Dec. 23, 1969 G. LANDWEHR ET AL 3,485,193

TOP FEED ROLLER DEVICE FOR SEWING MACHINES

Filed May 10, 1967 6 Sheets-Sheet 1

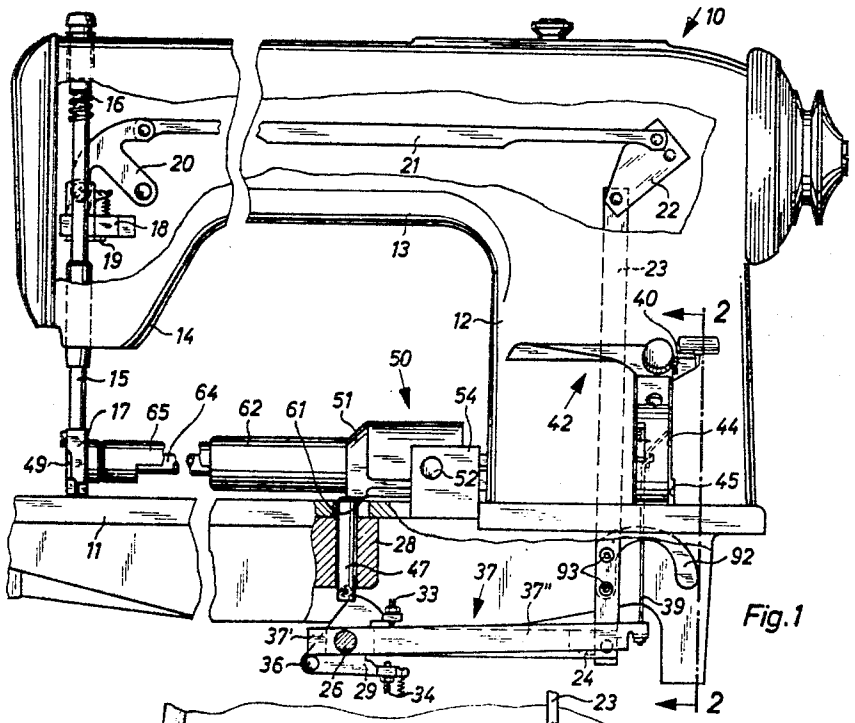

Fig. 1

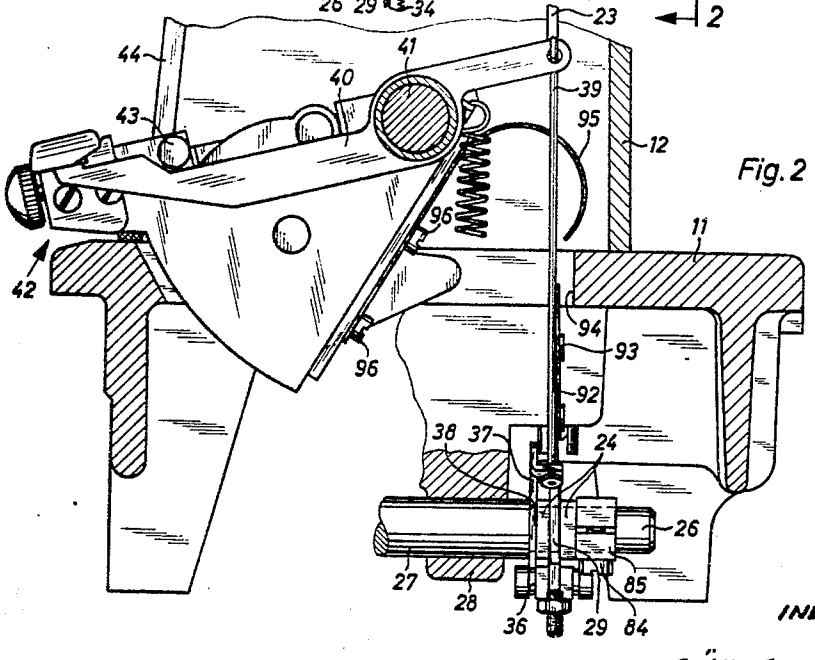

Fig. 2

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Dec. 23, 1969 G. LANDWEHR ET AL 3,485,193

