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L. DOYEN ET AL
PORTABLE SEWING-MACHINE

2,778,328

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2 Sheets-Sheet 1

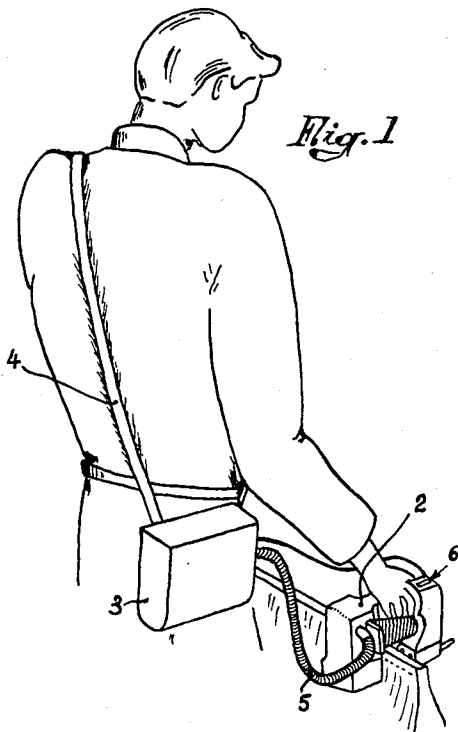


Fig. 1

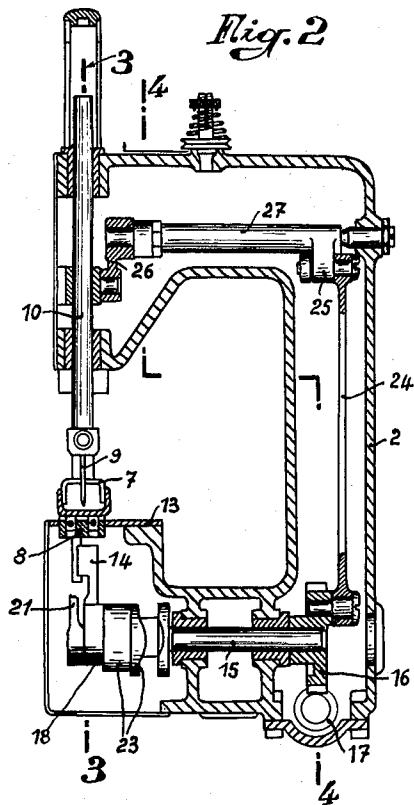


Fig. 2

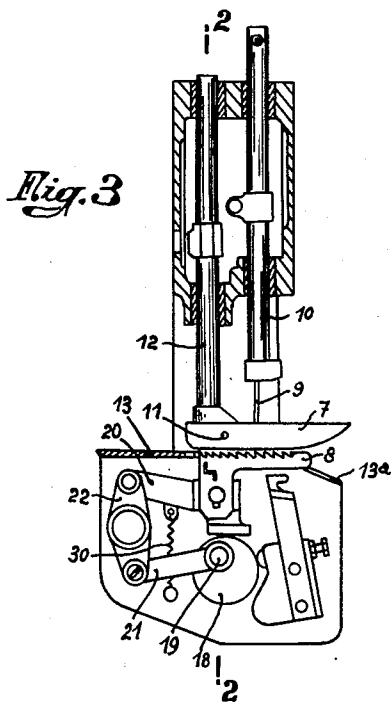


Fig. 3

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2 Sheets-Sheet 2

Fig. 4

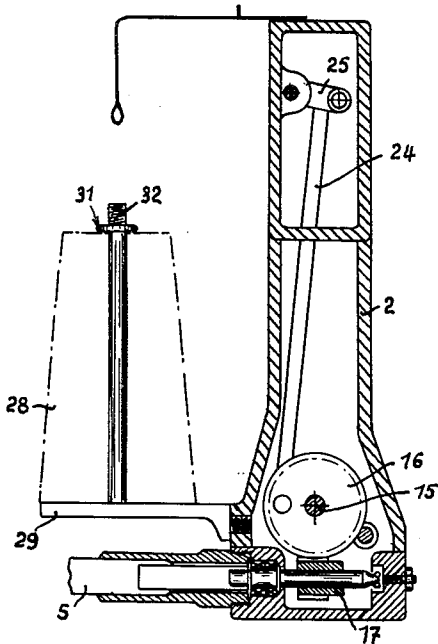


Fig. 6

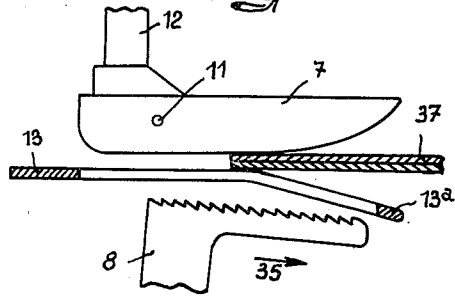


Fig. 7

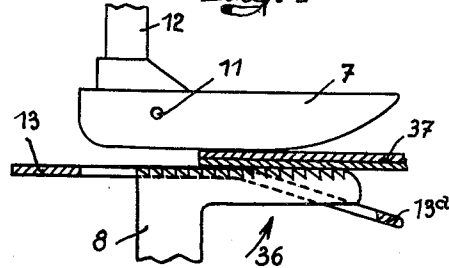


Fig. 5

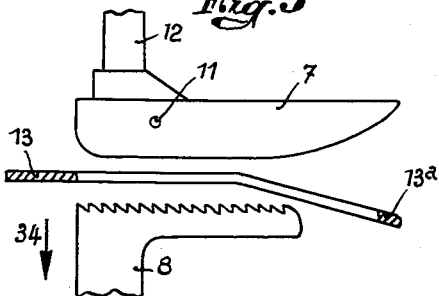
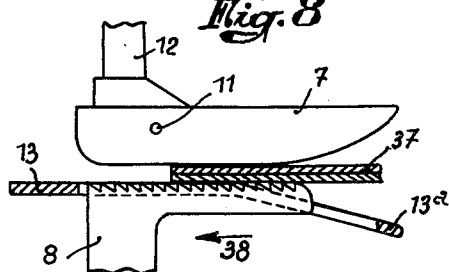


Fig. 8



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1

2,778,328

PORTABLE SEWING-MACHINE

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2 Claims. (Cl. 112—11)

Our invention has for its object a portable sewing machine for chain stitching, the said machine being more particularly but not exclusively intended for the closing of all types of bags and chiefly paper, jute and the like bags.

Our improved sewing machine shows the following novel and interesting features:

The central section of the body of the machine, i. e. the section connecting the extreme sections carrying respectively the needle and the presser foot on one hand and the feed dog, the thread finger and the needle plate on the other hand, forms the handle of the machine.

The driving motor is carried inside a satchel slung across the operator's back and the said motor is connected with the machine through a flexible cable and is controlled through a switch carried by the body of the machine and actuatable through a finger of the operator's hand carrying said machine so that the second hand of the operator is quite free and may hold the two plies of the fabric, which are sewn together before and during stitching.

