Jan. 5, 1954 R. D. CUMMINS 2,664,839

TAPE TENSIONING ATTACHMENT FOR SEWING MACHINES

Filed Sept. 14, 1951 2 Sheets-Sheet 1

FIG. 1.

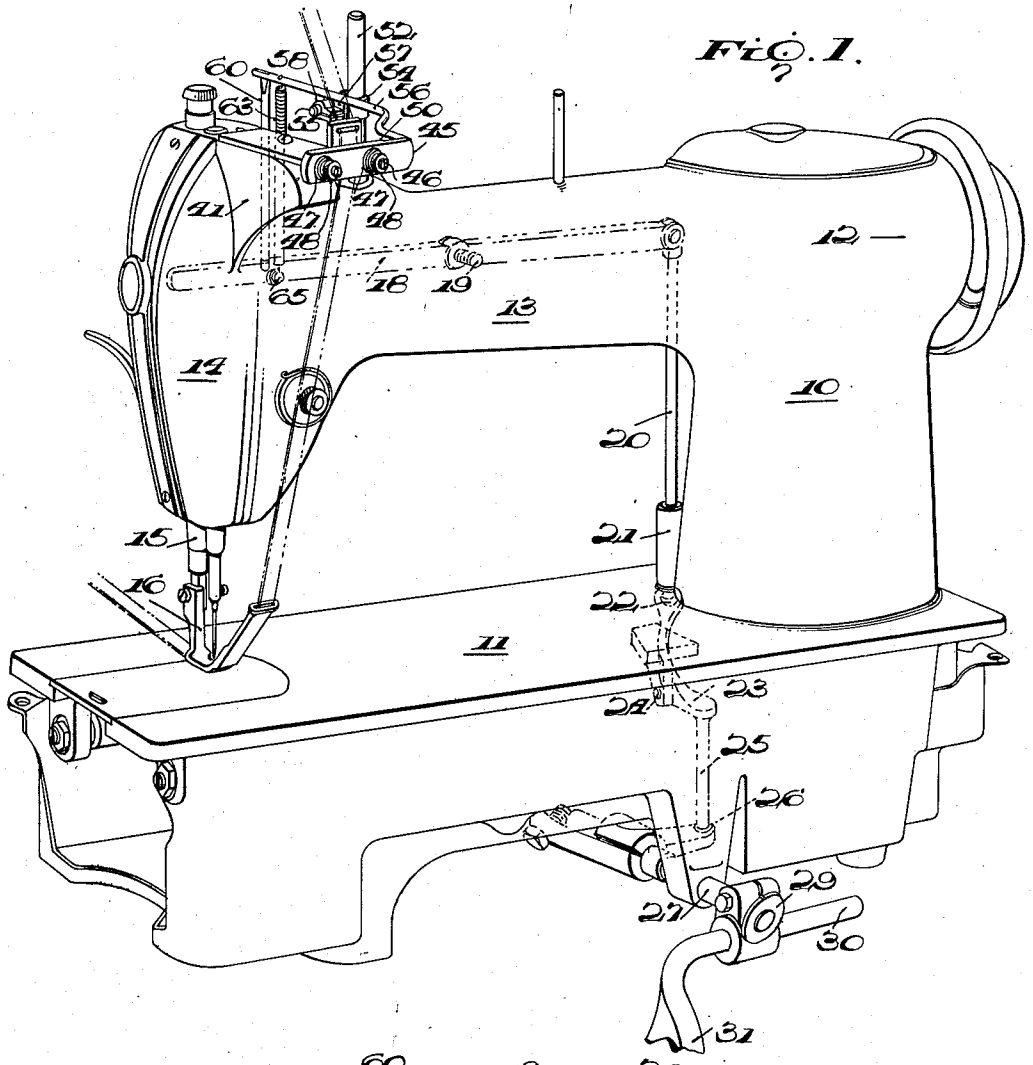
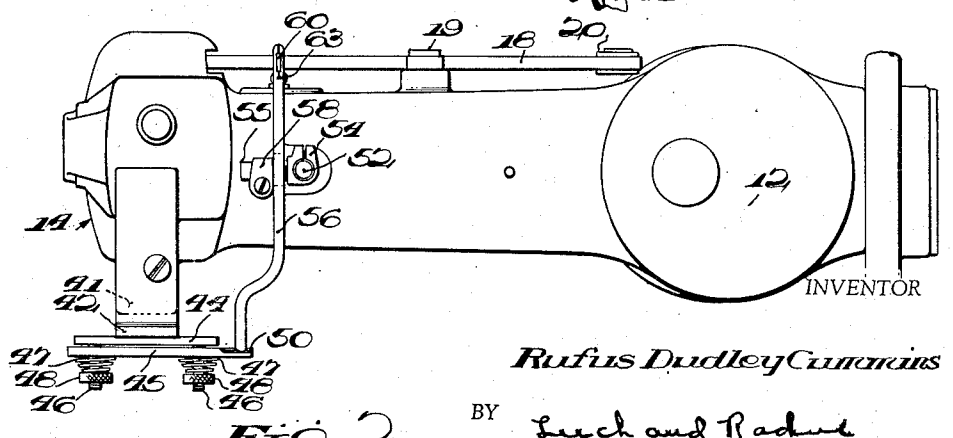


