

May 11, 1937.

C. E. KNAPP

2,080,320

SHOEMAKING

Filed July 11, 1936

2 Sheets-Sheet 1

Fig. 1.

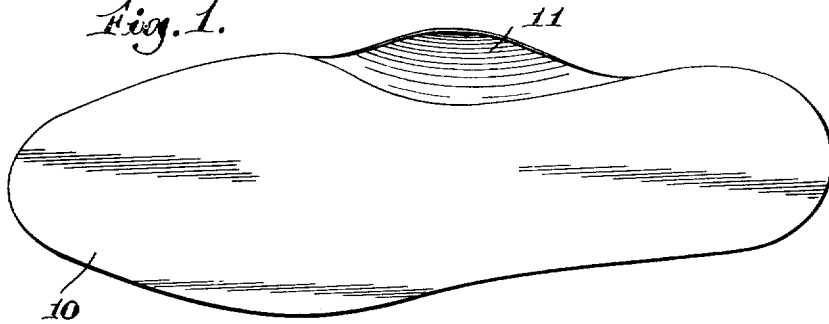


Fig. 2.

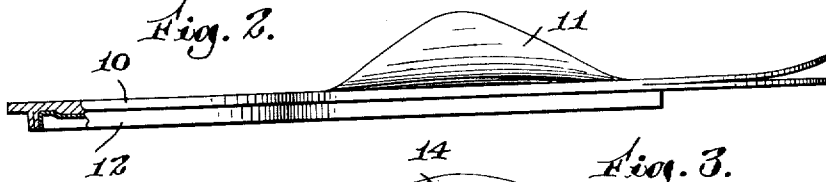


Fig. 3.

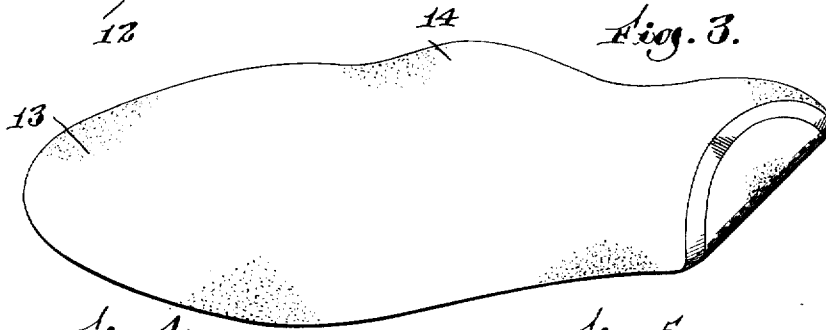


Fig. 4.

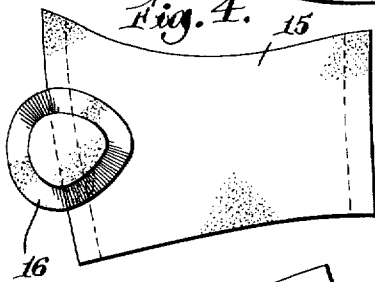
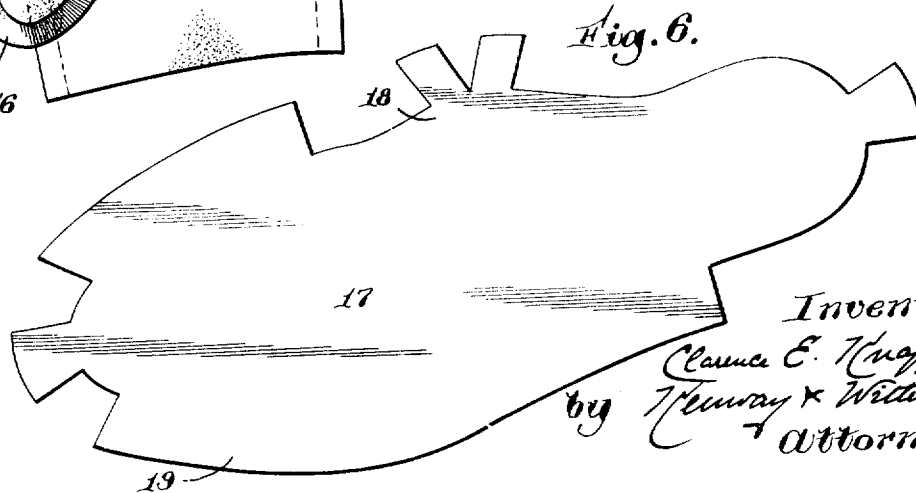


