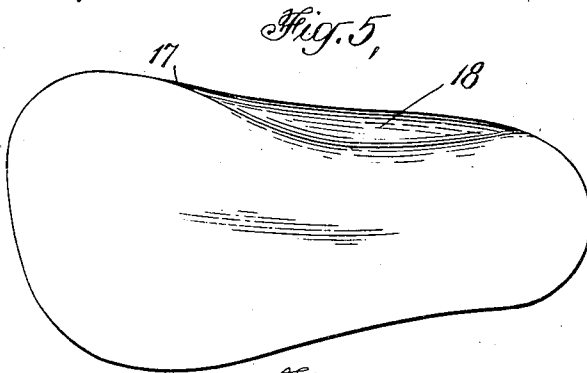
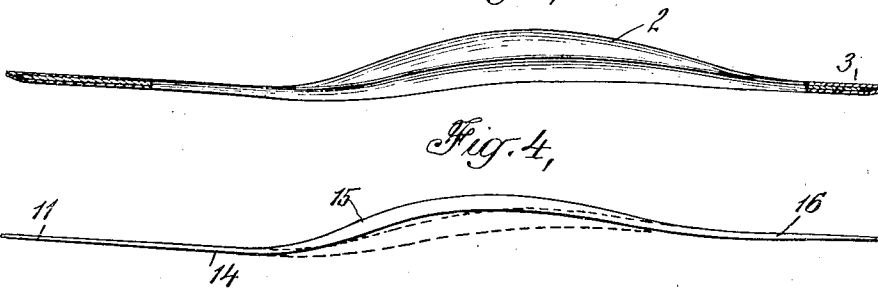
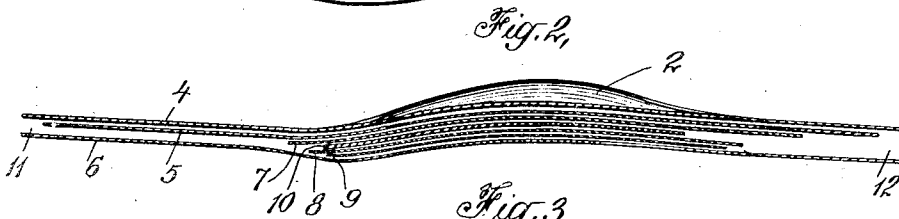
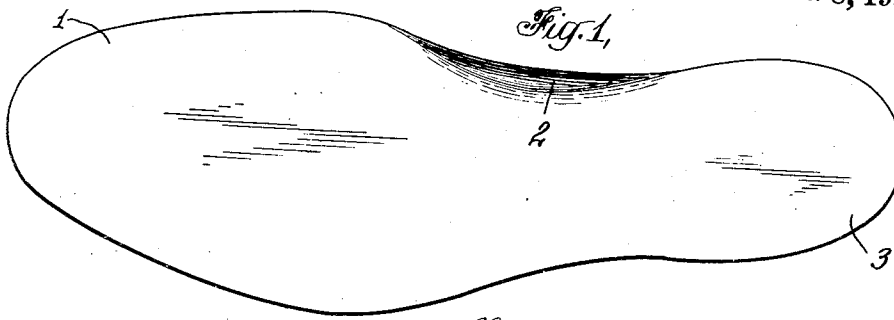


H. C. EGERTON.
ARCH SUPPORTING INSOLE.
APPLICATION FILED MAR. 31, 1919.

1,370,799.

Patented Mar. 8, 1921.



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ARCH-SUPPORTING INSOLE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY C. EGERTON, a citizen of the United States, and resident of Ridgewood, county of Bergen, State of New Jersey, have made a certain new and useful Invention Relating to Arch-Supporting Insoles, of which the following is a specification, taken in connection with the accompanying drawing.

This invention relates especially to stiffening insoles or arch supports which may be separately inserted in shoes and secured in position therein, if desired, or may be otherwise used or incorporated in shoes to stiffen the soles thereof as well as to support the arch of the wearer's foot. These insoles may comprise fabric or other fibrous material carrying or incorporated with phenolic condensation cementing material, such as bakelite, condensite or redmanol varnish compositions and a number of layers of canvas or other woven or knit fabric, paper, cotton batting or other fibrous material may be used to give the desired thickness at various parts of the insole and by curing such material at the desired heat and pressure the cementing material may be cured or hardened into its permanently solid condition in which it not only secures the various elements together but greatly stiffens and strengthens them.

