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MATTRESS BORDER SEWING AND EYELETTING MACHINE

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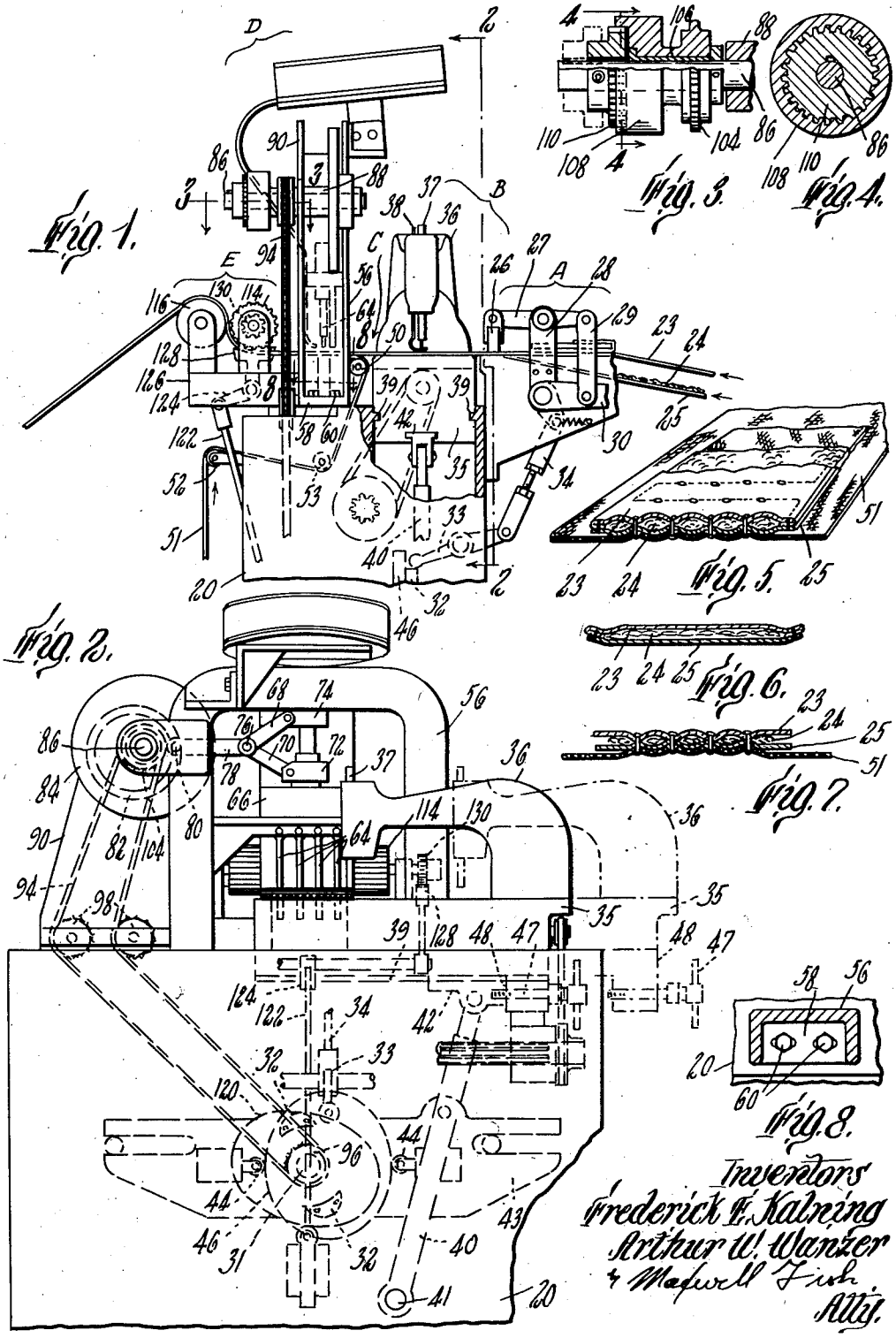


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

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MATTRESS BORDER SEWING AND EYELETTING MACHINE

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8 Claims. (Cl. 218—.5)

The present invention relates to a mattress border sewing and eyeletting machine.

It is an object of the invention to provide a novel and improved machine for sewing and eyeletting a mattress border, which is well adapted for the performance of these operations successively and continuously, in which the stitching will be placed uniformly on the border in accordance with a pattern, and in which the successively inserted eyelets will be accurately placed with relation to the stitching.

