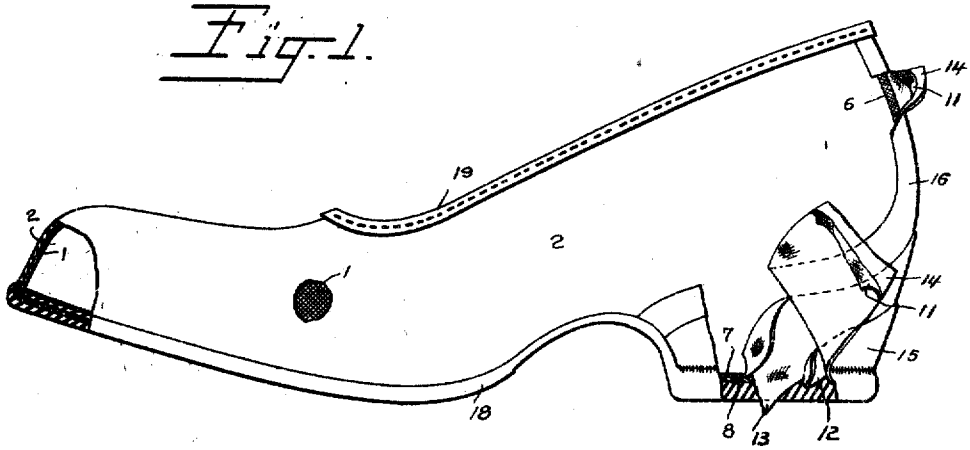
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RUBBER FOOTWEAR AND METHOD OF MANUFACTURING THE SAME.

APPLICATION FILED SEPT. 27, 1918.

1,349,296. Patented Aug. 10, 1920.

Fig. 1.



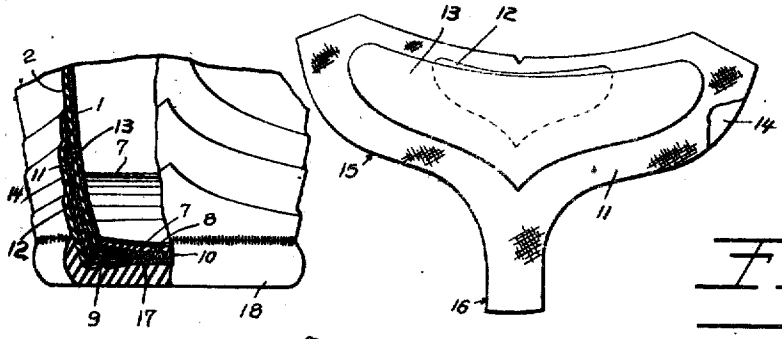


Fig. 2.

Fig. 4.

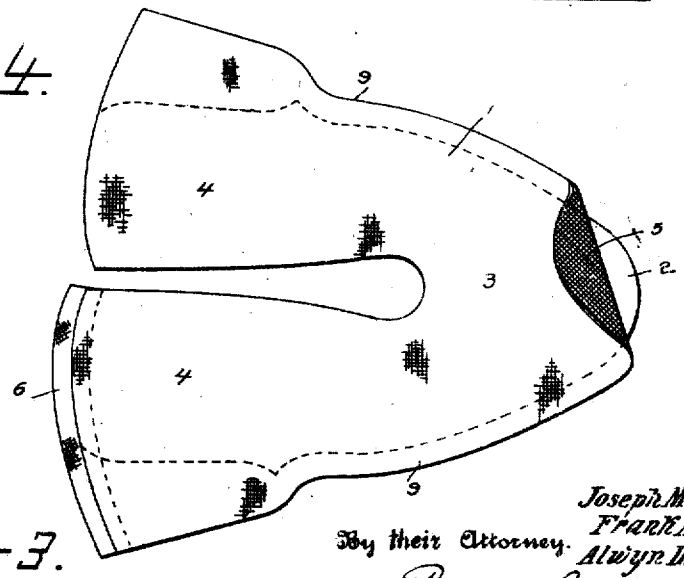


Fig. 3.

