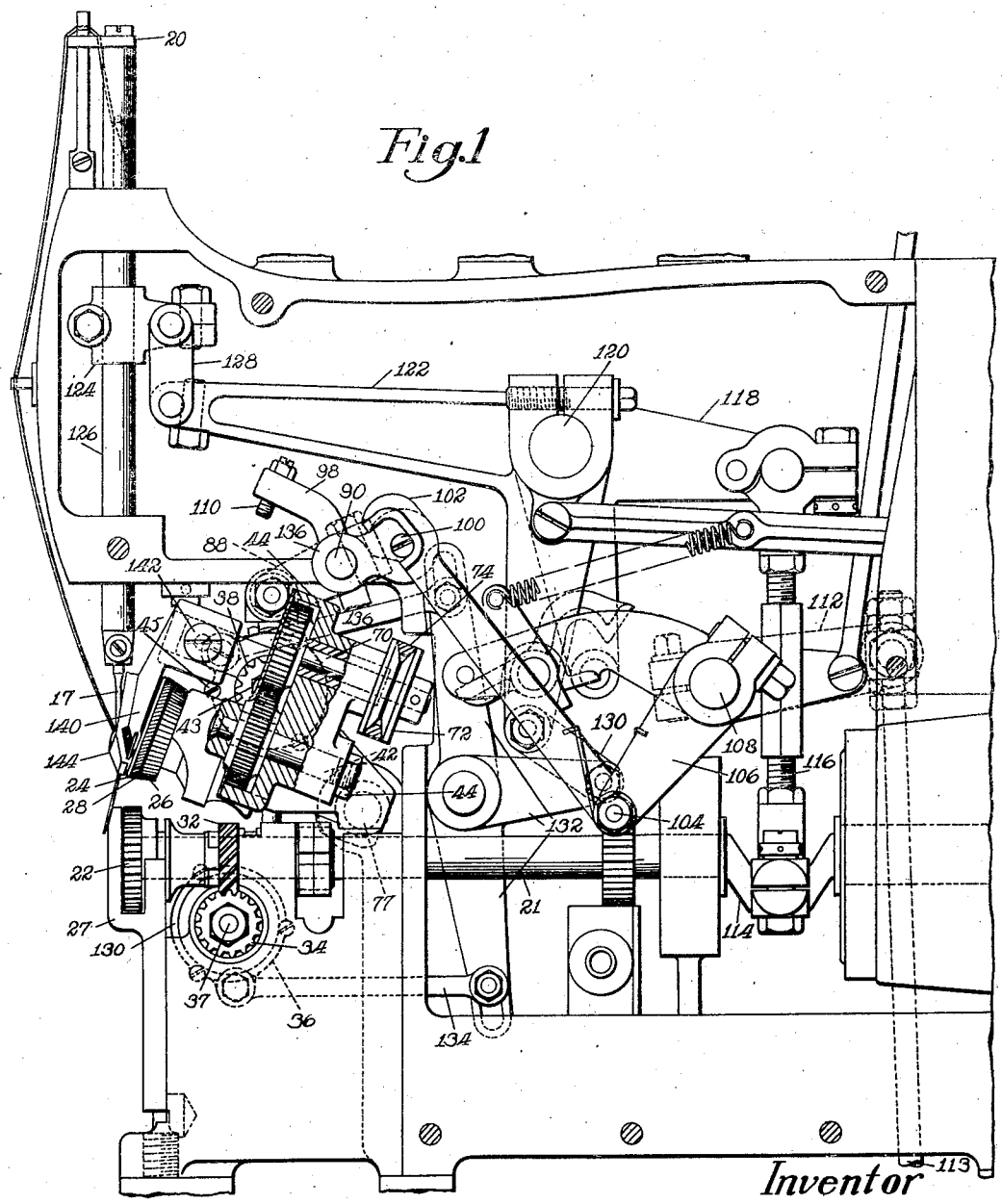
April 2, 1946. J. R. OLIVER 2,397,619

SEWING AND ROUGHENING MACHINE

Filed Nov. 4, 1943 5 Sheets-Sheet 1

Fig.1



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SEWING AND ROUGHENING MACHINE

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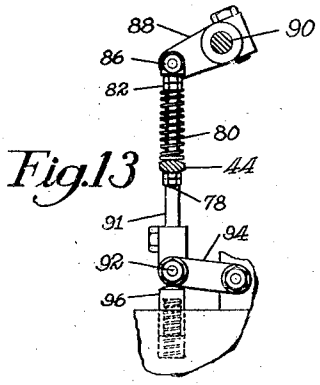


Fig. 13

Fig. 2

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SEWING AND ROUGHENING MACHINE

