United States Patent [19]

Off et al.

[11] **3,841,247**

[45] **Oct. 15, 1974**

[54] **SEMIAUTOMATIC BELT LOOP SEWING SYSTEM**

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[73] Assignee: **Haggar Company,** Dallas, Tex.

[22] Filed: **Sept. 7, 1973**

[21] Appl. No.: **395,230**

[52] **U.S. Cl.** **112/121.27,** 112/104

[51] **Int. Cl.** **D05b 23/00**

[58] **Field of Search** 112/104, 121.27, 121.26

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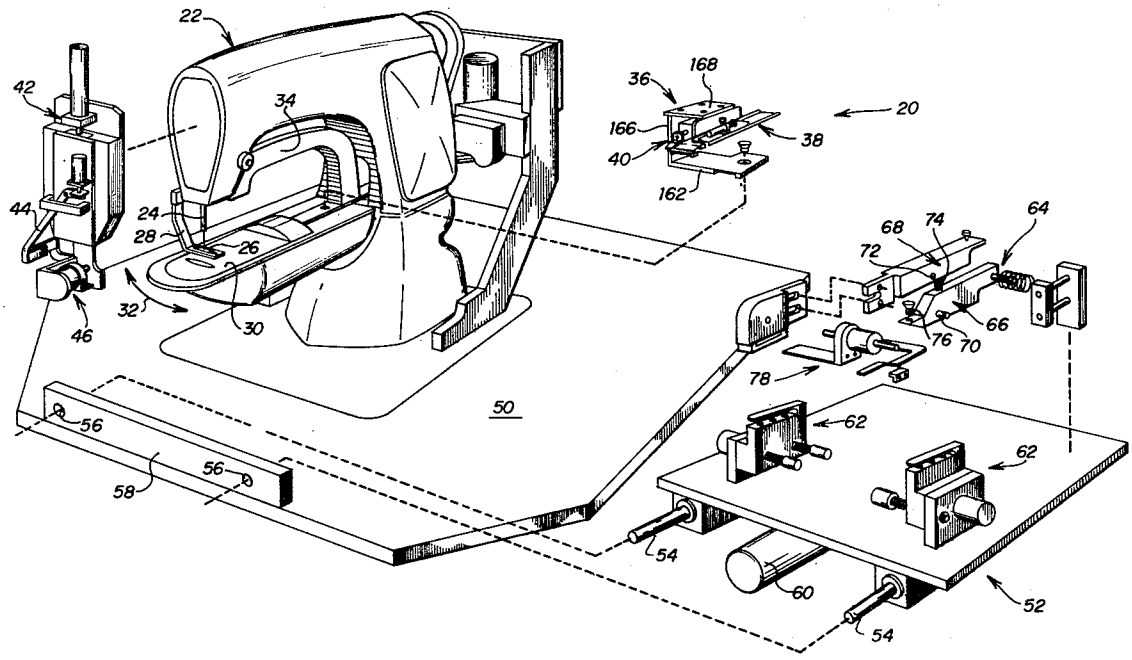
Attorney, Agent, or Firm—Richards, Harris & Medlock

[57] **ABSTRACT**

In a semiautomatic belt loop sewing system, a sewing machine includes a sewing needle supported for reciprocation along a fixed, vertically disposed axis and a cloth plate positioned generally beneath the sewing needle for oscillation in a horizontal plane. By this means, the reverse side of the upper end of a belt loop is initially sewn to the upper portion of a garment waistband. The belt loop is then folded forwardly, downwardly, and finally inwardly, after which the lower end of the belt loop is sewn to the lower portion of the waistband.

The belt loop is initially positioned relative to the sewing needle by a loop guide assembly mounted on the cloth plate of the sewing machine. By this means the entire belt loop and the portion of the garment waistband which is to receive the belt loop are oscillated in unison with the cloth plate of the sewing machine, whereby the sewing operation is carried out without twisting the belt loop. The loop chute assembly includes a belt loop guide chute, air jets for advancing the belt loop along the guide chute, a belt loop stop depending from the face plate of the sewing machine for terminating the advance of the belt loop when it is properly positioned relative to the sewing needle, and a loop positioning finger for positioning the belt loop laterally with respect to the sewing needle.

