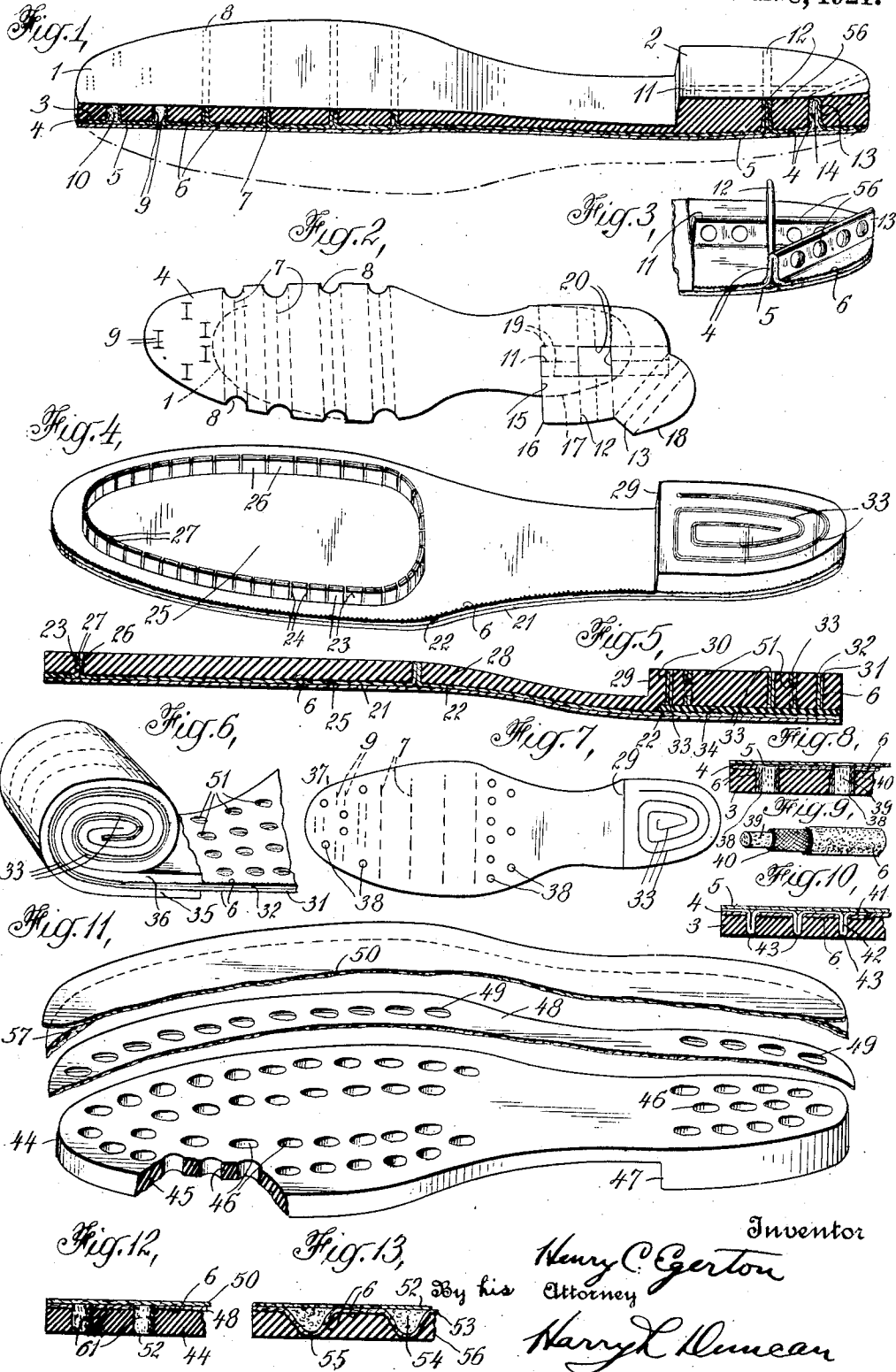


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 REINFORCED GRIPPING RUBBER SHOE SOLE.
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Specification of Letters Patent.