It is a further object of the invention to provide a novel arrangement of the several operating mechanisms in a mattress border sewing and eyeletting machine by which the machine is adapted for the performance of a number of different operations which include fastening the elements of the border together by sewing or eyeletting only, and the feeding of a backing strip into the machine in position to be secured to the previously assembled stitched cover and filler elements of the border by eyeletting only.

With these and other objects in view as may hereinafter appear a feature of the invention consists in the provision of means for synchronizing the operation of the several operating mechanisms of the machine for the simultaneous performance of the successive sewing and eyeletting operations, including means for adjusting the position of successively inserted groups of eyelets to coincide with the lines of stitching in the pattern produced by the sewing mechanism.

Other features of the invention consist in the novel construction and arrangement of the several mechanisms and of their operating parts for carrying out the several objects of the invention as hereinafter more fully set forth.

The several features of the invention will be readily understood by one skilled in the art from the following description taken in connection with the accompanying drawings; in which:

Fig. 1 is a view in side elevation of a mattress border sewing and eyeletting machine embodying therein the several features of the invention;

Fig. 2 is an end view taken on a line 2—2 of Fig. 1 illustrating substantially parts shown in Fig. 1, but with border folding mechanism removed;

Fig. 3 is a detail sectional plan view taken on a line 3—3 of Fig. 1 illustrating a means for shifting the timing of the eyeletting mechanism with relation to the sewing mechanism;

Fig. 4 is a detail sectional view taken on a line 4—4 of Fig. 3;

Fig. 5 is a perspective view of a portion of the border which is both stitched and eyeletted in accordance with the invention;

Fig. 6 is a transverse sectional view of a portion of a border stitched only by the machine of Figs. 1 and 2;

Fig. 7 is a detailed sectional view of the border eyeletted only by the machine of Fig. 1; and

Fig. 8 is a detail sectional plan view taken on line 8—8 of Fig. 1 showing particularly the adjustable mount for the eyeletting machine.

Referring particularly to the drawings the illustrated border sewing and eyeletting machine comprises a base 20, on which are mounted a border assembling device A, a sewing mechanism B, a backing strip feeding device C, an eyeletting mechanism D, and a border feed mechanism E. The border assembling device A may be of ordinary description and consists of guiding devices, not specifically shown, for guiding a border cover strip 23 into position with relation to a similarly guided filler strip 24 having attached thereto an inside backing strip 25, the edges of the cover strip being folded under and creased preparatory for the sewing of the cover strip and filler strip together. There is also associated with the border assembling device a presser bar 26 which is moved into and out of pressing engagement with the assembled border strip in timed relation with the stepped feeding movement imparted to the assembled border by the intermittent or stepped feeding movement of the border feed mechanism E.

The presser bar 26 as shown in Fig. 1 is mounted on a horizontally disposed arm 27 pivoted intermediate its length on a vertically disposed bracket 28. A vertical link 29 connected to the other end of the lever 27 is connected at its lower end to a hand lever 30. The presser bar 26 is raised and lowered automatically in timed relation with the operation of the border feeding mechanism by means of connections including a cam follower and a cam mounted on a main drive shaft 31 of the machine. These connections include a cam 32 on the shaft 31, a follower lever 33, and a link 34 connecting the lever 33 with arm 30 above described.

The sewing mechanism which may be of any well known type as for example a lock stitch machine adapted for sewing together an upper and a locking thread having a looper, not shown, a base 35, and an overarm 36 in which are mounted a reciprocating eye needle 37 and presser foot bar 38. Inasmuch as the sewing mechanism is well known in the art and forms specifically no part of the invention no further description thereof is believed necessary.

The sewing mechanism including base 35 with its overarm 36 is supported for sliding movement in a direction transverse to the border feed on ways 39 supported by the base 20 (see Fig. 1). The transverse positioning movements imparted to the sewing mechanism are synchronized, as hereinafter more fully set forth, with relation to a stepped feeding movement of the assembled border to cause the sewing mechanism to sew a zig-zag stitch, which includes a first line of stitching extending across the width of the border, which is produced by a transverse movement of the sewing mechanism during a dwell of the stepped feed, then a line of stitching extending for a short distance along one edge of the border, which is produced by a feeding movement of the border while the sewing mechanism remains stationary, thereafter a second transverse line of stitching extending across the fabric in the opposite direction produced by the return transverse movement of the sewing mechanism during another dwell period of the border stepped feed, then a short line of stitching extending longitudinally along the other edge of the fabric produced by a further stepped feeding movement of the border while the sewing mechanism remains stationary in the starting full-line position of the sewing mechanism at the right hand end of its feed.