22 Claims, 18 Drawing Figures



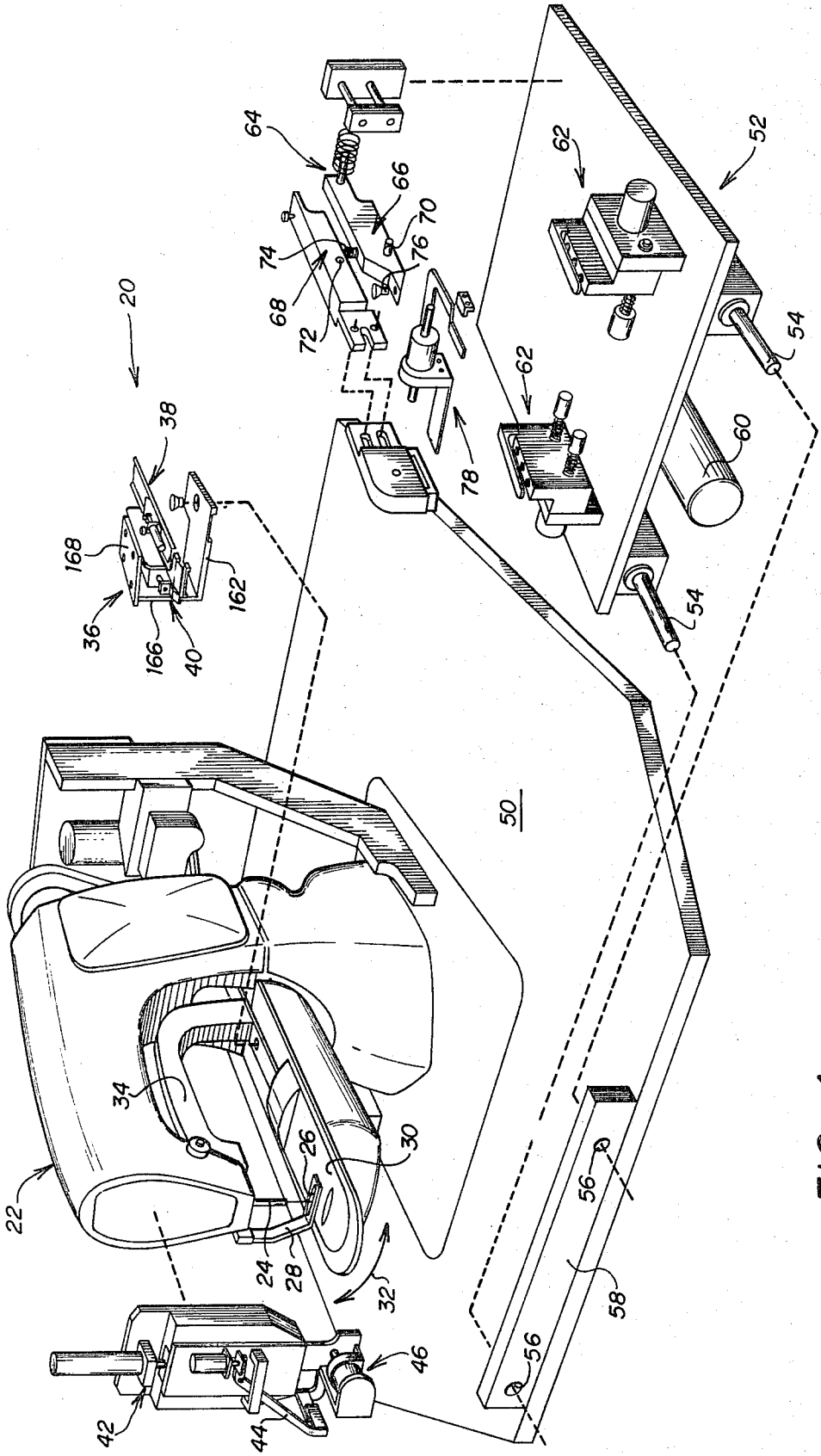

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FIG. 1

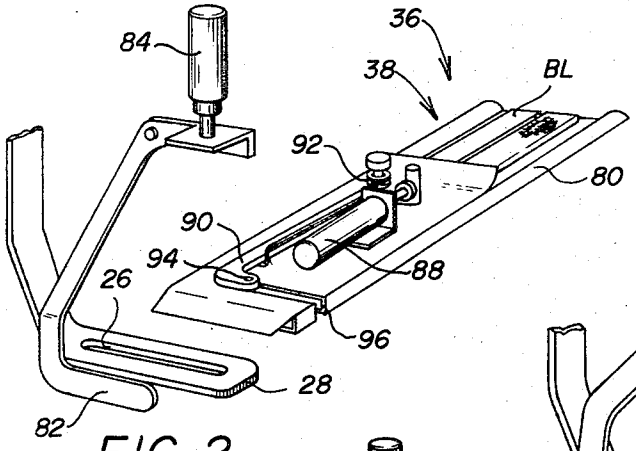

FIG. 2

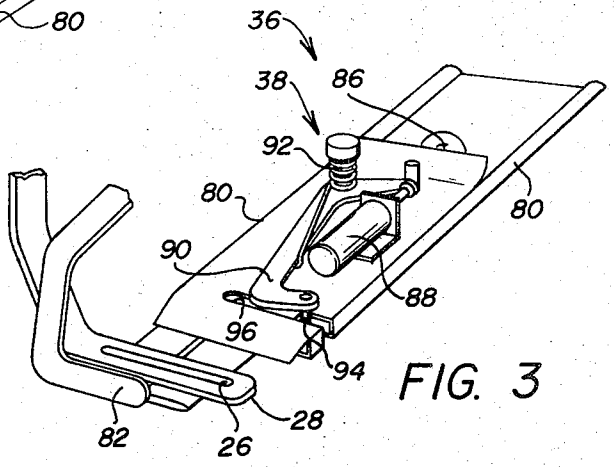

FIG. 3

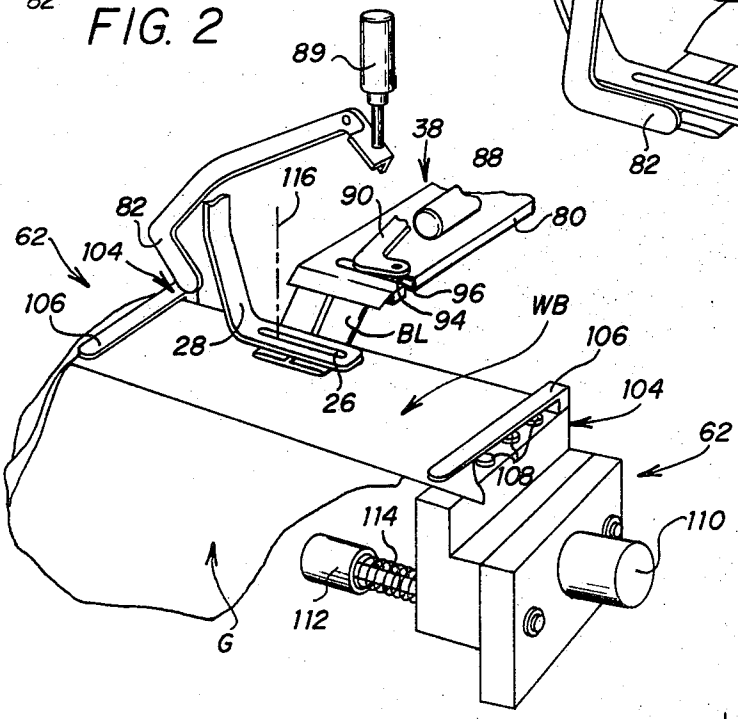

FIG. 4

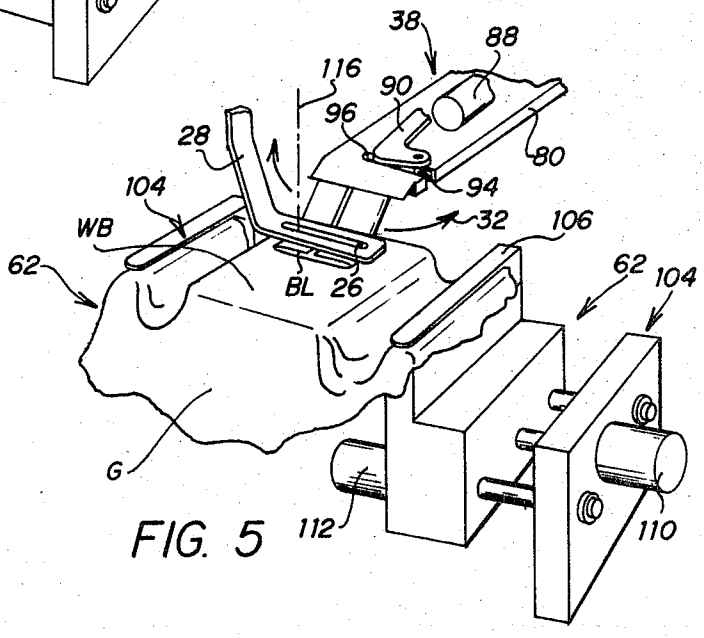

FIG. 5

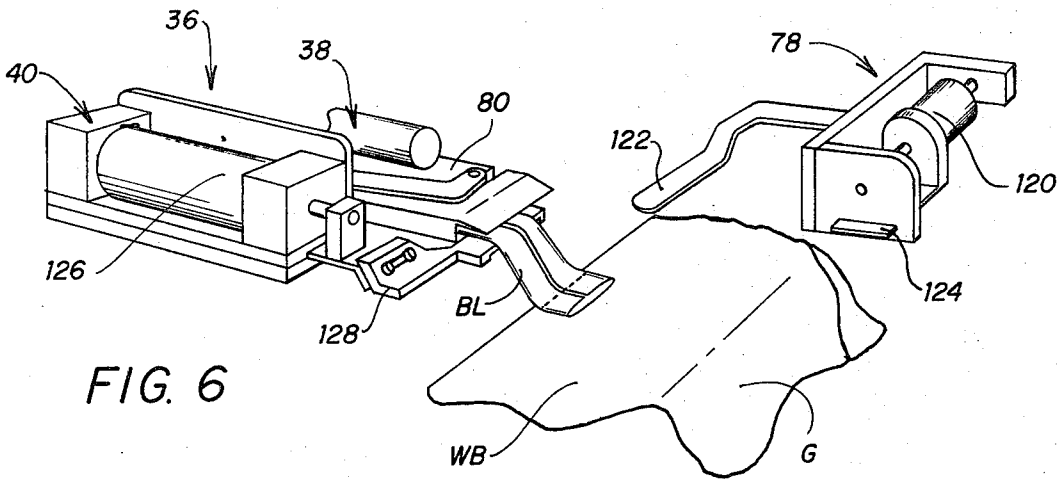

FIG. 6

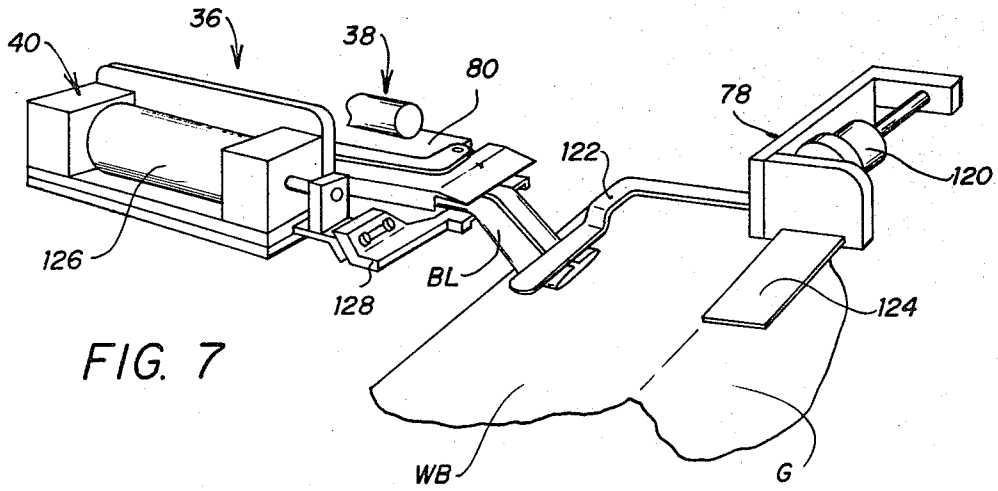

FIG. 7

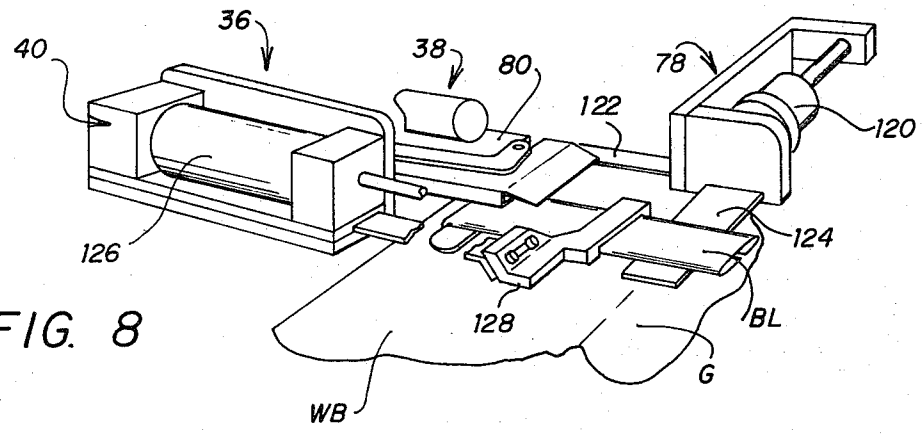

FIG. 8

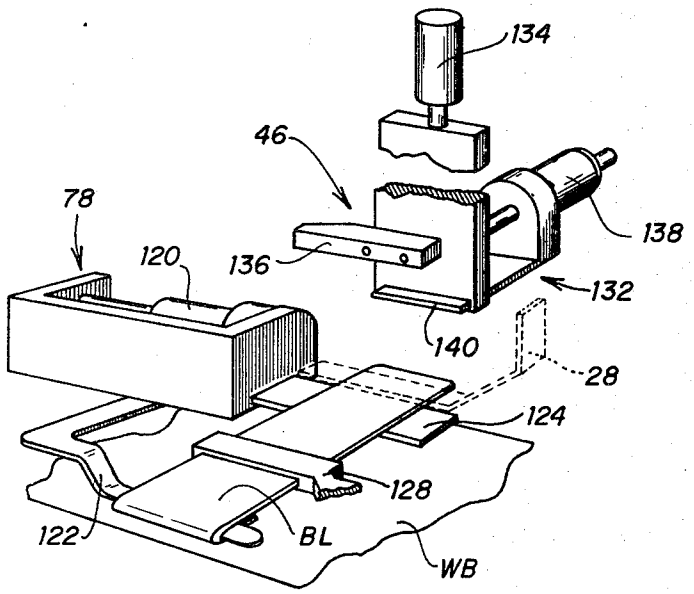

FIG. 9

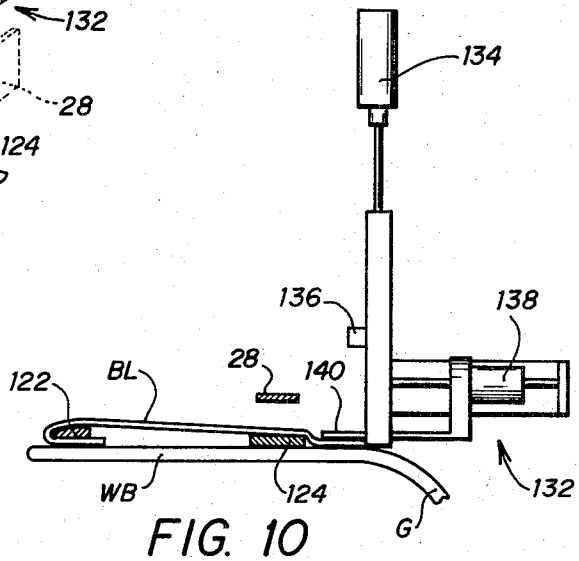

FIG. 10

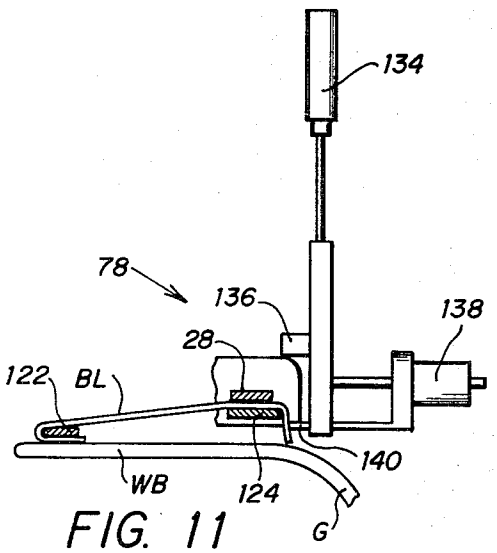

FIG. 11

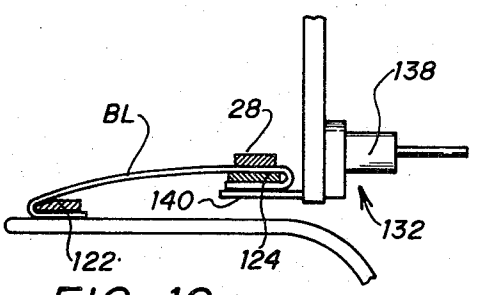

FIG. 12

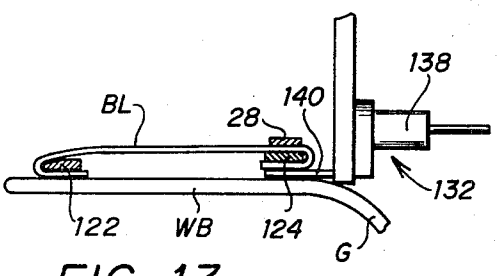

FIG. 13

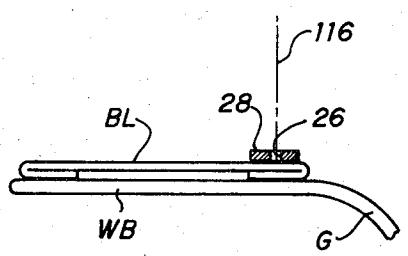

FIG. 14

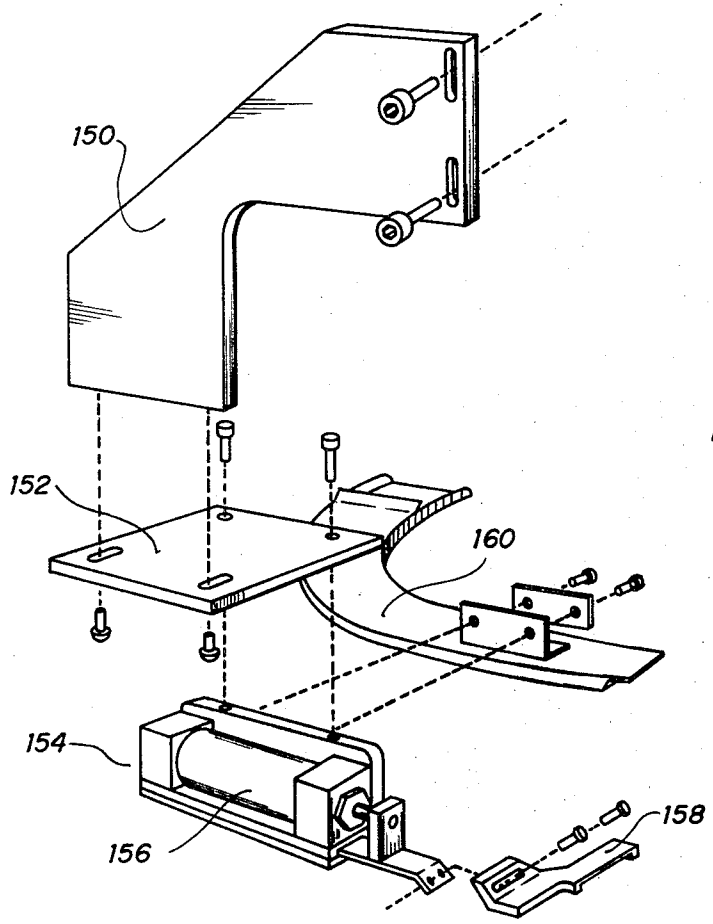

FIG. 15
PRIOR ART

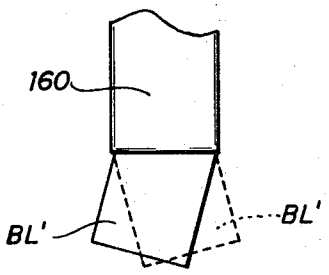

FIG. 17
PRIOR ART

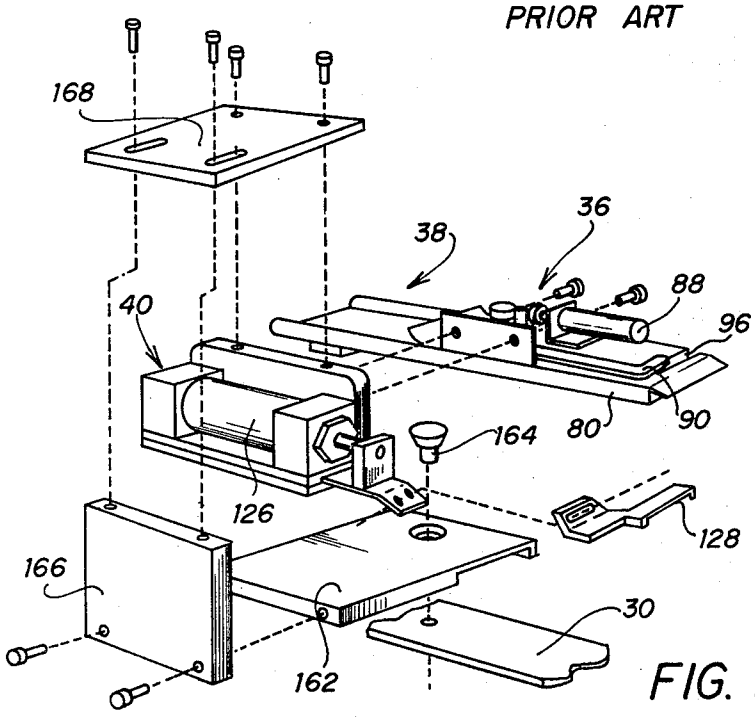

FIG. 16

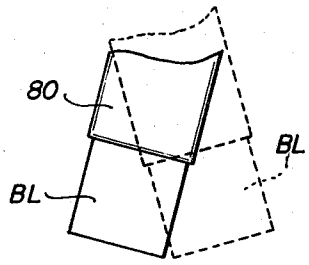

FIG. 18

SEMIAUTOMATIC BELT LOOP SEWING SYSTEM

BACKGROUND AND SUMMARY OF THE INVENTION

This invention relates to a semiautomatic belt loop sewing system, and more particularly to such a system in which the belt loop and the guiding apparatus therefor are moved concurrently with the underlying garment during the sewing operation.

In the manufacture of men's trousers and similar garments, belt loops are frequently provided at spaced intervals around the waistband of the garment. Typically each belt loop is sewn to the waistband of the garment by menas of a process wherein the upper end of the belt loop is first sewn to the upper portion of the waistband with the reverse side of the belt loop facing outwardly. The belt loop is then folded forwardly, downwardly, and finally inwardly, after which the portion of the belt loop adjacent the lower fold is sewn to the lower portion of the waistband of the garment.

