Dec. 30, 1952 F. ASHWORTH 2,623,488

MACHINE FRAME

Filed Sept. 23, 1949 4 Sheets-Sheet 1

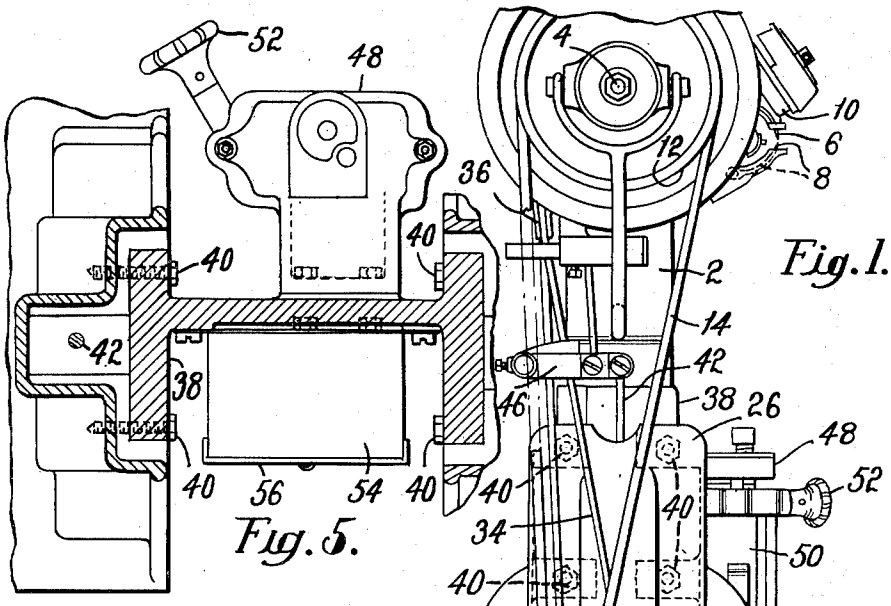
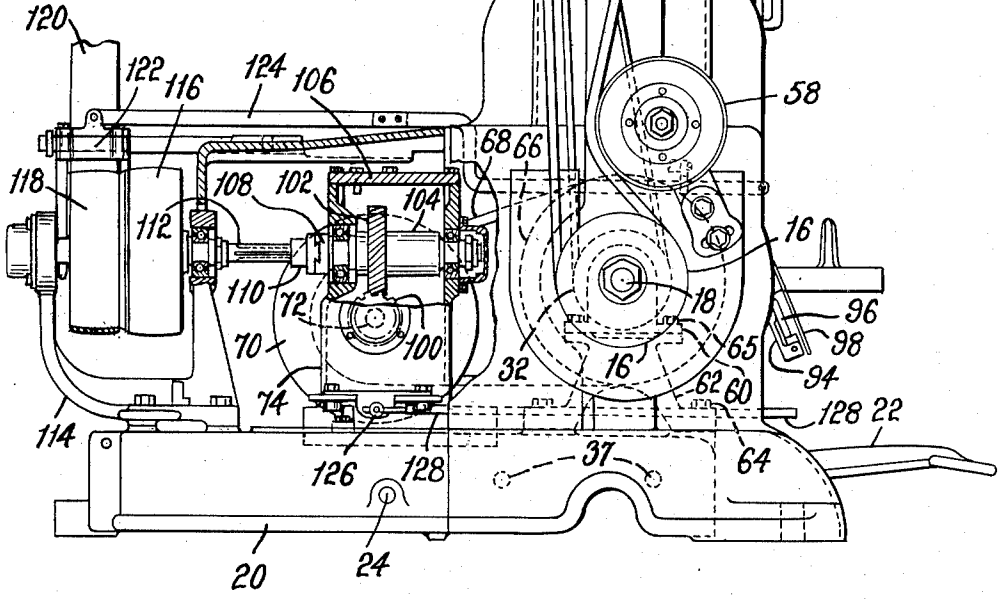


Fig. 5.

Fig. 1.



