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Cash

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[45] **Sept. 24, 1974**

[54] **DUAL HEAD BORDER PANEL MANUFACTURING MACHINE**

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[73] Assignee: **James Cash Machine Co.,** Louisville, Ky.

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[52] **U.S. Cl.** **112/3**

[51] **Int. Cl.** **D05b 11/00**

[58] **Field of Search** 112/3, 121.11, 121.14, 112/121.27, 117

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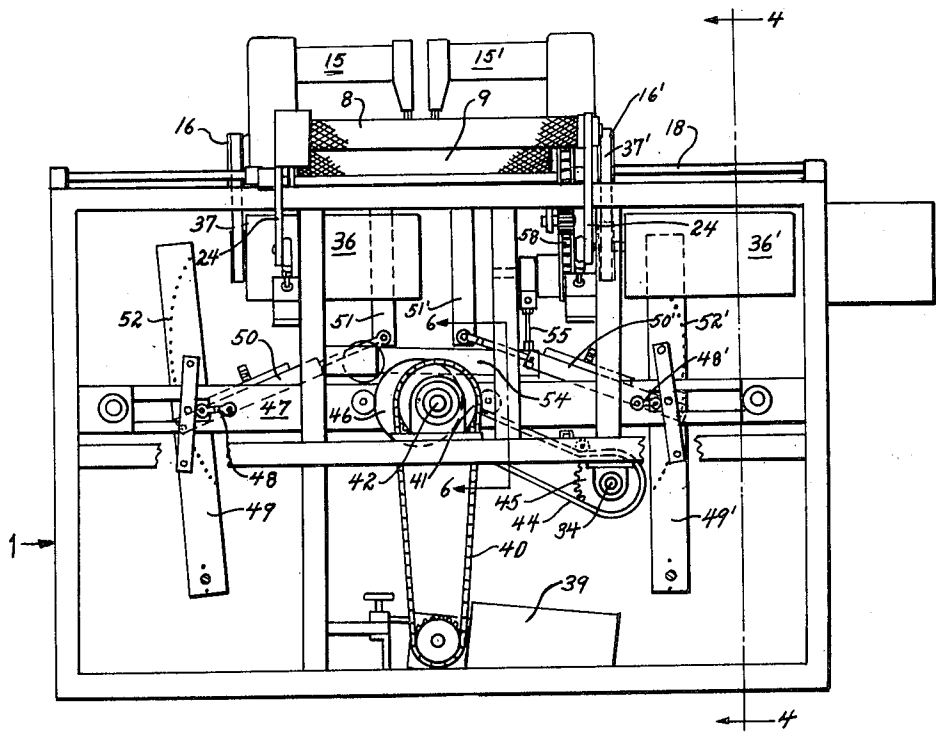
Primary Examiner—Alfred R. Guest
Attorney, Agent, or Firm—Arthur F. Robert

[57] **ABSTRACT**

A border panel manufacturing machine having 1st and 2nd sewing heads mounted for contemporaneous transverse right and left movement over cross traverses, each of which is horizontally planar, straight and relatively adjustable in size. In one case, the 1st head sews along a conventional square cut zigzag path extending completely across a 1st strip-like border panel component assembly of full width while the 2nd head sews along a similar square cut path extending completely across a 2nd completely separate border component panel assembly, the full width of which is the same as or different from the full width of the 1st panel assembly. In another case, both heads sew along similar square cut zigzag paths respectively extending completely across the width of separate "left" and "right" halves of one border panel component assembly while both heads cooperate with each other to sew, to said separate left and right halves, the left and right borders or flanges of a zipper strip arranged between them. This procedure integrates said panel assemblies into one single border panel having a centrally disposed zipper. Naturally, either head of the machine can also be used to sew a single border panel assembly while the other head remains idle.

Provision is also made: to clamp the work or unclamp it contemporaneously on both front and rear sides of the sewing zone and to clamp it only on the front side when desired; and to adjust the size and the position of each sewing head reciprocation independently of the other.

