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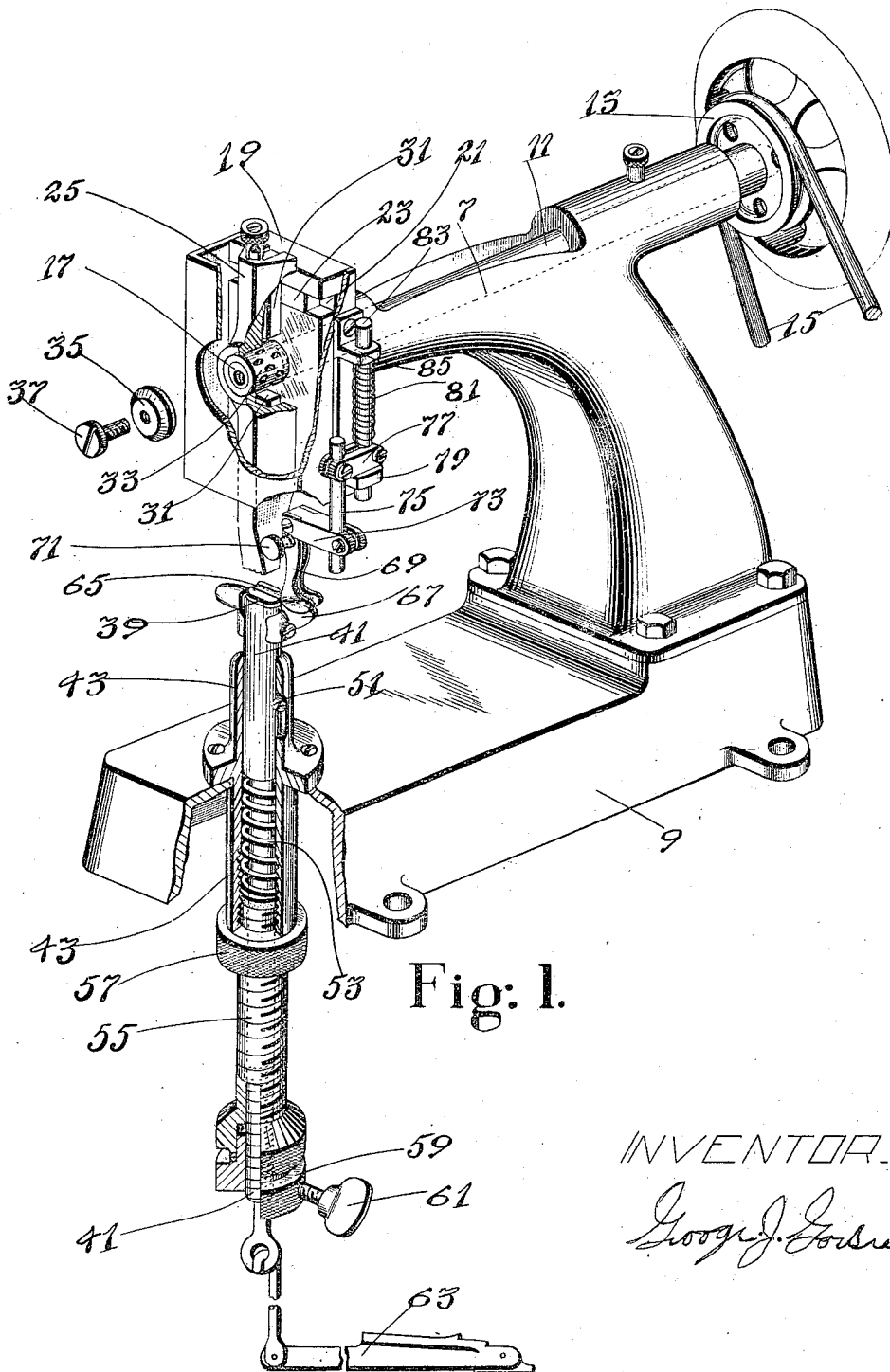
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G. J. GORSUCH

SEAM FINISHING MACHINE

Filed July 10, 1919

2 Sheets-Sheet 1



INVENTOR.