Fig. 5.



Fig. 6.



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2 Sheets-Sheet 2

Fig. 7.

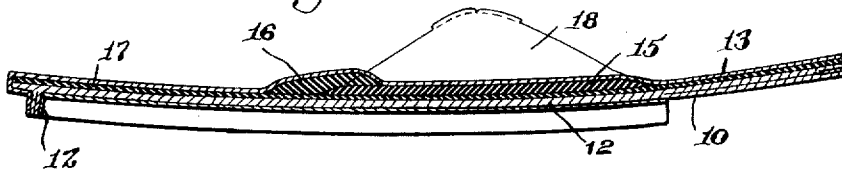


Fig. 8.

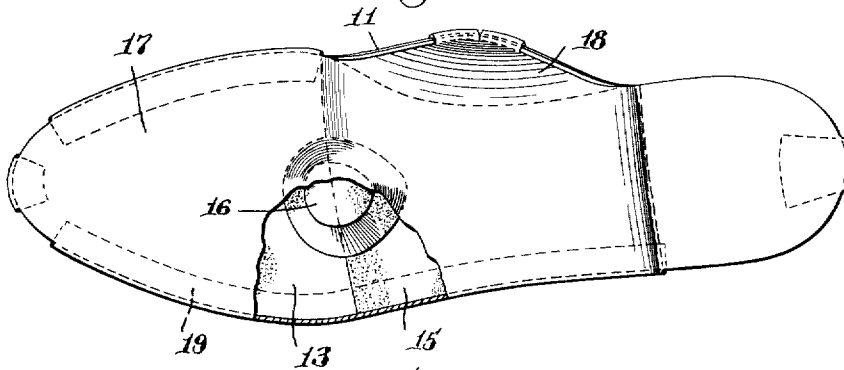


Fig. 9.

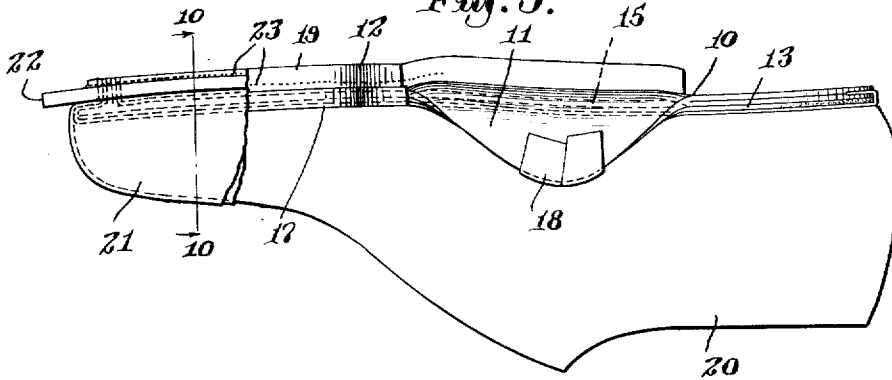
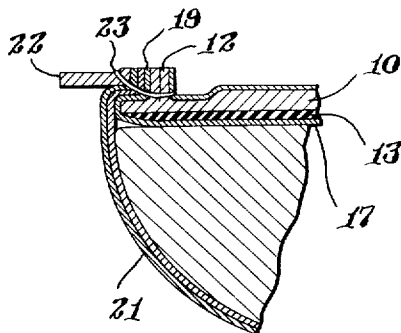


Fig. 10.



