April 12, 1960 B. S. NICKERSON 2,932,267

PANTOGRAPH ATTACHMENT FOR SEWING MACHINES

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Fig. 1.

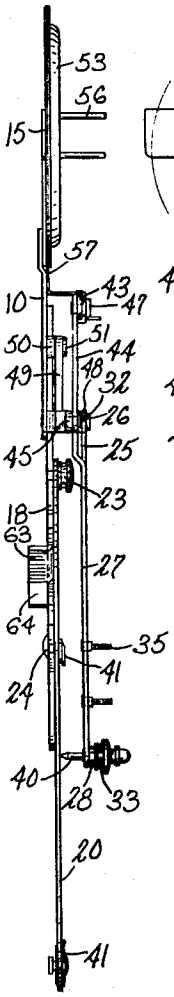


Fig. 2.

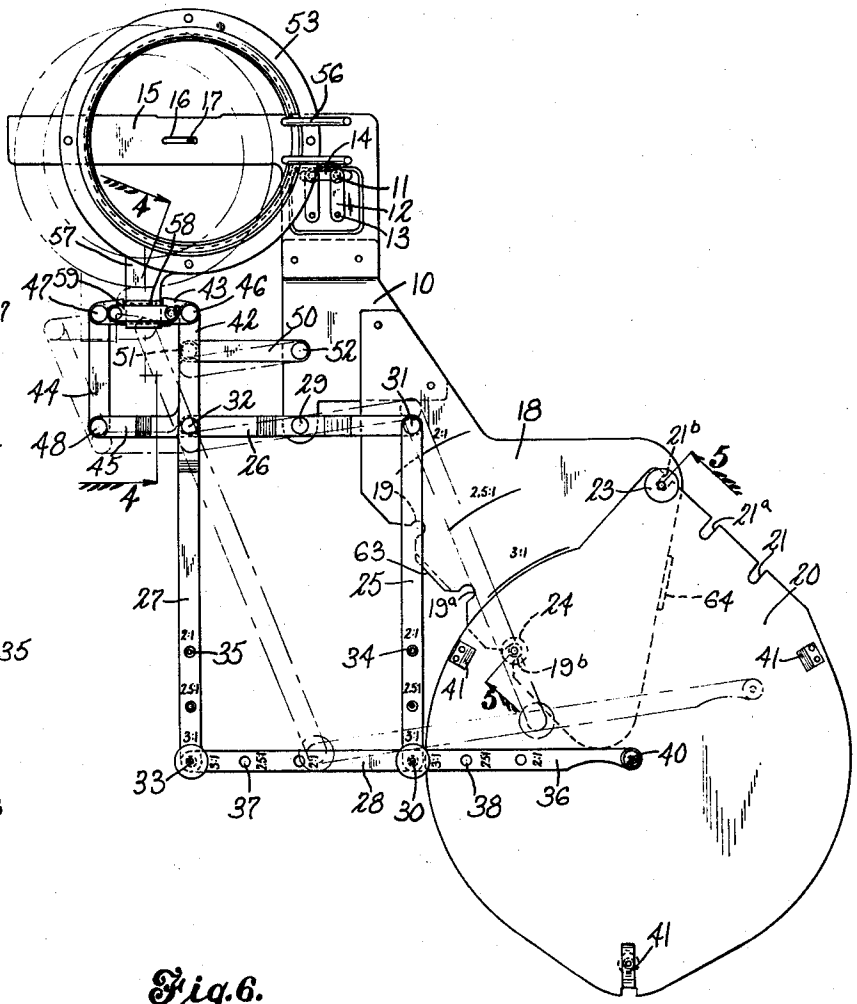
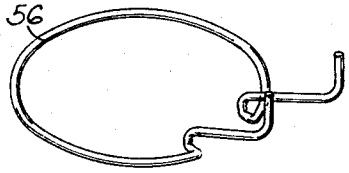


Fig. 6.



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Fig.3.

