Sept. 6, 1927. 1,641,535

J. DE NORONHA

OVERSHOE

Filed Feb. 28, 1925

Fig. 1.

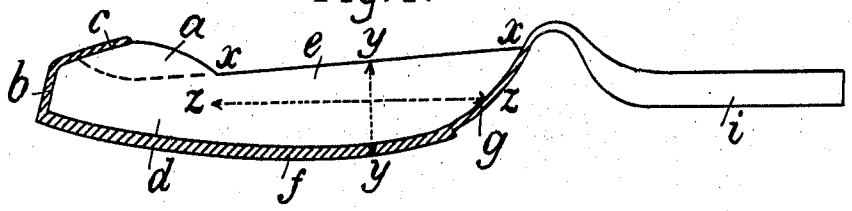


Fig. 2.

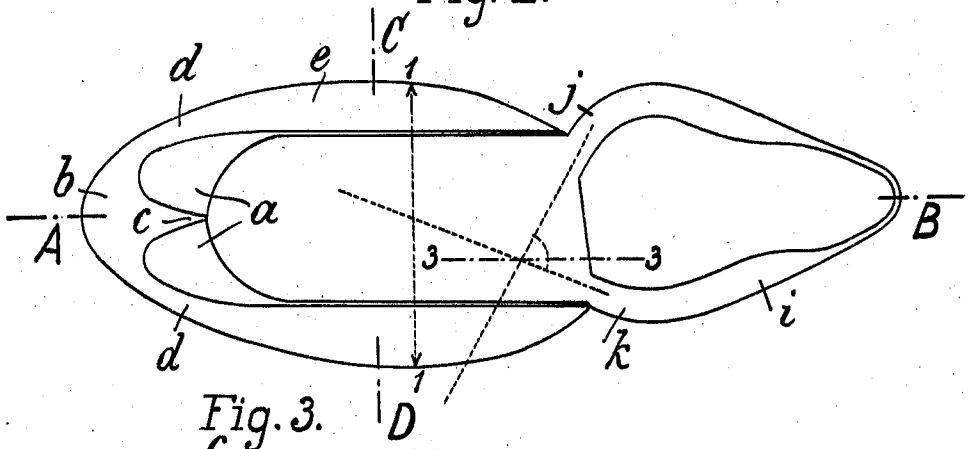


Fig. 3.

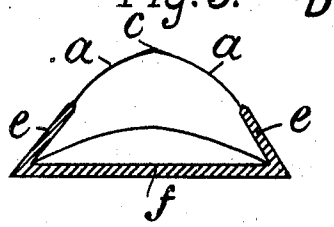
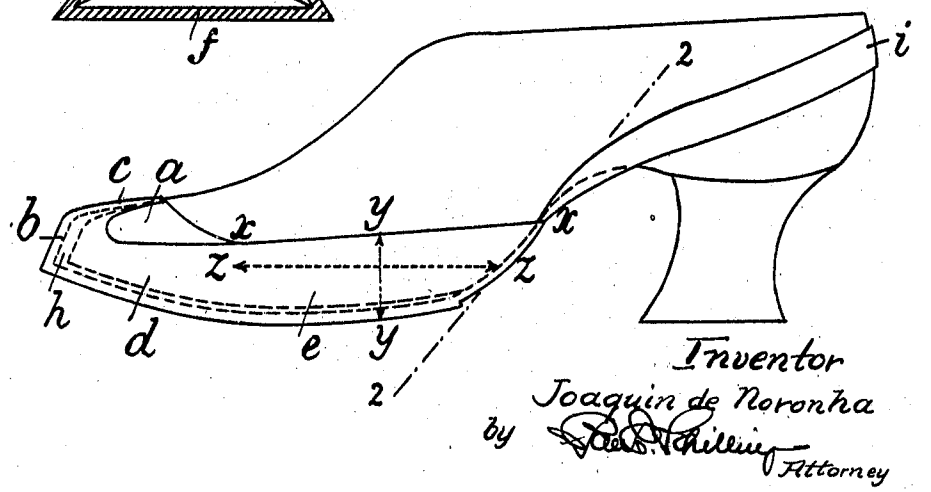


Fig. 4.



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UNITED STATES PATENT OFFICE.

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OVERSHOE.

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The present invention relates to improvements in rubber overshoes of the type which have neither heel part nor top cover. It aims to reduce to a minimum all unnecessary weight, cumbersomeness and squeezing of the shoe and foot, disadvantages which the heretofore manufactured overshoes possess to a more or less pronounced degree.