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UNITED STATES PATENT OFFICE

2,080,320

SHOEMAKING

Clarence E. Knapp, Boston, Mass.

Application July 11, 1936, Serial No. 90,155

5 Claims. (Cl. 36—71)

This invention consists in an improved cushion innersole for use in boots and shoes and in a novel process of preparing the innersole. It is designed to promote the comfort of the wearer by providing a cushion innersole having a smooth and yielding surface shaped substantially to conform to the contour of the sole of his foot, particularly to the longitudinal arch of the instep, the inside shank curve and the metatarsal arch. Further, the cushion innersole of my invention is of relatively light weight and sturdy, compact construction and may be relied upon to remain permanently in place in the shoe without displacement as a whole or in any of its constituent parts. In addition to conforming comfortably to the contour of the wearer's foot, the innersole of my invention provides a yielding supporting cushion beneath the entire area of the foot, thus greatly contributing to the comfort of the wearer and increasing his range of activity.

An important feature of my invention consists in a continuous cover sheet or blank which is conformed to the entire upper surface of the innersole, including the arch supporting wing extension thereof. Preferably the cushion portions of the innersole are built up of a series of supplementary blanks of various shapes, all produced from commercial sheet stock originally of uniform thickness. For example, an underlying sheet of sponge rubber may extend throughout the whole area of the innersole, including the shank supporting wing, and this may be supplemented by one or more pieces of the same material superposed in the shank or in the vicinity of the ball line. By following this procedure the expense of molded pads may be avoided and all conditions of varying requirements of the wearer fully supplied.

Cushion innersoles as heretofore constructed have sometimes given trouble by wrinkling under the foot of the wearer when subjected to long continued use. This difficulty is entirely obviated in accordance with another feature of my invention. It is proposed to fit the cover of the cushion innersole to the assembly of its constituent parts while the latter is maintained in a slightly curved condition. From this it results that when the cushion innersole is straightened by being applied to the last and so maintained in the completed shoe, the cover is slightly stretched and thereafter maintained under a sufficient degree of tension to prevent the occurrence of wrinkles even after long continued wear.

The cushion innersole of my invention may be utilized as the innersole of a welt shoe and built integrally into the construction of the shoe, or

it may be utilized as a slip sole and inserted in a shoe already manufactured. For purposes of illustration it is herein shown as embodied in a cushion innersole of the former type. This will be best understood and appreciated from the following description of a preferred embodiment thereof, selected for purposes of illustration and shown in the accompanying drawings in which,

Fig. 1 is a plan view of the leather insole which forms the basis of my cushion innersole,

Fig. 2 is a corresponding view in side elevation,

Fig. 3 is a plan view of the sponge rubber blank which forms one constituent of the innersole,

Fig. 4 is a plan view of the shank pad and metatarsal pad shown in their assembled relation,

Fig. 5 is a corresponding edge view,

Fig. 6 is a plan view of the cover blank, which is another constituent of the innersole,

Fig. 7 is a view in side elevation of the complete cushion innersole,

Fig. 8 is a corresponding plan view,

Fig. 9 is a view showing the innersole in position upon a last, the upper being shown as broken away, and

Fig. 10 is a fragmentary view in cross-section on the line 10—10 of Fig. 9.

The base member of my cushion innersole comprises a welt innersole 10 preferably made of a good grade of leather and including as an integral part thereof a curved shank wing or extension 11 which is molded upon the inside shank portion of the innersole to fit the side curvature of the instep of the wearer's foot and is preferably skived so that it tapers outwardly to a curved feather edge. Upon its outer face the welt innersole is provided with the usual rib 12 and this may be reinforced with duck if desired. This innersole may be prepared by any commercial process of manufacturing welt innersoles for good grades of shoes, the shank wing being skived and molded as a separate operation. The heel seat of the innersole may be split approximately to the heel breast line, permitting a clenching plate to be inserted during the heel nailing operation.

