

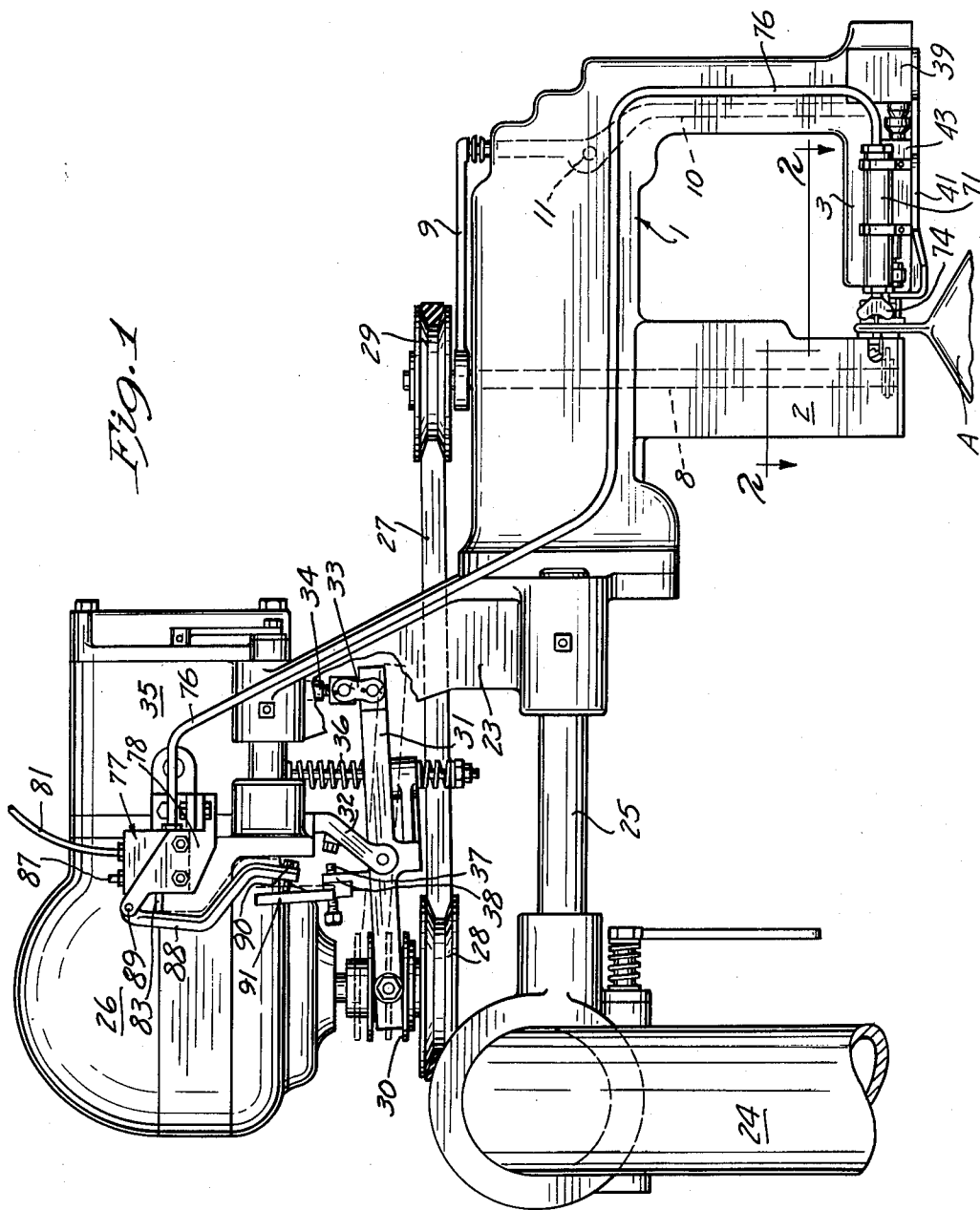
Sept. 20, 1955

H. V. KINDSETH ET AL
SEWING MACHINE ACTUATOR

2,718,201

Filed Dec. 28, 1951

4 Sheets-Sheet 1



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