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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 Reinforced Gripping Rubber Shoe-Soles, of which the following is a specification, taken in connection with the accompanying drawing, which forms part of the same.

This invention relates especially to rubber shoe soles in some cases, including heel portions thereof and also including separate heel members, which comprise gripping elements or members of a relatively rigid character adapted to have desirable strengthening and wear resisting properties which may be embedded in the rubber or other shoe soles so as to form ribs, stud pins or other shaped members flush with or more or less projecting from the normal wearing surface of the shoe sole so as to give increased gripping engagement with the ground. Gripping members of this character may advantageously be formed of or comprise fabric or other fibrous material, at least in the body portions of such members, containing or impregnated with phenol aldehyde cementing material such as bakelite varnish or similar compositions which has been cured or solidified by heat so as to be in the stiff and strong moderately cured condition of such phenolic condensation cementing material in the finished shoe sole. The gripping members when in the form of ribs, folds or generally similar projections may in many cases be formed by shaping up the desired number of layers of fabric coated or impregnated with such phenolic condensation cementing material and then curing or solidifying them into permanent form before or after they have been secured to or incorporated with the rubber or other material constituting the main wearing surface of the sole. In some cases, however, the gripping members may be given a relatively rigid character by forming them of such bakelite or other phenolic condensation cementing material which may be molded into studs, pins, ribs, or other members to properly cooperate with the sole wearing surface and these gripping members may in some instances be toughened and rendered more desirable by incorporating therein varying amounts of fibrous material, such as chopped threads, string or fabric, wood pulp, etc., or pieces of heavier cord or rope may be used

as the body or substantial part of such gripping members after being impregnated or coated with such phenolic condensation cementing material. The gripping members may be given increased adherence to the rubber shoe sole element in which they may be incorporated by giving them a frictioned or other coating or layer of rubber throughout more or less of the surface with which the rubber sole composition engages and the gripping elements which may of course be incorporated or connected with sole stiffening members or elements which may constitute backing layers or members on the side of the sole opposite to its wearing surface, may contain phenolic condensation cementing material which may either be cured or solidified before being connected or incorporated with the rubber sole composition or subsequently to such incorporation which makes it possible to simultaneously cure the phenolic condensation cementing material and vulcanize the rubber sole composition and unite all the parts together.

In the accompanying drawing showing in a somewhat diagrammatic way various illustrative embodiments of this invention,

Figure 1 is a perspective view of a shoe sole member, parts being shown in section for greater clearness.

Fig. 2 is a plan view of one of the elements of this shoe sole indicating the shaping of the parts.

Fig. 3 is a perspective view showing the heel gripping member before incorporation of the rubber sole composition therewith.

Fig. 4 is a perspective view showing another construction.

Fig. 5 is a corresponding longitudinal section.

Fig. 6 is a perspective view showing the manner of forming heel stock therefor.

Fig. 7 is a plan view showing another construction.

Fig. 8 is an enlarged partial section showing portions thereof.

Fig. 9 is an enlarged perspective view of one of these elements.

Fig. 10 is an enlarged sectional view of another construction.

Fig. 11 is a perspective view showing still another arrangement, the parts being shown in separated position before assembly.

Fig. 12 is an enlarged sectional view of this completed construction; and

Fig. 13 is a similar section showing still another arrangement.