George J. Gorsuch

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2 Sheets-Sheet 2

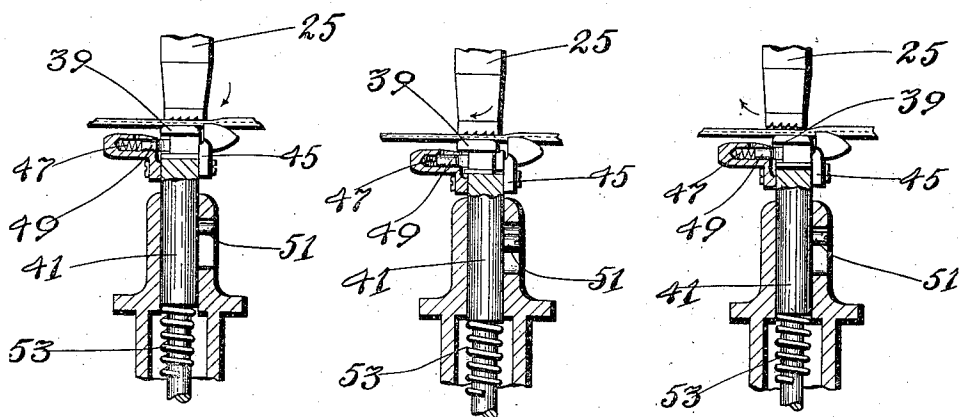


Fig: 2.

Fig: 3.

Fig: 4.

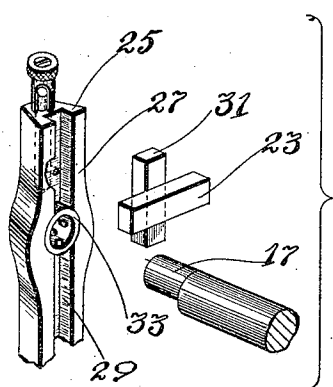


Fig: 5.

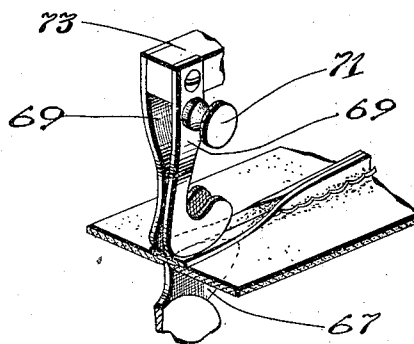


Fig: 6.

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UNITED STATES PATENT OFFICE.

GEORGE J. GORSUCH, OF ROCHESTER, NEW YORK, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SEAM-FINISHING MACHINE.

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To all whom it may concern:

Be it known that I, GEORGE J. GORSUCH, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain Improvements in Seam-Finishing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to seam finishing machines and is herein illustrated as embodied in a machine designed to finish, by pounding and rubbing, the seams formed in the uppers of boots and shoes.

In the manufacture of boots and shoes it is customary to flatten the seams which, if not thus treated, would leave objectionable ridges on the inside of the finished articles. To some extent with cloth seams, but more particularly with those of leather, it is desirable that they should be pounded as well as rubbed, since the free edges of such seams are quite stiff and difficult to lay flat. Pounding a seam, however, has hitherto resulted in more or less broken stitches, and consequently machines which pound have come into disfavor with manufacturers even though, as has been stated, the pounding effects admirable results so far as the laying flat of the free edges of the seam is concerned. Hitherto the pounding has been done either on a stationary member having a flat surface or upon a movable member, such as a wheel, having a curved surface. When a stationary, flat work-support is used, the full force of the blow of the hammer is received by the seam. When a movable wheel is used as a work support, the effective force of the blow of the hammer is somewhat diminished; but, owing to the curvature of the wheel, all of this effective force tends to be concentrated on a small area of the seam. Thus in both cases a strong tendency to break stitches is present.

