March 22, 1932. A. THOMA 1,850,309

SHOE

Filed Aug. 10, 1927

Fig. 1.

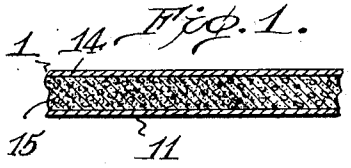


Fig. 3.

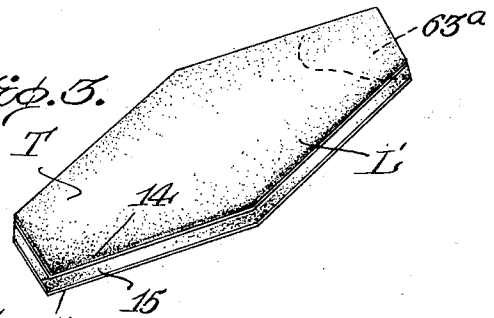


Fig. 2.

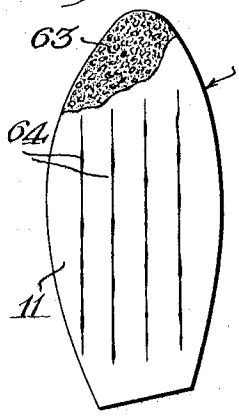


Fig. 5.

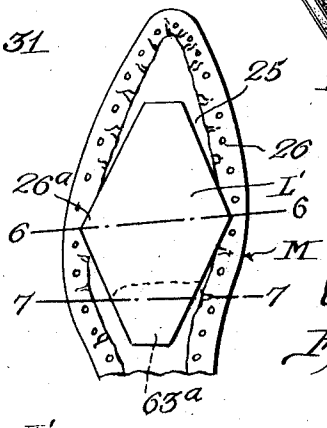


Fig. 8.

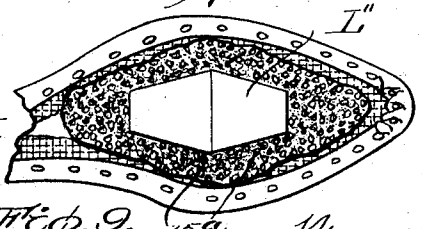


Fig. 9.

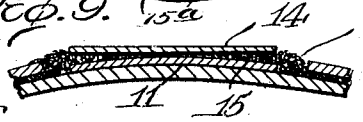


Fig. 6.

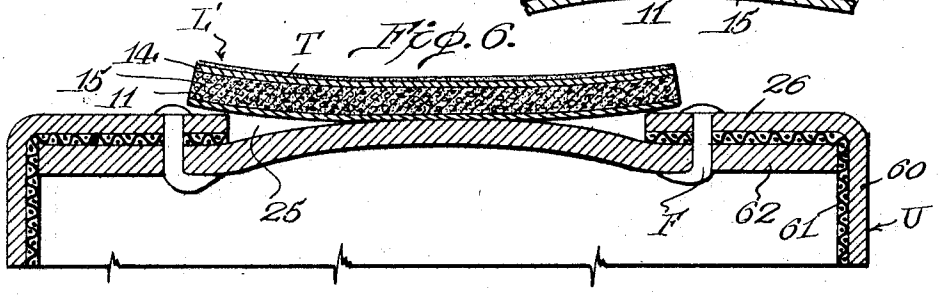


Fig. 7.

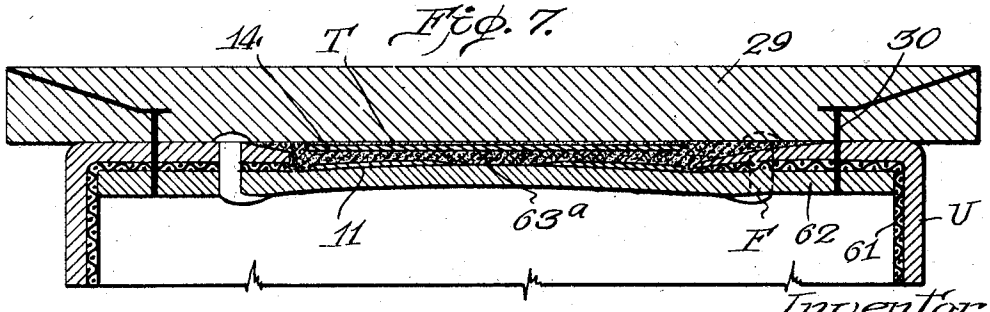
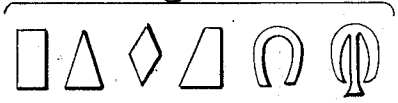


Fig. 4



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UNITED STATES PATENT OFFICE

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SHOE

Application filed August 10, 1927. Serial No. 212,017.

