

[54] SEWING MACHINE

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[51] Int. Cl..... **D05b 69/02**

[58] Field of Search..... 112/220, 219 R, 219 B, 112/218 A, 237, 238

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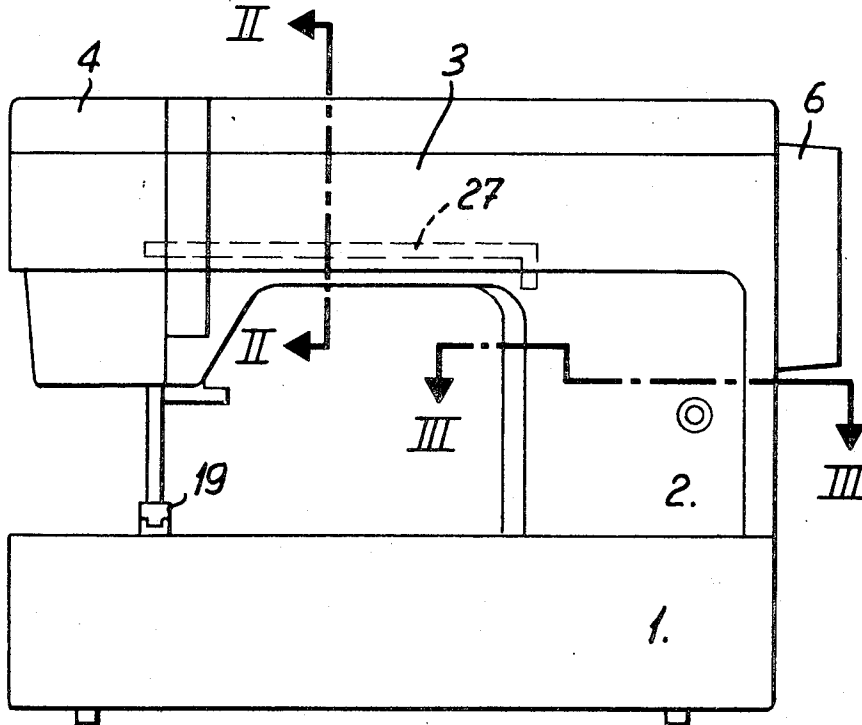
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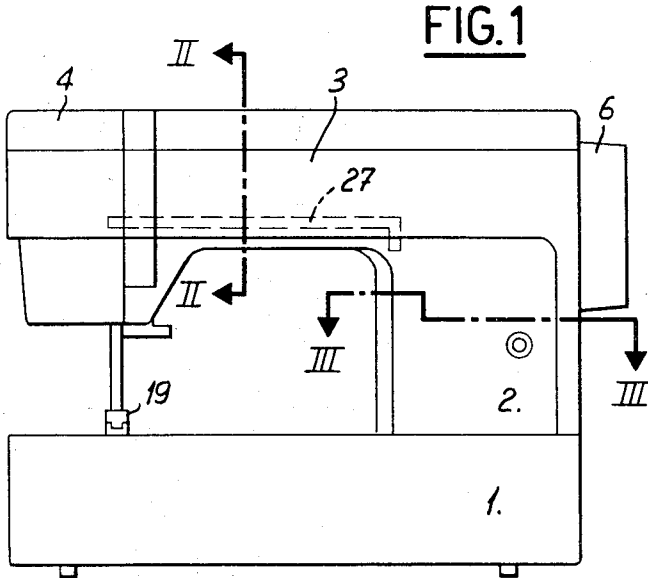
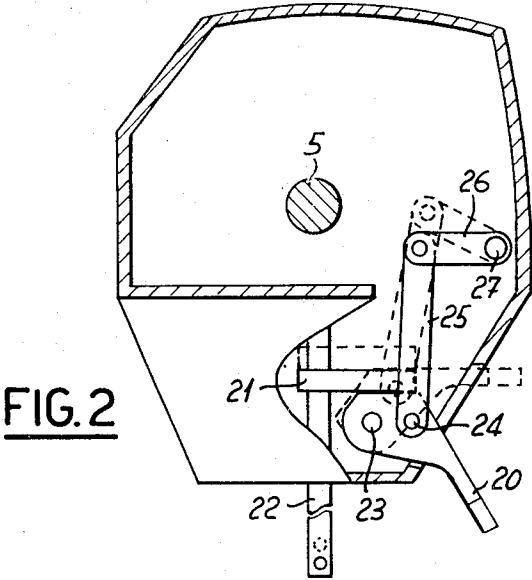
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[57] ABSTRACT