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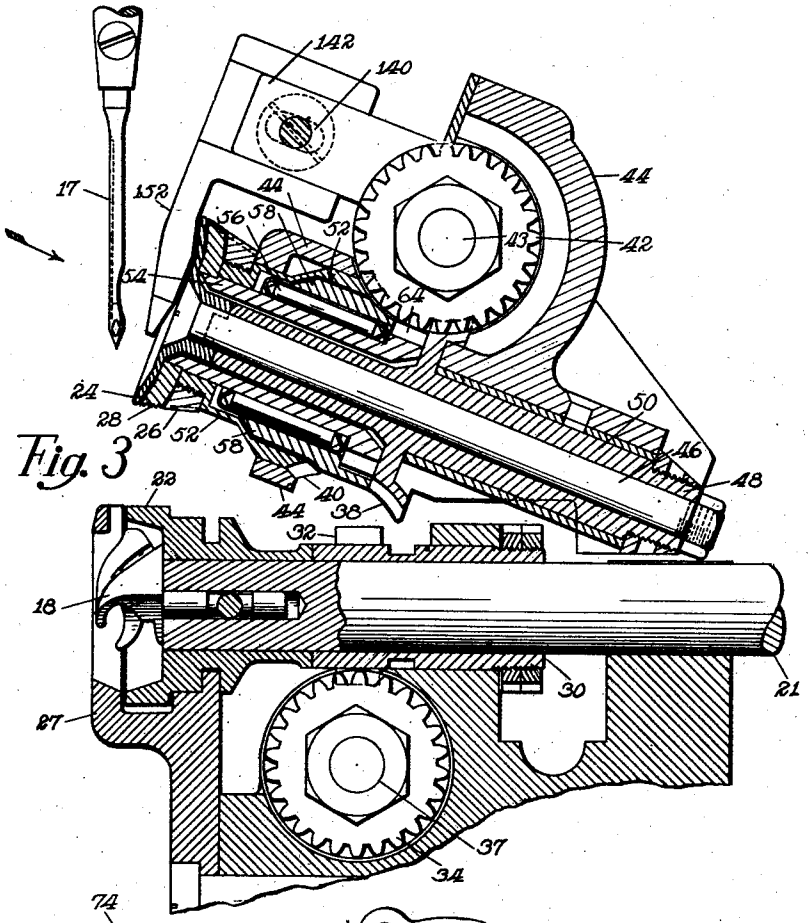


Fig. 3

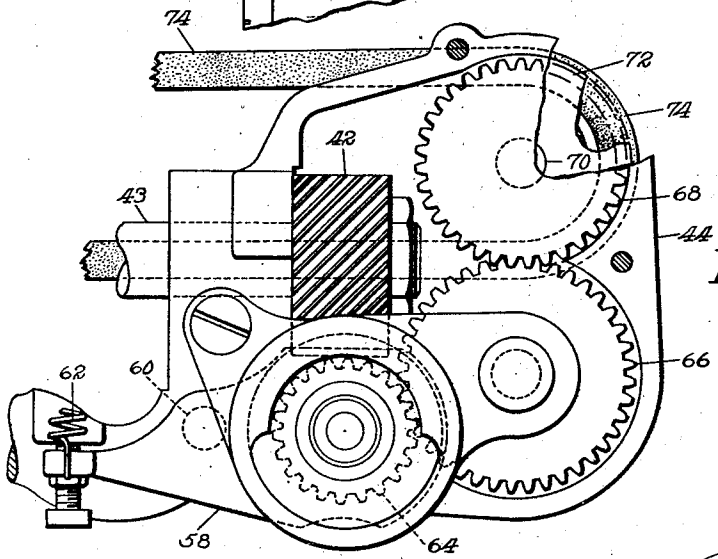


Fig. 4

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SEWING AND ROUGHENING MACHINE

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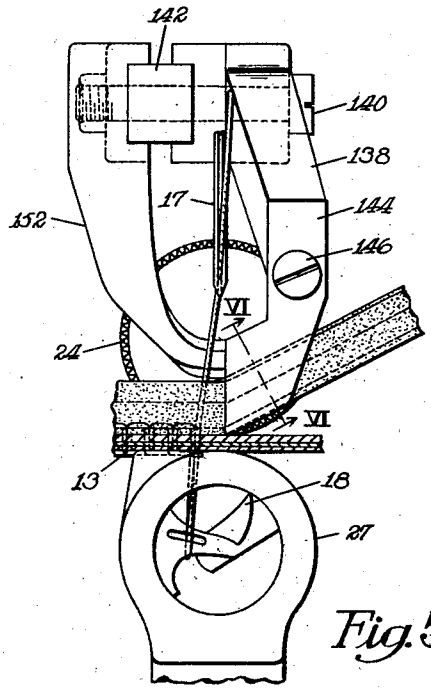