The apparatus most often utilized in carrying out the foregoing belt loop sewing process includes a sewing machine having a sewing needle which reciprocates along a fixed, vertically extending axis. A cloth plate underlies the sewing needle and is adapted for oscillatory motion with respect thereto in a horizontal plane. By this means there is effected the relative motion between the garment and the sewing needle which is necessary in order to complete the belt loop sewing operation.

Heretofore the apparatus for positioning each belt loop with respect to the sewing needle has been attached directly to the frame of the sewing machine, and more particularly to the face plate thereof. It will be appreciated that during the sewing operation, the waistband of the garment and the portion of the belt loop being secured thereto are effectively secured to and thereby oscillate with the cloth plate. Since the guiding apparatus for the belt loop is secured to the frame of the sewing machine, at least some twisting of the belt loop is therefore necessarily encountered as a part of the sewing operation. While this twisting has not proven to be a problem in the case of traditional narrow belt loops, it has proven to be quite troublesome in the case of the wide belt loops which are presently in style, and has effectively prevented the use of the foregoing type of belt loop sewing apparatus in the case of belt loops having widths in excess of about five-eighths inch.

The present invention relates to a belt loop sewing apparatus which eliminates the foregoing and other problems long since associated with the prior art. In accordance with the broader aspects of the invention, apparatus for positioning each belt loop relative to the sewing needle of a sewing machine is mounted directly on the cloth plate of the sewing machine. By this means the