6 Claims, 15 Drawing Figures



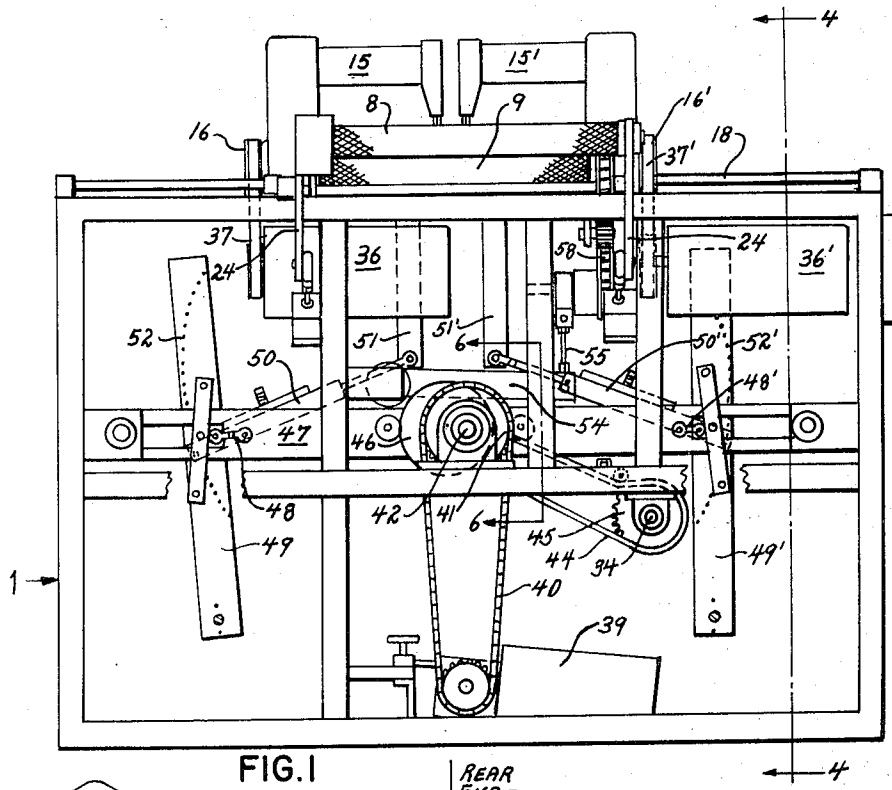


FIG. 1

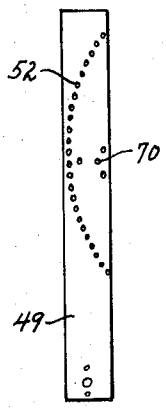


FIG. 1B

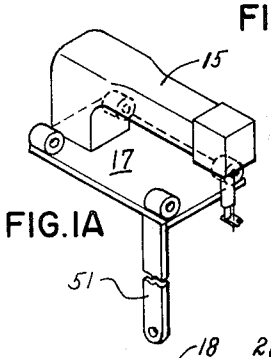


FIG. 1A

FIG. 2

FIG. 2A

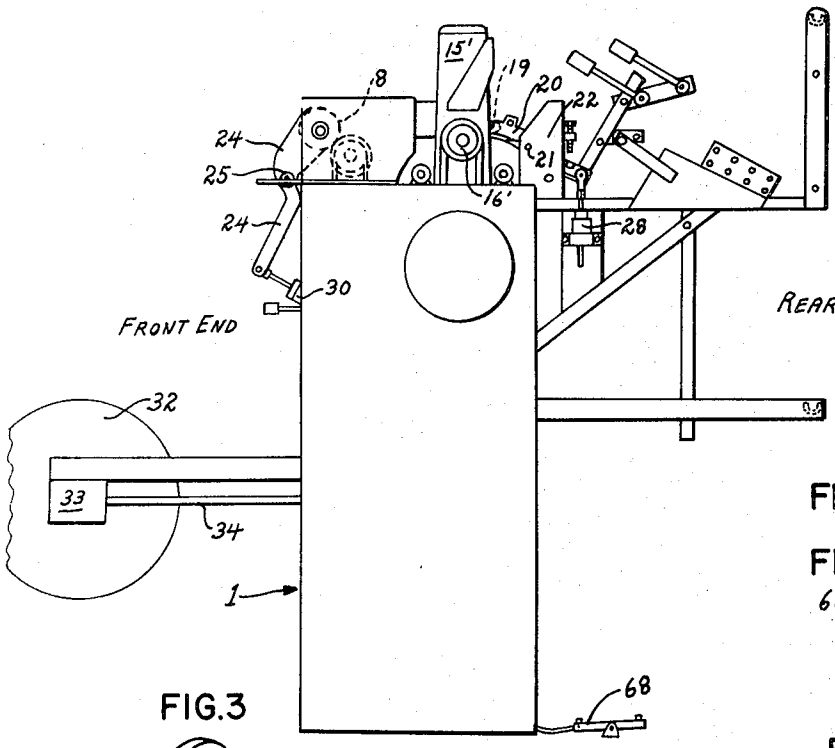


FIG.3

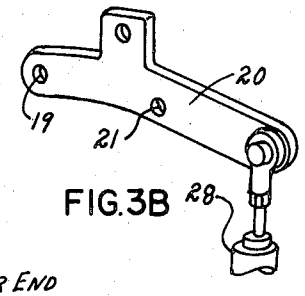


FIG.3B

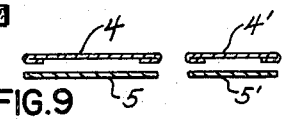


FIG.9

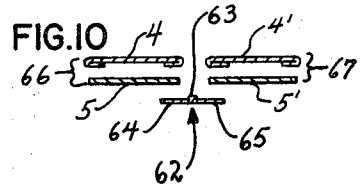


FIG.10

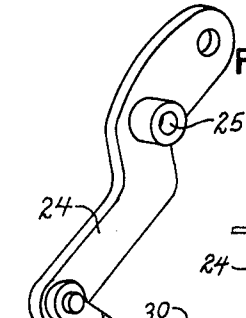


FIG.3A

FIG.4

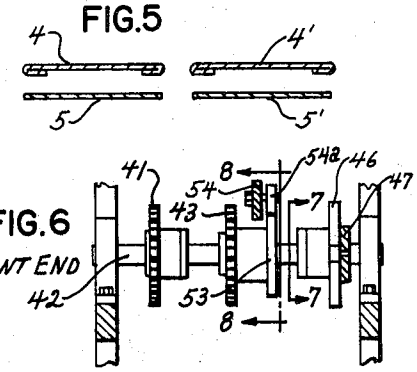


FIG.5

FIG.6

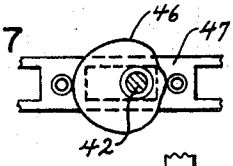


FIG.7

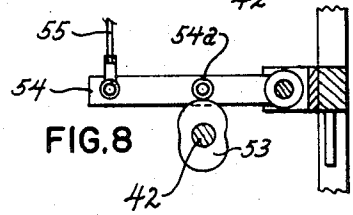


FIG.8

DUAL HEAD BORDER PANEL MANUFACTURING MACHINE

BACKGROUND OF THE INVENTION

1. Field Of The Invention

This invention relates to machines for manufacturing border panels, which encircle the periphery of a mattress and are sewn to the top and bottom face panels of the mattress to form an envelope completely enclosing the mattress.

2. Description Of The Prior Art

Border panel manufacturing machines are old, see Jas. A. Cash U.S. Pat. No. 3,371,630 granted Mar. 5, 1968. It is old to provide two heads for simultaneously sewing hems into the opposite long outer margins of a single border panel. The relative positions of the heads are adjustable to accommodate panels of different widths but the position of each head is fixed during each hemming operation.

The Bell U.S. Pat. No. 2,611,910 shows an elongate zipper centrally mounted upon a border panel composed of one layer of fabric. The Marsico U.S. Pat. No. 3,287,749 granted Nov. 29, 1966 shows an elongate zipper mounted on an elongate border panel composed of multilayers or components wherein the manufacturing process comprises: providing a 1st border panel component assembly of fractional width; similarly providing a 2nd border panel component assembly of fractional width; sewing the 1st assembly to form the "left half" of a given border panel of full width; sewing the 2nd assembly to form the "right half" of the same border panel of full width; and thereafter sewing one elongate half of a zipper into the left half of the given panel and separately sewing the other elongate half of the zipper into the right half of said panel

SUMMARY OF THE INVENTION

Objects Of The Invention

The principal object of the present invention is to provide a flexible border panel manufacturing machine which, in one operation, is capable of simultaneously sewing together the strip-like component assemblies of two different border panels of the same or different full widths and which, in another operation, is capable not only of sewing two separate border panel component assemblies of half width (or appropriate fractional widths) into one integrated border panel of full width but also of simultaneously sewing into the respective halves (or fractions) of that border panel component assembly a centered (or off-centered) closed zipper strip arranged between them.