TOP FEED ROLLER DEVICE FOR SEWING MACHINES

Filed May 10, 1967 6 Sheets-Sheet 2

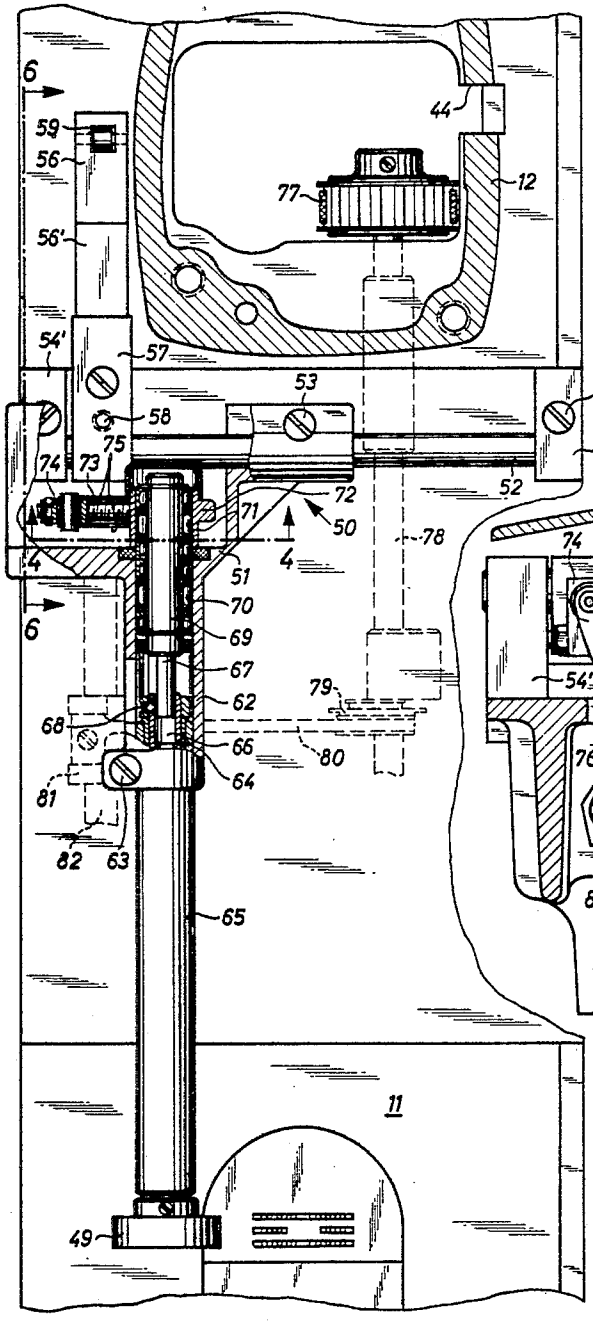

Fig.3

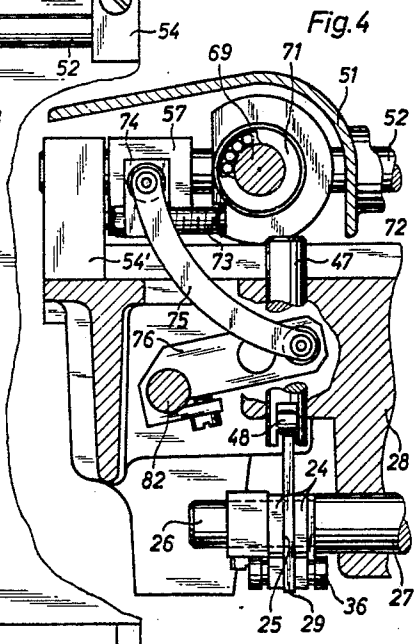

Fig.4

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Dec. 23, 1969 G. LANDWEHR ET AL 3,485,193

TOP FEED ROLLER DEVICE FOR SEWING MACHINES

Filed May 10, 1967 6 Sheets-Sheet 5

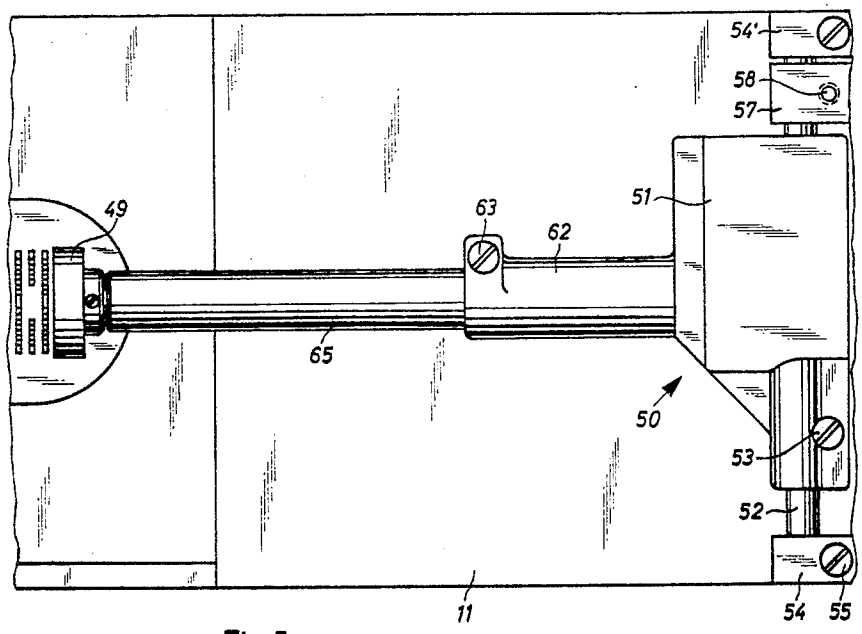

Fig. 5

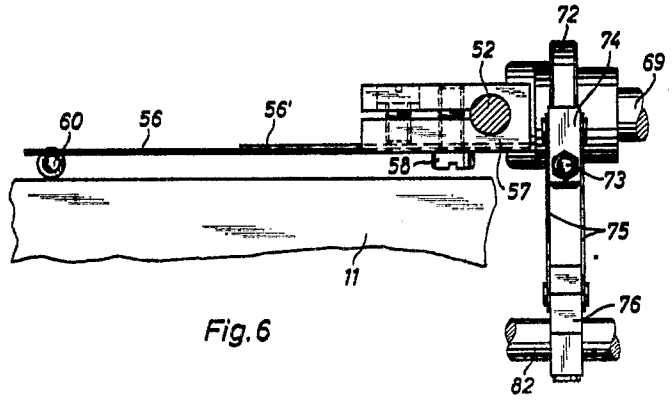

Fig. 6

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Dec. 23, 1969 G. LANDWEHR ET AL 3,485,193

TOP FEED ROLLER DEVICE FOR SEWING MACHINES

Filed May 10, 1967 6 Sheets-Sheet 4

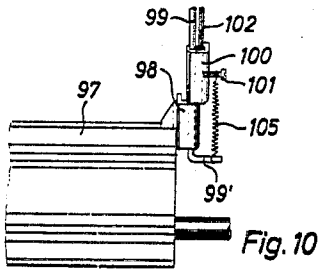

Fig. 10

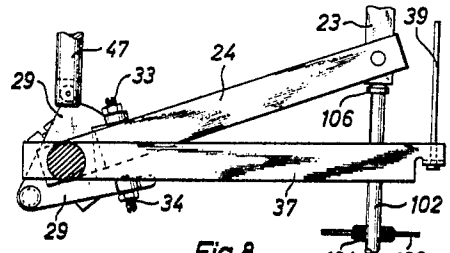

Fig. 8

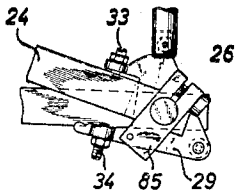

Fig. 9

Fig. 7

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TOP FEED ROLLER DEVICE FOR SEWING MACHINES

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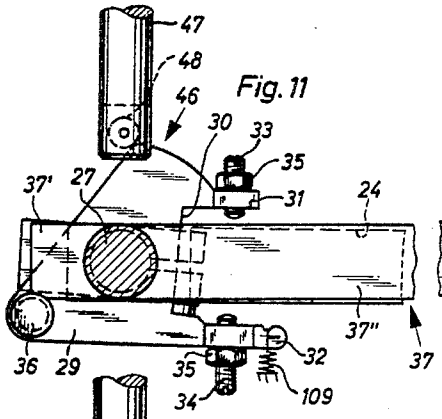

