April 12, 1938. A. GELLMAN 2,114,075

FAGOTING STITCHING MACHINE

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FIG. 1.

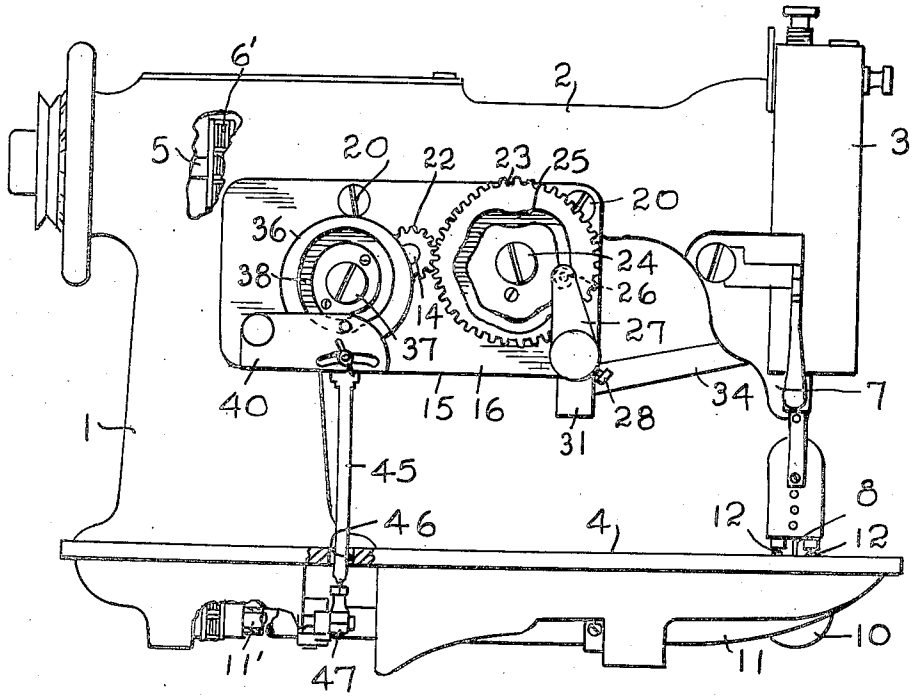

FIG. 2.

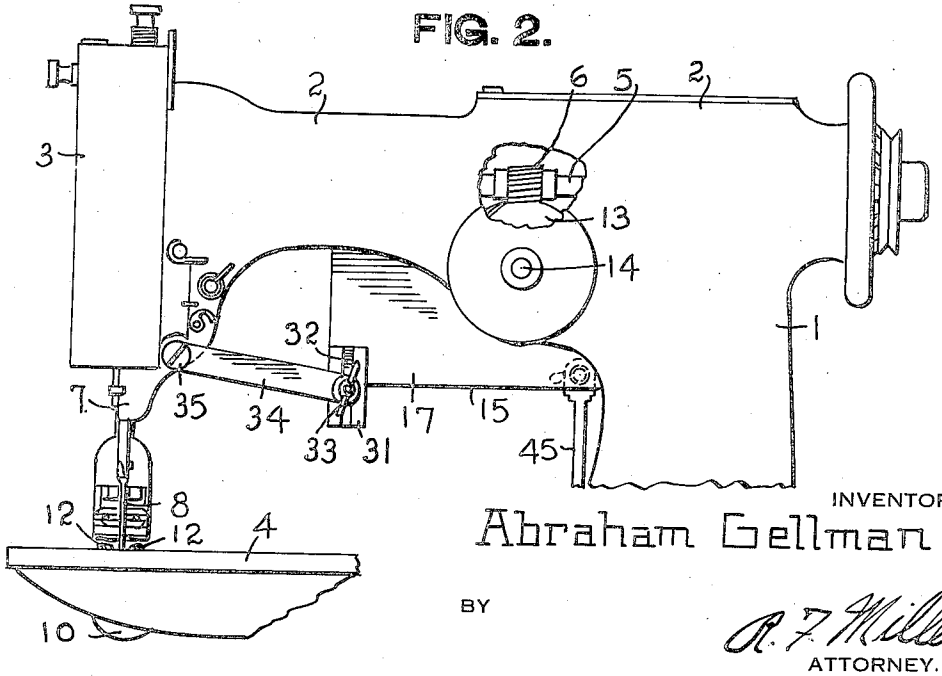

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FIG. 3.