Furthermore, the machine incorporates a pivotally mounted presser foot, a needle plate sloping forwardly so as to form with the said presser foot a substantially V-shaped angle and a feed dog the path periodically travelled over by which is such that it is tilted downwardly during its forward movement so as to become substantially parallel with the needle plate at the end of its stroke while extending underneath the latter, the rearward return movement of the feed dog being executed after a quick rising movement which allows the said feed dog to take hold of the fabric lying between the presser foot and the needle plate, whereby the fabric is engaged and the stitching begins without the operator releasing the pressure exerted by the presser foot and even without said operator having to raise the latter.

This design of the sewing machine, associated on one hand with the use of light alloys in the execution of its different parts and on the other hand with the provision of parts of tubular shape, allows obtaining a machine which is very light and the weight of which is of the order of 1 to 1.5 kg. whereas portable sewing machines of the type used up to now weigh at least 3 kg. Now the weight is a critical factor for portable sewing machines which are to be held with one hand often during the whole day.

We have illustrated in accompanying drawings, by way of example and by no means in a limiting sense, a preferred embodiment of our improved sewing machine. In said drawings:

Fig. 1 is a perspective view of the machine during use;

Fig. 2 shows on an enlarged scale a sectional view through line 2—2 of Fig. 3;

Figs. 3 and 4 are sectional views, respectively through lines 3—3 and 4—4, of Fig. 2;

Figs. 5, 6, 7 and 8 are diagrammatic views showing

2

the successive positions of the feed dog during one cycle of its operation.