Fig. 11

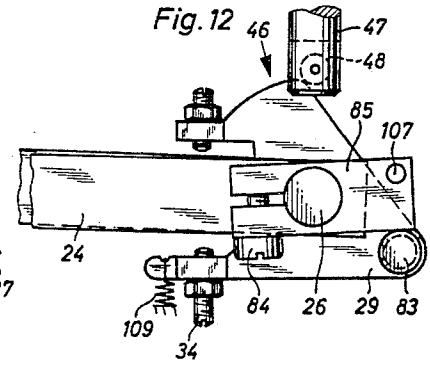

Fig. 12

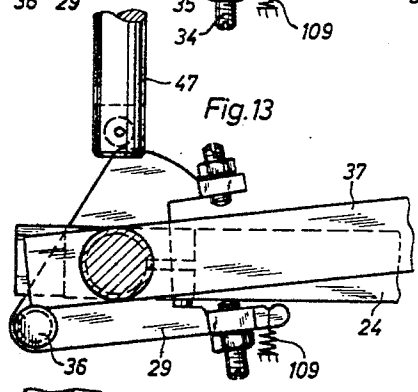

Fig. 13

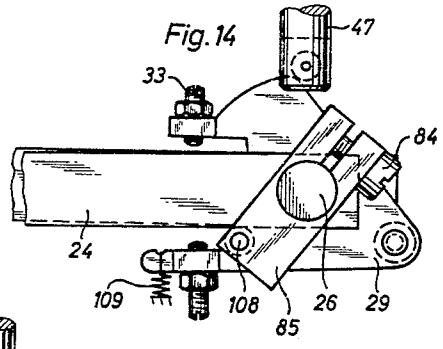

Fig. 14

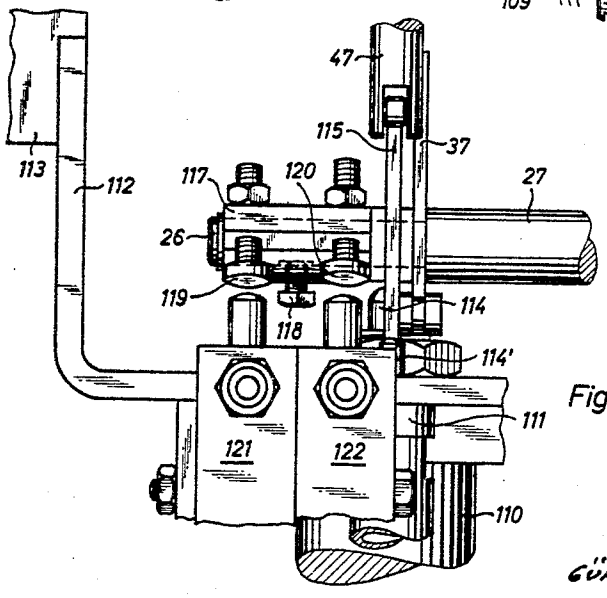

Fig. 18

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TOP FEED ROLLER DEVICE FOR SEWING MACHINES

Filed May 10, 1967 6 Sheets-Sheet 6

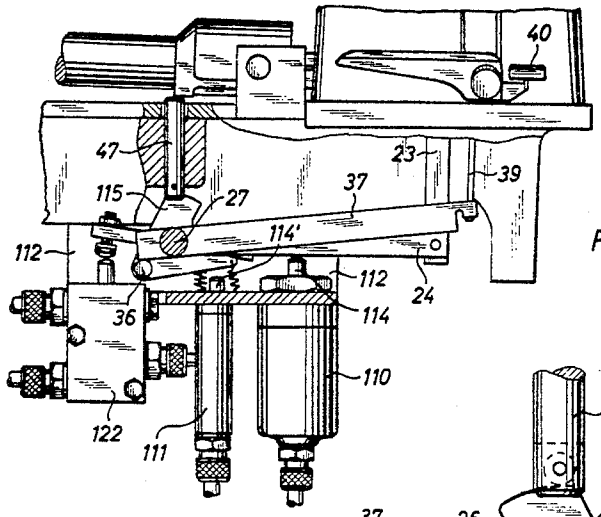

Fig. 15

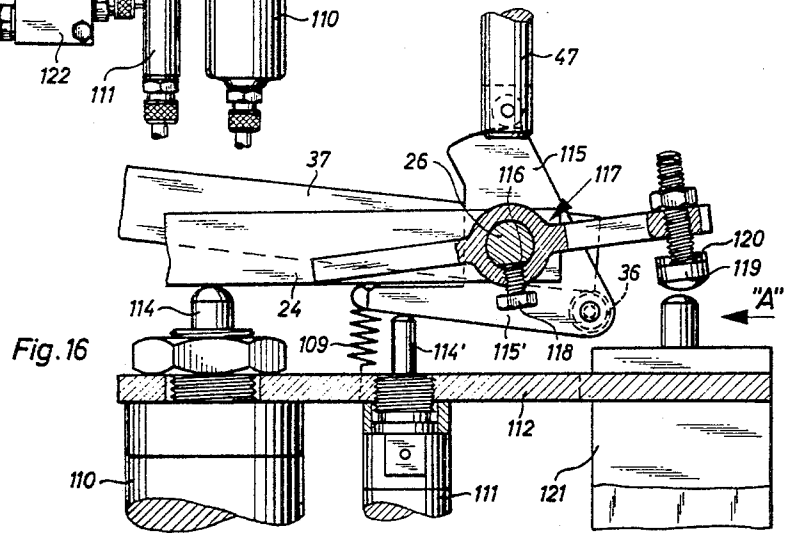

Fig. 16

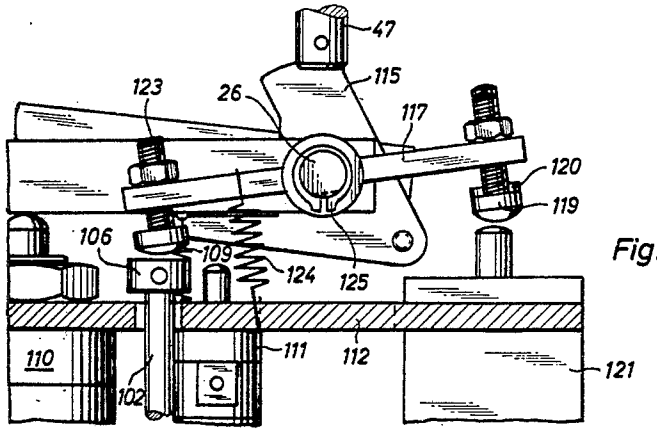

Fig. 17

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United States Patent Office 3,485,193
Patented Dec. 23, 1969

3,485,193

TOP FEED ROLLER DEVICE FOR SEWING MACHINES

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Claims priority, application Germany, May 14, 1966, K 59,259
Int. Cl. D05b 27/14
U.S. Cl. 112—214 14 Claims

ABSTRACT OF THE DISCLOSURE

An additional work feed device for sewing machines in the form of an intermittently driven top feed roller provided as an auxiliary feeding mechanism for a section of a workpiece being fed by the action of intermittently driven feed means provided beneath the work support.