Another important object is to provide a flexible border panel manufacturing machine of higher capacity and of simple design, which is easy to make, assemble, operate and maintain and the parts of which are more accessible for repair and maintenance purposes.

statement Of The Invention

The principal object of the present invention can be readily achieved by widening the machine to receive two side-by-side panel component assemblies of full width; providing the machine with two sewing heads separately mounted for transverse reciprocating movement; providing drive means for continuously operating the sewing mechanisms while intermittently feeding both panel assemblies and intermittently reciprocating

the heads transversely with dwell periods between transverse strokes; and arranging each head so that the outer limit of its reciprocating movement can be lengthened or shortened without affecting the inner limit thereof. With two heads operating on two separate border panel component assemblies, each of full width, the production capacity of the machine is doubled. The independent adjustment of the outer limit of the outward stroke of each head enables one head to be adjusted to sew a 1st panel component assembly of one width while the other head is adjusted to sew a 2nd panel component assembly of the same width or of a different width.

Other important objects of the invention are accomplished by providing two or more fabric strips forming the superposed components of a 1st panel assembly of fractional width; similarly providing a 2nd strip forming a 2nd panel component assembly of the same or different fractional width; intermittently feeding said 1st and 2nd assemblies simultaneously through the machine in slightly spaced side-by-side relationship; contemporaneously feeding a 3rd strip, in the form of a closed zipper strip, between the 1st and 2nd panel component assemblies with the flanges of the closed zipper strip lapping the adjacent margins of said 1st and 2nd assemblies; continuously sewing the components of each assembly transversely together during each transverse head-reciprocating, non-feeding period and longitudinally together during each head-dwelling, longitudinal-feeding period; sewing the 1st flange of the closed zipper strip longitudinally to the inner margin of the 1st panel assembly during one longitudinal-feeding period, which occurs when both heads dwell following the end of each rightward stroke; and sewing the 2nd flange of the closed zipper strip longitudinally to the inner margin of the 2nd panel assembly during the next longitudinal feeding movement, which occurs when both heads dwell following the end of each leftward stroke. In this manner, the zipper is sewn to the border panel product contemporaneously with the sewing of the components of each half of that assembly. This practice avoids the necessity for an earlier or later independent sewing operation for zipper mounting or securing purposes.