In the overshoe, as hereafter described, it will be found that such shapes and proportions of the component parts are chosen as to preclude all unnecessary material. They are disposed in such a manner as to localize their tensions and pressures at those points of the shoe which are most suitable for the purpose, whereby damage caused by friction to the leather as well as tiring of the feet are reduced to a minimum. It will also be noticed that such an overshoe can be worn with more than one particular size and shape of shoe, the fit remaining in each case equally good. Its hold on the shoe is specially characterized by an exceptional softness and elasticity.

These qualities render the overshoe particularly suitable for wear with light footwear, such as ladies' shoes with thin soles generally without extension edges and the uppers of which are made of delicate and easily damaged leather or cloth.

All references made in this description are contained in the accompanying drawing, which illustrates one embodiment of the new features of the invention and represents a left overshoe.

Fig. 1 is a longitudinal section at A—B in Fig. 2.

Fig. 2 is a plan view seen from above.

Fig. 3 is a cross section at C—D in Fig. 2.

Fig. 4 shows the overshoe worn on a shoe.

The toe-cap is built up in quite a novel way. It consists of two distinct, yet interdependent parts: a particularly elastic rubber layer (a) of so called live rubber serving as a cover, and a fairly rigid wall (d—b—d), which supports this cover both at the front (b) and along its entire length at the sides (d). Due to its elasticity, the cover a extends or contracts according as the overshoe is worn on a broad or more pointed shoe. Thus its toe cap adapts itself to and fits equally well any shape of shoe toe within limits. However, as the cover a is thin and soft, it would tend to roll or fold upon itself whilst the overshoe is being pulled on. A certain amount of rigidity is therefore necessary to avoid this disadvantage. The required rigidity is obtained by thickening the rubber at one or more points convenient for the purpose, in the form of one or more ribs or tongues c, as shown in Fig. 2. Such reinforcement may take other shapes and appear on the cover a at points other than that indicated in the drawing, the essential feature of these ribs being that they impart the required rigidity without depriving the cover a of its natural elasticity.

In all such overshoes hitherto manufactured it has been always aimed at making the toe cap as near a facsimile of the shoe toe cap as possible. The result of the consequent exact fit is that friction between the two cap front ends sets in the moment walking starts. In the case of ladies' shoes with delicate uppers of kid leather or silk cloth, such friction is followed by worn and shabby toe ends. This disadvantage is avoided in my overshoe by making the toe cap wall (b) at the front rise from its sole vertically and to a greater height than the corresponding toe portion of the conventional shoe rises from its sole, so as to create an air space (h) Fig. 4 between the two cap ends. The right angle as chosen in my overshoe is sufficient according to present practice of manufacturing conventional shoes with toe caps rising at the front at an acute angle. Should however this practice be changed and a wider angle adopted, it would naturally be necessary to correspondingly increase the angle of the part (b) in my overshoe so as to be always a few degrees larger than the angle of the corresponding part of a conventional shoe. At the sides the supporting wall at d adopts a gradually decreasing angle until the acute angle of the side walls e, into which it runs, is reached. By virtue of this gradual adoption of an acute angle the wall d draws the cover a gradually tightly against the upper part of the toe-cap and, furthermore, itself offers an efficient side support to the sides of the shoe toe-cap. From Fig. 4, it will be seen that the grasp of the cover (a) is limited to the rear part of the shoe toe-cap the forepart of the latter being left free of contact through the intervention of the air space (h); and further in as much as this grasp is a soft and elastic one, it is evident that the most vulnerable part of the shoe, the whole toe-cap, is subjected to the least pos-

sible wear and tear by friction and pressure.