A control disc is pivoted on a shaft arranged beneath the work supporting base and is in effective connection with a lifting device for the feed roller, the presser foot, the reverse feed and stitch regulator and with a hand lever for lifting the feed roller by hand.

This device can be operated mechanically by a knee lever or a foot treadle or by pneumatic means for lifting the feed roller in timed relation before, after, or simultaneously with the lifting of the presser foot.

BACKGROUND OF THE INVENTION

This invention is in the field of U.S. patent classification class 112—214 entitled "Sewing-Stitch Forming-Feeding Rotary."

A primary object of the invention is to provide an improved device for facilitating the manipulation of a sewing machine, which is provided with a top feed roller.

It is a further object of the invention to provide a feeding device for sewing machines by means of which the intermittently actuated feed roller may be lifted alone or selectively in timed relation before, or simultaneously with the lifting of the presser foot, by means of a knee lever and/or a foot treadle.

It is also an object of the invention to provide a feed roller device, the feed roller and/or presser foot of which may be arrested in a raised position after lifting, said feed roller being in lifted position during the actuation of the reverse feed and stitch regulator or by a reverse feeding of the work.

A further object of the invention is to enable the device to be actuated by means of compressed air.

Finally, it is an object of this invention to provide a device, which requires only slight space above the work supporting base of the machine, and having a presser bar which is free from attaching parts for the feed roller.

There are already known top feed roller devices in which the feed roller is connected with the presser foot in such a manner that a common lifting movement takes place after overcoming a small clearance between the presser foot and the feed roller. Greater liftings take place commonly.

The relative movements between the presser foot and the feed roller permit the sewing webs of fabric which are thickened by cross seams at various points. The lifting of the feed roller takes place before the presser foot is taken along and depends upon the same. Such an arrangement is disclosed in U.S. Patent No. 2,544,549 patented Mar. 6, 1951.

Apart from the device for the simultaneous lifting of the presser foot and the feed roller, it is further known to

provide a hand lever for lifting the feed roller irrespective of the presser foot and to keep it in a raised, arrested position.

Finally, it has been proposed that when blocking a seam, the feed roller, acting in one direction of rotation, should be lifted automatically when manipulating the forward and backward stitch regulator, and therewith be put out of operation.

These known devices have a driven feed roller which is connected directly or indirectly with the presser bar for lifting the roller from the workpiece and which is guided by said presser bar. This additional mechanism is not only expensive, but it also hinders the observation of the workpiece by the operator.

SUMMARY

According to the invention, these objects are effected substantially by the provision of a control disc pivoted on a shaft and in effective connection with a lifting device for the feed roller, the presser foot and the reverse feed and stitch regulator.

A plungr, vertically guided in the supporting base, is operably connected with the control disc and the lifting device for the feed roller. The shaft is pivoted in the work supporting base and accommodates the control disc, a control lever and a second control lever, whereby these control levers are pivoted on the shaft and in effective connection with the vertically movable presser foot and the control disc. An arm lever is provided to operate the shaft.

This shaft, being pivoted in the work supporting base, accommodates the control disc and the control levers in operative connection with the vertically movable presser foot and the control disc. A foot treadle is provided to operate the control lever. A rod, linked to the foot treadle and provided with a plate, cooperates with the control lever.

The control lever, pivoted on the shaft, has a fork-shaped end for the arrangement of the control disc between the fork.

The control disc is provided with a carrier bolt which is disposed in the effective radius of the one arm of the second control lever, its other arm being connected to a hand lever by means of a lifting rod, for lifting the feed roller by means of this hand lever. The hand lever is disposed in the effective radius of a carrier bolt which is secured in the reverse feed and stitch regulator in such a manner that, by reversing the stitch regulator to a reverse feed position, the hand lever, provided with means for lifting the feed roller, will be taken along by the stitch regulator. The control disc is provided with a further carrier bolt disposed in the effective radius of a lever. This lever is clamped on the shaft to allow the lifting of the presser foot and the feed roller by means of a knee lever over the control disc. The control disc is provided with stop screws which cooperate with the control lever to effect the lifting of the feed roller in timed relation before, after or simultaneously with the lifting of the presser foot.

The jack of the feed roller is provided with a housing which is displaceably fastened to a shaft pivoted at a right angle to the main shaft above the work supporting base and which is under the tension of a flat spring.

The housing is provided with a pressure area which is parallel to the work supporting base and is in operative connection with the control disc by means of the plunger.

To keep the presser foot in a raised position after it is lifted, there is provided a spring leaf attached to a connecting rod for the presser foot, a baffle plate attached to the stitch regulator and an edge formed in the work supporting base. The spring leaf interacts with the edge

and the baffle plate in such a manner, that after the presser foot is lifted by operating the stitch regulator, the spring leaf will be deflected over the edge by means of said baffle plate for the purpose of supporting the spring leaf on the supporting base, to keep the presser foot in a raised position.

To facilitate the manipulation of the sewing machine, the control lever for lifting the presser foot and the control disc for lifting the feed roller may be operated by means of air cylinders controlled by control valves. For this purpose the cylinders and the control valves are arranged on a holder below the table plate of the sewing machine and are attached to the plate. The control valves may be actuated by a knee lever. In this case there is provided a lever fastened to the shaft which carries the control disc. The lever is provided with thrust bolts for operating the control valves controlling the cylinders and with a spring for holding and returning the lever to its normal position.

