

[54] **SEWING MACHINE ACCESSORY**

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[58] Field of Search.....112/121.11, 121.12, 121.15,
112/102, 204, 205, 2

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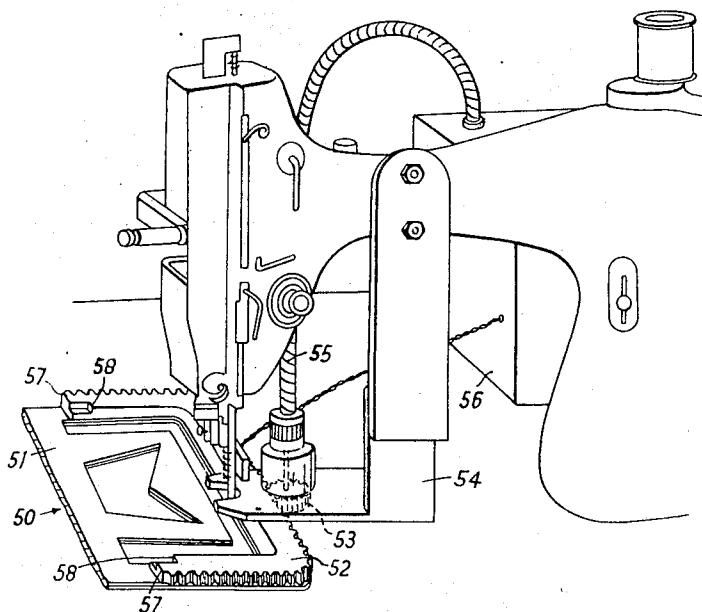
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[57] **ABSTRACT**

A jig for use in conjunction with a Sewing Machine to sew pocket flaps and the like, comprising plates between which panels of material are clamped and which define a sewing line along which passes the Sewing Machine needle. The jig has a drive track, preferably on an upstanding nib parallel to the sewing line, and the sewing machine has drive means for driving on the track and moving the jig and Sewing Machine head relatively.

3 Claims, 11 Drawing Figures



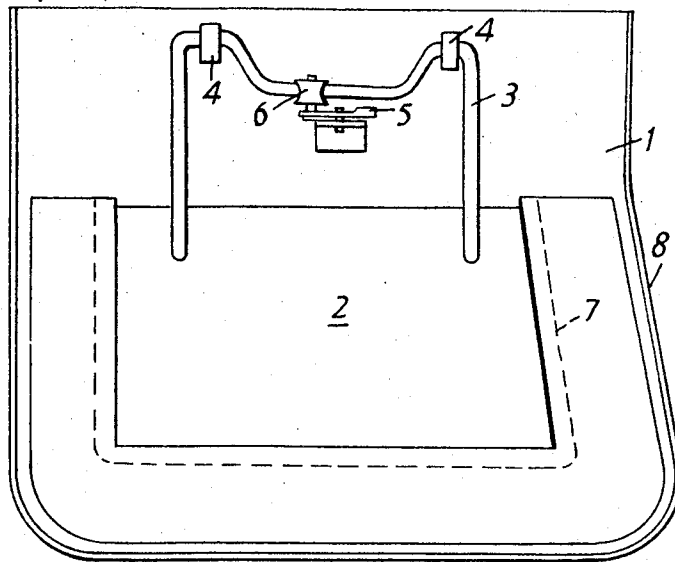


FIG. 1.

