

April 13, 1954

W. K. McINERNEY ET AL

2,674,965

FEEDING DEVICE FOR SEWING MACHINES

Filed May 13, 1952

4 Sheets-Sheet 1

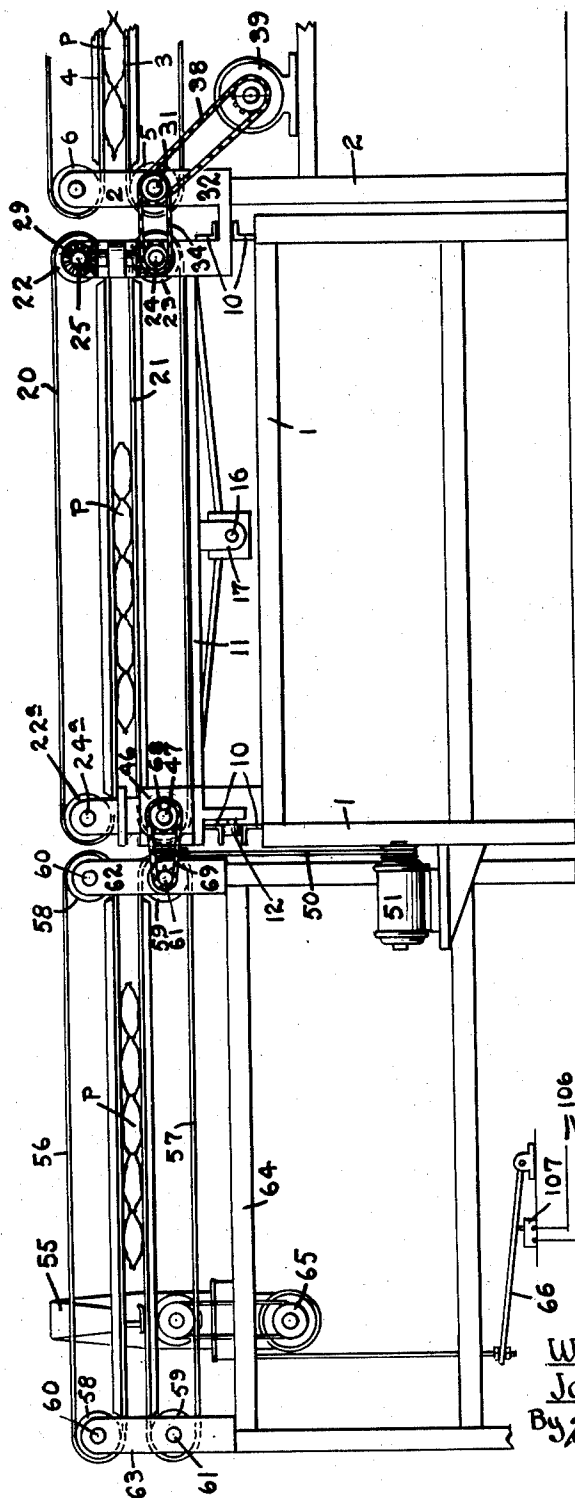