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RUBBER FOOTWEAR AND METHOD OF MANUFACTURING THE SAME.

1,349,296. Specification of Letters Patent. Patented Aug. 10, 1920.

Application filed September 27, 1918. Serial No. 255,901.

To all whom it may concern:

Be it known that we, JOSEPH M. RICE, FRANK A. JOSEPH, and ALWYN D. RUPP, citizens of the United States, residing at New Haven, county of New Haven, and State of Connecticut, have invented certain new and useful Improvements in Rubber Footwear and Methods of Manufacturing the Same, of which the following is a full, clear, and exact description.

This invention relates to rubber boots, overshoes, and the like, and to methods of manufacturing the same.

Heretofore in the manufacture of rubber footwear it has been the practice to first cut a lining of suitable pattern from a sheet of knitted fabric having a coating of rubber on one surface. A narrow binding strip of friction coated fabric is then cemented to one of the rear margins of the lining, after which the lining is shaped to the last, fabric side down. The binding strip is arranged to extend beyond the margin to which it is secured a sufficient distance so that when the two rear margins of the lining are brought together at the back of the last it will overlie both margins and serve to hold the lining in position. An insole consisting of a sheet of woven fabric and a relatively thick outer layer of rag stock is then placed upon the bottom of the last, fabric side down, and the outer margin of the lining is turned in and cemented thereto.

A crescent-shaped heel reinforcement cut from rag stock and known as the "junior," is then superposed upon the lining at the back of the last.

A heel plug cut from friction coated fabric is next applied. This part consists of a D-shaped portion which is superposed upon the insole and a substantially crescent-shaped portion which is turned up and superposed upon the junior.

Another heel reinforcement of friction coated fabric, known as the outer heel piece, is then superposed upon the previously applied heel reinforcing parts. It is somewhat similar in shape to the junior with the exception that it is formed with a tongue adapted to extend to the top of the joint between the rear margins of the lining.

The next step in the old method is the application of the rubber outer. This part is cut full to provide surplus material at the rear margins of the quarters and the outer margin, to enable such margins to be grasped by the fingers in fitting the outer to the last. Considerable manipulation and stretching is required to conform the rubber outer to the configuration of the last and snugly fit it to the lining with the result that additional surplus material is drawn to the rear margins of the quarters and the outer margin. The surplus material of the rear magins is removed by trimming with a sharp knife one of the rear margins along the center line of the insole and then trimming the other margin with a pair of shears to adapt it to slightly overlap the edge of the margin first cut. The seam so formed is finished by the use of a suitable stitching instrument. The surplus material of the outer margin which is turned in upon the insole is then skived off with a sharp knife along a line substantially coincident with the outer edge of the filler sole.

The various cutting operations necessitated by this old method, constitute very serious difficulties in the manufacture of rubber footwear, as great expertness is required to prevent the knife from cutting into the lining, insole and various heel reinforcing parts. For this reason only highly skilled operators can be intrusted with the work, adding materially to the cost of manufacture. In practice it has been found that even when experienced operators are employed the disadvantages are not entirely overcome as numerous seconds still occur as a result of making the cuts too deep.

Another disadvantage of the old method is that the lining and rubber outer are separately fitted to the last necessitating two difficult shaping operations in forming the upper.

Another disadvantage of the old method is that air bubbles or blisters are liable to be formed between the lining and the outer and also between the various heel reinforcing parts, destroying the efficiency and value of the article.

Another disadvantage of the old method is the difficulty experienced in centering the various heel reinforcing parts to produce an article of uniform appearance.

Another disadvantage of the old method is that in fitting the rubber outer separately to the lining there is a tendency to stretch

it unduly at certain parts resulting in an undesirable weakness of the rubber outer.

A further disadvantage of the old method is that the various heel reinforcing parts are individually fitted to the last requiring a plurality of shaping operations to build the heel reinforcing structure.

An object of the present invention, accordingly, is to provide an improved method of manufacturing rubber footwear whereby the various disadvantages noted in connection with the method heretofore practised are overcome, permitting the rapid and economical production of a superior article of footwear.