Likewise, the control valves may be actuated by a foot treadle. In this case a two-armed lever is pivoted on the shaft which carries the control disc. This lever is provided on its one arm with thrust bolts for operating the control valves controlling the air cylinders and with an adjustable pressing screw arranged in the other arm of the lever. A rod linked to the foot treadle, which is provided with a plate, cooperates with the adjustable pressing screw.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a sewing machine with the work feeding device in front elevation, partially in section;

FIG. 2 shows a section taken on line 2—2 of FIG. 1 with the stitch regulator-lever and the hand lever, in effective connection with the same, for the feed roller in lifted position of the presser foot and the feed roller;

FIG. 3 is a partial view of the work supporting base of the machine with the work feeeding device, partially in section;

FIG. 4 is a section on line 4—4 of FIG. 3 with the motion drive of the feeding device;

FIG. 5 is a partial view on the work supporting base of the machine, whereby the feed roller is arranged by the side of the presser foot;

FIG. 6 is a section taken on line 6—6 of FIG. 3;

FIG. 7 is the feeding device, with its driving and parts seen from below, shown in a diagrammatic, schematic view;

FIG. 8 is a view, in front elevation, of the essential parts of the device arranged for operation by means of a foot treadle;

FIG. 9 is a partial view of FIG. 8 seen from rear;

FIG. 10 is a partial view, in front elevation, of a foot treadle with the control linkage for the clutch motor and the device;

FIGS. 11–14 show the control disc with the regulating means in different work positions, in front and rear elevation;

FIG. 15 shows another form of construction of the invention with a compressed-air control for the device, in front elevation;

FIG. 16 is a partial view, on an enlarged scale, of a form of construction with manipulation of the control valves by the knee lever as described in FIG. 12, seen from the rear;

FIG. 17 is a similar view with foot-treadle operation of the control valves; and

FIG. 18 is a side view taken in the direction of the arrow A in FIG. 16.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIG. 1, there is shown a sewing machine **10** in front elevation, having a work supporting base **11**, on which is mounted the standard **12** with the horizontal arm **13**, which terminates in the needle head **14**. Within the needle head **14** there is mounted, for vertical reciprocation and against the tension of a spring **16**, a presser bar **15**. The lifting of the presser bar **15** (FIGS. 1 and 7) with the presser foot **17** is effected through a block **18** by means of an angle plate **19**, which is pivoted to a crank **20**, and through a lifting rod **21**, a link **22** and a connecting rod **23**, which is pivoted to a control lever **24** formed with forks **25**, **25'** at its respective ends.

The other end of the control lever is slidably supported on the shoulder part **26** of the shaft **27** (FIGS. 2 and 4), which is likewise slidably supported below the work supporting base **11** in the socket **28** of the machine **10**. Within the fork **25** of the control lever **24** there is a control disc **29** arranged pivotally on the shoulder part **26** of the shaft. It is provided with a recess **30** (FIG. 11), forming two shanks **31**, **32**, wherein are inserted two stop screws **33**, **34** in the form of pressure screws which are able to join the control lever **24**. The stop screws **33**, **34** are secured against loosening by means of nuts **35**. In the control disc **29** there is inserted a carrier bolt **36**, to which can be joined the arm **37'** of a two-armed control lever **37**.

The control lever **37** is likewise pivotally arranged on the shoulder part **26** of the shaft, and abuts the control lever **24** and a collar **38** of the shaft **27** (FIG. 2). The other arm **37''** of the two-armed control lever **37** is pivoted through a lifting rod **39** to a hand lever **40**, which is pivotally supported on the shaft **41** (FIG. 2) by the side of the reverse feed and stitch regulator. The hand lever **40** is situated in the sphere of activity of a carrier bolt **43** which is fastened in the reverse feed and stitch regulator. The standard of the sewing machine **10** (FIG. 1) is provided with an opening **44** for the reverse feed and stitch regulator **42** and the hand lever **40**, termination in a clearance **45**, in which the flexible hand lever **40** can rest when it is deflected into its lowest position.

A plunger **47** (FIGS. 1 and 7), slidably supported in the socket **28**, abuts against the front surface **46** (FIG. 11) of the control disc **29**. For this purpose the plunger **47** carries a movable pulley **48**.

The lifting device **50** for the feed roller **49** is provided with a housing **51** (FIGS. 1, 3 to 5 and 7), which is pivotally supported on a support shaft **52**, lying at right angle to the main shaft **78**, and which is clamped to shaft **52** by means of a screw **53**. The shaft **52** is pivoted in two bearing blocks **54**, fastened to the work supporting base **11** by means of screws **55**, against the action of flat springs **56**, **56'**, which are fastened to a clamp lever **57** on the shaft **52**.

The clamp lever **57** is provided with a screw **58** (FIG. 6). The free end of the flat spring **56** is supported against the work supporting base **11** by a roller **60** (FIGS. 3 and 6) situated in a clearance **59**.

The housing **51** has a pressure area **61**, extending parallel with the work supporting base **11**, for the plunger **47** (FIGS. 1 and 7). Furthermore, the housing **51** is formed with a cylindrical part **62**, in which, clamped by means of a screw **63** (FIG. 3), is a bearing neck **65**, rotatably supporting the driving shaft **64** for the feed roller **49**, and movably supported. The driving shaft **64** has a bore **66** for displaceably receiving a pivot **67**, in driving connection with the driving shaft **64** by means of a set screw **68**, in the driving shaft **64**.

The pivot **67** is part of an intermittent shaft **69**, which is likewise pivoted in the cylindrical part **62** of the housing **51** on a roller ratchet brake **70**, arranged accordingly in the housing, said roller ratchet brake allowing a rotation of the intermittent shaft **69** only in clockwise direction. On the part of the intermittent shaft **69** which extends into he housing **51**, there is mounted a ratchet brake **71**, which operates counter clockwise and drives the shaft **69** intermittently. The ratchet brake is embraced by a follower **72**, having a screw bolt **73**, on which can be screwed

on a toggle lever 74, adjustable to the desired angle of rotation of the intermittent shaft 69.

The toggle lever 74 is linked to a rocking lever 76 by means of flat-spring-like levers 75 (FIGS. 4, 6). The rocking lever 76 is fastened to a rocking shaft 82, driven by the arm shaft through a belt 77 (FIG. 3), the main shaft 78, an eccentric 79, an eccentric rod 80, and a rocking lever 81.

Screwed into the control disc 29 is another carrier bolt 83 (FIG. 12), lying in the sphere of activity of a lever 85, clamped to the shouldered part 26 of the shaft 27 by means of a screw 84. At its front end the shaft 27 is provided with a bore 86 (FIG. 7) for coupling with a knee lever 87, the supports 88 of which are for this purpose developed with a guide pilot 89 which can be pushed into the bore 86, and a flattening 90. After the guide pilot 89 is pushed into the shaft 27 under a cutout 91 in the shaft, the flattening 90 becomes coupled with the shaft 27.

Fastened to the connecting rod 23 (FIGS. 2 and 7) by means of nuts 93 is a spring leaf 92, which can be moved closely along an edge 94 of the work supporting base 11. A baffle plate 95 (FIG. 2) for the spring leaf 92 is fastened to the reverse feed and stitch regulator 42 by means of screws 96.