Having prepared the innersole in this manner, I next die out from sponge rubber sheet a blank 13 which corresponds in its outline to the contour of the welt innersole, being provided with an extension 14 corresponding to the shank wing 11 of the welt innersole. Preferably the sponge rubber blank is reduced in thickness about its marginal edge by skiving its under surface, but otherwise it is of uniform thickness throughout. The sponge rubber blank may be cemented to the smooth inner face of the welt innersole at this

stage of manufacture, or it may be first assembled with the other cushion members of the cushion innersole and cemented with them to the surface of the welt insole at a later point in the process.

The shank pad 15 is then prepared also from sponge rubber sheet. This pad is preferably of sufficient length to extend from about the heel breast line to about the ball line of the sole. Its marginal edges coincide substantially with the general contour of the welt insole and it too is preferably reduced by skiving about all its marginal edges, particularly on its forward and rear transverse edges. The metatarsal pad 16 may be also formed from sponge rubber sheet being generally circular in shape and being also reduced about its marginal edge. The sequence of operations in assembling these supplementary pads is of only secondary importance. They may be cemented one after another in place on the innersole or they may be cemented together outside the innersole to form an assembly which is then cemented in position upon the surface of the rubber blank 13 or the surface of the leather innersole.

The cushion members, after being cemented together as above explained, are then enclosed in a flexible cover blank 17 which may be died out from a good grade of kid or calf leather, in substantially the shape shown in Fig. 6, that is to say, with a curved shank extension 18, with a long marginal tongue 19 adapted to be wrapped about the edge of the cushion innersole and with other shorter tongues located at convenient points about the contour of the blank. The cover blank is now positioned upon the assembled parts of the cushioned innersole and cemented to them in continuous face to face contact. The marginal tongue 19 and the other narrow tongues in the margin of the cover blank are wrapped about the marginal edges of the assembled blanks and cemented to the outer marginal edge of the welt innersole and to the outer face of the rib 12, and to the upper surface of the shank wing 11. The result is a firm, compact, light weight, cushion innersole presenting a smooth continuous face having a contour comfortably fitting the bottom of the wearer's foot and instep and of such sturdy construction as to withstand hard usage for a long period of wear.

In fitting the parts of the innersole the cover blank 17 is shaped to cover the welt innersole and its assembled cushion blanks while they occupy a slightly bowed position as indicated in Fig. 7. However, when the cushion insole is assembled on the last as shown in Fig. 9, the innersole as a whole is straightened and the cover blank 17 is accordingly subjected to longitudinal tension. This has the effect of consolidating all parts of the innersole, of removing any possibility of wrinkles being formed in the cover blank in wear and of causing the cushion innersole to remain flat and free from wrinkles during the life of the shoe in which it is embodied.

It will be understood that in the completed shoe the upper 21 and the welt 22 are sewn to the rib 12 of the assembled innersole. In this operation the welt seam 23 passes through the inner edge of the welt 22, the marginal edge of the upper 21, the marginal edge of the cover 17 and the rib 12 of the innersole. The welt seam therefore supplies an additional and positive securing means for holding the cover 17 in place upon the cushion insole. Subsequently an outersole is sewn to the welt 22 and this is effective to maintain the cush-

ion innersole in the straightened condition which has been imparted to it by the last bottom and to maintain the cover 17 continuously in a smooth condition in the shoe.

The cushion innersole thus produced is characterized by a flat heel seat portion and a flat toe portion of substantially the same thickness of cushion and these are connected by a longitudinally curved shank portion presenting at least twice the thickness of cushion of the former. The thicker shank portion, in turn, merges at its inside shank side into the upwardly curved wing and in the forward part of the shank cushion is the rounded projection of the metatarsal cushion. Finally the whole foot-engaging surface of the innersole is formed by the smooth covering which by its tension is rendered wrinkle-proof.