cloth plate, the belt loop guiding apparatus, the belt loop, and the portion of the garment that is to receive the belt loop reciprocate as a unit during the belt loop sewing operation. This eliminates the twisting of the belt loop which is necessarily encountered in the use of the prior art apparatus, whereby the sewing of both traditional narrow belt loops and the wider belt loops which are presently in style is facilitated.

In accordance with more specific aspects of the invention, the apparatus for guiding each belt loop into position under the sewing needle of the sewing machine comprises a chute mounted on the cloth plate of the sewing machine and provided with air jets for directing the belt loop therealong. The travel of each belt loop under the action of the air jets is arrested by a loop stop member which extends downwardly from the face plate of the sewing machine. The guide chute also mounts a positioning finger which is selectively actuated to position the belt loop laterally within the guide chute.

DESCRIPTION OF THE DRAWINGS

A more complete understanding of the invention may be had by referring to the following Detailed Description when taken in conjunction with the accompanying Drawings, wherein:

FIG. **1** is an exploded view of a semiautomatic belt loop sewing system incorporating the invention;

FIGS. **2–14** inclusive are illustrations of progressive steps in the operation of the semiautomatic belt loop sewing system illustrated in FIG. **1**;

FIGS. **15** and **16** are illustrations of the corresponding portions of a prior art belt loop sewing system and of the semiautomatic belt loop sewing system shown in FIG. **1** respectively; and

FIGS. **17** and **18** are diagrammatic illustrations of the operation of the system shown in FIG. **15** and of the operation of the system shown in FIG. **16** respectively.

DETAILED DESCRIPTION