A further object of the present invention is to provide an article of footwear of more rugged and economical construction and of more sightly appearance than those produced by the methods heretofore known.

Another object of the present invention is to provide novel structural elements adapted to simplify the manufacture and reduce the cost of rubber footwear.

Further objects of the invention will hereinafter appear.

Referring to the drawings:—

Figure 1 is a side view with portions cut away and laid back, of a rubber overshoe embodying our invention;

Fig. 2 is a plan view showing the assemblage in the flat of several of the reinforcing parts used at the heel portion of the overshoe;

Fig. 3 is a plan view showing the assemblage in the flat of the fabric lining and rubber cover forming the upper of the overshoe;

Fig. 4 is an enlarged view of the back of the heel of the overshoe with portions broken away to show the assemblage of the various parts.

For the purpose of simplicity the invention will be described in connection with the manufacture of rubber overshoes.

In carrying out the improved method in one of the preferred ways, the fabric lining 1 and rubber outer 2, which constitute the upper of the overshoe, are assembled together in the flat, prior to application to the last, as shown in Fig. 3 of the drawings. These parts are cut to exact pattern to provide a vamp portion 3 and quarter portions 4. The lining is cut from a sheet of fabric having a coating of rubber 5 on one side and the rubber outer is superposed upon the rubber coated surface thereof. The rubber outer is cut to a definite pattern from a sheet of rubber to provide an outer margin preferably limited to lie within the area existing between the outer edge of the filler sole and the outer edge of the insole when turned in upon the bottom of the last. In one of the preferred forms of the invention, the rubber outer 2 is cut smaller than the fabric lining 1 so that the outer margin of the rubber outer will be spaced in from the outer edge of the fabric lining as indicated in Fig. 3 of the drawings. This construction avoids puckers of two thicknesses of material at undesirable points on the bottom of the overshoe with the result that when the filler sole is applied a substantially level surface is obtained upon which to superpose the outsole, thus avoiding the irregular humps on the outsole which have been present in footwear manufactured by the old method.

After the lining and outer have been assembled as set forth, a binding strip 6 of friction coated fabric is cemented to the rear margin of one of the quarters. This strip extends beyond the edge of the quarter to which it is applied a sufficient distance so that when the edges of the two quarters are brought together at the rear of the last, it will overlie both edges and serve to hold the upper upon the last.

By assembling the lining and rubber outer before application to the last, the necessity of stretching the rubber outer to fit the lining is avoided, enabling a satisfactory joint between the two rear margins of the quarters to be made at the center line of the heel without cutting the rubber outer, as was required in the old method.

Another advantage of assembling the parts forming the upper, prior to application to the last, is that it enables the upper to be fitted to the last at one shaping operation, whereas in the old method two shaping operations were required, one to fit the lining to the last, the other to fit the rubber outer to the lining.

Another advantage of assembling the rubber outer and lining in the flat is that integral union of the two parts may be obtained throughout by means of pressure rolls or other instrumentalities, thus avoiding air bubbles or blisters which are frequently present in footwear manufactured by the old method.

A further advantage of the method is that by cutting the outer to definite pattern and superposing it upon the lining its outer margin when turned in upon the insole will extend a predetermined distance thereon, obviating the necessity of cutting away surplus material as has heretofore been required.

When the upper has been applied, the insole 7, formed of a sheet of woven fabric provided on one surface with a relatively thick layer of rag stock 8 is set in place upon the bottom of the last, fabric side down. The outer margin 9 of the upper is then turned in upon the insole and cemented thereto, after which, the D-shaped heel plug 10 formed of a piece of friction coated fabric is set in place upon the insole.