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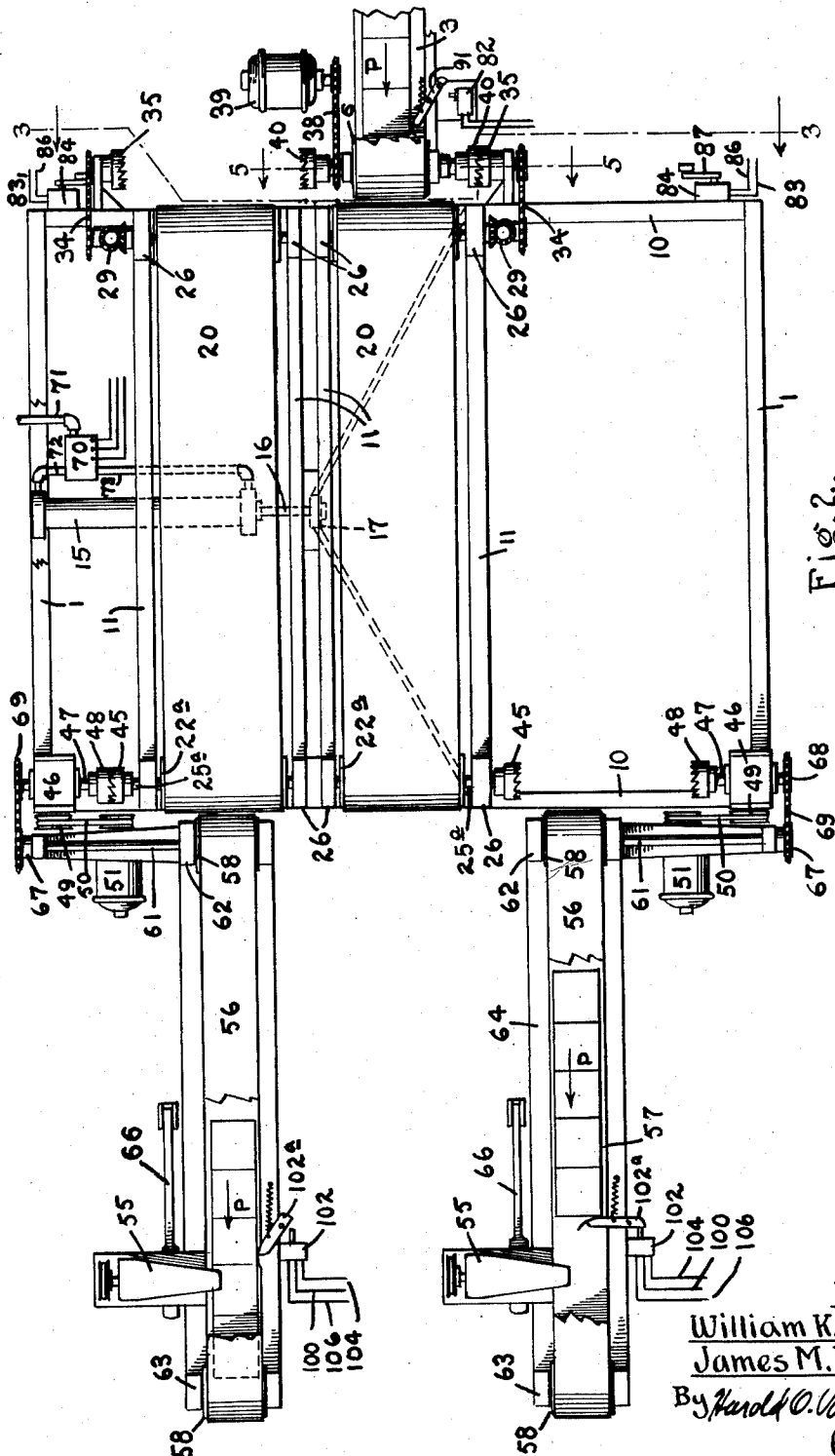


Fig. 2.

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4 Sheets-Sheet 4

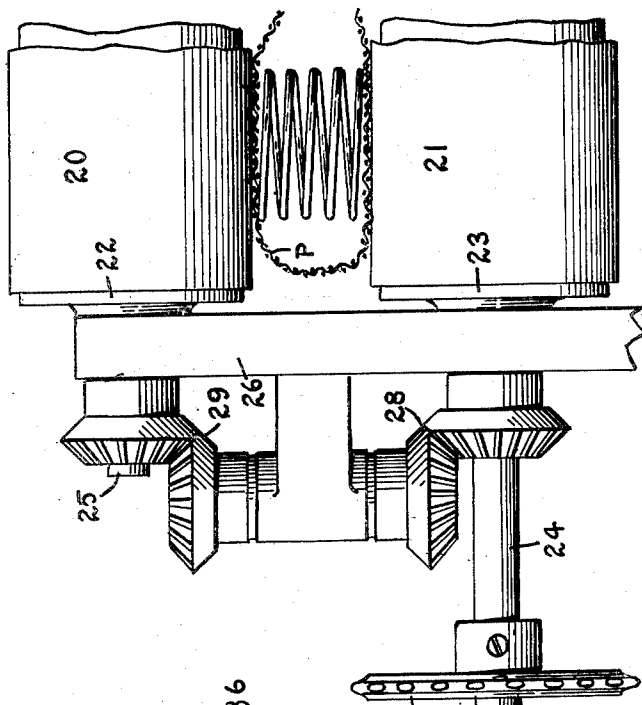


Fig. 4.

