

Feb. 10, 1959

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2,872,885

ELECTRIC SEWING MACHINES

Filed Oct. 2, 1953

2 Sheets-Sheet 1

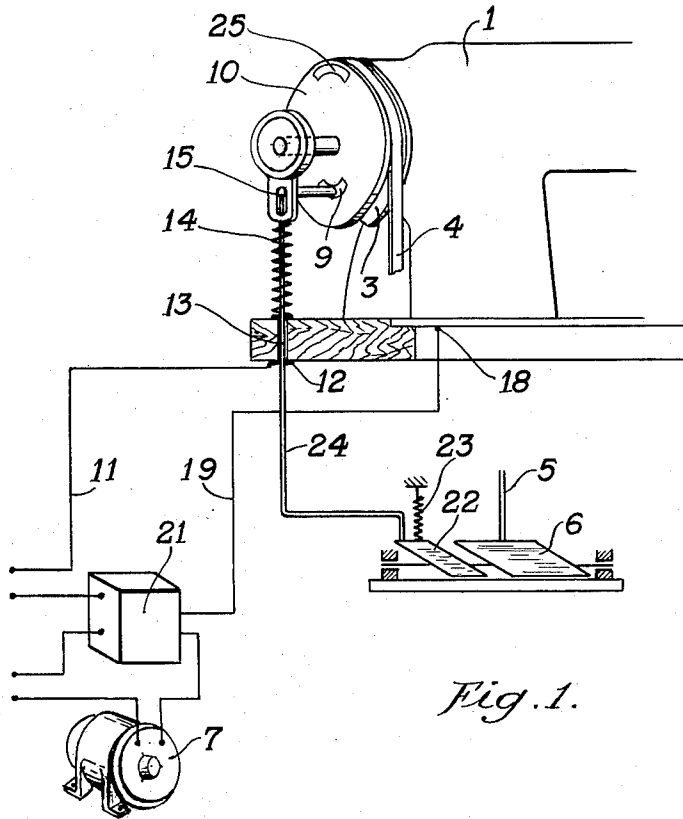


Fig. 1.

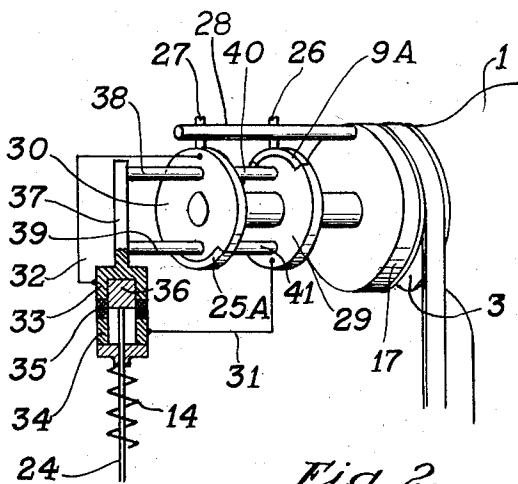


Fig. 2.

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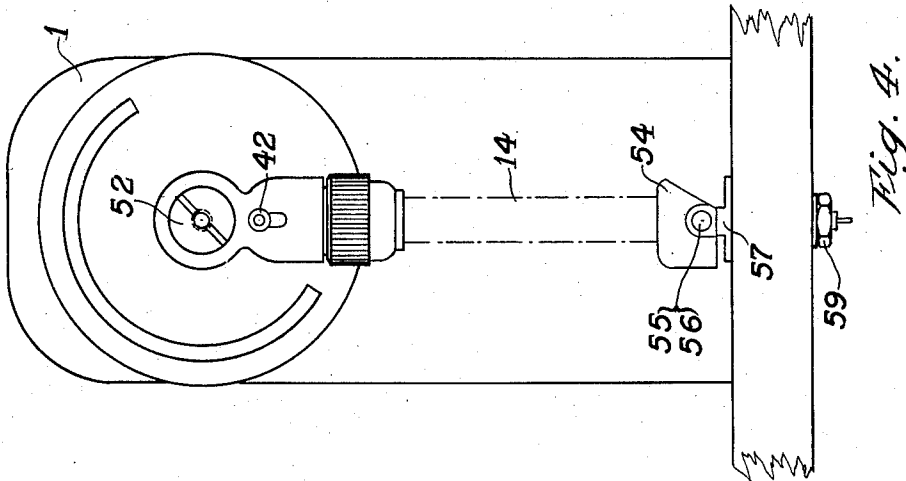