BRIEF DESCRIPTION OF THE DRAWINGS

The preferred embodiment of my invention is illustrated in the accompanying drawings, wherein:

FIG. 1 is a front elevational view which omits the windup reel;

FIG. 1A is a partly broken perspective view of the "left" sewing head and its mounting plate which are shown on the left side of FIGS. 1 and 2;

FIG. 1B is a front elevational view of the reciprocating drive oscillating arm shown on the left side of FIG. 1;

FIG. 2 is a top plan view of the machine as it appears in FIG. 1;

FIG. 2A is a fragmentary perspective view of the indexing mechanism controlling the intermittent movement of the lower feed roll;

FIG. 3 is an elevational view of the right side of the machine as seen in FIGS. 1 and 2;

FIGS. 3A and 3B are perspective views of the front and rear declining arms respectively used in the front and rear border panel clamping means.

FIG. 4 is a view similar to FIG. 3 but corresponding generally to one taken along line 4—4 of FIG. 1;

FIG. 5 is an exploded cross-sectional view of two full width border panel component assemblies arranged in side-by-side relationship;

FIG. 6 is a fragmentary view corresponding generally to one taken along line 6—6 of FIG. 1 but omitting certain details such as the chains seen in FIGS. 1 and 4;

FIG. 7 is a fragmentary view corresponding generally to one taken along line 7—7 of FIG. 6 at the extreme limit of leftward reciprocation;

FIG. 8 is a fragmentary view corresponding generally to one taken along line 8—8 of FIG. 6;

FIG. 9 is an exploded cross-sectional view of two border panel component assemblies, of different full widths, arranged in side-by-side relationship; and

FIG. 10 is an exploded cross-sectional view of two half width component assemblies for one full width border panel plus a strip of closed zipper material.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment comprises elements A–I which include conventional structure of conventional operation and inventive structure.

Conventional Structure

The conventional content of elements A–I may be stated broadly as comprising: A. a base; B. work supply means; C. work feed means; D. work tensioning means; E. work sewing means; F. work clamping means; G. clamp operating means; H. work-product-receiving means; and I. drive means.

A. Base

The base **1**, over which the work moves longitudinally forward in a direction proceeding from the rear end of the base toward the front end thereof, comprises: a box-like sheet metal housing; and any suitable form of skeletonized structural frame enclosed therein.

B. Work Supply Means

The work supply means, which is spaced rearwardly from the rear end of the base **1** and suitably mounted preferably on a rearward extension of the base **1**, includes: a supply roll of ticking **4**; a supply roll of wadding **5**; and, in some cases, a supply roll of scrim or backing (not shown). The supply rolls are not shown. The ticking **4** and wadding **5** are best seen on the left side of FIG. **5**.

C. Work Feed Means

The work feed means is located over the front end portion of the base and functions to pull the work from the rear supply rolls forwardly over the base **1** through a sewing zone between the rear end of the base and the work feed means. The work feed means comprises: an upper driven roll **8**; and a lower drive roll **9** geared at one end to the upper roll **8** and carrying a drive gear **10** on its opposite end.

D. Work Tensioning Means

The work tensioning means, which is mounted on the base **1** and its rearward extension, comprises a suitable zigzag arrangement of rearmost and intermediate friction bars **12** and **13** for the ticking. These bars are located between the rear supply roll of ticking **4** and the sewing heads. The wadding is not tensioned. The backing scrim may be tensioned but often is not.

E. Work Sewing Means

A sewing machine or head **15**, which is located on the top of base **1** between the rear end thereof and the work feed rolls, has a head frame and a base frame with a sewing zone therebetween, a drive pulley **16**, a sewing needle which is supported above the work for vertical reciprocation through the work and a cooperating thread-locking means (not shown) supported in the sewing machine base over which the work travels. The sewing machine **15** is mounted on a plate **17**, which is slidably supported on front and rear transverse rods **18**, carried by the base, for right and left reciprocating movement.