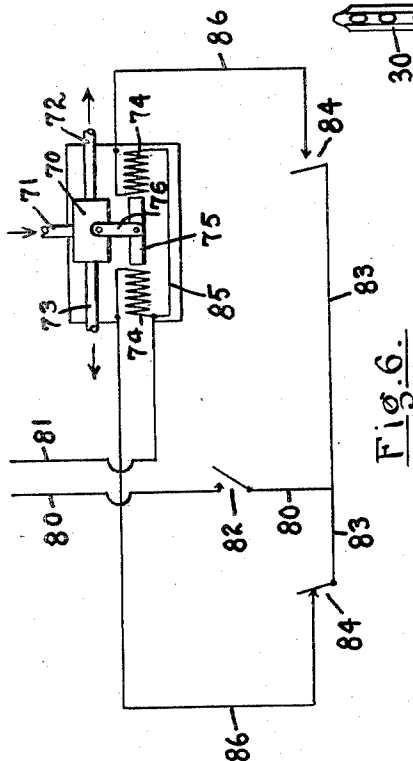


Fig. 6.

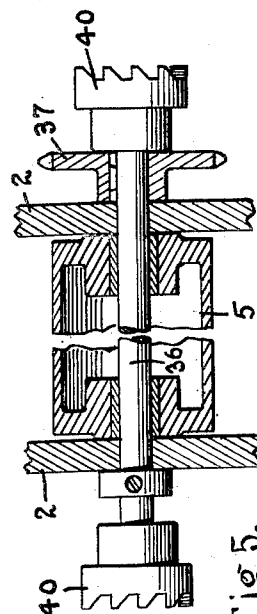


Fig. 5.

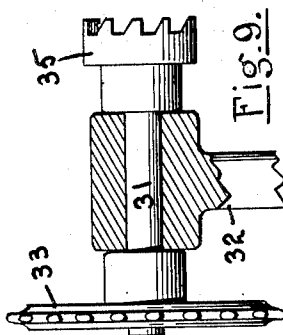


Fig. 9.

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UNITED STATES PATENT OFFICE

2,674,965

FEEDING DEVICE FOR SEWING MACHINES

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13 Claims. (Cl. 112—203)

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This invention relates to a feeding device for sewing machines used in the commercial production of cushion spring units for upholstery. The machine comprising the invention is particularly intended to be used to sew closed the fabric spring covering pockets delivered from a spring pocket filling machine such as that shown in our Patent No. 2,663,475, dated December 22, 1953, although it has other uses and may be used with other machines.

The spring pocket filling machine above mentioned automatically inserts compressed coiled springs into the open ends of spring pockets. These spring pockets are formed in multiple side by side relation in elongated strips of fabric with their open ends adjacent one edge of the strip. After the springs are inserted the open ends must be closed to complete the unit. This closing is done by running the strip of pockets through a sewing machine which sews a seam along the edge of the strip closing the open ends and confining the springs, each in a pocket, and finishes the spring unit for assembly in upholstery such as seat cushions.

Speed of production is important in any manufacturing operation as is likewise automatic operation to reduce as much as possible the number of operators employed to do hand work. The spring pocket filling machine mentioned is designed to automatically fill and deliver the strips of pockets very rapidly. The speed of operation of fastest commercial sewing machines is limited and is slower than necessary to sew closed the filled pocket strips at the speed they are delivered from the filling machine and hence it is found necessary to utilize two sewing machines to close the pocket strips at the speed they are delivered from one filling machine.