The operation of this device may be described as follows. When a knee lever is used for lifting the presser foot 17 and the feed roller 49:

When the knee lever 87, which has been slipped into the shaft 27, is operated, the lever 85 adjacent to the carrier bolt 83, takes up the control disc 29 (FIGS. 7 and 12), the front surface 46 of which first lifts, by means of the movable pulley 48, the plunger 47, which swings the jack lifting device 50 (FIG. 7) with the feed roller 49 upwards against the action of flat springs 56, 56', whereby the feed roller 49 is taken off the workpiece. Upon further lifting of the shaft 27, the control lever 24, rotatable around the shoulder part 26 of the shaft 27, is lifted by the stop screw 34, whereby the control lever 24 lifts the presser bar 15 with the presser foot 17, through the connecting rod 23, the link 22, the lifting rod 21 and the crank 20. When the reverse feed and stitch regulator 42 is now swung down the baffle plate 95 moves the spring leaf 92, which is now disposed above the plane of the work supporting base 11, to the standard 12, so that when the knee lever 87 is released, the end of the spring leaf 92 is supported on the work supporting base 11, thereby leaving the presser foot 17 in lifted position even after the knee lever 87 has been released. As the knee lever 87 is operated again, when the reverse feed and stitch regulator 42 is swung up, the spring leaf 92 springs back into its original position, so that when the knee lever 87 is released again, it gets out of the sphere of activity of the work supporting base 11 and thereby no longer prevents the connecting rod 23 from moving down.

During the operation of the reverse feed and stitch regulator 42 for a backward feeding of the workpiece, the hand lever 40, being pivoted on the shaft 41, will be taken along by the carrier bolt 43 (FIG. 2). The hand lever 40 effects a rotation of the control disc 29 through the lifting rod 39, the control lever 37 (FIGS. 11 and 12) and the carrier bolt 36, said control disc 29 lifting the feed roller by means of the plunger 47, whereby the presser foot 17 rests on the workpiece during backward sewing. It is also possible, however, to move the hand lever 40 downwards when the reverse feed and stitch regulator 42 is regulated to "forward sewing" (FIG. 1), for the purpose of lifting the feed roller 49 from the work piece, which is necessary, for example, when a narrow radius of the course of the seam is desired.

It is possible to lift the feed roller 49 and the presser foot 17 simultaneously when operating the knee lever 87 by appropriate regulation. As shown in FIG. 14, a follower pin 108, for the presser foot 17, is installed in a bore 107 in the lever 85, for lifting the control lever 24. When the control lever 24 is lifted, the control disc 29 is operated by the stop screw 33, the control disc 29 pressing the plunger 47 upwards for the operation of the feed roller 49. The return of the control disc is effected by means of a bolt spring 109. By displacement of the stoip screw 33 (FIG. 14), now the presser foot 17 can also be lifted in timed relation before the feed roller 49. The foot treadle 97 (FIG. 10), which is in effective connection with the clutch motor (not described), can be used instead of the knee lever 87 for operating the device, as can be noted in FIGS. 7 to 10.

For this purpose the foot treadle 97 is provided with a sliding sleeve 98, pivoted to said foot treadle. In the sliding sleeve 98, the linkage 99, which is connected to the coupling motor—not described—and which has a rectangular offset part 99' below, is movably guided in the sliding sleeve 98. Another sliding sleeve 100, in which a rod 102 is secured by means of a screw 101, is slidably supported on the linkage 99. The rod 102 is movably guided in the guide sleeve 104 disposed in the oil pan 103 (FIG. 8). Between the screw 101 and the end 99' of the linkage 99 there is provided a bolt spring 105. The free end of the rod 102 is provided with a plate 106 adjacent to the connecting rod 23.

During the backward operation of the foot treadle 97 (FIG. 10) the rod 102 will be lifted against the tension of the spring 105 and will operate the presser foot 17 through the connecting rod 23 (FIGS. 7 and 8). Depending on the regulation of the stop screw 33, the lifting of the feed roller 49 will take place either before or simultaneously with the presser foot 17. The lever 85, clamped on the shoulder part 26 of the shaft 27, thereby serves only as a lateral limitation for control levers 24 and 37, supported on the lever 85.

As the foot treadle 97 is pressed (FIG. 10) forward, the rod 102 is first lowered to rest on its plate 106 on the guide sleeve 104. After this, when the sliding sleeve 98 is joined with the offset part 99' of the linkage 99 and the bolt spring 105 is tensioned further, the clutch of the motor is engaged.

Another operation is possible, by lifting the presser foot 17 by means of foot treadle 97, and removing the feed roller 49 by means of knee lever 87.

Compressed-air cylinders may also be used for removing the presser foot 17 and the feed roller 49, as can be seen in FIGS. 15–18. For this purpose there are employed two single-acting compressed-air cylinders 110, 111, provided with a spring return, taken up in a U-shaped holder 112, said holder 112 being fastened in a cutout of the table plate 113.

The piston rod 114 of the cylinder 110 (FIGS. 15 to 16) is adjacent to the control lever 24 for the presser foot 17, whereas the piston rod 114' of the cylinder 111 is adjacent to the arm 115' of the control disc 115, which is under the tension of the spring 109. The control disc 115 controls the plunger 47 for lifting the feed roller 49.

On the shoulder part 26 of the shaft 27, which is provided with a flattening, there is fastened a two-armed lever 117, by means of a screw 118, said lever being provided with two adjustable thrust bolts 119, 120. These bolts operate control valves 121, 122 for ventilating the air cylinders 110, 111, which are likewise secured to the holder 112.

During the operation of the knee lever 87, the two-armed lever 117, connected with the shaft 27, is carried along, whereby the control valves 121, 122 are pressed by thrust bolts 119, 120, said control valves effecting the ventilation of the air cylinders 110, 111, whereby the cylinder 111, being connected with the control valve 121, lifts the feed roller 49 by means of the control disc and the plunger 47, while the control valve 122 controls the lifting of the presser foot 17 by means of the cylinder 110 and the control lever 24. Depending on the regulation of the thrust bolts 119, 120, it is possible, by operating the knee lever 87 to ventilate first the cylinder 111 (feed roller) and afterwards the cylinder 110 (presser foot) or

both, simultaneously, or first the cylinder **110** and then the cylinder **111**. The lifting of the plunger **47** by means of a hand lever **40** (FIG. 15) throuhg the lifting rod **39**, the control lever **37**, the carrier bolt **36** and the control disc **115**, is likewise possible.

According to another practical example, which is illustrated in FIG. 17, the operation of the control valves **120**, **121** can also be effected by means of the rod **102**, connected with the foot treadle **97**.