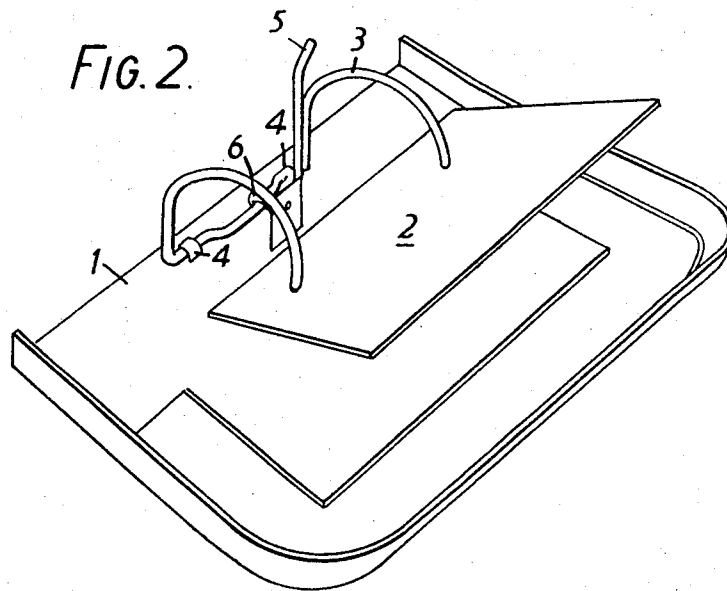
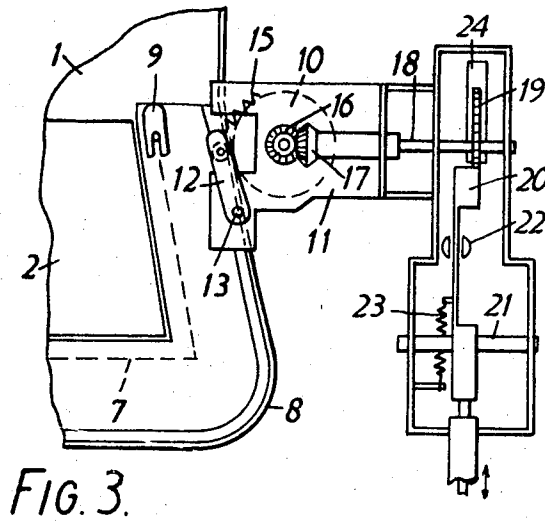
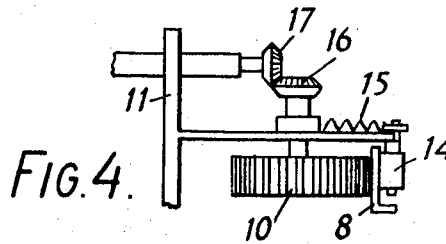
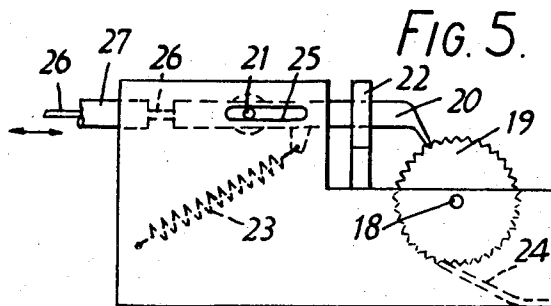


FIG. 2.