F. Work Clamping Means

During all feed and non-feed intervals, the work is clamped on the rear side of the sewing zone, by a transverse clamping bar **19**, and on the front side of the sewing zone, by the feed rolls **8, 9.**

The work is unclamped for threading and other purposes by mounting the front and rear clamping means for translational down and up movement bodily into and out of clamping position. The rear clamping bar **19** is rotationally carried at opposite ends by the upper ends of rearwardly declining rear arms **20** which are pivoted midway at **21** to upright brackets **22** on the base **1.** The upper feed roll **8** is carried at opposite ends by the upper ends of a pair of forwardly declining front arms **24** which are pivoted at their mid-points **25** to the base **1.**

G. Clamping Operating Means

For clamp arm operating purposes, the opposite lower ends of the rearwardly declining rear arms **20** are connected to the pistons of a pair of rear base-mounted air cylinders **28.** The opposite lower ends of the forwardly declining front arms **24** are connected to the pistons of a pair of front base-mounted air cylinders **30.** It is conventional to spring-bias the cylinders **28** and **30** in the down direction to release the work for threading and other purposes and air-energize them in the up direction to force the feed roll **8** and the clamping bar **19** downwardly to clamp the work for feeding purposes. The flow of air to the cylinders from a suitable compressed air source is controlled by foot pedal **68.**

H. Work-Product-Receiving Means

The work-product-receiving means is in the form of a power driven windup reel **32** (FIGS. **3–4**) carried by a rotational cross-shaft, which is mounted on a forward extension of the base **1.** This cross-shaft (with reel **32**) is conventionally driven through a slip clutch **33** and a longitudinal drive shaft **34.**

I. Drive Means

The preferred drive means comprises: independent drive means for the sewing machine; and a common drive means (a) for reciprocating the sewing assembly (i.e., head **15,** pulley **16** and slidable mounting plate **17**) with a dwell period at the end of each stroke, (b) for indexing the feed rolls **8, 9** rotationally during each dwell period and (c) for continuously rotating the windup reel drive shaft **34.**

The independent sewing machine drive, which continuously operates the needle and thread-locking means of the sewing machine **15,** comprises: a continuously operating electric motor **36** rigidly mounted to depend from the underside of slidable plate **17,** which bodily carries the motor **36** for reciprocating movement as a part of the head-pulley-plate assembly **15–17;** and a belt **37** connecting the drive pulley of the motor **36** to the drive pulley **16** of the sewing machine **15.**

The common drive means for the reciprocating, feeding and windup functions includes a continuously rotat-

ing base-mounted motor **39** (see FIG. **1**) connected on the front side of the machine by vertical sprocket chain **40** and sprocket **41** to drive a base-mounted main drive shaft **42** extending longitudinally through the machine.

The windup reel **32** is driven from shaft **42** and its sprocket **43** through a sprocket chain **44** which connects sprocket **43** to a sprocket **45** on the reel drive shaft **34.** This drive is continuous except for the slippage operation of the slip clutch **33.**

The sewing machine is reciprocated intermittently by a main drive train interconnecting the main drive shaft **42** with the reciprocatable plate **17,** on which the sewing machine is mounted. As seen in FIGS. **1** and **7,** this main drive train includes: a main cam **46** on the front end portion of the main shaft **42;** a horizontally-slidable main bar **47** reciprocated by the main cam **46,** which is shaped to provide a dwell period at the end of each stroke; a short link **48** connecting the main reciprocating bar **47** to an upright base-mounted oscillatable arm **49,** the lower end of which is pivoted to the base; and a longer inclined link **50** interconnecting the oscillating arm (at an upper point along its length) with the lower end of a vertical post **51,** the upper end of which is rigidly secured to said slidable plate **17** for plate reciprocating purposes.

The oscillatable arm **49** is provided with a long series of perforations **52** spaced along its length to receive the connection between arm **49** and the adjacent end of the inclined long link **50** for stroke length adjusting purposes. As that connection is raised, its horizontal arc of travel increases for the same fixed angle of arm **49** oscillation; hence, the length of the horizontal stroke it imparts to arm **51** and, through arm **51,** to the sewing head/plate assembly **15–17** increases. With this increase, the inner limit of the sewing head stroke moves inwardly toward the CVL plane while the outer limit moves outwardly from that plane.

It is obviously desirable to hold the inner limit of that reciprocation at a substantially fixed location. To this end, the perforations **52,** on "left" arm **49,** are located along a vertical arc which, as the connection between arm **49** and long link **50** rises, shifts that connection "leftward," as seen in FIG. **1.** The size of this leftward shift is made sufficient to shift the reciprocation as a whole "leftward" to the degree necessary to hold the inner limit of the reciprocation at its original position. In other words, sewing head **15**'s leftward shift of the inner limit of its leftward stroke is held at zero while the leftward shift of the outer limit of its rightward stroke is doubled over what it would be without any such stroke-length adjustment.