Fig. 5

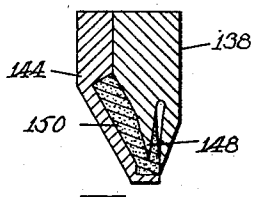


Fig. 6

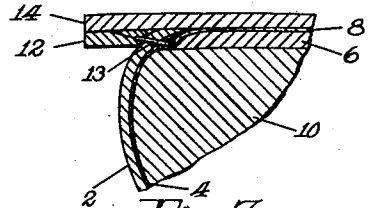


Fig. 7

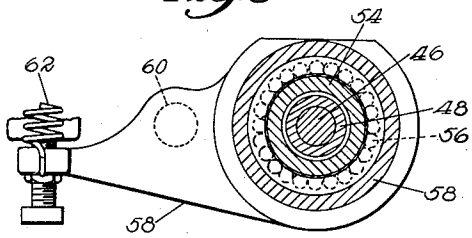
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SEWING AND ROUGHENING MACHINE

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Fig.8



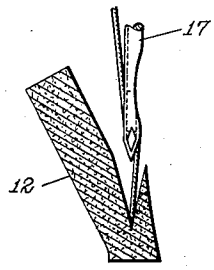


Fig.9

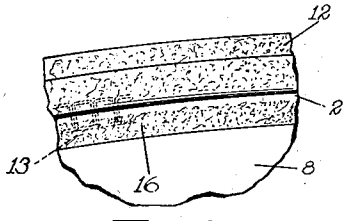


Fig.10

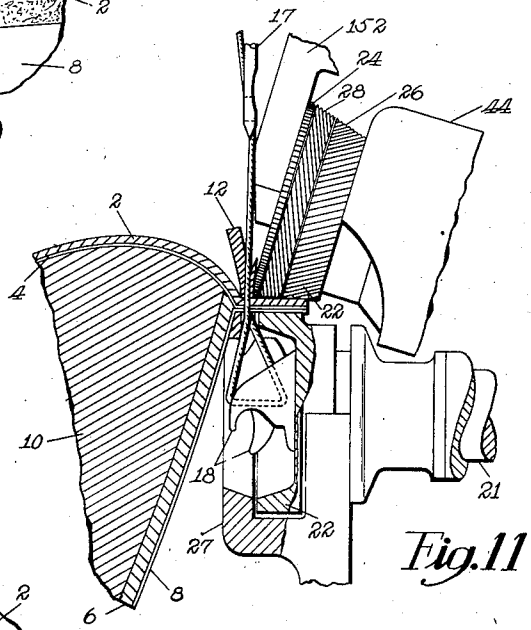


Fig.11

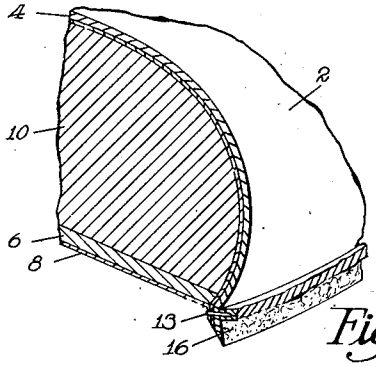


Fig.12

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Patented Apr. 2, 1946 2,397,619

UNITED STATES PATENT OFFICE

2,397,619

SEWING AND ROUGHENING MACHINE

John R. Oliver, Beverly, Mass., assignor to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Application November 4, 1943, Serial No. 508,913

12 Claims. (Cl. 12—1)

The present invention relates generally to improvements in sewing and lasting machines and more particularly to means in a sewing machine for roughening parts of shoes while being sewn together, although in certain of its aspects the invention is not limited to machines for operating upon shoes or shoe parts only.

In the use of a machine disclosed in United States Letters Patent to Leveque No. 1,864,510, granted June 21, 1932, to Fredericksen No. 2,246,993, granted June 24, 1941, and to Koloske and Curtin No. 2,272,065, granted February 3, 1942, the parts of a shoe are lasted and sewed while clamped between a pair of work-gripping and feeding rolls rotated alternately with a stitching operation to cause the point of operation to progress about the shoe. The machine of the Koloske et al. patent is arranged to operate on a relatively thin unchanneled midsole and upper, and, during sewing, a welt is attached by the seam inserted. After being sewn, an outsole is secured to the shoe either by stitches passing through the welt and outsole or by cement. If cement is employed, it is necessary to roughen the parts to which the cement is applied in order that the cement may form an effective bond. Preferably, the lasting margin of the upper is folded inwardly of the midsole and the exposed grain surface of the upper also is roughened so that when the outsole is attached the bond of the cement to the upper renders it unnecessary to rely entirely on the strength of the lasting threads to hold the outsole and welt to the upper. After the welt, upper and midsole are sewn together in lasted relation, it frequently may be difficult to roughen the lasting allowance along the margin of the upper as close to the lasting seam as desired without danger of injury to the stitches. This difficulty is particularly pronounced when the lasting allowance of the upper is trimmed closely to the lasting seam, since close trimming requires also close roughening.

One object of the present invention is to provide a machine in which the work operated upon may be roughened for reception of cement and sewn simultaneously with the formation of a narrow strip of abraded surface close to the exposed threads of a seam, thus avoiding any danger of injury to the stitches during a separate roughening operation or of accidental removal of the roughened areas by subsequent close trimming. Another object is to improve the operation of a lasting and sewing machine of the type disclosed in the patents above referred to and to so arrange the machine that the grain surface on the upper of a stitchdown-type shoe may be roughened while the shoe is being lasted and sewed, thereby eliminating the necessity of a separate roughening operation on the upper after the lasting seam has been inserted.