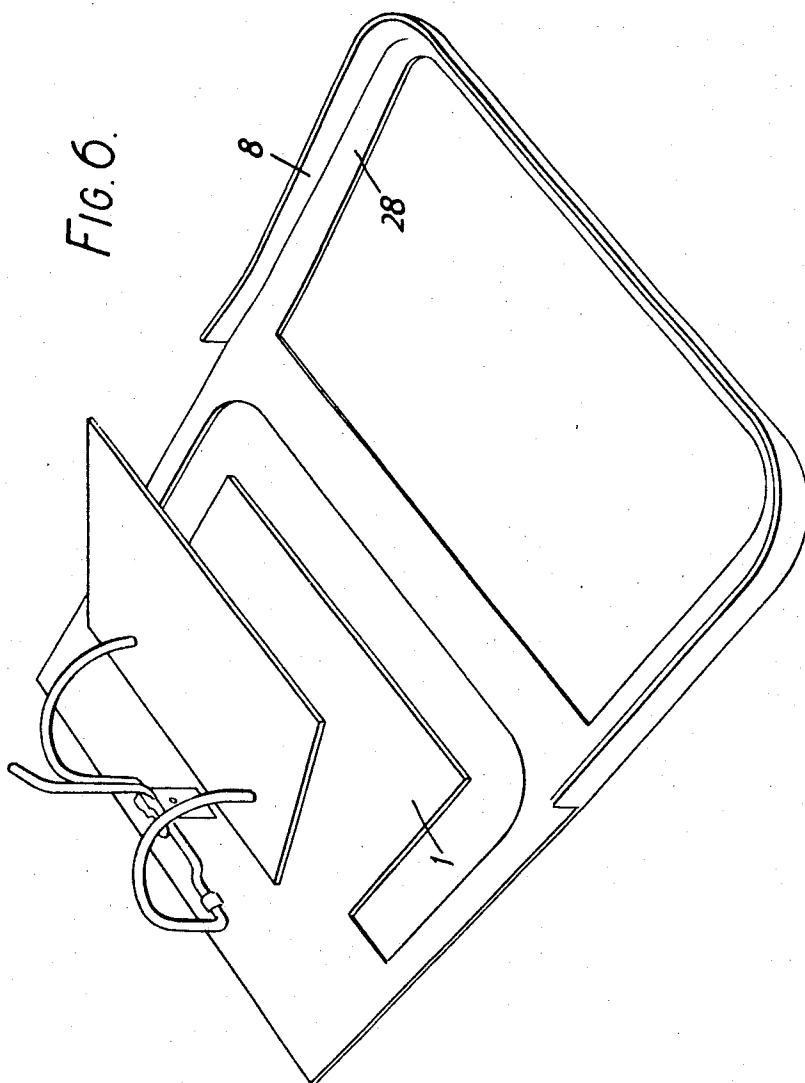
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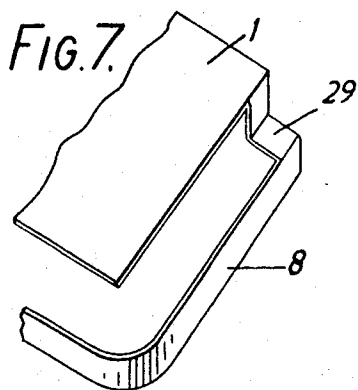
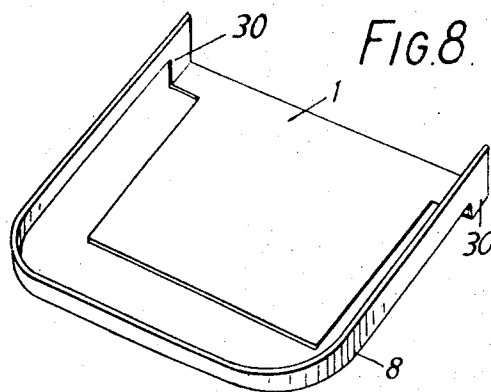