This invention pertains to the manufacture of shoes and especially to shoes having both inner and outer soles, for example, shoes of McKay or Goodyear type, the invention relating particularly to a shoe comprising means interposed between its inner and outer sole adapted to waterproof the shoe and to prevent squeaking without sacrifice of flexibility, and to fill the central cavity and all irregularities or crevices in the shoe bottom, thus providing a smooth supporting surface for engagement with the outer sole and, if desired, uniting the inner and outer soles at their marginal portions.

In my copending application Serial No. 133,506, filed September 3, 1926, of which this is a part continuation, I have disclosed a novel shoe filler layer or piece of coherent self-supporting character comprising a sheet-like layer of a shoe-bottom filler of the general type disclosed for example in my prior Patents No. 808,224, December 26, 1905; No. 832,002, September 25, 1906; No. 861,555, July 30, 1907, and in other patents subsequently granted to me. Such filler compounds are in general sticky and extremely adherent to leather, permanently elastic, pliable and compressible when cold, waterproof or water repellent, capable of becoming sluggishly fluid when heated, but being quick setting, non-inflammable, heat insulating, and permanent and durable when confined as a filler within the cavity of a shoe bottom.

As pointed out in my copending application Serial No. 183,302, filed April 13, 1927, the prior practice, in applying such filler compounds to the cavity of a shoe, has necessitated the application of heat to the filler compound in order to make it soft and mobile, in which condition it was applied to the shoe bottom by spreading, rolling, etc. In my copending application Serial No. 133,506, as well as in my application Serial No. 183,302, I have disclosed a method of packaging a normally sticky, plastic (semi-fluid), loose and non-coherent filler compound so as to provide a self-supporting and shape-retaining piece or leaf which is coherent and normally stiff and suitable for application cold to a shoe bottom, but which is capable, when subjected at normal temperature to sufficient pressure, of flowing or spreading in any or all directions so as accurately to conform itself to its surroundings. In my application Serial No. 133,506 I have described some of the advantages flowing from the use of such improved filler pieces, including new and desirable characteristics of the shoe in which such piece is used, such, for example, as freedom from squeak, flexibility, evenness of sole, resistance to penetration by water, etc.; and in my application Serial No. 183,302 I have more fully disclosed and illustrated these and other features of improvement.

The present application is directed more particularly to a shoe possessing some or all of the above desirable qualities and in its preferred form comprising as an element of its structure a filler piece or the constituents thereof of the kind disclosed in my various pending applications.

In the accompanying drawings I have chosen to illustrate a shoe of McKay type as an example of a shoe construction embodying my present invention, but in so illustrating my invention I do not intend to limit it to this specific environment since it is capable of application to shoes or other articles of footwear of other kinds, for example, footwear of the Goodyear welt type.

In the accompanying drawings

Fig. 1 is a fragmentary vertical section, to large scale, showing one form of my improved sheeting self-supporting and coherent shoe-bottom filler;

Fig. 2 is a plan view illustrating one form of filler leaf which may be made from the sheeted material of Fig. 1;

Fig. 3 is a perspective view illustrating a filler leaf of another shape and which is also adapted to be made from the sheeted material of Fig. 1, or material having the same general characteristics;

Fig. 4 is a view illustrating other shapes of filler piece or leaf which may be desirable under certain circumstances;

Fig. 5 is a diagrammatic bottom view of a shoe of the McKay type, omitting the outer sole, showing a filler piece positioned in the

cavity of the shoe bottom ready to be spread;

Fig. 6 is a transverse section substantially on the line 6—6 of Fig. 5 but to much larger scale;

Fig. 7 is a fragmentary transverse section on a line such, for example, as 7—7 of Fig. 5 but showing the outer sole of the shoe in position and indicating the condition of the filler piece after the leveling operation; and

Fig. 8 is a plan view of a filled shoe bottom, omitting the outer sole; and

Fig. 9 is a fragmentary cross section of a shoe bottom, in which the cover layers of the filler piece are thick.

