

Jan. 6, 1953

S. H. MEISTER

2,624,302

MONOGRAMMING MACHINE

Filed Sept. 10, 1949

3 Sheets-Sheet 1

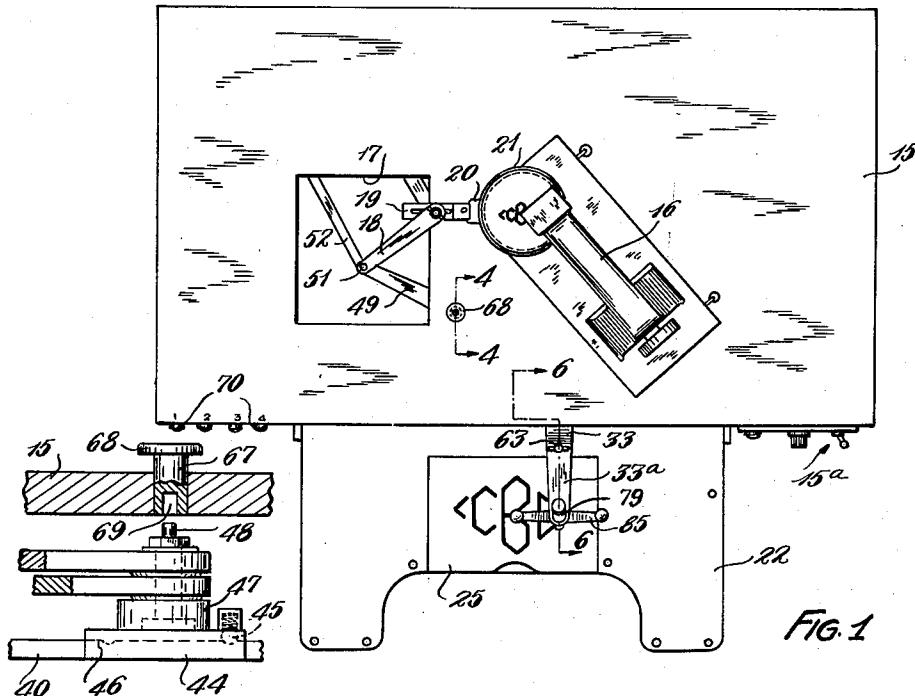


FIG. 1

FIG. 4

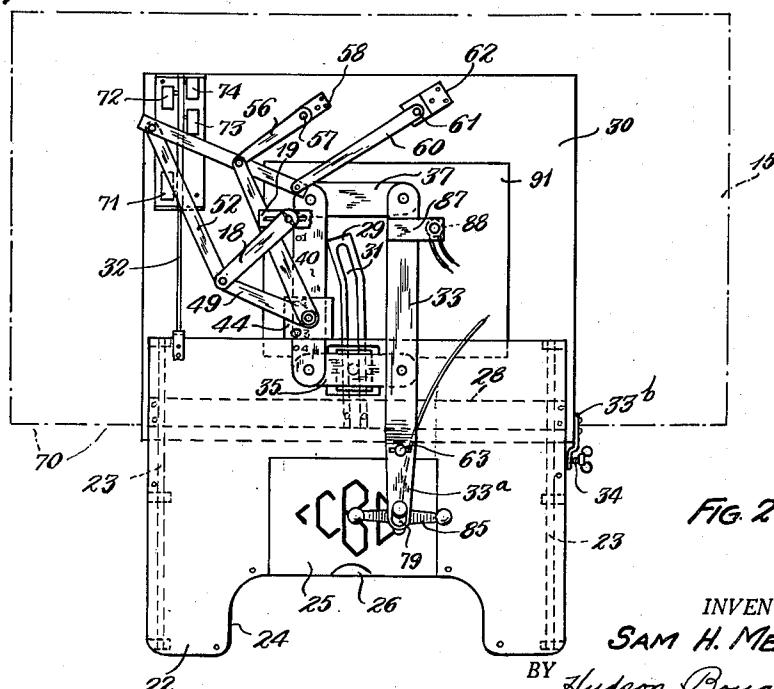


FIG. 2

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3 Sheets-Sheet 2

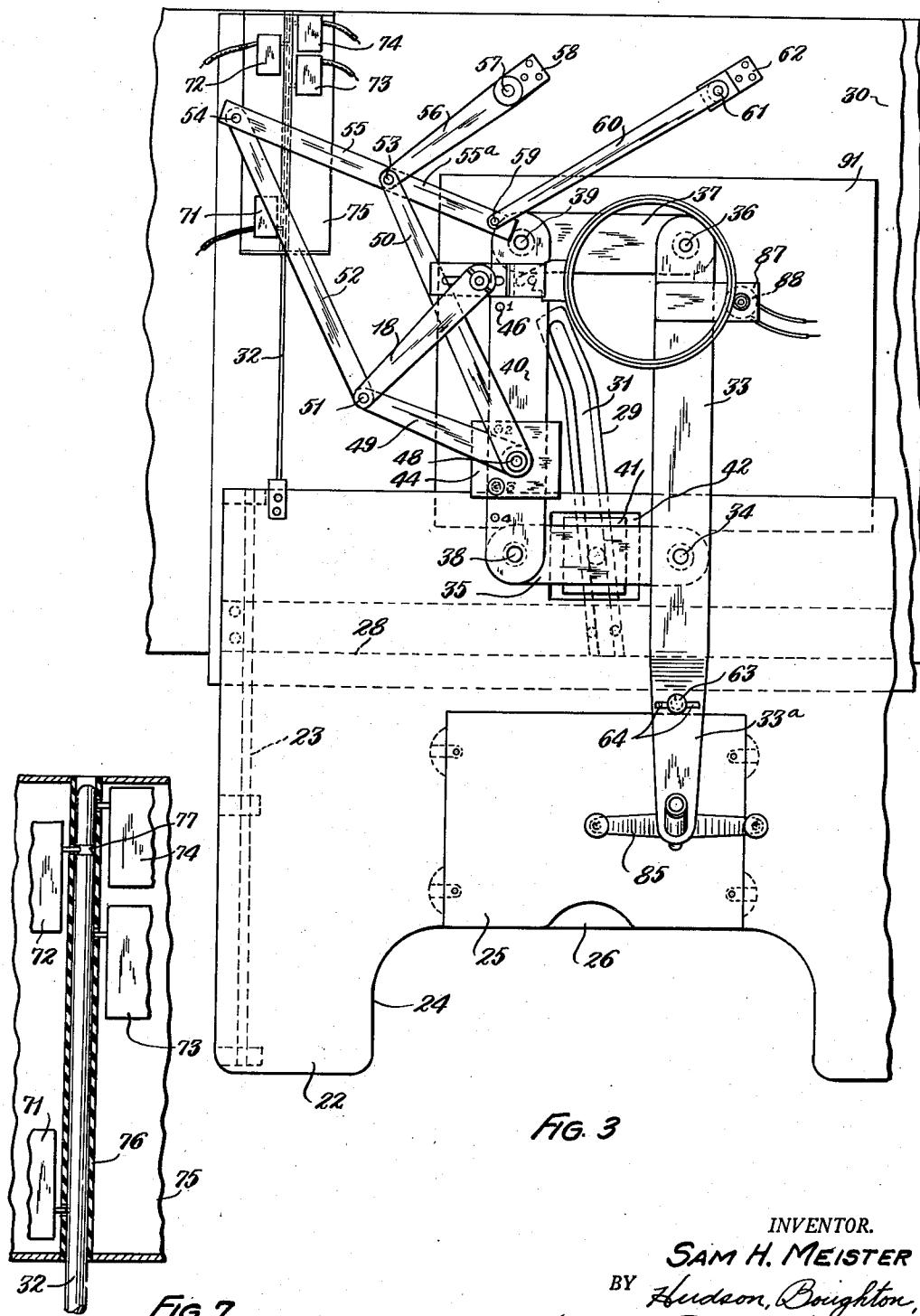


FIG. 3

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3 Sheets-Sheet 3

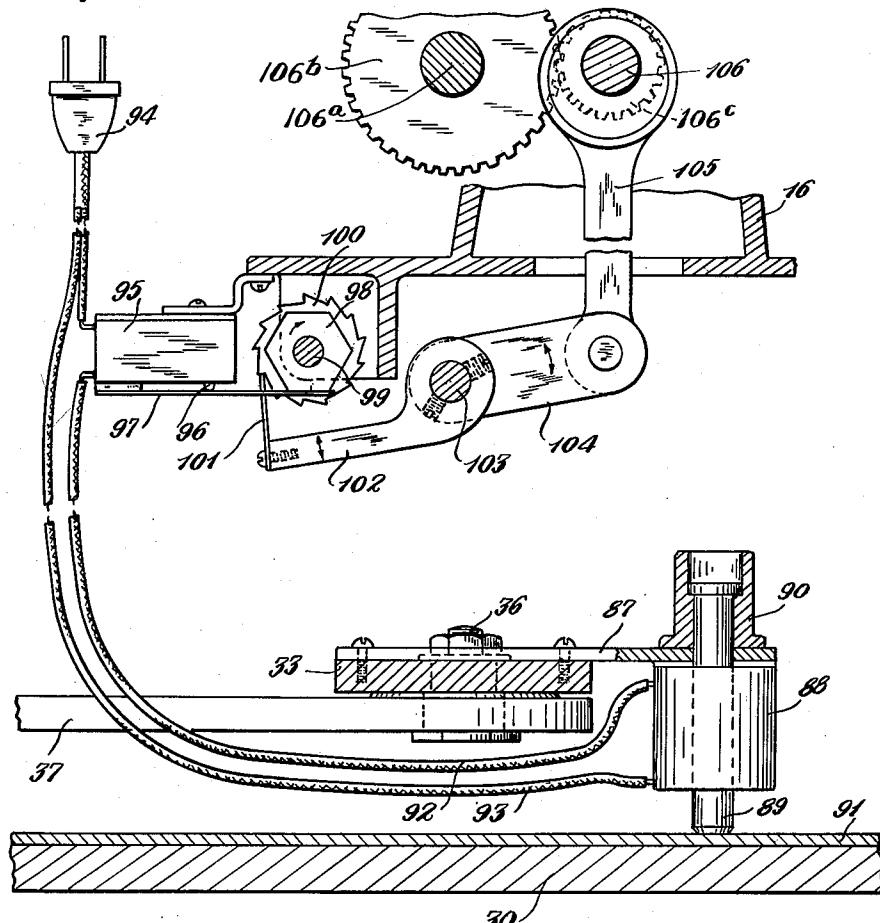


FIG. 5

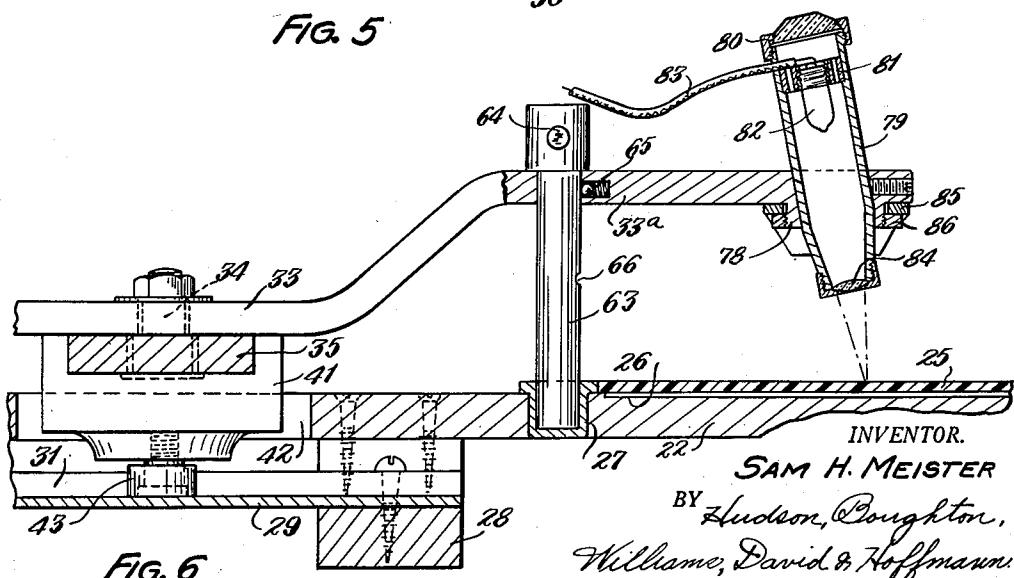


FIG. 6

## UNITED STATES PATENT OFFICE

2,624,302

## MONOGRAMMING MACHINE

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Application September 10, 1949, Serial No. 114,971

5 Claims. (Cl. 112—102)

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This invention relates to a monogramming or embroidering machine, and particularly to a machine for applying monograms, such as initials, or emblems or other designs, to shirts, pajamas, nightgowns, underclothing, handkerchiefs, towels, sheets, table cloths, napkins and various other articles or clothing, household linens and other articles.

Heretofore, monogramming or embroidering machines have been used commercially for the purposes above stated but such previous machines have necessitated the direct stencilling of the monogram, emblem or design outlines on the articles and the operators of the prior machines have had to manipulate the articles themselves in the machines to cause the machine needles to follow the outlines and reproduce the desired monograms, emblems or designs.

The previous commercial machines have necessitated the use of skilled operators, the obtainance of which has required extensive training or instructional courses. Also the previous machines have been slow and inefficient, have resulted in faulty monograms, emblems or designs with a consequent wastage of articles, and have required in conjunction with their use a large number of different stencils or patterns including stencils or patterns for various sizes of the same monogram, emblem or design.