Referring now to the Drawings, and particularly to FIG. **1**, there is shown a semiautomatic belt loop sewing system **20** incorporating the present invention. The system **20** includes a sewing machine **22** which is conventional in design, and may be of the type manufactured by the Singer Company of New York, N.Y. and identified by that company as Model Number 269W149. The sewing machine **22** includes a needle **24** supported for reciprocation along a fixed, vertically extending axis. The distal end of the needle **24** extends through a slot **26** formed in a presser foot **28**.

The sewing machine **22** further includes a cloth plate **30** disposed beneath the needle **24** and the presser foot **28**. The cloth plate **30** is mounted for oscillation with respect to the needle **24** in the manner illustrated by the arrow **32**. The presser foot **28** is supported on the cloth plate **30** by means of an arch clamp **34** and therefore oscillates with the cloth plate **30** relative to the needle **24**.

The semiautomatic belt loop sewing system **20** further includes as assembly **36** which is supported on the cloth plate **30** of the sewing machine **22**. The assembly **36** includes a loop chute assembly **38** and a first folder assembly **40**. A face plate assembly **42** is secured to the face plate of the sewing machine **22**. The face plate assembly **42** includes a loop stop assembly **44** and an end turn assembly **46**.

The sewing machine **22** is mounted on a table **50**. The table **50** also supports a slide assembly **52** comprising a pair of guide rods **54** which are received in corresponding apertures **56** formed in a block **58** extending upwardly from the table **50**. The slide assembly **52** is adapted for selective reciprocation relative to the sewing machine **22** under the action of an air cylinder **60**.