Fig. 4.

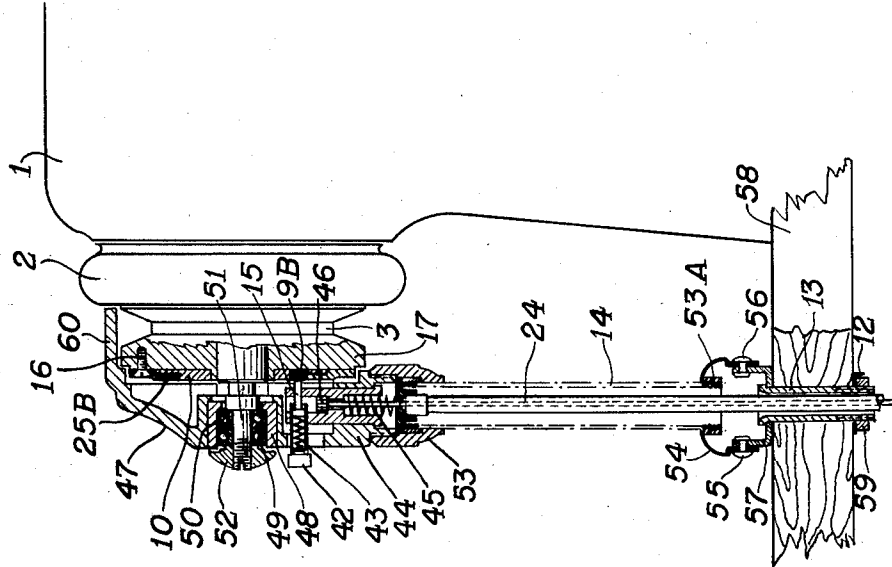


Fig. 3.

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ELECTRIC SEWING MACHINES

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Application October 2, 1953, Serial No. 383,837

Claims priority, application Germany February 6, 1953

6 Claims. (Cl. 112—219)

The present invention relates to an improvement in electric sewing machines and, more particularly, to new devices for stopping a sewing machine with the needle bar in a pre-elected dead position.

According to U. S. patent application Serial No. 349,061, filed April 15, 1953, which is entitled "Electric Power Source for Sewing Machines" and of which this application is a continuation-in-part, a sewing machine is provided with a main drive, a coupling and a slow auxiliary drive. The driven component of the coupling is adapted to be rotated by the main drive at one time and by the auxiliary drive at another time, whereby the auxiliary drive, after cut-out of the main drive, also acts as a braking device. A second motor can be provided as the power source for the auxiliary drive, or, according to the foregoing prior application, the principal motor can be used for this purpose by inserting suitable means for reducing the operating speed. Included in such means is, for example, a magnetic coupling, adapted to respond to starting and stopping impulses. The construction disclosed in the aforementioned application provides that, as soon as the main drive is cut out, the speed of the machine is immediately reduced to the speed of the auxiliary drive which then, at its lower speed, turns the mechanism over until a certain rotatory position is attained at which the auxiliary drive is cut out.