The illustrative machine in which these objects are attained is provided with the usual stitch forming and work feeding devices and is equipped with abrading means acting during operation of the stitch forming devices to roughen a surface of the work in proximity to or along the line of the seam simultaneously with its insertion and preferably continuously. In the present form of the invention, the work is fed by devices comprising one or more gripping rolls engaging the work at one side of the seam line and, in order to avoid any tendency for the work to become displaced in the machine or the thread of the seam to be injured by the roughening means, the roughening means acts on an area of the work along a line at right angles to the seam, connecting the work engaging portions of the gripping and feeding rolls. In the illustrated embodiment of this feature, the roughening means is guarded by one of the gripping and feeding rolls from accidental engagement with the sewing thread.

To enable proper lasting operations to be performed as well as to impart suitable stretching action to the upper during each movement of the work feeding rolls while at the same time providing ample space for operation of the stitch forming devices close to the area roughened, the roughening means, in the illustrative machine, consists of a rotating wheel having at its periphery an abrading surface of generally conical shape, and at least one of the work feeding rolls is similarly shaped and mounted substantially coaxially with the abrading wheel. In the present embodiment of this feature, two work feeding rolls are provided at the same side of the work and of approximately the same diameter as the abrading wheel, both of which rolls are substantially coaxial with and disposed one on either side of the abrading wheel, one of the rolls acting as a guard for the abrading wheel. By this arrangement, the abrading wheel engages the work between the feeding rolls, and the full benefit of the feeding rolls in lasting and stretching the upper is retained as described in the Leveque patent. In accordance with this feature of the invention, the roughening wheel and the coaxial feeding rolls may be utilized to advantage when no sewing or lasting operations are being performed or when a shoe is being sub-

jected to manufacturing processes other than sewing.

Other features of the invention consist of certain novel constructions, combinations and arrangements of parts hereinafter described and claimed, the advantages of which will be apparent to those skilled in the art from the following description and the accompanying drawings, in which

Fig. 1 is a view in side elevation, partly broken away and in section, of the operating devices in a lasting and sewing machine embodying the features of the present invention;

Fig. 2 is a view in front elevation and partly in section of the same portions of the machine illustrated in Fig. 1;

Fig. 3 is a large scale sectional showing of the lasting or feeding rolls together with the roughening wheel of the improved machine, illustrating their manner of operation upon the work in relation to the positions of the stitch forming devices;

Fig. 4 is a detail view in elevation, as viewed in the direction of the arrow in Fig. 3, of portions of the driving gear arrangements for the feeding rolls and roughening wheel;

Fig. 5 is a view in front elevation on a somewhat reduced scale of the stitch forming devices, work feeding rolls and welt guide in the machine;

Fig. 6 is an enlarged sectional view of the welt guide taken along the line VI—VI of Fig. 5;

Fig. 7 is a sectional view of a portion of a completed shoe the parts of which are lasted and roughened on the machine of the invention;

Fig. 8 is a detail sectional view of the supporting bearing for the roughening wheel, illustrating its manner of adjustment toward and from the work;

Fig. 9 is a detail view on an enlarged scale, indicating the position of the welt and needle after the welt leaves the welt guide and as the stitches are being inserted by the machine;

Fig. 10 is a partial sectional view of a portion of a shoe bottom disclosing the relation of the roughened strip to the seam after being inserted and the excess material trimmed in preparation for the reception of cement;

Fig. 11 is a view in side elevation and partially in section of the work engaging parts and of the stitch forming devices in the improved machine taken while operating upon a portion of the shoe illustrated in Fig. 5;

Fig. 12 is a perspective view of a portion of the shoe after being lasted with the grain surface of the upper roughened for the reception of cement and trimmed but not fully prepared as in Fig. 10 for application of the outsole; and

Fig. 13 is a detail view in left side elevation of a set of link connections in the machine.

The shoes operated upon by the illustrated machine are similar to those constructed with the machine of the Fredericksen and Koloske et al. patents identified above. As best shown in Figs. 7 and 10 to 12, inclusive, this type of shoe comprises an upper 2 backed by a lining 4, an insole 6 and a thin unchanneled sheet of woven material constituting a midsole 8 superposed upon the insole 6, all the parts being mounted temporarily upon and enclosing a last 10. During sewing the upper is stretched and carried around the break line of the enclosed last a short distance onto the tread surface of the last. An outsole is then attached by stitches or cement with or without the addition of a beveled welt inserted along the crease formed by the outturned margin of the upper and sole. The resulting shoe may be classified as a stitchdown, or where sewed on the Koloske et al. machine, the shoe is more nearly in the nature of a welt shoe in which a welt strip, such as is indicated at 12, is led into the lasting seam during sewing. Accordingly, instead of turning the marginal portions of the upper outwardly, as in a stitchdown shoe, the lasting allowances of the upper and attached midsole are trimmed off close to the lasting seam, indicated at 13, with a bevel cut, and the trimmed edges are turned from the line of the seam inwardly along the under surface of the midsole before an outsole is applied to the shoe. When the outsole is applied the resulting shoe has the construction of that illustrated in Fig. 7. Where cement is employed on the outsole a bond is obtained between the welt 12 and the outsole, indicated at 14.