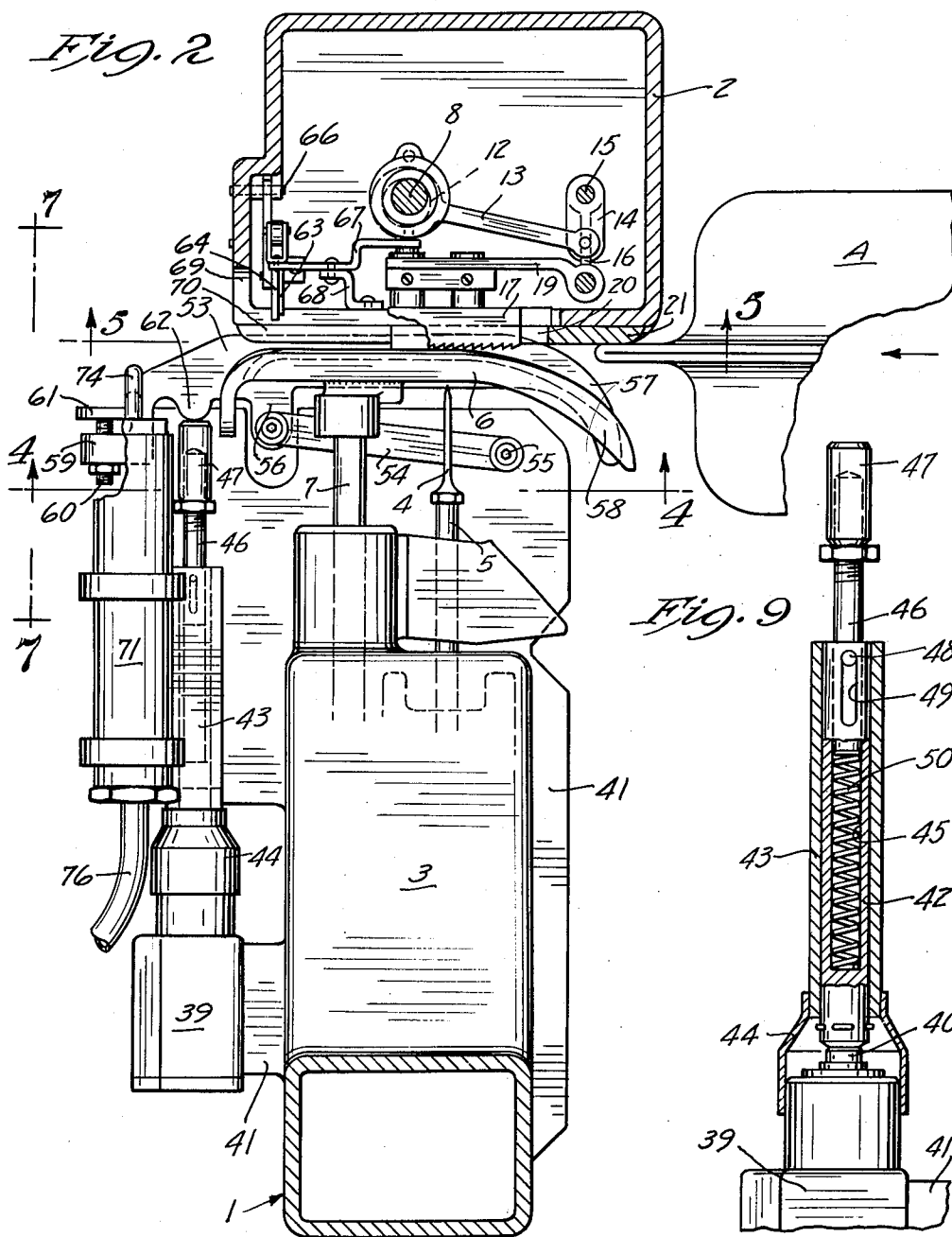
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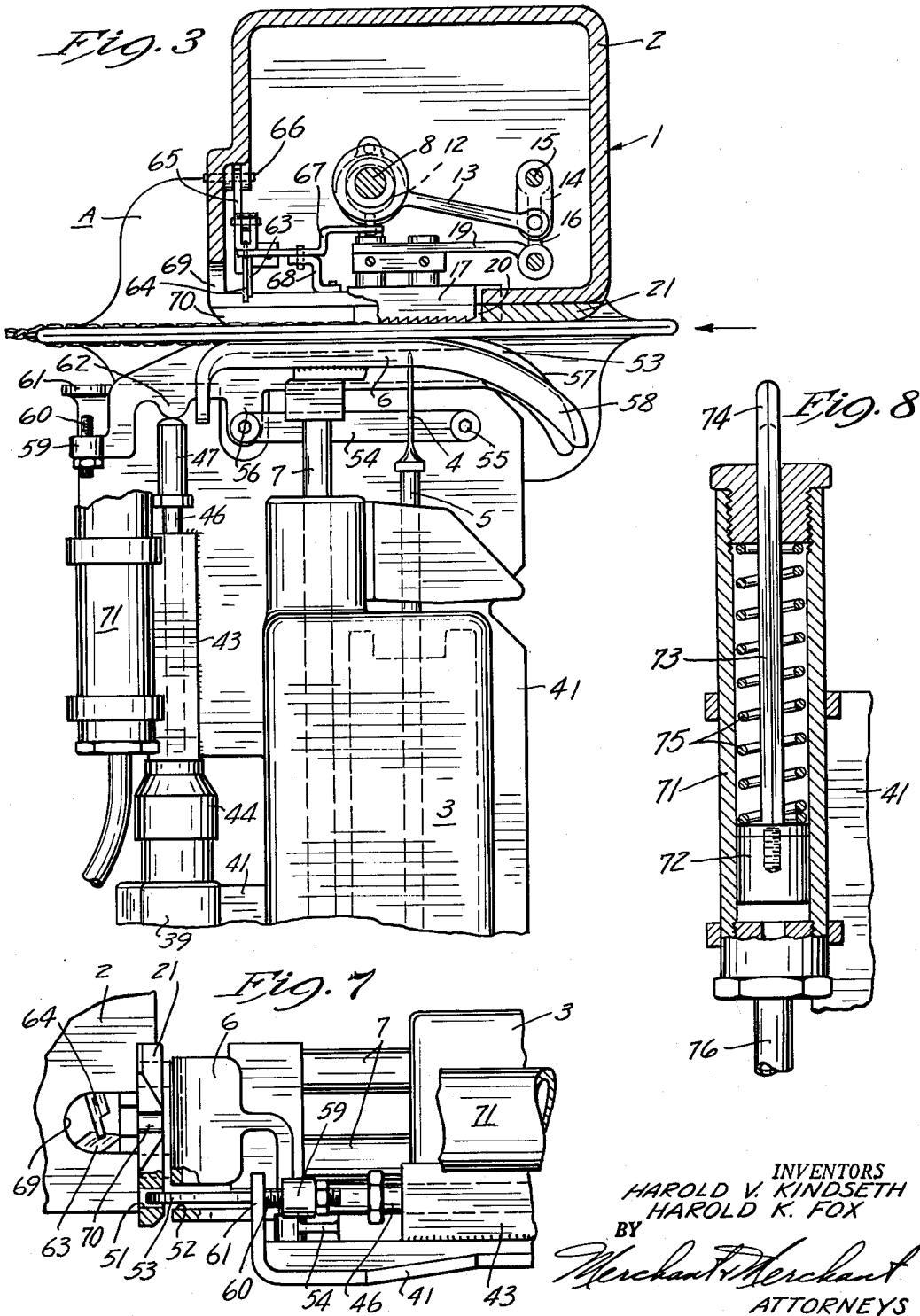
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