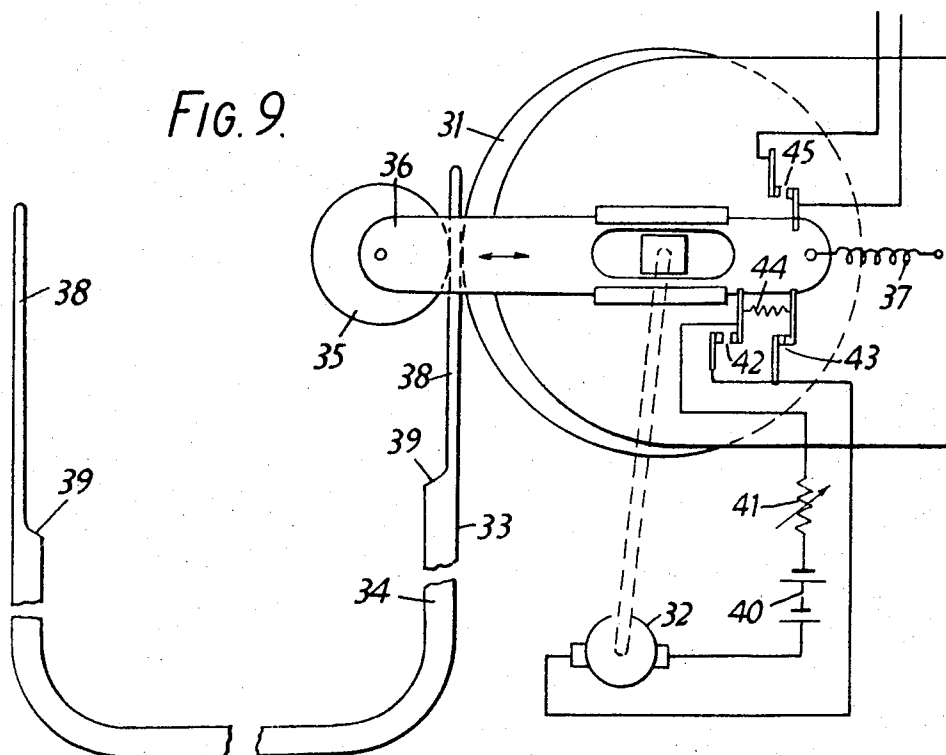
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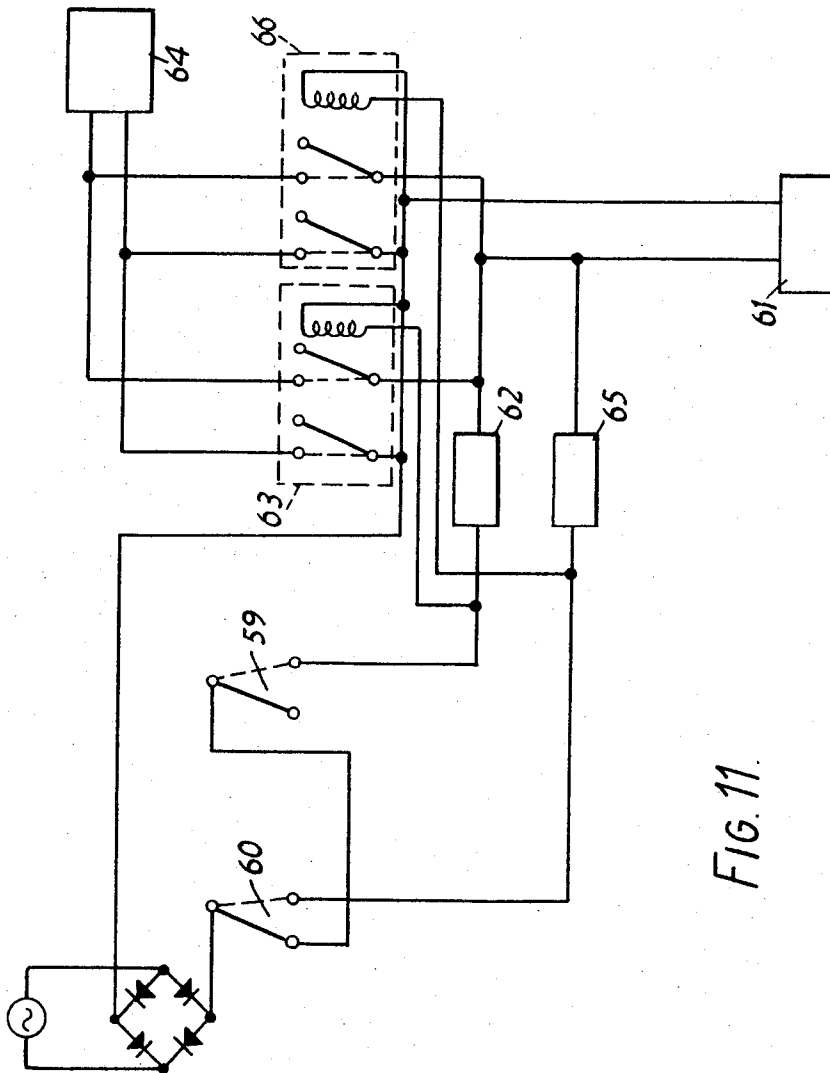