For this purpose the two-armed lever **117** is provided with an adjustable pressing screw **123**, and the adjacent plate **106**, disposed at the rod **102**, under the tension of a spring **124**. The two-armed lever **117** is pivoted on the shoulder part **26** of the shaft and secured against axial displacement by means of a guard ring **125**.

The advantage of the device according to the invention compared with others known previously is that the lifting of the feed roller is no longer followed by the presser bar itself, but by the control disc below the work supporting base, said control disc making it possible to put into, or take out of operation the feed roller according to the accumulating sewing, corresponding to the requirements of the operator, whereby by employing a servomotor the operator needs to apply only a minimum of force.

What we claim is:

1. In a sewing machine having a work supporting base, a standard and an overhanging arm carrying a needle head, and a first main shaft extending longitudinally of said base, work feeding devices comprising a feed dog arranged to engage the under surface of the work and intermittently advance the same, a vertically movable presser foot (**17**) arranged to engage the upper surface of the work in opposition to said feed dog, a feed roller (**49**) arranged above said base (**11**) for engaging the upper surface of the work, means for imparting intermittent movements to said feed roller (**49**), a rocking shaft (**82**) driven by said main shaft (**78**) and causing the longitudinal movements of said feed dog, a driving connection between said rocking shaft (**82**) and said means for imparting intermittent movements to said feed roller (**49**), a reverse feed and stitch regulator (**42**) arranged in said standard (**12**) to vary and reverse the movement of said rocking shaft (**82**), lifting and retaining means for said presser foot, means for lifting said feed roller (**49**) before and after the lifting of said presser foot (**17**) and to keep said feed roller (**49**) in a raised position for preventing the engagement of said feed roller (**49**) with the work during its reverse movement caused by actuating said reverse feed and stitch regulator (**42**), said means for lifting said feed roller including a second shaft (**27**) pivotally mounted perpendicularly to said main shaft (**78**) beneath said supporting base (**11**), a control disk (**29**) pivoted on said second shaft (**27**), a control lever (**24**) pivoted on said second shaft (**27**) and cooperating with said control disk (**29**), means for actuating said control disk (**29**) and said control lever (**24**), a transmitting means (**47**) between said control disk (**49**) and said feed roller (**29**), and connection means between said control lever (**24**) and said presser foot (**17**).

2. In a work feeding device for sewing machines as claimed in claim **1**, wherein said transmitting means between said control disk (**29**) and said feed roller (**49**) consists of a plunger (**47**) being vertically guided in said supporting base (**11**).

3. In a work feeding device for sewing machines as claimed in claim G, wherein said shaft (**27**) pivoted in said work supporting base (**11**) and carrying said control disk (**29**) and said control lever (**24**) is provided with a bore (**86**) and a cutout (**91**), a knee lever (**87**) provided with a guide pilot (**89**) received in said bore (**86**) and a flattening (**90**) coupled with said cutout (**91**), a lever (**85**) secured to said second shaft (**27**), and a carrier bolt (**83**) inserted in said control disk (**29**) and cooperating with said lever (**85**).

4. In a work feeding device for sewing machines as claimed in claim **1**, wherein a foot treadle (**97**) including a rod (**102**) linked to said foot treadle (**97**), said rod (**102**) being provided with a plate (**106**) for actuating said control lever (**24**) and said connection means between it and said presser foot (**17**), and said control disk (**29**) for lifting said feed roller (**49**).

5. In a work feeding device for sewing machines, as claimed in claim **1**, wherein said control lever (**24**) pivoted on said second shaft (**27**) is shaped as a fork (**25**), and said control disk (**29**) is arranged intermediate said fork (**25**).

6. In a work feeding device for sewing machines as claimed in claim **1**, wherein said control disk (**29**) pivoted on said shaft (**27**) is provided with a carrier bolt (**36**), and said transmitting means between said control disk (**29**) and said feed roller (**49**) consists of a plunger (**47**) guided vertically in said supporting base (**11**), a second two-armed control lever (**37**) pivoted on said shaft (**27**), a hand lever (**40**) for actuating said second control lever (**37**), a lifting rod (**39**) arranged between one arm (**37''**) of said second control lever (**37**) and said hand lever (**40**), and a bolt spring (**109**) for holding said carrier bolt (**36**) inserted in said control disk (**29**) in engagement with the other arm (**37'**) of said second control lever (**37**).

7. In a work feeding device for sewing machines as claimed in claim **1**, wherein said control disk (**29**) pivoted on said shaft (**27**) is provided with a carrier bolt (**36**), said transmitting means between said control disk (**29**) and said feed roller (**49**) consisting of a plunger (**47**) guided vertically in said supporting base (**11**), and said reverse feed and stitch regulator (**42**) pivoted on a third shaft (**41**) and arranged in said standard (**12**) being provided with a carrier bolt (**43**), a second two-armed control lever (**37**) pivoted on said second shaft (**27**), a hand lever (**40**) pivoted on said third shaft (**41**) carrying said stitch regulator (**42**), a lifting rod (**39**) arranged between one arm (**37''**) of said second control lever (**37**) and said hand lever (**40**), and a bolt spring (**109**) for holding said carrier bolt (**36**) inserted in said control disk (**29**) in engagement with the other arm (**37'**) of said second control lever (**37**) and said hand lever (**40**) in engagement with said carrier bolt (**43**) inserted in said stitch regulator (**42**).

8. In a work feeding device for sewing machines as claimed in claim **1**, wherein said transmitting means between said control disk (**29**) and said feed roller (**49**) consists of a plunger (**47**) guided vertically in said supporting base (**11**), said second shaft (**27**) pivoted in said work supporting base (**11**) and carrying said control disk (**29**) and said control lever (**24**) connected with said presser foot (**17**) is actuated by a knee lever (**87**), and wherein said control lever (**24**) pivoted on said second shaft (**27**) is shaped as a fork (**25**), and said control disk (**29**) is arranged intermediate said fork (**25**), a lever (**85**) fastened to said second shaft (**27**), a carrier bolt (**83**) inserted in said control disk (**29**), a bolt spring (**109**) for holding said carrier bolt (**83**) in engagement with said lever (**85**), and a lower adjustable stop screw (**34**) inserted in said control disk (**29**) and cooperating with the bottom side of said control lever (**24**) simultaneously with the turning of said second shaft (**27**) and said control disk (**29**) or after setting back of an adjustable angle of rotation.