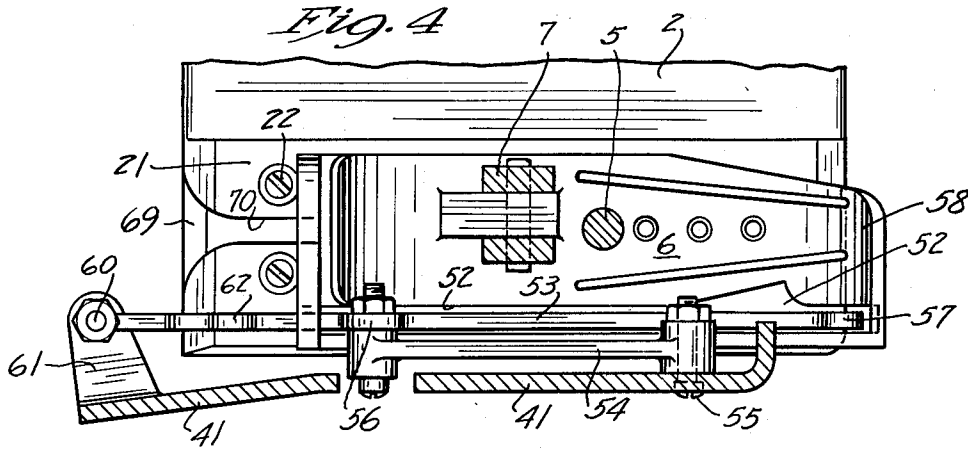
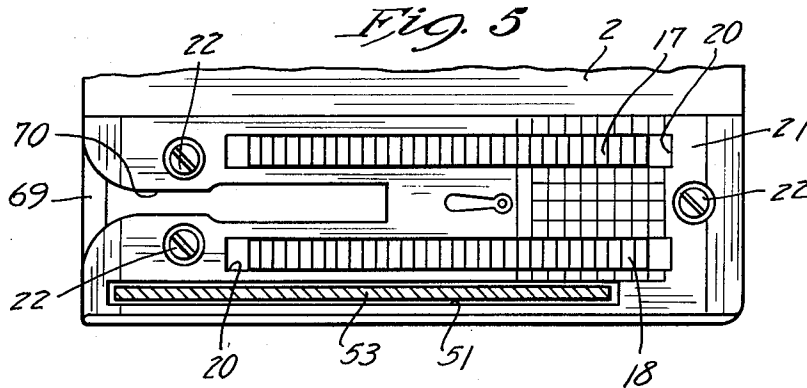
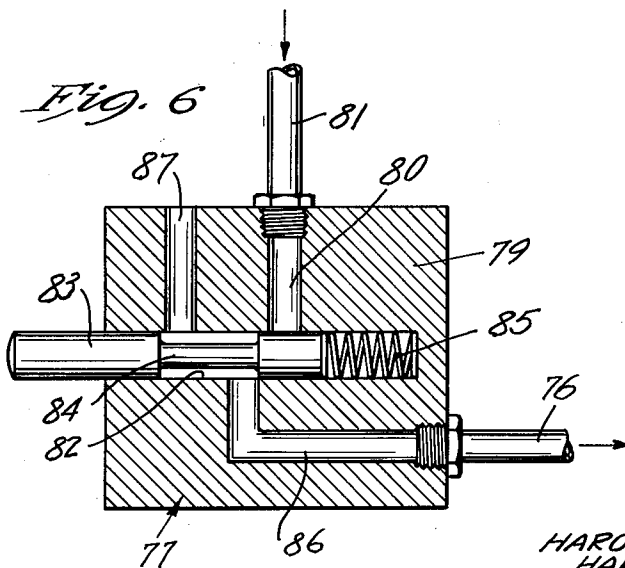
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4 Sheets-Sheet 4