FIG. 11.

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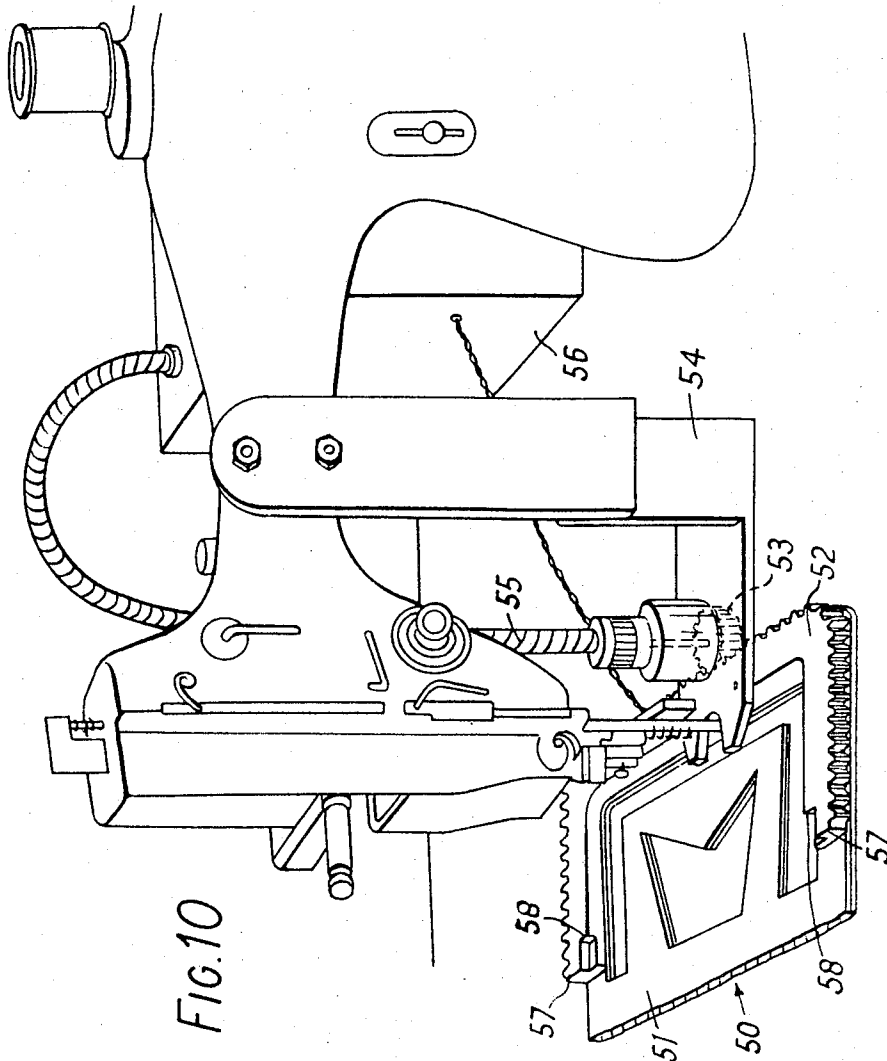


FIG. 10

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SEWING MACHINE ACCESSORY

The invention relates to a sewing machine accessory for use in sewing two or more panels of material together. Typically, the accessory may be of the kind suitable for making pocket flaps for suits, the material being cloth. However, it is to be understood that the invention is equally applicable to the sewing of other materials such as, for example, canvas or leather and may, therefore, have application in the manufacture of boots and shoes.

According to one aspect of the invention a sewing machine accessory for use in sewing two or more panels of material together comprises a jig having a base plate and a cover plate, the plates being adapted to clamp the panels of material between them so as to allow the sewing machine to sew the panels together along a required sewing line, one of the plates having a drive track thereon parallel with the sewing line; and drive means adapted to be mounted on the sewing machine so that a drive member thereon co-operates with the drive track on the jig at a place corresponding to the position of the sewing machine needle on the sewing line, the drive means being actuable to drive the jig so that the sewing machine needle sews along the sewing line.

A fulling plate may be interposed between the base plate and the cover plate, the cover plate having one or more apertures and the fulling plate having one or more projections which, when the jig is closed, project through the apertures. With this arrangement a panel of material laid between the fulling plate and the cover plate is "fulled" with respect to a panel laid between the base plate and the fulling plate.

Preferably the drive track is on an upstanding rib parallel with the sewing line. The rib may be integral with one of the plates, preferably the base plate, or may be fixed thereto. Preferably, for instance, the plates are metal and the track is a plastics or rubber length bonded to one of the plates.