The mechanism by means of which the sewing mechanism is shifted transversely to form the transverse lines of stitching on the border comprises a cam actuated lever 40 pivoted at its lower end at 41 in the machine base 20, and at its upper end connected to a slidably supported driver 42. Intermediate its length the lever 41 is con-

nected to a transversely movable slide 43 which has mounted thereon follower members 44 which engage against opposite sides of a cam 46 on the main drive shaft 31 of the machine. As best shown in Fig. 2 the driver 42 is normally connected to the base of the sewing mechanism by means of a locking screw 47 which is mounted in a downwardly extending lug 48 on the base 35 of the sewing mechanism, and is arranged for screw threaded engagement with a tapped bore in the slide 42. The sewing mechanism is shown in dotted lines in its disconnected inoperative position (see Fig. 2) in which the sewing mechanism is out of operation so that the parts of the border will be fastened together only by means of the eyeletting mechanism.

The illustrated machine is provided with a backing strip feeding device C which consists of a roller 50 mounted adjacent to the left side of the sewing mechanism B as shown in Fig. 1 to guide a backing strip of material against the underside of the assembled border as it leaves the sewing mechanism. The backing strip generally indicated at 51 is drawn from a supply source, not shown, over an idler roller 52, thence around an idler roll 53 to the roller 50 from which it is drawn by the operation of the border feed mechanism, hereinafter more fully described, with the assembled border through the eyeletting mechanism of the machine.

The eyeletting mechanism D provided with the present machine comprises a U-shaped frame 56 having a base member 58 (see Fig. 1), which is mounted for a limited adjustment in the direction of feed of the border by means of clamping screws 60 (see Fig. 8) which pass through oval slots formed in the base member 58 of the eyeletting mechanism frame and are screw threaded into underlying portions of the machine base 20.

The eyeletting mechanism consists specifically of a battery of four eyelet inserting punch members 64, each comprising an upper punch member and an underlying die member, not specifically here shown. The punch member 64 is suspended from a vertically movable press 66 and is adapted to be acted upon by means of a pair of toggle links 68 and 70, one arm of which is connected to a collar 72 movable with the press 66, and the other arm of which is connected to a fixed bracket 74 in the upper portion of the eyeletting frame 56. The central pivot 76 of the toggle links 68, 70 is connected with one end of a slide 78, the other end of which is provided with a follower roll 80 which rides in a closed cam track 82 forming one face of a cam disk 84 fixedly secured on a cam shaft 86 for the eyeletting mechanism. The cam shaft 86 is mounted from the U-shaped frame 56 in a bearing 88 (see Figs. 1 and 3), carried on a vertically disposed bracket 90 mounted integrally with the U-shaped frame 56, and is driven from the main cam shaft 31 in the base 20 of the machine through a sprocket chain 94 which passes around a sprocket 96 on the shaft 31 around idler pulleys 98 mounted on the lower end of bracket 90 and thence around a sprocket 104 which is mounted loosely to turn on a bearing sleeve 106 on the shaft 86. The sprocket 104 is normally connected to drive the shaft 86 by means of a gear type clutch consisting of a member 108 formed integrally with the sprocket 104 and having formed in one face thereof internal gear teeth which are intermeshed with teeth on a cooperating clutch member 110 which is slidably mounted upon and keyed to turn with the shaft 86. With this arrangement the operator has merely to slide the clutch member 110 to the left from the position shown in Fig. 3 to disengage the drive to the shaft 86, and thus to render the eyeletting mechanism inoperative.

The border feed mechanism E of the machine comprises a pair of nip rollers 114, 116 which are mounted in horizontal parallel relation so that the border passing through the eyeletting mechanism passes under roller 114 which is preferably provided with a serrated gripping surface, thence upwardly through the nip of rollers 114, 116,

is given a partial wrap around the roller 116, and is wound on a beam, not here shown. A stepped feeding movement is imparted to the serrated roller 114 through connections from the main cam shaft 31 in the base 20 of the machine which include an eccentric 120 on shaft 31 connected by an upwardly extending link 122 with a bell crank 124 pivoted on a stationary bracket 126, the second arm of the bell crank being provided with a gear segment 128 which meshes during the rocking movement in one direction with a pinion 130 fixed to one end of roller 114. The arrangement of these parts is such that rocking movement of the bell crank 124 in one direction acts to impart a rocking movement to roller 114, the return movement being utilized only to reset the mechanism for the next stepped advance.

