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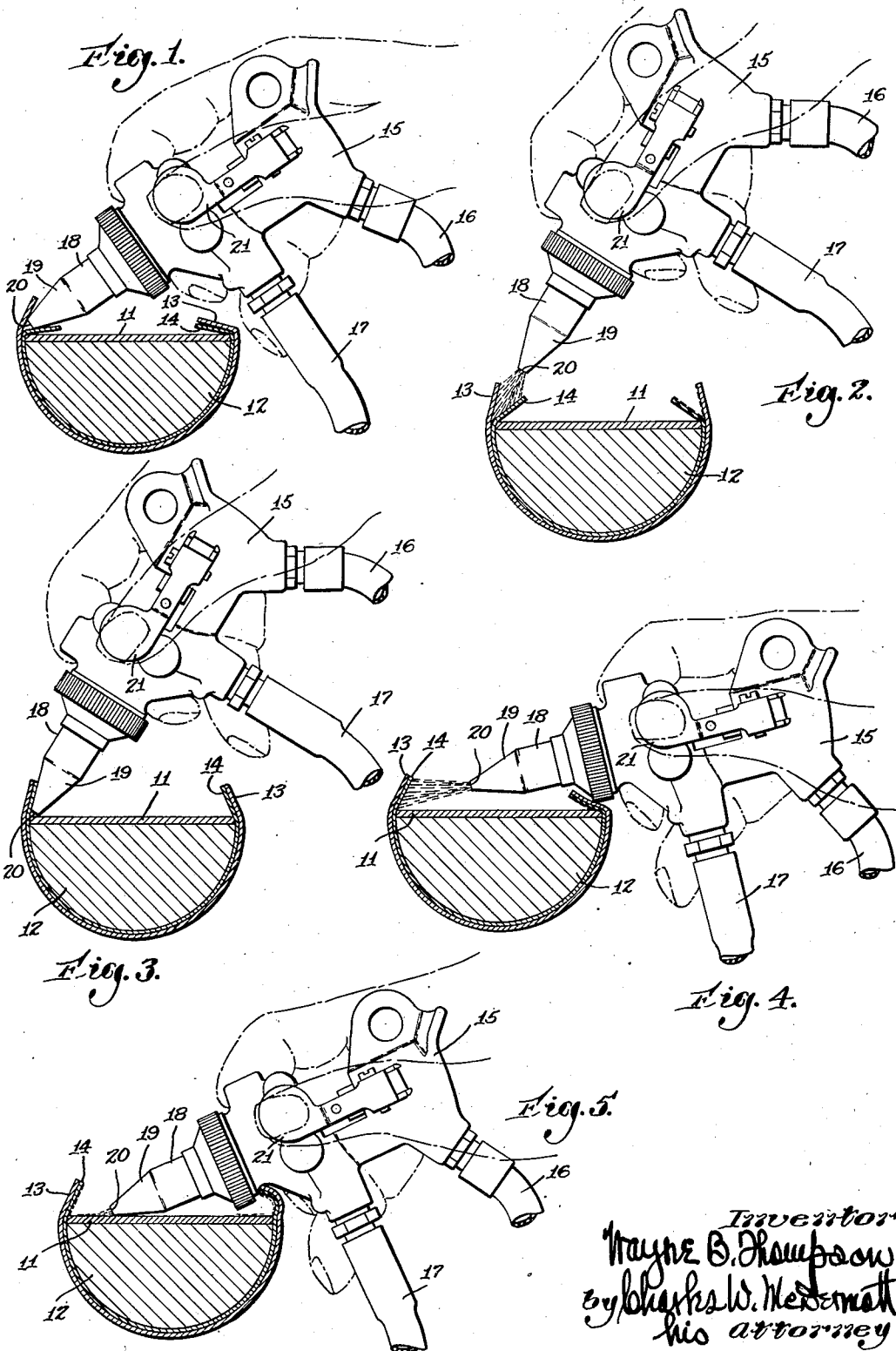
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ART OF LASTING SHOES