In Fig. 1 of the drawings I have shown a preferred form of my sheeted shoe-bottom filler 1 which may be prepared as more fully disclosed in my copending application Serial No. 183,302 and which consists of a layer 15 of plastic and sticky filler compound (which ordinarily comprises a semi-fluid and very sticky binder and a comminuted solid such as ground cork,) interposed between protecting and reinforcing or stiffening skins or integuments 11 and 14 respectively. As described in my application just referred to these skins or integuments may for example consists of paper or paper-like material, textile fabric, colloidal films, or layers of normally dry and non-adhesive powder partially or completely saturated with the sticky binder of the filler compound, and the opposite skins or integuments may be of like or different character, as desired. Furthermore, these skins may be and preferably are waterproof or water repellent, and if of paper or textile fabric, the waterproofing of these skins may be accomplished either by treating them with a waterproofing solution or substance prior to association with the layer 15 or in their manufacture they may be subjected to pressure (with heat if necessary) sufficient to cause the binder itself to impregnate the skins, possibly rendering the outer surfaces of such skins slightly sticky.

This sheeted material is normally stiff when cold and capable of retaining its shape indefinitely. It is easily handled and may be packed or piled (for shipment, storage, or as a preliminary step in the cutting of the individual filler package) with substantially the same facility as sheet materials of ordinary types except that it may be desirable, when the outer skins are waterproofed or slightly sticky due to impregnation with the sticky binder, to dust the outer surfaces with a non-sticky powder to prevent adjacent sheets from adhering.

As described in my application Serial No. 183,302, this sheet material may be cut up into individual filler pieces or leaves such as indicated at 31 in Fig. 2, the cutting being performed by suitable dies, or for the sake of economy and to avoid waste in cutting (as more fully described in my application Serial No. 192,076) the material may be cut by means of straight knives into pieces of polygonal contour such, for example, as shown in Figs. 3 and 4, the latter figure also showing at the right forms of strip-like pieces. I find that a piece of substantially double trapezoidal contour, as shown at L′ in Fig. 3, is well suited for use in filling foreparts of shoes since it conforms roughly to the general shape of the cavity in the shoe bottom.

The piece L′, being cut from the sheeted material, consists of an intermediate layer 15 of the plastic and sticky bottom filler interposed between the skins 11 and 14. Prior to applying this to the shoe bottom I prefer to dust or coat one side, for example, the outer surface of the skin 14, with a slippery non-adhesive substance, as indicated at T in Figs. 3, 6 and 7. This slippery substance preferably consists of an unctuous dry powder such, for example, as a powdered mineral such as talc or soapstone,—combined, if desired, with a fibrous or organic substance, for instance, finely divided cork, or dry starch or the like and this powder may be applied either to the individual piece L′, or to the sheeted material 1 either during or after the manufacture of the latter and before it is cut up into individual pieces. While I have mentioned a powder as constituting a suitable slippery or anti-friction medium, I contemplate that other materials, for example, dry or semi-fluid films, of suitable character may be substituted for the powder, or anti-squeak material in sheet form, if this be found preferable.

Having provided a piece or layer such as indicated at 31 in Fig. 2 or at L′ in Fig. 3, I now apply this to the bottom of the shoe either by the use of adhesive, (see my application Serial No. 211,157 filed August 6, 1927 and other applications therein referred to explaining how broad this term is in this connection), which may be applied to the shoe bottom and the piece or to both, or preferably by tearing off or otherwise removing a section (large or small) of one of the skins 11 or 14 so as to expose a portion of the sticky filler layer or the application may be in any of the ways explained in my copending application Serial No. 210,558 filed Aug. 4, 1927. In Fig. 2 I have shown a portion of the skin 11 thus removed to expose an area 63 of the sticky filler, and in Fig. 3 I have indicated in dotted lines the removal of a portion of the skin 11 of the filler piece L′ to expose an area 63ª of the sticky filler.

Having thus exposed a portion of the filler layer this exposed portion may be applied directly to the outer sole or to the inner sole of a shoe, the inner sole being referred to here conventionally as conforming to the common way of making shoes up to the present, thus causing the piece to adhere firmly in position until the outer sole is applied.