Our improved sewing machine includes a body of a generally conventional shape, except for the fact that its medial section 2 extending in parallelism with the needle bar is sufficiently thin to form the handle through which the machine may be manipulated. The electric motor driving the machine is independent of the body of the latter and is carried inside a satchel 3 provided with a strap 4 slung across the back of the operator, as clearly apparent from inspection of Fig. 1. The machine is connected with the motor through a cable extending inside a sheath 5 and providing for the transmission of movement between the motor and the machine.

The operation of the motor is controlled by a switch 6 carried by the body of the machine at one end of its handle-forming section 2 in a manner such that the motor and consequently the machine may be started through depression of the thumb of the operator's hand carrying the machine.

In Figs. 2 to 4, 7 designates the presser-foot pivotally secured through the pivot 11 to a carrier rod 12. 8 designates the feed dog, 9 the needle, 10 the needle bar, 13 the needle plate the front end of which is defined by a sloping surface 13a. Furthermore, 14 designates the thread finger, 15 the shaft carrying the different cams, the said shaft being driven by the flexible transmission 5 through the agency of a pinion 16 and of a worm 17. The cam 18 carried by the said camshaft controls the upward and downward movements of the feed dog 8 while the crank 19 controls the levers 21 and 22 which produce in their turn the horizontal reciprocation of the carrier 20 of the feed dog 8, the said carrier being submitted to the action of a spring 30 urging it against the cam 18. The thread finger 14 is controlled by the cam 23 on the camshaft while the connecting rod 24 which is pivotally secured to the pinion 16, transmits, through the crank pins 25 and 26 interconnected by the intermediate shaft 27, a rectilinear reciprocation to the needle bar 10. A conical thread spool 28 is carried by a support 29 secured to the body of the machine, the said conical spool being held on said support by a nut 31 screwed over the upper end of the vertical rod 32 over which said spool 28 is fitted.

The portable sewing machine thus designed shows the following chief advantages:

Assuming its different component parts are made of a light alloy, the machine weighs between about 1 and 1.5 kg.

The fabric-engaging feed dog 8 provided on the machine allows cutting out the conventional part serving for the raising of the presser foot. As a matter of fact, and through the combined action of the cam 18 and crank 19, the feed dog 8 executes no longer a movement along the sides of a rectangle as in conventional sewing machines and its periodical movement is constituted by successive steps as follows:

(a) After it has ended its rearward movement, as shown in Fig. 5, the feed dog 8 is constrained to sink vertically in the direction of the arrow 34 (Fig. 5);

(b) When the feed dog 8 has reached its lowest position, it moves forwardly while assuming a downwardly tilted position as shown by the arrows 35 of Fig. 6, whereby at the end of its stroke the said feed dog is substantially parallel with the front sloping end 13a of the needle plate 13, while extending underneath the said sloping end;

(c) Through the operation of the cam 18, the feed dog 8 rises then suddenly in the direction of the arrow 36 shown in Fig. 7, whereby it engages through its front teeth the two fabric plies 37 which have been introduced inside the V-shaped angle between the end of the presser foot 7 and the needle plate 13;

3

(d) The feed dog 8 assumes finally a rectilinear rearward movement in the direction of the arrow 38 shown in Fig. 8 and draws the fabric 37 along with it;

(e) The feed dog 8 now returns into the position of Fig. 5 and begins a further cycle of similar operative steps.

The association of this cycle of movement of the feed dog 8 with the pivotal connection provided for the presser foot and the slope given to the needle plate in its forward section, allows engaging the fabric without it being necessary to raise the presser foot and without it being necessary to reduce the pressure exerted by the said presser foot.

Our improved machine is particularly, but not exclusively, of interest in the case where it is to execute short stitches in thick fabrics, which operation is comparatively difficult to perform with conventional machines and requires always, each time a fabric is introduced into them, a raising and lowering of the presser foot.