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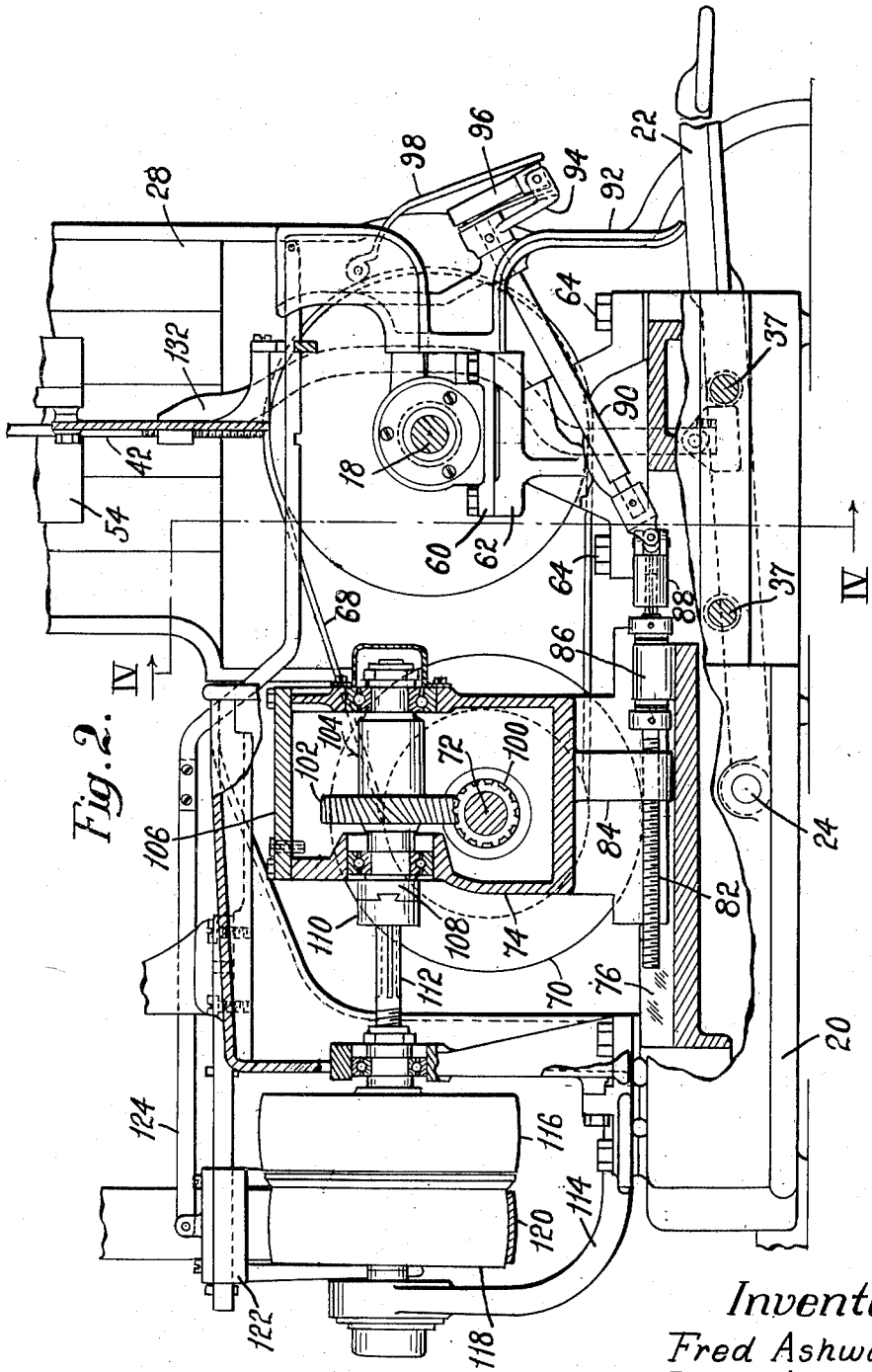


Fig. 2.

