sole *a* and ply sole *c*. As will be understood, the lead ball 54 is placed between the prongs 51^b before the insertion of the socket.

The socket 51 is then driven through the hole 55 by means of a hammer, the lead ball 54 being carried in front of the socket until arrested by coming into contact with the surface of the insole *b*. The ball 54 being held against further movement, the continued blows of the hammer on the outer end of the socket 51 causes the prongs 51^b to be expanded or splayed outwards. The hammering is continued until the expanded prongs 51^b are beaten flat between the insole *b* and ply sole *c*, and, in the case of the ball 54, the original form thereof is destroyed and the lead spread out (see Fig. 8). The socket 51 with the screwed member constitutes a firm attachment device for detachably securing the plates of the tread device on the sole.

In lieu of the fixed studs 15 shown in Figs. 1 to 4, the plates may simply be provided with the corresponding apertures, in which detachable studs can be fitted so as to be readily removable or interchangeable. A form of detachable stud for use in this manner is shown in Fig. 9. As will be seen, the stud consists of a flat-headed screw 56 and an internally-threaded head 57, the two being connected together, with the head 57 outwards, about the plate of the tread device.

In Fig. 10, a stud is shown in which the screw element consists of a screw-stud 58 formed with a collar 58^a between its ends and riveted over at one end 58^b on the plate of the tread device. The head or stud proper 59 is provided with a screwed recess adapted to engage with the projecting end of the screw-stud 58 as shown. In practice, the plate or plates of the tread device can be provided with a number of screw-studs 58, to which any one of a variety of heads 59 can be removably or interchangeably fitted.

In Fig. 11, a device is shown for positively preventing the plate or plates of the thread devices from working back upon their screwed members 14. The said device comprises a strip 60 of spring steel which is secured to the plate of the tread device so that normally the end 60^a of the strip lies above the open end 61^a of the slot 61 and in the same plane as the head of the screwed member 14.

Another device for the same purpose is comprised in the tread device shown in plan in Fig. 1. This second device consists of a stud having an elongated head 62, this stud being secured to the plate 2 adjacent to the open or wide end of the keyhole slot 7 and being turnable by means of a small key or spanner so as to cause the elongated head 62 to project over the wide end of the slot 7, in the plane of the head of the screwed member 14.

As will be understood, unless the detachable tread device is shaped so as to fit either the left or right boot or shoe, or is adjustable for this purpose, the devices are made and supplied in pairs, the one device of each pair being the mirror image of the other device.

In the case of heel plates, the plates may be circular or conform to the shape of the heel itself. If desired, the head plate may have riveted or otherwise secured thereto an ordinary rubber or leather heel piece, the part of the said heel piece above the keyhole or equivalent slot in the heel plate being removed so as to permit the tightening and easing off of the screwed member.

When my detachable tread device is removed from the boot or shoe, the screwed member or members is or are screwed in flush with the heel or sole thereof, the holes to receive the said member or members being countersunk or recessed, if desired, for this purpose. Where lightness of weight is desired in respect of the aforesaid plate or plates, I have found that the alloy known under the registered trade mark "Duralumin" may be advantageously employed. The plates may also be made of vulcanite, ebonite or similar hard non-metallic material. Moreover, the studs, spikes or other foot grips may be stamped out of, or otherwise formed integral with, the plates. Foot-grips of this kind are particularly suitable for use on ice, and may take the form of serrations or indentations projecting sufficiently to provide a secure foot-grip, whilst being strong enough to resist deformation due to the pressure and wear to which they are subjected on the boot or shoe.

It will be apparent that the tread device made in accordance with my invention can be both attached and removed quickly and easily, and thus golfers and others are saved the expense of purchasing an extra pair of shoes for sports use. The light and simple nature of the tread device enables it to be carried conveniently on the person, and the tread device, when fitted, remains rigidly in place. The device also imparts resiliency to the tread

of the wearer, and enables him or her always to take a sure and comfortable stance.

While I have shown and described the preferred construction and arrangement of the several features of the device, it is to be understood that the same is susceptible of considerable modification and I, therefore, reserve the privilege of adopting all such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim:—

1. A tread device having foot grip members thereon, and attachable to the outer soles of athletic footwear by screwed means let into the sole, comprising flangeless flexible plate means having a forked formation at the rear so as to provide side tongue portions extending rearwardly of the sole at the sides and leaving bare the rear part of the sole at the middle, and slotted means provided in the side of said plate means and adapted to be engaged by said screwed means.

2. A tread device attachable to the outer soles of athletic foot wear by screwed means let into the sole and adapted to engage slots in said device, comprising a number of flangeless flexible plates, means for connecting said plates together adjustably, and foot grip members passed through and secured in perforations in said plates.

3. A tread device attachable to the outer soles of athletic foot wear by screwed means let into the sole and adapted to engage slots in said device, comprising a number of cambered flexible slotted plates each provided with apertures adapted to register with apertures on the other of said plates, means adapted to engage the registering apertures of said plates to permit said plates to be secured together in different relative positions, and foot grip members passed through and secured in perforations in said plates.

4. A tread device having foot grip members thereon and attachable to the outer soles of athletic footwear by screwed means let into the sole, comprising flangeless flexible plate means having a forked formation at the rear so as to provide integral side tongue portions extending rearwardly of the sole at the sides and leaving bare the rear part of the sole at the middle, and slotted means provided in both sides of said plate means and adapted to be engaged by said screwed means.

In testimony whereof I affix my signature.

RICHARD McCUBBIN DOBBIE.