The frame of the machine comprises a base, a column, an upper arm ending in a needle-bearing head, and a lower part containing a cloth transport actuating mechanism. The frame houses a main drive shaft for the machine mechanism and an electric motor. The needle-bearing head includes a presser foot control device movable between an upper and a lower position above the cloth transport element. There is a coupling device between the motor and the main drive shaft and a member which can be actuated by the presser foot control device to prevent the drive of the main shaft by the motor when the presser foot is in upper position. The member is constituted by a mechanical linkage between the presser foot control device and the coupling device to bring the latter into inactive position when the presser foot is brought into upper position. The machine eliminates the risk of being suddenly started by accident.

2 Claims, 6 Drawing Figures





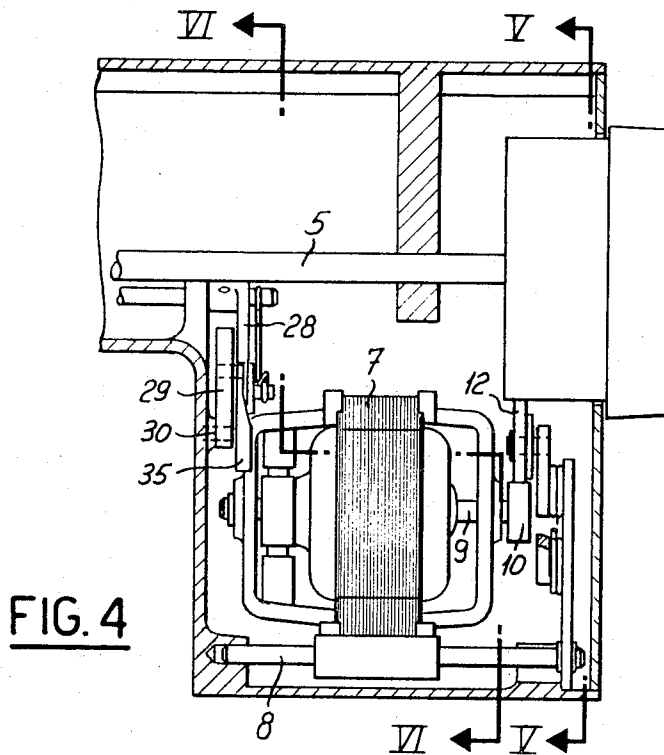


FIG. 4

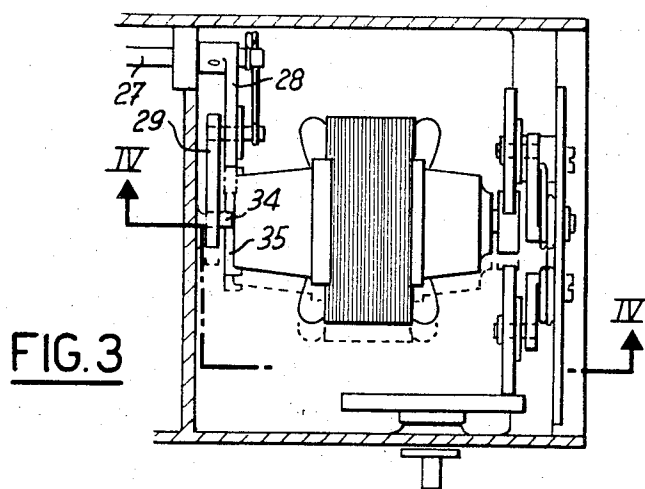


FIG. 3

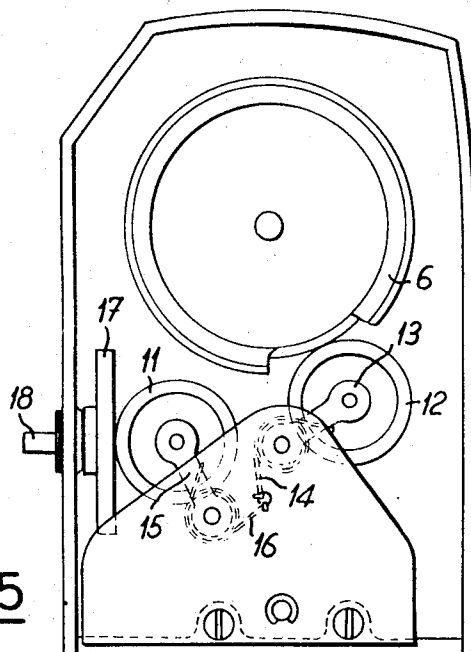


FIG. 5

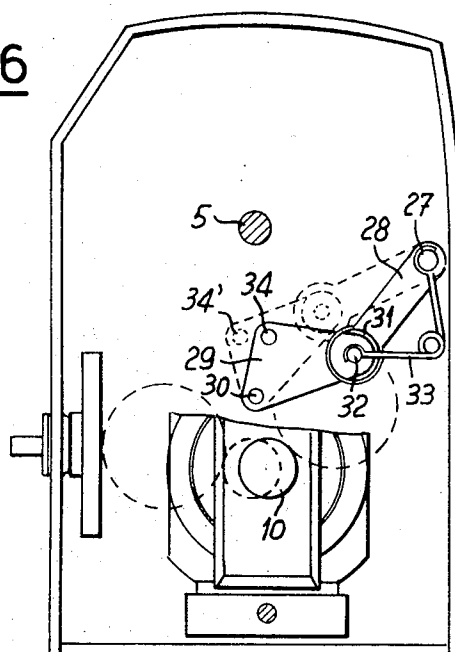


FIG. 6

## SEWING MACHINE

In the use of sewing machines, there is a risk, when the user withdraws or places the fabric in position under the presser foot, that the machine may unexpectedly be put into operation as a result of an accidental movement, clumsiness or external interference, for example by a child.

It is an object of the present invention to overcome risks of this type.

The sewing machine according to the invention has a frame which comprises a base, a column, an upper arm terminated by a needle-carrying head, a lower portion containing a transporter actuating mechanism, this frame housing a principal drive shaft for the machine mechanism and an electric motor, the needle-carrying head comprising a control device for a presser foot movable between a high position and a low position above the transporter. This machine, which comprises also a coupling device between the motor and the principal shaft and a member capable of being actuated by the control device of the presser foot to prevent