

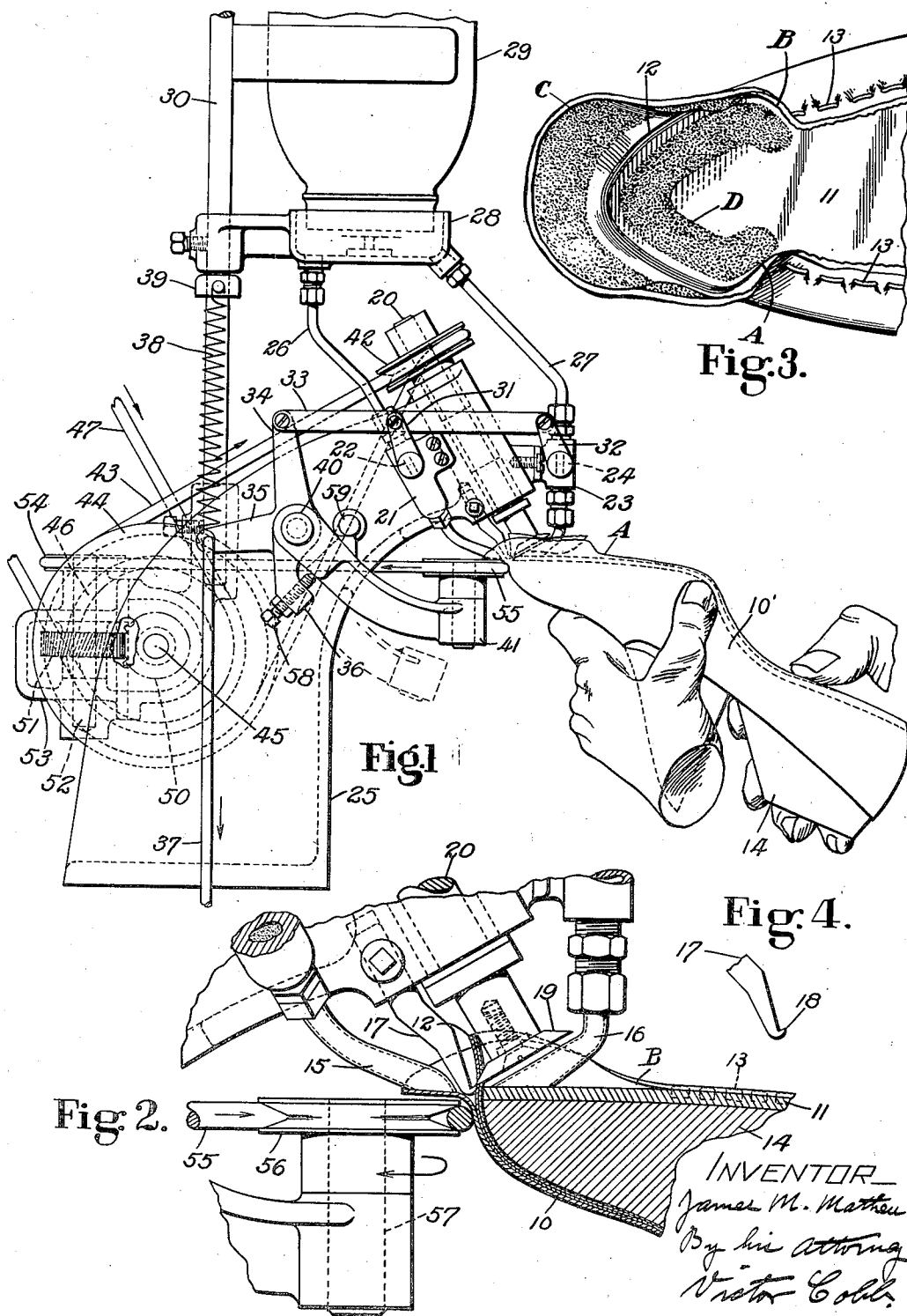
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TRIMMING MACHINE

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TRIMMING MACHINE

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This invention relates to trimming machines and is herein disclosed as providing an improved combination comprising power-operated trimming means, power-operated work-feeding means, and means for spreading liquid cement on certain portions of a work-piece while another portion of the work-piece is in process of being trimmed. A machine embodying such a combination has utility in the manufacture of cement-lasted shoes, and particularly those to be toe-lasted with cement.

