W. A. KRENTLER.

LAST.

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Fig. 1.

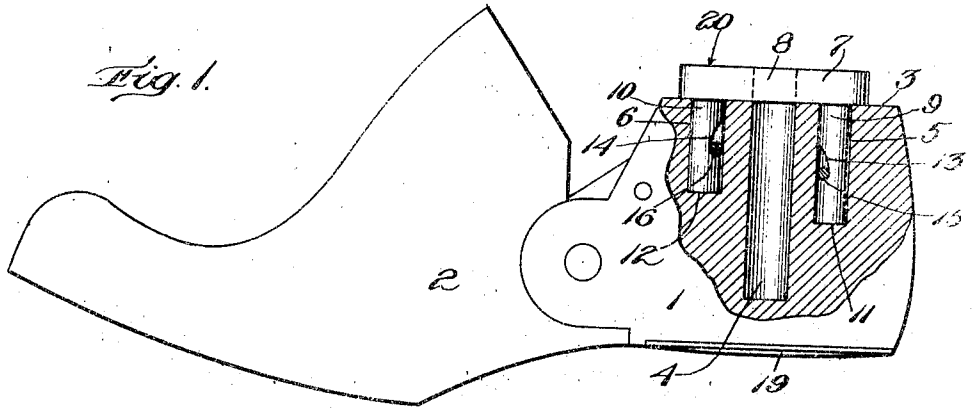
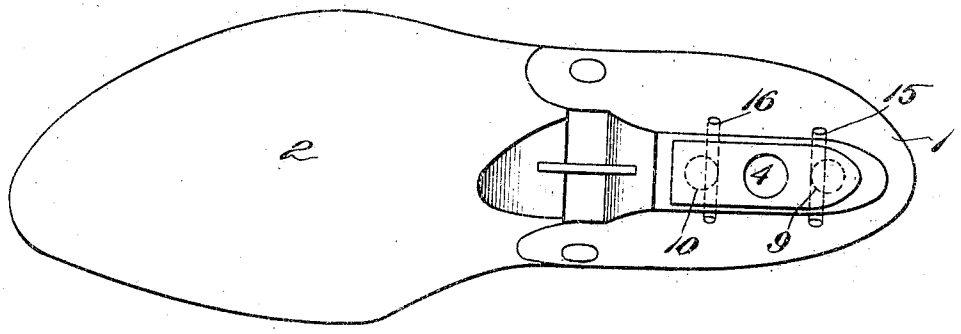


Fig. 2.



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UNITED STATES PATENT OFFICE.

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LAST.

1,067,742. Specification of Letters Patent. **Patented July 15, 1913.**

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To all whom it may concern:

Be it known that I, WALTER A. KRENTLER, a citizen of the United States, and resident of Detroit, county of Wayne, State of Michigan, have invented an Improvement in Lasts, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to wooden lasts for use in the manufacture of boots and shoes

In the manufacture of certain kind of footwear, particularly low shoes, such as ladies' oxfords, the style of last required has such a narrow and slender cone portion that such lasts are easily broken during the various machine processes of shoe manufacture, particularly when being subjected to heeling machine pressures. Such lasts being made of wood are provided with a metallic thimble, the socket for such thimble being bored through the central cone portion of the last, having a diameter sufficient to receive a solid metal thimble, which thimble receives the supporting spindle of a heeling or other machine when the last and shoe are mounted thereon during the various machine processes of shoe making. A last with a thin cone, and having the main central portion bored out to receive the thimble, necessarily weakens the wood and the last is apt to be split through the lateral strains of the machine spindle contained within the thimble during machine operations on the lasted shoe. These difficulties have long been known, and many efforts have been made by inventors to provide protective devices for the cones of wooden lasts by means of iron protecting plates, and the like, but such prior devices have been unsatisfactory either because of expense, weight, difficulty of attaching the same, or the like.