Furthermore, our improved machine is preferably provided with a straight thread finger 14 instead of a rotary looper as in conventional machines and consequently it may easily stitch thick fabrics and fabrics provided with a layer of rubber or bar, because the amount of thread used for a loop is much smaller in the case of a thread finger than in the case of a rotary looper.

A further important advantage of our machine consists in the position of the handle 2 which is located perpendicularly to the line of operation of the machine; consequently the machine may be used in all positions, in other words, as well in a position for which the handle is horizontal when it is desired to close bags and bales, as illustrated in Fig. 1, and in a position for which the handle is vertical. It may, in fact, be used in all angular positions, which allows, if required, sewing fabrics extending above the operator as is necessary for instance in the case of upholstery work. It should be remarked also that the flexible transmission 5 enters the machine perpendicularly to the handle and in parallelism with the direction of operation of said machine so that it cannot hinder such operation in whatever position the machine be set. Furthermore, the spool of thread 28 held by the nut 31 may unwind under favorable conditions, whatever position is assumed by the machine.

What we claim is:

1. A portable sewing machine comprising a machine body including a narrow elongated tubular section adapted to serve as a grip for the operator's hand and two short parallel tubular transverse sections perpendicular to the elongated section and rigid with the outer ends thereof respectively, a carrier rod rigid with one transverse section of the body, parallel with the elongated section and projecting into proximity with the second transverse section, a presser foot pivotally secured to the projecting end of the carrier rod round an axis perpendicular to the plane defined by the axes of the two sections, a needle adapted to reciprocate inside the said first transverse section in parallelism with the axis of the elongated section in register with said presser foot, an apertured needle plate rigid with the second transverse section of the body, facing the presser foot and including a lateral portion forming an acute angle with the said presser foot, a feed dog carried by the second transverse section in close proximity with the said needle plate and adapted to engage a fabric held between the latter and the presser foot through the aperture in the needle plate, a thread-finger and thread-feeding means carried by the second extreme section, a rotary control member for the said thread finger, a portable driving motor independent of the machine body, a

4

yielding shaft operatively connecting the said driving motor with the said control member, means inserted between the said control member and the feed dog to constrain the latter to execute first a forwardly and upwardly directed movement to make it assume a tilted position substantially underneath the lateral portion of the needle plate and parallel therewith, then a speedy rising movement adapted to make the feed dog engage the fabric held between the presser foot and the needle plate, a rearward movement operatively shifting the fabric and finally a downwardly directed return motion, and switching means carried by the machine body within reach of a finger of the operator's hand grasping the elongated section of the machine body and controlling the operation of the motor.

2. A portable sewing machine comprising a machine body including a narrow elongated tubular section adapted to serve as a grip for the operator's hand and two short parallel tubular transverse sections perpendicular to the elongated section and rigid with the outer ends thereof respectively, a carrier rod rigid with one transverse section of the body, parallel with the elongated section and projecting into proximity with the second transverse section, a presser foot pivotally secured to the projecting end of the carrier rod round an axis perpendicular to the plane defined by the axes of the two short sections, a needle adapted to reciprocate inside the said first transverse section in parallelism with the axis of the elongated section in register with said presser foot, an apertured needle plate rigid with the second transverse section of the body, facing the presser foot and including a lateral portion forming an acute angle with the said presser foot, a feed dog carried by the second transverse section in close proximity with the said needle plate and adapted to engage a fabric held between the latter and the presser foot through the aperture in the needle plate, a thread-finger and thread-feeding means carried by the second extreme section, a rotary control member for the said thread finger, a portable driving motor independent of the machine body, a yielding shaft operatively connecting the said driving motor with the said control member, a cam and a crank rigid with said rotary control member, a member carrying the feed dog, a spring urging said carrier member against said cam and a lever system controlled by the crank and pivotally carrying said member, the combination of the cam, lever system and crank imparting to the feed dog in succession a forwardly directed movement to make the feed dog assume a tilted position lying substantially underneath the lateral portion of the needle plate and parallel therewith, then a speedy rising movement to make the feed dog engage the fabric held between the pressure foot and the needle plate, a rearward movement with the fabric and finally a lowering movement to make the feed dog return into its starting position, and switching means carried by the machine body within reach of a finger of the operator's hand grasping the elongated section of the machine body and controlling the operation of the motor.

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