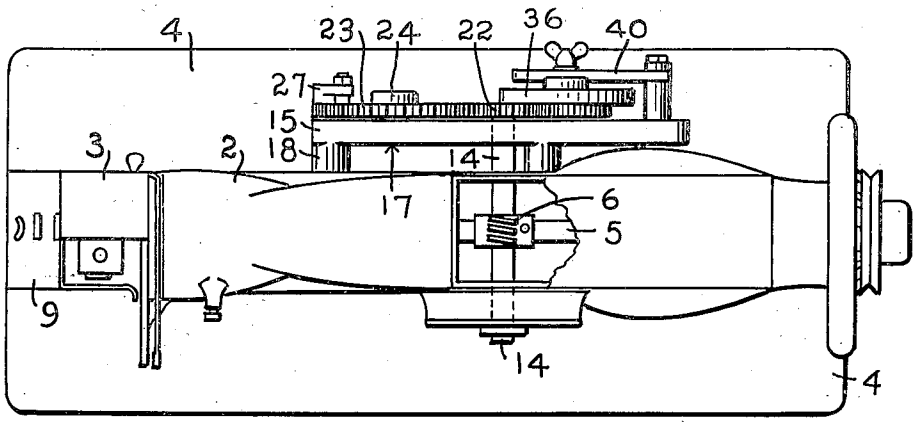


FIG. 4.

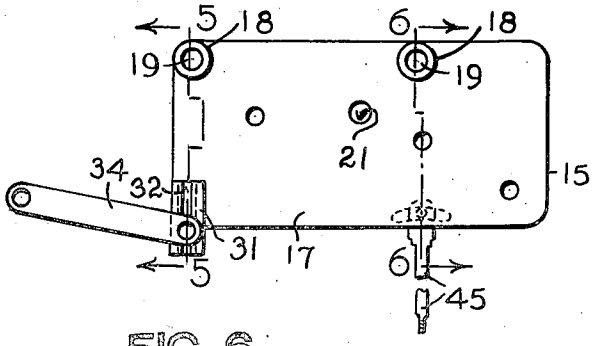


FIG. 5.

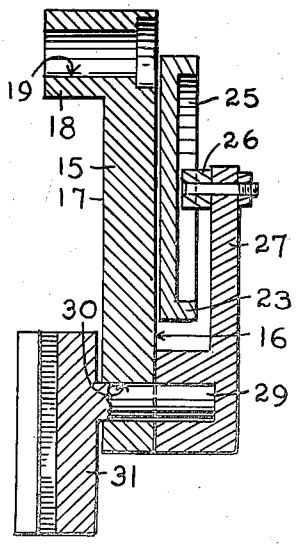


FIG. 6.

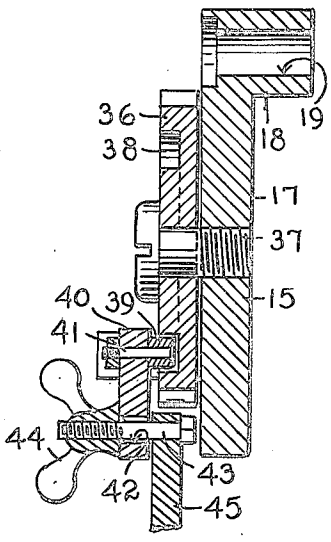
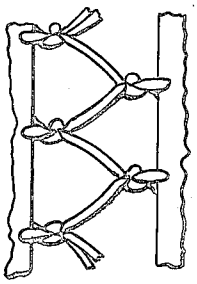


FIG. 7.



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UNITED STATES PATENT OFFICE

2,114,075

FAGOTING STITCHING MACHINE

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Application February 27, 1937, Serial No. 128,256

2 Claims. (Cl. 112—179)

This invention relates to improvements in ornamental stitch sewing machines, and more particularly to a mechanism for actuating the stitch forming means of such machines.

At the present time, machines provided for sewing ornamental stitching, such as fagoting, are capable of producing such stitching only relatively slowly. In addition to this limitation in speed, existing machines are capable of producing ornamental stitching of only a very limited width.