The present invention relates more specifically to novel and improved arrangements of elements necessary for producing the desired stops of the needle bar. Broadly, the principal feature of the herein disclosed arrangements is a rotatory electric contact element operated in synchronism with the sewing machine and a switch or adjustable brush permitting the operator to stop the machine with the needle bar in one or another dead position, depending upon the momentary requirements. The electric circuit needed in conjunction with the device is simple and without ramifications. One particular advantage of the herein disclosed arrangements is the compact shape which, in contrast to the construction disclosed in the parent application, permits the use thereof with sewing machines originally built without this improvement. Moreover, the present attachments do not interfere with turning the machine body into a prone or upside-down position, which is often desirable.

To assure synchronism between the sewing machine and the required electric contact element, such as, for example, a metal disk having dielectric inserts in order to stop the machine at certain rotatory positions, I find it expedient to mount the metal disk on the main shaft of the sewing machine to rotate therewith. A bearing post carrying a brush holder is then positioned about the shaft in operative alignment with the contact element or a brush or brushes are made to rotate by fastening them to a bolt extending eccentrically from the fly wheel of the machine parallel to the shaft, in which case the contact elements are fixedly held by shaft bearings and stays.

The device can be inclosed by a cowl anchored to

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the base plate of the machine. The anchorage is preferably by elastic means, such as a cylindrical spiral spring. This permits the disposition within the spring of a flexible cable connected at one end with the switch or adjustable brush. By means of this cable the operator can turn the switch or relocate the brush and thereby cause the sewing machine to stop with the needle bar in another dead position than that which is automatically attained after cut-out of the main drive. The lower end of the spring is preferably held within a hinged socket having a threaded sleeve attached thereto which is sunk into the base plate carrying the sewing machine. The flexible cable passing through the sleeve and the spring anchorage permit a tilting of the machine or placing it in a prone position.

Obviously, it will be possible to extend the cowl in order to also use it as a cover for the belt.

The nature and purpose of the invention will be readily understood by referring to the accompanying drawings, in which:

Fig. 1 is a schematic view of one embodiment of the invention,

Fig. 2 is a schematic view of another embodiment, Fig. 3 is a sectional side view, of a third, preferred embodiment, and

Fig. 4 is a front view of the device shown in Fig. 3.

Referring more particularly to Fig. 1, there is shown part of a sewing machine 1 of the usual type. Mounted at the head of the sewing machine is a fly wheel 2, having a groove 3 machined into the rim to accommodate the belt 4 connecting the sewing machine with the driving element of a coupling, such as disclosed, for example, in the parent application. One way of forcing the driven element of the coupling into contact with the driving element is by means of a lever and a connecting rod 5, the latter being fastened to the foot pedal 6 adapted to transmit the required operating pressure. As soon as the operating pressure upon this foot pedal ceases, spring means adapted to act in opposition thereto interrupt the contact between the driven coupling element and the driving coupling element transmitting rotational impulse from the main power source and move it into contact with the driving coupling element of an auxiliary power transmission such as shown in the parent application or into contact with the driving coupling element actuated by an auxiliary motor 7. Simultaneously with the release of the foot pedal, the operating speed of the sewing machine is reduced to the speed of the auxiliary driving means and the machine continues to rotate at this reduced speed until the electric circuit of the auxiliary motor or of the auxiliary power transmission is opened by suitable means, such as by interrupting the circuit with the dielectric body 9, which forms an insert in the contact disk 10. As shown, the said contact disk is part of the fly wheel 2 which is fixedly mounted on the main drive shaft of the sewing machine. An arrangement comprising the lead 11, the clamp 12, the sleeve 13, the spring 14 and the brush holder 15 permits the transmission of a small voltage to the said contact disk. This small voltage circuit comprises, furthermore, the contact screw 18 by means of which the lead 19 is attached to the mass of the sewing machine, as well as a relay 21 which closes the small voltage circuit after the power supply to the main drive has been cut off, and keeps the circuit closed until the contact disk 10 attains a position whereby the brush moves onto the face of the dielectric insert 9, with the result that the sewing machine is stopped with the needle bar in a pre-elected position. An adjusting pedal 22 adapted to be depressed against the tension of a spring 23 is provided together with a flexible cable 24 to relocate the brush which is slidably mounted within the brush holder 15 in order to stop the sewing machine in another pre-elected position as soon

as the brush moves across the face of a second dielectric body 25, inserted more peripherally into the contact disk 10.