It is an object of my invention to provide an efficient protector for the cone of a wooden last, particularly a narrow coned last, which eliminates entirely the necessity for a thimble, and hence for boring and weakening the central part of the wood to the extent heretofore required for inserting a thimble, and which also provides reinforcing and strengthening means to eliminate the danger of the last being split through the torsional strains of a heeling machine spindle or the like, during machine operations to which the last is subjected.

It is also an important feature of my present invention to provide means whereby the protecting plate may be firmly and securely attached to the last by devices which will tend to strengthen the cone portion, instead of weakening the same, and which devices will also permit the protecting plate to yield freely under heeling machine blows, but which will at once prevent the plate from being removed.

It is also an important feature of the present invention to provide a protecting plate which will have an increased contact area between the plate and the wood of the last, and which will enable the strains and pressures received by the plate to be transmitted to the firmer and more solid interior portion of the wood of the last, instead of transmitting the same directly on the top of the cone. This is of great importance, especially in a thin coned last, as the top of the cone is so narrow and the wooden fiber easily compressed and damaged during the various machine operations to which lasts are ordinarily subjected in modern shoe factories.

Further objects of the invention, novel combinations of parts, and details of construction, will be hereinafter more distinctly pointed out and claimed.

Referring to the drawings, wherein a preferred embodiment of the invention is illustrated, Figure 1 is a side view with a part of the last shown in section; and Fig. 2 is a top plan view of the last.

My invention may be applied to any type of last, being herein illustrated in connection with a wellknown hinged last, the last comprising a heel part 1 and a forepart 2. The heel part 1 has the top of the cone portion 3 substantially level, and has a central socket 4 bored therein, which socket may be of suitable diameter to fit the standard size spindle of the shoe machines, and therefore is of less diameter than that ordinarily required, the entire thickness of the ordinary thimble being left in the wood of the heel, and thus much added strength thereby secured. Additional sockets 5 and 6 are also formed in the heel parallel with the socket 4, and at the front and rear thereof, respectively. These sockets are of different depths, both as to each other, and different from that of the spindle socket 4, thus securing the advantages of having the bottom of said

sockets "staggered" which will largely obviate the tendency of the wood to split. Preferably the forward socket 6 is of less depth than the rear socket 5, the latter being in the line of greater pressure during the heeling machine operations, and it being therefore desirable to have the same more firmly seated in the heavier part of the wood constituting the heel portion of the last. To the last so prepared I apply a protector, preferably of metal, and comprising a plate 7, having therein a central aperture 8 to register with the spindle socket 4, and having formed integrally therewith or welded securely thereto, downwardly projecting studs 9 and 10 in a position and of a diameter and length to firmly fit in the sockets 5 and 6 respectively. Such fit is preferably a "driving fit," and preferably also the length of these studs 9 and 10 is slightly greater than the depth of the sockets 5 and 6, so that in driving the plate 7 home until it is firmly seated on the top 3 of the cone, the lower ends of the members 9 and 10 will act to compress the wood of the last slightly at the points 11 and 12 respectively, so that at these points a very substantial amount of pressure will be supported by the wood of the last, thus relieving the cone surface 3 very substantially from the pressures to which the last may be subjected.

By having the plate 7 of a substantial depth approximately as shown in Fig. 2, a construction is provided which enables the ordinary last thimble to be eliminated, the member 7 protecting the opening of the socket 4, and the entire plate 7, by means of its firmly fitted studs 9 and 10, taking up the torsional strain which may be exerted by a machine spindle, and thus relieving the spindle socket 4 therefrom. This distribution of the strain over a greater area of the wood of the last, and at points within the firmer and thicker portions of the heel than is afforded by the narrow top of the cone 3, enables the wood to stand up much better than formerly, and thereby to withstand the machine pressures, which, when applied directly to the cone, would be sufficient to damage it.