An object of this invention is, therefore, to provide a mechanism which will greatly increase the speed with which such stitching may be produced. Another object is an ornamental stitch sewing machine which makes possible the production of stitching of much greater width than has been possible with the machines heretofore used. Another object is to provide a compact assembly of parts of a mechanism for actuating the stitch forming means, whereby the cams and associated portions of the needle shifting mechanism and of the actuating mechanism for the feed advance are disposed in juxtaposition and readily accessible for adjustments, repairs, and the like. Other objects and advantages of the invention will be apparent during the course of the following detailed description thereof, taken in connection with the accompanying drawings, forming a portion of this specification, and in which drawings:

Fig. 1 is a side elevation of a conventional zig-zag sewing machine having associated therewith my improved mechanism which actuates the stitch forming means, and which converts the machine into one capable of producing fagoting stitching of large width at high speed;

Fig. 2 is a side elevation, opposite that shown in Fig. 1, of the machine and novel mechanism;

Fig. 3 is a top plan view of the structure shown in Figs. 1 and 2;

Fig. 4 is a side elevation of the novel mechanism, detached from the sewing machine;

Figs. 5 and 6 are sections, taken upon substantially the lines 5—5 and 6—6 of Fig. 4; and

Fig. 7 is a plan view in full size of the ornamental stitching made by my improved machine.

In carrying out my invention I have associated in a novel manner with the zig-zag type of sewing machine which is constructed for high speed operation, a combination of mechanical parts which make possible the successful actuation of the needle and feed advance mechanism for the manufacture at high speed of fagoting stitching of width considerably wider than hitherto possible. By the mechanism described herein the tapes or strip materials joined by the stitching may easily be spaced one-half inch or more.

The ornamental stitch sewing machine, shown by way of example in the drawings, includes the usual high speed zig-zag machine having a standard 1, from which projects a bracket arm 2, terminating in a head 3. The bracket arm 2 and head 3 are disposed above a bed plate 4. Extending longitudinally through the bracket arm 2 is a main drive shaft 5 carrying a worm gear 6 intermediate its ends and housed within the bracket arm 2. This main shaft 5 is operatively connected, as is well known in the art, with the stitch forming means which ordinarily includes a vibrating needle bar frame 7, carrying needle 8, so as to provide for a reciprocation of the needle, through a suitable opening in the needle plate 9 carried by the bed plate 4, in order that the thread or other material upon the needle 8 will lock with the thread or other material carried by a bobbin 10 disposed below the needle plate 9.

Beneath the bed plate 4 is a feed advance rocker shaft 11 operatively connected, as is well known in the art, with the feed advance means, including a pair of feed dogs 12, having a roughened file-like surface providing work-engaging teeth which project upwardly through openings in the needle plate 9. The feed dogs are longer, wider and are spaced further apart than the similar parts in the known type of fagoting stitching machine.

Meshing with the worm gear 6 is a suitable gear 13 carried by the driven shaft 14 which extends transversely of the bracket arm 2 and below the main shaft 5, being journaled in suitable bearings in the bracket arm 2 and projecting outwardly therefrom at one side of the latter, as shown in Fig. 3.

The novel mechanism for actuating the stitch forming means, includes a suitable support which may be a plate 15, having a pair of opposite faces, one of which may be designated as the outer face 16 and the other, the inner face 17. From the inner face 17 may project one or more lugs 18 provided with bores 19, so that suitable means may be provided for attaching the plate 15 to the bracket arm 2. In the example shown, the shanks of screws 20 extend through the bores 19 and into suitable screw-threaded sockets in the wall of the bracket arm 2 so that the plate 15 may be detachably secured

to the bracket arm, but spaced therefrom, substantially as shown in Figs. 1 to 3.

A bore 21, extending through the plate 15, accommodates the protruding end of the shaft 14 so that a suitable driving gear 22, designated as the main driving gear, may be rotatably carried thereby and extend from the outer face 16.

Meshing with the gear 22 is a needle vibrating cam gear 23, rotatably carried by the plate 15 and mounted to rotate upon a suitable pivot, such as the smooth portion of the shank of a suitable screw 24, which is detachably secured to the plate 15. This gear 23 is provided in one of its faces, preferably the outer face, with a cam groove 25 of suitable configuration.