The usual lasting procedure in the manufacture of certain types of shoes is to use staples with or without lasting cement for the side-lasting operation, to terminate such lasting at points near but at the rear of the tip-line, thus leaving the materials forming the toe of the shoe to be otherwise lasted with cement only. Satisfactory toe-lasting requires severing all or nearly all of the lasting allowance of the lining at the toe (including the corresponding margin of a toe-box and the corresponding margin of a doubler, both of which are usually interposed between the lining and the upper before the shoe is pulled over), to the end that the toe-margin of the upper may lie in contact with the corresponding margin of the insole when the toe-lasting operation is performed. Accordingly, it has heretofore been customary, at the conclusion of the side-lasting operation, but before beginning the toe-lasting operation, to sever a marginal strip comprising the undesirable elements above specified, thereafter to coat the inner face of the lasting margin of the upper and the corresponding margin of the insole with lasting cement, and finally to perform the toe-lasting operation with a machine of the bed-type in which wipers are provided to lay the lasting margin of the upper on the insole and maintain it in overlasted condition until the cement-coated surfaces become sufficiently bonded by adhesion.

Many shoe manufacturers still practice the above-described procedure according to its original order of operations in which the side-lasted shoe is jacked in a bed-machine before the marginal strip of undesirable elements is severed, and before toe-lasting cement is applied to the upper and the insole. Consequently, that order of operations not only retards the output of the toe-lasting machines but also consumes too much time of skilled and highly-paid toe-lasting operators who, in the interest of economy, should not be required to sever the undesirable materials nor to apply the toe-lasting cement nor to wait

for the cement to become sufficiently tacky before proceeding with the toe-lasting operation.

With a view to saving time in such work, an object of the present invention is to provide an improved machine by which another operator, not so skilled or highly paid as a toe-lasting operator, may sever the marginal strip of undesirable materials and at the same time apply the toe-lasting cement to the upper and the insole before the shoe is set up in a toe-lasting machine. According to this latter procedure, the trimmed and cement-coated shoes may lie on a rack for a sufficient length of time to develop a tacky condition of the cement without retarding the output of the toe-lasting machines and the toe-lasting operators.

To fulfill the object above stated, the machine herein illustrated is provided with an improved combination of elements comprising power-operated cutting means arranged to sever the undesirable marginal strip of the lining of a partially fabricated shoe, a pair of cement-applying nozzles, one arranged to spread a layer of cement on the inner surface of the lasting margin of the upper and the other arranged to spread a layer of cement on the corresponding margin of the insole, and manually operable means, preferably deriving operating movement from a treadle, for controlling the discharge of cement from the nozzles. Although operating conditions may not, in every case, require two cement-applying nozzles, it is usually preferable to apply lasting cement to both of the surfaces ultimately to be bonded by adhesion rather than to rely upon a single coating to effect the bond.

In addition to the combination above set forth, the illustrated machine includes power-operated work-feeding means the work-engaging member of which may be moved manually to and from its operative position, to the end that it may be controlled so that it will not take effect until the operator has arranged the component parts of the shoe in their respective desired relationships to the trimming means and the cement-applying nozzles. With respect to the cement-supplying means and the work-feeding means, the invention also provides dual control of the latter means and the discharge of cement from the nozzles in that these two means are so interconnected that when the treadle is operated to supply cement to the work, the same operating movement of the treadle shifts the work-engaging element of the work-feeding means to its operative position where it not only fulfills its work-feeding function but also maintains the

lasting margin of the upper in contiguous relation to the corresponding cement-applying nozzle. Conversely, when the treadle mechanism is moved to turn off the supply of cement, it also effects retraction of the work-feeding member from its operative position.