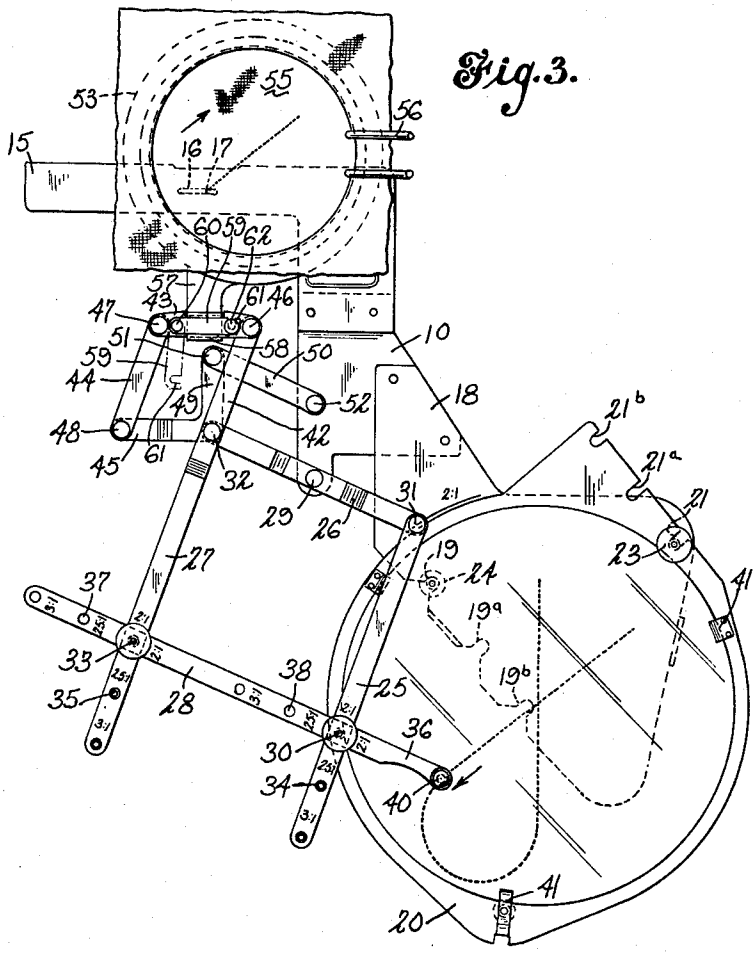


Fig.4.

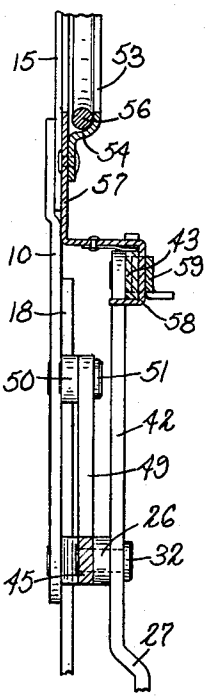
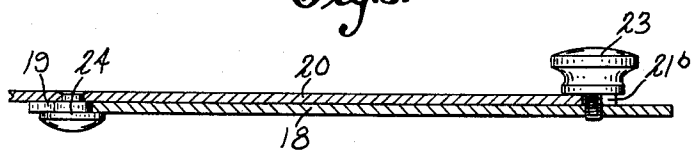


Fig.5.



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PANTOGRAPH ATTACHMENT FOR SEWING MACHINES

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6 Claims. (Cl. 112—102)

This invention relates to a pantograph attachment for sewing machines and more particularly to an attachment whereby any desired design appearing upon a template or plattern supported by the attachment may be sewn upon a piece of material.

In general the device of the application comprises a supporting plate adapted to be attached to the bed of a sewing machine upon which plate is supported the pattern or template to be copied. A pantograph pivotally connected to this plate is provided upon one leg thereof with a stylus adapted to follow the pattern or design to be copied. This pantograph is connected by suitable mechanism to a cloth support or carrier which is moved, with respect to the reciprocating needle of the sewing machine, over a course corresponding to the pattern or design to be copied.

Provision is made for covering the feed dog of the sewing machine so that the material upon which the work is being done is moved entirely by the movement of the frame in which it is clamped, which in turn is moved by the pantograph in accordance with the movements of the stylus.

In devices of this type it is desirable that the pattern or design be copied in the same position that it appears upon the template and not in a reverse position. The arrangement of the parts according to the present invention is such that this is accurately effected. Moreover, it is also desirable that the design which is sewn upon the material carried by its supporting frame be made larger or smaller and provision is made for adjusting the effective length of the legs of the pantograph so that the template or design may be copied upon the material in varying sizes.

One object of the invention is to provide a pantograph attachment for sewing machines which shall be economical to construct and at the same time be efficient in operation.

A still further object of the invention is to provide a pantograph attachment for sewing machines which will enable the user to copy upon a piece of material a pattern or design upon a template and wherein adjustment of the apparatus may be made so that the size of the pattern obtained may vary with respect to that being copied.