In order to form a more durable union between the outsole 14, the welt 12 and the upper 2 of the shoe illustrated in Fig. 7, it is desirable to avoid trimming the lasting allowances of the upper and midsole too close to the lasting seam connecting the welt and upper. It is preferable to trim the upper and midsole with an allowance sufficient in width when folded over inwardly of the midsole to provide a narrow strip of surface 16 on the upper to which the outsole attaching cement may be applied. Before the cement can be applied to the surface 16 of the lasting allowance, the upper preferably is suitably prepared and roughened, since the grain or finished surface of the leather in the upper is exposed. In roughening the lasting and cementing allowance of the upper, extreme care must be taken to avoid abrading or otherwise injuring the threads of the lasting seam, and because the cementing allowance is comparatively narrow in width and of flexible nature there are numerous practical difficulties in this operation.

In the machine to which the present invention is applied the work engaging parts are constructed and arranged to form, simultaneously with the sewing operation, the roughened strip 16 on the grain surface of the upper close to the line of stitches inserted. For this purpose, the illustrated machine is provided with work guiding and feeding devices to prevent the sewing thread from coming into engagement with the roughening means and to insure that the operation of the roughening means will be guided accurately in close proximity to the point where the stitches of the seam are inserted.

The stitch forming devices of the illustrated machine comprise a straight eye-pointed needle 17, a loop taker 18 and a take-up 20, all actuated by a main sewing shaft 21 of the same construction and mode of operation as in the machine of the patent to Leveque above identified. In the machine of both the above-mentioned patents, the work is gripped and fed by a pair of opposed upper tensioning and work engaging rolls, one at either side of the work and termed the "top or upper engaging" and "lower or support" rolls. To grip and feed the work past the point of sewing operations, the present illustrated machine is provided with three work engaging rolls 22, 24 and 26. The rolls 24 and 26 rotate about the same axis, have conical work engaging surfaces and together perform the upper tensioning functions of the single upper engaging roll in the patented machine, the shoe being held in contact with a work support 27. The upper engaging rolls 24 and 26 are rotated simultaneously and intermit-

tently while engaging the work, the stitches being inserted alternately with the feeding movements of the rolls. The lower support roll 22 also is rotated simultaneously with the upper engaging rolls 24 and 26 by mechanism more fully illustrated and described in the Leveque patent.

To roughen the strip 16 on the grain surface along the lasting allowance of the shoe upper 2 which extends beyond the seam line and which is gripped by the work engaging and feeding rolls, the rolls 24 and 26 are spaced axially a short distance apart and there is interposed between them a rotatable abrading wheel 28 having a generally conical peripheral surface formed in the usual way with spaced rows of teeth. The adjacent peripheral surfaces of both rolls 24 and 26 and of the abrading wheel are arranged substantially coaxially with each other and form an unbroken generally conical contour, the rolls and wheel being nested together in compact relationship. The roll 24 is so mounted that the needle 17 operates diametrically across its outer face, thus serving as a work guide and thread guard for the abrading wheel. The guide roll 24 is provided with a relatively narrow peripheral edge surface so that the abrading wheel 28 may act close to the seam line and at the same time will be guarded from accidental contact with the thread during sewing. The roll 26 is spaced a short distance to the rear of the roll 24 and assists in gathering the fullness of the outflanged allowance of the upper and distributing it evenly along the seam.

The mountings and means for driving the feed rolls and abrading wheel are best illustrated in Fig. 3 and enable the needle to operate across an end face, diametrically of the substantially coaxial feeding rolls and abrading wheel along a path forming an obtuse angle with the axis about which the rolls and wheel rotate. The lower support roll 22 is rotatably mounted upon the forward end of the main sewing shaft 21 of the machine and is driven by a sleeve 30 on which are formed helical gear teeth 32 meshing with a helical gear 34 driven intermittently by mechanism including a one-way Horton clutch, or ratchet, 36 (see Fig. 1) on a shaft 37. The guide roll 24 and the upper gathering roll 26 are similarly driven by helical gears 38 and 40 to which they are connected respectively. The gears 38 and 40 are spaced axially to mesh at separate locations about the circumference of a single intermittently rotated helical driving gear 42 secured to a shaft rotatably mounted in a pivoted support member 44, the intermittent feeding movement being imparted by a one-way Horton clutch 45 on the shaft 43.