In Figs. 5–9 I have shown a shoe of McKay type. This shoe comprises the upper U (which is shown as consisting of the outer member 60, usually of leather, and the lining 61) and the inner sole 62, the edge portions of the upper being lasted in or crimped over the marginal portion of the bottom of the inner sole as shown at 26, the material of the upper forming plaits or folds where it is gathered in over the inner sole and being secured to the latter by a series of fasteners F. The inner edges of the folded portions 26 of the upper define a central cavity 25 which is of irregular contour and which at intervals merges into the crevices or depressions between adjacent folds of the upper. Due to the irregular outline of this cavity it has been extremely difficult heretofore properly to fill shoes of this type by means of the fillers previously available, such, for example, as felt, tarred paper, etc.

My present filler piece possesses characteristics wholly unlike the above class in that it is plastic, compressible when cold, and of a pad-like consistency so that when compressed it spreads freely in the direction of least resistance. Thus, as shown in Figs. 8 and 9, when such a piece is subjected to pressure between flat surfaces such as the two soles, the layer 15 of filler material exudes from between the edges of the skins 11 and 14, as shown at 15ª, forming a plastic and adhesive margin surrounding said skins and that portion of the filler layer which still remains between the skins 11 and 14. Owing to this peculiar characteristic of my filler piece it is capable, when applied to the irregular surface of a shoe bottom, of conforming itself to the irregularities and of providing a smooth and uniform surface for support of the outer sole.

The piece may be secured to the inner sole of the shoe by means of any liquid that will cooperate with the sole or cavity in causing the piece to adhere or stay placed temporarily, or by means of the sticky filler material itself and, if desired, I may, as shown at 64 in Fig. 2, slit one of the skins, for example the skin 11, before applying it to the sole so that when subjected to pressure the slits will widen and permit some of the sticky filler to engage the surface of the shoe sole sufficient for adhering purposes and also as an anti-squeak as will be presently explained. Obviously both skins might be slitted in this manner so that the filler piece would adhere to the central parts of both inner and outer soles.

In applying the filler piece to the shoe bottom it is not essential that it conform with any degree of exactitude to the cavity and ordinarily some parts of the piece, as indicated at 26ª in Fig. 5, may overlap the folded edges 26 of the upper. The parts thus assembled occupy a position such as indicated, for example, in Fig. 6.

With the parts all assembled, as shown in Fig. 7, the sole 29 is secured to the other shoe parts by suitable fasteners such as the stitches 30, but, as will be understood, with the filler piece not yet spread nor the shoe bottom leveled. After the outer sole has been attached, the shoe is then subjected to the usual leveling operation during which a very high pressure is applied to the outer sole, for example, a pressure of the order of several tons.

By reason of the plastic pad-like character of the filler piece the latter decreases in thickness while the plastic filler layer exudes laterally from between the skins 11 and 14 and flows up, down, outwardly, or inwardly as the case may be, filling the entire central cavity of the shoe bottom and pressing out into all of the crevices and interstices between the folds of the upper or between the upper or the inner sole and the outer sole. Due to the fact that the final spreading and positioning of the filler is effected after the sole is fastened in its final position and due also to the filler piece structure, the filler is spread tight against the edges and plaits of the upper and is forced into a waterproofing intimacy and crevice closing, smoothness and compactness heretofore impossible. This constitutes one of the readily distinctive and recognizable features of a shoe made to embody my invention so far as this feature is concerned.

As this patent is on the article and not the method of manufacture, I am using for this purpose of description or explanation the old method as heretofore followed in making McKay shoes, and will simply refer to my copending application Serial No. 210,558 filed August 4, 1927 and others therein referred to for my new and preferred method, which therefore I will not further refer to. As above described I coat one surface, in the present instance that surface of the piece which engages the inner face of the outer sole, with slippery (at least non-adhesive powder) or other suitable anti-friction or anti-squeak material, as indicated at T. The central portion of the outer sole is thus free from connection to the filler piece or such remnants of the piece as may remain after the leveling operation, permitting relative movement or slight slipping of the outer sole with reference to the filler so that the flexibility of the shoe is not interfered with. On the other hand, the sticky filler which exudes from between the top and bottom skins of the piece adheres firmly to the marginal portions of the outer sole and inner sole and to the folded portions of the upper thereby securing them all firmly together, substantially as one unit. By reason of this firm union of the parts it is possible, if desired, to employ an inner sole which is thinner or less strong than usual. Moreover