Referring to the drawing,

Fig. 1 is a left-side elevation of a combined trimming and cement-applying machine embodying the present invention, the parts being represented in their fully operative positions;

Fig. 2 is a fragmentary elevation on a larger scale of the work-engaging elements, as represented in Fig. 1, the toe portion of a partially fabricated shoe being represented in section and in process of being trimmed and coated with cement;

Fig. 3 is a top-plan view of the toe portion of such a shoe after the trimming and cement-applying operations have been performed; and

Fig. 4 is a side elevation of a stationary shearing member of the lining-trimming mechanism.

A shoe partially fabricated as herein shown comprises an upper 10, an insole 11, a lining 12 including a toe-box and a doubler, and lasting staples 13 which, for side-lasting purposes, are used to secure the opposite overdrawn margins of the upper and the lining to the insole in accordance with one well-known practice. These elements, having first been pulled over on a last 14 and thereafter subjected to the usual side-lasting operation, have no means at this stage to secure the lasting margins of the upper and the lining at the toe except the temporary toe-tack (not shown) usually driven in the pulling-over operation. In the drawing, the toe-tack has been pulled out to release the lasting margins of the upper and the lining from the insole, to the end that these marginal portions may be separated from each other as pictured in Fig. 2 in which the splayed margin of the upper underlies a cement-applying nozzle 15, the corresponding margin of the insole underlies another cement-applying nozzle 16, and the intermediate margin of the lining is in process of being severed along a line contiguous to the edge of the insole.

The nozzle 15 is arranged to discharge lasting cement downwardly on the inner surface of the splayed margin of the upper, while the nozzle 16 is arranged to discharge cement on the corresponding margin of the insole. These nozzles are spaced one from the other far enough to provide a gap through which the upstanding lasting margin of the lining may be fed without obstruction. A stationary finger 17 projects downwardly between the nozzle 15 and the margin of the lining and is provided at its lower end with a narrow ledge having a sharp shearing edge 18 (Fig. 4). A rotary cutter 19 of the disk type, affixed to a driven shaft 20, overlies the nozzle 16 and confronts the margin of the insole, its perimeter being beveled to provide an acute circular cutting edge arranged in shearing relation to the shearing edge 18 of the finger 17. The cutter 19 is inclined to provide a space into which the nozzle may project nearly, if not quite, to the perimeter of the insole.

The nozzle 15 is affixed to a fitting 21 in which an oscillatory valve 22 is arranged to open and close a passageway through which the cement may flow, and the nozzle 16 is likewise affixed to a fitting 23 comprising a similar valve 24. In Fig. 1 the parallel dotted lines indicated at 22 and 24 represent the cement ducts in the oscillatory valve members which in this figure stand in the open position. The fittings 21 and 23 and

the finger 17 are all affixed to an overhanging portion of a frame 25 that may be mounted on a pedestal (not shown) or on a bench, this overhanging portion of the frame also providing bearings for the cutter-shaft 20. Cement is supplied to the valves 22 and 24 by pipes 26 and 27 both connected to a common source such as the bowl 28 of a barometric feeder including a storage container 29 closed at the top. As herein shown a post 30 affixed to the frame 25 supports the barometric feeder.

The valves 22 and 24 are interconnected to be opened and closed simultaneously, and for this purpose they are provided with parallel operating arms 31 and 32 to which a link 33 is pivotally connected. One end of the link is pivotally connected to an operating arm 34 of a bell-crank lever which also comprises arms 35 and 36. A rod 37 connected to the arm 35 extends downwardly to a treadle (not shown). When this treadle is depressed, it opens the valves 22 and 24, but when it is released, the valves are closed by a tension spring 38 that raises the rod 37, the upper end of this spring being anchored to a fitting 39 affixed to the post 30. The bell-crank lever 34, 35, 36 is arranged on a fulcrum pin 40 secured to the frame 25. This pin serves as a fulcrum also for an arm 41 which constitutes an element of the work-feeding mechanism hereinafter described.