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SEWING MACHINE ACTUATOR

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Application December 23, 1951, Serial No. 263,826

6 Claims. (Cl. 112—11)

Our invention relates generally to power driven sewing machines and more specifically to improvements in machines for stitching articles successively fed in spaced relationship.

More particularly, our invention is in the nature of control mechanism for sewing machines adapted to stitch closed the open upper ends of filled bags and provides an improvement on the machine disclosed in the United States Letters Patent No. 2,539,627 to Kindseth et al.

An important object of our invention is the provision of novel means for automatically initiating a sewing operation when an article is introduced to the sewing mechanism, causing the stitching thread to be automatically severed in outwardly spaced relation to one side of the bag after the bag has been stitched closed, and shutting off the stitching mechanism.

Another object of our invention is the provision of an article engaging control element for sewing machines of the above type which will function under a minimum pressure exerted thereon by the article to be stitched whereby to permit bags or other articles having relatively thin flimsy wall structures to actuate the control member without becoming deformed.

Another object of our invention is the provision of means for supporting the control member above described in all positions of its movement between machine operative and machine inoperative positions.

Another object of our invention is the provision of apparatus for controlling machines of the above type which is relatively simple and inexpensive to manufacture, which is efficient in operation, and which is rugged in construction and durable in use.

The above and other highly important objects and advantages of our invention will become apparent from the following detailed specification, appended claims, and attached drawings.