According to one feature of the present invention the work support is movable and the construction is such that the support moves with the hammer during part of the movement of that member and is then returned to its initial position. In the illustrative machine the work support is slidable back and forth in the line of feed, a spring tending at all times to move it to and

hold it in its rearward position. The hammer is moved in a closed path such that the work is both pounded and fed, the path being such that when the pressure of the hammer upon the work is greatest, that is at and near the apex of the force of the blow of the hammer, the work support yields in a forward direction and moves forward with the hammer. The effective force of the blow of the hammer is thus diminished slightly and the tendency to break the stitches counteracted.

The organization is also such that the seam is rubbed by the work support. In the illustrative machine the operative face of the hammer moves in a circular path, first engaging the work rather lightly, then with increasing pressure until the maximum is reached and then with decreasing pressure until the work is gradually released. Consequently first the work is moved a short distance over the work support, the seam being thereby rubbed, then the hammer, work and work support move in unison a short distance to feed the work, and finally the work support is moved back to initial position thereby imparting a second rub to the seam. Consequently at every complete cycle of movement of the hammer the seam is both pounded and rubbed.

This and other features of the invention, including certain details of construction and combinations of parts, will be described as embodied in an illustrative machine and pointed out in the appended claims.

Referring now to the accompanying drawings,—

Fig. 1 is a perspective of a machine in which the present invention is embodied;

Figs. 2, 3 and 4 are details, principally in section, showing the progress of the work through the machine;

Fig. 5 is a fragmentary perspective of part of the mechanism for operating the combined hammer and feed member, and

Fig. 6 is a perspective showing the seam guiding and opening means.

Mounted in horizontal bearings in an overhanging arm 7, which is bolted to the frame 9 of the machine, is a shaft 11 which may be continually rotated by means of a pulley 13 and belt 15, the shaft having at its outer end an eccentric pin 17 which projects out beyond a plate or head 19 at the end of the arm. This plate has formed in it two

horizontal grooves rectangular in cross-section, one of which is shown at 21 and in these grooves lie the horizontal arms 23 of two crosses. The combined hammer and feed member 25 has both a flat inner face 27 which bears against the flat outer face of the plate 19 and a vertical groove 29 to receive the vertical arms 31 of the crosses. Carried by the hammer is a perforated bushing 33 into which the eccentric pin 17 extends, the hammer being held in place by a washer 35 and a screw 37 which is threaded into the end of the pin 17. With this construction the hammer will be moved in a circular path but will at all times be maintained upright so that its operative flat lower face will always be parallel to the flat upper face of the work support 39. As will presently be explained, the lower face of the hammer has teeth formed upon it and the work support has a groove cut in it; but the operative faces of both members are substantially flat and co-operate to hold the work flat.

Turning now to the work support 39, this member is slidable in the line of feed in a guideway formed at the upper end of a work support holder in the form of a rod 41 which is itself vertically slidable in a bearing in a boss 43 fastened to the frame of the machine. The work support or anvil 39 is limited in its rearward movement by a stop 45 carried at the upper end of the rod 41 and is at all times urged rearwardly with respect to the direction of feed (to the right as viewed in the figures) by a spring 47 which acts upon a plunger 49, the plunger in turn acting upon the anvil or support. The work support is thus acted upon at all times by a force which tends to move it toward and hold it in its initial rearward position.

The rod is held from angular movement by a screw 51, which is threaded into the rod and extends through a vertical slot in the boss 41, and is constantly urged upwardly by a spring 53 which is coiled around a reduced portion of the rod and rests upon the upper edge of an externally threaded sleeve 55. This sleeve is threaded into the lower end of the boss 43 and has the rod 41 passing freely through it. A lock-nut 57 holds the sleeve in adjusted position after it has been turned to secure the proper tension on the spring 53. The lower end of the rod 41 is threaded to receive an adjusting nut 59 provided with a lock-screw 61. By turning the nut 59 the work support may be raised and lowered to take care of work of different thicknesses. In order to provide means for lowering the work support preparatory to presenting a piece of work to the machine, a treadle 63 is attached to the lower end of the rod 41 as shown.