The guide roll 24 has an inclined central spindle 46 in the form of a bolt for clamping the roll 24 to a sleeve 48 rotatably mounted in a bushing 50 in the support member 44 concentrically with the sleeve 30. The guide roll is keyed to the forward end of the sleeve 48 and, along its central portion, the sleeve is provided with a flange forming the helical gear 38 meshing with the gear 42 along those tooth portions of the gear 42 approximately beneath the center of the shaft 43.

The upper gathering feed roll 26 is of washer-like configuration threaded within a central opening to a sleeve 52 rotatably mounted in bearing surfaces of the support member 44. At its rearward end, the sleeve 52 has an enlargement forming the helical gear 40 meshing with the intermittently driven gear 42 along those tooth portions of the gear which are disposed with an angular displacement of approximately 45° from those engaged by the helical gear 38.

To drive the abrading wheel 28 continuously while the feed rolls act intermittently, the abrading wheel is secured to the outer end of a sleeve 54 surrounding the forward end of the sleeve 48, the internal diameter of the sleeve 54 being sufficient to enable slight relative movement between the sleeve 54 and the sleeve 44 transversely to their axes, the purpose of which will be explained hereinafter. Surrounding the abrading wheel sleeve 54 is a needle-type roller bearing 56 supported within bearing surfaces of a tubular seat at one end of a mounting lever 58 (see Fig. 4) fulcrumed by means of an integrally formed stud 60 which enters an opening in the support member 44. The left end of the mounting lever 58 is forced yieldingly upwardly by a tension spring 62 connected between the lever and a pin extending laterally from the support member 44. The arrangement is such that the upward force of the spring 62 forces the abrading wheel yieldingly downwardly to engage the surface of the work operated upon along a line at right angles to the seam connecting the upper engaging portions of the rolls 24 and 26 and the point of sewing operations. Thus, all the work engaging devices are located in alinement effectively to operate within a small area on the work with the least possible tendency to exert forces which must be overcome by the operator in presenting the shoe to and guiding it in the machine. The work is securely held in the grip of the feed rolls acting at opposite sides of the abrading wheel to prevent movement of the work by the abrading wheel as a result of its reaction on the work.

To drive the abrading wheel sleeve 54, the rearward end of the sleeve is formed with a spur gear 64 of sufficiently small external diameter to escape contact with the feed roll driving gear 42. Meshing with the spur gear 64 at the right-hand side of the axis of the sleeve 54 is an idler gear 66 rotatable in the support member 44 (see Figs. 1 and 4) which idler gear in turn meshes with a driving gear 68 fixed to the forward end of a spindle 70. The rearward end of the spindle 70 has secured to it a pulley 72 about which passed a V-belt 74 surrounding a motor driven pulley 76 (Fig. 2) at the left side of the machine. The motor pulley 76 is rotated continuously at a sufficiently high speed to cause the strip of material engaged by the abrading wheel to be roughened thoroughly and to a sufficient depth below the grain surface of the upper to provide a firm grip for the cement.

It will be noted that, as in the patented machine, the present work gripping and feeding rolls are rotated intermittently and only during the times when the needle is disengaged from the work. The abrading wheel of the present machine, however, is continuously rotated and, due to its yielding mounting in the support member, has a tendency to produce an increased roughening effect while the shoe is stationary, cutting into the upper below the grain surface engaged by the top rolls 24 and 26 at positions on the upper directly in line with the points of engagement on the upper of the top rolls and opposite the point of needle penetration. Thus, the intermittent feeding movement on the work produces a varied degree of roughening along the area operated upon. A varied roughening action causes a desirable effect, particularly when applied close to the stitches of a seam, since it increases the grip provided for the cement at se-

lected locations with relation to the inserted stitches, thereby tending to equalize the strains in the cemented materials produced by the tension of the thread in the stitches and also tending to increase the flexibility of the resulting shoe in a manner more fully set forth in United States Letters Patent No. 2,013,341, granted September 3, 1935, upon an application filed in the name of Karl Engel.

Another advantage of the variations in degree of roughening is a result of a general improvement in the quality of the bond resulting when cement is applied to the roughened strip 16. In certain types of material the surfaces of which are relatively hard and inflexible, a light abrasion is sufficient to insure a reliable bond with cement, whereas, with softer and more flexible materials, it is desirable to prepare the surfaces by abrading more deeply into the substance of the material, thus producing elongated free fibers, the roots of which are more deeply anchored than those at the surface of the material. If the free fibers are too long, however, it is difficult to obtain a firm foundation for the cement on the main body of the material so that an insecure bond results. When different types of work are operated upon in the usual roughening machine, it is the practice, therefore, to adjust the machine manually for the particular type of material.

In the machine of the present invention, variation in depth of abrasion occurs automatically along the roughened strip 16, and a secure bond is insured for all types of material within a given range of quality since both deep and shallow abrasion of the surface is produced alternately. The shallow areas of abrasion will cause no substantial weakening in the strength of the material such as would be produced by a strip of roughened material with uniform and relatively deep abrasion. Also, under proper adjustment, the abrading wheel may roughen the material below the surfaces engaged by the rolls 24 and 26 only while the work is held stationary between feeding movements. With such adjustment, separate roughened areas will be produced to which the cement will adhere without bonding with the unroughened areas between. When thus cemented, the completed shoe will have greater flexibility and the cement will not have the opportunity to crack or to become disengaged from the parts as where the upper is uniformly roughened along a continuous strip.