Still another object of the invention is the provision of a pantograph attachment for sewing machines of the character described wherein the parts of the finished design will correspond in position to those of the pattern or design which is copied and not be in reversed position or order.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a side elevational view of a pantograph attachment embodying my invention, the view being taken in a direction looking from left to right on Fig. 2;

Fig. 2 is a top plan view of the attachment;

Fig. 3 is a view similar to Fig. 2 but showing the parts

in another position and adjusted for a design of a different size;

Fig. 4 is an enlarged partial sectional view on line 4—4 of Fig. 2;

Fig. 5 is an enlarged partial sectional view on line 5—5 of Fig. 2; and

Fig. 6 is a detail perspective view of the ring for clamping the material upon its support.

To illustrate one embodiment of the invention there is shown in the drawings a sewing machine attachment comprising a supporting plate 10 which is adapted to be secured to the base of the head of the sewing machine. To this end screws 11 are mounted in short resilient arms 12 pivoted at 13 to a cover plate 15 secured to the plate 10 so that the members 12 may be moved with respect to the plate. The plate 15 is slotted, as shown at 14, to movably receive the screws 11 so that the latter may be aligned with threaded openings in the base of the sewing machine head so as to secure the plate thereto.

The cover plate 15 is of relatively thin metal adapted to extend over the feed dog of the sewing machine when the attachment is in place. This cover plate is provided with a slotted needle opening 16 which will register with the needle opening 17 in the throat plate (not shown) of the sewing machine. As illustrated, the cover plate 15 is of L-shaped form although its particular shape is not of importance.

Also secured to (or formed integrally with) the plate 10 is a support 18 having a plurality of recesses or notches 19, 19^a and 19^b in one edge thereof. A pattern or template support 20 is adapted to be secured to the support 18, and to this end is provided with a plurality of notches 21, 21^a and 21^b in one edge thereof. A screw 23 is received in one of these notches or recesses and threaded into the plate 18, while similarly a rivet 24 is secured to the lower surface of the support 20 and adapted to be received in one of the notches 19, 19^a or 19^b. As shown, the screw 23 is received in the notch 21^b of the support 20 while the rivet 24 is received in the notch 19^b of the member 18, in which position, as will be explained hereinafter, the resulting design is of the smallest size provided by the attachment.

A pantograph is pivoted to the plate 10, which pantograph comprises links 25, 26, 27 and 28, the link 26 being pivoted at 29 to the plate so that the parallelogram formed by these links may swing about this pivot, and it will be understood that the individual links are pivoted together at points 30, 31, 32 and 33 so that the angles between them may vary.

As shown, the link 25 is provided with a plurality of pivot screws 34, the link 27 provided with corresponding pivot screws 35, and the link 28, which is extended at one end, as shown at 36, is provided with two series of openings 37 and 38 to receive the screws 34 and 35 so that the dimensions of the parallelogram formed by the links 25, 26, 27 and 28 and the effective length of the arm 36 may be varied by placing these screws (which also form the pivots 30 and 33) in different ones of these openings.

Upon the free end of the arm 36 is a stylus 40 which is adapted to be moved to follow the pattern or design upon a template placed upon the support 20. The latter is provided with spring clamps shown at 41 by which the template may be clamped to the support.

The link 27 is extended beyond the pivot 32 as shown at 42, and this extended end portion 42 comprises one side of a parallelogram of which the links 43, 44 and 45 form the other three sides. These links are pivoted together at the points 32, 46, 47 and 48.

The link 45 is of L-shaped form, as shown more particularly in Fig. 3, and an arm 49 of this link lies below the extended portion 42 of the link 27. A link 50 is

pivoted to the arm 49 at 51 and pivoted to the support 10 at 52 so as to form a control for the sides of the parallelogram 42, 43, 44 and 45 during movement of the pantograph.

A material or work-holding frame 53 is provided to hold the work upon which the design is to be made. As shown more especially in Figs. 2 and 5, this frame is of hoop-shaped form and is provided with an inwardly opening recess 54 within which the material 55 (Fig. 3) may be clamped by the resilient clamping ring 56 (Fig. 6).

Secured to the work holder or frame 53 is an L-shaped arm 57, one end of which extends upwardly (Fig. 4) and is provided with a channel or U-shaped portion 58 to embrace the link 43. The work holder may then be clamped to the link 43 by the latch member 59 pivoted at 60 to the link and provided with a hooked end 61 to receive a headed pin 62 secured to the link. By this means the work-holding frame is rigidly secured in place so that its movement will be controlled by the movement of the link 43.