Filed Dec. 30, 1933

2 Sheets-Sheet 1



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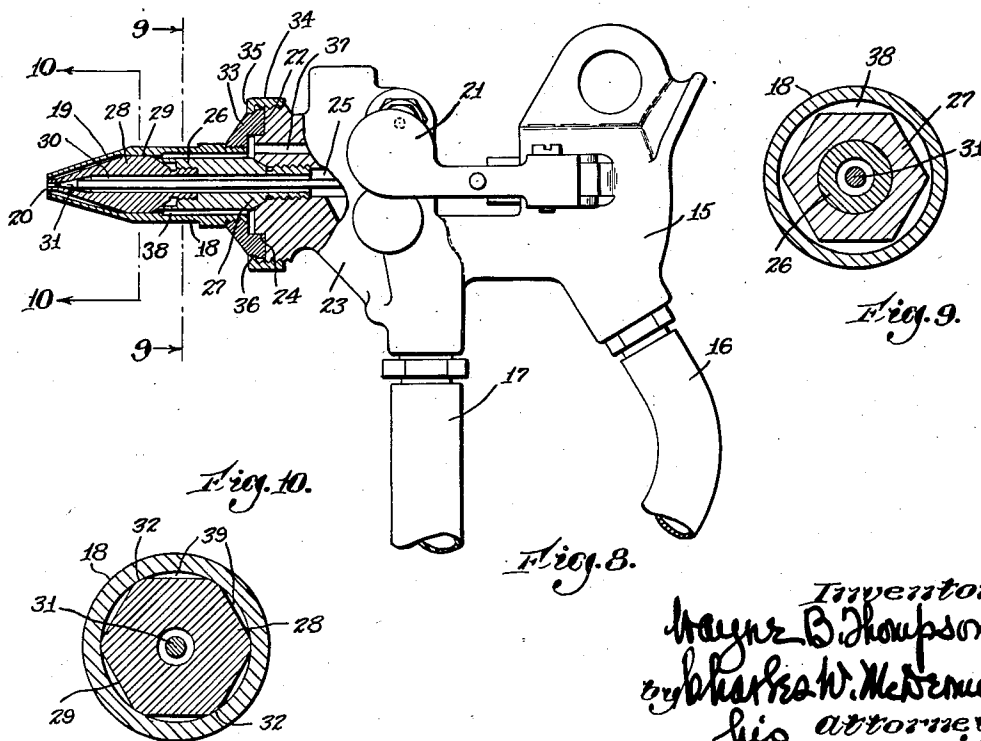
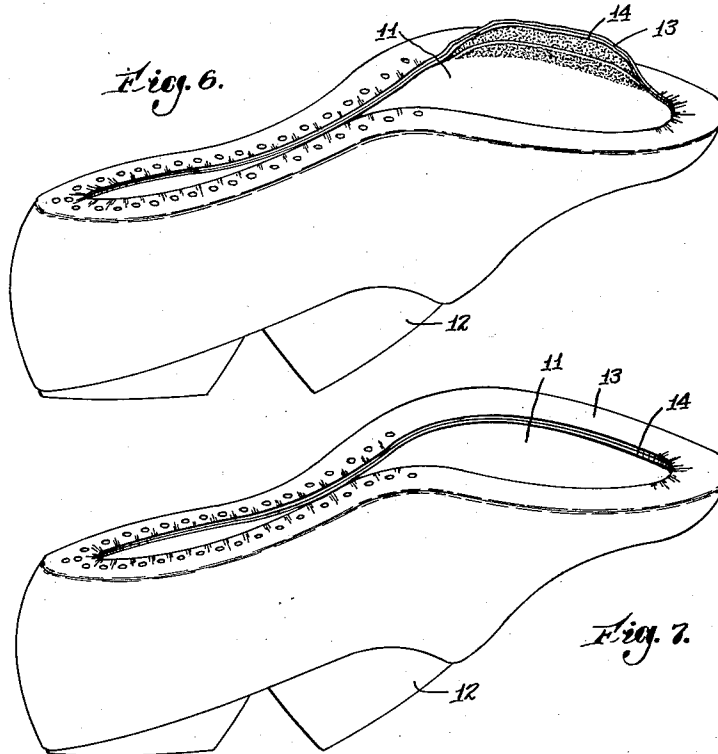
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ART OF LASTING SHOES

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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ART OF LASTING SHOES

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10 Claims. (Cl. 12—145)

The present invention relates to the art of lasting shoes.