A general object of the present invention is to provide a monogramming or embroidering machine which is efficient, accurate and speedy in operation, requires a minimum amount of training and skill on the part of the operator, a relatively small supply of stencilled patterns or type blocks for producing a wide variety of different monograms, emblems or designs and a number of different sizes of the same monogram, emblem or design and enables the production of perfectly produced monograms, emblems or designs, thus avoiding wastage of the articles.

Another object is to provide a monogramming or embroidering machine wherein the monogram, emblem or design outline does not first have to be stencilled on the article and the operator does not need to manipulate the article beneath the needle of the machine, since a stencilled pattern or type block containing the desired monogram, emblem or design can be positioned on a table or board remote from the needle of the machine and a tracing device moved by the operator over the outline of the monogram, emblem or design on the stencilled pattern or type block automatically effects a corresponding movement of the article beneath the needle of the machine.

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A further object is to provide a monogramming or embroidering machine as referred to in the last named object and wherein the operator can reproduce on the articles various sized emblems, designs or monograms from the same or different stencilled patterns or type blocks.

Another object of the invention is to provide a monogramming or embroidering machine wherein there is a tracing device that the operator can easily, efficiently and accurately move over the outline of the emblem, design or monogram on the stencilled pattern or type block to reproduce the same on the article, thus eliminating error and waste or spoiling of the article, enabling an unskilled operator to produce perfect monograms, emblems or designs without strain or effort since it is unnecessary to watch the article and the needle of the machine as the article moves relatively to the needle.

A further object of the invention is to provide a monogramming or embroidering machine wherein there is a tracer device movable by the operator and remote from the machine needle and the work piece but operatively connected to the latter to transmit corresponding movements thereto from the tracing device, with the operative connections between the work piece and the tracing device including a novel mechanism guaranteeing smoothness of movement of the tracing device by the operator and enabling the article to be moved relative to the needle at a uniform pace, thus keeping the flow of thread even and preventing the piling up of stitches at one location and an inadequate number of stitches at another location.

Another object is to provide a novel mechanism, as referred to in the last named object, and which prevents movement of the tracer device when the needle is making a stitching stroke in the article, thus avoiding bending or breakage of the needles.

Another object of the invention is to provide in a monogramming or embroidering machine of the type referred to a novel arrangement for easily and quickly adjusting the operative connections between the tracing device and the article mounted in the work holder of the machine so that various sized monograms, emblems or designs can be reproduced from a single sized stencilled pattern or type block mounted on the pattern table beneath the tracing device and including one to one reproductions.

A further object incident to the adjustment feature referred to in the last named object is to provide for the reproduction on the article of

emblems, designs or monograms smaller in size than the emblem, design or monogram of the stencilled pattern or type block, thus minimizing errors or flaws in the reproductions.