By referring to Fig. 1, it will be seen that the work support is provided with a longi-

tudinal groove 65 the purpose of which is to provide space to receive the seam when the hammer descends upon it or at least to receive part of the seam so that there shall be less of a tendency than might otherwise exist to break a stitch. And by referring to Figs. 2, 3 and 4 it will be seen that the hammer has formed upon its lower face a series of short blunt teeth the purpose of which is to aid in feeding the work. It should be noted, however, as stated above that the co-operating faces of the hammer and work support are substantially flat and that, except as the seam is crowded into the groove 65, the work is maintained flat, the result of this being to spread the effect of the blows of the hammer over a considerable area of the work instead of concentrating it upon a small area as occurs when a curved work support is used.

In order to open the seam and to guide it to the groove 65, a seam opening and guiding device, shown best in Fig. 6, is provided. This comprises a blade 67 in line with the groove 65 and adapted to run in the crease in the display side of the seam and two pressers 69 adapted, when the free ends of the seam are of sufficient extent, to bend them over and press them down as shown in Fig. 6. These pressers are of spring material and may be adjusted toward and from each other by turning a thumb screw 71 which passes through one presser and is threaded into the other. They are fastened at their upper ends to a block 73 having a split, pinch-bearing at its opposite end. A rod 75, the lower end of which is clamped in this pinch-bearing, is fastened at its upper end to one end of a second block 77 by a similar bearing. This second block is normally held down against an ear 79 by a spring 81 and is adjustably fastened to a rod 83, which is slidably mounted in aligned bores formed respectively in the ear 79 and in a second ear 85. With this construction the pressers 69 may be adjusted toward and from each other, and may be adjusted together up and down as well as angularly about the axes of the rods 75 and 83 to line up the pressers with the blade 67 and to adjust them longitudinally of the blade.

Referring again to the groove 65, one function of this groove has been explained as being to receive the seam, or part of the seam, and thereby to lessen the tendency of the hammer to break a stitch. In addition to this function, the effect of forcing the seam more or less into the groove is to facilitate the turning of the seam inside out. The two pieces of upper or lining material are commonly sewed together wrong side out, and after the seam has been rubbed they are turned right side out. The seam is often a curved one, such as the back seam; and, when the joined pieces are turned right

side out, the direction of curvature of the seam is reversed. It is this reversal which is facilitated by crowding the display side of the seam into the groove.

5 The operation of the machine is as follows: The treadle is depressed to facilitate proper presentation of the seam to the guiding and seam opening means and the work is pushed far enough forward to be caught by the hammer, after which the treadle is released. However, it may not be necessary to manipulate the treadle at all but merely to present the work in proper position. Referring now to Figs. 2, 3 and 4, the hammer comes down upon the work in a curved path as shown in Fig. 2. As it descends and moves forward, it first compresses the spring 53 to some extent and at the same time drags the work over the face of the work support and thereby gives a rub to the seam. This action continues until the hammer has descended a little further whereupon the work support 39 and the work carried forward in unison, the forward movement of the support being resisted by the spring 47 until the parts reach the position shown in Fig. 3. Thereafter the hammer rises to release the work but this release is gradual; and before it is accomplished, the spring 47 forces the support back into its initial position, as shown in Fig. 4, thereby imparting a second rub to the seam. The effect of the spring-pressed sliding work support is thus twofold. By moving in a forward direction with the work at the time the member 25 is at its maximum effectiveness as a hammer, the harshness of the blow is somewhat broken; and by first lagging behind the forward movement of the member 25 when it is first feeding the work and by being moved backwardly during the last part of the feeding movement it rubs the seam on the display side. The glancing blow struck by the hammer is in practice a short, quick one, the extent of each intermittent feed in the machine as now built being about one-eighth of an inch, and the proportions of parts being such that it requires four feed movements to move any given point in the work across the anvil. Each point in the seam is thus pounded four and rubbed eight times.

Although an illustrative machine has been described in detail in which the seam is both pounded and rubbed in a certain manner, it should be understood that by constructing and adjusting the parts properly, the relative effectiveness of either the pounding or the rubbing action may be made greatly to predominate and that with various kinds of work such predominance one way or the other is desirable.