Extending into this cam groove 25 is a roller 26, rotatably carried by a rocker arm 27, as at one end thereof and with the other end of the arm adjustably secured, as by a set screw 28, to a shaft 29 extending through a suitable perforation 30 in the plate 15 and terminating in an adjusting segment lever 31 having a slot 32 accommodating the shank of a suitable adjusting and securing member, such as a wing nut 33, for connecting thereto a shifting bar 34, which is detachably connected to the swinging frame 7 as by a stud 35 the shank of which passes through a perforation ordinarily found in swinging frames. It will be noted in Figs. 1 and 2 that the operative connection of the actuating mechanism for this portion of the stitch forming means is quite direct and short. The adjustment provided by the slot 32 increases or decreases the width of the stitch by varying the amplitude of motion of the needle as will be readily apparent.

A second gear meshes with the gear 22, this being a feed cam gear 36 rotatably carried by the plate 15 and mounted to rotate upon a suitable pivot, such as the smooth portion of the shank of a suitable screw 37, which is detachably secured to the plate 15. Preferably, the feed cam gear 36 is provided in its outer face with a cam groove 38 of suitable configuration.

Projecting into the cam groove 38 is a roller 39 rotatably carried by the feed rocker arm 40, as by a suitable pivot pin 41. This arm 40 is suitably pivoted to the plate 15 and may extend over a portion of the outer face 16 substantially as shown in Fig. 1.

The feed rocker arm 40 may be provided with an arcuate slot 42 through which extends a screw threaded shank 43 having, for example, a wing nut 44 upon one protruding end and coupling a feed connection rod or member 45 to the arm 40 at its other end. Slot 42 is to decrease or increase the length of the stitch by varying the motion of the feed dogs.

This rod 45 extends downwardly through a suitable opening 46 in the bed plate 4. At its lower end, the rod 45 is detachably secured, as by a crank arm 47, to the rock shaft 11.

The needle vibrating cam is larger than the feed cam and its gear is provided with teeth in such excess of that of the feed cam as will cause the less rapidly rotating needle vibrating cam to vibrate the needle bar frame in the required relation to the feed actuated by the feed cam.

The numeral 11' indicates the shaft, driven by belt 6', for revolving the hook (not shown) which is conventional on zig-zag machines.

I have found after experimenting with various mechanisms for producing improved fagoting machines that the arrangement of parts above described embodies a highly practical, if not the only practicable, mechanism for producing at high speed large stitching of the fagoting type.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do not limit myself to the specific embodiments thereof except as defined in the appended claims.

I claim:

1. A fagoting stitching machine comprising in combination with a zig-zag sewing machine provided with a vibrating needle bar frame, a main drive shaft, a driven shaft, and a feed advance rock shaft, of a support mounted on said machine, said driven shaft extending through said support and having a driving gear thereon exteriorly of said support, a needle vibrating cam rotatably carried by said support and driven by said driving gear, a rocker arm pivotally carried by said support and actuated by said cam, a segment lever rocked by said rocker arm, a shifting bar pivoted to and adjustable longitudinally on said segment lever and pivoted at its other end to said vibrating needle bar frame, a feed cam rotatably carried by said support and driven by said driving gear, a feed rocker arm pivotally carried by said support and rocked by said feed cam, and a feed connection rod pivotally engaging said feed rocker arm and longitudinally adjustable thereof, said feed connection rod actuating said feed advance rock shaft.

2. A fagoting stitching machine comprising in combination a vibrating needle bar frame, a feed advance rock shaft, a rotatable needle vibrating cam consisting of a gear provided with a cam groove in its face, a feed cam mounted to rotate on a separate parallel axis and consisting of a gear provided with a cam groove in its face, a driven gear having its teeth meshing with the teeth on both of said cams, a pivoted needle vibrating rocker arm one arm of which engages the groove in said needle vibrating cam, a shifting bar actuated by the other arm of said needle vibrating rocker arm and attached to said needle bar frame, adjusting means positioned between said needle vibrating cam and needle bar frame to vary the width of the stitching made by the needle, a feed rocker arm engaging the groove in said feed cam, a feed connection rod connecting said feed rocker arm and said feed rock shaft to rock the latter, and adjusting means positioned between said feed cam and said feed advance rock shaft for varying the length of the stitch.

ABRAHAM GELLMAN.