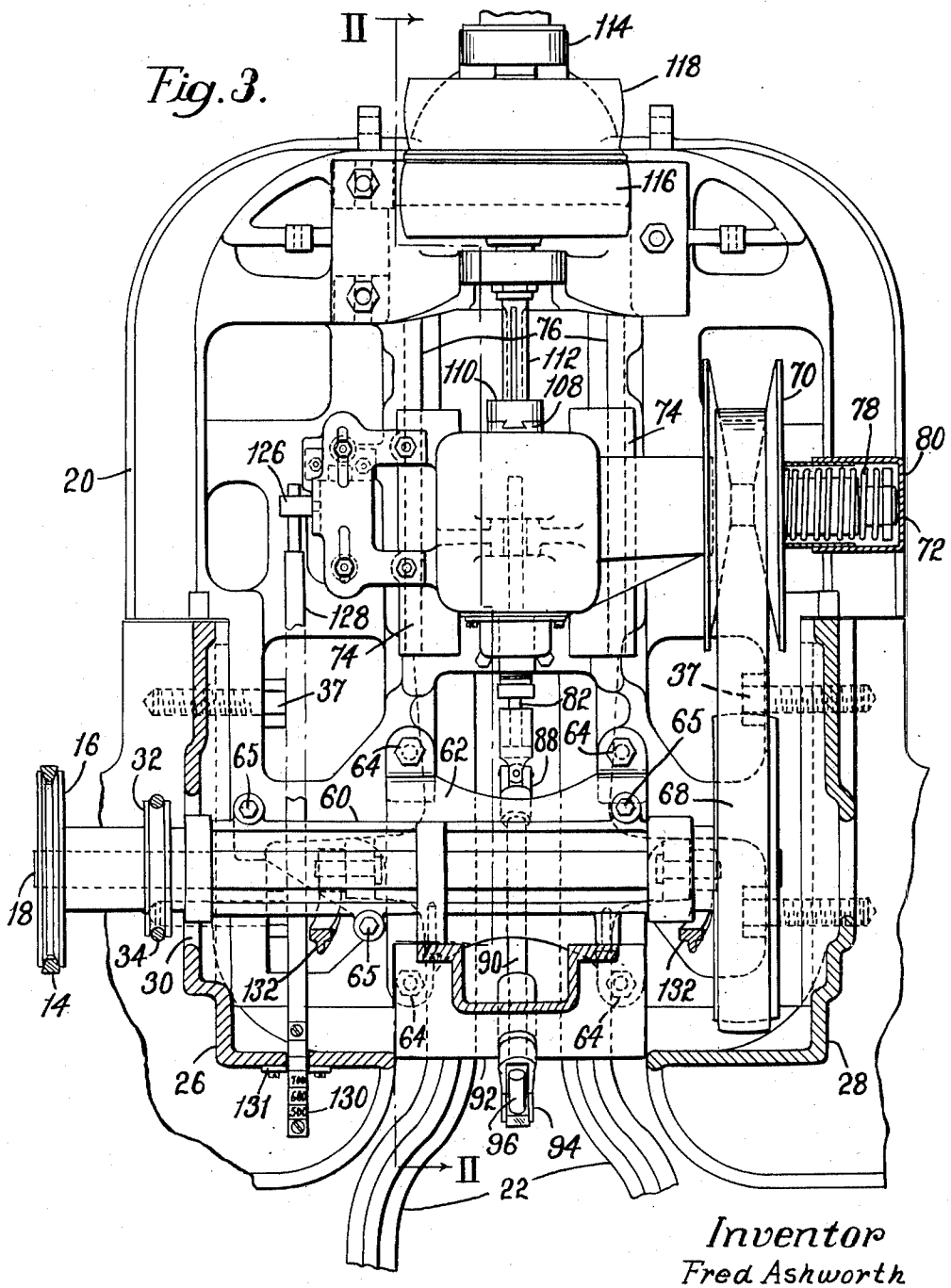
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MACHINE FRAME

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Fig. 3.



