

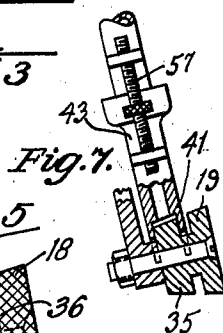
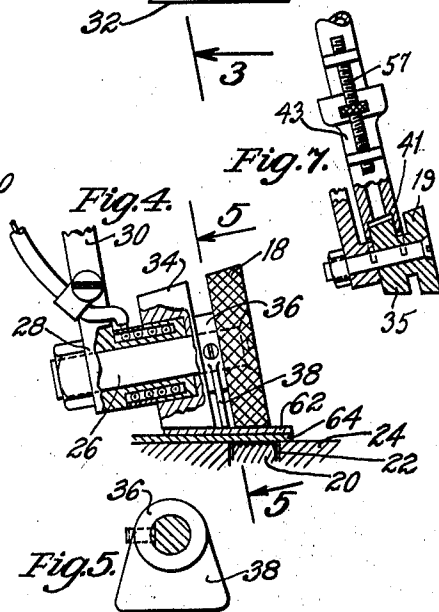
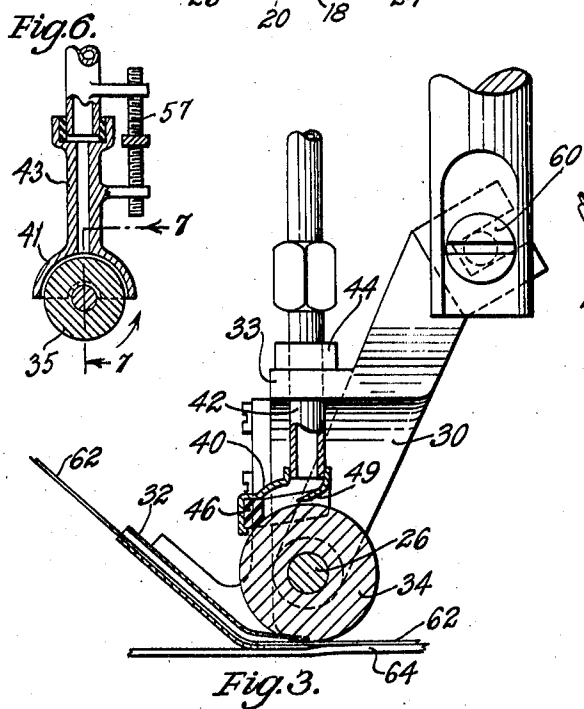
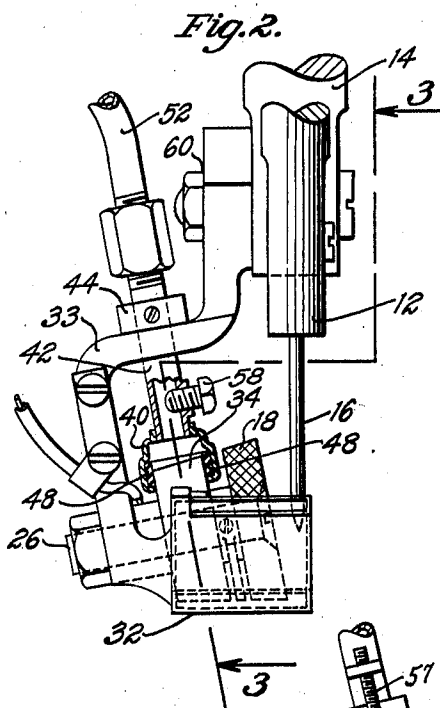
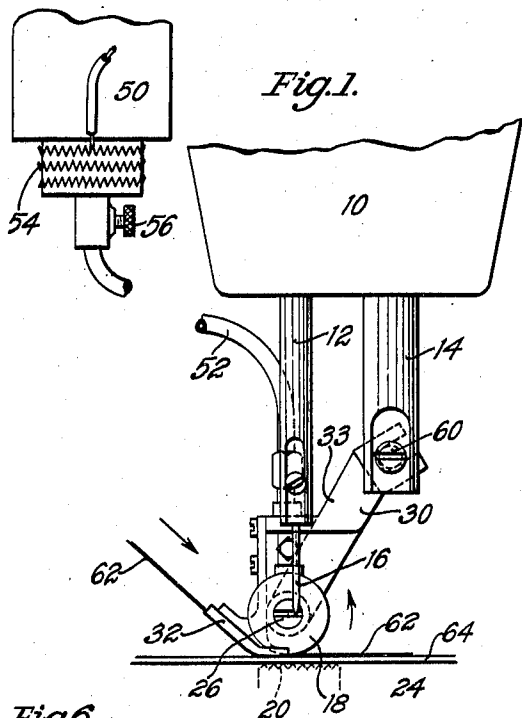
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ADHESIVE APPLYING ATTACHMENT FOR SEWING MACHINES

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ADHESIVE-APPLYING ATTACHMENT FOR
SEWING MACHINES

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Application March 1, 1938, Serial No. 193,307

6 Claims. (Cl. 112—2)

This invention relates to improvements in adhesive-applying attachments for sewing machines.