The sole of this overshoe has two new characteristics: The non-tread sole (*g*) at the shank is made necessarily of live rubber, irrespective of whether the adjoining tread sole (*f*) is made of equally, or less elastic, or quite rigid rubber. By virtue of the nature of elastic materials, when the overshoe is on, and the side walls (*e*) pull the part (*g*) horizontally forward, the latter lies adhering tightly against the upward slanting sole of the shoe at the shank, without slipping downwards, thus ensuring a good fit there. The second characteristic is that, from its greatest width (1—1 Fig. 2), the sole tapers toward the rear only in slight extent, whereby it is possible for the shank sole (*g*) to be always wider than the corresponding shank sole of the shoe to be protected, no matter how wide the latter might be within limits. This is in direct opposition to the practice current in other such overshoes in which it is aimed at making the sole at the shank as near a facsimile of the shoe sole as possible. Inasmuch as in all overshoes the fit at the shank is dependent on the tension of fastening means working upwards, sidewise or rearwards, it is even an advantage to make this portion narrower than the shoe sole at the shank, at any rate never wider, for in the latter case a sagging at the shank would be the result. In my overshoe, inasmuch as the shank sole (*g*) is drawn against the sole and sides of the upper at the shank of the shoe, because of the horizontal elastic tension of the side-walls (*e*), such sagging is not possible, no matter how great the overlap is, of course within limits. Two main advantages are obtained through this novel construction:— Firstly, the overshoe offers a larger opening to the shoe, facilitating thereby its slipping on. Secondly, the range of a perfect fit at the shank is extended to all shoes within size limits, which is a very important item considering the almost countless widths current in conventional shoes, especially in ladies' shoes. In this connection it is also to be borne in mind that the soles of ladies' shoes taper towards the rear to a large extent.

The setting of the side walls (*e*) represents also quite a new departure. They rise from the sole at acute angles to it, as inward slanting flat planes, straight both along their length (*z*—*z*) and along their height (*y*—*y*). They extend between and connect the toe-cap to the shank part (*g*), as two straight bands, without either curving outwards along their length (thus disregarding the curvature of the edge of the sole on which they are set), or curving upwards along their height, (thus disregarding the convexity of the sides of the shoe on which they are to fit). The result of this way of setting the side walls (*e*) is that, when the overshoe is on, they press tightly on the sides of the shoe body with an upward increasing pressure. This pressure is practically zero along the edge of the sole, and increases upwardly proportionately with the height, to reach its maximum along the upmost rims (*x*—*x*) of the side walls (*e*). Such an upwardly increasing pressure on the convex sides of the shoe not only ensures a good hold, but tends to push the body of the shoe downwards against the sole of the overshoe. It must be mentioned that the overshoe tread-sole (*f*) is made wide enough to cover even a very wide shoe sole. Now, as the side walls depend for their fit on their contact with the sides of the shoe, independent of whether they touch or not the edge of the shoe sole, and as their inward slant is a very considerable one, it is evident that their hold is equally good on the sides of both a narrow and a wide soled shoe.

The combined effect, with the overshoe on (Fig. 4) is that the shoe is gripped softly and elastically at the toe-cap; at its convex sides it is seized with an upwardly increasing pressure, and at the shank the overshoe sole adheres to the sole of the shoe lying tightly against it. The result is that the overshoe seizes the lower part of the shoe, all forces acting with a tendency to push the sole of latter to lie flat on and against the overshoe sole. The lower part of the shoe body is thus, so to speak, encased elastically by the overshoe. The latter in consequence, even at walking does not fall off of itself, giving and taking in accordance with the extension and contraction of the shoe.

However, in order to safeguard against possible shifting caused by unforseen external forces, and also in order to provide a means for pulling the overshoe on and off, an elastic strap (*i*) to be slung around the rear of the shoe, is attached to it. Such an elastic strap, when pulled on, naturally gives rise to an appreciable tension on the overshoe, which might be enough to disturb the above described balanced elastic encasing fit of the overshoe. To reduce such an eventual disturbance to its utmost minimum, and further to ensure a good lying-on fit of the strap itself on the shoe, it is attached to the overshoe in the following quite new manner:

Its ends are connected to the sole itself of the overshoe, at the shank, where the movement of the foot is practically zero. Further, they enter this sole in line with the downward-slope of latter (2—2 Fig. 4) at the shaft, while they themselves converge towards each other asymmetrically with respect to their common longitudinal axis (3—3 Fig. 2), the inner end (*j*) entering at

a more open angle to that axis than the outer end (*k*). Owing to the setting of the strap ends in line with the downward slope (2—2) of the overshoe sole at the shank, the tension of the strap does not shift appreciably the non-tread part (*g*) from its fitting position. Owing to this sloping setting, in combination with the convergence of the strap ends, the tension of the strap loses itself already at an early stage of the sole (*g*), without reaching far enough to curve round and affect the horizontal tread sole (*f*). And finally, owing to this sloping setting, in combination with the asymmetric convergence of the strap ends, the sides of the bands run out from the sole upwards, to lie naturally and fit equally well both the inner hollower side of the shoe at the shank, and the outer side. Thus, the strap is attached in the most advantageous manner, fulfilling the purpose for which it is destined, without appreciably disturbing the good fit of the overshoe.