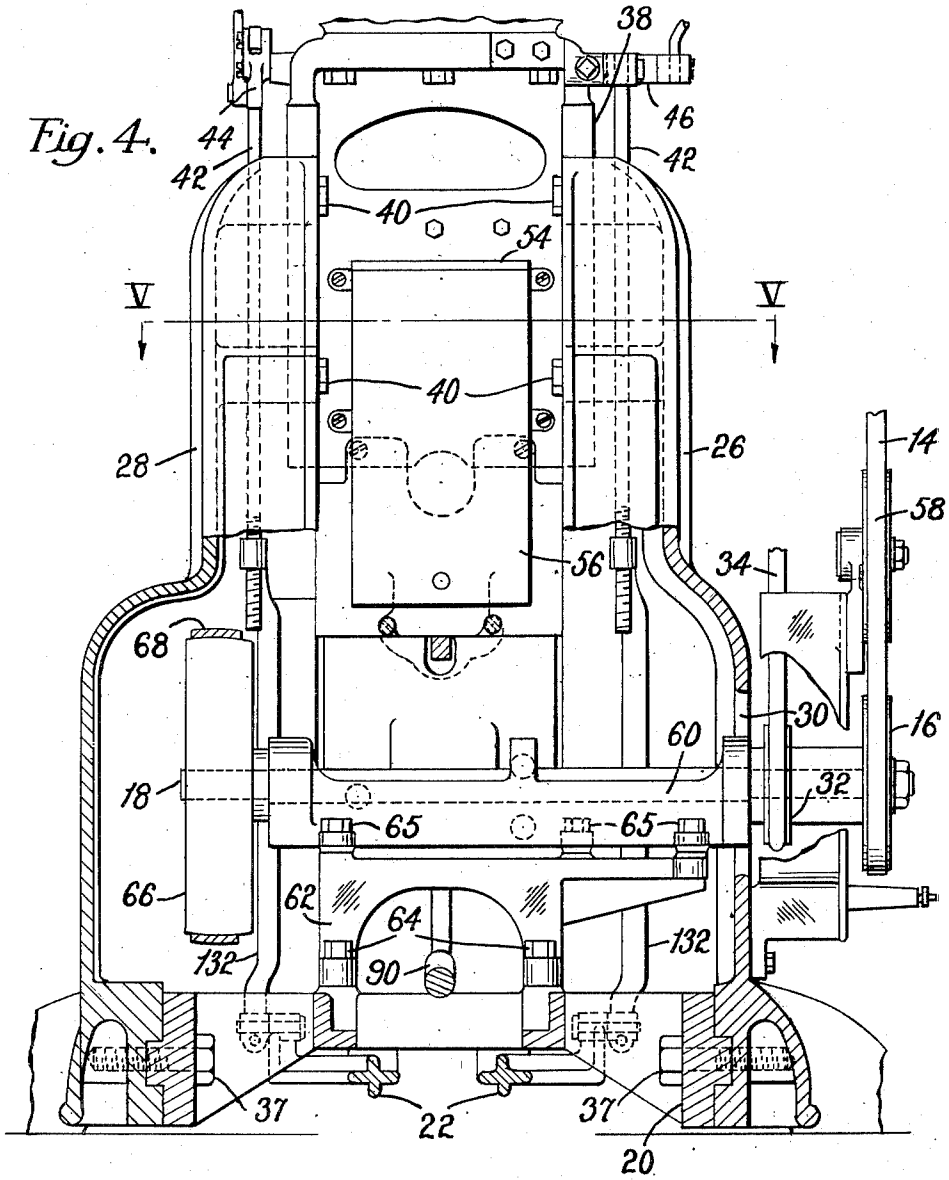
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Fig. 4.



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2,623,488

UNITED STATES PATENT OFFICE

2,623,488

MACHINE FRAME

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Application September 23, 1949, Serial No. 117,377

12 Claims. (Cl. 112—220)

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The present invention relates to supporting frames for heavily constructed machines and more particularly to frames of machines of the type employed for high speed shoe sewing having self-contained power driving mechanism and comprises an improvement over the frame disclosed in United States Letters Patent 2,347,782, granted May 2, 1944, upon application of C. L. Knott.

The machine disclosed in the Knott patent comprises a base and a generally rectangular frame for the operating devices of the machine secured between similar reversely disposed guide plates shaped in the form of open shells joined to the frame and base with the openings in the shells facing each other. The frame is more or less box-shaped with openings of limited dimensions to provide access to concealed fastenings by means of which the frame is secured to the side shells.

In certain types of machine, apparatus auxiliary to the operating devices are required. In a shoe sewing machine of the type referred to, these auxiliary apparatus include a thread treating or waxing container and electrical fixtures and control boxes. With the use of a boxlike frame for the operating devices of the machine disclosed in the Knott patent, no convenient unexposed location for the auxiliary apparatus is available unless they are mounted within the boxlike frame construction. If this is done, difficulty may be encountered in unduly weakening the structure through formation in the frame of openings essential for manipulation and assembly of the auxiliary apparatus.

The object of the present invention is generally to improve the construction and arrangement of parts in a frame for a machine of the class described, wherein good rigidity of construction is provided while at the same time convenient unexposed but readily accessible mounting locations are available for the auxiliary apparatus. A further object is to improve the construction of machine frames having variable speed, power driving connections mounted in the base of the machine but protected from accidental contact and being controlled in stopping and starting by foot treadles, the connections to which treadles also are shielded in a convenient manner.

To the ends set forth, the present embodiment of the invention comprises a machine of the class described having a base and open shell members secured to opposite sides of the base, in which central supporting devices for the operating devices of the machine are provided having a generally H-shaped horizontal section spaced above

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the base with each of the flat side flanges thereof secured to one of said shell members to provide enclosures for the spaces within the shell members. By such construction, not only is a light rigid support provided for the machine but well located open niches within opposite sides of the H-shaped frame enable advantageous mounting of auxiliary apparatus and adjustable power driving mechanism for the machine. In the illustrated machine, the devices for performing the operation comprise stitch forming devices and the auxiliary apparatus located within the open niches of the frame include a wax pot and an electrical connection box. In one form of this feature, the enclosed spaces within the shell members provide a vertical through-passage from the base to the operating devices for treadle rod connections.