Referring to the drawings which illustrate the invention and in which like characters indicate like parts throughout the several views:

Fig. 1 is a fragmentary view in side elevation, some parts broken away and some parts shown in section, of a power driven sewing machine and controls therefor built in accordance with the invention;

Fig. 2 is an enlarged fragmentary view partly in plan and partly in horizontal section taken substantially on the line 2—2 of Fig. 1;

Fig. 3, Sheet 3, is a view corresponding to a portion of Fig. 2 but showing a different position of some of the parts;

Fig. 4 is a view partly in plan and partly in section taken substantially on the line 4—4 of Fig. 2, some parts being broken away;

Fig. 5, Sheet 4, is a view partly in section and partly in side elevation taken substantially on the line 5—5 of Fig. 2;

Fig. 6 is a diagrammatic section of a valve of our invention;

Fig. 7 is an enlarged fragmentary detail, some parts

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being broken away and some parts shown in section, as seen from the line 7—7 of Fig. 2;

Fig. 8 is a view partly in plan and partly in section of a stitching thread carrier incorporated in the machine of our invention; and

Fig. 9, Sheet 2, is a longitudinal sectional view of a portion of the control means of our invention.

In the drawings, a power driven sewing machine 1 is shown as comprising a base 2 and a sewing head 3. The head 3 supports a needle 4 by means of a conventional reciprocatory needle bar 5 and a presser foot 6 rigidly secured to the end of a reciprocating rod or shaft 7. The sewing and feeding mechanism of the machine is conventional in nature and is shown in the drawings more or less diagrammatically. With reference particularly to Figs. 1—3 inclusive, it will be seen that the needle bar 5 and feeding mechanism are driven from a drive shaft 8, the needle bar 5 being operatively connected thereto by an eccentric operated pitman rod 9 and a lever 10 pivotally mounted to the machine 1, as indicated at 11, and connected at one end to the pitman rod 9 and at its other end suitably connected to the opposite end of the needle bar 5. The feeding mechanism comprises an eccentric 12 on the shaft 8 and a pitman arm 13 driven by the eccentric 12 and connected at its free end to a crank arm 14 fast on a rock shaft 15. The rock shaft 15 is suitably journaled in the base 2 and has rigidly secured thereto a crank arm 16 which drives a pair of serrated feed dogs 17 and 18 through a rigid link 19. The feed dogs 17 and 18 extend laterally outwardly through apertures 20 in a base plate 21 mounted on the base 2 by screws or the like 22, see Fig. 5.

The frame 1 of the sewing machine is rigidly secured to a mounting bracket 23 which is supported from a main supporting frame 24 by laterally extending arms 25, one of which is shown, see Fig. 1. With further reference to Fig. 1, it will be seen that a drive motor 26 is rigidly mounted on the upper end of the bracket 23 and drives the sewing and feeding mechanism through a V-belt 27 running over a V-pulley 28 on the drive shaft of the motor 25 and a similar pulley 29 mounted fast on the outer end of the drive shaft 8. The pulley 28 is provided with a clutch mechanism 30 which is controlled by a clutch lever 31 to operatively couple the pulley 28 to the motor 26. The clutch lever 31 is pivotally secured intermediate its ends to a rigid arm 32 depending from the base of the motor 26. At its free end, the clutch lever 31 is secured by a coupling 33 to a plunger 34 operated by a solenoid, not shown but contained within a housing 35 secured to the base of the motor 26 and supported by the upper end of the bracket 23. The lever 31 is further provided with a spring 36 which biases the clutch 30 toward its inoperative position, shown by dotted lines in Fig. 1, and an adjustable stop element 37. The stop element 37 is in the nature of a machine screw or the like having screw-threaded engagement in a laterally outwardly projecting arm 38 integrally formed with the lever 31. The clutch and operating linkage therefor do not in themselves constitute the invention and further detailed description thereof is, therefore, deemed unnecessary.

The clutch operating solenoid contained in the housing 35 is controlled by a switch contained in a switch housing 39 and provided with an operating button 40. The switch housing 39 is rigidly secured to one end portion of a plate-like bracket 41 that is anchored to the sewing head 3 by suitable means, not shown. The switch may be assumed to be of the momentary contact type in which the button 40 thereof is yieldingly biased toward a normal switch-open position. The switch within the housing 39 and the solenoid within the housing 35 are interposed in an electrical circuit including the motor 26 and a source

of electrical potential, not shown. The above-mentioned electrical circuit and parts heretofore described are fully disclosed in our pending United States patent application, Serial No. 204,526, filed January 5, 1951, now Patent No. 2,630,086, dated March 3, 1953.