More particularly it relates to mechanism for applying cement or other adhesive along a strip simultaneously with the stitching of the strip, close beside the line of its stitching. A particular example is an applying of cement to a tape which is to be turned over an edge of shoe upper material and stuck to the adjoining back surface to bind and finish that edge, with what is known as "French cord".

The invention is herein illustrated and described in connection with such a binding. The tape is laid and stitched along the edge which is to be bound, with the face of the tape against the face of the upper material, and with the stitching close to the edges of both. The body of the tape is then to be turned over the edge of the upper, and the greater part of its body portion is to be made to adhere to the back surface of the upper. By this procedure all but the stitched edge part of the tape is faced outward, housing the raw edge of the upper, and covering the stitches by which the tape and upper are secured together.

Apparatus is already known to guide tape to the edge of upper material for the stitching to press both tape and upper against the usual step by step feed dog in the bed, to hold and to feed the work as the stitching progresses.

The tape-turning and tape-sticking operation is subsequent to the said stitching. It is of commercial and industrial importance that the tape shall be given its sticking capabilities economically, and that the tape shall be prepared for the sticking without introducing possibilities of waste or of ineffective adhesion.

Hitherto the tape has customarily been prepared beforehand with dried adhesive, or there has had to be some purchasing of adhesive tape to be combined with the binding tape, in order to accomplish the desired ultimate adhesion of the binding tape to the upper. These procedures introduce steps and costs, or wastage and losses, which the present invention makes unnecessary.

Also the invention eliminates costs for time and material, hitherto arising from ineffectiveness of cement or other adhesive, as, for example, when preliminarily prepared tape, having been once stuck, has later had to be stripped for a correction of the stitching. Tape thus stripped has no power to hold if re-applied.

In my co-pending application Serial No. 145,063, filed May 27, 1937, I have disclosed and

claimed the method of applying cement to binding tape simultaneously with the stitching of the tape to the upper; and this present invention is of improved mechanism for accomplishing that.

By applying the cement simultaneously with the stitching of the tape to an upper or the like, I make sure of attaining the aim that only that amount of tape which will be actually and promptly used for edge binding shall undergo the step of receiving cement or other adhesive,—a step which in present practice works out, in the end, as involving a wastage of a substantial percentage of the tape, or a tying up of capital in it while awaiting the coming of a season when the excess prepared can be used.

One feature resides in applying the cement to the tape beside the needle which is effecting the stitching, but without any gumming of the needle.

Another object is to apply the cement, by a roller, in a uniformly thin coating over a broad area along an edge of the tape, sufficient to accomplish a secure adhesion of tape on the back surface of the upper when the tape is turned over the edge of upper and pressed against said surface.

Still another feature resides in the arrangement of means for de-chilling the applicator, thereby to assure and maintain a workable consistency of the cement.

It is, moreover, an important feature that the applicator may be effectively combined with a presser wheel for the stitching, carried on the presser bar of a standard type of sewing machine.

The invention attains the mentioned objects and results by combining appliances with a tape guide and a presser wheel or roller which may be the same as is now customary in sewing machines for stitching tape along the edge of shoe upper material, except that the wheel preferably has a narrower face than that at present customary. According to the invention a roller may be mounted on a shaft or stud whose end portion will support the presser wheel close to the plane in which the needle reciprocates. This second roller may be integral with the presser wheel, or may be a separate element as illustrated. In either case a slight space intervenes between its periphery and the periphery of the presser wheel, with the roller located further from the needle, and constituting a cement-applying roller,—which may be supplied with its cement in any suitable manner. As represented, the cement is supplied through a tube to the periphery of the applicator roller, and this roller turns freely on its shaft for depositing that cement on the upper

surface of the tape as the latter is guided into superimposed relation to the shoe upper material, for the stitching. The applicator, of suitably designed width, transfers a thin coating of the cement to an area on the upper surface of the tape. This area extends from a location near but slightly removed from the line of stitches to that edge of the tape which is remote from the stitching.

