

Feb. 5, 1946.

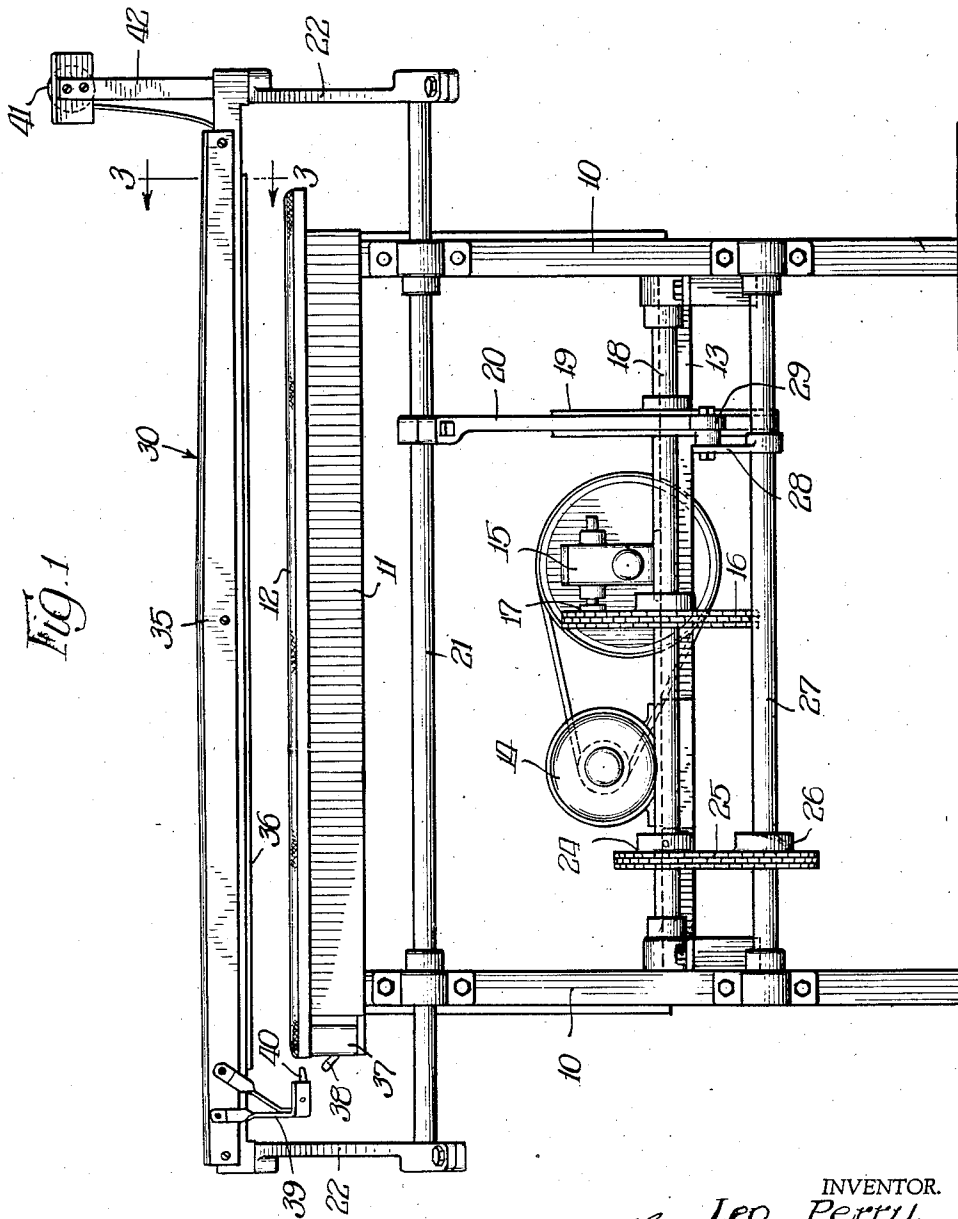
L. PERRY

2,394,473

SEAMING MACHINE

Filed Dec. 12, 1941

2 Sheets-Sheet 1



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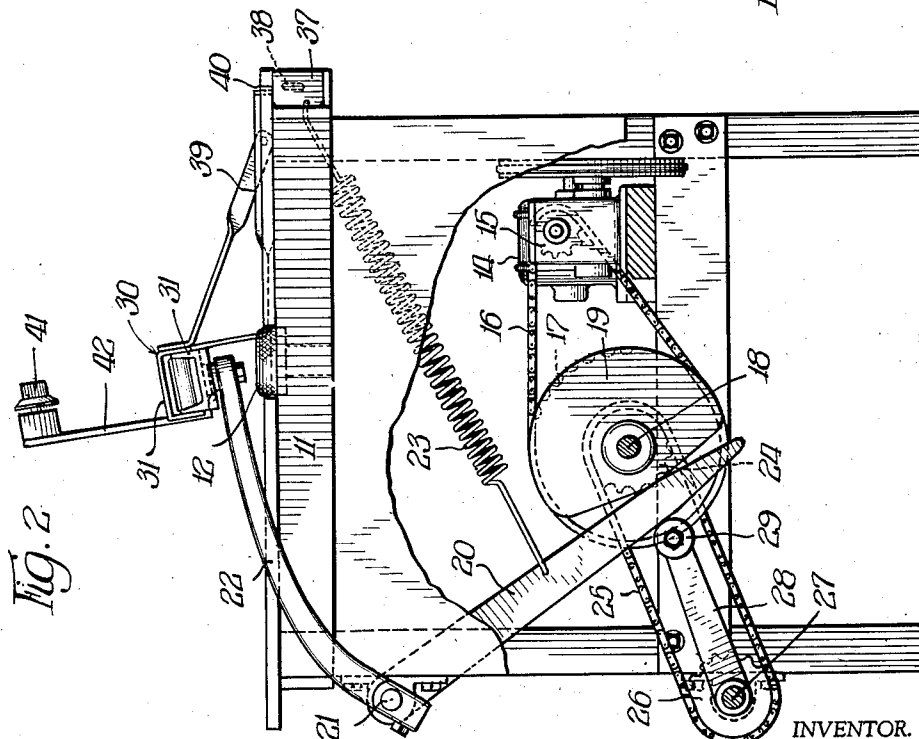
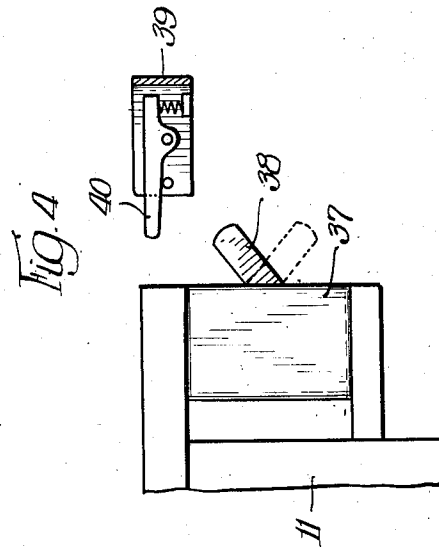
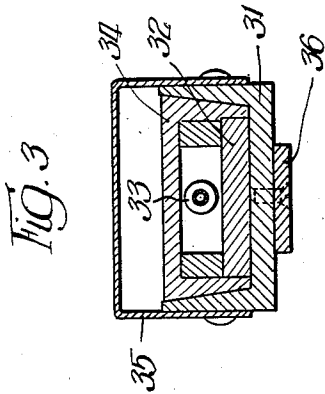
L. PERRY

2,394,473

SEAMING MACHINE

Filed Dec. 12, 1941

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,394,473

SEAMING MACHINE

Leo Perry, Whitewater, Wis.

Application December 12, 1941, Serial No. 422,781

1 Claim. (Cl. 154-42)

My invention relates to a machine for joining sections of synthetic fabrics, particularly fabrics that unite by the application of heat and pressure.

Difficulty has been experienced in forming garments composed partly or wholly of flexible or pliable sheets of synthetic material, due to the difficulties in controlling the heat, the degree of pressure and the time of treatment, since there is a critical period of time and temperature which may not be varied. Different materials have different critical periods but each may be treated satisfactorily without variation in the two elements of pressure and time. This leaves as the only necessary variation a capacity for variation in the degree of heat applied.

I have found that by the use of fixed and movable seam-engaging elements, the movable element carrying a heating device having means for maintaining a definite controlled temperature, together with means for effecting cyclic movement, I am able to form the described seams with complete certainty. The matter of certainty involves the completion of the seam from end to end without interruptions and without such overheating as would weaken or cause deterioration of the material at the seam.

Machines such as herein disclosed are used extensively for producing waterproof garments for use by government forces as well as for civilian use.

A machine such as contemplated is illustrated in the accompanying drawings; in which:

Fig. 1 is a side elevation;

Fig. 2 is an end elevation;

Fig. 3 is an enlarged sectional view on the line 3-3 of Fig. 1; and,

Fig. 4 is an enlarged detailed view showing the means for shutting off the motor at the completion of a cycle.