A grooved pulley 42 affixed to the cutter-shaft receives rotation from a belt 43, the driving pulley of which is indicated at 44. This pulley is affixed to a shaft 45 journaled in bearings in the frame 25 and provided with a receiving pulley 46 to which rotation may be transmitted from any convenient source by a belt 47. So long as the belt 47 is driven, the cutting disk 19 will be in rotation.

The shaft 45 also carries a worm 50 for operating the work-feeding mechanism now about to be described. The worm cooperates with a worm-wheel 51 affixed to a vertical shaft 52. This shaft is journaled in bearings provided by a member 53 affixed to the frame 25. A grooved pulley 54 affixed to the upper end of the shaft 52 drives a belt 55 preferably containing friction material such as rubber, since this belt constitutes the work-engaging element of the work-feeding mechanism and operates on the upper 10 at a point slightly below the level of the insole where the upper and the lining are seated on the toe portion of the last. The work-engaging portion of the belt 55 runs on a freely rotatable grooved pulley 56 affixed to a stem 57. The hub of the pulley 56 is seated on a bearing portion at the forward end of the arm 41, and the lower portion of the stem 57 is journaled in this bearing portion of the arm. Although the arm 41 is not rigidly secured to the lever 34, 35, 36, it derives operating movement from the latter to carry the pulley 56 and the work-engaging portion of the belt 55 to and from their operating position. For this purpose, the arm 36 is provided with an adjustable abutment such as a screw 58 that underlies and engages the arm 41 to support it. When the treadle-rod 37 is depressed to permit cement to flow through the valves 22 and 24, it also raises the arm 41 to its operative position, as shown in Figs. 1 and 2, the arm being arrested at its operative position by a stop 59 projecting from the frame 25. Since the treadle-rod is likewise arrested the stop 59 is effective also to arrest the opening movement of the valves 22 and 24, and the screw 58 provides for regulating the maximum opening afforded by the valves.

Before using the described machine, the user will first release the lasting margins of the upper and the lining from the insole by pulling out the toe-tack previously driven in the pulling-over operation. Then, before presenting the shoe to the machine, it will usually be necessary for the operator to fold back the lasting margin of the upper at point A (Fig. 3) which is the point at which the trimming operation and the cement-applying operation will be started. While holding the heel end of the shoe in the left hand and the toe end in the right hand the operator may hold back the upper at point A with the forefinger of the right hand until that portion is placed under the nozzle 15. At first, the operator will feed the shoe manually to run the cut into the lining from its inner edge to the edge of the insole, and then swing the heel end of the shoe toward his body, meanwhile supporting the toe end with the right hand.

Having begun the operation as above described, the user will maintain the toe of the insole against the nozzle 16 and depress the treadle to turn on the supply of cement and to raise the feeding belt 55 to its operative position. A slight pressure of the shoe against the belt will develop the desired feeding effect. Meanwhile, the nozzle 16, in addition to spreading a coat of cement on the margin of the insole, guides the shoe in the desired relation to the feeding means and the trimming means. The belt 55 feeds the shoe at a speed that will enable the operator to turn the shoe end for end as the operation progresses around the toe.

When the arm 41 is against the stop 59, the gap between the upper face of the pulley 56 and the nozzle 15 is barely deep enough to enable the outturned margin of the upper to pass between them. Consequently, the pulley and the nozzle are effective to flatten the "dog-ears" commonly formed in the upper as a result of pulling over. Moreover, the normal tendency of the margin of the upper to stand erect is usually sufficient to maintain the upper in contact with the nozzle. Both nozzles have flat work-engaging surfaces surrounding their outlets, and these flat surfaces spread the discharged cement in broad bands on the corresponding surfaces of the upper and the insole. The shaded areas C and D in Fig. 3 represent the cement applied to the upper and the insole respectively. In this figure the lining 12 is represented as having been trimmed as a result of severing a strip therefrom in the manner represented in Fig. 2. As the operation approaches the terminal point B (Fig. 3) the user may rock the shoe slightly to one side to facilitate carrying the trimming cut out to the edge of the lining, and at the same time the treadle will be released to permit the spring 38 to turn off the supply of cement and lower the forward portion of the feeding belt 55.