Further and additional objects and advantages not hereinbefore specified will become apparent hereinafter during the detailed description of an embodiment of the invention which is illustrated in the accompanying drawings wherein,

Fig. 1 is a plan view of a monogramming or 10 embroidering machine embodying the inventive concept.

Fig. 2 is a plan view similar to Fig. 1, but with the top table of the machine omitted and indicated by dot and dash lines to show in plan the operative connections between the tracing device and the work holder.

Fig. 3 is a view similar to Fig. 2 but on a substantially larger scale.

Fig. 4 is a fragmentary sectional view taken substantially on line 4—4 of Fig. 1 looking in the direction of the arrows.

Fig. 5 is a fragmentary partial sectional and partial elevational view illustrating the electromagnetic device that controls the smoothness of the operator's motions in moving the tracing device over the stencilled pattern or type block on the stencil table.

Fig. 6 is a sectional view taken substantially on line 6—6 of Fig. 1 looking in the direction of the arrows, and

Fig. 7 is a fragmentary sectional view showing the switches which control the adjustment indicating lights of the machine and the switch actuating rod that is connected to the adjustable stencil table.

The monogramming or embroidering machine embodying my inventive features may, of course, have various external appearances and may possess suitable ornamental features. However, at the present time the preferred external appearance and ornamentation of the machine is such as is shown in my application Serial No. D-4510, filed August 15, 1949 for Design Letters Patent now Design Patent 158,780, issued May 30, 1950.

It will be understood without illustrating the same herein that the monogramming or embroidering machine includes a suitable cabinet housing the operative parts of the machine and on which a suitable sewing machine head is mounted and also that it may contain a cabinet section provided with supply drawers while the various control knobs and indicating lights will be suitably positioned on the cabinet.

Referring to Fig. 1, 15 indicates the table top of that part of the cabinet which mounts the sewing machine head and contains the operative parts, while the control switches and knobs for the electric circuits and the sewing machine motor are indicated generally at 15a. The table top 15 has mounted thereon a suitable sewing machine head 16 which may be any well known type of the usual domestic or industrial sewing machine having a movable needle bar adapted for vibrating zigzag or straight needle stitching as is well understood in the art.

The table top 15 is provided adjacent to the sewing machine head with an opening 17 and through which opening extends an arm 18, later to be referred to, and having its outer end adjustably connected to a second arm 19 by means of a slot and wing nut connection. The second arm 19 at its end adjacent to the sewing machine head has removably connected to it a fitting 20 which carries a hoop or frame 21 in which the

article to be monogrammed or embroidered can be clamped in a manner well known in connection with embroidery hoops. It will be understood that the hoop or frame 21 with the article 5 clamped therein is located beneath the needle of the sewing machine head and will have movements imparted thereto such that the monogram, emblem or design will be reproduced on the article from a suitable stencilled pattern or type block.

A stencilled pattern or type block board or table 22 is slidably mounted in the cabinet to extend outwardly of the front of the cabinet and to move beneath the table top 15 of the cabinet. The board 22 is mounted for easy and accurate 15 straight line sliding movement inwardly and outwardly of the cabinet by means of suitable tracks, rods or guides well understood in the art and illustrated in Figs. 2 and 3 diagrammatically by dash lines at 23.

The front or outer edge of the board or table 22 is recessed as indicated at 24 to accommodate the body of the operator. The table or board 22 centrally of its recessed front edge is illustrated as provided in its upper surface with a 25 rectangular depression that is covered by a transparent sheet 25 secured to the table or board in any suitable manner permitting its removal for cleaning purposes and providing with the depression an envelope into which the stencilled patterns 26 can be inserted, with the monograms, emblems or designs on the patterns visible through the sheet 25. This arrangement is a simple and effective one for readily inserting and withdrawing the patterns and for holding the 30 same properly in position during the reproducing operation. Although stencilled patterns have been referred to and illustrated herein it will be understood that other forms of patterns or type blocks might be employed in lieu thereof and suitable means provided if necessary for holding such pattern or type blocks in position on the table or board 22.

The table or board 22 just inwardly of the inner edge of the sheet or plate 25 is provided with a vertical recess in which may be mounted a bushing 27 (see Fig. 6) for a purpose later to be explained. The table 22 inwardly of the bushing has secured to its underside a cross bar 28, see Figs. 2, 3 and 6, and said cross bar has fixedly secured to it a rigid strap or arm 29 projecting beyond the inner edge of the table and intermediate the cabinet table top 15 and an interior supporting shelf 30 located in the cabinet beneath the top 15. The strap 29 is provided in its upper side with a longitudinally extending cam adjusting groove 31 having two angularly disposed portions, the purpose of said strap and said cam groove later becoming apparent.

The inner edge of the table 22 has fixedly secured to it a switch actuating rod 32 later to be referred to in detail. The table 22 may be clamped or locked in any adjusted inward or outward position with respect to the cabinet by means of suitable clamping or locking devices as, for instance, the bracket 33b carried by a fixed part of the cabinet and mounting a clamping or locking screw 34 which engages the table 22, see Fig. 2.

As already stated, a tracing device is provided for tracing the outline of the monogram, emblem or design on the stencilled pattern or type block, together with mechanism operatively interconnecting the tracer device with the article or work holder 21, so that the movements of the tracer

device will be imparted to the article or work holder.