The machine comprises a frame including legs 10, a bed or bar 11 having a padded upper surface 12 and a cross bar 13. On the cross-bar is mounted a constant speed motor 14 connected by a belt and pulley to a reducing gear box 15. A chain 16 connects the pinion on the gear box to a sprocket wheel 17 mounted on a transverse shaft 18. The shaft also carries a cam 19 which actuates an arm 20 fixed to a shaft 21, the ends of which project outside of the frame and carry arms 22 at each end. A tension spring 23 tends to hold the arm 20 against the cam. A sprocket wheel 24 also mounted on the shaft 18 connects the shaft through a chain 25 to a sprocket wheel 26 fixed to a shaft 27, this shaft carrying an arm

28 having a roller 29 thereon which lies against the arm 20 and supplements the action of the spring 23 in positively holding the arm against the cam.

The arms 22 are connected to the bar 30 containing the heating element, the bar comprising, as best shown in Fig. 3, a channel iron 31, in the cavity of which is a heating element 32, indicated generally, and a thermostatic tube 33. The space above the heating element is filled with an insulating material 34 and a channel shaped cap 35 encloses the channel. A narrow plate 36 is secured to the bottom face of the channel and acts as the heat transmission element or "iron." In order that Fig. 3 may not be confusing, I have omitted the arm 22 and its connection to the heating bar. The bars 11-30 are of considerable length, adapting the machine for use in making seams of substantial length or of any shorter length, each garment including a number of seams of varying length.

Current is supplied to the motor through a switch 37 having a switch arm 38 and mounted on the frame member 11. An arm 39 carried by the heating bar 30 carries a pivoted finger 40, as best shown in Figs. 1 and 4, the finger being so positioned that as the arm moves downwardly toward a position in which the heating element is moving toward contact position, the finger will ride over the switch arm 38 without moving the latter. However, toward the completion of the cycle and when the heating element is moving away from the contact position, the finger 40 will contact the switch arm in the dotted line position of Fig. 4, which is the "on" position and move the switch arm to the full line position of Fig. 4 which is the "off" position.

In operation the heating element having been energized and raised to a definite temperature as controlled by the regulating knob 41 carried by the arm 42 on the heating bar, the operator manually moves the switch arm 38 to the dotted line position. The motor will start its operation, rotating the cam 19 to oscillate the arms 20-22 and lower the heating bar into pressure relation with the contact pad, it being assumed that the sections of synthetic material have been placed in proper position on the pad. The length of time during which the pressure and heat are applied is determined by the dwell of the cam, the speed of the motor and the gear reduction. Thus the operator cannot vary the time element or cause misoperation by attempting to substitute his judgment as to the time of contact. Of course, the dwell may be varied by substituting a cam

having a different contour, but for most materials any variation in the requirements for proper sealing may be made by varying the temperature of the heating element through the control knob 41.

As the cam approaches a completion of one revolution the heating bar will be approaching its elevated position at which point the arm 39 and finger 40 will actuate the switch arm 38 to interrupt the motor, this serving to complete a cycle. Thus each cycle must be initiated by the operator and is completed by the machine itself. This enables the operator to take the necessary time for the preparation of the two sections of material and placing of them in proper position for the seaming operation.

It is possible that the heating element might be placed in the fixed bar, the movable bar having a resilient face for pressing materials against the heating bar. This is not recommended, however, since the act of placing the two sections of material in position to be joined requires a definite length of time and must be done manually. Thus difficulty would be experienced in holding the material with the fingers on the hot surface while waiting for the machine to function.

Other means than those shown may be provided for stopping and starting the operation and the shape and extent of the heating bar and cooperating pad may be varied to suit different garments or other articles being manufactured, 30

and I do not wish to be limited except as indicated in the appended claim.

I claim:

A machine for heat sealing flexible synthetic thin sheet material comprising an elongated unheated seam-forming bar, means for mounting said bar in substantially fixed position, a shiftable elongated seam-forming bar cooperable with the fixed bar, said shiftable bar having a heating element associated therewith, means for controlling the temperature of said heating element so as to maintain the shiftable bar at a temperature to heat seal synthetic sheet material, said shiftable bar normally being mounted in spaced relation from the fixed bar, and power operated cyclically operable shifting means for shifting the shiftable bar into engagement with the fixed bar, said shifting means including an electric motor, a control switch for energizing the motor, and means driven by the motor for moving said bars into contact and for holding the bars in contact for a period in respect to the contacting pressure and temperature of the heated bar sufficient to heat seal synthetic sheet material superposed upon the stationary bar, and thereafter to effect automatic separation of said bars, deenergize the control switch, and hold the bars in separated relation.

LEO PERRY.