Depending lugs 63 and 64 may be provided upon the member 18 to support the device from the table or other support upon which the sewing machine is carried. Also the member 18 may be provided with indicia such as 3:1, 2.5:1, and 2:1 to indicate the reduction in size between the design on the template to be copied and that made upon the work. For example, as shown, the work support 20 is mounted in the recesses 19^b and 21^b and the rounded edge of this support corresponds with the arcuate line designated 3:1 indicating that the reduction will be 3 to 1. If the work support 20 is moved upwardly and to the left so that it is supported in the recesses 19 and 21, the upper edge of the work holder will register with the arcuate line marked 2:1 showing that the design when made will be one half the size of the pattern which is copied.

When the above adjustments are made, the arm 28 of the pantograph will also be adjusted with respect to the arms 25 and 27. As shown in Fig. 1, the link 28 is pivoted in the outermost of the screws 34 and 35 of the links 25 and 27. As shown in Fig. 3, however, where the ratio between the work and the pattern is 2 to 1, the link 28 is pivoted to the links 25 and 27 at the innermost of the screws 34 and 35 which are designated as 2:1 to correspond with the indication on the member 18, indicating the adjustment of the work support 20. In this adjustment, the openings 37 and 38 which are farthest to the right are employed so as to shorten the effective length of the stylus arm 36.

As shown in dotted lines in Fig. 2, when the stylus 40 is moved over the pattern or design upon the template held by the work support 20, the pantograph consisting of the links 25, 26, 27 and 28 will be moved, the link 26 moving about the pivot 29. This movement will, of course, effect movements of the links 42, 43, 44 and 45 as indicated in dotted lines, thus moving the work-holding frame 53 with respect to the needle opening 17 so as to duplicate, in a smaller size, the pattern or design traced by the stylus.

While I have shown and described a preferred embodiment of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the claims.

What I claim is:

1. A sewing machine attachment for copying designs or the like upon a piece of material, said attachment comprising a support, means for securing the support in place upon the bed of a sewing machine, a pattern holder carried by said support, a pantograph comprising four pivoted links, one link of which is pivoted intermediate its ends to said support, the opposite link being extended beyond its pivot and carrying a stylus to move over said pattern holder, a parallelogram comprising four pivoted sides connected to said pantograph, one of the pivots of which coincides with one of the pivots of the pantograph, a work-holding frame carried by one side of the parallelogram and the opposite side thereof being pivoted to one link of the pantograph and having an arm extending at an angle from said pivot, a link pivotally connecting said arm to a fixed point on the support, and a third side of said parallelogram being constituted by the end of one link of the pantograph extended beyond said pivot.

2. A sewing machine attachment for copying designs or the like upon a piece of material, said attachment comprising a support, means for securing the support in place upon the bed of a sewing machine, a pattern holder carried by said support, pantograph comprising four pivoted links, one link of which is pivoted intermediate its ends to said support, the opposite link being extended beyond its pivot and carrying a stylus to move over said pattern holder, a parallelogram comprising four pivoted sides connected to said pantograph, one of the pivots of which coincides with one of the pivots of the pantograph, a work-holding frame carried by one side of the parallelogram and the opposite side thereof being pivoted to one link of the pantograph and having an arm extending at an angle from said pivot, a link pivotally connecting said arm to a fixed point on the support, a third side of said parallelogram being constituted by the end of one link of the pantograph extended beyond said pivot, and the link connecting said arm to the support being constrained to lie parallel to said one link of the pantograph.

3. A sewing machine attachment for copying designs or the like upon a piece of material, said attachment comprising a support, means for securing the support in place upon the bed of a sewing machine, a pattern holder carried by said support, a pantograph comprising four pivoted links, one link of which is pivoted intermediate its ends to said support, the opposite link being extended beyond its pivot and carrying a stylus to move over said pattern holder, a parallelogram comprising four pivoted sides connected to said pantograph, one of the pivots of which coincides with one of the pivots of the pantograph, a work-holding frame carried by one side of the parallelogram, the opposite side of the parallelogram being of angular form and pivoted at its vertex to said one link of the pantograph and having an arm extending beyond said pivot, a second link pivoted to the free end of said arm and to a fixed point on said support at a distance from the pivot of said one link substantially equal to the length of said arm, and a third side of said parallelogram being constituted by the extended end of one link of the pantograph beyond the common pivot of the parallelogram and pantograph.

4. A sewing machine attachment as in claim 1 wherein the stylus-carrying link of the pantograph is adjustably pivoted to the two adjacent links whereby the effective length of its extended end may be varied.

5. A sewing machine attachment as in claim 4 wherein the pattern holder is adjustably mounted on the support.

6. A sewing machine attachment as in claim 1 wherein means are provided for adjusting the effective length of the links of the pantograph to which the stylus-carrying link is connected and for adjusting the effective length of the extended end of the latter.

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