For convenience in applying the shoe to the machine and removing the shoe after the operations are completed the supporting member 44 is shiftable on its pivot 77 to carry the feed rolls and abrading wheel, mounted thereon, toward and from the lower feed roll 22. For actuating the upper engaging rolls toward the supporting roll to grip the work, the support member 44 has a laterally extending arm formed with a perforation receiving loosely a threaded rod 78 coiled about which is a compression spring 80 acting at its lower end against the arm of the support member 44 and at its upper end against a check nut 82 on the rod 78. The upper end of the rod 78 also is threaded into a perforated block 84 pivotally mounted on a stud 86 which passes through the perforation in the block 84 and is secured to an arm 88 clamped to one end of a horizontal rockshaft 90 rotatable in the machine frame. When the rockshaft 90 is rotated, the arm 88 and the threaded rod 78 about which is coiled the compression spring 80 act as a toggle to depress the support member 44 and lock the rolls 24 and 26 yieldingly in engagement with the work. During movement of the rockshaft 90, the arm 88 reaches a position of alinement with the rod 78, and the spring 80 is compressed to force the feed rolls 24 and 26 against the work. Before engaging the work, the abrading wheel 28 which projects slightly below the adjacent edges of the feed rolls 24 and 26 first engages the work and, during continued downward movement of the support member, the abrading wheel causes the spring 62 connected to the mounting lever 58 for the abrading wheel to yield, thus providing a yielding engagement of the abrading wheel with the work, the toggle spring 80 being stronger than the spring 62 and, therefore, overcoming the force of the spring 62. After the arm 88 moves beyond a position of alinement with the rod 78, the spring 80 serves to hold the rolls in work gripping position until the rockshaft 90 is positively operated in the opposite direction. When the rockshaft is rotated in the opposite direction to unlock and raise the gripping and feeding rolls and the abrading wheel, the support member 44 is maintained in its raised position by the action of a link 91 pivotally connected to the stud 86 and to a stud 92 at the forward end of a radius arm 94 carried by a pivot on the machine frame. The lower end of the radius arm 94 is urged yieldingly upwardly by a spring pressed plunger 96 slidably mounted in the machine frame beneath the radius arm. Thus, the abrading wheel and adjacent upper feed rolls may be yieldingly pressed against or forced away from the work as a unit and, when disengaged from the work, the condition of the surface of the upper may readily be examined by the operator without removing the work from operative position on the support roll 22.

The shaft 90 is rocked by mechanism similar to that for raising and lowering the upper feed roll in the Leveque patent above referred to. This mechanism briefly comprises a three-arm member 98 (see Fig. 1) one arm of which carries a projecting screw 100 acted upon by a hook 102 pivoted by means of a bolt 104 on the end of an arm 106 secured to a treadle controlled rockshaft 108. The other arms of the three-arm member 98 are provided with set screws, one of which is indicated at 110, arranged to contact with stationary portions of the frame to limit rotational movement of the rockshaft 90. The treadle controlled rockshaft 108 is actuated to shift the position of the hook 102 by an arm 112 secured to the outer end of the rockshaft 108 and a treadle actuated rod 113 extending downwardly from the left side of the machine and connected to the arm 112. Movement of the treadle controlled rockshaft 108 causes the feeding rolls to grip the work and also connects the actuating mechanism for the feeding rolls with the main sewing shaft 21.

To connect the actuating mechanism for the work gripping and feeding rolls with the main sewing shaft 21, the sewing shaft is formed with a crank portion 114 surrounded by a bearing at one end of a connecting rod 116, the other end of which is connected to a bell crank 118 rotatably mounted on a fixed stud 120. Also rotatable on the stud 120 is a needle actuating bell crank 122 between which and a clamp collar 124 on a needle supporting bar 126 is a short link 128. Also connected to the needle actuating lever 122 is a pair of short links 130, one beside the other, operatively connecting a pair of similar but oppositely disposed bell cranks 132 for the feed roll

actuating mechanism. To oppositely disposed similar arms on the bell cranks 132 there are connected through links 134 and 136, respectively, the Horton clutches 36 and 45 acting simultaneously to drive the shafts 37 and 43 on which the driving gears for the feed rolls are mounted. For a complete description of the construction and mode of operation of this mechanism, reference may be had to the Leveque patent.