In the manufacture of cemented shoes it has been proposed heretofore to assemble an upper and an insole on a last, and to last the upper to the last and secure the lasted upper to the marginal portion of the insole in successive operations, one of which comprises the forepart lasting operation. The term "upper" is used herein, where the context so requires or admits, to include the unit comprising an upper and its lining material united adhesively. The term "lining material" is used herein, where the context so requires or admits, to include the lining and a doubler and/or reinforcing or stiffening material.

In one method of forepart lasting it has been customary for the operative to apply a brush, carrying adhesive, to the margin of the insole around its forepart and then to overdraw the upper upon the coated margin of the insole. This procedure is not only time consuming, messy, and wasteful of cement, but the adhesion between the upper and the insole thus obtained is not uniform, the adhesive being too thick in some places and too thin, or lacking, in other places. Moreover, it is impracticable with a brush to prevent the adhesive from piling up in the vertex of the angle formed by the insole and the upper. When this piling up occurs the adhesive is squeezed out of the vertex downwardly in the direction of the thickness of the insole during the subsequent overdrawing operation. Experience has demonstrated that this method of forepart lasting is impracticable owing to the inability of the operative to apply a stripe of coating uniform in thickness to the marginal portion of the insole spaced from the edge thereof.

In this, and other methods of lasting, the upper may not be united to its lining material adhesively prior to the assembling of the upper, its lining material and an insole upon a last, thereby necessitating the uniting of the upper and its lining material adhesively while they are assembled on the last in order to prepare them for the lasting operation. It has been proposed heretofore to apply a brush, carrying adhesive, to the upper and its lining material in preparation for the lasting operation, but this procedure is also time consuming, messy, and wasteful of cement, and requires, in addition, the use of some extraneous instrumentality to separate the upper and its lining material to permit the introduction of the brush therebetween.

The principal objects of the present invention are to enable the upper to be secured adhesively

to the marginal portion of the insole and/or to the lining material in a smooth and uniform manner, and to provide for the application of the coating to the various surfaces in a quick, neat and economical manner.

To the accomplishment of these objects, and such others as may appear hereinafter, the features of the present invention relate to certain methods, devices, combinations and arrangements of parts hereinafter described and then set forth broadly and in detail in the appended claims possessing advantages which will be apparent to those skilled in the art.

The various features of the present invention will be readily understood from an inspection of the accompanying drawings, illustrating the best forms of the invention at present devised, in which,

Figure 1 is a detail view, showing the spray gun in left side elevation and the forepart of the shoe in process in lateral sectional elevation and illustrating how the discharge nozzle of the spray gun may be used to separate the marginal portion of the upper and its lining;

Fig. 2 is a view similar to Fig. 1, illustrating how the spray gun may be used to discharge adhesive into the angle formed by the separated upper and its lining;

Fig. 3 is a view similar to Fig. 1, illustrating how the discharge nozzle may be used to uplift the marginal portion of the lining away from the marginal portion of the insole into contact with the marginal portion of the upper;

Fig. 4 is a view similar to the previous views, illustrating how the spray gun may be used to apply adhesive to the exposed face of the uplifted marginal portion of the lining;

Fig. 5 is a view similar to the previous views, illustrating how the spray gun may be used to apply adhesive to the marginal portion of the insole;

Fig. 6 is a view in perspective of a partially lasted shoe;

Fig. 7 is a view in perspective of the lasted shoe;

Fig. 8 is a detail view in left side elevation, partly in section, of the spray gun;

Fig. 9 is a detail view in sectional elevation on the line 9—9, Fig. 8, and

Fig. 10 is a detail view in sectional elevation on the line 10—10, Fig. 8.

For the purposes of disclosure the various features of the present invention are explained in connection with an upper and its lining material which are united adhesively at their marginal por-

tions after they have been assembled with an insole on a last. It will be understood by those skilled in the art that certain steps of the method herein explained for purposes of disclosure are particularly applicable to the preparation of the marginal portion of an insole so that it will function to secure a unit, comprising the upper and its lining material united adhesively, in its over-drawn position.