A pair of opposed material clamp assemblies **62** are mounted on the front portion of the slide assembly **52**. A jaw assembly **64** is mounted at the rear of the slide

assembly **52** and includes a lower jaw **66** and an upper jaw **68.** The upper jaw **68** is hollow and normally receives the lower jaw **66.** The jaws **66** and **68** are pivotally interconnected by means of a pin **70** which is received in aligned apertures **72.**

The front portion of the upper jaw **68** is normally pivoted downwardly under the action of a spring **74.** An air piston **76** is provided for selective actuation to pivot the jaw **68** upwardly. A side loop fold assembly **78** is supported on the jaw **68** for pivotal movement therewith.

The operation of the semiautomatic belt loop sewing system **20** will be better understood by referring to FIGS. **2–14** which comprise illustrations of sequential steps in the operation of the system. Referring particularly to FIG. **2,** the loop chute assembly **38** includes a guide chute **80.** A belt loop BL is initially manually positioned in the guide chute **80.** At this point in time the presser foot **28** is raised and a loop stop arm **82** comprising part of the loop stop assembly **44** is positioned directly in front of the guide chute **80** under the action of an air cylinder **84.**

Referring now to FIG. **3,** an operating cycle of the semiautomatic belt loop sewing system **20** is initiated by actuating a pair of air jets **86** (only one of which is shown) that function to move the belt loop BL forwardly. Simultaneously a cylinder **88** is extended, thereby pivoting an arm **90** against the action of the spring **92** to clear a positioning finger **94** out of a slot **96** formed in the guide chute **80.** The belt loop BL is advanced under the action of the air jets **86** until it engages the loop stop arm **82.** At this point in time the cylinder **88** is released, whereupon the spring **92** pivots the arm **90** to move the positioning finger **94** back into the slot **96.** By this means the belt loop BL is located in engagement with the left-hand side (FIG. **3**) of the guide chute **80.**

In FIG. **4** there is shown a portion of a garment G having a waistband WB. For example, the garment G may comprise a pair of men's trousers, or the like. An operator positions the garment G on the slide assembly **52** with a portion of the waistband WB extending between the material clamp assemblies **62.** By this means the now positioned belt loop BL is accurately located with respect to the waistband WB of the garment G.

The material clamp assemblies **62** each comprise a subassembly **104** including a fixed jaw **106** and a plurality of air pistons **108** positioned for cooperation with the fixed jaw **106** to clamp the waistband WB therebetween. Each subassembly **104** is supported for inward reciprocation under the action of an air cylinder **110.** Reciprocation of the subassembly **104** is limited by stops **112,** and springs **114** are provided for returning the subassembly **104** upon the release of the cylinders **110.**

At this point in time the slide assembly is retracted under the action of the air cylinder **60.** That is, the slide assembly is in its forwardmost position relative to the sewing machine **22.** This causes the material clamp assembly **62** to position the upper portion of the waistband WB in alignment with the sewing needle of the sewing machine.

Referring now to FIG. **5,** the next step in the operation of the semiautomatic belt loop sewing system **20** comprises sewing the upper portion of the belt loop BL to the upper portion of the waistband WB. This is accomplished by reciprocating the needle **24** of the sewing machine **22** along a fixed, vertically extending axis **116** while simultaneously reciprocating the cloth plate **30** of the sewing machine **22** in the manner illustrated by the arrow **32.** It will be understood that since the presser foot **28** is supported on the arch clamp **34** which is in turn supported on the cloth plate **30,** and since the loop chute assembly **38** is also mounted directly on the cloth plate **30,** the belt loop BL, the positioning apparatus therefor reciprocate with the cloth plate **30** in the manner of a unitary structure, hereby elminating any possible twisting of the belt loop BL during the sewing operation. It will be further understood that the purpose of the inward reciprocation of the subassemblies **104** of the material clamp assemblies **62** is to provide sufficient slack in the waistband WB to accommodate the reciprocation of the cloth plate **30.**

At the completion of the sewing cycle, the subassemblies **104** of the material clamping assemblies **62** are returned to their original positions, and the presser foot **28** is raised. As is best shown in FIG. **6,** the side loop fold assembly **78** includes an air cyclinder **120** which functions to selectively extend or retract a loop form bar **122** and a side loop folder **124.** Moreover, the vertical positioning of the entire side loop fold assembly **78** is controlled by the selective actuation of the jaw assembly **64.**

Following the first sewing cycle, the cylinder **120** is actuated to extend the loop form bar **122** and the side loop folder **124,** and the jaw assembly **64** is simultaneously actuated to lower the entire side loop fold assembly **78.** At the conclusion of these stops, the loop form bar **122** and the side loop folder **124** are positioned as shown in FIG. **7.** The first folder assembly **40** of the assembly **36** includes an air cylinder **126** which functions to selectively extend and retract a first folder **128.** Thus, following the positioning of the loop form bar **122** and the side folder **124** as shown in FIG. **7,** the cylinder **126** is extended and the slide assembly **52** is simultaneously advanced under the action of the cylinder **60.** This combination of movements causes the belt loop BL to be pulled out of the guide chute **80** and to be folded around the loop form bar **122.** It will be noted that the belt loop BL also extends under the first folder **128** and over the side loop folder **124.**

It will be further understood that upon the advance of the slide assembly **52** under the action of the cylinder **60,** the slide assembly is positioned in the rearwardmost position relative to the sewing machine **22.** By this means the material clamp assemblies **62** are moved rearwardly, whereby the lower portion of the waistband WB of the garment G is positioned in alignment with the sewing needle of the sewing machine.

Referring now to FIG. **9,** the end turn assembly **46** includes a subassembly **132** which is normally retained in a raised position by means of an air cylinder **134.** The subassembly **132** includes a stabilizer bar **136** and an air cylinder **138** which functions to selectively extend and retract an end turn finger **140.**

to the sequence of operation of the semiautomatic belt loop sewing system **20,** the first folder **128** is next retracted and the cylinder **134** is simultaneously actuated to lower the subassembly **132.** This positions the tip of the end turn finger **140** in engagement with the end of the belt loop BL in the manner illustrated in FIG. **10.** The cylinder **134** is then released but is not retracted, leaving the subassembly **132** in a floating con-

dition. Simultaneously, the jaw assembly **64** is actuated to raise the side loop fold assembly **78.** The stabilizer bar **136** is engaged by the side loop fold assembly **78,** thereby raising the end turn assembly **46** to the position illustrated in FIG. **11.** This action also clamps the belt loop BL between the side loop folder **124** and the raised presser foot **28.**

At the completion of the foregoing steps, the cylinder **138** is actuated to advance the end turn finger **140.** By this action the end of the belt loop BL is folded under the side loop folder **124** in the manner illustrated in FIG. **12.** The jaw assembly **64** is then actuated to lower the side loop fold assembly **78** and the subassembly **132.** The presser foot **28** is simultaneously lowered to trap the loop at the lower end of the belt loop BL in the manner illustrated in FIG. **13.**

Following these steps, the cylinder **138** is actuated to retract the end turn finger **140.** The cylinder **134** is next actuated to retract the subassembly **132.** Next the cylinder **120** is actuated to retract the side loop folder **124** and the loop form bar **122,** after which the jaw assembly **64** is actuated to raise the side loop fold assembly **78.** The subassemblies **104** of the material clamping assemblies **62** are then reciprocated inwardly to provide slack in the waistband WB. Thereafter, a sewing cycle of the sewing machine **22** is initiated. This sewing cycle is substantially identical to the sewing cycle described hereinbefore in connection with the connection of the upper end of the belt loop BL to the upper portion of the waistband **102,** and functions to sew the lower end of the belt loop BL to the lower portion of the waistband WB of the garment G.