The present invention provides mechanism for automatically transferring the spring filled pocket strips from the delivery end of one filling machine alternately to two sewing machines which, operating at normal speed, can handle the output of the filling machine. This feeding mechanism which takes the filled pockets strips from the filling machine and alternately delivers them to the two sewing machines is entirely automatic and requires no manual operation, the sewing machines themselves each being manipulated by an operator, but this manipulation is simplified by operation of this feeding machine, thereby increasing the output of the sewing machines.

The feeding device embodies various new and useful features of arrangement and operation hereafter more fully described and particularly pointed out in the claims, reference being had to the accompanying drawings in which:

Fig. 1 is a front elevation of the feeding device including the delivery end of the filling machine,

Fig. 2 is a plan view of the same with parts broken away.

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Fig. 3 is an end elevation of the feeding device on the line 3—3 of Fig. 2,

Fig. 4 is an enlarged fragmentary elevation of the feed belt rolls and driving mechanism,

Fig. 5 is an enlarged sectional elevation of one of the clutch drive shafts on the line 5—5 of Fig. 2.

Fig. 6 is a diagram of the electric circuit which controls the shifting of the conveyor carriage,

Fig. 7 is a diagram of the electric circuit which controls operation of the feeding belts,

Fig. 8 is an enlarged fragmentary plan view of the electric switch mechanism which controls operation of the shifting of the conveyor carriage,

Fig. 9 is an enlarged fragmentary elevation of one of the clutch members and its shaft mounting, and

Fig. 10 is a fragmentary elevation of a portion of the delivery end of the conveyor carriage.

Like reference members refer to like parts throughout the drawings.

The feeding machine has a main frame 1 which is located adjacent the delivery end of the pocket filling machine, which has a frame 2. The filling machine has a pair of superposed conveyor belts 3 and 4 running over pulleys 5 and 6 between which the filled spring pocket strips P are moved from and out of the filling machine. The belts 3 and 4 and pulleys 5 and 6 are driven by the mechanism of the filling machine, and the filled pockets P are delivered therefrom normally at the speed of operation of the filling machine.

At each side of the frame 1 are spaced tracks 10 upon which a transfer carriage 11 is mounted for reciprocation, the carriage being mounted on rollers 12 which run between the tracks 10. The carriage is reciprocated from front to rear of the frame 1 by action of a pneumatic cylinder 15 having a piston rod 16 connected to the carriage at 17. Operation of the cylinder 15 will be hereafter described.

On the carriage 11 are mounted two pairs of conveyor belts, each pair consisting of an upper belt 20 and a lower belt 21, which run over pulleys 22 and 23, the adjacent horizontal runs of the belts being spaced apart to receive the spring filled pocket strips sufficiently to convey them with considerable force, the compressed springs in the pockets tending to spread them aids in the gripping action.

The lower pulleys have shafts 24 and the upper pulleys have shafts 25 to which they are fixed, the shafts 24 and 25 being journaled in uprights 26 on the carriage 11. Thus the pulleys with their belts, are mounted to move with the reciprocations of the carriage 11.

The shafts 24 at the end of the carriage adjacent the filling machine drive the shafts 25 at the same end of the carriage through trains of bevel gears 28 and 29 so that the pulleys 22 and 23 carrying the belts 20 and 21 are turned in unison

when the shafts 24 are driven, but these pairs of shafts and pulleys for each pair of belts are separate and both are not driven in unison, but each pair is driven separately as hereafter described.

Each shaft 24 at said end of the carriage near the filling machine is provided near its end with a sprocket 30 and a shaft 31 for each shaft 24 is journaled in a bracket 32 on the carriage 11 and has a corresponding sprocket 33 and a chain 34 passes over the sprockets 30 and 34 to drive the shafts 24. Each shaft 31 has attached to it a clutch member 35 and these shafts 31 with their sprockets 33 and clutch members 35 travel with the carriage 11.