In the illustrative form of the invention shown in Fig. 1 the toe portion 1 of the shoe sole may be formed of rubber composition 3 on the outer or wearing surface and where an incorporated stiffener strip or member is used this rubber composition may be of the softer and stronger grades of vulcanized rubber giving increased wearing and other desirable properties as compared to the stiffer rubber sole compositions usually employed which contain such undesirably large proportions of relatively inflexible material. If desired a connector stiffener strip or member 4 may be used having its upper surface adjacent the rubber composition coated with a frictioned or other rubber coating 6 which may be united or incorporated in any suitable way with the canvas or other fabric of which this stiffener member may be composed. The other side of this connector stiffener member may be coated or incorporated with phenolic condensation cementing material, such, for instance, as bakelite varnish No. 1 and a similarly coated or incorporated canvas or other stiffener strip or member 5 may be used throughout the entire or any desired extent of the shoe sole to give increased stiffness thereto and be securely and permanently united to the connector stiffener member when the phenolic condensation cementing material carried by these members is cured or solidified by any suitable heat curing treatment. One or more such stiffener strips or members of canvas or other fabric or material may be folded or formed into relatively rigid gripping members projecting toward or to the wearing surface of the shoe sole and as indicated in Fig. 1 any desired number of transverse gripping ribs or folds 7 may be formed in this way which may project adjacent the wearing surface of the incorporated rubber sole composition 3. By folding one or more layers of 8 ounce army duck or generally similar canvas or fabric in this way quite strong and heavy transverse gripping ribs may be formed in this connector stiffener member and it is usually desirable to have these ribs terminate adjacent to but not at the sides of the shoe sole.

A convenient way of shaping the blank for this purpose is shown in Fig. 2 in which indentations, such as 8, may be stamped or cut in the blank at the proper intervals and then when the blank is formed or folded along the dotted lines as by forcing these parts of the fabric successively into slots or recesses in a suitable metallic mold, for example, the adjacent faces of the impregnated fabric are brought into contact or united by the incorporated phenolic condensation cementing material so that the stiffener member may be cured in this form so as to subsequently retain its shape. Gripping studs may be simultaneously formed in this

stiffener member by cutting or shaping the fabric to form several flaps, such as 9, in the desired parts of the shoe sole and these may be forced into corresponding recesses in the mold and phenolic condensation material forced between the flaps so as to form projecting studs or pins 10 of any desired size and shape which are relatively rigid and strong after the heat curing of the cementing material. The blank shown in Fig. 2 may be forced into such a mold beginning with the shank portion of the blank and successively forcing each fold 7 into its corresponding slot which of course draws the front end of the blank backward so that finally the folded blank has the desired sole outline indicated by the dotted line 1 in Fig. 2. The flaps 9 may then be forced into the stud recesses in the mold and additional phenolic condensation material in which any suitable fibrous material or elements have been incorporated may be forced between these flaps and also between the folds of fabric forming the other gripping members, if desired, so as to completely fill the spaces between them and give additional stiffness, strength and wearing properties to the members after curing. For this purpose thread or other fibrous materials, such as wood pulp or fibrous pieces may be incorporated with phenolic condensation cementing material of any suitable character and dried, or pieces or relatively short lengths of cotton waste, thread, cord, or fabric may advantageously be used to form a relatively dry granular material which can be placed adjacent or sometimes forced into these openings and melted and forced thoroughly into all spaces by the molding pressure and heat and then solidified by the continued heat of the curing process to form a permanently shaped sole element comprising these gripping members. Where, as is desirable, the outer surface of this connector stiffener member has been previously coated with a frictioned or other rubber coating the curing or solidifying of the incorporated phenolic condensation cementing material is preferably effected at moderate heat insufficient to undesirably vulcanize or harden the rubber coating and if this is done at moderate temperatures of, say, 200° Fahrenheit, or less for a number of hours these stiffening elements projecting from the connecting backing layer or member on the other side of the shoe sole from its wearing surface, may, if desired, be completely cured or solidified without undesirably vulcanizing or hardening the rubber layer or composition which may be present on the other side of the connector member. If desired one or more additional stiffener strips or members, such as 5, which may be similarly coated or impregnated duck or other fabric, may be united to the connector stiffener

member during this heat curing process by forcing them against the same in a suitable mold during this heat curing operation which permanently solidifies the phenolic condensation cementing material which may be applied or incorporated in any suitable way with one or more of these elements. Such a shaped composite sole stiffener may then be united or incorporated with the rubber sole composition 3 of any desired character and forced strongly against the same in a suitable mold during the vulcanizing heat treatment at 300° to 400° Fahrenheit more or less for the desired time so as to properly vulcanize this rubber sole composition and vulcanize it to the rubber coated or impregnated side of the connector stiffener member at the same time. Such a shoe sole may of course extend throughout part or the whole of the wearing surface of the shoe and where used for re-soleing may extend beneath the separately applied heel, or if desired, a special heel of any suitable construction may be permanently united to the shoe sole, as is indicated in the drawings.