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

65 1. A seam finishing machine, having in

combination, a work support movable back and forth in the line of feed, a hammer, means for imparting to the operative portion of the hammer movement in a path to pound and feed the work, and means constructed and arranged to permit the work support to be moved forward with the hammer during part of its stroke and then to move the work support backward in contact with the work to its initial position. 70

2. A seam finishing machine, having in combination, a hammer, means for operating the hammer in a path to pound and feed the work, a work support movable back and forth, and yielding means tending at all times to move the support to and hold it in its rearmost position. 75

3. A seam finishing machine, having in combination, a flat support of substantial area over which the work is fed, and means for feeding the work across the support and for reciprocating the support to rub the seam. 80

4. A seam finishing machine having, in combination, a support over which the work is fed, and means for feeding the work over the support and for imparting back and forth movement to the support to rub the seam. 85

5. A seam finishing machine having, in combination, a support for the seam, a flattening member engaging a seam thereon, and mechanical connections relatively to move the member and support to feed the work relatively to the support and simultaneously to rub the seam. 90

6. A seam finishing machine having, in combination, a support for the seam, a flattening member engaging a seam thereon, and mechanical connections operative to move said member forward to feed the seam over said support, said connections operating through the work to move said support forward at a different speed from that of said member, thereby enabling the support to rub the seam as the seam is fed over the support. 95

7. A seam finishing machine, having in combination, a substantially flat support over which the work is fed, and means for feeding the work over the support and for imparting a reciprocating movement to the support to rub the seam. 100

8. A seam finishing machine, having in combination, a substantially flat support over which the work is fed, said support having a groove therein extending in the line of feed, and means for feeding the work over the support and for imparting reciprocating movement to the support to rub the seam. 105

9. A seam finishing machine, having in combination, a substantially flat support over which the work is fed, said support having a groove therein extending in the line of feed, and means for feeding the work 110

over the support and for imparting reciprocating movement to the support in the line of extent of the groove to rub the seam.

10. A seam finishing machine, having in combination, a support for the work, means for feeding the work over the support, and means co-operating with the feeding means for moving the support in such manner as to cause it to rub the seam.

11. A seam finishing machine, having in combination, a support for the work, means for feeding the work over the support, and means co-operating with the feeding means for moving the support back and forth to cause it to rub the seam.

12. A seam finishing machine having, in combination, a movable support for the work, and a member for feeding the work relatively to said support and for co-operating with said support simultaneously to rub and press a seam to flatten it.

13. A seam finishing machine, having in combination, a support for the work, means for dragging the work over the support to rub it, and means including the dragging means for moving the support to a position where it is effective to rub the seam again.

14. A seam finishing machine, having in combination, a work support movable with respect to the work to rub the seam, and means for imparting such movement intermittently to the support.

15. A seam finishing machine, having in combination, a work support, means for feeding the work over the support, and means for moving the support in a direction opposite to that of the feed movement to rub the seam.

16. A seam finishing machine, having in combination, a flat support to receive the display side of the work, means for feeding the work over the flat support and means for imparting movement to the support to rub the display side of the work.

17. A seam finishing machine, having in combination, a support to receive the display side of the work, and means for feeding the work over the support and for imparting a back and forth movement to the support in the line of feed to cause the support to rub the display side of the work.

18. A seam pressing machine, having in combination, a work support, means operating intermittently through the work to move the support in one direction, and other means for moving the support back to its normal position to rub the seam.

19. A seam finishing machine, having in combination, a work support movable back and forth in the line of feed, a spring tending at all times to move the support to and hold it in its rearward position, and means for intermittently dragging the work across the support and moving it and the support forward.

20. A seam finishing machine, having in combination, a work support movable back and forth in the line of feed, a spring tending at all times to move the support to and hold it in its rearward position, and means for intermittently moving the support forward and then releasing it to permit the spring to return it to its rearward position.