The operative connections between the tracer device and the article or work holder constitute a pantograph mechanism and preferably a double pantograph so as to reproduce monograms, emblems or designs on the article without inversion. Also the pantograph mechanism is capable of adjustment so that the monograms, emblems or designs reproduced from the stencilled pattern or type block will be of equal size to the outline thereon or of a different size with respect thereto. In this way the stencilled patterns or type blocks can be provided with monograms, emblems or designs of the maximum size desired to be reproduced in a one-to-one ratio on the article but can be used also for reproducing on the article monograms, emblems or designs of lesser size, thus reducing the number of stencilled patterns or type blocks which must be kept in stock and also avoiding the necessity of interchanging the stencilled patterns or type blocks when it is desired to reproduce the same monogram, emblem or design on different articles but varying in size. It will be appreciated that the reproduction of smaller sized emblems, monograms or designs on the article minimizes errors or flaws in the reproductions.

The pantograph mechanism referred to includes a first pantograph comprising a master arm 33 extending between the table top 15 of the cabinet and the intermediate shelf 30 thereof and having an upwardly offset portion 33a overlying the table or board 22 and the stencilled pattern or type block mounted on said table or board, with the said offset portion 33a mounting the tracer device later to be referred to.

The master arm 33 inwardly of the offset portion 33a but still where it overlies the table or board 22 is pivotally connected at 34 to one end of a link 35. The inner end of the master arm 33 is pivotally connected at 36 to one end of a link 37 equal in length to the link 35. The opposite ends of the links 35 and 37 are pivotally connected, respectively, at 38 and 39 to the opposite ends of an arm 40. The distance between the pivotal points 34 and 36 equals that between the pivotal points 38 and 39 so that the arms 33 and 40 and the links 35 and 37 constitute a parallelogram.

The link 35 is slidably supported in a swiveling cradle 41 that projects downwardly through an opening 42 formed in the pattern, table or board 22 adjacent the rear end of the latter. The swiveling cradle 41 on its underside is provided with a roller 43, see Fig. 6, that rotatably interfits the cam adjustment groove 31 in the strap 29. The arm 40 slidably interfits and mounts an adjustment block 44 which carries a ball spring point 45 engageable in predeterminedly spaced recesses 46 formed on the upper side of the arm 40 to hold the block 44 in different adjusted positions longitudinally of the arm 40, see Figs. 3 and 4. The adjustable block 44 on its upper side is provided with a boss 47 (see Fig. 4) that supports an upwardly extending pivot pin 48 having an extended upper end.

The pivot pin 48 has pivotally mounted thereon one end of a link 49 and above said link one end of an arm 50 of a second pantograph. The opposite end of the link 49 is pivotally connected at 51 to one end of an arm 52 while the end of the arm 18 previously referred to as connected to the article or work holder 20 through the bar 19 is pivotally connected to the link 49 and arm 52 above the latter at the pivot point 51. The

arm 50 and the arm 52 at their other ends are pivotally connected, respectively, at 53 and 54 to a link 55. The arms 50 and 52 of the second pantograph between the pivot points 48 and 53 and 51 and 54 are equal in length to the arms 33 and 40 of the first pantograph between the pivot points 34 and 36 and 38 and 39. Also the links 49 and 55 of the second pantograph between the pivot points 48 and 51 and 53 and 54 are equal in length to the links 35 and 37 of the first pantograph between the pivot points 34 and 38 and 36 and 39 so that the mechanism includes two parallelograms constituting the first and second pantographs.

The arm 50 and the link 55 of the second pantograph also are pivotally connected at 53 to the free end of a stabilizing bar 56 that has its other end pivotally connected at 57 to an anchoring bracket 58 fixedly secured to the intermediate shelf 30 of the cabinet. The link 55 is provided with a portion 55a extended beyond the pivot point 53 and this extended portion adjacent its free end is pivotally connected at 59 to the free end of a stabilizing bar 60, the opposite end of which is pivotally connected at 61 to an anchoring bracket 62 fixedly mounted on the intermediate shelf 30 of the cabinet.

It will be seen that movements imparted to the master arm 33 of the first pantograph and applied at the offset portion 33a thereof will be correspondingly imparted to the arm 18 and work or article holder 20 without inversion through the double pantograph arrangement just described.

It will also be understood by this time that the amplitude of the movements thus imparted to the article or work holder 20 will equal or be less than the amplitude of the movements imparted to the master arm 33, depending upon the adjusted position of the block 44 on the arm 40 and the location of the cradle 41 longitudinally of the cam adjusting groove 31 in the strap 29. The manner in which the positions of the cradle 41 and block 44 may be adjusted will now be described.

The offset portion 33a of the master arm 33 slidably mounts a vertical locking pin 63 provided at its upper end with actuating handles 64 and having its lower end when the locking pin is in its lowermost position engaged in the bushing 27 in the table or board 22, at which time the master arm 33 and said table or board 22 are interlocked for movement together as the table or board is moved inwardly or outwardly with respect to the cabinet.

The pin 63 may be raised by its actuating handles 64 to an inactive position and retained in such position by a spring point 65 carried by the portion 33a of the master arm 33 and engaging in a recess 66 formed in the pin 63, see Fig. 6, and at such time the master arm 33 can move relative to the table or board 22.

The table top 15 of the cabinet slidably mounts a vertical locking plunger 67 provided on its upper end with an operating knob 68 and at its lower end with a recess 69 engageable with the upper end of the pivot pin 48 carried by the block 44. It will be seen that when the locking plunger 67 is engaged with the pivot pin 48 the block 44 is locked to the table top 15 of the cabinet so that movement of the arm 40 will overcome the action of the spring point 45 and cause the block 44 to move relative to the arm 40 to change its adjusted position thereon.