A switch button extension rod 42 is axially slidable in a bearing sleeve 43 in axial alignment with the button 40 and rigidly anchored to the switch housing 39 by means of a tubular mounting member 44. The extension rod 42 is provided with an axially extended internal recess 45 in which is slidably mounted a rod or shaft 46 having at its outer end a diametrically enlarged head or cap 47. A pin 48 extends radially outwardly of the rod 46, the outer end thereof being contained within an axially extended slot 49 in the outer end portion of the extension rod 42 whereby to provide limited axial movement of the shaft 46 relative to the extension rod 42. A coil compression spring 50 is interposed between the bottom of the recess 45 and the inner end of the shaft 46 whereby to bias the shaft 46 axially outwardly of the extension rod 42. The spring 50 exerts a greater bias than that of the switch toward its open position so that initial movement of the head 47 toward the switch housing 39 will close the switch contained therein, after which overtravel of the head is permitted by the pin and slot connections 48 and 49 respectively, against bias of the spring 50, said overtravel being limited by the length of the slot 49.

The base plate 21 is provided with a slot or channel 51 which extends longitudinally of the path of travel of bags being fed to the machine, see Figs. 5 and 7. In the drawings, filled bags to be stitched closed are indicated at A. The presser foot 6 is also provided with a slot 52 extending longitudinally of the bags A and in register with the slot 51 in the base plate 21. A control member in the nature of a laterally movable control finger 53 extends in a direction parallel to the slots 51 and 52 in the base plate and presser foot respectively and is movable through the slot 52 laterally toward and away from a normal position wherein one longitudinal edge portion is contained within the slot 51 of the base plate 21 where it will intercept and be moved by the upper ends of the bags A when said upper ends are moved between the base plate and presser foot. Means for mounting the control finger 53 comprises a rigid link 54 that extends generally longitudinally of the control finger 53 and has one end pivotally secured to the bracket or mounting plate 41, as indicated at 55. At its opposite end, the link 54 is pivotally secured to a laterally projected lug or ear 56 integrally formed with the control finger 53 intermediate the ends thereof, see Figs. 2 and 3. It will also be seen, with reference to Figs. 2 and 3, that the forward end 57 of the control finger 53 and the corresponding end 58 of the presser foot 6 curve laterally outwardly to provide easy entrance therebetween and the base plate 21 of the upper ends of the bags A as they approach the stitching mechanism. As will hereinafter be described, the upper ends of the bags A exert a camming action on the forward end of the control finger 53 to move the same laterally outwardly of the slot 51 in the base plate 21.

At its opposite or rear end, the control finger 53 is provided with a rearwardly projecting boss 59 in which is screwthreaded a lock nut-equipped stop screw 60 which is adapted to engage an abutment in the nature of an ear 61 integrally formed with the mounting bracket or plate 41. Engagement of the adjacent end of the stop screw 60 with the abutment ear 61 positively limits lateral movement of the rear end portion of the control finger 53 in the direction of the base 2. Intermediate the lug 59 and the ear 56 of the control finger 53 is a laterally outwardly projecting tongue 62 which is positioned to engage the head 47 of the switch operating shaft 46. The shaft 46 and its cooperating rod 42 are axially parallel to the lateral direction of movement of the control finger 53, see Figs. 2 and 3. The above-described means for mounting the control finger 53 provides for extreme ease of movement

of the control finger so that bags A of thin relatively flimsy material will move the control finger without buckling or otherwise being deformed. Engagement of the presser foot 6 of the bag top on opposite sides of the control finger 53 further adds to the support of the bag top and effectively prevents damage to the bag tops during the stitching operation which would otherwise sometimes occur due to lack of proper support.