FIG. 2.



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FIG. 3.

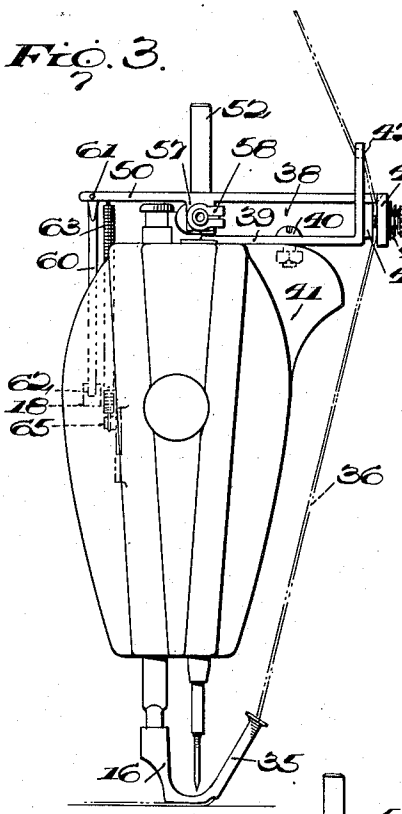


FIG. 4.

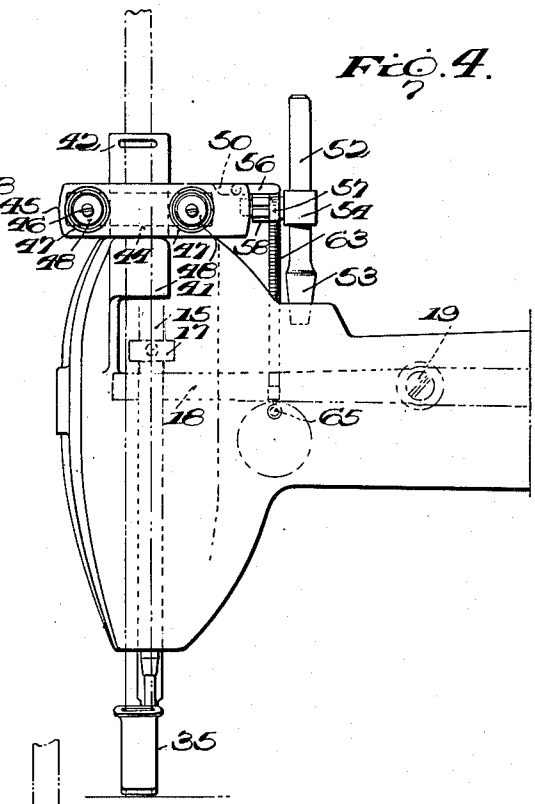
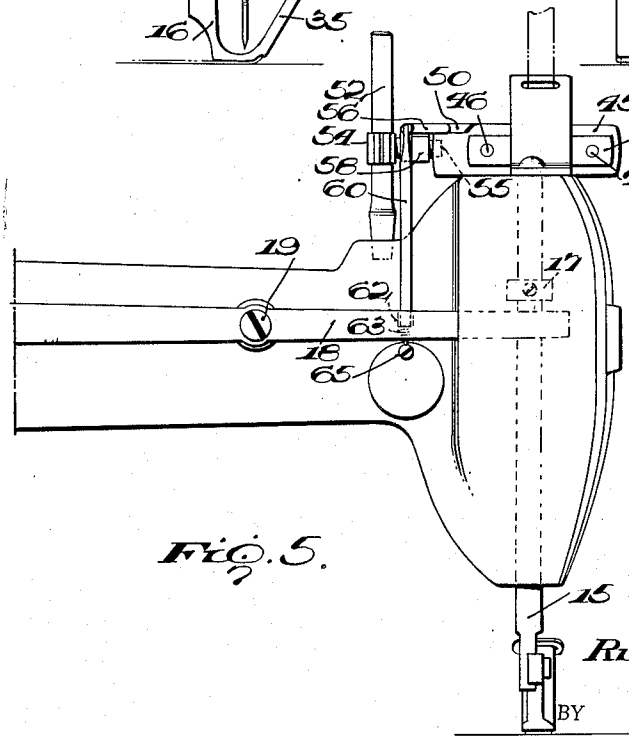