Preferably the drive track is specially adapted having regard to the nature of the drive member. For example, the drive member may be a wheel for frictional engagement with the drive track, in which case the drive track is preferably roughened. The drive track may be a rod of circular, square or triangular cross-section, for example, or of U or C-shaped channel section, the wheel having a periphery of complementary shape for engagement therewith. The wheel may be provided with regular serrations around its periphery and corresponding serrations made in the drive track to provide operative engagement of the rack and pinion kind. For example, a serrated rubber strip may be glued along the track. The drive track and drive member may be a true rack and pinion having metal teeth or a positive drive arrangement comprising a rack and pinion with pegs on the pinion engaging in holes in the rack or pegs on the rack engaging in holes in the pinion. Where the drive track is on an upstanding rib the drive may be applied to one or both sides of the rib or to the upstanding edge thereof.

It is envisaged that the drive may be magnetic, the track being made of magnetic material and the drive member perhaps constituted by a wheel bearing on the track and having electromagnetically induced poles spaced around its periphery. Alternatively, the drive

track may be a linear ratchet and the drive member a reciprocating pawl engaging with the ratchet and driven by a reciprocating flexible drive which is driven, in turn, by a reciprocating part of the sewing machine in synchronism with the needle.

According to another aspect of the invention there is provided a jig for a sewing machine accessory for use in sewing two or more panels of material together, the jig having a base plate and a cover plate, the plates being adapted to clamp the panels of material between them so as to allow the sewing machine to sew the panels together along a required sewing line, one of the plates having a drive track thereon parallel with the sewing line, which drive track comprises a toothed rack for engagement with a pinion.

The drive member may be a rotating worm gear co-operating with suitably inclined teeth on the drive track. With this arrangement the worm gear may be rotatably driven in steps synchronized with sewing machine needle.

The drive member may be driven by an electric motor, possibly of the stepping kind driven in steps in response to a switch actuated by the sewing machine in synchronism with the needle.

With a rack and pinion drive arrangement or the like, the arrangement may be such that the sewing machine needle passes through a hole at the pinion axis to effect sewing. In this way the pinion axis travels along the sewing line.

Instead of the jig moving relative to the sewing machine bed the sewing machine may be arranged so that its head moves relative to the sewing machine bed, being driven along the sewing line by a drive arrangement of any of the kinds described above. To this end the sewing machine arm which carries the head is preferably articulated at a point between its ends to be capable of being hinged about a vertical axis and the vertical post which carries the arm is rotatable about a vertical axis.

As was mentioned above, the drive member may be driven by an electric motor which may be a stepping motor or which may rotate continuously. With this arrangement the speed of the motor may be automatically adjusted in relation to the position of the drive member on the drive track. To this end the thickness of the drive track may be varied appropriately and a switch or switches operated in accordance with the track thickness may be arranged to control the motor. A further switch operated by the same mechanism may be arranged to control the sewing machine motor.

The invention will further be described with reference to the accompanying drawings of which:

FIG. 1 is a plan view of an accessory jig according to the invention;

FIG. 2 is a perspective view of the jig of FIG. 1;

FIG. 3 is a plan view of a drive arrangement for the jig of FIG. 1;

FIG. 4 is an end elevation showing the engagement of the drive member with the drive track of FIG. 3;

FIG. 5 is a side elevation of the drive means of FIG. 3;

FIGS. 6 to 8 are perspective views showing respectively three further drive track arrangements for use in conjunction with the invention;

FIG. 9 is a schematic illustration of a drive arrangement for use with the invention;

FIG. 10 is a perspective view illustrating a preferred embodiment of the invention in use on a sewing machine; and

FIG. 11 is a circuit diagram of the control arrangement of FIG. 10.

Referring to FIGS. 1 and 2 the jig comprises an aluminum base plate 1 to which is hinged an aluminum cover plate 2. The hinge mount comprises a curved rod 3 fixed at its end to cover plate 2 and rotatable in mounts 4 on the base plate. The cover plate may be locked in the closed position shown in FIG. 1 by means of a manually operable locking mechanism comprising a lever 5 whereby a roller 6 can be urged against rod 3 to press it downwards.

The jig is for sewing pocket flaps of suits and in use the jig is placed on a sewing machine and two or more panels of material which make a pocket flap are placed between the plates 1 and 2 and are clamped therebetween by operation of the locking mechanism. Then, in a manner to be described the jig is moved as the sewing machine sews the panels of material together along the sewing line indicated in broken line at 7 in FIG. 1.