Referring to Fig. 5, the insole 11 is mounted upon the bottom of a last 12. The upper 13 and its lining 14 are united adhesively. In order to provide the marginal portion of the insole 11 with a stripe of coating uniform in thickness throughout its length I establish separate flowing streams of adhesive and compressed air, bring the streams together, and direct a spray of the combined streams against the marginal portion of the insole in a direction to cause the insole to deflect the adhesive over the marginal portion of the insole towards the vertex of the angle formed by the insole and the lining 14. The stream of compressed air not only acts as an atomizing agent, but in rebounding from the upper, creates an air baffle which prevents the adhesive from reaching the vertex and, in flowing backwardly over the marginal portion of the insole, confines the adhesive to a stripe uniform in thickness. As shown in Figs. 5 and 6 the air baffle acts to space the stripe from the edge of the insole. During the subsequent overdrawing operation the adhesive is squeezed backwardly to the edge of the insole but not downwardly in the direction of the thickness of the insole.

Preferably, I establish the separate flowing streams of adhesive and compressed air, bring the streams together and direct a spray of the combined streams against the marginal portion of the insole through the medium of a spray gun 15 held in the operative's hand and connected to a compressed air conduit 16 and to an adhesive conduit 17. The spray gun 15 is provided with an elongated discharge nozzle 18 provided with a frusto-conical tip or nose 19 in the small base of which the discharge orifice 20 is formed. As shown in Figs. 1 to 5 the spray gun is located during use on one side of the shoe, the discharge nozzle 18 being elongated to locate the discharge orifice at the opposite side of the shoe.

As shown in Fig. 5 the sloping face of the nose 19 is positioned substantially flatwise on the insole with the discharge orifice 20 located at a point spaced from the vertex of the angle formed by the unit upper and the adjacent face of the insole a distance substantially commensurate with the width of the projecting lining face of the unit upper. The operative slides the conical surface along the marginal portion of the insole to transfer the discharge orifice along or around the forepart and thereby produces a stripe of adhesive uniform in thickness and substantially uniform in width.

Preferably, the spray gun is of the general type disclosed in Patent No. 1,779,922, issued October 28, 1930. In this general type of spray gun the compressed air and coating material valves within the gun are controlled from a thumb-piece 21 (Fig. 8) arranged to be engaged by the thumb of the operative's hand upon which the gun is hung. In this type of spray gun the front vertical face 22 of the body portion 23 is provided with a projecting cylindrical seat 24.

The novel features of the spray gun disclosed in Fig. 8 consist in certain changes, presently to be described, in the patented spray gun, to en-

able it to be used in practising the methods of lasting disclosed herein. The coating material flows from the conduit 17 into a central chamber 25 the forward end of which is internally threaded to receive an elongated threaded internal nozzle 26 through which the coating material is discharged from the gun. The elongated nozzle 26 is constructed in two portions. The rear portion 27, which is the part threaded into the chamber 25, is provided with an hexagonal surface to facilitate the application of a wrench thereto and its threading into the chamber 25. The front portion 28 of the elongated nozzle 26 is threaded into the portion 27 and is provided with an hexagonal surface 29. The axial opening 30 in the portion 28 and the front end of the elongated needle valve 31 are constructed and arranged substantially like the similar parts disclosed in Patent No. 1,706,006, March 19, 1929.

After the cylindrical discharge orifice 20 in the front portion 28 is formed, the orifice may be centered in a lathe and the corner edges of the hexagonal portion 29 turned down to form seats 32 concentric to the cylindrical orifice 20, for the elongated external nozzle 18.

The rear end of the external nozzle 18 is threaded into a union 33 supported on the cylindrical seat 24 with the rear edge face of the union 33 seated flatwise against the front face 22 of the body portion. The union 33 is held in position by a suitable locking means shown as an internally threaded collar or nut 34 threaded on the body portion 23 and having an intumed flange 35 to engage an out-turned flange 36 on the union 33.

The compressed air introduced into the spray gun by the conduit 16 flows out of the body portion 23 through the longitudinal passage 37 into the space 38 (Fig. 9) formed between the interior of the nozzle 18 and the hexagonal surface of the portion 27. From the space 38 the air flows through the six spaces 39 (Fig. 10), between the nozzle 18 and the seats therefor formed on the portion 28, into and out of the discharge orifice 20.