In the accompanying drawing showing in a somewhat diagrammatic way various illustrative embodiments of this invention, Figure 1 is a top view showing one form of arch supporting insole.

Fig. 2 is a diagrammatic longitudinal section thereof showing the different layers or elements in separated position;

Fig. 3 is a corresponding side view of the finished insole, parts being shown in section.

Fig. 4 is a side view showing another embodiment.

Fig. 5 is a top view showing still another form; and

Fig. 6 is a side view thereof.

When canvas or other fabric or strong fibrous material contains thirty to sixty per cent. more or less of thoroughly incorporated cured bakelite varnish or other generally similar phenolic condensation cementing material, it has a great deal of elastic or resilient strength and is desirable for use in arch supporting insoles where it can advantageously exert a yielding restoring ac-

tion on the arch of the foot. Such arch supporting insoles may advantageously have their upper supporting portions formed with an impervious non-absorbent surface which may be smoothly finished, if desired, and the lower or bottom surface of the insole which may, if desired, be cured into a single unitary article may be of sufficiently absorbent fabric or the like, so that it can be conveniently cemented or adhesively secured to the inside of a shoe by rubber or other suitable cements. As shown in Figs. 1 and 3, the arch supporting insole may have a relatively thin yieldable toe portion 1 and heel or rear portion 3, the intermediate or shank portion 2 being of heavier and stronger material, and if desired formed with an upstanding edge portion on the inner side of the foot. As shown in Fig. 2 such an article may advantageously be formed of a number of layers of fabric and the layer 4 may be woven cotton fabric such as cambric or sheeting of relatively close texture which has preferably been quite thoroughly impregnated with dried bakelite varnish compositions so that it contains some fifty per cent. or so by weight of such material. One or more layers of heavy canvas or other fabric 5 may be used also containing considerable quantities of similar phenolic condensation cementing material and such fabric may be prepared and used as described in the Egerton Patent 1,282,399 of October 22, 1918 which broadly covers such insoles or shoe elements. The bottom surface of the article may for some purposes be left in a sufficiently absorbent condition so that rubber or other ordinary cements may be sufficiently absorbed thereby to be effectively used to secure the completed article within the shoe in connection with such nailing or other securing means as may be desired. For this purpose a layer of untreated cotton fabric may be used on the bottom of the article and sufficiently secured to the other elements by the phenolic condensation cementing material contained therein which under the molding heat is forced out to become incorporated with the contacting surface of this lower fabric layer so that it is effectively secured to the article throughout its extent. In many cases it is desirable to have the edge 11 of the insole at least throughout the front portion thereof of a relatively weak or yieldable character so that it more readily conforms

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to the shape of the inside of the shoe. After trimming down the insole to the extent necessary the edge may further be weakened to a still greater extent by rubbing over it a tool with sufficient force to bend up this weakened edge which still further minimizes the possibility of injury to the other parts of the shoe and the somewhat weakened edge portion 12 may, if desired, be formed at the heel portion of the insole.

10 The shank portion of the insole may advantageously be considerably reinforced and strengthened by incorporating therein additional layers of fabric, such as canvas carrying or incorporated with such phenolic condensation cementing material, or strong more or less absorbent grades of impregnated paper or cotton batting which may be so arranged or formed that the cotton fibers are to a greater extent arranged longitudinally of the insole and somewhat tapered down at the front and rear portions so as to be most effective and also merge gradually into the other elements at the front and back portions of this shank stiffener. In some cases also special fabric may be used in this and other parts of the stiffening insole in which the threads running longitudinally of the insole are of relatively heavier straight character so that the longitudinal strength of the finished article is correspondingly increased. As indicated in Fig. 2 a number of layers of fabric 7, 8, 9 may be used at this portion of the insole and in some cases also one or more spring steel strips or other resilient metal stiffeners 10 may be used preferably so arranged or formed that the fabric may be securely united through or around them so that splitting is prevented. The different layers after being suitably arranged and if desired temporarily secured together in any desired way may be subjected to a heat curing treatment under high pressure, so that they are securely united and the upper surface at least accurately formed and finished so as to conform to the particular contour desired.