At this point in time the operating cycle of the semiautomatic belt loop sewing system **20** is substantially complete. The air pistons **108** are relaxed to permit removal or repositioning of the garment **100** and slide assembly **52** is retracted under the action of the cylinder **60.** Simultaneously the loop stop arm **82** is returned to the position illustrated in FIG. **2,** and the cylinder **88** is actuated to clear the finger **94** out of the slot **96.** The system is now ready to receive another belt loop BL, whereupon the foregoing cycle of operation is repeated.

The full significance of the present invention will be best understood by referring to FIGS. **15–18.** Referring specifically to FIG. **15,** prior art semiautomatic belt loop sewing systems typically include a bracket **150** which is mounted on the face plate of a sewing machine, such as the sewing machine **22** illustrated in FIG. **1.** A bracket **152** is secured to the bracket **150** and a first folder assembly **154** is secured to the bracket **152.** The first folder assembly **154** includes a cylinder **156** which functions to selectively extend and retract a first folder **158.**

The prior art semiautomatic belt loop sewing system further includes a curved belt loop guide chute **160** which is secured to the first folder assembly **154.** It will thus be understood that the guide chute **160** is secured to the face plate of the sewing machine by means of the bracket **152** and the bracket **150.** Since the face plate of the sewing machine is fixedly positioned with respect to the cloth plate thereof, the belt loop guide chute **160** is also fixedly positioned with respect to the cloth plate.

The difficulty that is encountered in the use of prior art semiautomatic belt loop sewing systems of the type illustrated in FIG. **15** will be best understood by reference to FIG. **17.** From the foregoing discussion of the present invention, it will be understood that the garment which is to receive the belt loop and the presser foot of the sewing machine do not remain stationary during the sewing operation, but instead oscillate with the cloth plate in order to effect the relative motion which is necessary to complete the sewing of the belt loop to the garment. This means that the projecting portion of the belt loop BL′ that is positioned in the guide chute **160** is necessarily forced to oscillate with the garment and the presser foot, while the remainder of the belt loop is held stationary by the guide chute. This results in substantial twisting of the belt loop during the sewing operation in the manner illustrated diagrammatically in FIG. **17.**

Referring now to FIG. **16,** the present invention contemplates the use of a bracket **162** secured to the cloth plate **30** of the sewing machine **22** by means of a fastener **164.** A bracket **166** is secured to the bracket **162** and a bracket **168** is in turn secured to the bracket **166.** The first folder assembly **40** of the assembly **36** is secured to the bracket **168,** and the loop chute assembly **38** is secured to the first folder assembly **40.** This means that both the first folder assembly **40** and the loop chute assembly **38** oscillate with the cloth plate **30** of the sewing machine **22** during each sewing cycle.

As is illustrated in FIG. **18,** the fact that the loop guide assembly **36** is mounted for oscillation with the cloth plate **30** of the sewing machine **22** comprises a critical feature of the present invention. By means of this arrangement, the entire belt loop BL, together with the guide structure therefor, and the garment which will receive the belt loop oscillate with the cloth plate **30** in the manner of the unitary structure. This completely eliminates the twisting which is characteristic of the prior art structure illustrated in FIGS. **15** and **17,** and thereby facilitates the use of the semiautomatic belt loop sewing system in the sewing not only of the relatively narrow belt loops which have been used heretofore, but also in the wide belt loops which are presently in style.

From the foregoing, it will be understood that the present invention comprises a semiautomatic belt loop sewing system incorporating numerous advantages over the prior art. Thus, in accordance with the invention, structure for guiding a belt loop into position to be sewn to the waistband of a garment is mounted for oscillation together with the garment and the cloth plate of a sewing machine. By this means belt loops of any desired width may be automatically sewn without difficulty. The invention further contemplates the use of belt loop guide structure including air jets for advancing each belt loop and structure for automatically positioning the advancing belt loop in the sewing position.

Although particular embodiments of the invention have been illustrated in the accompanying DRawings and described in the foregoing Detailed Description, it will be understood that the invention is not limited to the embodiments dislcosed, but is capable of numerous rearrangements, modifications and substitutions of parts and elements without departing from the spirit of the invention.

What is claimed is:

1. A semiautomatic belt loop sewing system comprising:

a sewing machine including a sewing needle supported for reciprocation along a fixed substantially vertically extending axis and a cloth plate positioned generally beneath the sewing needle for oscillation in a substantially horizontally disposed plane;

a belt loop guide chute mounted on the cloth plate for oscillation therewith;

means for advancing a belt loop along the belt loop guide chute and into a sewing position wherein the axis of reciprocation of the needle passes through the belt loop;

means for receiving the waistband of a garment and for positioning the waistband on the cloth plate of the sewing machine and in a sewing position wherein the axis of reciprocation of the needle passes through the waistband;

whereby both the belt loop and the waistband oscillate with the cloth plate as the belt loop is sewn to the wasitband under the action of the sewing needle.

2. The semiautomatic belt loop sewing system according to claim **1** wherein the belt loop advancing means further comprises:

air jet means for advancing a belt loop along the belt loop guide; and

belt loop stop means for terminating movement of the belt loop along the belt loop guide under the action of the air jet means when the belt loop is in the sewing position.

3. The semiautomatic belt loop sewing system according to claim **2** wherein the belt loop stop is pivotally supported on the frame of the sewing machine.

4. The semiautomatic belt loop sewing system according to claim **3** wherein the waistband positioning means comprises:

gripping apparatus for receiving the waistband of the garment in a substantially taut condition; and

means for displacing the gripping mechanisms inwardly to provide sufficient slack in the waistband to accommodate oscillation thereof under the action of the cloth plate of the sewing machine.