Formed integrally with the base plate 1 is an upstanding rib 8 parallel with and on the outside of the sewing line 7. The side of the rib constitutes a drive track for the jig whereby the jig is driven as sewing proceeds along the sewing line 7.

FIGS. 3 to 5 show the means for driving the jig. In FIG. 3 part of the jig is shown and the sewing machine presser foot is shown at 9 at the beginning of the sewing line. A rubber-tyred driving wheel 10 bears against the outer side of the rib 8 at a place corresponding to the position of the sewing machine needle on line 7. Wheel 10 is rotatably mounted in a frame 11 fixed to the bed of the sewing machine and is urged against the outer side of rib 8 by means of a spring loaded arm 12 pivotally mounted at 13 on the frame 11 and carrying a free-running roller 14 (FIG. 4). A coil spring 15 urges the roller against the inside of the rib 8, thereby drawing the wheel 10 against the rib.

Wheel 10 is rotatably driven by a pair of bevel gears 16, 17, gear 17 being mounted on a shaft 18 which is driven by a sprocket wheel 19. Sprocket wheel 19 is driven forwards periodically by a reciprocating pawl 20 which is mounted on a shaft 21 and guided by a slotted pillar guide 22, being urged against the wheel 19 by means of a coil spring 23. Wheel 19 is prevented from returning in the reverse direction by means of a leaf spring 24 bearing against it and acting as a fixed pawl.

Shaft 21 is reciprocated in slots, one of which is shown at 25, in frame 11 by engagement with a reciprocating shaft 26 which is flexible and which is mounted in a hollow flexible sheath 27 fixed to frame 11. Spring 23, besides urging pawl 20 into contact with wheel 19, also urges a hollow extension on shaft 21 into contact with the end of shaft 26.

Shaft 26 is reciprocated by engagement with a reciprocating part of the sewing machine (not shown). In order to control the drive to wheel 10 it may be desirable in some applications of the invention to provide in, say, shaft 18, a solenoid clutch which is disengageable by depression of a switch. This will allow increase of the number of stitches per unit length at the beginning and end of the sewing line 7. Furthermore, a reversing gear may be incorporated in shaft 18 capable

of being switched in and out of the drive to allow the wheel 10 to be reversed for back-tacking as desired.

Referring now to FIG. 6 there is shown an alternative arrangement of the drive track. The drive rib 8 is mounted on a support member 28 disposed in relation to the jig so that the rib 8 is parallel with the sewing line but displaced linearly therefrom.

FIG. 7 shows a drive track arrangement suitable for use with a post-bed or cylinder arm sewing machine. The drive track is arranged on a rib 8 depending from the base plate 1 of the jig by means of angular supports, one of which is shown at 29.

In FIG. 8 there is shown a drive track arrangement suitable for use on a flat sewing table or bed, the track being arranged on a rib 8 spaced apart and upstanding from the base plate 1 by means of angular supports 30.

Referring now to FIG. 9 there is shown schematically a drive arrangement comprising a drive wheel 31 driven by an electric motor 32 and engaging a drive track 33 on a rib 34. A roller 35 is spring-urged against the other side of the rib 34, being mounted on a slide bar 36 urged to the right in the FIGURE by means of a spring 37. At its ends 38 the rib 34 is relatively thin. Over the major part of its length the rib is thicker, there being steps at 39.

Motor 32 is in series with a source 40 of electric current, a preset variable resistor 41 and a switch arrangement comprising two pairs of switch contacts 42, 43 and a resistor 44. In the position shown, with a thin portion 38 of the rib between wheel 31 and roller 35, contacts 42 are open and contacts 43 are closed, so that resistor 44 is in series with motor 32 and the motor turns at low speed. This condition pertains at the beginning and end of the sewing of each pocket flap.

When the drive track is drawn past the step 39 the roller 35 is urged further away from wheel 31, thereby closing contacts 42 and short-circuiting resistor 44. Thus the motor 32 is run at full speed over the major part of the sewing cycle.

When the jig is removed so that the roller 35 is allowed to touch wheel 31, contacts 43 are opened so that the motor is de-energized.