The next step of the method consists in applying the heel reinforcing structure, designated for purpose of description, the

counter. This counter comprises the heel piece 11, the small junior 12, and the large junior 13. The various parts are assembled together in the flat in the order given prior to application to the last. The heel piece 11 is cut from a piece of friction coated fabric having a thick calendered coating of rubber 14 on one surface adapted to form the outer surface of the counter. It is cut to exact pattern to provide a crescent-shaped portion 15 and a tongue like portion 16. If desired instead of using the calendered coat of rubber 14 upon the heel piece, a separate sheet of rubber cut to suitable pattern may be employed. The small junior 12 consists of a substantially crescent-shaped piece of rag stock considerably smaller in area than the portion 15 of the heel piece upon which it is superposed. The large junior 13 is cut from a composite sheet of rag stock and cloth and is somewhat similar in shape to the small junior 12 upon which it is superposed. It is intermediate in size between the small junior 12 and the crescent-shaped portion 15 of the heel piece. When the parts have been assembled they are run through pressure rolls to integrally unite them together. The term counter as used in the specification is to be understood to mean the various reinforcing parts used at the heel of the article, irrespective of their number, arrangement or shape.

When the counter has been built up as described, it is applied to the heel of the last, being superposed upon the rubber outer 2 of the upper and overlying the joint between the rear margins of the quarters thereof. Although in the drawings, we have shown the rubber outer shaped to extend over the entire areas covered by the counter, it is within the contemplation of the invention to employ an outer having portions cut away at the rear of the quarters to expose the lining beneath the counter thus effecting an economy of material. In fitting the counter to the upper, the lower margins of the heel piece 11 are turned in upon the bottom of the last. During vulcanization of the overshoe, the edge of the rubber coating 14 of the heel piece merges into the rubber outer 2 of the upper completely covering the edge of the fabric ply of the heel piece, or if desired the edge of the rubber coating 14 may be allowed to slightly overhang the edge of the fabric, thus producing a sightly uniform construction. It is to be particularly noted that in the method described the various heel reinforcing pieces are superposed upon the upper, while in the methods heretofore practised they have been disposed between the rubber outer and the lining.

After the counter has been shaped to the last, the filler sole 17, made of friction coated fabric and rag stock, is laid upon the bottom of the last, and then the thick rubber outsole 18 is applied. A reinforcing strip of rubber 19 is next cemented around the margin at the throat of the upper completing the assemblage of parts. The overshoe so built is then subjected to suitable vulcanization to complete the article.

The improved method of forming rubber footwear, possesses the advantage that no delicate cutting operations are required, enabling a less expensive grade of labor to be employed in the production of footwear. A further advantage of the method is that both the lining and rubber cover are fitted to the last at one operation effecting a material reduction in the time required to build an overshoe. Another important advantage, effecting a substantial economy in time, is that the various heel reinforcements are applied at one operation instead of individually as was formerly the practice. Another advantage of the method is that it enables the various heel reinforcing parts to be centered in the flat resulting in the production of a more uniform product. Further advantages of the method are that by assembling the rubber outer and the lining in the flat the danger of weakening the outer by unduly stretching it at certain parts is avoided, and the formation of blisters and air bubbles between the outer and lining is prevented.

The article of footwear produced by the method is characterized by the absence of a weak exterior seam at the center line at the back of the heel, presenting a more sightly appearance and constituting a more rugged structure than the footwear heretofore known.

Although we have described the upper and counter as both being formed in the flat, it is within the contemplation of the invention to apply a counter formed in the flat upon an upper formed by the old method and also to build up a suitable counter, piece by piece, upon an upper formed in the flat.

While some of the preferred embodiments of the invention have been set forth, it is to be understood that various modifications in procedure, and in the shape, number, material and assembly of the parts may be resorted to without sacrificing any of the advantages of the invention defined in the appended claims.

Having thus described our invention, what we claim as new and desire to protect by Letters Patent is:—

1. The method of manufacturing rubber footwear, which comprises applying to a last an upper embodying a sheet of fabric and an outer of rubber, superposing a multiply counter upon the upper, and finally subjecting the assembled parts to vulcanization.

2. The method of manufacturing rubber footwear, which comprises building in the

flat an upper embodying an outer of rubber and a sheet of fabric, applying the upper so formed to a last, superposing a multi-ply counter upon the outer of the upper, and finally subjecting the assembled parts to vulcanization.