the driving of the principal shaft by the motor when the presser foot is in high position, is characterized in that the said member is constituted by a mechanical linkage between the control device of the presser foot and the coupling device to bring the latter into inactive position when the presser foot is brought into high position.

In order that the invention may be more fully understood, one embodiment of the sewing machine according to the invention is described below, purely by way of illustrative but non-limiting example, with reference to the accompanying drawing, in which:

FIG. 1 is a front view of this embodiment;

FIG. 2 is a partial section along the line II—II of FIG. 1;

FIG. 3 is a section along the line III—III of FIG. 1

FIG. 4 is a section along the line IV—IV of FIG. 3;

FIG. 5 is a view with partial section along the line V—V of FIG. 4; and

FIG. 6 is an explanatory section along the line VI—VI of FIG. 4.

The embodiment shown comprises a frame formed by a base 1 supporting a column 2 and an upper arm 3 which is terminated by a needle-carrying head 4. The lower portion formed by the base 1 contains an actuating mechanism for a transporter, this mechanism not being shown, since it does not form part of the invention.

The upper arm 3 houses a principal drive shaft 5 of the machine mechanism, this shaft 5 bearing at its end a flywheel 6.

The driving of the mechanism of the sewing machine is effected by an electric motor 7 which is mounted to rock on an axis 8 inside the column 2. To this end, the shaft 9 of the motor 7 bears a drive roller 10 capable of coming into cooperation as desired with one or other of two rollers 11 and 12 (FIG. 5) according to the position of the motor 7.

The roller 12 is mounted on a rocker arm 13 urged by a spring 14 and enables the rotary movement of the drive roller 10 to be transmitted to the flywheel 6 to provide the drive of the sewing machine mechanism.

The roller 11 is mounted on a rocker arm 15 urged by a spring 16 and enables the rotation of the drive roller 10 to be transmitted to a disc 17 fast to a shaft 18 mounted pivotably in the front wall of the column 2.