A further pair of contacts 45 is operated by the slide bar 36 in the same way as contacts 43, being closed when the rib is between the roller and the wheel and open at other times. Contacts 45 are connected in series with the sewing machine motor, which may be a "stop-right" motor of the kind which stops only with the sewing machine needle in a predetermined position. Thus the sewing machine is automatically started when the jig is inserted and stopped when it is removed.

Referring now to FIG. 10 there is shown a jig 50 having a cover plate 51 with an upstanding rib 52 constituted by a length of polytetrafluorethylene curved to the appropriate shape and glued to plate 51. The outer edge of rib 52 is provided with teeth which mesh with a pinion 53. Pinion 53 is mounted on a bracket 54 attached to the sewing machine and is driven by a flexible rotating drive 55 from a control unit 56 mounted on the bed of the sewing machine. Unit 56 includes an electric motor (not shown) driving the flexible drive.

The motor is controlled by two microswitches mounted on bracket 54 and operated by the top surface of rib 52 which has at each end a step 57 at the extreme end and a step 58 spaced from the end. Step 57

operates a first microswitch and step 58 a second microswitch.

Referring now to FIG. 11 the first microswitch is shown at 59 and the second microswitch at 60. When the jig is placed in position the step 57 operates switch 59 and this drives the motor which is shown at 61 by way of a slow speed control arrangement 62. This draws the jig forwards by means of pinion 53 at a relatively slow speed. Switch 59 also operates a relay 63 which energises a solenoid 64 to engage the clutch of the sewing machine and drive the needle. Thus, initially the jig moves slowly and a fine stitch is obtained.

When the jig has advanced a short distance the step 58 engages microswitch 60 and the slow speed control circuit is over-ridden by a high-speed control circuit 65 to drive the motor and continue stitching at high speed. Solenoid 64 is maintained in the operated condition by energisation of a relay 66. At the end of the stitching line the switch 60 is disengaged before switch 59 and the sewing operation ends with slow speed drive and fine stitching.

It is to be understood that the invention is not restricted to the details of the foregoing description of one embodiment thereof. For example, the plates may be made of any suitable material and in particular may be steel. Furthermore, the rack of the preferred embodiment described with reference to FIG. 10 may be made of any other suitable plastics material such as nylon or of metal or perhaps steel, as in the pinion.

We claim:

1. A sewing machine assessor for use in sewing two or more panels of material together comprising a jig having a base plate and cover plate, said plates being adapted to clamp said panels of material therebetween so as to allow the sewing machine to sew said panels together along a required sewing line; and upstanding rib mounted directly on one of said plates parallel with and adjacent said sewing line; a drive track comprising

a toothed rack on said rib; and drive means adapted to be mounted on said sewing machine so that a drive member thereon comprising a pinion co-operates with said drive track on the jig at a place adjacent to the position of the sewing machine needle on said sewing line, said drive means being actuable to drive the jig so that said sewing machine needle sews along said sewing line, the jig being shaped to define said sewing line along three sides of a flap and said rack being situated on the outside of said sewing line and facing away therefrom.

2. A sewing machine accessory as claimed in claim 1 wherein said rack is a length of molded material bonded directly to one of said plates.

3. A sewing machine accessory for use in sewing two or more panels of material together comprising a jig having a base plate and cover plate, said plates being adapted to clamp said panels of material therebetween so as to allow the sewing machine to sew said panels together along a required sewing line; an upstanding rib mounted directly on one of said plates parallel with and adjacent said sewing line; a drive track on said rib; drive means adapted to be mounted on said sewing machine so that a drive member thereon co-operates with said drive track on the jig at a place adjacent to the position of the sewing machine needle on said sewing line, said drive means being actuable to drive the jig so that said sewing machine needle sews along said sewing line; a cam profile on said drive track; microswitch means positioned to co-operate with said cam profile to be operated in dependence on the position of the jig; an electric motor coupled to drive said drive member and a control circuit for controlling the speed of said electric motor, said control circuit including and being controlled by said microswitch means, said cam profile and control circuit being operable to feed said jig slowly at the beginning and end of said sewing line and quickly therebetween.

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