For this purpose the connector stiffener member 4 may be formed with portions adapted to constitute suitable gripping ribs or members and as indicated in Fig. 2 a cut 15 may be formed extending about half way inward from one side of the sole and the blank which may be of one or more layers of canvas or other fabric previously coated or impregnated with phenolic condensation cementing material may have a portion between the dotted lines 19 adapted to be folded up into a longitudinal gripping rib or fold 11, as shown in Figs. 1 and 3, which would of course bring the side 16 about into line with the dotted heel outline 17 in Fig. 2. A transverse gripping fold, such as 12, may be similarly formed by folding up a corresponding portion of the blank and it is usually desirable to cut or punch out a central portion 20 along the lines of these folds to prevent undesirable crumpling of the fabric. If desired, also one or more additional gripping and wear resisting ribs or folds, such as 13, may be formed in the heel portion by forming the blank with a corresponding lateral extension 18 which when folded up along the dotted lines may form the diagonal gripping fold or rib 13 extending along the outside of the rear portion of the heel, for instance, so as to take the heavy wear which usually occurs at this point. If desired also one or more of these gripping ribs or members may be further reinforced and stiffened by folding up additional layers of coated or impregnated fabric or other material inside or outside of the folded portion of the main blank. Such an arrangement is shown in Fig. 1 in connection with the diagonal rib or fold 13, the strip 14 of canvas or other

fabric which may be similarly impregnated or coated with phenolic condensation cementing material being shown as inside the folded portion of the main connector stiffener member 4. It is of course understood that this folding may be conveniently effected by successively forcing the corresponding portions of the blank into slots or recesses in a metallic mold so that the material assumes some such form as is indicated in Fig. 3. Additional phenolic condensation cementing material with or without incorporated fibrous material such as wood pulp or fiber, or string or fabric lengths or pieces may be forced into these folded portions during the heat curing, and if desired, a similarly impregnated fabric strip or member 5 may be forced against the face of the connector stiffener member and the whole heat cured or solidified into the desired form by sufficient heat treatment to cure the phenolic condensation cementing material used. As indicated in Fig. 1 the body of the heel 2 may be formed of any suitable rubber composition which may be molded or incorporated with the stiffening elements described which are preferably provided with a frictioned or other rubber coating 6 and with junction holes 56 to be penetrated by connecting plugs of the vulcanized rubber composition to increase the gripping action of the rubber and promote its permanent and strong union with the other parts.

Another arrangement is shown in Figs. 4 and 5 as comprising a relatively rigid gripping flange or member 27 which may extend more or less around the forward portion of the shoe sole to more effectively minimize side slip. The main connector stiffener strip or member 22 may be originally formed with a central aperture and with more or less separated tongues or projections 23 extending into the same. This strip of impregnated canvas or other fabric may be forced into a mold so that these tongues or projecting portions are forced into upwardly projecting position as indicated in Figs. 4 and 5, and are separated by the junction holes or slots 24 to more thoroughly unite the rubber subsequently molded thereto. Then a cooperating or inner connector member 25 having similarly separated tongues 26 may be put in place in the mold and the tongues forced into the same slot into contact with the tongues 23 so that on heat curing in such mold the stiffener member may be permanently retained in this desired shape and the curing of the incorporated phenolic condensation stiffening material may unite the projecting cooperating tongues of these two strips and form therefrom a relatively rigid gripping rib 27 having weakened portions where the cooperating slots occur in the inner and

outer layers thereof, this gripping rib extending if desired practically around the forward part of the shoe sole as indicated in Fig. 4. If desired also an additional stiffening strip or member 21 formed of one or more layers of canvas or other woven fabric, paper, etc., may be simultaneously united to these elements during the heat curing process which permanently unites and stiffens all these parts of the sole backing layer or member. The wearing surface of the shoe sole may be formed of any suitable rubber composition such as 28, which may be molded upon the other parts as is indicated roughly in Fig. 5 and these elements may be vulcanized and united in a suitable mold so as to effect their strong union which is preferably promoted by originally providing the connector stiffener members with frictioned or other rubber coating 6.