The mechanism and the adjustable portions thereof, in this instance, are so designed with

respect to each other and correlated to the inward or outward adjustments of the table or board 22 that said mechanism can be set to procure a one-to-one movement of the article or work holder relative to the movement of the master arm 33 or movements thereof equal to one-third, one-half or one-fourth of the amplitude of the master arm movement as desired to effect one-to-one reproductions on the work of the monogram, design or emblem on the stencilled pattern or type block or reproductions equal to one-third, one-half or one-fourth the size thereof.

In procuring the adjustment of the pantograph mechanism, as just referred to, the table or top 22 is unclamped by loosening the wing clamping nut 34 and the operator simply moves the table 22 inwardly or outwardly of the cabinet.

The locking pin 63 is lowered to have its end engage in the bushing 21 to interconnect the master arm 33 and the table or top 22 for simultaneous movement. Also the locking plunger 67 is lowered or positioned inwardly to engage the pivot pin 48 and lock the block 44 to the table top 15 of the cabinet.

It will be seen that under such circumstances mere inward or outward movement of the table or board 22 relative to the cabinet will act to locate the cradle 41 with respect to different longitudinal portions of the cam groove 31, thus imparting turning movement to the cradle with a resultant movement of the arm 40 relative to the block 44 and thereby changing the ratio of the movements imparted to the article or work holder by the movements of the master arm 33.

The recesses 46 provided in the upper side of the arm 40 are spaced in this instance in correlation to adjustments providing for the one-to-one reproduction of monograms, emblems or designs on the article equal in size to the pattern or reproductions thereon of one-third, one-half or one-fourth its size.

When the table or board has been moved inwardly or outwardly to obtain the desired adjustment for the size monogram, emblem or design that is to be reproduced from the pattern then the table is locked by the lock means 34 in adjusted position, the lock bolt 63 and the lock plunger 67 are released and the pantograph mechanism is set for the desired operation.

In order to indicate to the operator quickly and visually when the table or board 22 and the pantograph mechanism have been moved to obtain the desired adjustment, the front of the cabinet may be provided with signal lights indicated at 70 in Fig. 1. In this instance there are four such signal lights corresponding, respectively, to the four different adjustments whereby monograms, designs or emblems may be reproduced equalling in size the monogram on the stencilled pattern or type block of one-third, one-half or one-fourth the size thereof.

The signal lights 70 are individually controlled, respectively, by switches 71, 72, 73 and 74 mounted on a suitable switch supporting plate 75 carried by the intermediate shelf 30 of the cabinet. The switches 71, 72, 73 and 74 may be any desired form of switch for controlling the lighting of the signal lights, but preferably are micro switches of well known form.

Various means may be provided for actuating the switches in correlation to the inward or outward adjustment of the table or board 22. A preferred way of actuating the switches is by means of the switch actuating rod 32, previously referred to, and fixedly connected to the inner

edge of the table or board 22. The rod 32 projects through an insulating sleeve 76 carried by the switch plate 75 and said rod is provided with an annular groove 77 adapted to register with the spring pressed actuating pins of the switches, depending upon the adjusted position of the table or board 22.

As shown in Fig. 7 the actuating pin of the switch 72 is engaged in the groove 77 of the rod 32 and said switch is closed and the circuit to its related signal light 70 is completed, the rod 32 forming part of said circuit. The switch 72 controls the signal light that indicates reproductions of one-third the size of the pattern, while the switches 71, 73 and 74 control the signal lights indicating, respectively, reproductions of one-to-one (actual size) or of one-half or one-fourth the size of the pattern.

It will be noted that when the table or board 22 is adjusted outwardly to the position for obtaining reproductions of one-to-one (actual size) with respect to the pattern then the actuating plunger of the switch 71 will engage in the groove 77, at which time the plungers of the switches 72, 73 and 74 will be extended but not in contact with the rod 32 and hence the closing of the switches 72, 73 and 74 will be merely an idle closing thereof since the circuits to the signal lights controlled thereby will not then be completed. The inner end of the rod 32 is beveled so that inward movement of the rod will depress such switch actuating plungers as may be extended but not in contact with the rod.

As previously stated, the master arm 33 mounts on the offset portion 33a thereof a tracer device which the operator can move over the outline of the monogram, emblem or design on the stencilled pattern or type block to produce through the pantograph mechanism corresponding movements of the work holder and thus reproduce the monogram, emblem or design on the article.

The tracer device may take various forms, but preferably it will be so constructed as to provide for a pin point light beam that will impinge on the outline of the monogram, emblem or design of the pattern, wherefore the operator by moving the master arm 33 can cause the pin point of light to follow the outline.

The free end of the offset portion 33a is shown as provided on its underside with a boss 78 registering with an opening through the arm. In this opening there is mounted a light tube 79 closed at its upper end by a removable cap 80 (which may carry a colored glass window) and mounting internally a light support 81 in which can be mounted a small electric light bulb 82 connected by wire leads 83 to a suitable source of electrical current such as the usual commercial current.

The lower end of the tube 79 is convergently tapered and mounts a lens 84 of such character that the rays from the light bulb 82 will project downwardly upon the plate 25 and the stencilled pattern and form the desired pin point of light which can be moved by the operator over the outline of the monogram, emblem or design by movement of the arm 33.

In order to facilitate the movement of the arm 33 by the operator a double handle 85, preferably provided at its opposite ends with knob portions, is swiveled on the boss 78 beneath the arm portion 33a and is held in position by a retaining nut 86 screwed onto the exterior threads of the boss.