As clearly shown in Figs. 2 and 3, when a bag A enters the machine between the base plate 21 and the presser foot 6, the top portion of the bag A engages the outwardly curved portion 57 of the control finger 53 and tends to displace the same by camming action thereagainst. The pivotal mounting of the control finger 53 tends to retain the rear end portion of the control finger in the slot 51 of the base plate 21. It should be noted that at this point, the stop screw 60 is in abutting engagement with the abutment ear 61 whereby to provide a fulcrum about which the control finger swings during its initial laterally outward movement. It will be seen, by reference to Figs. 2 and 3, that the control 53 acts as a lever having a relatively short lever arm between the stop screw 60 and the head-engaging tongue 62, and a relatively long lever arm between said tongue and the front bag-engaged portion of the finger 53. Thus, very little laterally outward pressure is required to the front end 57 of the control finger to close the control switch in the housing 39 whereby to energize the solenoid in the casing 35 to initiate operation of the stitching means and thread cutting mechanism. As the bag A is fed through the machine, the control finger 53 is gradually moved out of the slot 51 in the base plate, the finger being held against longitudinal movement by the pivoted rigid link 54. During this time, the stop screw 60 is moved out of engagement with the abutment ear 61 and the entire bias of the switch toward its normally open position and the overtravel spring 50 is exerted against the top of the bag A. During this time, however, a sufficient amount of bag material has advanced between the control finger and the base plate 21 to adequately resist said bias without giving way until the stitching operation has been completed across the entire width of the bag top. As the bag leaves the machine, moving from left to right, with respect to Figs. 2 and 3, the control finger 53 is again permitted to move laterally toward the base plate and enter the slot 51 thereof and cause the switch to open thereby uncoupling the stitching and thread cutting mechanism from the motor 26. It should be noted that there is sufficient kinetic energy in the stitching and thread cutting mechanism to cause the same to continue operating for a very brief interval after the switch has been opened. During this time, the stitching thread laterally outwardly of the stitched bag is moved into operative engagement with thread cutting mechanism by mechanism now to be described. The thread cutting mechanism includes a stationary cutting blade 63 and a movable blade 64, see particularly Figs. 2, 3 and 7. The stationary blade 63 is suitably anchored in the base 3 and the movable blade 64 is mounted on a swinging arm 65 pivotally mounted in the base 3, as indicated at 66. Reciprocatory movements are imparted to the movable blade 64 by the drive shaft 8 through suitable mechanism including a lever arm 67 pivotally mounted at its intermediate portion to a bracket 68 mounted in the base 3. The above-described cutting mechanism is fully disclosed in our pending application above identified. The base 2 and the base plate 21 are provided with openings 69 and 70 respectively through which the stitching thread is moved into operative engagement with the cutting blades 63 and 64. A fluid pressure cylinder 71 is rigidly mounted on the bracket 41 in closely spaced parallel relation to the bearing sleeve 43 and has mounted for reciprocatory movement therein a piston 72 carrying a cross-sectionally rectangular plunger rod 73 which projects outwardly therefrom in the general direction of the base 2 which terminates in a fork-like

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stitching thread engaging head 74. As shown, in Fig. 8, a coil compression spring 75 biases the piston 72 in a direction to retract the head 74 out of the path of travel of the upper ends of the bags A.

Means for introducing fluid under pressure to the cylinder 71 whereby to project the thread engaging head 74 into engagement with the stitched thread and carry the same between the cutting blades 63 and 64 comprises a conduit 76 leading to a valve 77 secured by means of a bracket 78 to the solenoid housing 35. The valve 77 is illustrated in Fig. 6 and comprises a valve body 79 having therein an air inlet passage 80 from which extends a conduit 81 which may be assumed to be connected at its other end to a source of fluid, such as air, under pressure. The passage 80 terminates at its inner end in a transverse bore 82 and in which is mounted for axial movements a valve stem 83 having a diametrically reduced intermediate portion 84. The stem 83 projects laterally outwardly from one side of the valve body 79 and is yieldingly biased in a direction outwardly therefrom by a coil compression spring 85 interposed between the inner end of the stem 83 and the bottom of the bore 82. A second passage 86 extends from the bore 82 in laterally offset relation to the passage 80 and communicates with the conduit 76. A third passage 87 extends outwardly from the bore 82 in laterally spaced relation to the passages 80 and 86 to atmosphere. The construction is such that, when the stem 83 is moved inwardly against bias of the spring 85, the reduced portion of the stem 83 will be in register with the passages 80 and 86 thereby permitting air under pressure to be introduced to the cylinder 71 in a direction to project the head-equipped piston rod 73 and piston 72 in a direction generally toward the cutting blades. At this time, the third passage 87 to atmosphere is shut off from both other passages 80 and 86. When the valve stem 83 is permitted to return to its position of Fig. 6, the passages 86 and 87 are in register with the reduced portion 84 of the valve stem and the piston 72 and parts carried thereby will move in a direction to retract the head 74 generally away from the cutting blades and out of the path of travel of the bags being fed through the machine under bias of the return spring 75. The valve stem 83 is moved inwardly of the valve body 79 by a lever 88 pivotally secured at its upper end to the bracket 78, as indicated at 89. The lower end of the lever 88 is provided with an adjustable stop screw 90 which has abutting engagement with an arm extension 91 that is anchored at its lower end to the arm 38 of the clutch lever 31. With reference to Fig. 1, it will be seen that, when the clutch element is in its operative position, shown by full lines, the lever 88 is moved to a position wherein the cylinder 71 is open to atmosphere through the conduit 76 and the passages 86 and 87 of the valve 77. In this position, the head 74 of the plunger rod 73 is retracted and the bag A permitted to pass therebeyond. Immediately upon opening of the switch 39 and consequent deenergization of the solenoid in the casing 35, the spring 36 will move the clutch element 30 to its inoperative dotted line position of Fig. 1. This movement causes the arm 91 to move the lever 88 and the valve stem 83 into the position where air under pressure is admitted to the cylinder 71 through the conduit 81, the intercommunicating passages 80 and 86, and the conduit 76, the pressure being great enough to overcome the bias of the spring 75 in the cylinder 71 and project the plunger rod 73 to a point where the stitching thread engaged by the head 74 thereof is moved through the openings 69 and 70 and between the cutting blades 63 and 64.