Any desired form of heel construction may be used with a shoe sole of this character and if desired the heel 29 shown in Figs. 4 and 5 may be of suitable rubber composition in which is incorporated a suitable spiral gripping heel rib or member 33 which may have separated relatively rigid convolutions adapted to grippingly engage the ground or other surface which may cause the yielding of the adjacent portions of the rubber. Such a gripping rib may be formed of several united layers of fabric having their inner portions carrying phenolic condensation cementing material which may be incorporated therewith in any suitable way while the outer surfaces of these fabric strips may advantageously be previously coated or frictioned with any suitable rubber composition adapted to unite with the rubber composition used for the heel body. A convenient way of forming such a heel is indicated in Fig. 6 where a plurality of strips of fabric 31, 32 which may be specially woven duck, canvas or the like, may have originally applied thereto a frictioned or other coating 6 of rubber composition on their outer faces. The fabric may then be impregnated with suitable phenolic condensation cementing material such as bakelite varnish or the like, which may be partly or substantially dried either before or after the strips are forced together and the composite fabric strip may then preferably have punched or otherwise formed therein suitable junction holes 51 to promote the effective union of the rubber composition on two sides of the strip. Sheets or layers 35, 36 of suitable rubber composition may then be forced against the outer sides of these two strips of fabric as by rolling, for instance, which forces the raw rubber composition through the junction holes and effects union of these rubber connecting plugs there-through and then this rubber fabric strip may be rolled up as indicated in Fig. 6 to

form a roll or length of heel stock of the desired size, the gripping rib or fabric preferably not extending to the outer end of the strip where the two rubber layers are completely united as indicated in Fig. 4. Such a roll of heel stock may be shaped or molded into the desired cross-section to form the heels to be manufactured and may then be cut or severed into the desired short lengths by band knives or other means so that the individual heels of this material may be applied to such a shoe sole as is indicated in Fig. 5, a relatively thin rubber cushion layer 34 being preferably though not necessarily interposed between this composite heel member and the main stiffener members 21, 22, forming the backing layer or member of the shoe sole. The entire shoe sole may then be forced into a suitable mold and vulcanized at the desired heat which vulcanizes the rubber elements and permanently unites the parts together in an obvious way.

Of course any of these forms of heel construction may be used alone for separate shoe heels and applied in any way to the shoes of any desired construction, or if desired any of these forms of heel may be used with the other forms of shoe sole construction. Fig. 7, for example, shows such a heel element as described in connection with Figs. 4 to 6 being used on a sole of the general character shown in Figs. 1 and 2 and provided with relatively rigid transverse gripping members 7 and with gripping flaps and studs 9 arranged in the desired locations in the sole, all these parts being molded together and heat cured or vulcanized so as to form a unitary structure. If desired also additional gripping pins or studs, such as 38, may be used in this or any other form of shoe sole described and these studs may as indicated in Fig. 8 be formed of central portions 39 of fiber elements or heavy cord or rope of twisted or braided construction which may be coated or thoroughly impregnated with phenolic condensation cementing material so that it is adapted to be permanently united to one of the similarly impregnated stiffening elements, such as 5, during the heat treatment. For some purposes it is desirable to have the outer surface of such a member covered with a fabric sheath of any suitable construction to facilitate the connection of the rubber sole composition therewith and for this purpose a braided sheath 40 may be formed around the cord or member after such phenolic condensation cementing material has been incorporated therewith and preferably more or less dried. This fabric sheath may then be frictioned by passing through rolls or the like so that a frictioned rubber coating 6 may be incorporated therewith and facilitate the vulcanizing union of the rubber sole composition 3 with this gripping member. Fig. 130