9. In a work feeding device for sewing machines as claimed in claim **1**, wherein said transmitting means between said control disk (**29**) and said feed roller (**49**) consists of a plunger (**47**) guided vertically in said supporting base (**11**), said control disk (**29**) for lifting said feed roller (**49**) and said control lever (**24**) are actuated by a foot treadle (**97**), said control lever (**24**) pivoted on said second shaft (**27**) is shaped as a fork (**25**), and said control disk (**29**) is arranged intermediate said fork (**25**), a rod (**102**) linked to said foot treadle (**97**), a plate

(106) attached to said rod (102) for actuating said control lever (24) with said connection means between it and said presser foot (17), an upper adjustable stop screw (33) inserted in said control disk (29) and cooperating with the upper side of said control lever (24), and a bolt spring (109) for holding said adjustable stop screw (33) in engagement with said control lever (24).

10. In a work feeding device for sewing machines as claimed in claim 1, wherein said transmitting means is a plunger (47) guided vertically in said supporting base (11) and said means for lifting said feed roller (49) further includes a support shaft (52) pivotally mounted on the upper surface of said supporting base (11) at right angle to said main shaft (78), a housing (51) secured to said support shaft, a feed roller shaft (69) carrying said feed roller (49) and rotatably mounted in said housing (51) parallel to said main shaft (78), said means for imparting intermittent movements to said feed roller (49) being mounted on said feed roller shaft (69) within said housing (51), a flat spring (56) having one end fixedly mounted on said support shaft (52) and the other end being in engagement with the top surface of said supporting base (11) for holding down said feed roller (49) upon a workpiece, said housing (51) being provided with a pressure area (61) parallel to said supporting base (11) for cooperating with said plunger (47) to pivotally displace said housing (51).

11. In a work feeding device for sewing machines as claimed in claim 1, wherein said lifting and retaining means for said presser foot (17) includes a control lever (24), connection means between said control lever (24) and said presser foot (17) having a vertical connecting rod (23) linked to said control lever (24), and a reverse feed and stitch regulator (42) arranged in said standard (12), an edge portion (94) of said supporting base (11) arranged adjacent said connecting rod (23), a spring leaf (92) secured to said connecting rod (23) and cooperating with said edge (94), and a baffle plate (95) secured to said stitch regulator (42) and cooperating with said spring leaf (92) whereby when said connecting rod (23) is lifted and said spring leaf (92) is above the plane of said supporting base (11), said baffle plate (95) when actuated by said stitch regulator (42) moves said spring leaf (92) past said edge (94) over the surface of said supporting base (11), so that when said connecting rod (23) is released the end of said spring leaf (92) is supported on said supporting base (11), thereby retaining said presser foot (17) in lifted position.

12. In a sewing machine having a supporting base (11), a table plate (113), a standard (12) and an overhanging arm (13) carrying a needle head (14), and a first main shaft (78) extending longitudinally of said base (11), work feeding means comprising a feed dog arranged to engage the under surface of the work and advance intermittently the same, a vertically movable presser foot (17) arranged to engage the upper surface of the work in opposition to said feed dog, a feed roller (49) arranged above said base (11) for engaging the upper surface of the work, means for imparting intermittent movements to said feed roller (49), a rocking shaft (82) driven by said main shaft (78) and causing the longitudinal movements of said feed dog, a feed roller shaft (69) carrying said feed roller (49) a housing (51) mounted on said supporting base (11), said feed roller shaft (69) rotatably mounted in said housing parallel to said main shaft (78), said means for imparting intermittent movements to said feed roller (49) being mounted on said feed roller shaft (69) within said housing (51), a second shaft (52) pivotally mounted at a right angle to said first main shaft (78) on the upper surface of said work supporting base (11), said housing (51) being secured to said second shaft (52) for angular displacement relative to said supporting base (11), spring means (56) for holding down said feed roller (49) upon a workpiece, a driving connection means between said rocking shaft (82) and said means for imparting intermittent movements to said feed roller shaft (69), and a reverse feed and stitch regulator (42) to vary and reverse the movement of said rocking shaft (82), lifting means for said presser foot (17) and said feed roller (49) comprising a third shaft (27) pivotally mounted perpendicularly to said first main shaft (78) beneath said supporting base (11), a control disk (115) pivoted on said third shaft (27), a plunger (47) guided vertically in said supporting base (11) and cooperating with said control disk (115) and said housing (51), a bolt spring (109) for holding said control disk (115) out of engagement with said plunger (47), a first control lever (24) pivotally connected on one end to said third shaft (27) and shaped as a fork for receiving said control disk (115) intermediate said fork, lever means linked to the other end of said first control lever (24) and connected with said presser foot (17), a carrier bolt (36) inserted in said control disk (115), a second control lever (37) pivotally connected to said third shaft (27) and cooperating with its one end (37') with said carrier bolt (36), a fourth shaft (41), said stitch regulator pivoted on said shaft (41), a hand lever (40) pivoted on said shaft (41) adjacent said stitch regulator (42), a lifting rod (39) connected to the other end (37'') of said second control lever (37) and to said hand lever (40), a carrier bolt (43) inserted in said stitch regulator (42) for contacting and actuating said hand lever (40) when said stitch regulator (52) is actuated, an air cylinder (110) for operating said first control lever (24) for lifting said presser foot (17), an air cylinder (111) for operating said control disk (115) for lifting said feed roller (49), control valves (121, 122) for controlling said air cylinders (110, 111), and a holder (112) for said air cylinders (110, 111) and said control valves (121, 122) being disposed below the table plate (113) of said sewing machine and secured to said table plate (113).

13. In a work feeding device for sewing machines as claimed in claim 12, wherein said third shaft (27) carrying said control disk (115), said control lever (24) and said second control lever (37) is actuated by a knee lever (87), a third lever (117) secured to said shaft (27), adjustable thrust bolts (119, 120) inserted in said third lever (117) for operating said control valves (121, 122) controlling said air cylinders (110, 111), and a spring (124) for holding and returning said third lever (117) with said knee lever (87) to a normal position.

14. In a work feeding device for sewing machines as claimed in claim 12, a foot treadle (97) including a rod (102) linked to said foot treadle (97), a plate (106) attached to the end of said rod (102), a two-armed lever (117) pivoted on said third shaft (27) carrying said control disk (115), said first control lever (24) and said second control lever (37), an adjustable pressing screw (123) inserted in one arm of said third lever (117) and cooperating with said plate (106), adjustable thrust bolts (119, 120) inserted in the other arm of said third lever (117) for operating said control valves (121, 122) controlling said air cylinders (110, 111), and a spring (124) for holding and returning said third lever (117) to its normal position.

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