In some instances it may be desirable to employ in place of a stencilled pattern a type block

in which the design, emblem or monogram outline is formed by means of grooves. In such instance it might be more desirable to employ on the tube 79 a feeler or pointer or stylus that could travel in the grooves of the type block and it will be noted that the lower end of the tube 79 is formed to permit the lens to be removed and a feeler or pointer or stylus to be screwed thereon at which time, of course, the light would not be used.

In order that the movements imparted to the master arm 33 by the operator will be smooth, regular and in accordance with the stitching movements of the needle of the sewing machine head to prevent movement of the master arm when the needle is stitching and thus keep the flow of thread even and prevent the piling up of stitches at some locations and an inadequate number of stitches at other locations on the article the following mechanism is employed.

Referring to Figs. 2, 3 and 5 it will be seen that the master arm 33 adjacent to the point 36 of its pivotal connection with the link 37 has secured on its upper side a laterally projecting bracket plate 87. The bracket plate 87 mounts on its underside adjacent its free end the housing 88 of an electromagnet, it being understood that the coils or windings of said magnet are contained in the housing. The electromagnet is provided with a core 89 extending therethrough and having its upper end contained in a bushing 90 on top of the bracket 87. The lower end of the core 89 cooperates with an armature which is a metal plate 91 secured to the upper side of the intermediate shelf 30 of the cabinet. It will be seen that when the electromagnet is energized the core 89 will engage with magnetic attraction the plate 91, with the result that a stabilizing drag or braking action is imparted at such time to the movements of the master arm 33 of the pantograph mechanism.

The coils of the electromagnet are connected by wires 92 and 93 to a suitable source of electrical energy, said wires being secured to a plug 94 that can be inserted into an electrical outlet contained within the cabinet. The wire 92 is interrupted and is connected to the contacts of a switch 95 shown as secured to the underside of the sewing machine head 16, although said switch could be located in some other position on or in the sewing machine head. This switch 95 is illustrated as being of the normally open type and is provided with an actuating plunger 96 which when moved inwardly closes the switch and completes the circuit to the electromagnet.

In order for the electromagnet to exert its drag or braking action on the movements of the master arm 33 when the needle of the sewing machine is actually stitching to thus prevent the movement of the master arm during stitching movement of the needle and the piling up of stitches in one location and the skimping of stitches in another location on the article, to eliminate bending or breakage of the needle and to stabilize and make uniform the movement of the master arm and the pantograph as well as the movements of the article beneath the needle the following mechanism is employed.

The underside of the casing of the switch 95 mounts a spring arm 97 which when free to flex to its normal position retains the plunger 96 in its inward position with the switch contacts closed. The outer end of the spring arm 97 is shown as cooperating, in this instance, with a six-sided actuating member 98 rotatable on a

shaft 99 supported on the underside of the sewing machine head. The member 98 might be located on some other part of the sewing machine either on or within the head. When the spring arm 97 is in contact with one of the flat sides of the actuating member 98, as shown in Fig. 5, said arm flexes to its normal position and the contacts of the switch 95 are closed and the electromagnet is energized. However, when the member 98 is rotated so as to bring one of its exterior corner edges into contact with the spring arm 97 the latter is flexed out of normal position and the switch plunger 96 moves to its normal position and the contacts of the switch 95 are opened and the electromagnet is deenergized.

A ratchet wheel 100 is secured to the member 98 and rotates in unison therewith. The ratchet wheel 100 cooperates with a pawl 101 which is fixed to the outer end of the arm 102 of a double arm lever. The hub of the double arm lever is fixed on a rockable shaft 103 shown in this instance as mounted in suitable supports beneath the sewing machine head. The other arm 104 of the double arm lever is pivotally connected to the free end of a crank arm 105 which is operatively mounted on a rotatable shaft 106. The main shaft 106a of the sewing machine and which actuates the reciprocating needle bar of the machine as is well understood in the art is schematically illustrated in Fig. 5. The shaft 106 may be driven from the main shaft 106a to rotate at twice the speed of the main shaft by any well known driving connection, as, for instance, by the 1 to 2 gears 106b and 106c schematically illustrated in Fig. 5.

It will be seen that when the sewing machine is operating the shaft 106 will reciprocate the crank arm 105 and cause the double arm lever on the shaft 103 to rockably oscillate. The oscillation of the double arm lever on the shaft 103 causes the pawl to engage the teeth of the ratchet 100 and each time that the pawl moves upwardly the ratchet 100 and member 98 will be rotated correspondingly. It will be noted that two upward movements of the pawl 101 are required to rotate the member 98 from a position wherein the spring arm 97 is in contact with one flat side of the member to a position wherein it is in contact with the adjacent flat side thereof. The parts are so related and synchronized with the sewing mechanism that the spring arm 97 is in contact with a flat side of the member 98 when the needle of the sewing machine is actually making a stitching stroke in the work, and hence the electromagnet 88 is energized in synchronism with the actual stitching movements of the needle.

When the needle has a non-stitching movement one of the corner edges of the member 98 will be in engagement with the spring arm 97 and the latter will be flexed out of normal position to cause opening of the switch 95 and de-energization of the electromagnet. Inasmuch as the stitching movements of the needle are approximately one-half of the idle or non-stitching movements thereof the arrangement just described causes the electromagnet to be energized to exert its retarding or braking effect during the actual stitching movements and de-energized during the idle movements of the needle. In other words, the period in which the spring arm 97 contacts the flat side of the hex member 98 is one-half that in which the spring arm 97 is flexed outwardly by a corner edge of the member 98. It will be noted that in this particular

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instance the ratchet 100 contains twice the number of teeth as there are faces on the member 98, but this ratio may vary under different conditions. Whatever the ratio, it will be such that the magnet is energized and the master arm movement is braked when the needle is in the material of the work, thus preventing movement of the work at such time which might cause uneven stitches or bending or breaking of the needle.