A reservoir is provided for a supply of adhesive, to be held at any convenient location above the applying roller, for gravity feed into a hood which is arranged over a portion of the periphery of the roller. The adhesive, being thus deposited, is carried around by the roller and applied in a thin coating on the upper surface of the tape. There may be a heating unit at the supply, to maintain a free flowing consistency for the cement; and, if desired, a second heating unit may be associated with the applicator roller to serve as a dechiller and to maintain a desired degree of fluidity of the cement at the instant of its application to the tape.

The tape guide, presser wheel, applicator roller and the hood of that roller all may be mounted on the presser bar, removably, as an attachment for a standard type of sewing machine.

Also I may provide, as an additional element of the attachment, a shield standing down between the presser wheel and the roller, in contact with the work, for preventing passage of adhesive across the space between the roller and the presser wheel.

It is intended that the patent shall cover, by suitable expression in the appended claims, whatever features of patentable novelty exist in the invention disclosed.

In the accompanying drawing:

Figure 1 is an elevation of a fragment of a sewing machine head, embodying features of the invention, looking from the drive end of the machine toward the head;

Figure 2 is a front elevation of the lower portion of Figure 1, looking from the left in Figure 1, and on an enlarged scale;

Figure 3 is an elevation, in section on 3—3 of Figure 2;

Figure 4 is a detail elevation, partly in section, of the presser wheel and applicator unit;

Figure 5 is an elevation in section on 5—5 of Figure 4;

Figure 6 is an elevation, in medial vertical section, through a modified form of applicator roller and supply means therefor; and

Figure 7 is an elevation in section on 7—7 of Figure 6.

In the drawing, the invention is portrayed as embodied in a standard type of Singer sewing machine, which has an usual head 10, needle bar 12 and presser bar 14. The needle bar and the presser bar are mounted side by side in the head, for vertical reciprocation in timed relation by usual mechanism (not shown) within the head. The needle 16 is carried at the lower end of the needle bar 12. The attachment embodying the invention, carried at the lower end of presser bar 14, includes a presser wheel 18 for coacting with the corrugated feed dog 20 which works in a slot 22 in the flat bed plate 24 of the machine.

The presser wheel 18 is rotatable on the outer end portion of a stud 26 which may have its base held as at 28 in a bracket 30. As represented, shaft 26 projects from bracket 30 at a

slight upward inclination from the horizontal plane of the bed plate 24, so that the wheel 18 is correspondingly canted slightly from turning in a vertical plane, but which wheel has a tapering peripheral surface which on the under side of the wheel comes into parallelism with the bed plate 24, for clamping the work between itself and the feed dog 20. This slight canting of the presser wheel permits the needle bar to operate its needle 16 into the work very close to the wheel 18, where and while the under side of that wheel is securely holding the work, all as is well known in tape feeding and stitching machines as heretofore available. Also the tape guide 32 may be mounted on bracket 30 as has been common practice.

According to the invention a cement-applying roller 34 is coordinated with the regular work feeding mechanism, being mounted on the presser wheel stud 26, at a location a little inward from the presser wheel, that is, nearer to the bracket. In one illustrative example, to which the invention is not limited, the binding tape may approximate only three-eighths of an inch in width, and available space over this tape, not covered by the presser wheel, is small. The invention utilizes a presser wheel 18, which in an ordinary case may be one sixteenth of an inch thick, more or less, in place of the thicker wheels heretofore used. By thus thinning wheel 18, the roller 34 can have a thickness approximating three sixteenths of an inch, more or less, and can be spaced approximately three thirty seconds of an inch, more or less, from wheel 18. In one embodiment, a collar 36, secured on shaft 26 to space the wheel and roller apart, may preferably have a depending guard plate 38 reaching down to a depth sufficient for its lower edge to engage the work when the roller is in contact with the work. This prevents spread of the cement into the region of the stitching. Whatever cement may spread from the roller toward the presser wheel will be obstructed by this guard plate, and fresh material continuing to spread from the roller will not build up an accumulation that will reach the wheel, because that which first arrives is continuously removed by the forward travel of the tape on which it must be deposited, and must spread, if at all, in order to reach the presser wheel.

The hood 40 needs to fit over only a portion of the circumference of roller 34. It is represented as extending from a location at the uppermost portion of the roller, down along the circumference, in the direction of rotation of the roller, and stopping short of the region of contact of the roller with the work. This hood conveniently may be mounted on the lower end of a stiff tube 42 which itself may extend loosely through the offset portion 33 of bracket 30. An adjustable collar 44 may be secured on the tube on the upper side of offset 33, for engaging the offset and thus determining the location of hood 40 below. Suitable packing 46 along the lower edge of the hood past which the circumference of roller 34 moves downward, and similar packing 48 along each side edge of the hood, prevent escape of cement, except what is carried past packing 46 on the circumference of the roller. This packing may be adjusted to permit a desired thin film to pass, but to prevent escape downward of more cement than is desirable for application to the tape. The end of the hood past which the circumference of the roller moves upward needs no packing, due to a

deflector 49 whose surface directs incoming cement downward in the direction of rotation of the roller.