In some cases it is quite desirable to have a one-piece arch supporting insole of this character exert a resilient and yielding restoring action on the arch of the foot and Fig. 4 shows such an arrangement in which the shank or arch supporting portion 15 is of such a resilient yielding material as to be somewhat flattened or depressed by the weight of the foot so that under such pressure it may assume the dotted position while normally it tends to spring upward into the full line position shown. It is advantageous to have such an arch supporting insole formed with sufficiently stiff front extensions or portions 14 so as to stiffen the shoe sole at this point at least beneath the ball of the foot which makes it quite advantageous for use with light or flexible rubber soled

shoes of various grades and a similar heel stiffening portion 16 is also sometimes advantageous. It is also desirable to have this arch supporting insole and sole stiffener formed with relatively yieldable weak edges 70 11 which may be of the character previously described. Such an insole may be effectively made in the general way above described, a greater degree of resilient elasticity and toughness being secured by employing a greater proportion of cotton or similar fabric as compared with the proportion of paper used which while somewhat stronger has less toughness and resistance to fracture on bending. In some cases the insole may be formed almost entirely of canvas, cotton batting or other similar fibrous material containing only a relatively small proportion of paper pulp which for such uses should be employed adjacent the central portion of the insole where the bending strains are least.

Figs. 5 and 6 show another form of arch supporting insole of relatively small area, the shank or arch supporting portion 18 being in this case also of relatively thick heavy and stiff material, while the front portion 17 is of thinner and lighter construction, a number of layers of fabric such as paper, cloth or other fibrous material carrying or impregnated with large proportions of cured phenolic condensation cementing material giving good results for such purposes. This construction has the decided advantage that a one-piece unitary article is made which has a high degree of resilient stiffness and strength as compared to its weight. Also when forty or fifty per cent. or more of such cured phenolic condensation cementing material is present in the upper supporting surface of the insole, it is practically impervious and absorption cannot therefore take place to any appreciable or objectionable extent under service conditions.

This invention has been disclosed in connection with a number of illustrative embodiments, forms, proportions, elements, parts, shapes, materials, compositions, conditions and methods of preparation, production and use, to the details of which disclosure the invention is not of course to be limited, since what is claimed as new and what is desired to be secured by Letters Patent is set forth in the appended claims:

1. The unitary arch supporting insole and sole stiffener having a substantially impervious smooth upper supporting surface comprising close textured woven fabric carrying a large proportion of cured phenolic condensation cementing material, said stiffener having an absorbent fabric bottom capable of being cemented to a shoe element and having a plurality of layers of paper carrying cured phenolic condensation cementing material adjacent its arch support-

ing shank portion, the front edge of said stiffener being relatively thin and yieldable.

2. The unitary arch supporting insole and sole stiffener having a substantially impervious smooth upper supporting surface comprising a large proportion of cured phenolic condensation cementing material, said stiffener having a plurality of layers of paper carrying cured phenolic condensation cementing material adjacent its arch supporting shank portion, the front edge of said stiffener being relatively thin and yieldable.

3. The unitary arch supporting insole and sole stiffener comprising fibrous material having a substantially impervious smooth upper supporting surface comprising cured phenolic condensation cementing material, the front edge of said stiffener being relatively thin and yieldable.

4. The unitary arch supporting insole and sole stiffener comprising fibrous material having a substantially impervious upper supporting surface comprising cured phenolic condensation cementing material, the front edge of said stiffener being relatively yieldable.

5. The unitary arch supporting insole and sole stiffener having an absorbent fabric bottom capable of being cemented to a shoe element and having a plurality of layers of paper carrying cured phenolic condensation cementing material adjacent its arch supporting shank portion.

6. The unitary arch supporting insole having a plurality of layers of fibrous material carrying cured phenolic condensation

cementing material adjacent its arch supporting shank portion.

7. The unitary arch supporting insole comprising a plurality of layers of woven and paper fabric permanently united and strengthened by incorporated cured phenolic condensation cementing material and having a relatively yielding edge portion.

8. The unitary arch supporting insole comprising a plurality of layers of paper permanently united and strengthened by incorporated cured phenolic condensation cementing material.

9. The insertible unitary arch supporting insole and sole stiffener comprising fibrous material united and strengthened by incorporated cured phenolic condensation cementing material and having a resiliently yielding shank portion.

10. The insertable arch supporting insole and sole stiffener comprising fibrous material united and strengthened by incorporated cured phenolic condensation cementing material.

11. The unitary arch supporting insole and sole stiffener comprising a plurality of layers of fabric permanently united and strengthened by incorporated cured phenolic condensation cementing material and having a resiliently yielding shank portion.

12. The unitary arch supporting insole and sole stiffener comprising fabric strengthened by incorporated cured phenolic condensation cementing material.

HENRY C. EGERTON.