10 shows another arrangement in which twisted or braided cord or small rope may be used for such gripping members, the cord 41 such as relatively hard braided or 5 twisted cord a sixteenth to an eighth of an inch in diameter more or less being preferably first impregnated with phenolic condensation cementing material and then forced through a layer of rubber sole composition 3 upon which a stiffener connector member 4 may have been previously secured. This cord may be sewed through such a rubber sole element, if desired, on any suitable lock stitch sewing machine and the relatively light lower thread subsequently removed if desired, or of course these cord loops may be forced through previously punched or formed holes in the rubber sole composition to form such loops as are indicated in Fig. 10. The parts may then be put into a suitable mold in connection with one or more additional stiffener layers 5 of fabric such as canvas or other cloth or paper preferably coated or impregnated with phenolic condensation cementing material and then a single heat treatment may simultaneously cure and solidify the phenolic condensation cementing material and also vulcanize the rubber sole composition and unite all the parts as of course may also be the case if any of the previously described constructions are similarly formed.

Another arrangement is shown in Figs. 11 and 12 as comprising a rubber sole member 44 of any suitable rubber composition which before vulcanization may be molded into shape and formed with suitable stud holes 46 in the front and also in the heel portions 47, if desired. A connector stiffener layer of fabric 48 may be applied to this rubber sole member and previously formed with correspondingly located holes 49, or if desired this strip or layer of fabric may be first applied to the layer of rubber composition forming the main wearing surface of the sole and then the stud holes punched or otherwise formed therein. This stiffening connector member 48 preferably has a frictioned or other rubber coating next the rubber and is also coated or impregnated with phenolic condensation cementing material and after these two parts have been assembled and the stud holes formed therein they may be put in a suitable metallic mold and the holes filled with phenolic condensation cementing material 57 in which is preferably incorporated fibrous material of any suitable character, such as cut string or fabric, wood pulp or cotton in such lengths or pieces as to allow the more or less plastic composition to be forced thoroughly into the holes during the heat curing. This may be done to a considerable extent at least when the mold is forced together preferably after another stiffener layer or member 50

of canvas or other fabric coated or impregnated with phenolic condensation cementing material has been put in place. The heat curing of the parts, at, say, 300° or so Fahrenheit for an hour or so may cure or solidify the phenolic condensation cementing material and simultaneously vulcanize the rubber and unite all of the parts so that the gripping studs or pins 52 may project down through the rubber to the wearing surface thereof as shown in Fig. 12. Fig. 13 shows another arrangement in which projecting gripping studs or bosses 55 may be formed in the incorporated and united rubber sole composition 56. The layer of suitable fabric 53 preferably having the frictioned coating 6 of rubber on its lower side may be forced into the soft or plastic unvulcanized rubber so as to form the projecting bosses or gripping studs which may extend to or more or less adjacent the wearing surface of the shoe sole, the fabric yielding in the case of flexible or knitted fabrics or folding at the adjacent points to allow these projections to be formed. The corresponding recesses may be filled with any suitable material, such, for example, as phenolic condensation cementing material and incorporated fibrous or other filler form the body 54 of these studs and heat cured and united to another stiffener backing member 52, if desired.

These gripping members more or less formed of fabric carrying cured phenolic condensation stiffening material are extremely strong and are practically independent of any ordinary heat changes to which footwear should be subjected, maintaining their waterproof and impervious properties throughout such temperature changes and they are free from serious cracking or other injury in marked contrast to the softening of heated pyroxylin or similar cementing material under moderate heat and its tendency to crack when chilled. Furthermore such impregnated fabric material is very strong and rigid and a couple of connected layers of eight ounce duck about a sixteenth of an inch thick and containing about 50% or so of cured phenolic condensation cementing material has a bending modulus of rupture of 15,000 to 18,000 pounds per square inch.