FIG. 5.



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TAPE TENSIONING ATTACHMENT FOR SEWING MACHINES

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4 Claims. (Cl. 112—152)

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This invention relates to improvements in tape applying and tensioning devices for sewing machines and more particularly to such devices for use and cooperation with conventional sewing machines, the tape tensioning regulator being associated with one of the machine controls for sequential operation with the machine part manipulated thereby.

It is a general object of the present invention to provide a novel and improved tape applying and tension regulating device for association with and control by portions of a standard sewing machine.

More particularly it is an object of the invention to provide a tape applying attachment for sewing machines including means for applying a regulated tension to the tape and means under control of the presser-foot elevating mechanism to release the tape tension without lifting the presser-foot.

An important feature of the invention resides in the construction of the attachment for quick application to and association with regular parts of the sewing machine.

Another important feature of the invention resides in the construction and mounting of the tensioning device and the arrangement for cooperating with the presser-foot lifting device whereby the tape tension may be released without raising the presser-foot.

Other and further features and objects of the invention will be more apparent to those skilled in the art of sewing machines upon consideration of the accompanying drawing and following specification wherein is disclosed a single exemplary embodiment of the invention, with the understanding that such modifications may be made therein as fall within the scope of the appended claims without departing from the spirit of the invention.

In said drawings:

Fig. 1 is a perspective view of a sewing machine equipped with a tape applying and tensioning attachment constructed in accordance with the present invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is an end elevation of the head end of the machine;

Fig. 4 is a front elevation thereof; and

Fig. 5 is a rear elevation thereof.

Many operations in the manufacture of garments and the like require the application of a strip of tape at the time of making a seam, or for binding edges of garments with tape. In certain constructions, as in the formation of arm

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holes and the like, this tape may have as a feature adding to the reinforcing action the purpose of providing a degree of gathering of the material of the garment. Where the application must be by hand stitching in order to achieve this additional result considerable time and labor must be expended. It is a purpose of the present invention to provide an attachment for a standard sewing machine which will not guide and apply the tape but permit an adjustment in the degree of tension thereon in such a manner that the quantity of gathering is always under the control of the operator. In addition the apparatus is provided with means whereby all tension may be released from the tape so that it follows along smoothly without causing any puckering of the garment material.

All of the above is effected by feeding the tensioned tape through a guide tube on the nose of a conventional presser-foot through which the needle of the sewing machine operates. The feed dog which advances the fabric beneath the presser-foot engages the fabric of a garment beneath the tape and the gathering is effected when the tape is given sufficient tension. When this tension is released, garment and tape move in unison and a smooth seam results.

As seen in Fig. 1 the attachment of the present invention is applied to a conventional form of industrial sewing machine 10 having a base 11, a standard 12, an arm 13 and a head 14.