The lower belt pulley 5 of the filling machine is mounted for free rotation on a shaft 36 which is journaled in upright members of the frame 2 of the filling machine, and this shaft 36 has a sprocket 37 which is driven by a chain 38 from a motor 39 and the shaft 36 is provided at each end with a clutch member 40 each of which alternately meshes with a clutch member 35 at alternate reciprocations of the carriage 11 so that the pairs of belts are driven alternately by the motor 39. As previously stated, the conveyor belts 3 and 4 of the filling machine are driven by mechanism of that machine, the shaft 36 driven by the motor 39 having no driving connection with the pulley 5 which rotates idly upon it and the shaft 36 may be driven by the motor 39 at a considerably greater speed than the pulley 5. This is for the purpose of removing the pocket strips from the filling machine faster than they would be delivered by the belts 3 and 4. After the pocket strips have entered between the belts 20 and 21, a considerable part of their length, the grip of the belts 20 and 21 is greater than that of the belts 3 and 4 and the pocket strips will be pulled from the belts 3 and 4 faster than the movements of the belts. It will be understood that the grip of the conveyor belts throughout the machine is not positive and the pocket strips will slip between the belts whenever sufficient effort is exerted upon them.

The pulleys 22^a and 23^a at the end of the carriage 11 remote from the filling machine are fixed to shafts 24^a and 25^a which are journaled in uprights 26 on the carriage. The lower shafts 25^a carrying the pulleys 23^a are each provided at their outer ends with clutch members 45. It will be noted that the two shafts 24^a are separate and are not driven in synchronism.

On the main frame 1 and in alignment with the shafts 24^a two gear boxes 46 are mounted and projecting from these gear boxes are shafts 47 each carrying a clutch member 48 similar to and adapted to mesh with the clutch members 45 alternately at alternate reciprocations of the carriage 11. The gears within the boxes 46, preferably constitute a train of reduction gears connected with the shafts 47, are driven by pulleys 49 over which belts 50 pass, the belts being driven by motors 51. The motors 51 are two-speed motors for a purpose hereafter described.

Thus it will be seen that while the machine is in operation the motor 39 continuously drives the clutch members 40 and the motors 51 continuously drive the clutch members 48. When the carriage 11 is at one extremity of its reciprocation the pair of belts 20 and 21 which are opposite the filling machine delivery belts 3 and 4 are driven by one of the clutch members 40 while the opposite pair of belts 20 and 21 are driven by one of the clutch members 48. At the opposite reciprocation of the carriage the opposite pair of

belts 20 and 21 is moved in alignment with the delivery belts 3 and 4, the opposite clutch member 40 drives these opposite belts 20 and 21 and the opposite clutch member 48 drives the first mentioned belts 20 and 21.

Each of the sewing machines 55 is provided with a pair of feed belts 56 and 57 running parallel with the belts 20 and 21 on the carriage and spaced apart in the direction of reciprocation of the carriage.

One pair of these feed belts 56 and 57 is arranged to be in alignment with a pair of belts 20 and 21 on the carriage when the carriage is in one extremity of its reciprocation and the other pair of feed belts 56 and 57 is in alignment with the other pair of belts 20 and 21 at the other extremity of carriage reciprocation. Each pair of feed belts 56 and 57 runs over pulleys 58 and 59 mounted on shafts 60 and 61 journaled in upward extensions 62 and 63 of frames 64. The sewing machines 55 are located on, or in fixed relation to, their respective frames 64 near the end thereof remote from the carriage 11 and each sewing machine has a conventional motor drive 65 controlled by actuation of a foot pedal 66 depression of which causes operation of the sewing machine and release of the pedal ceases operation.

Each of the lower shafts 61 adjacent the carriage 11 and carrying the pulley 59 is extended outwardly and has attached at its end a sprocket 67 opposite a sprocket 68 fixed to an adjacent shaft 47 extending from a gear box 46 and a chain 69 passing around these sprockets drives the gears 67 and shafts 61 from the gears 46 which in turn are driven by the two-speed motors 51. The sprockets 67 are slightly smaller than the sprockets 68 so that the belts 56 and 57 are driven at a somewhat greater speed than the belts 20 and 21. This is for the purpose of stretching the pocket strips P longitudinally as they pass from the belts 56 and 57 thereby drawing them taut to facilitate the stitching operation performed on them by the sewing machines.