These and other features of the machine of the invention, including an improved arrangement of self-contained adjustable speed power driving mechanism, as hereinafter described and claimed, will be apparent from a consideration of the following detail specification taken in connection with the accompanying drawings, in which

Fig. 1 is a view in left side elevation, partly broken away and in section, of a shoe outsole sewing machine embodying the features of the present invention;

Fig. 2 is a sectional view on an enlarged scale, looking from the left of the machine, of the parts at the lower portion of the machine base;

Fig. 3 is a rear sectional plan view of the base and the adjustable speed driving mechanism mounted thereon;

Fig. 4 is a sectional view taken along the line IV—IV of Fig. 2; and

Fig. 5 is an enlarged sectional plan view taken along the line V—V of Fig. 4.

The machine illustrated in the drawings is a shoe sewing machine similar in construction and in mode of operation to that disclosed in United States Letters Patent 2,271,611, granted February 3, 1942 upon application of Fred Ashworth et al.

The machine comprises a sewing head **2** including stitch forming devices actuated by a main sewing shaft **4**, the rotation of which is controlled by driving and stopping mechanism and the axis of which runs horizontally from one side to the other of the machine. The stitch forming devices consist of a curved hook needle **6**, curved awl **8**, a shuttle **10** and other devices for inserting a lock stitch outseam. The driving mechanism is in the form of a high speed clutch **12** driven from a V-belt **14** running over the grooved rotating member

of the clutch and being driven at high speed by a pulley 16 secured to a countershaft 18.

The support for the machine, which is necessarily heavily constructed, is of cast and assembled construction generally similar to that disclosed in the Knott patent. The base of the machine, indicated at 20, is elongated in a forwardly and rearwardly direction sufficient to carry on a rearwardly projecting portion thereof, power driving mechanism and adjustable variable speed driving mechanism interposed between the power driving mechanism and the driving and stopping mechanism. To control the machine there is mounted in the base 20 a pair of forwardly projecting treadles 22 fulcrumed on a cross-shaft 24 having bearings in the rearward portion of the base.

To provide a comparatively light weight but rigid construction within which most of the moving parts may be mounted for purposes of protection against accidental contact, the base of the illustrated machine has secured to its opposite sides along the forward portion thereof a pair of open concave shell members 26, 28 composed of cast metal of the so-called "draw mold" type, the concavities in the shell members facing each other and containing between them a portion of the variable speed driving mechanism. The shell member 26 at the left side has an opening 30 (Fig. 3) through which the countershaft 18 projects, the high speed driving pulley 16 and a low speed driving pulley 32 on the countershaft being carried thereby outside the shell member 26. The low speed pulley 32 is engaged by a round belt 34 for actuating a low speed stopping mechanism including a pulley 36 (see Fig. 1) secured to a shaft in the head of the machine. To secure the shell members to the base the sides of the base are ribbed to fit within grooves in the shell members and are perforated to receive bolts 37 threaded into the shell members. As thus far described the machine is similar to that of the Ashworth et al. patent and the column is of the same type as that shown in the Knott patent, both above referred to.

To retain the advantages of the column construction disclosed in the Knott patent while at the same time providing suitable accessible space for auxiliary apparatus on the machine, the frame of the present invention, as indicated at 38 in Fig. 5, is of generally H-shaped horizontal section, the head of the machine including all of its operating devices being clamped directly to the upper end of the frame 38 spaced above the base. The main operating shaft 4 is located above and the countershaft 18 extends below the frame, both being substantially parallel to the central web of the H frame. Each side flange of the frame 38 is secured by means of bolts 40 to one of the shell members inside the shell members and to lugs formed adjacent to the side edges of the shell members. Between the lugs on the shell members within which the bolts 40 are threaded are concavities forming enclosures with the side flanges of the H frame. These enclosures run vertically the full length of the shell members from the base and within the enclosures are shielded a pair of treadle rods 42, one at either side of the frame. The upper ends of the treadle rods are connected to levers 44 and 46, best shown in Fig. 4, and through other suitable link connections are arranged to actuate control levers for the driving and stopping mechanism and others of the operating devices in the machine.

It will be readily apparent in a supporting structure with the use of an H-shaped frame having side flanges secured to the edges of shell members, that the H frame has within it open niches at opposite sides of the machine. These niches provide conveniently accessible mounting spaces for auxiliary apparatus. Accordingly, at the front of the central web in the frame is bolted a thread lubricant or wax pot 48 of conventional form, the container 50 of which is lowered or raised from the supporting parts of the wax pot by loosening a hand clamping screw 52. At the rear of the central web is an electrical connection box 54 for heating and other circuits required by the machine. This connection box is provided with a rearwardly opening cover 56 behind which are mounted essential electrical fixtures.