From the foregoing description it will be seen that the objects of the invention hereinbefore specified are adequately attained. The monogramming or embroidering machine avoids the necessity of the operator directly moving the work holder and article beneath the needle. This lessens the strain on the operator and also enables accurate reproduction of monograms, emblems or designs by relatively unskilled operators since any person of normal intelligence can move the tracing device over the outline of the stencilled pattern or type block to reproduce automatically the corresponding movements of the work holder. Also since the pantograph mechanism is adjustable a single stencilled pattern or type block can reproduce a number of different size monograms, emblems or designs as explained, thus lessening the number of patterns or type blocks which must be kept in stock or drawn or produced. Furthermore, the machine can be operated more efficiently and have a higher rate of production since it is not necessary for the operator to first stencil the outline of the desired design, emblem or monogram directly onto the article.

The adjustments of the pantograph mechanism can be accomplished by the operator quickly and readily without the use of tools and in accordance with the explanation herein given by merely sliding the table or board 22 inwardly or outwardly and because of the signal lights the operator will be visually advised at all times as to what adjustment has been made and the size of the monogram, emblem or design which will be reproduced on the article.

The electromagnet device explained herein assures steady and uniform movement of the master arm by the operator in moving the tracer device over the outline of the monogram, emblem or design on the stencilled pattern or type block and such movement will be correlated to the non-stitching movement of the needle. In addition, this movement of the tracer device is facilitated by the provision of the pin point light beam fully described herein.

Although a preferred embodiment of the invention has been illustrated and described herein, it will be understood that the invention is susceptible of various modifications and adaptations within the scope of the appended claims.

Having thus described my invention, I claim:

1. A monogramming or embroidering machine of the character described, comprising in combination, a cabinet, a sewing machine head mounted on said cabinet and including an operating shaft and a movable needle bar adapted to be provided with a needle and operatively connected with said shaft; means carried by said cabinet for mounting thereon a monogram, emblem or design stencilled pattern or type block, a work holder located and movable beneath the needle bar of the sewing machine head, a tracer device overlying said means, a pantograph operative connection between said device and work holder whereby movement of said device in con-

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formity with the monogram, emblem or design outline on the stencilled pattern or type block is transmitted to said work holder and the same reproduced on the work by the needle, and means for exerting resistance to the movements of the pantograph in correlation to the movements of the needle to provide uniform pantograph movements and including electromagnetic means carried by the pantograph, an armature plate carried by the cabinet and cooperating with said electromagnetic means, a switch controlling the energization and deenergization of said electromagnetic means, and operative connections between said switch and said shaft of the sewing machine head to effect energization of the electromagnetic means in correlation to the stitching movements of the needle.

2. A monogramming or embroidering machine of the character described comprising a cabinet adapted to mount a sewing machine head; a board slideable inwardly and outwardly of said cabinet and provided with means for mounting thereon a monogram, emblem or design stencilled pattern or type block; a work holder adapted to be located and moved beneath the needle of the sewing machine head, a tracer device overlying said board; operative connections between said device and work holder whereby movement of said device in conformity with the monogram, emblem or design outline on the stencilled pattern or type block is transmitted to said work holder; said operative connections including a first pantograph mechanism, one arm of which mounts said tracer device, a second and similar 35 pantograph mechanism, operative connections between said second mechanism and said work holder, a block on another arm of said first mechanism and slidably adjustable thereon, means operatively interconnecting said block and said second mechanism, an inwardly extending 40 strap provided with a cam groove carried by said board, a cradle swivelly mounted in an opening in said board and provided with a roller engaging in said groove, one of the links of said first mechanism which interconnects the arms thereof being slidably mounted in said cradle, means carried by said cabinet for locking said block against movement with said other arm of said first mechanism, means carried by said one arm of said first mechanism for operatively interconnecting it with said board whereby said pantograph mechanism may be adjusted by inward or outward movement of said board to vary the ratio of movement between said tracer device and said work holder, and means carried by said cabinet for locking said board relative to said cabinet and in its different adjusted positions.

3. A machine as defined in claim 2 and wherein in said cabinet is provided with signal lights for indicating the different adjusted positions of said board and with switches for controlling said lights, while said board mounts an actuating member for actuating said switches selectively in accordance with the adjusted positions of the board.

4. A machine as defined in claim 2 and wherein in said cabinet is provided internally with a metal plate, while said first pantograph mechanism mounts an electromagnet which when energized cooperates with said plate and is adapted to be energized and deenergized in correlation to the stitching movements of the sewing machine needle.

5. A monogramming or embroidering machine of the character described comprising a cabinet

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adapted to mount a sewing machine head; a board carried by and extending from said cabinet and provided with means for mounting thereon a monogram, design or emblem stencilled pattern or type block; a work holder adapted to be located and moved beneath the needle of the sewing machine head, a tracer device overlying said board, and a pantograph operative connection between said device and work holder whereby movement of said device in conformity with the monogram design or emblem outline on the stencilled pattern or type block is transmitted to said work holder and the same may be reproduced on the work; said board being slidably adjustable inwardly or outwardly relative to said cabinet, and said pantograph operative connection including means for adjusting the same to vary the ratio between the movements of the tracer device and the reproduced movements of the work holder, said cabinet and said board being provided with means operatively intercon-

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necting the same with said means for adjusting the pantograph operative connections whereby inward or outward adjustment of said board effects actuation of said adjusting means.

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