In order to hold the plate 7 securely to the wood of the heel part 1, as well as to strengthen the narrow cone portion and counteract the tendency to split the same, I provide the edge portions of the studs 9 and 10 with notches 13 and 14 and two bolts 15 and 16, are arranged transversely through the cone portion 1, intersecting the sockets 5 and 6, in a position to coöperate with the notches 13 and 14 to hold the studs 9 and 10 firmly seated. Preferably these bolts 15 and 16 are of the wellknown type, provided with enlarged heads bearing on the outer surfaces of the last at either end as indicated at 17 and 18 in Fig. 2. These bolts are also preferably "staggered" or offset, relatively to a horizontal line as indicated in Fig. 1, and are arranged to pass through the last on the inner edges of the studs 9 and 10 between the same and the spindle socket 4, so that any strain exerted thereon will be toward said socket, and it will also tend to counteract the torsional strains exerted on the walls of said socket by a machine spindle. The plate 7 is preferably of slightly less area than the top surface 3 of the cone of the last on which it is applied, particularly at the extreme rear portion, in order not to interfere with the shoe upper and also to permit the variation in styles of heel contours without a corresponding variation in the form of the plate 7.

I provide the notches 13 and 14 in the studs 9 and 10 with the upper walls thereof inclined for a short distance, and with the lower walls substantially in contact with the bolts 15 and 16, as clearly shown in Fig. 2. This feature is of importance, because during the applications of pressure on the plate 7, the entire plate and the studs 9 and 10 may be forced slightly downward relatively with the wooden part 1 of the last, and the upper inclined walls of said notches permit this yield without affecting the bolts 15 and 16. The withdrawal, however, of the plate 7 is prevented by said bolts, and therefore the entire plate will be firmly held in proper position on the heel part 1 of the last.

It will thus be seen that I have provided a last wherein a substantially increased strength in the wood of said cone portion is provided, where the machine spindle engages the same, by eliminating entirely the use of a thimble and that I have provided a construction whereby the torsional strains imparted to a last in machine operations is distributed throughout a considerable area of the wood, and in the thicker and firmer portions of the last below the narrow cone, thus enabling the wood of the last to withstand without damage, pressures which, if applied to the narrow cone alone, would quickly injure and splinter the fibers of the wood.

It is also an important feature of this construction, that by providing the plate 7 of varying thickness, I can equip any style or size of last with a plate so that all of such varying styles and sizes may be of the same depth at the heel from the top of the plate 7 to the outer surface of the nail clenching plate 19 on the bottom of the heel. This feature is of great importance, since the heeling machines are ordinarily "set" for lasts of one height, and if a last of a greater height or thickness is positioned therein and the operator neglects to reset the machine, the pressure subsequently applied is usually sufficient to splinter and break the last.

By means of my device all lasts could be

made with the same height or thickness, and therefore the danger of breaking the same on the heeling machine is eliminated, as such machine can be kept constantly arranged for one height, and no neglect of the operator will result in damaging lasts. This feature, however, I do not claim herein, as it is the subject matter of a separate copending application.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A wooden last, having its heel portion provided with a spindle socket and with a plurality of other sockets of differing depth, and a protecting plate for the cone of the heel portion provided with an aperture to register with the spindle socket and a plurality of studs of differing length to fit the other sockets respectively.

2. A wooden last, having its heel portion provided with a spindle socket and with a plurality of other sockets of differing depth, and a protecting plate for the cone of the heel portion provided with an aperture to register with the spindle socket and a plurality of studs of differing length to fit the other sockets respectively, and means to secure the plate to the wood of the last.

3. A wooden last, having its heel portion provided with a spindle socket and with a plurality of other sockets of differing depth, and a protecting plate for the cone of the heel portion provided with an aperture to register with the spindle socket and a plurality of studs of differing length to fit the other sockets respectively, said studs being provided with notches and means carried by the wood of the last and coöperating with said notches, having provision to permit a downward yielding of the studs relatively with said engaging means, while preventing the removal of said studs.

4. A wooden last, having its heel portion provided with a spindle socket and with a plurality of other sockets of differing depth, and a removable protecting plate having socket members to fit said plurality of other sockets, in combination with detachable means engaging said socket members and holding the plate and last in assembled position.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WALTER A. KRENTLER.

Witnesses:
W. G. GILMORE,
N. E. CHAVENELLE.