the bottom skin constitutes a protector against the common staining of the sock through the tack hole at the ball of the shoe-bottom. In making a McKay shoe, the innersole is always fastened on the last by a tack at the ball and another at the heel (removed after the upper has been brought over and crimped around the edges of said innersole), and one of the serious objections to a McKay shoe has been the tendency to soil the foot or sock through the said tack hole at or near the ball of the forepart. The skin 11 covers and closes said tack-hole and in connection with the fact that the sticky element of the piece in the layer 15 is kept by said skin out of all possible access to said tack-hole and is spread by the pressure into adherent enclosing engagement with the innersole all around and beyond said skin, constitutes a complete, neat protector of or closure for said tack-hole.

The outward flow of the sticky filler into the crevices between the outer sole and the upper unites these parts so that there is substantially no possibility of squeaking, and, on the other hand, the layer T of slippery anti-friction material between the center of the outer sole and the filler piece effectually prevents such rubbing of these parts as would cause a squeak.

As the plastic filler material is of a waterproof or water repellent character and as it is squeezed out between the folds of the upper, it constitutes an effective barrier against the entrance of water between the outer sole and adjacent parts of the shoe. Moreover since it fills all of the crevices and spaces between the folds of the upper it produces a smooth and level surface for contact with the inner face of the outer sole so that the latter is uniformly supported over the entire area of the shoe bottom, providing for maximum comfort and durability. The filler layer is plastic in the sense of being spreadable and the term plastic is used in that sense in the claims.

While the present invention has been described with particular reference to a McKay shoe, it is obvious that the filler here described is equally applicable to a welt shoe. In such a shoe the filler piece would occupy the space defined by the in-seam, and in applying this piece to a welt shoe no more care would be necessary than in applying it to a McKay shoe. Any portions of the filler piece which project over the in-seam are compressed during the leveling operation and flow in the direction of least resistance so that no difficulty from ridges or bunches on the outer sole is experienced. All this depends to some extent on the particular form or kind of filler piece. The movement of the spreading filler would be inward mostly instead of outward if the strip forms were employed as shown in the two examples at the right of Fig. 4. In any case, the cover or skin, whatever its shape or predetermined extent tends to prevent bunching of the filler layer.

During the leveling operation the piece becomes thinner at its central part, due to the convexity of the inner sole, (then on the last), so that the skins 11 and 14 approach each other at the central part of the shoe bottom, sometimes coming substantially into contact. If the skins be of relatively weak material or if they be slitted as indicated in Fig. 2, the skins may burst or spread, leaving only fragmentary portions of the skins intermingled with the plastic filler. Or the plastic binder exudes through the slits and fastens the parts, while also constituting one form of anti-squeak construction. In either case the skins or the remnants thereof, being of predetermined area, substantially non-plastic and preferably inextensible as compared with the plastic filler, and being disposed in the narrow space at the central portion of the shoe bottom, constitute barriers which choke or block the passage from one side of the shoe to the other. Thus even though the shoe bottom be subjected subsequently to forces tending to shift the filler, the filler meets opposition to movement by reason of the original skins 11, 14.

For convenience in description and illustration I have described my filler as applied to a shoe having certain definite structural characteristics, for example, an upper comprising a lining, independent fasteners for uniting the upper to the inner sole, and stitches for uniting the outer sole to the inner sole, but I wish it to be understood that my invention is not in any way limited to any particular shoe, but that it may be embodied in shoes varying in these particulars or in others from the shoe herein illustrated and further that the invention is not necessarily limited to the employment of the particular filler above referred to or to the proportions of the particular filler piece above referred to or to the proportions of parts here shown, but that the invention boadly embraces a shoe or equivalent article of footwear possessing the characteristics and construction set forth in the accompanying claims.

Generic claims for the filler leaf or piece shown herein are made in my copending application Serial No. 297,630, filed August 6, 1928.

I claim:

1. A shoe, having an outer sole and an inner sole with an interposed filler layer having an non-adherent part and an adherent part, said adherent part holding said two soles and the contiguous part of the shoe together as a unit by adhesion.