What I claim is:—

1. A rubber overshoe comprising a sole portion, an upper composed of spaced side walls adapted to overhang the side portions only of a shoe upper, and a toe cap joining said side walls and sole at the front of the overshoe, said toe cap portion embodying a front wall and a top wall, said top wall of the toe cap portion forming a highly elastic web of reduced thickness with respect to the side walls.

2. A rubber overshoe comprising a sole portion, an upper composed of spaced side walls adapted to overhang the side portions only of said shoe upper, and a toe cap joining said side walls and sole at the front of the overshoe, said toe cap portion embodying a front wall and a top wall, said top wall of the toe cap portion having a reinforcing rib of a thickness conforming at least to the thickness of the side walls and highly elastic webs of reduced thickness with respect to the rib and side walls and connecting said rib and side walls.

3. A rubber overshoe comprising a sole portion of less length than the sole of a shoe and adapted to extend over only the tread part of the shoe sole, a toe cap portion adapted to extend over only the toe part of the shoe upper, a breast portion at the rear of the sole portion adapted to bear upon the curved arched portion of the shoe sole, and side walls joining said sole, the cap and breast portions, and adapted to engage only the sides of the shoe upper, said side walls being both latitudinally and longitudinally straight and extending upwardly and inwardly from the sole portion in the form of inclined planes.

4. A rubber overshoe comprising a comparatively stiff sole portion of less length than the sole of a shoe and adapted to extend over only the tread part of the shoe sole, a relatively elastic toe cap portion adapted to extend over only the toe part of the shoe upper, a breast portion at the rear of the sole portion of less thickness and greater elasticity than said sole portion and adapted to bear upon the curved arched portion of the shoe sole, and side walls joining said sole, the cap and breast portions, and adapted to engage only the side of the shoe upper, said side walls being both latitudinally and longitudinally straight and extending upwardly and inwardly from the sole portion in the form of inclined planes, and said overshoe being of a width conforming substantially to the width of a shoe to which it is to be applied in advance of the point of maximum width of the shoe and of greater width than the shoe in rear of such maximum width point.

5. A rubber overshoe comprising a sole portion of less length than the sole of a shoe and adapted to extend over only the tread part of the shoe sole, a toe cap portion adapted to extend over only the toe part of the shoe upper, a breast portion at the rear of the sole portion adapted to bear upon the curved arched portion of the shoe sole, side walls joining said sole, the cap and breast portions, said side walls being both latitudinally and longitudinally straight and extending upwardly and inwardly from the sole portion in the form of inclined planes and adapted to engage only the sides of the shoe upper, and an elastic strap adapted to embrace the heel of the shoe and having its forward ends joined to the upper transverse edge of the breast portion in planes continuous with the plane of the latter.

6. A rubber overshoe comprising a sole portion of a length to extend only over the tread part of a shoe sole to which the overshoe is designed to be applied, a toe cap at the front of the sole portion, elastic side walls sharply inclined inwardly and joined to the sole portion and to the toe cap and adapted to linearly stretch when the shoe is inserted into the overshoe, said side walls having rearwardly elastic extensions adapted to bear upon the sides of the shoe upper at the shank, a breast portion at the rear of said sole portion curved upwardly in the longitudinal direction but straight transversely, said breast portion connecting and lying between the lower edges of said extensions of the side walls and being adapted, when the overshoe is applied to the shoe, to be drawn snugly against the sloping breast of the shoe sole at the shank under the elastic stress of the stretched side walls and their extensions, and a strap to embrace the heel part of the shoe upper or counter having its forward ends joined to the rear transverse edge of the breast portion, said strap ends forming rearward extensions of

the breast portion and being adapted, when the overshoe is applied to the shoe, to bear flatly upon the breast of the shoe sole immediately behind the breast portion of the overshoe where the shoe sole is subjected at walking to practically no bending action and so as to neutralize the tension of the strap and thereby reduce to a minimum the tiring of the foot and the disturbance of the snug fit of the overshoe.

7. A rubber overshoe comprising a sole portion of a length to extend over only the tread part of the shoe sole to which it is to be applied, a breast portion at the rear of the sole portion adapted to bear upon the sloping breast of the shoe sole at the shank, an upper joined to the sole and breast portions throughout the length of the latter-named parts, and a strap to embrace the heel part of the shoe upper having its forward ends converging towards each other asymmetrically with respect to their common longitudinal axis, said strap ends being joined to the transverse rear edge of the said breast portion of the overshoe in planes conforming to and continuous with the plane of the latter so as to bear flat upon the said sloping breast portion of the sole of the shoe at the shank, when the overshoe is applied to the shoe.