This invention has been described in connection with a number of illustrative embodiments, forms, proportions, elements, parts, shapes, materials, compositions, 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.

I claim—

1. The integral stiffened rubber shoe sole comprising a sole connector stiffener mem-

ber of fabric carrying phenolic condensation cementing material, said connector stiffener member being folded to form a series of transverse gripping ribs projecting adjacent the wearing surface of the sole near its forward portion, a stiffener member carrying phenolic condensation cementing material united to the relatively flat surface of said connector stiffener member and vulcanized rubber sole composition connected to said connector stiffener member and in which said gripping members are embedded.

2. The integral stiffened rubber shoe sole comprising a sole connector stiffener member carrying phenolic condensation cementing material, said connector stiffener member forming a gripping rib projecting adjacent the wearing surface of the sole, a stiffener member carrying phenolic condensation cementing material united to the relatively flat surface of said connector stiffener member and vulcanized rubber sole composition connected to said connector stiffener member and in which said gripping members are embedded.

3. The integral stiffened rubber shoe sole having relatively rigid gripping members projecting adjacent its wearing surface and comprising a sole connector stiffener member having projecting portions of fabric having a coating of rubber composition on one side and cured phenolic condensation cementing material on its other side and impregnating the fibers thereof, said connector stiffener member being folded to form a series of transverse gripping ribs projecting adjacent the wearing surface of the sole near its forward portion and having a series of flaps forced toward said wearing surface, additional phenolic condensation cementing material and incorporated fibrous material connected to said flaps to form gripping studs in connection therewith, a stiffener member carrying cured phenolic condensation cementing material united to the relatively flat surface of said connector stiffener member and rubber sole composition molded upon and vulcanized to said connector stiffener member in which said gripping members are embedded.

4. The integral stiffened rubber shoe sole having relatively rigid gripping members projecting adjacent its wearing surface and comprising a sole connector stiffener member of fabric having a coating of rubber composition on one side and cured phenolic condensation cementing material on its other side and impregnating the fibers thereof, said connector stiffener member being folded to form a series of transverse gripping ribs projecting adjacent the wearing surface of the sole near its forward portion and having a series of flaps forced toward said wearing surface, additional phenolic condensa-

tion cementing material connected to said flaps to form gripping studs in connection therewith, and rubber sole composition molded upon and vulcanized to said connector stiffener member in which said gripping members are embedded.

5. The integral stiffened rubber shoe sole having relatively rigid gripping members projecting adjacent its wearing surface and comprising a sole connector stiffener member of fabric having cured phenolic condensation cementing material on its other side and impregnating the fibers thereof, said connector stiffener member being folded to form a series of transverse gripping ribs projecting adjacent the wearing surface of the sole near its forward portion and rubber sole composition molded upon said connector stiffener member in which said gripping members are embedded.

6. The integral stiffened rubber shoe sole having a stiffener backing member carrying cured phenolic condensation cementing material and connected gripping members cemented thereto and projecting adjacent the wearing surface of the sole and comprising a series of transverse gripping ribs adjacent the forward portion of the sole and gripping studs having cord center portions carrying phenolic condensation cementing material and united thereby to said stiffener backing embedded in the rubber sole composition.

7. The integral stiffened rubber shoe sole having a stiffener backing member carrying cured phenolic condensation cementing material and cemented gripping members projecting adjacent the wearing surface of the sole and comprising a transverse gripping rib adjacent the forward portion of the sole, and gripping studs carrying phenolic condensation cementing material and united thereby to said stiffener backing embedded in the rubber sole composition.

8. The integral stiffened rubber shoe sole having a stiffener member carrying cured phenolic condensation cementing material and connected gripping members projecting adjacent the wearing surface of the sole and comprising gripping pins embedded in the rubber sole composition and formed of braided cord center portions carrying phenolic condensation cementing material and thereby united to said stiffener member and a braided fabric sheath around said center portion and having a rubber coating vulcanized to the adjacent rubber sole composition.