3. The method of manufacturing rubber footwear, which comprises building in the flat an upper embodying an outer of rubber and a sheet of fabric, applying the upper so formed to a last, superposing a portion of a multi-ply counter upon the outer of the upper, and finally subjecting the assembled parts to vulcanization.

4. The method of manufacturing rubber footwear, which comprises building in the flat an upper embodying an outer of rubber and a sheet of fabric, assembling in the flat a plurality of parts constituting a counter, applying the upper to a last, superposing the counter upon the outer of the upper, and finally subjecting the assembled parts to vulcanization.

5. The method of manufacturing rubber footwear, which comprises building in the flat an upper embodying an outer of rubber and a sheet of fabric, assembling in the flat a plurality of parts constituting a counter, applying the upper to a last, superposing a portion of the counter upon the outer of the upper, and finally subjecting the assembled parts to vulcanization.

6. The method of manufacturing rubber footwear, which comprises building upon a last an upper embodying an outer of rubber and a sheet of fabric, assembling in the flat a plurality of parts constituting a counter, superposing the counter upon the outer of the upper, and finally subjecting the assembled parts to vulcanization.

7. The method of manufacturing rubber footwear, which comprises building upon a last an upper embodying an outer of rubber and a sheet of fabric, assembling in the flat a plurality of parts constituting a counter, superposing a portion of the counter upon the outer of the upper, and finally subjecting the assembled parts to vulcanization.

8. The method of manufacturing rubber footwear, which comprises shaping an upper of fabric and rubber upon a last, forming a multi-ply counter of fabric and rubber with an exposed outer rubber covering, superposing the counter upon the lasted upper with an edge of the said exposed rubber covering in intimate contact with the rubber of said upper, and vulcanizing.

9. The method of manufacturing rubber footwear which comprises building in the flat a composite upper having its lower edge cut to finished size, applying said upper and an insole to a last, turning over and cementing said finished edge to the insole, superposing a counter on the upper, and finishing and vulcanizing the article.

10. The method of manufacturing rubber footwear, which consists in applying to a last a composite upper of lining and rubber, butt joining the quarter portions of the upper at the heel portion of the last, applying a counter to the heel portion, and finishing and vulcanizing the article.

11. The method of manufacturing rubber footwear which consists in applying to a last a composite upper of lining and rubber, butt joining the quarter portions of the upper at the heel end of the last, applying a composite counter to the heel portion, and finishing and vulcanizing the article.

12. An upper for use in manufacturing rubber boots or overshoes, embodying a lining of fabric to form the interior of the boot or overshoe upper and a ply of rubber superposed upon the fabric, the latter being composed of an inner portion to constitute the exterior of the vamp of the boot or overshoe, and an outer marginal portion adapted to be turned in upon the insole, the edge of said marginal portion being spaced in from the outer edge of said lining.

13. A counter for use in manufacturing rubber boots or overshoes, embodying a ply of woven fabric, and a ply of rag stock, the said plies being integrally united together.

14. A counter for use in manufacturing rubber boots or overshoes, embodying a ply of rag stock, a ply of woven fabric, and an exposed ply of rubber, the said plies being integrally united together.

15. A counter for rubber footwear, including a heel piece, a small junior, and a large junior, all united together.

16. A counter for rubber footwear, including an outer heel piece, an intermediate small junior, and an inner large junior of less area than the heel piece, all united together.

17. The method of manufacturing rubber footwear, which consists in applying an upper as a unit to a last, applying a heel reinforcement as a unit to the exterior of the upper, applying the sole parts, and vulcanizing the article.

18. The method of manufacturing rubber footwear, which consists in applying a composite upper to a last, butt joining the quarter portions of the upper, applying to the butt joint a heel reinforcement of graduated thickness, and finishing and vulcanizing the article.

Signed at New Haven, county of New Haven, State of Connecticut, this 16th day of August, 1918.

JOSEPH M. RICE.
FRANK A. JOSEPH.
ALWYN D. RUPP.