The work feed means is operated intermittently by a drive train interconnecting the main drive shaft **42** with the lower drive roll **9** of the work feed means. This drive train includes: a cam **53** on a mid-portion of the main drive shaft **42** between cam **46** and sprocket **43** of the front reciprocating drive and the central windup drive; a horizontal arm **54** pivoted to the base and provided midway of its length with a follower in the form of a roller **54a** resting on top of cam **53** to be oscillated thereby; a vertical reciprocating link **55** on the outer end of oscillating arm **54,** and an indexing connection, (including horizontal arm **56** interconnecting the upper end of link **55** with a horizontal shaft **57,**) which is so arranged as to turn shaft **57,** during the upward stroke of vertically reciprocating link **55** and leave it remain stationary during the next downward stroke; a gear **58** on intermittently rotated horizontal shaft **57;** and a chain **59** interconnecting the intermittently rotated gear **58** with drive gear **10** on one end of lower drive roll **9,** the other end of which is geared to upper drive roll **8.**

Conventional Operation

The machine is **1**st loaded with a supply of full width materials required for the manufacture of one zipperless full width panel product, these materials, including ticking and wadding (and scrim, if used). The ticking is now threaded around the friction bars **12, 13** and all of these supply materials, assembled in close superposed relationship, constitute the starting work, or workpiece or **1**st unsewn panel strip. This workpiece is directed over the base **1** and under the rear rotatable clamping bar **19** which is raised, thence through the sewing zone and between the work feed rolls **8** and **9,** with the upper roll **8** raised and ultimately to the windup reel **32.**

When the rotatable clamping bar **19** and the upper feed roll **8** are lowered and drive motors **36** and **39** started, the machine will operate automatically through successive cycles, each of which embraces four intervals comprising: a **1**st non-feeding (or stroke) interval; a **1**st feeding (or dwell) interval; and repetitions thereof starting with a **2**nd non-feeding (or stroke) interval and a **2**nd feeding (or dwell) interval.

During the **1**st non-feeding or stroke interval, the work or workpiece is stationary while the work sewing machine is slidably moved transversely through one stroke of a **1**st reciprocation to sew one transverse line of stitching across the work. During the **1**st feeding or dwell interval, the continuously operating sewing machine dwells while the feed rolls turn to pull the work forward longitudinally through the sewing zone during which the sewing machine needle sews, say the outer long margin of the moving work, with one longitudinal line of stitching.

During the **2**nd stroke interval, the work is stationary while the sewing machine is slidably moved transversely through the return stroke of its aforesaid **1**st reciprocation to sew another transverse line of stitching across the work. During the **2**nd dwell interval, the continuously operating sewing machine dwells while the feed rolls rotate to pull the work forward longitudinally through the sewing zone during which the sewing machine needle sews, say the opposite or inner margin of the moving work, with the **2**nd longitudinal line of stitching.

During the foregoing cyclic operation, the windup reel **32** is operated continuously. When the flow of sewing material, from the machine to the windup reel, slows down or ceases, the slip clutch permits the windup reel to slow down or stop while the windup reel drive means continues to operate.

Inventive Structure

In accordance with one phase of my invention, the machine is modified in two basic respects, viz: A. it is provided with a duplicate set of border panel supply, sewing and windup means; and B. its base is transversely widened and appropriate transverse parts are transversely lengthened to accommodate the addition of the foregoing duplicate set of means so that the machine may contemporaneously supply, sew and wind up

two border panels of the same full width or of different full widths with such panels arranged in side-by-side relationship.

Looking at FIGS. **1, 2** and **5,** the duplicate border panel supply, sewing and windup means includes (on the "right" side of a centrally-disposed vertical, longitudinal plane, hereafter called the CVL plane,) supply rolls of ticking **4'** and wadding **5'** (and scrim, if used); a 2nd sewing head, drive pulley and mounting plate assembly **15', 16'** and **17'** arranged (on the right side of the CVL plane,) with the duplicate sewing head **15'** in endwise head-to-head allochiral relationship with the 1st sewing head **15** for contemporaneous right and left movement therewith; a 2nd windup reel (not shown) mounted on the same cross-shaft; a 2nd sewing machine drive motor **36'** and belt **37'** for the pulley **16'** of head **15'**; and a 2nd drive train interconnecting the main drive shaft **42** with the reciprocatable plate **17'**. This 2nd drive train includes: a short link **48'** connecting "right" oscillating arm **49'** with long link **50'**; and a vertical post **51'** connecting link **50'** with plate **17'**. The sewing heads are arranged in head-to-head relationship with their respective needle ends in opposed spaced relationship from opposite sides of the interposed CVL plane.

The transverse widening and lengthening variations required to accommodate the addition of the foregoing duplicate parts include: transversely widening base **1** and its rearward extension, which supports the rolls of ticking **4** and **4'** and wadding **5** and **5'** in side-by-side relationship; and transversely lengthening certain parts including the feed rolls **8** an **9,** the rear ticking friction bars **12** and **13,** the sewing machine slide bars **18,** the rear rotatable work-clamping bar **19** and the reciprocating main bar **47.**

The 2nd supply, sewing and windup means contemporaneously operates automatically through the same successive cycles as the 1st means; hence, each cycle embraces the aforesaid two stroke and two dwell intervals. In so operating, it can be used to manufacture (at the same time) two separate full width left and right panels of the same full width size as seen in FIG. **5** in which case production is doubled. It can also be used to make two full width panels of different full width sizes as seen in FIG. **9.**

The duplicate supply, sewing and windup means may also be used to supply and sew the "left" and "right" fractional width components of a single border panel of desired full width with a closed zipper strip contemporaneously fed into the sewing zone in position to bridge the gap between the overlap the top or bottom side of either the ticking or other component of the fabric assembly so as to be sewn to all components thereof in the sewing zone. The ticking and wadding components may be of the same fractional width or of different fractional widths.