The countershaft 18 is mounted directly below the H frame 38, the belt 14 running to the high speed pulley 16 being engaged by a belt tensioning idler 58 adjustably secured to the outside of the shell member 26. The countershaft 18 is rotatable in bearings formed in a bracket 60 bolted to a sub-bracket 62 in turn clamped by bolts 64 to the base 20. The bolts between the bracket and sub-bracket are indicated at 65. The line of division between brackets 60 and 62 is such that the dimensions of the bracket 60 radially of the countershaft 18 are less than the dimensions of the opening 30 through which the countershaft passes. By so forming the bracket 60 the countershaft and the bearing bracket may be assembled in the machine as a unit. Such an arrangement is of advantage not only in assembling the machine but also in case the bearings for the countershaft become seized or frozen to the shaft rendering difficult the removal of the shaft from the bearings.

The adjustable driving mechanism includes a flat faced pulley 66 secured to the right end of the countershaft. Within the machine is a belt 68 surrounding the pulley and having V-type side edges engaging a V-pulley 70 secured to a constant speed shaft 72 rotatable in bearings in a carrier 74. The constant speed shaft 72 extends in parallel relation to the countershaft 18. The carrier 74 has dovetail faces along its lower side edges engaging a correspondingly shaped rearwardly extending guideway 76 in the base 20 along which the carrier and constant speed shaft 72 are movable toward and from the countershaft 18. The V-pulley 70 has side cones which are yieldingly pressed together by a compression spring 78 (see Fig. 3) enclosed within a housing 80 rotating with the shaft 72. When the carriage and constant speed shaft are moved toward and from the countershaft 18 the V-belt 68 is brought into different radial driving relationship with the side cones on the pulley 70 providing a desirable speed adjusting control.

In the illustrated form of the adjustable speed driving mechanism the movement of the carriage 74 toward and from the countershaft 18 is produced by a jack screw 82 threaded into a downwardly projecting lug 84 (Fig. 2) on the carriage 74 and rotatably mounted in a bearing 86 forming a part of the base 20 between the shell members 26 and 28. The forward end of the jack screw has a universal joint 88 connecting to it an upwardly inclined shaft 90. The shaft 90 projects from the front of the machine and is rotatably mounted in a bearing in a plate 92 secured to the forward sides of the bracket 60 and sub-bracket 62. At the forward end of the inclined shaft 90 is a crank 94 having pivoted to

its outer end an adjusting handle 96 arranged to be swung from a position radial to the shaft to a position axial to the shaft for convenient operation. After operation of the adjusting handle it is again returned to its radial position and is protected from accumulation of oil or surplus wax falling from the wax pot by a hinged cover 98 pivoted to the plate 92.

To enable the carriage 74 and the constant speed shaft 72 to be moved toward and from the countershaft 18 without disturbing the driving relationship between the constant speed shaft and the power driver of the driving mechanism, the constant speed shaft is rotated through an angle drive connection. The angle drive connection consists of helical gears 100 and 102 on the constant speed shaft 72 and on a spindle 104 disposed at right angles to and above the constant speed shaft. The spindle 104 is hollow and is rotatably mounted in the side walls of the carriage which is in box-like form arranged to receive a supply of lubricant for the gears, the upper end of the carriage being closed by a cover plate 106. At one end of the spindle 104 it is connected by means of a radially sliding joint to a collar 108 which in turn is connected by a similar joint sliding at right angles to the first mentioned joint between the collar and the spindle to a splined sleeve 110. Running through the splined sleeve 110 and into the spindle is a splined power driver shaft 112 rotatably mounted in spaced bearings carried by a bracket 114 bolted to the rearward end of the base 20 which projects beyond the shell members 26, 28. The power driver shaft is disposed at right angles to the direction of the countershaft 18.

The power driver shaft 112 supports between its bearings in the bracket 114 an idler pulley 116 and a fast pulley 118 over which a factory drive belt 120 passes. The belt 120 is conveniently shiftable from one pulley to another by means of a forked shifter 122 actuable by a shifter rod 124 extending forwardly of the machine with its forward end exposed at the front of the machine.

To enable the speed of machine operation to be determined when the adjusting handle 96 is operated, the carriage 74 has secured to a laterally projecting lug 126 thereon a speed indicating rod 128 projecting from the front of the machine. At its forward end which projects from the machine the rod has fastened to it a calibrated plate 130 provided with suitable indicia, shown in Fig. 3, arranged to be brought into alined relationship with a perforated guide 131 on the shell member 26 through which the rod slides.