The operation of the mattress border sewing and eyeletting machine may be briefly described as follows:

The parts of the border, including the facing strip 23, filler strip 24, and an inside backing strip 25 are drawn by the feeding mechanism E through the border assembly device A which, as above noted, may be of ordinary description and acts to position the filler and coarse backing strip with relation to the facing strip and, at the same time, to form folds in the edges of the facing strip. A stepped feeding movement is imparted to the assembled border through the machine by means of the feed mechanism comprising nip rollers 114 and 116 which are intermittently advanced by the reciprocating movement of the cam actuated pawl lever 124. During each dwell period the border presser bar 26 is held down against the material to maintain portions of the assembled border extending through the sewing and eyeletting mechanism in a stretched out taut position. The presser bar 26 is raised in timed relation with each stepped feeding movement of the rollers 114 and 116 to release the border which is then permitted to advance one step with the rollers 114, 116. During each successive dwell movement of the feed the sewing mechanism will move transversely across the border from one side thereof to the other, while at the same time the eyeletting mechanism is caused to insert a group of four eyelets in an already stitched portion of the border passing through the eyeletting station D. Thereafter, as the feed rolls 114, 116 located at the border feed station E are rotated by the action of the cam actuated bell crank 124 imparting a stepped feeding movement to the border, the punch members 64 are raised preparatory for the insertion of a new set of eyelets. At this time the sewing mechanism is maintained in one of its two limiting positions so that as the border is advanced a line of stitching is produced along the border edge.

Provision is made for adjusting the position of the eyeletting mechanism with relation to the sewing mechanism along the line of border feed to cause each row of eyelets to be placed in an exactly predetermined position with relation to the pattern formed by the lines of stitching produced by the sewing mechanism. In the preferred form of the invention shown a row of eyelets is placed exactly over each successive transverse row of stitching which is for this purpose positioned directly under the punch members with each advance of the border feed. This adjustment in the position of the eyeletting mechanism is effected at the start of the operation by backing off the clamping screws 60, 60 and then by adjusting the eyeletting mechanism to exactly the desired position. The screws 60, 60 are tightened down. It is usually not necessary thereafter to change this adjustment of the position of the eyeletting mechanism during the operation of the machine.

A thin backing material 51 is introduced at station C between the sewing and eyelet inseting mechanisms so that this thin backing is not stitched into the fabric, being held only by the eyelets inserted at the eyeletting station D. With this arrangement in which the thin backing material is secured to the assembled parts of the border by

the eyelets only which are spaced inwardly from the edges of the border, spaces are provided between the edges of the filler and the thin backing material **51** which will facilitate the fastening of the backing material into the mattress, and the positioning of the assembled portions of the border for fastening.

The illustrated machine may be set up to operate in a number of different ways. It may, for example, be desired to manufacture a border which is held together by sewing only. In this event it is necessary only to disconnect the clutch member **108** from its cooperating clutch member **110** to render the eyeletting mechanism inoperative. When the eyeletting mechanism is disconnected the feed of the backing strip **51** at station C also will be discontinued.

In the event that a border is to be produced which is held together by eyelets only the sewing mechanism is disconnected. To this end locking screw **47** is backed off thus disconnecting the base of the sewing machine from the slide **42**. The sewing mechanism is then moved to the right to the dotted line position shown in Fig. 2. A border produced in this manner may include the facing material and filling material, and if so desired, the outside backing material **51** which is introduced at station C. When the border is produced in this manner the facing strip may be folded in the manner above described by the border assembling mechanism at station A which causes the edges of the border facing strip to be folded over and creased. In the event that a more positive control of the fold of the edge of the border facing strip is required the edges may be pinned down either by stitching or by the use of suitable ironing devices.

The invention having been described what is claimed is:

1. A mattress border sewing and eyeletting machine having, in combination, a border assembling device through which elements of the border are assembled and drawn into the machine, a stepped feeding mechanism having alternate dwell and feed periods to engage and to draw the assembled border from the machine, a border sewing mechanism disposed with relation to the assembled border drawn from the assembling device for sewing together said assembled border and including means acting in timed relation to said stepped feeding mechanism for traversing the sewing mechanism during a dwell portion of said feed to insert a transverse row of stitches from one side to the other of the border, and a border eyeletting mechanism synchronized with relation to said stepped feeding mechanism to insert eyelets in a portion of the border extending from the sewing mechanism to said stepped feed mechanism during a dwell period of said stepped feeding mechanism.