The operation of the pneumatic cylinder 15 which reciprocates the carriage 11 is controlled by a conventional two-way air valve 70 having an inlet pipe 71 and two outlet pipes 72 and 73 each communicating with a respective opposite end of the cylinder 15. By means of this valve 70 air under pressure may be directed to either end of the cylinder causing the piston therein to reciprocate and causing a like reciprocation of the carriage 11 by means of the piston rod 16 connected with the carriage at 17.

The two-way air valve is electrically actuated by suitable conventional means such as a pair of solenoid windings 74 (Fig. 6) acting alternately on a core 75 connected to a valve lever 76, energizing one of the windings 74 moving the valve to direct air to one end of the cylinder and energizing the other winding 74 directing air to the other end of the cylinder.

The solenoid windings 74 are energized by electric current passing over a circuit comprising the wires 80 and 81 leading from a source of supply. The wire 80 has interposed in it the momentary contact switch 82, hereafter described and branches into the wires 83 which lead to two carriage actuated switches 84, hereafter described. The wire 81, together with a jumper wire 85 leads to one end of each of the solenoid windings 74 and the other end of each winding 74 is connected to a respective carriage switch 84 by wires 86.

The carriage operated switches 84 are fixed to

the frame 1 of the machine at spaced locations where their operating levers 87 (Fig. 3) are alternately engaged by parts of the carriage, such as the brackets 32, upon reciprocations of the carriage, one of the switches 84 being closed when the carriage is at one extremity of reciprocation and the other switch being closed at the other extremity of reciprocation, the switches automatically opening when the carriage leaves them.

The momentary contact switch 82 is located on the frame 2 of the filling machine (Fig. 8) near its delivery end. It comprises the switch body having a push button 90 which closes the circuit in the wire 80 when depressed, and opens the circuit when released. A lever 91 is pivoted between its ends to the frame 2 with one of its ends in the path of the pocket strips P near the location where they leave the filling machine to enter between the carriage belts 20 and 21. The opposite end of the lever 91 is provided with a pivoted trigger 92 which swings past the end of the push button 90. The lever 91 has a spring 93 which yieldably holds its one end in the path of the pocket strips P. The trigger is pivoted to the end of the lever 91 and has a shoulder engaging the end of the lever. The spring 94 presses the shoulder of the trigger against the end of the lever and the shoulder prevents pivoting of the trigger to the right but the trigger may pivot to the left under tension of the spring 91.

As the pocket strips P move outwardly from the filling machine they engage and swing one end of the lever 91 moving its opposite end with the trigger past the push button 90 but in this direction of movement the spring 94 yields and the trigger 92 swings on its pivot without depressing the push button. When a pocket strip passes the lever 91, substantially its whole length being between the belts 20 and 21, the lever is released and returned by the spring 93 and in this direction of movement the trigger strikes the button 90 without yielding and depresses the button to momentarily close the circuit in the wire 80.

With this mechanism, when the carriage is at one extremity of its movement, as for example as shown in Fig. 2, the upper belts 20 and 21 are delivering a pocket strip to the upper feed belts 56 and 57 and the lower belts 20 and 21 are receiving a pocket strip from the filling machine. The carriage holds closed the upper switch 84 which would be at the left in Figure 6. Just before the pocket strip leaves the belts 3 and 4 of the filling machine the switch lever 91 is released and its trigger depresses the push button momentarily closing the switch 82 on the circuit wire 80 and the current flowing through the wires 83—85 energizes the left solenoid winding 74 attracting the core 75 which moves the air valve 70 to direct air through the pipe 72 to the upper end of the cylinder moving the piston therein to move the carriage to its other extremity. This movement releases the left switch 84 and closes the right one so that when another pocket strip leaves the filling machine the action of the switch lever 91 closing the switch 82 will energize the right winding 74, reverse the position of the air valve 70 and direct air through the pipe 73 to the opposite end of the cylinder 15 and move the carriage back to its first position.