To this end, a supply roll (not shown) of zipper strip material **62** is mounted on the base **1** and suitably directed through the machine with its zipper **63** closed. As shown in FIG. **10,** zipper strip **62** is positioned between the left and right fractional width components and with its left and right flanges **64** and **65** lapping the adjacent inner bottom-side margins of the wadding **5** and **5'**. With this arrangement, the left and right sewing machines **15, 15'** operate contemporaneously to sew (a) the longitudinal left-outer margin **66** and the left-inner margin of their respective panel components during each "left" dwell period and (b) the longitudinal right-inner margin and right-outer border margin **67** of their respective panel components during each "right" dwell period. In each of the alternate inner margin-sewing operations, the corresponding machine sews the corresponding flange of the closed zipper strip to the inner margin of the corresponding work or border panel component assembly. Thus, at the end of the left transverse-sewing stroke, the right machine **15'** sews the right flange **65** of the zipper strip **62** to the adjacent inner left margin of the panel on the right.

In accordance with a 2nd phase of my invention, the "left" halves of the FIGS. **1–2** slide bars **18** are extended leftwardly outward beyond the outermost limit of the leftward reciprocation of the left head-pulley-plate assembly **15–17,** a distance sufficient to permit the "left" assembly **15–17** to be shifted leftwardly along the bars **18** to an outer inoperative position (such as the one indicated by dotted lines at the left side of FIG. **2**) where it is readily accessible for maintenance and repair purposes without requiring the sewing machine to be bodily removed from the machine. This shift requires that post **51** of the left assembly first be disconnected from inclined arm **50.** The "right" halves of the slide bars **18** are similarly extended rightwardly for a similar distance so that, when post **51'** is disconnected from arm **50',** the right sewing machine assembly **15'–17'** may be shifted rightwardly to a corresponding inoperative position for corresponding maintenance and repair purposes.

In accordance with a 3rd phase of my invention, the rear cylinders **28** (FIG. **3**) are arranged to utilize spring pressure and unbalanced weight to force the rear clamping bar **19** up and pressurized air to force it down while the front cylinders **30** are double-acting air cylinders utilizing pressurized air for both movements with unbalanced weight supplementing the down movement of feed roll **8.** Furthermore, in controlling the operation of the rear and front cylinders **28, 30,** a seesaw pedal **68** (FIG. **3**) is arranged at the floor level of the rear end of the machine for movement to three stable positions, via: (**1**) rear-end-down to clamp work at rear and front; (**2**) neutral to clamp at front only; and (**3**) front-end-down to unclamp work at both front and rear.

The control is such that when the rear end of the pedal **68** is pushed down, pressurized air on both front and rear cylinders **28** and **30** press the clamping means down. In the neutral position of pedal **68,** the source air is cut off and the cylinders vented so that the front roller **8** remains down by unbalanced weight only whereas the rear clamping bar **19** is forced up by both spring pressure and unbalanced weight. When the front end of pedal **68** is forced down, air pressure forces the front feed roll **8** up while spring pressure and unbalanced weight hold the rear clamping bar **19** up. In other words, the clamping bar **19** is up in both the neutral and front-down positions of the pedal **68** while the front feed roller **8** is down in both the neutral and rear-down positions of the pedal **68.**

In accordance with a 4th phase of my invention, each oscillating arm **49** (**49'**) is provided with a short vertical arc of perforations **70** (**70'**) to receive the short links **48** (**48'**). The holes **70** are so located as to hold the lever **49** to a fixed "inner" position, which corresponds to a desired fixed inner limit of the sewing head **15.** Consequently, when the connection of link **48** to lever **49** is adjusted downwardly, the angle of oscilla-

tion of lever 49 is widened with a corresponding shift of the outermost position of the oscillating lever 49 to the left as seen in FIG. 1. This increase in the angle of oscillation of lever 49 effects a corresponding increase in the length of the stroke of the sewing head 15 from its fixed inner limit to a new outer limit. The foregoing changes on the "left" side of the machine, as seen in FIG. 1, are independent of the "right" side thereof which may be changed at the same time or at different times to the same extent, to different extents or not at all.