5. The semiautomatic belt loop sewing system according to claim **2** further characterized by:

a locating surface disposed along one edge of the belt loop chute;

slot means formed in the belt loop chute and extending substantially transversely with respect thereto;

a belt loop positioning finger mounted for reciprocation in the slot means;

means for withdrawing the belt loop positioning finger from the slot means during movement of a belt loop in the belt loop chute under the action of the air jet means; and

means for thereafter reciprocating the belt loop positioning finger into the slot means and thereby engaging the belt loop with the locating surface.

6. The semiautomatic belt loop sewing system according to claim **1** further including means mounted on the cloth plate of the sewing machine for reciprocation with the belt loop guide chute for activation following the sewing of the belt loop to the waistband of the garment to pull the belt loop out of the belt loop guide chute.

7. A semiautomatic belt loop sewing system comprising:

a sewing machine including a sewing needle supported for reciprocation along a fixed, substantially vertically extending axis and a cloth plate positioned generally beneath the sewing needle for oscillation in a substantially horizontally disposed plane;

means for receiving a portion of a garment waistband which is to receive a belt loop and for locating the portion of the waistband on the cloth plate of the sewing machine and in the path of reciprocation of the sewing needle;

a belt loop guide chute mounted on the cloth plate of the sewing machine for oscillation therewith;

means for advancing a belt loop along the belt loop guide chute and for terminating the movement of the belt loop at a position wherein the belt loop overlies the cloth plate of the sewing machine and is in the path of reciprocation of the sewing needle;

whereby the portion of the waistband and the entire belt loop are oscillated in unison with the cloth plate of the sewing machine relative to the sewing needle thereof to effect the motion necessary to complete sewing of the belt loop to the waistband without twisting of the belt loop as it is sewn to the waistband.

8. The semiautomatic belt loop sewing system according to claim **7** further including means mounted on the cloth plate for oscillation therewith for pulling the belt loop out of the belt loop guide chute following the sewing cycle.

9. The semiautomatic sewing system according to claim **7** further characterized by:

a belt loop locating surface extending along one edge of the belt loop guide chute;

a slot formed in the belt loop guide chute and extending substantially transversely with respect thereto;

a belt loop positioning finger mounted for reciprocation in the slot;

means for reciprocating the belt loop positioning finger out of the slot during advancement of the belt loop therealong; and;

means for thereafter moving the belt loop positioning finger into the slot and into engagement with the belt loop and thereby positioning the belt loop in engagement with the belt loop locating surface.

10. The semiautomatic belt loop sewing system according to claim **7** further characterized by a member depending from the face plate of the sewing machine for terminating the advance of the belt loop through the belt loop chute when the belt loop is positioned in the path of reciprocation of the sewing needle.

11. The semiautomatic belt loop sewing system according to claim **7** wherein the means for advancing the belt loop through the belt loop guide chute comprises air jet means disposed in the belt loop guide chute and adapted to advance the belt loop into engagement with the belt loop stop.

12. The semiautomatic belt loop sewing system according to claim **7** wherein the means for receiving and positioning the waistband of the garment is further characterized by means for receiving the waistband in a substantially taut condition, and means for thereafter providing sufficient slack in the waistband to accommodate the oscillatory movement of the cloth plate of the sewing machine.

13. In a semiautomatic belt loop sewing system of the type including a sewing machine having a sewing needle mounted for reciprocation along a fixed, substantially vertically extending axis and a cloth plate disposed generally beneath the sewing needle for oscillatory movement to effect the relative motion necessary to sew a belt loop to the waistband of a garment and apparatus for positioning a portion of a garment waistband in a sewing position wherein the axis of reciprocation of the sewing needle of the sewing machine extends through the point on the waistband which is to receive the belt loop, the improvement comprising:

belt loop guide means mounted on the cloth plate of the sewing machine for receiving a belt loop and for advancing a belt loop to a sewing position wherein the axis of reciprocation of the sewing needle of the sewing machine extends through the point on the belt loop which is to be attached to the waistband of the garment;

whereby during operation of the sewing needle to sew the belt loop onto the waistband, both the belt loop and the portion of the waistband oscillate in unison with the cloth plate of the sewing machine.

14. The improvment according to claim 13 wherein the belt loop guide means comprises a belt loop guide chute secured to the cloth plate of the sewing machine and air jet means disposed in the belt loop guide chute for advancing the belt loop therealong to the sewing position.

15. The improvement according to claim 14 further characterized by belt loop stop means depending from the face plate of the sewing machine for terminating movement of the belt loop along the belt loop chute under the action of the air jet means when the belt loop is in the sewing position.

16. The improvement according to claim 13 further characterized by:

a locating surface extending along one edge of the belt loop guide chute; and

means for urging the belt loop into engagement with the locating surface and thereby positioning the belt loop laterally with respect to the sewing needle of the sewing machine.

17. The improvement according to claim 16 wherein the means for urging the belt loop into engagement with the locating surface comprises a slot formed in the belt loop guide chute and extending generally transversely with respect thereto, a belt loop positioning finger for reciprocation in the slot, means for withdrawing the belt loop positioning finger from the slot during the advance of the belt loop therethrough under the action of the air jet means, and means for thereafter moving the belt loop positioning finger into the slot and into engagement with the belt loop disposed therein.

18. A process for sewing a belt loop to a garment waistband which comprises:

reciprocating a sewing needle along a fixed, substantially horizontally disposed axis;

simultaneously oscillating a portion of a garment waistband in a generally horizontally disposed plane intersecting the axis of reciprocation of the sewing needle and with the portion of the waistband that is to receive the belt loop positioned in the path of the sewing needle and thereby effecting the relative motion necessary to complete the sewing operation; and

simultaneously oscillating an entire belt loop in unison with the portion of the waistband and with the portion of the belt loop that is to be sewn to the waistband positioned in the path of the sewing needle and thereby sewing the belt loop to the waistband without twisting the belt loop.

19. The belt loop sewing process according to claim 18 further characterized by positioning the portion of the waistband on a cloth plate supported for oscillation relative to the sewing needle and supporting the belt loop in a belt loop guide chute mounted on the cloth plate.

20. The belt loop sewing process according to claim 19 further characterized by the preliminary stop of advancing the belt loop along the belt loop chute and terminating the advance of the belt loop in the belt loop chute when the portion of the belt loop which is to be sewn to the waistband is positioned in the path of the sewing needle.

21. The belt loop sewing process according to claim 20 further characterized by the step of positioning the belt loop laterally with respect to the sewing needle prior to the oscillating step.

22. The belt loop sewing process according to claim 21 wherein the belt loop advancing and positioning steps are further characterized by first advancing the belt loop along the belt loop chute and into engagement with a belt loop stop under the action of air jets disposed in the belt loop chute and then engaging the belt loop with a locating surface depending along one edge of the belt loop chute.

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