As already noted the heel seat of the leather welt innersole 10 is split from its rear end approximately to the heel breast line, and in securing the cover 17 in place the rear tongue of the cover is cemented to the under surface of the uppermost eration and the heel nails clenched upon an inspection of Figs. 7 and 9. From this it results that the upper section of the heel seat of the cushion innersole may be temporarily separated from the lower section during the heel nailing operation and the heel nails clenched upon an inserted steel clenching plate. This leaves a nailless heel seat beneath the heel of the wearer, a condition greatly to be desired.

While I have referred specifically to sponge rubber sheet as the material from which the cushion of my improved innersole may be built up, this is by way of illustration only and I contemplate the use of any homogeneous sheet material of yielding character which may be died in flat blanks and cemented as above set forth.

Having thus described my invention and one way of putting it into practice, I claim as new and desire to secure by Letters Patent:—

1. A cushion innersole having as a base, a leather welt innersole provided with a rib on its lower face and an outwardly and upwardly curved arch-supporting wing in its inner edge, a blank of sponge rubber coextensive with the entire area of said welt innersole including its shank-supporting wing and secured thereto in continuous face-to-face contact, said blank being built up to increased thickness throughout the shank portion of the sole, a circular metatarsal pad located in the vicinity of the ball line, and a continuous covering for the entire foot-engaging surface of the innersole.

2. A cushion innersole including, as a base, a welt innersole having a split heel seat and a projecting shank wing, a blank of sponge rubber sheet coextensive with the entire foot-engaging surface of the innersole, a supplementary blank arranged to thicken the shank portion of the innersole, and a flexible covering for the foot-engaging surface of the innersole enclosing the heel seat portion of the cushion upon the uppermost flap of the welt innersole thus leaving a slot for the reception of a clenching plate.

3. A cushion insole, comprising a sole-shaped and substantially flat and relatively stiff base member of substantially uniform thickness throughout, a tapering wing integral with the base member at its inside shank portion and projecting upwardly and outwardly thereof, the base having a downwardly extending sewing rib

within and adjacent to its margin and extending along the base member adjacent to the junction of said wing therewith, a cushion member of substantially uniform thickness and of a shape and area corresponding to the base member and its wing cemented to the upper face of the base member and wing, means providing an increased thickness of cushioning material at the shank portion of the insole, and a sheet of flexible material cemented to the foot-engaging surface of the insole including the wing and having edge portions wrapped around the edge of the insole and cemented in face to face contact with the lower marginal surface thereof.

4. In a welt shoe, an insole comprising a ribbed leather blank having a thin tapering outwardly and upwardly extending supporting wing on one edge thereof, a continuous sheet of sponge rubber smoothly covering one face of the insole blank and said arch supporting wing, a longitudinal arch supporting pad secured to said

sponge rubber sheet opposite to said wing, and a flexible cover enclosing the entire exposed face of the insole and extending over its margins to the rib thereof, thus providing a continuous cushion surface beneath the foot and instep arch of the wearer.

5. In a welt shoe, an insole unit comprising a full length leather welt innersole provided with a rib on its lower face and having a sponge rubber sheet of uniform thickness extending continuously upon its upper face, a shank pad extending substantially from the heel breast line to the ball line upon said sponge rubber sheet and having a forwardly bevelled end, a bevelled edge metatarsal pad secured partly to the sponge rubber sheet and partly to the shank pad and positioned above the forward bevelled edge of the latter, and a flexible cover enclosing all of said pads and extending over the margin of the innersole blank.

CLARENCE E. KNAPP.

CERTIFICATE OF CORRECTION.

Patent No. 2,080,320.

May 11, 1937.

CLARENCE E. KNAPP.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 24, for the syllable and words "eration and the heel nails clenched upon" read flap of the heel seat, as is apparent from; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of June, A. D. 1937.

Henry Van Arsdale

(Seal)

Acting Commissioner of Patents.

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