The head 14 has slidably mounted therein a vertical rod 15 which is tensioned to urge the presser-foot 16 down into engagement with the fabric and the feed dog beneath it. When fabric is being inserted or removed from beneath the presser-foot it is desirable that the latter be elevated to facilitate the operation, and this is achieved in accordance with the illustrated construction of the machine by having a collar 17 with an attached arm adjustably secured to rod 15 as best seen in Figs. 4 and 5 and having this arm overhang the upper edge of lever 18, pivoted intermediate its ends at 19 and lying along the rear face of the machine arm 13. If the right end of lever 18 is lowered the left end rises, engages beneath arm 17 and lifts the presser-foot.

Lowering of the right end of arm 18 is effected by pull rod 20, passing through guide sleeve 21 in the base plate of the machine and connected at 22 to the rear end of lever 23 fulcrumed at 24 beneath the base and having its forward end engaging over the top of strut 25 whose lower end sets in socket 26 in a crank arm extending to the right from fore and aft shaft 27 journaled

in portions of the base structure of the machine. Attached to the front end of this shaft 27 is a fitting 29 adjustably carrying the end 30 of knee lever 31. The structure just described is such that when the knee lever is pressed to the right, the right end of horizontal lever 18 is drawn down and the outer end lifted. It is preferred to adjust the position of collar 17 and its arm on rod 15 so that there is approximately one-quarter of an inch clearance between it and the top edge of arm 18 whereby lost motion occurs on the first movement of the knee lever for a purpose which will later appear.

The presser-foot 16 of the sewing machine is augmented by a tape guide tube 35 secured to the upturned forward end thereof and of adequate width to receive the desired tape and guide it beneath the presser-foot and in line with the needle. The upward inclination of the tube is such as to receive the tape 36 smoothly from the tension mechanism 38 therefor.

This tension mechanism includes the right angled bracket 39, the horizontal portion of which is attached by bolt 40 to the overhanging protecting shield 41 covering the thread takeup guard on the sewing machine. The upwardly extending vertical portion of bracket 39 is provided near its upper end with a horizontal slot 42 through which the tape is fed from any suitable holding reel. Near its lower end there is secured transversely and over the front face of the vertical arm of the bracket a tension plate 44 by riveting or the like. The tape is adapted to pass downwardly over the forward face of this tension plate and when it is to be tensioned is engaged on its front side by the movable tension plate 45 somewhat greater in all dimensions than the stationary one, as clearly seen in the rear view in Fig. 5. This is slidably supported for movement toward and from the stationary plate on bolts 46 fixed in the stationary plate. Pressure is applied to tension the movable plate by means of helical springs 47 and thumb screws 48 on the bolts. Thus by adjusting the screws the desired tension may be placed on the tape as required for any particular work being done.

As viewed in Figs. 2, 4 and 5 the upper left corner of the movable tension plate 45 is chamfered or provided with a wedge-shaped surface 50 for cooperation with a tension releasing mechanism now to be described.

The tension releasing mechanism is mounted on the sewing machine by means of a standard or rod 52 having a tapered lower end 53 which, in the instance shown, is adapted to be received in an oil wick aperture in the upper surface of the junction between the head and arm of the sewing machine. Any other means, including bolts, clamps or screws may be used to support this standard in a substantially vertical position, as shown. A clamp 54 is vertically slidable on the standard for adjustment as necessary and supports an integral horizontal stud 55 which provides a fulcrum for the tension releasing lever 56. This lever is an appropriately bent rod having secured intermediate its ends the tab 57 horizontally drilled to slip easily over stud 55 and rock thereon. A split clamp 58 engaged over the end of the stud 55 prevents the tab from coming off and may be used as a lateral adjusting means.