With the spray gun disclosed in the drawings the separately flowing streams of adhesive and compressed air are brought together outside the gun, but this is immaterial, as the streams may be brought together in a spray gun of the internal mix type.

If the marginal portion of the upper 13 and its lining 14 are not united adhesively prior to their assembly with an insole on a last, the spray gun 15 may be used effectively to unite them adhesively while on the last.

Referring to Figs. 1 to 7, the insole 11 is mounted upon the bottom of a last 12. The upper 13 and its lining 14 are assembled on the last 12 and then subjected to a lasting operation in which the marginal portions of the upper and its lining back of the ball line are lasted to the last and secured to the margin of the insole by some suitable fastening means, such for instance, as tacks, (Fig. 6).

In using the spray gun, the operative releases the pressure of his thumb on the thumb-piece 21 thereby maintaining closed the compressed air and coating material valves within the gun, and inserts the tip 19 (Fig. 1) between the marginal portion of the upper and its lining. The operative then transfers the point of engagement of the tip 19 along or around the forepart of the shoe to separate the marginal portion of the upper from its lining.

The operative then tips the gun into the position of Fig. 2 and operates the thumb-piece 21 to open the valves within the gun and discharge the adhesive into the angle formed by the marginal portion of the upper and its lining. The operative then transfers the point of operation of the gun back to the original starting position thereby coating the adjacent faces of the marginal portion of the upper and its lining along or around the forepart.

The operative then shuts off the discharge of coating material, inserts the tip of the spray gun in between the adjacent faces of the lining and the marginal portion of the insole (Fig. 3), lifts the marginal portion of the lining away from the marginal portion of the insole, and wipes the coated face of the lining into engagement with the coated face of the upper. The operative then transfers the point of operation along or around the forepart of the shoe, lifting and wiping the lining face during the transfer.

Again causing the spray gun to discharge coating, the operative applies the adhesive to the exposed upstanding face of the lining (Fig. 4). When this upstanding face has been provided with a coating along or around the forepart of the shoe, the operative performs the step hereinbefore referred to in which the marginal portion of the insole along or around the forepart is provided with a stripe of adhesive uniform in thickness and substantially uniform in width and spaced slightly from the edge of the insole. The unit comprising the upper 13 and 14 adhesively united may then be overdrawn upon the marginal portion of the insole and secured thereto by the previously applied adhesive in any suitable one of the well known machines.

Nothing herein explained is to be interpreted as limiting the various features of the present invention in the scope of its application to use in connection with the particular spray gun or the particular mode of operation, or both, selected for the purposes of illustration and disclosure. While the particulars of construction herein set forth are well suited to one mechanical form of the invention and to the uses to which it is put, it is not limited to these uses, nor to these particulars of construction, nor to the conjoint use of all its features, nor is it to be understood that these particulars are essential since they, and the various steps of the process, may be modified or varied within the skill of the artisan without departing from the true scope of the actual invention, characterizing features of which are set forth in the following claims by the intentional use of generic terms and expressions inclusive of various modifications.

What is claimed as new, is:

1. That improvement in the art of lasting shoes which consists in assembling an upper and an insole on a last, establishing separate flowing streams of coating material and compressed air, bringing the streams together, directing a spray of the combined streams against the marginal portion of the insole in a direction to cause the insole to deflect the coating material towards the vertex of the angle formed by the marginal portion of the insole and the upper and to cause the upper to deflect the air stream backwardly over the spray.

2. That improvement in the art of uniting an upper and its lining adhesively which consists in assembling an upper, its lining and an insole on a last, utilizing the discharge nozzle of a spray gun to separate the marginal portion of the up-

per and its lining, spraying an adhesive through said discharge nozzle into the angle formed by the separated upper and its lining, and utilizing the said nozzle to engage the coated faces of the upper and lining with each other.

3. That improvement in the art of preparing for a lasting operation the unit comprising an upper and a lining adhesively united and mounted on a last with marginal portions of said unit upstanding from the last which consists in establishing separate flowing streams of coating material and compressed air, bringing the streams together and directing a spray of the combined streams against the exposed lining face of the unit prior to the lasting operation.