When latex cement is used for toe-lasting as contemplated for the procedure herein described, the coated areas C and D should be exposed to the air for a few minutes to develop a tacky condition of the cement before the toe is actually lasted. Consequently, a rack of shoes that have been trimmed and coated with cement as herein described will be in suitable condition for toe-lasting if taken in regular order as soon as they have all been trimmed and coated. The toe-lasting operator may thereafter proceed immediately without waiting and without having any other duty to perform than to last the toes thus fully prepared for that operation.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A trimming machine comprising trimming means including a power-operated cutter arranged to sever progressively a strip of the inlasted lasting margin of the lining loosely enveloping the toe-end of a last and the insole of a partially fabricated shoe, and means arranged adjacent to said cutter to splay the corresponding margin of the upper and spread a layer of lasting cement on the inner surface thereof while said strip is being severed as aforesaid.

2. A trimming machine comprising trimming means including a power-operated cutter arranged to sever progressively a strip of the unlasted lasting margin of the lining loosely enveloping the toe-end of a last and the insole of a partially fabricated shoe, and means arranged adjacent to said cutter to guide the insole and to spread a layer of lasting cement on the lasting margin thereof while said strip is being severed as aforesaid.

3. A machine as defined in claim 1 comprising also means arranged adjacent to said cutter to guide the insole and to spread a layer of lasting cement on the lasting margin thereof while the upper and the lining are being operated upon as aforesaid.

4. A trimming machine comprising trimming means including a power-operated cutter arranged to sever progressively a strip of the unlasted lasting margin of the lining loosely enveloping the toe-end of a last and the insole of a partially fabricated shoe, a cement-applying nozzle arranged to engage the inner surface of the corresponding margin of the upper and to deflect the latter margin outwardly from said trimming means, and means for supplying cement through said nozzle to coat said surface of the upper.

5. A trimming machine comprising trimming means including a power-operated cutter arranged to sever progressively a strip of the unlasted lasting margin of the lining loosely enveloping the toe-end of a last and the insole of a partially fabricated shoe, a cement-applying nozzle arranged adjacent to said cutter to guide the insole and to discharge lasting cement on the lasting margin thereof, and means for supplying cement through said nozzle.

6. A trimming machine comprising trimming means including a power-operated cutter arranged to sever progressively a strip of the unlasted lasting margin of the lining loosely enveloping the toe-end of a last and the insole of a partially fabricated shoe, power-driven means arranged to feed the shoe by engagement with the outer surface of the upper lying on the perimeter of the toe of the last, and means arranged to brace the lining against the cutting edge of said cutter and to deflect the unlasted lasting margin of the upper from the field of operation of said cutter.

7. A trimming machine comprising trimming means including a power-operated cutter arranged to sever progressively a strip of the unlasted lasting margin of the lining loosely enveloping the toe-end of a last and the insole of a partially fabricated shoe, a power-driven pulley, a belt of friction material one portion of which runs on said pulley and another portion of which is arranged to feed the shoe by engagement with the outer surface of the upper lying on the perimeter of the toe of the last, and

means arranged to shift the work-engaging portion of said belt to and from its operative position.

8. A machine as defined in claim 4 comprising
 5 also power-driven means arranged to feed the shoe by engagement with the outer surface of the upper lying on the perimeter of the toe of the last and to maintain the outturned margin of the upper against the mouth of said nozzle,
 10 whereby the cement discharged from the nozzle will be spread to form a thin band on said outturned margin.

9. A machine for operating on the unlasted toe-end of a partially fabricated shoe on a last,
 15 comprising two cement-applying nozzles spaced apart, one arranged to discharge lasting cement on the lasting margin of the insole and the other to discharge cement on the inner surface of the lasting margin of the upper, means for supplying cement through said nozzles to coat the work, and power-driven cutting means arranged
 20 to sever progressively a strip of the margin of lining projecting into the space between said nozzles.

10. A machine as defined in claim 9 comprising
 25 also power-driven means arranged to feed the shoe by engagement with the outer surface of the upper lying on the perimeter of the toe of the last.