9. The integral stiffened rubber shoe sole having a stiffener member carrying cured phenolic condensation cementing material and connected gripping members projecting adjacent the wearing surface of the sole and comprising gripping pins embedded in the rubber sole composition and formed of cord center portions carrying phenolic condensa-

tion cementing material and thereby united to said stiffener member and a braided fabric sheath around said center portion and vulcanized to the adjacent rubber sole composition.

10. The integral stiffened rubber shoe sole having a stiffener member carrying cured phenolic condensation cementing material and connected gripping members projecting adjacent the wearing surface of the sole and comprising gripping pins embedded in the rubber sole composition and formed of fibrous center portions carrying phenolic condensation cementing material and thereby united to said stiffener member and a fabric sheath around said center portion and vulcanized to the adjacent rubber sole composition.

11. The integral stiffened rubber shoe sole having a stiffener member carrying cured phenolic condensation cementing material and connected gripping members projecting adjacent the wearing surface of the sole and comprising gripping studs embedded in the rubber sole composition and formed of fibrous center portions carrying phenolic condensation cementing material and united thereby to said stiffener member.

12. The stiffened rubber shoe sole comprising a stiffener member and connected gripping members embedded in the rubber sole composition and comprising woven fibrous portions carrying cured phenolic condensation cementing material and extending adjacent the wearing surface of the shoe sole to secure increased grip on the ground.

13. The rubber shoe sole comprising gripping members embedded in the rubber sole composition and comprising portions carrying cured phenolic condensation cementing material and extending adjacent the wearing surface of the shoe sole to secure increased grip on the ground.

14. The stiffened rubber shoe sole having a backing stiffener member and an integral heel vulcanized to said shoe sole and comprising a spiral gripping heel rib formed of fabric strip carrying cured phenolic condensation cementing material and extending toward the wearing surface of the heel and forming substantially rigid separated gripping members and connected rubber composition forming the body of said heel and a rubber cushion layer between said heel rib and the backing stiffener member at the heel of said shoe sole.

15. The stiffened rubber shoe sole having a backing stiffener member and an integral heel vulcanized to said shoe sole and comprising a gripping heel rib formed of fabric carrying cured phenolic condensation cementing material and extending toward the

wearing surface of the heel and forming substantially rigid gripping members, and connected rubber composition forming the body of said heel.

16. The rubber shoe sole element comprising a spiral gripping rib formed of a plurality of united fabric strips impregnated with cured phenolic condensation cementing material and extending substantially across the wearing surface of sole element and forming substantially rigid separated convolutions provided with junction holes, vulcanized rubber composition forming the body of said sole element and substantially surrounding and vulcanized to said rib and forming connecting plugs extending through said junction holes, and a rubber cushion layer beneath said rib and secured to one side of said element.

17. The rubber shoe sole element comprising a substantially spiral gripping rib formed of fabric strip carrying cured phenolic condensation cementing material and extending substantially across and extending to the wearing surface of the sole element and forming relatively rigid separated convolutions, vulcanized rubber composition forming the body of said sole element and substantially surrounding and vulcanized to said rib.

18. The stiffened rubber shoe sole element having a backing stiffener member and incorporated spiral gripping members formed of a plurality of united fabric strips carrying cured phenolic condensation cementing material and extending toward the wearing surface of the sole element to form substantially rigid separated gripping members provided with junction holes and connected rubber composition forming the main wearing surface of said sole element and forming connecting plugs extending through said junction holes.

19. The stiffened rubber shoe sole element having a backing stiffener member and incorporated gripping members formed of fabric carrying cured phenolic condensation cementing material and extending toward the wearing surface of the sole element to form substantially rigid separated gripping members, and connected rubber composition forming the main wearing surface of said sole element.

20. The stiffened rubber shoe sole element having an incorporated gripping member formed of fabric carrying cured phenolic condensation cementing material and extending toward the wearing surface of the sole element to form a substantially rigid gripping member, and connected rubber composition forming the main wearing surface of said sole element.

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