In the embodiment illustrated in Fig. 2, the brushes 26 and 27 are mounted on a stay bolt 28, extending horizontally from the flange 17 of the fly wheel 2. Mounted on insulating bushings fastened to the extended main drive shaft of the sewing machine but not fixedly attached thereto are two contact disks 29 and 30. As shown, the stays 38 and 39 are fastened to a post 37 for the purpose of fixing the disk 30 in position and the interconnecting insulating bolts 40 and 41 are provided to prevent rotational movements of the disk 29. Each disk has a dielectric inlay at the rim and the disks are mounted in such a manner that the inlay 25A is offset at a certain angle against the inlay 9A. In the illustration, the disks are shown at an angular adjustment whereby the dielectric inlays are exactly opposite each other to produce a stop of the sewing machine with the needle bar in either the highest or lowest position. The circuit wires 31 and 32 connect the disks with a switch comprising the caps 33 and 34 with the insulator 35 therebetween. The numeral 36 indicates a contact adapted to move up and down within the caps, thereby closing the circuit across either the wire 31 or the wire 32, depending upon whether the contact 36 is held in its normal upper position, or is moved into a lower position by means of a flexible cable 24 operated by an auxiliary foot pedal similar to the foot pedal 22 shown in Fig. 1.

Fig. 3 illustrates a particularly adaptable design of the invention. By means of a screw 16 a contact disk is fixedly attached to the flange 17 of a sheave 3 forming part of the fly wheel 2. Inserted into the surface of the contact disk in a manner similar to that shown in Fig. 1 are the two dielectric bodies 9B and 25B. Held by the brush holder 42 and pressed against the face of the contact disk by means of the spring 43 is the brush 15. The brush and brush holder are mounted passing through a sleeve 44 which is held within a slide provided by the cowl 47 as shown. By means of a spring 45 pressing against the sleeve from below, the brush is ordinarily held in an upper position so as to slide over the dielectric insert 9B upon rotation of the contact disk 10. However, by means of the flexible cable 24 adjustably attached to the sleeve at 46, the operator is able to change the effective location of the brush in the manner described in connection with Fig. 1, with the result that, upon rotation of the contact disk, the brush will slide over the dielectric insert 25B. The cowl 47 together with the sleeve 44 and the brush holder 42 are held in position by means of the insulating journal box 48 which is provided with ball bearings such as shown at 49 and 50 and is mounted on the journal 51 extending from the main shaft of the sewing machine. The cowl is secured in position by means of the screw 52.

To prevent rotational movements of the cowl, a tubular spring 14 is provided. One end of this spring is fastened to the cowl by means of the coupling 53, and the other end is fastened to a coupling 53A, inserted into a socket whose upper part 54 is hinged at 55 and 56 to a lower part 57. A threaded sleeve 13, fitted into an opening drilled through the base plate 58 is attached to the hinged socket and held in position by the nut 59. Circuit means, such as the clamp 12, are similar to those illustrated in Fig. 1. The cowl 47 can be provided with a collar of appropriate shape to serve as a guard for the belt of the machine.

Obviously the shifting of the brush from one into the other position can be accomplished by means of an electro-magnet or a knee-operated lever can be employed in lieu of the foot pedal 22 shown in Fig. 1.