2. A mattress border sewing and eyeletting machine having, in combination, a border assembling device through which elements of the border are assembled and drawn into the machine, a stepped feeding mechanism having alternate dwell and feed periods to engage and to draw the assembled border from the machine, a border sewing mechanism disposed with relation to the assembled border drawn from the assembling device for sewing together said assembled border, including means for traversing the sewing mechanism to insert a transverse row of stitches from one side to the other of the border, a border eyeletting mechanism disposed to insert eyelets in a portion of the border extending from the sewing mechanism to said stepped feed mechanism, and means for driving each of said mechanisms in synchronism for effecting the transverse movement of the sewing mechanism and an operation of said eyeletting mechanism during each successive dwell of said stepped feed.

3. A mattress border sewing and eyeletting machine having, in combination, a border assembling device through which elements of the border are assembled and drawn into the machine, a stepped feeding mechanism having alternate dwell and feed periods to engage and

to draw the assembled border from the machine, a border sewing mechanism disposed with relation to the assembled border drawn from the assembling device for sewing together said assembled border, means acting in timed relation to said stepped feeding mechanism for traversing the sewing mechanism during a dwell portion of said feed to insert a transverse row of stitches from one side to the other of the border, a border eyeletting mechanism synchronized with relation to said stepped feeding mechanism to insert eyelets in a portion of the border extending from the sewing mechanism to said stepped feed mechanism during a dwell period of said stepped feeding mechanism, and means for adjusting relatively the positions of the sewing mechanism and eyeletting mechanism one from the other in the direction of feed.

4. A matteress border sewing and eyeletting machine according to claim 3 in which the position of the sewing mechanism is fixed in the direction of feed, and releasable means are provided to permit adjustment of and to secure the position of the eyeletting mechanism toward and away from the sewing mechanism in the line of feed.

5. A mattress border sewing and eyeletting machine having, in combination, a border assembling device through which elements of the border including a filler strip and a facing strip are assembled and drawn into the machine, a stepped feeding mechanism having alternate dwell and feed periods to engage and draw the assembled border from the machine, a border sewing mechanism disposed with relation to the assembled border drawn from the assembling device for sewing together said assembled border, a border eyeletting mechanism disposed to insert eyelets in a portion of the border extending from the sewing mechanism to said stepped feed mechanism, and means for guiding an additional backing strip against the backside of the assembled border after the assembled border has been sewn and before it reaches the eyeletting mechanism.

6. A mattress border sewing and eyeletting machine having, in combination, a border assembling and facing strip edge folding device through which elements of the border including a filler strip and a facing strip are assembled and drawn into the machine, a stepped feeding mechanism having alternate dwell and feed periods to engage and draw the assembled border from the machine, a border sewing mechanism disposed with relation to the assembled border drawn from the assembling device for sewing together said assembled border including the folded facing strip edge including means for traversing the sewing mechanism to insert a transverse row of stitches from one side to the other of the border, a border eyeletting mechanism disposed to insert eyelets placed inwardly from the edge of a portion of the border extending from the sewing mechanism to the stepped feed mechanism, and means for guiding an additional backing strip against the backside of the assembled border after the assembled border has been sewn and before it reaches the eyeletting mechanism.

7. A mattress border sewing and eyeletting machine having, in combination, a border assembling device through which elements of the border are assembled and drawn into the machine, a stepped feeding mechanism having alternate dwell and feed periods to engage and draw the assembled border from the machine, a border sewing mechanism disposed with relation to the assembled border drawn from the assembling device for securing together said assembled border, a border eyeletting mechanism disposed to insert eyelets in the portion of the border extending in the sewing mechanism to said stepped feed mechanism, means for driving each of said mechanisms in synchronism whereby the operation of both the sewing and eyeletting mechanism is timed to said stepped feed mechanism, and means acting when rendered operative to disconnect the eyeletting mechanism from said drive.

8. A mattress border sewing and eyeletting machine

having, in combination, a border assembling device through which elements of the border are assembled and drawn into the machine, a stepped feeding mechanism having alternate dwell and feed periods to engage and draw the assembled border from the machine, a border sewing mechanism disclosed with relation to the assembled border drawn from the assembling device for securing together said assembled border, a border eyeletting mechanism disposed to insert eyelets in the portion of the

border extending in the sewing mechanism to said stepped feed mechanism, means for driving each of said mechanisms, in synchronism whereby the operation of both the sewing and eyeletting mechanism is timed to said stepped feed mechanism, and means acting when rendered operative to disconnect the sewing mechanism from said drive.

No references cited.