This shaft 18 enables a bobbin fixed on the latter to be rotated in order to allow the thread to be wound on the bobbin.

Referring to FIG. 5, the flywheel 6 must be driven in anti-clockwise direction, this direction of rotation being the same for the roller 10 (FIG. 6) of the motor 7. In this way, the tangential forces exerted on the roller 12 by the roller 10 on one hand, and by the flywheel 6 on the other hand, produce a resultant which tends to push this roller 12 between the drive roller and the driven flywheel. This resultant has therefore the effect of increasing the mutual thrust between these three movable parts. The same conditions are also produced on driving the bobbin winding device, so that the transmission of the drive torque of the roller 10 to the disc 17 has the effect of increasing the pressing force of the roller 11 on the roller 10 and the disc 17.

The movement of the motor 7 around its axis 8 are actuated from the control mechanism of the presser foot 19 seen in FIG. 1. The control mechanism of the presser foot is shown in more detail in FIG. 2. This mechanism comprises a control lever 20 which is shown in full line in the position corresponding to the low position of the presser foot, and in dashed line in the high position of the presser foot. This lever acts on a part 21 fast to the presser foot bar 22. This bar is urged downwardly by a spring, not shown. The lever 20 pivots at 23 and bears a pivot 24 for one end of a link rod 25 of which the other end is hinged on an arm 26 fast to a rod 27. The latter is housed in the upper arm 3 of the machine, and its other end bears an arm 28 which is seen in FIGS. 3, 4 and 6. This arm 28 cooperates with a lever 29 of triangular shape hinged at 30 on the frame of the machine.

The end of the arm 28 has a hole 31 in which a pin 32 borne by the lever 29 is engaged. The diameter of this hole 31 is greater than that of the pin 32. The latter is subject to the effect of a spring 33 which is supported, on the other side, against the rod 27. The assembly of the arm 28 of the lever 29 and of the spring 33 constitutes a sort of knee member with two stable positions which are shown in FIG. 6 in full line and dashed line respectively, the latter position corresponding to the high position of the presser foot control device.

The lever 29 has also a pin 34 which is moved to 34' in the raised position of the presser foot. The movement of this pin actuates a corresponding pivoting of the motor 7 around its axle 8, since the motor has a fork-shaped part 35 with two arms between which the pin 34 is engaged.

It is clear that the movements of the presser foot control lever 20 cause, through the mechanical linkage constituted by the link rod 25, the arm 26, the rod 27, the arm 28, the lever 29 and the pin 34, corresponding movements of the motor 7 to couple it either to the machine mechanism through the roller 12, or to the bobbin winding device through the roller 11.

It is of course understood that different variations could be provided and it is not indispensable that in the raised position of the presser foot, the bobbin winding device be automatically coupled to the motor. Similarly, to achieve the desired object of safety, it suffices that the coupling between the motor and the machine mechanism be interrupted when the presser foot is raised, but it is not necessary that it be automatically restored into drive position when the presser foot is

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lowered. This replacement of the coupling device into active position could be actuated, for example, by a special knob or on the placing in operation of the motor.

In another possible variation, the presser foot device could be a switch mounted in the supply circuit of the motor.

I claim:

1. In a sewing machine including a frame comprising a base, a column, an upper arm and a needle bearing head, a work-feeding mechanism housed in said base, an electric motor rockably mounted in said column, a main drive shaft for the machine mechanism housed in said upper arm and a presser foot bar mounted in said needle-bearing head, the improvement comprising a first coupling device between said motor and said main shaft, a control lever articulated on said needle-bearing

head for moving said presser foot bar between a high position and a low position above said work-feeding mechanism, a rod connected to said lever and housed in the upper arm of said machine, a mechanical linkage system connected with said rod, actuation of said control lever controlling the displacements of said electric motor in a first position, in driving engagement with the said first coupling device when the presser bar is lowered, and in a second position, out of engagement with the said first coupling device, when the presser bar is raised.

2. A sewing machine according to claim 1, including a bobbin winding device, a second coupling device between the motor and said bobbin winding device, the motor being in driving engagement with said second coupling device when the presser bar is raised.

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