The electric circuit and controls for the two-speed motors 51 is shown in Fig. 7. Each motor 51 has its individual circuit and both are alike. Electric current is supplied from a suitable source over the wires 100 and 101, the wire 101 leading to the common binding post of the motor. The

wire 100 leads to a double throw switch 102 which has an operating lever 102^a. The switch 102 has a high speed contact 103 connected by a wire 104 to the high speed binding post of the motor 51. The low speed contact 105 of the switch is connected by a wire 106, in which is the normally open switch 107, to the low speed binding post of the motor. The foot pedal 66 closes the switch 107 when depressed.

As previously stated, each sewing machine 55 has a conventional motor drive 65 which may be a continuously operating motor with a clutch to control operation of the sewing machine or the motor may be of the stop and start variety, but either style or drive is controlled by the foot pedal 66 which starts the sewing machine when depressed and stops it when released. The current from the wires 100—101 does not operate the sewing machine.

As previously stated, speed of operation is the essence of this invention and wherever possible the belts moving the pocket strips run at high speed but because of the limited speed of operation of the sewing machines, the pocket strips must be slowed in moving through them. Therefore the feed belts 56—57 move at high speed to carry the pocket strips to the sewing machines, but as a pocket strip reaches the sewing machine the feed belt movement is slowed down to the speed capacity of the sewing machine. This is accomplished by the two speed motors 51 and the circuit controls therefor as follows:

The double throw switch 102 normally closes the high speed circuit to the motor 51 over the wire 104. The switch 102 is located adjacent the sewing machine with its switch lever 102^a in the path of the pocket strips P moved by the belts 56—57. As a pocket strip reaches a sewing machine 55 it engages and moves a lever 102^a breaking the high speed motor circuit at the contact 103 and engages the low speed circuit contact 105. Then when the operator depresses the pedal 66 to operate the sewing machine the switch 107 is moved to close the low speed motor circuit and the belts 56—57 are driven at slow speed to feed the pocket strip through the sewing machine at a speed equal to the capacity of the sewing machine. As the pocket strip leaves the switch lever 102^a, and at the same time leaves the sewing machine, the lever is released and springs back into contact with contact 103 closing the high speed and opening the low speed circuits to the motor 51 whereupon the feed belts 56—57 resume high speed movement to bring another pocket strip to the sewing machine and the pocket strip just completed is ejected from the machine.

In résumé of the complete operation, Figs. 1 and 2, a pocket strip is fed from the belts 3—4 of the filling machine between one pair of transfer belts 20—21 on the carriage 11 which are driven by the motor 39 through clutches 35—40 at a higher speed than the belts 3—4 so as to take the pocket strip away from the filling machine rapidly.

As the pocket strip leaves the filling machine it releases the lever 91 of the switch 82 which closes the circuit to the air valve 70 through the switch 84 which has been closed by the carriage. Movement of the valve 70 directs air into one end of the cylinder 15 and quickly moves the carriage 11 to the opposite end of its stroke.

This movement of the carriage moves the belts 20—21 which have just received a pocket strip into register with one pair of feed belts

56—57 and at the same time moves the other set of transfer belts 20—21 opposite the delivery belts 3—4 of the filling machine.

During this movement one set of clutch members 35—40 have been disconnected and the other set connected so that the transfer belts 20—21 now opposite the filling machine are driven to convey a pocket strip therefrom and the clutch members 45—48 at the other end of the carriage are engaged so that the first-named transfer belts 20—21 are now driven by a motor 51, preferably at a higher speed than before, to enter the pocket strip between them into a pair of feed belts 56—57 which are also driven by the motor 51 at a slightly greater speed because of the different diameters of the sprockets 67—68 stretching the strips lengthwise and putting them under longitudinal tension.