As best seen in Fig. 2, the front end of lever 56 is preferably complementarily shaped to the inclined or wedge surface 50 on the movable tension plate 45 and normally positioned above it. Thus, lowering the lever end will cause it to engage the wedge surface of tension plate 45 lifting the latter from the stationary plate 44 and relieving the tension on the tape. Tension plates 44 and 45 fulcrum on each other at the opposite ends. Lever 56 is actuated by a push rod or strut 60 which has its narrowed upper end passing through a slot at the rear end of 56 and pivoted therein by pin 61. The lower end of strut 60 is received loosely in a hole 62 drilled in the upper face of the lever 18 which actuates the presser-foot lift. The end of the strut is maintained in the hole and the rear end of lever 56 biased toward tension position by means of helical spring 63 the upper end of which is attached to lever 56 near its junction with the strut 60. The lower end of the spring is attached in any convenient way to the arm of the sewing machine, such for instance as over the screw 65 which holds the inspection plate in position.

With the parts assembled as shown, adjustments of the fulcrum for the tension releasing lever 56 along the standard 52 are made so that everything is positioned as required for proper operation. Under these conditions the clearance shown in Fig. 5 between the end of lever 18 and the lift arm on presser-foot rod 15 should be about one-quarter of an inch so that movement of the knee lever 31 may be available for actuating the tension release mechanism as described above before there is any lift movement for the presser-foot. Under these conditions the operator is free to apply or relieve tension by movement of the knee lever without actuating the presser-foot, but when it is desired to lift the presser-foot he must first release the tension on plate 45, so that the goods beneath the presser-foot may be easily withdrawn along with an appropriate length of tape. The arrangements shown to fit the attachments to the specific machine illustrated are subject to considerable variation in order to adapt them to other types and styles of sewing machines, it being understood that the principal feature of the invention resides in the operation of the tape releasing mechanism by some control means on the sewing machine during the lost motion interval before it takes effect on the sewing machine parts for which it was constructed.

I claim:

1. The combination with a sewing machine having a head, a supporting arm and a control lever and linkage system for raising the presser-foot upon application of force by the operator, of a presser-foot having an upwardly and forwardly projecting tape guide tube thereon, a tape guiding and tensioning unit for attachment at the top of the machine head in lateral alignment with said presser-foot and including a biased plate for engaging and tensioning the tape, mechanism including a lever having an end movable to engage said biased plate and move it against the bias to release the tape tension of said unit, and a strut connecting said tension releasing lever and the control lever for actuation by said control lever and linkage to effect said tension release.

2. An attachment for a sewing machine having a head supporting a presser-foot lift rod, an arm supporting said head, a lever pivoted to said arm at the rear thereof and having one end arranged to cooperate with and elevate said lift rod, and means to position the lever to require lost motion before cooperation, said attachment comprising a bracket for mounting on said head,

a tension plate carried by said bracket, a cooperating tension plate having a projecting end, bolts slidably supporting the second plate from the first, springs and nuts on said bolts for adjusting the tension said plates exert on tape passing between them, a standard for mounting on said sewing machine near said bracket, a releasing lever pivoted on said standard and having one end adjacent said projecting end, a wedge surface on said projecting end of said plate for engagement by said end of said releasing lever, a strut pivoted to the releasing lever and extending to engage the lever pivoted to the machine arm and means biasing said strut into engagement with said last-mentioned lever.

3. The attachment defined in claim 2 in which said standard is mounted vertically in an existing oil hole in the machine arm, a clamp slidable on said standard having a horizontal shaft, means on said release lever having a sliding and rotary fit on said shaft and a stop on said shaft to limit sliding movement thereon.

4. A tape tensioning and releasing device for a sewing machine having a horizontal lever provided with a lost motion connection for lifting the presser-foot comprising in combination, a bracket having an arm adapted to be secured horizontally to the top of the head of the machine, a vertical arm thereon having a tape guiding slot at its upper end, a tape tensioning plate secured to said arm transversely thereof below said slot, a movable tension plate, means loosely supporting the second plate from the first, adjustable spring means urging said second plate toward the first to frictionally hold the tape therebetween, a lever extending substantially normal to said plates and fulcrumed from the machine, cooperating inclined areas on the end of the lever and said second plate to move the latter from the first plate when the lever is moved and means connecting said lever directly with the horizontal lever for lifting the presser-foot whereby the plate is released before the presser-foot is elevated.

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