To connect the control treadles 22 to the treadle rods 42, the treadles have pivotally connected to them the lower ends of a pair of yokes 132 formed with lugs at their upper ends. The lugs at the upper ends of the yokes are threaded to receive the lower ends of the treadle rods 42 thereby providing convenient means for adjusting the effective lengths of the rods. The yokes 132 enable a pivotal connection to be located on the treadles directly below the countershaft 18, the yokes straddling the countershaft and providing a direct pull on the rods without requiring their displacement from the enclosures of the shell members. In this way a saving of space within the supporting structure of the machine is afforded with the countershaft 18 directly below the sewing head of the machine.

The nature and scope of the invention having been indicated and a specific embodiment having been described what is claimed is:

1. A machine of the class described having devices for performing an operation, a base, and open concave shell members secured to opposite sides of the base with their concavities facing each other, in combination with a central supporting frame for the operating devices spaced above the base, said frame being of generally H-shaped horizontal section with each of its side flanges secured to one of said shell members to provide enclosures for the spaces within the shell members.

2. A machine of the class described having devices for performing an operation, apparatus auxiliary to the operating devices, a base and open concave shell members secured to opposite sides of the base with their concavities facing each other, in combination with a central supporting frame for the operating devices, of generally H-shaped horizontal section, with each of its side flanges secured to the edges of one of said shell members to provide enclosures for the spaces within the shell members, and open niches at opposite sides of the central web in the frame within which at least one auxiliary apparatus is mounted between the side flanges of the H-shaped frame.

3. A shoe sewing machine having stitch forming devices, a base, and open concave shell members secured to opposite sides of the base with their concavities facing each other, in combination with a central supporting frame for the stitch forming devices, of generally H-shaped horizontal section, with each of its side flanges secured to a shell member to provide enclosures for the spaces within the shell members and open niches at opposite sides of the central web and between the side flanges of the frame, a wax pot within one of said niches, and an electrical connection box within the opposite niche.

4. A shoe machine having devices for performing an operation on a shoe, a base, a control treadle in the base projecting from the front of the base and open concave shell members secured to opposite sides of the base with their concavities facing each other, in combination with a central supporting frame for the operating devices, of generally H-shaped horizontal section, with each of its side flanges secured inside one of said shell members to provide enclosed spaces within the shell members, and a rod connecting the treadle to the operating devices passing through the enclosed space within one of the shell members.

5. A shoe machine having devices for performing an operation, a base, control treadles in the base projecting from the front of the base and open concave shell members secured to opposite sides of the base with the concavities in the shell members facing each other, in combination with a central supporting frame for the operating devices, of generally H-shaped horizontal section, with each of its side flanges secured inside one of said shell members to provide enclosed spaces within the shell members, and rods connecting the treadles to the operating devices passing through the enclosed spaces within both of the shell members.

6. A shoe machine having devices for performing an operation, an elongated base, control treadles in the base projecting from the front of the base, and open concave shell members secured to opposite sides of the base with the concavities in the shell members facing each other, in combination with a supporting frame of gen-

erally H-shaped horizontal section for the operating devices, said frame having each of its side flanges secured to one only of the shell members to provide enclosures for the spaces within the shell members, power driving apparatus for the operating devices mounted on that portion of the base projecting rearwardly beyond the shell members, and rods connecting the treadles to the operating devices passing through the enclosed spaces within both of the shell members.

7. A shoe machine having devices for performing an operation, an elongated base, control treadles in the base projecting from the front of the base, and open concave shell members secured to opposite sides of the base with the concavities in the shell members facing each other, in combination with a supporting frame of generally H-shaped horizontal section spaced above the base for the operating devices, said frame having each of its side flanges secured to one only of the shell members to provide enclosures for the spaces within the shell members, rods connecting the treadles to the operating devices passing through the enclosed spaces within both of the shell members, and power driving mechanism for the operating devices mounted on the base comprising a countershaft on the base beneath the central supporting frame, a power driver on that portion of the base projecting rearwardly beyond the shell members, and adjustable driving mechanism between the countershaft and the power driver for changing the speed of operation of the operating devices.

8. A shoe machine having devices for performing an operation, an elongated base, control treadles in the base projecting from the front of the base, and open concave shell mambers secured to opposite sides of the base with the concavities in the shell members facing each other, in combination with a supporting frame of generally H-shaped horizontal section spaced above the base for the operating devices, said frame having each of its side flanges secured to one only of the shell members to provide enclosures for the spaces within the shell members, rods connecting the treadles to the operating devices passing through the enclosed spaces within both of the shell members, and power driving mechanism for the operating devices mounted on the base comprising a countershaft on the base beneath the central supporting frame, a power driver on that portion of the base projecting rearwardly beyond the shell members, adjustable driving mechanism between the countershaft and the power driver for changing the speed of operation of the operating devices, and a speed adjusting handle rotatably mounted at the front of the machine between the shell members and connected to the driving mechanism.