As the second pocket strip leaves the filling machine the lever 91 is released again, tripping the switch 82 to actuate the air valve 70 which causes movement of the carriage 11 to its former position, but before this has happened the first pocket strip has left the first transfer rollers 20—21 and is between the feed belts 56—57 being fed to the sewing machine at high speed until it reaches the sewing machine and trips the switch 102 changing the speed of the motor 51 from high to low when the foot pedal 66 is depressed to operate the sewing machine 55 and the pocket strip is fed through the sewing machine at a slower speed within the capacity thereof.

Thus the pocket strips which are delivered from the filling machine at a speed faster than the capacity of one sewing machine to sew them are alternately and automatically delivered to two sewing machines at a high speed, and then upon reaching its respective sewing machine its movement is slowed and it is then fed through the sewing machine at a speed that it can be sewed therein.

The invention is defined by the appended claims and is to be considered comprehensive of all forms coming within their scope.

We claim:

1. The combination with a machine having an article delivery location and two sewing machines spaced therefrom, of a transfer and feeding device located between the delivery location and the sewing machines comprising means for automatically and alternately transferring articles from said delivery location to each of said sewing machines and means for feeding said articles through said sewing machines.

2. The elements of claim 1 in which said means for feeding said articles through said sewing machines moves slower than said transfer means.

3. The elements of claim 1 combined with manually controlled means for operating said sewing machines, said manually controlled means also controlling the means for feeding the articles through the sewing machines.

4. The combination with a machine having an article delivery means and two sewing machines, of transfer and feeding mechanism comprising, an independently operative feeding mechanism for each sewing machine, a reciprocable carriage located between said delivery means, and said feeding mechanisms, two independently operative transfer mechanisms on said carriage and reciprocal therewith, means for reciprocating said carriage to two positions in each of which one of said transfer mechanisms is registered with said delivery means and the other transfer

mechanism is registered with one of said feeding mechanisms.

5. The elements of claim 4 combined with independent means for driving each of said feeding mechanisms and means for driving connection of the transfer mechanism with the driving means for the feeding mechanism with which it is in register.

6. The elements of claim 5 in which the feeding mechanism driving means drives the feeding mechanism faster than it drives the transfer mechanism.

7. The elements of claim 5 combined with independent means for driving each transfer mechanism when it is in register with said delivery means.

8. The elements of claim 5 combined with means for automatically slowing movement of each feeding mechanism as the leading edge of an article therein enters said sewing machine.

9. The elements of claim 5 combined with independent manual means for controlling operation of each sewing machine, said manual means also controlling operation of said feeding mechanism driving means.

10. The elements of claim 4 combined with means for causing alternate reciprocations of said carriage controlled by entrance of an article into its respective transfer mechanisms from said delivery means.

11. The combination with a machine having an article delivery means and two sewing machines, of transfer and feeding mechanism comprising, an independently operative feeding mechanism for each sewing machine, a variable speed motor for driving each of said feed mechanisms, a reciprocal carriage located between said feeding mechanisms and said delivery means, two independently operative transfer mechanisms on said carriage and reciprocal therewith, means for reciprocating said carriage to two alternate positions in each of which one of said transfer mechanisms is in register with said delivery means and the other transfer mechanism is in register with one of said feeding mechanisms, automatically connectable means for driving each transfer mechanism when it is in register with said delivery means, automatically connectable means for driving each transfer mechanism by the variable speed motor for the feeding mechanism with which it is in register and automatic means for slowing the speed of each variable speed motor actuated by an article entering each respective sewing machine, said automatic speed control means acting to increase the speed of its respective motor when an article leaves its respective sewing machine.

12. The elements of claim 11 combined with manual means for controlling the actuation of each sewing machine, said manual means also acting to stop and start its respective motor.

13. The elements of claim 12 combined with means for alternately reciprocating said carriage and automatic means controlled by entrance of an article into each respective transfer mechanism for actuating said reciprocating means.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
900,267	Davis	Oct. 6, 1908
1,292,178	Waterman	Jan. 21, 1919
1,871,832	Absmeier	Aug. 16, 1932
1,955,637	Klau	Apr. 17, 1934