Having described my invention, I claim:

1. A mattress border panel manufacturing machine for use in sewing 1st and 2nd panel component assemblies into a single border panel having an interposed zipper strip composed of a zipper and 1st and 2nd flanges corresponding to said 1st and 2nd panel component assemblies, comprising:

A. a frame having longitudinally-spaced front and rear sides and transversely spaced ends;

B. feed means mounted adjacent the front side of the machine and operative, when actuated,

1. for simultaneously feeding said pair of 1st and 2nd border panel component assemblies longitudinally forward through the machine in spaced side-by-side relationship and

2. for contemporaneously feeding said zipper strip in a like forward manner with its zipper in the space between component assemblies and with its 1st and 2nd flanges lapping the adjacent inner margins of the corresponding 1st and 2nd panel component assemblies;

C. a pair of 1st and 2nd sewing heads, one head for each panel component assembly and its zipper strip flange;

D. means for separately mounting said 1st and 2nd sewing heads on the frame in endwise head-to-head relationship for transverse movement thereon, each head being arranged adjacent the path of its corresponding component assembly and in sewing relationship thereto;

E. head drive means for continuously operating both sewing heads; and

F. machine drive means for transversely reciprocating both heads contemporaneously in the same directional relationship during each stroke with a dwell period at the end of each stroke, and for actuating the feed means during each dwell period so as to sew the 1st and 2nd flanges to the adjacent inner margins of the corresponding 1st and 2nd panel component assemblies,

1. said machine drive means including means

a. for adjusting the length of one stroke independently of the other, and

b. for shifting the adjusted stroke transversely to maintain its inner limit at the same inner position.

2. The machine of claim 1 wherein:

A. said feed means include lower and upper feed rolls arranged on the front side of said sewing heads with the upper roll mounted for unbalanced weight movement downwardly toward the lower roll for feeding and clamping purposes;

B. a front double-acting cylinder operative, when fluid energized one way, to move the front roll up and, when fluid energized the opposite way, to move it down;

C. said machine includes a rotatable clamping bar arranged on the rear side of said sewing heads and mounted for movement downwardly into a position in which it clamps both of said panel component assemblies against the machine and upwardly out of said clamping position;

D. a rear cylinder operative, when fluid energized, to move the clamping bar down;

E. yieldable means operative, when the cylinder is not fluid energized, to urge the bar up; and

F. foot pedal means movable

1. to one end down position to fluid energize both cylinders for said down movement,

2. to a neutral position to cut off the fluid energy and vent those cylinders so that

a. said front roller remains down, and

b. said yieldable means is operative to urge the rear clamping bar up and hold it up, and

3. to its opposite end down position to fluid energize the front cylinder for the upward movement of said front roll.

3. The machine of claim 2 wherein:

A. said yieldable means for urging the clamping bar up comprises an unbalance in the mounting and weight of said clamping bar supplemented by a spring bias in said rear cylinder.

4. The machine of claim 1 wherein:

A. the machine drive means for reciprocating one sewing head includes

1. an upright oscillatable arm pivoted at its lower end to the frame for horizontal oscillation purposes,

2. means connecting that arm to said one sewing head to reciprocate the latter when the arm is oscillated,

3. a horizontal bar mounted on the frame for horizontal reciprocation purposes,

4. motorized means for reciprocating the bar, and

5. a link interconnecting said reciprocating bar and oscillating arm,

a. said stroke adjusting means including means for adjusting the connection of said link to said oscillating arm along the length of said arm outwardly so as to lengthen the stroke for a wider panel assembly and inwardly so as to shorten the stroke for a narrower panel assembly, and

b. said stroke shifting means including means for angularly shifting said connection across said arm in a direction and to an extent such as to hold said arm substantially to a fixed inner position, which corresponds to a desired fixed inner limit of said one sewing head, while shifting the location of the angle of bar oscillation laterally and correspondingly shifting the outer limit of reciprocation of said one sewing head.

5. The machine of claim 4 wherein:

A. said machine drive means for reciprocating the other sewing head includes

1. a duplicate of said oscillatable arm,

2. a duplicate of said connecting means,

3. said horizontal bar,

4. said motorized means, and

5. a duplicate of said link.

6. A mattress border panel manufacturing machine for use in sewing 1st and 2nd panel component assemblies into a single border panel component assembly, comprising:

A. a frame having longitudinally-spaced front and rear sides and transversely spaced ends;

B. feed means mounted on the frame adjacent the front side of the machine and operative, when actuated, for simultaneously feeding said pair of 1st and 2nd border panel component assemblies longitudinally forward through the machine in spaced side-by-side relationship;

C. a pair of 1st and 2nd sewing heads, one head for each panel component assembly;

D. means for separately mounting said 1st and 2nd sewing heads on the frame for endwise head-to-head relationship for transverse movement thereon, each head being arranged adjacent the path of its corresponding component assembly and in sewing relationship thereto;

E. head drive means for continuously operating the needle of both sewing heads; and

F. machine drive means for transversely reciprocating both heads contemporaneously and in the same directional relationship during each stroke with a dwell period at the end of each stroke, and for actuating said feed means during each dwell period,

1. said machine drive means including means for adjusting the length of one stroke relative to and independently of the other stroke so as to enable said one stroke to be lengthened for a wider panel assembly and shortened for a narrower panel assembly.

7. The machine of claim 6 wherein:

A. said machine drive means includes means for shifting the adjusted stroke transversely to maintain its inner limit at the same inner position.

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