9. A shoe machine having devices for performing an operation, an elongated base, control treadles in the base projecting from the front of the base, and open concave shell members secured to opposite sides of the base with the concavities in the shell members facing each other, in combination with a supporting frame of generally H-shaped horizontal section spaced above the base for the operating devices having each of its side flanges secured to one only of the shell members to provide enclosures for the spaces within the shell members, a main operating shaft for the operating devices extending substantially parallel to the central web of the frame, rods connecting the treadles to the operating devices passing through the enclosed spaces within both of the shell members, a countershaft on the base beneath the central supporting frame, belt and pulley connections between the operating shaft and countershaft, a power driver for the countershaft on that portion of the base projecting rearwardly beyond the shell members disposed at right angles to the countershaft, and adjustable driving mechanism between the countershaft and the power driver for changing the speed of operation of the operating devices, comprising a constant speed shaft extending in parallel relation to the countershaft, a bearing carriage for the constant speed shaft movable on the base toward and from the countershaft, a V-type pulley on the constant speed shaft, the side cones of which pulley are yieldingly pressed toward each other, a V-belt on said pulley for driving the countershaft, an angle drive connection on the carriage for the constant speed shaft, and a splined connection between the power driver and the angle drive connection for rendering the constant speed shaft free for movement toward and from the countershaft to enable the belt to be brought into different radial driving relationships with the side cones on the pulley.

10. A shoe machine having devices for performing an operation, an elongated base, control treadles in the base projecting from the front of the base, and open concave shell members secured to opposite sides of the base with their concavities facing each other, in combination with a supporting frame of generally H-shaped horizontal section for the operating devices having each of its side flanges secured to one only of the shell members to provide enclosures for the spaces within the shell members, a main operating shaft for the operating devices extending substantially parallel to the central web of the frame rods connecting the treadles to the operating devices passing through the enclosed spaces within both of the shell members, a countershaft on the base beneath the central supporting frame extending parallel to the central web of the frame, belt and pulley driving connections between the main shaft and the countershaft, a power driver for the countershaft on that portion of the base projecting rearwardly beyond the shell members, said power driver being disposed at right angles to the countershaft, and adjustable driving mechanism between the countershaft and the power driver for changing the speed of operation of the operating devices, comprising a constant speed shaft, a bearing carriage for the constant speed shaft movable on the base toward and from the countershaft, a V-type pulley on the constant speed shaft, the side cones of which pulley are yieldingly pressed toward each other, a V-belt on said pulley for driving the countershaft, an angle drive connection on the carriage for the constant speed shaft, a splined connection between the power driver and the angle drive connection for rendering the constant speed shaft free for movement toward and from the countershaft to enable the belt to be brought into different radial driving relationships with the side cones on the pulley, and a calibrated rod connected to the carriage projecting from the front of the machine beneath the frame to indicate the speed ratio relationship of the belt on the pulley.

11. A shoe machine having devices for performing an operation, an elongated base, control treadles for the operating devices in the base projecting from the front of the base, open concave shell members secured to opposite sides of the base with their concavities facing each other

and a countershaft projecting through the opening for actuating the operating devices, in combination with a supporting frame for the operating devices secured to the shell members above the base to provide enclosures for the spaces within the shell members, power driving mechanism for the operating devices mounted on that portion of the base projecting rearwardly beyond the shell members, rods connecting the treadles to the operating devices passing through the enclosed spaces within both the shell members, and yokes between the rods and the treadles straddling the countershaft.

12. A shoe machine having devices for performing an operation, an elongated base, control treadles in the base projecting from the front of the base, open concave shell members secured to opposite sides of the base with their concavities facing each other, one of which members has a side opening adjacent to the base, and a countershaft projecting through the opening for actuating the operating devices, in combination with a supporting frame for the operating devices

secured to the shell members to provide enclosures for the spaces within the shell members, power driving mechanism for the operating devices mounted on that portion of the base projecting rearwardly beyond the shell members, rods connecting the treadles to the operating devices passing through the enclosed spaces within both the shell members, yokes between the rods and the treadles straddling the countershaft, and a bearing member for the countershaft secured to the base of sufficiently small radial dimensions to enable removal of the bearing member through the opening in said shell member.

FRED ASHWORTH.

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The following references are of record in the file of this patent:

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Number	Name	Date
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