8. A rubber overshoe comprising a sole and an upper, the latter including side walls and a toe cap consisting of a front wall rising from the sole at an angle to a perpendicular plane intersecting the front edge of the sole and a top wall joined at its forward portion to said front wall, said walls meeting at an angle so as to form, when the overshoe is applied to the shoe, an air space over and in advance of the conventionally rounded fore part of the toe cap of the shoe, the said top wall being of greater elasticity than said front and side walls to permit transverse expansion and contraction thereof.

9. A rubber overshoe comprising a sole portion of less length than the sole of a shoe and adapted to extend over only the tread part of the shoe sole, a toe cap portion at the front of said sole portion adapted to extend over the toe part of the shoe upper, a breast portion at the rear of the sole portion adapted to bear upon the curved arched portion of the shoe sole, side walls joining said sole, the cap and breast portions, and adapted to engage only the sides of the shoe upper, and an elastic strap having its ends connected with the overshoe sole at the sides of the arch at a downward and forward angle conforming to the angle of the arch, said ends of the strap converging toward each other asymmetrically with respect to their common longitudinal axis, the end of the strap at the inner side of the sole extending into the sole at a wider angle to that axis than the end of the strap at the outer side of the sole.

10. A rubber overshoe comprising a sole portion of less length than the sole of a shoe to which the overshoe is to be applied and adapted to extend over only the tread part of the shoe sole, a breast portion rising from the rear of the sole portion and adapted to bear upon the curved arched portion of the shoe sole, said breast portion being of reduced thickness and greater elasticity than the sole portion, elastic side walls adapted to overhang the side portions only of a shoe upper, and a toe cap joining said side walls and sole at the front of the overshoe, said toe cap having a top wall of greater elasticity than its front wall and said side walls being joined in rear of the toe cap to the sole and breast portion throughout the length of the latter-named parts.

11. A rubber overshoe comprising a comparatively stiff sole portion of less length than the sole of a shoe to which it is to be applied and adapted to extend over only the tread part of the shoe sole, an elastic breast portion rising from the rear of the sole portion and adapted to bear upon the curved arched portion of the shoe sole, elastic side walls adapted to engage only the sides of the shoe upper, a toe cap joining the sole and side walls at the front of the overshoe and having a top wall of greater elasticity than its front wall and than said side walls, the overshoe being of a width conforming substantially to the width of the shoe to which it is to be applied in advance of the point of maximum width of the shoe and of greater width than the shoe in rear of such maximum width point, and means for connecting the elastic breast portion to a shoe so as to place the breast portion and side walls under elastic stress to hold the overshoe elastically secured under stress on the shoe.

12. A rubber overshoe comprising a sole of less length than the sole of a shoe of a size to which the overshoe is designed to be applied, said sole comprising a comparatively stiff sole portion proper adapted to bear only upon the tread of the shoe sole and having at its rear a relatively thinner and more elastic breast portion adapted to bear upon the curved arched portion of the shoe sole, a toe cap, and elastic side walls joined to the sole, breast portion and toe cap and adapted to bear upon the sides only of the shoe upper, the overshoe being of a width at its widest point substantially corresponding to the width of the shoe at its widest point in advance of the arched shank portion of the latter and thence narrowing rearwardly toward its breast portion to a degree less than that of the shoe toward its arched shank portion so as to make the overshoe at its rear wider than the correspond-

ing part of the shoe, the said toe cap being provided with an elastic web between the forward portions of the side walls so as to permit said walls to spread against its elastic resistance at the fore part of the overshoe.

13. An overshoe made wholly of rubber and comprising an elastic sole consisting of a forward portion of a length to extend over only the tread part of the sole of a shoe to which the overshoe is to be applied, a breast portion at the rear of the sole portion curved upwardly in the longitudinal direction but straight transversely and adapted to engage the shank of the shoe sole, a toe cap at the front of the sole, and elastic side walls sharply inclined upwardly and inwardly and joined to the sides of the breast and sole portions and to the toe cap and adapted to linearly stretch when the shoe is inserted into the overshoe, the top wall of said toe cap having elastic portions adapting it to stretch transversely and an inelastic portion for limiting its transverse expansion.

In testimony whereof I have affixed my signature.

JOAQUIN DE NORONHA.