The present machine is equipped with a guide for directing a welt into the seam formed by the stitch forming device. This welt guide is best shown in Figs. 1, 2, 5 and 6 and consists in a base block 138 secured by a bolt 140 to a forwardly extending arm 142 of the support member 44 and a cover plate 144 fastened to the base block 138 by a screw 146. Between the base block 138 and the cover plate 144 there is formed a welt receiving passage arranged with a downwardly extending rib 148 in alinement with the needle to enter into an angular cut provided in the flesh side of the welt indicated at 150. The rib 148 raises a flap formed by the cut in the welt from the main body of the welt so that the needle 17 during its work penetrating stroke may strike into the root of the cut in the welt and emerge from the lower edge of the welt when penetrating the parts of the shoe operated upon. In other respects, the operation of the welt guide directing the welt toward the point of sewing operation is the same as that in the machine of the Koloske patent.

To provide additional means for guiding the needle, as well as for guarding the sewing thread from the peripheral work engaging surfaces of the feed rolls and roughening wheel which are formed with pointed teeth or ridges and to strengthen the support of the welt guide in the machine, the bolt 140 passes through a brace member 152 at the opposite side of the support arm 142 having a downwardly curved horizontally bent lower end contacting with a side surface of the supporting block 138 of the welt guide. The brace member also assists in locating the welt properly and preventing its displacement from the work between the time the needle penetrates the work and the time each stitch is set.

Certain features of the present invention disclosed but not claimed herein, and relating to a roughing machine, form the subject of a divisional application for United States Letters Patent Serial No. 609,460, filed August 7, 1945.

The nature and scope of the invention having been indicated and a particular embodiment having been specifically described, what is claimed is:

1. A sewing machine having, in combination, stitch forming and work feeding devices, and abrading means acting during sewing to roughen a surface of the work in proximity to the seam inserted by the stitch forming devices.

2. A sewing machine having, in combination, stitch forming devices, work gripping and feeding rolls engaging the work along the line of operation of the stitch forming devices, and means acting continuously during sewing and feeding operations along the area of the work engaged by the rolls to roughen a surface of the work.

3. A sewing machine having, in combination, stitch forming devices, work gripping and feeding rolls engaging the work along the line of operation of the stitch forming devices, and means acting during the sewing operation along a line at right angles to the seam and connecting the work engaging portions of the rolls to roughen the surface of the work.

4. A sewing machine having, in combination, stitch forming devices, work gripping and feeding rolls engaging the work along the line of operation of the stitch forming devices, and means acting during the sewing operation along a line at right angles to the seam and connecting the work engaging portions of the rolls to roughen the surface of the work, said roughening means being guarded by one of the rolls against accidental engagement with the sewing thread.

5. A sewing machine having, in combination, stitch forming devices, a pair of spaced rolls rotatable about the same axis to engage and feed the work, and means acting between the rolls to roughen the surface of the work.

6. A sewing machine having, in combination, stitch forming devices, a pair of spaced rolls rotatable about the same axis to engage and feed the work, and an abrading wheel rotating between the rolls substantially coaxially therewith to roughen the surface of the work in proximity to the line of operation of the stitch forming devices.

7. A sewing machine having, in combination, stitch forming devices, a set of nested coaxial rotatable members having work engaging peripheries, certain of said members acting to roughen the surface of the work, and others of said members located at either side to feed the work.

8. A sewing machine having, in combination, work gripping and feeding rolls, a rotating wheel having its periphery formed with a surface to abrade the work operated upon for the reception of cement, said wheel being mounted for rotation substantially coaxially with one of the rolls, and stitch forming devices including a needle operating across an end diametrically of the coaxial roll and wheel along a path forming an obtuse angle with the axis about which the coaxial roll and wheel rotate.

9. A shoe sewing and lasting machine having, in combination, stitch forming devices, shoe supporting and feeding means including an upper engaging guide roll and a work support between which the peripheral surface of the guide roll the lasting margin of a shoe upper is gripped, and means for gathering the fullness in the upper and distributing it throughout the lasting margin of the upper, comprising a second upper engaging roll mounted coaxially with the guide roll and spaced to engage the upper at a distance from the upper engaging periphery of the guide roll.

10. A shoe sewing and lasting machine having, in combination, stitch forming devices, shoe supporting and feeding means including an upper engaging guide roll and a work support between which and the peripheral surface of the guide roll the lasting margin of a shoe upper is gripped, means for gathering the fullness in the upper and distributing it throughout the lasting margin of the upper, comprising a second upper engaging roll mounted coaxially with the guide roll and spaced to engage the upper at a distance from the upper engaging periphery of the guide roll, and a continuously driven abrading wheel engaging the upper between the guiding and the upper gathering rolls.

11. A shoe sewing and lasting machine having, in combination, stitch forming devices, shoe supporting and feeding means including an upper engaging guide roll and a work support between which and the peripheral surface of the guide roll the lasting margin of a shoe upper is gripped, a

pivoted support on which the upper engaging roll is mounted, a welt guide arranged in alinement with the point of operation of the stitch forming devices, and a rib on the welt guide entering a channel in the welt carried by the guide to open the channel for the reception of stitches.

12. A machine for operating upon shoes having, in combination, stitch forming devices, shoe supporting and feeding means including upper tensioning members, and abrading means acting to roughen at least one of the parts of the shoe being operated upon by the stitch forming devices.

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