21. A seam finishing machine, having in combination, a work support movable back and forth in the line of feed of the work, yielding means tending at all times to move the support to the limit of its backward movement, and means for striking the work as it lies upon the support a series of glancing blows each of which first rubs the seam over the support, then moves the support and the work in unison and then permits the yielding means to move the work support back to normal position thereby imparting a second rub to the seam.

22. A seam finishing machine, having in combination, a support to receive the display side of the work and movable back and forth, a spring normally holding the support at one limit of its movement, and means for pressing the work against the support, moving it forward against the force of the spring and then releasing it whereby the work support is moved first in one direction and then in the other.

23. A seam finishing machine having, in combination, a work support movable back and forth in the line of feed of the work, a spring tending at all times to resist movement in the direction of feed of the work, means acting through the work for intermittently moving the support against the force of the spring and for releasing the work to permit the spring to move the support in the opposite direction, and thereby cause the support to rub the seam.

24. A seam finishing machine, having in combination, a work support, a yielding member upon which the support is slidable, a spring acting upon the support to move the support in a direction opposite to the direction of feed of the work, a stop for limiting the sliding movement of the support, a feed member and means for causing the feed member to move the slidable support in opposition to the spring and then to release the support to permit the spring to move the support in the opposite direction to rub the seam.

25. A seam pressing machine, having in combination, a work supporting member movable back and forth in the line of feed of the work, a spring tending at all times to resist movement in the direction of the feed, a feed member, means for moving the feed member in a closed path such that the work is engaged, moved forward and released, and means for urging the one of said members toward the other constructed

and arranged to cause the grip of the work by the feed member and the work supporting member to be such that first the seam is rubbed over the support, then the seam and support are moved in unison and finally the support is moved in a direction counter to the feed movement to rub the seam a second time.

26. A seam finishing machine, having in combination, a combined hammer and feed member, a work support movable in one direction with respect to the work to rub the seam, and means including the combined member for moving the support in another direction.

27. A seam finishing machine, having in combination, a support for the work movable back and forth in the line of feed, a combined hammer and feed member for hammering the seam and for feeding the work, and means co-operating with the combined member for causing the support to move back and forth to rub the seam on the side opposite that engaged by the hammer.

28. A seam finishing machine, having in combination, a support for the work movable back and forth in the line of feed, said support having a groove therein to receive the seam, a combined hammer and feed member for hammering the seam as it lies above the groove and for feeding the work, and means co-operating with the combined member for causing the support to move back and forth to rub the seam on the side opposite that engaged by the hammer.

29. A seam finishing machine, having in combination, a combined hammer and feed member, a work support, an adjustable spring-sustained member upon which the support is movably mounted, and means bodily to move the combined hammer and feed member in an elliptical path and for imparting movement to the support in a direction to cause it to co-operate with the said member in flattening the seam.

30. A seam finishing machine, having in combination, seam guiding means, a hammer, means for operating the hammer to pound the seam and feed the work, a movable work support to which the seam is guided and over which it is rubbed, and yielding means tending at all times to cause the support to resist forward movement.

31. A seam finishing machine, having in combination, a guiding device over which the seam is fed, a flat support by which the guided seam is rubbed, and means for imparting movement to the support to rub the seam.

32. A seam finishing machine, having in combination, a seam guiding device, a support over which the guided seam is fed, and means for imparting back and forth movement to the support to rub the seam.

33. A seam finishing machine, having in

combination, a seam guiding device, a support over which the guided seam is fed, and means including a member engaging the work for imparting movement to the support to rub the seam.

34. A seam finishing machine, having in combination, a seam guiding device, a support over which the guided seam is fed, and means including a member engaging the work for imparting back and forth movement to the support to rub the seam.

35. A seam finishing machine, having in combination, a seam guiding device, feeding means, a support over which the guided seam is fed, and means co-operating with the feeding means for moving the support in such manner as to cause it to rub the seam.

36. A seam finishing machine, having in combination, a seam guiding device, a feed member, a support over which the guided seam is fed, and means for moving the feed member bodily in a closed orbit and for moving the support in such manner as to cause it to co-operate with the feed member to flatten the seam.