4. That improvement in the art of preparing an upper, its lining and an insole all mounted on a last for a lasting operation which consists in establishing separate flowing streams of coating material and compressed air, bringing the streams together and directing a spray of the combined streams successively against the adjacent faces of the marginal portions of the upper and the lining, against the opposite face of the marginal portion of the lining, and against the marginal portion of the insole, said spray application occurring prior to the overdrawing of the marginal portions of the upper and its lining upon the insole.

5. That improvement in the art of preparing an upper, its lining and an insole all mounted on a last for a lasting operation which consists in separating the marginal portion of the upper and the lining, establishing separate flowing streams of coating material and compressed air, bringing the streams together and directing a spray of the combined streams into the angle formed by the adjacent separated faces of the upper and the lining, wiping the coated faces of the upper and the lining into engagement, and directing a spray of the combined streams successively against the other face of the marginal portion of the lining and against the marginal portion of the insole.

6. That improvement in the art of lasting shoes which consists in assembling an upper, its lining and an insole on a last, utilizing the discharge nozzle of a spray gun to separate the marginal portion of the upper and its lining, spraying an adhesive through said discharge nozzle into the angle formed by the separated upper and its lining, utilizing the said nozzle to uplift the marginal portion of the lining away from the marginal portion of the insole into contact with the marginal portion of the upper, spraying an adhesive successively against the uplifted marginal portion of the lining and the adjacent marginal portion of the insole, and overdrawing the marginal portion of the upper and its lining upon the marginal portion of the insole.

7. That improvement in the art of lasting shoes which consists in assembling an upper, its lining and an insole on a last, utilizing the discharge nozzle of a spray gun to separate the marginal portion of the upper and its lining, spraying an adhesive through said discharge nozzle into the angle formed by the separated upper and its lining, utilizing the said nozzle to uplift the marginal portion of the lining away from the marginal portion of the insole into contact with the marginal portion of the upper, spraying an adhesive directly against the exposed face of the uplifted marginal portion of the lining, resting the said nozzle upon the in-

sole with its discharge orifice at a point spaced from the vertex of the angle formed by the adjacent faces of the uplifted lining and the adjacent marginal portion of the insole, spraying an adhesive on the insole between said point and said vertex, and overdrawing the marginal portion of the upper and its lining upon the marginal portion of the insole.

8. That improvement in the art of uniting an upper and its lining adhesively which consists in assembling an upper, its lining, and an insole upon a last, positioning the discharge nozzle of a spray gun in such relationship with respect to the marginal portions of the upper and its lining as to separate them adjacent the nozzle, transferring the nozzle along the assembly while maintaining the nozzle in its separating relationship with said marginal portions to separate so much thereof as are to receive adhesive, and re-transferring said nozzle along the separated marginal portions while spraying adhesive into the angle formed between said portions by reason of their separation.

9. That improvement in the art of lasting shoes which consists in assembling an upper, its lining, and an insole upon a last, positioning the discharge nozzle of a spray gun in such relationship with respect to the marginal portions of the upper and its lining as to separate them adjacent the nozzle, transferring the nozzle along the assembly while maintaining the nozzle in its separating relationship with said marginal

portions to separate so much thereof as are to receive adhesive, re-transferring said nozzle along the separated marginal portions while spraying adhesive into the angle formed between said portions by reason of their separation, transferring said nozzle along the uncoated face of the marginal portion of the lining while spraying adhesive thereupon, transferring said nozzle along the adjacent marginal portion of the insole while spraying adhesive thereupon, and overdrawing the marginal portions of the upper and its lining upon the marginal portion of the insole.

10. That improvement in the art of preparing for a lasting operation an upper, its lining, and an insole all mounted on a last with the marginal portions of the upper and its lining extending beyond the level of the insole, which consists in establishing separate flowing streams of coating material and compressed air, bringing the streams together, and directing a spray of the combined streams successively against the adjacent faces of the marginal portions of the upper and the lining, against the opposite face of the marginal portion of the lining, and against the marginal portion of the insole, said spray being directed to coat said upper and lining portions substantially to the insole level and to coat said insole portion substantially to the edge thereof adjacent the lining.

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