Since certain changes can be made in the above-described devices and other embodiments of the invention appear possible without departing from its scope, it is intended that all matter disclosed shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In an electric power source for a sewing machine which enables the operator to stop the sewing machine with the needle bar in one of two preelective positions, the said power source comprising a main drive and a slow auxiliary drive as well as electric circuit means including a cut-out for the main drive causing the auxiliary drive to rotate the sewing machine, the improvement comprising as part of said electric circuit means one rotary electric conductor attached to the main shaft of the sewing machine, one fixed electric conductor mounted in operative contact with the said rotary conductor, two dielectric inlays angularly offset against each other in one of said conductors, and pedal operated means for shifting the contact path of the other of said conductors from passing over one of said dielectric inlays to passing over the other of said dielectric inlays.

2. In an electric power source for a sewing machine which enables the operator to stop the sewing machine with the needle bar in one or two preelective positions, the said power source comprising a main drive and a slow auxiliary drive as well as electric circuit means including a cut-out for the main drive causing the auxiliary drive to rotate the sewing machine, the improvement comprising as part of said electric circuit means one rotary electric conductor attached to the main shaft of the sewing machine, one fixed electric conductor mounted in operative contact with said rotary conductor, two dielectric inlays angularly offset against each other in one of said conductors, and means for causing either of said dielectric inlays to break said electric current means.

3. The improvement according to claim 2, wherein said rotary conductor includes two brushes mounted on a stay bolt extending horizontally from near the periphery of the fly wheel of the sewing machine, and said fixed conductor includes two conductor disks held by insulating bushings fastened to the main shaft of the sewing machine, each of the said conductor disks being adjusted in size and position to make rim contact with one of the said brushes, one of said dielectric inlays is disposed at the rim of one of said conductor disks angularly offset against a similar dielectric inlay at the rim of the other of the said conductor disks, insulating means keeping the said conductor disks fixed in position, a two-way switch, and pedal operated means operating said two-way switch constituting said shifting means.

4. In an electric power source for a sewing machine which enables the operator to stop the sewing machine with the needle bar in one of two preelective positions, the said power source comprising a main drive and a slow auxiliary drive as well as electric circuit means including a cut-out for the main drive causing the auxiliary drive to rotate the sewing machine, the improvement comprising as part of said electric circuit means one rotary electric conductor attached to the main shaft of the sewing machine, one fixed electric conductor mounted in operative contact with the said rotary conductor, two dielectric inlays angularly offset against each other in one of said conductors, and pedal operated means for shifting the contact path of the other of said conductors from passing over one of said dielectric inlays to passing over the other of said dielectric inlays, and said rotary conductor including a conductor disk fastened to the main shaft of the sewing machine, the said conductor disk having a first of said dielectric inlays at a predetermined distance from the center of rotation and a second of said dielectric inlays at a greater distance from the center of rotation and angularly offset against said first dielectric inlay, and said fixed conductor including a brush holder fixedly mounted adjacent to said conductor disk, a brush fitted movably into the said brush holder, said shifting means comprising a spring held pedal with connecting means for shifting said brush from a position in which it will contact the first of said dielectric inlays upon rotation of said conductor disk into a position in which it will contact said second of said dielectric inlays

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upon rotation of said conductor disk, and a circuit passing current actuating said auxiliary drive from said brush through said conductor disk until the dielectric inlay which is in alignment with said brush attains an angular position whereby said circuit is interrupted.

5. The improvement according to claim 4, in which an arrangement of contact elements consisting of the said brush, the said brush holder and an adjustable spring pressing the said brush against the said conductor disk is mounted passing through a movable sleeve, connecting means are adjustably fastened with one end to the said sleeve and with the other end to an operating pedal, a cowl inclosing the said conductor disk and providing a slide for the said sleeve is held by an insulating journal box mounted on the main shaft of the sewing machine, and a coupling which retains a spring holding the said movable sleeve in an upper position in the absence of

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a stronger opposing force exerted upon the said connecting means whereby the lower part of the said slide is joined to the upper end of a tubular spring anchored to the base of the sewing machine and said tubular spring retains the said connecting means.

6. The improvement according to claim 5, in which the said connecting means between the said sleeve and the said operating lever consists of a flexible cable.

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