37. A seam finishing machine, having in combination, a seam guiding device, a support over which the guided seam is fed, and a feed member bodily movable in an elliptical orbit to press the seam against the support and to feed it across the support.

38. A seam finishing machine, having in combination, a seam guiding device, a support over which the guided seam is dragged to rub it, and means including the dragging means for moving the support to a position where it is effective to rub the seam again.

39. A seam finishing machine, having in combination, a flat work support, a feed member having a work-engaging surface parallel to the support, means for moving the feed member in a circular path, and means for holding said member from angular movement to preserve the parallelism of the support and the work-engaging surface of the feed member.

40. A seam finishing machine, having in combination, a work support, a feed member, means for moving the feed member in a curved path, and means for holding said member from angular movement, said means including a cross one arm of which runs in a groove in the frame of the machine and the other arm of which runs in a groove in the member.

41. A seam finishing machine, having in combination, a work support, a feed member, means for operating the member in a curved path, and means including two crosses located on opposite sides of the operating means and engaging grooves in the member and in the frame of the machine for preventing angular movement of the feed member.

42. A seam finishing machine, having in combination, a work support and means for hammering the work and moving it over the support, said means including a member
5 having a longitudinal groove therein there being in the frame a second groove at an angle to the first, connecting means between the member and frame comprising a cross, one arm of which lies in the longitudinal
10 groove in the member and the other arm of which lies in the groove in the frame, and means for causing the member to move in a circular path.

43. A seam finishing machine, having in
15 combination, a work support having a substantially flat face, a combined hammer and feed member having a substantially flat face which is substantially parallel to that of the work support and means for moving the
20 member in a closed path, said means being constructed and arranged to preserve the parallelism of the faces.

44. A seam finishing machine, having in
25 combination, a substantially flat work support movable back and forth to rub the seam, a member for feeding the work over the support, and means for moving the member in a curved path.

45. A seam finishing machine, having in
30 combination, a substantially flat work support movable back and forth to rub the seam, a member for feeding the work over the support, means for moving the member in a curved path, and means for holding
35 the member from angular movement.

46. A seam finishing machine, having in
combination, a substantially flat work support having a groove therein extending in
40 the line of feed, means for guiding the seam over the groove and means for feeding the work.

47. A seam finishing machine, having in
combination, a substantially flat work support having a groove therein extending in
45 the line of feed, means for guiding the seam over the groove, a member for feeding the work, and means for moving the member bodily in a closed path.

48. A seam finishing machine, having in

combination, a work support movable in
50 the line of feed, a hammer, means for operating the hammer to cause the work support to move with it during part of its movement, and means for returning the work support to initial position.

49. A seam finishing machine, having in
combination, a support for the work, means
55 for feeding the work over and hammering it upon the support, and means for moving the support to cause it to rub the seam.

50. A seam finishing machine, having in
combination, a work support provided with
60 a groove extending in the direction of feed, and means for feeding the work over the support and for crowding the display side of the seam into the groove.

51. A seam finishing machine, having in
combination, a work support, means for
70 feeding and pounding the work, a carrier on which the work support is mounted, a spring for sustaining the carrier, and means for adjusting the tension of the spring and for adjusting the carrier toward and from the pounding means.

52. A seam finishing machine, having in
75 combination, a work support, means for feeding and pounding the work, a carrier in the form of a rod on which the support is mounted, a hollow sleeve through which the rod extends, said sleeve being exteriorly
80 threaded into the frame of the machine, a coiled spring located between one end of the sleeve and a shoulder on the rod, and an adjusting nut threaded on the lower end of the rod and held against the lower end
85 of the sleeve by the spring.

53. A seam finishing machine having, in
combination, a movable support for a seam,
90 a hammer member to press a seam there-against, means to operate the hammer member, and auxiliary means to move the support, said means and auxiliary means co-operating to move the hammer member and the support to rub and press the seam and
95 to feed it through the machine.

In testimony whereof I have signed my name to this specification.

GEORGE J. GORSUCH.