2. A shoe, having a bottom including a bottom cavity with at least a portion filled with reinforcing material of predetermined

area and the rest of the cavity filled with moldable filler molded to fit said rest of the cavity, the reinforcing material lying wholly within the boundaries of the molded filler.

3. A shoe, having a bottom including a bottom cavity containing a plastic layer and central means reinforcing the central portion only of said layer.

4. A shoe, having a bottom including a bottom cavity containing a layer having a relatively stiff central portion and a plastic margin.

5. A shoe, having a bottom cavity filled by a multipart filler, one part having a predetermined area less than the cavity and another part consisting of moldable filler material having a shape corresponding to and determined by the shape and the requirements of the cavity, the part having a predetermined area lying wholly within the boundaries of the other part.

6. A shoe, having a bottom cavity filled by a multipart filler, one part having a predetermined area less than the cavity and another part consisting of moldable filler material having a shape and area governed as to its outer boundary by the rim of the cavity and said two parts mutually positioning each other to form a fixed bottom support.

7. A shoe, having a bottom including a bottom cavity containing a layer having a relatively stiff central portion and a plastic marginal portion adherently stuck to the central portion.

8. A shoe, having a bottom comprising an inner sole, an outer sole, and a layer interposed between said soles having on the same side thereof a relatively non-sticky portion and a sticky portion.

9. A shoe, having a bottom comprising an inner sole, an outer sole, and a layer interposed between said soles having on the same side thereof a relatively non-adhesive central portion and a sticky marginal portion.

10. A shoe, having a bottom comprising a layer of plastic material, and means reinforcing the central portion of said layer, the plastic material extending outwardly beyond the reinforcing means.

11. A shoe, having a bottom comprising a sole and a layer of material having on the same side thereof a substantially non-adhesive central portion and a sticky marginal portion, of which at least the marginal portion adheres to the sole.

12. A shoe, having a bottom comprising a sole and a layer of plastic material, the marginal portion of said plastic layer being secured to the sole and its central portion on the same side being unattached to the sole.

13. A shoe, having a bottom comprising an outer sole and inner sole shaped to form between them a bottom cavity, and an intervening layer of material in said cavity having a marginal portion adhering to one of said soles, and means on the same side of said layer interposed between the central portion of said layer and the outer sole to prevent squeaking.

14. A shoe, having a bottom comprising an outer sole and an inner sole and an upper, shaped to form between them a bottom cavity, a layer of sticky material interposed in said cavity between the soles, said layer at least at its marginal portion adhering to one of said soles, and means on the same side of said layer preventing said layer from adhering to the central part at least of one of said soles to prevent squeaking.

15. A shoe, having a tack-hole in the forepart of the inner sole and a bottom comprising an outer sole and inner sole, and a layer of plastic material comprising a comminuted solid and a sticky binder, and a skin interposed between the sole and a part at least of the plastic layer, and a slippery substance interposed between said skin and the adjacent sole.

16. A shoe, having a bottom comprising an outer sole and inner sole, and a layer of plastic material, and a skin interposed between one of said soles and a part at least of the plastic layer, said skin being provided with a sticky waterproofing medium, and a coating of slippery powder adhering to the skin and preventing the latter from sticking to the adjacent sole.

17. A shoe, having an inner sole and an outer sole, a layer of normally plastic material interposed between said soles, and centrally disposed means tending to oppose bunching of said plastic layer.

18. A shoe, having an inner sole and an outer sole, a layer of normally plastic material interposed between said soles, and a non-plastic substance engaging the central portion of said plastic layer and opposing bunching of the latter.

19. A McKay shoe having a tack-hole in the forepart of the inner sole and a bottom filler of the kind containing a plastic and sticky ingredient in its bottom cavity, provided with means in connection with said filler for closing the forepart tack-hole against the entrance of material liable to stain the sock.

20. A McKay shoe having plastic filler in its bottom cavity and having the cavity surface of the innersole covered by an impervious protector over the central region of the forepart in such position and relation as to protect the foot or sock of the wearer against soil or stain through the innersole at said central region.

Signed by me at Boston, Massachusetts, this 9th day of August, 1927.

ANDREW THOMA.