11. A machine for operating on the unlasted toe-end of a partially fabricated shoe on a last,
 30 comprising a work-guiding abutment formed and arranged to be engaged by the lasting margin of the toe-end of the insole, a cement-applying nozzle arranged to discharge cement on the inner
 35 surface of the unlasted lasting margin of the upper and to deflect said margin away from the corresponding unlasted margin of the lining, means for supplying cement to the upper through
 40 said nozzle, and power-driven cutting means arranged to sever a strip from said margin of the lining between said abutment and said nozzle.

12. A machine for operating on the unlasted toe-end of a partially fabricated shoe on a last,
 45 comprising a work-guiding abutment formed and arranged to be engaged by the lasting margin of the toe-end of the insole, a cement-applying nozzle arranged to bend outwardly the unlasted lasting margin of the upper and to spread a
 50 band of lasting cement on the inner surface of said margin, a power-driven work-feeding member operable adjacent to the mouth of said nozzle and arranged to have rolling contact with the upper lying on the perimeter of the toe of the last,
 55 manually operable means arranged to shift said feeding member toward and from said nozzle to facilitate insertion of the margin of the upper between them, and trimming means including a power-operated cutter arranged to sever a strip
 60 from the lasting margin of the lining between said abutment and said nozzle.

13. A machine as defined in claim 12 comprising
 also means controlled by said manually operable means for supplying cement to said nozzle
 65 only when said work-feeding member is adjacent to said nozzle.

14. A machine for operating on the unlasted toe-end of a partially fabricated shoe on a last,

comprising power-driven cutting means arranged to sever a strip of the unlasted lasting margin of the lining projecting from the perimeter of the insole, an abutment arranged to guide the shoe with respect to said cutting means by engagement with the lasting margin of the insole, said abutment having a duct to discharge lasting cement through its sole-engaging face, means for supplying cement to the insole through said duct, and means arranged to maintain the unlasted lasting margin of the upper out of the field of operation of said cutting means.

15. A trimming machine comprising power-operated cutting means arranged to sever progressively a marginal strip of surplus lining loosely enveloping the toe end of a last and the insole of a partially fabricated shoe, cement-supplying means including a nozzle arranged to discharge cement on the corresponding marginal portion of the upper, manually operable means arranged to turn on and off the cement supplied through said nozzle, and power-operated work-feeding means controlled by said manually operable means to be effective only when the cement supply is turned on.

16. A trimming machine comprising cement-applying means including two spaced delivery nozzles, one arranged to discharge cement on the insole of a partially fabricated shoe and the other to discharge cement on an outturned portion of the lasting margin of the upper, and power-operated cutting means located between said nozzles and arranged to sever progressively a strip from the lasting margin of the lining without severing said margin of the upper.

17. A trimming machine comprising two stationary nozzles arranged one to engage the insole of a partially fabricated shoe and the other to engage an outturned portion of the lasting margin of the upper, said nozzles being spaced apart to receive the lasting margin of the lining between them, power-operated cutting means located between said nozzles and arranged to sever progressively a strip from said margin of the lining, power-operated work-feeding mechanism, manual controlling means arranged to shift an element of said work-feeding mechanism to and from its operative position, and cement-supplying means controlled by said manual means to discharge lasting cement through said nozzles only when said element of the work-feeding mechanism is in its operative position.

18. A trimming machine comprising a nozzle and trimming means arranged adjacent to each other to operate simultaneously on a partially fabricated shoe, one to splay the lasting margin of the upper and spread lasting cement thereon, and the other to sever a strip from the corresponding margin of the lining, and power-driven work-feeding means the work-engaging element of which is shiftable manually to and from its operative position adjacent to said nozzle and said trimming means where it is effective to maintain said margin of the upper against said nozzle while feeding said margin of the lining past said trimming means.

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CERTIFICATE OF CORRECTION.

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It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 6, claim 1, for "inlasted" read --unlasted--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of June, A. D. 1940.

(Seal)

Henry Van Arsdale,
Acting Commissioner of Patents.