The mounting of the hood on tube 42, permits of its being lifted clear of the roller for removal of the latter for cleaning.

The supply of cement or other adhesive may be in a suitable container 50 located at any convenient high place on head 10, or it may be supported independently of the machine. A supply tube 52, which may be at least in part flexible, connects the supply container with the tube 42 which carries the hood. Preferably an electrical heating unit 54 will be associated with the supply to maintain the adhesive at a proper consistency to flow freely by gravity. Also I indicate a heating unit associated with roller 34 to act as a de-chiller.

The supply may be controlled at the container 50 by a valve 56, and I prefer to have an additional control in tube 42, indicated at 58.

In Figures 1-5 bracket 30, which supports the presser wheel, applicator roller, its hood, and the latter's carrying tube 42, is removably secured at 60 to the lower end of presser bar 14, the whole constituting an attachment for a standard type of sewing machine. But the invention is applicable to sewing machines in general. For example, it may be embodied in a walking foot machine by removing the walking foot and substituting an adhesive applying roller.

In Figures 6 and 7, the presser wheel 19 and the applicator roller 35 are integral, and the hood 41 fits over the upper half of the roller, being mounted on carrying tube 43 which is adjustable, by the right and left screw 57, to raise and lower the hood relative to the roller. Interiorly the hood is shaped to fit the peripheral contour of the roller, so that lowering of the hood into contact with the roller cuts off the supply of adhesive from tube 43. And by raising the hood more or less the supply to the roller may be controlled.

In operation the tape 62 is guided by guide 32 to position overlying the upper material 64, with their edges in registering alignment. As the stitching progresses, the work is fed into the grip between the presser wheel and feed dog; and, as the work passes, the roller 34 or 35 applies a thin coating of cement to the top surface portion of the tape which is remote from the line of stitching. Guard plate 38 may intervene between presser wheel and this deposit, and prevents spreading of the cement into the region of stitching.

While the adhesive continues fresh, but after the shoe upper has left the sewing machine, the body of tape may be turned over the edge of the upper and be pressed against the back surface of the upper, thereby to adhere and to provide a "French cord" finish for that edge.

I claim as my invention:

1. An adhesive applicator for edge-binding tape, comprising a sewing machine having a work support and work feeding mechanism including a presser bar with presser wheel for coacting with a feed dog in the work support, combined with a simultaneously acting stitch forming mechanism on one side of the presser wheel and an adhesive-applying roller carried by said presser bar on the other side of the presser wheel, adapted to deposit adhesive on the work; and means for supplying adhesive to the periphery of said roller.

2. An adhesive applicator as in claim 1, further characterized in that the said presser wheel and adhesive-applying roller are independently mounted for rotation on a common stud axle.

3. An adhesive applicator as in claim 1, wherein said wheel and roller are each a frustum of a cone, mounted for independent rotation on a common axle which is inclined from the horizontal at an angle corresponding to the apex angle of said frustums; said adhesive applying roller being close beside but separated by a small space from the presser wheel on the side which is away from the needle.

4. An adhesive applicator as in claim 1, wherein said means for supplying adhesive to the periphery of said roller comprises a remote reservoir for main supply of liquid adhesive, and a tubular passage thence; a hood fitting over a portion of the periphery of said roller, with packing means coacting with surfaces of the roller to maintain adhesive within the hood against running out beside the hood; but the edge of hood past which the periphery of roller moves downward being at a little distance for maintaining a local supply within said hood, and to permit a film of adhesive to be carried downward on said periphery, for application to the work.

5. An adhesive applicator as in claim 1, wherein said means for supplying adhesive to the periphery of said roller comprises a retarding hood fitting over a portion of the periphery of said roller, for controlling flow of adhesive downward on said periphery, for application to the work; there being a remote main supply of adhesive, a passage thence to said hood, and heating means for maintaining a flow-consistency of the adhesive at the said roller.

6. An adhesive applicator for edge-binding tape, comprising a sewing machine having a work support and work feeding mechanism including presser means for coacting with a feed dog in the work support, combined with a simultaneously acting stitch forming mechanism on one side of said presser means and an adhesive-applying roller on the other side of the presser means, adapted to deposit adhesive on the work; and means for applying adhesive to the periphery of said roller.

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