The entire device may be easily applied to stitching machinery in which the thread cutting means is offset from the path of travel of the bags, it being only necessary to cut the slots 51 and 52 in the base plate 21 and presser foot 6 respectively, inasmuch as the control finger 53, the head-equipped plunger rod 73, and the switch and operating head 47 thereof are all carried by the bracket 41.

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Our invention has been thoroughly tested and found to be completely satisfactory for the accomplishment of the objectives set forth; and while we have shown and described a preferred embodiment of our novel control mechanism, it will be understood that the same is capable of modification without departure from the spirit and scope of the invention, as defined in the claims.

What we claim is:

1. In a sewing machine, means for stitching articles successively fed in spaced relation, said means including a base plate and a sewing head, said base plate having a slot extending longitudinally of the direction of travel of said articles, said head having a presser foot and a cooperating needle, mechanism for cutting the stitching thread in laterally outwardly spaced relation to said articles, drive means imparting sewing movements to the needle and thread cutting movements to said mechanism, said presser foot having an opening therethrough elongated in the direction of said movements of said articles and in register with said slot, and control means for said drive means, said control means including a control element mounted on the head and a control member operatively engaging said control element and extending longitudinally of the direction of said articles and projecting laterally through the opening in said pressure foot, one longitudinal edge portion of said member being normally contained in the slot in said base plate, and means mounting said control member on the sewing head for lateral movements toward and away from said slot, said control member being yieldingly biased toward said slot whereby to intercept said articles and being laterally moved thereby in a direction away from the base plate to cause operation of the stitching means and said thread cutting mechanism.

2. The structure defined in claim 1 in which the control member mounting means comprises a bracket on the sewing head and a rigid link pivotally connected at its opposite ends to said bracket and said control member intermediate the ends thereof.

3. The structure defined in claim 1 in which the control member mounting means comprises a bracket on the sewing head and a rigid link pivotally connected at its opposite ends to said bracket and said control member intermediate the ends thereof, and in further combination with stop means limiting lateral movements of one end of the control member in one direction.

4. An attachment for sewing machines having means for stitching articles fed successively in spaced relation, said means comprising a base plate and a sewing head, said head having a presser foot and a cooperating needle mounted thereon, said presser foot having an opening therein elongated in the direction of movement of articles fed through the machine, means for operating the stitching means, mechanism for cutting the stitching thread outwardly of opposite sides of said articles, and control mechanism for said operating means; said attachment comprising a control element adapted to be mounted on said head and operatively associated with said control mechanism, an article engaging control finger extending longitudinally in the direction of movement of articles fed through the machine, said control finger being operatively connected to said control element, and means for mounting said control finger on said head independently of said presser foot for movements through the opening in the presser foot into and out of the path of travel of said articles, said control finger being operative responsive to movements of the articles through the machine to actuate said control element whereby to cause operation of the thread cutting mechanism and said stitching means.

5. The structure defined in claim 4 in which said control finger mounting means comprises a bracket adapted to be anchored to the sewing head and a rigid link pivotally connected at its opposite ends to said bracket and the intermediate portion of said control finger.

6. The structure defined in claim 4 in which the con-

trol finger mounting means comprises a bracket adapted to be anchored to the sewing head and a rigid link pivotally connected at its opposite ends to said bracket and the intermediate portion of said control finger, and in further combination with stop means limiting lateral movements of one end of the control finger in one direction.

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References Cited in the file of this patent

UNITED STATES PATENTS

639,216 Curtis ----- Dec. 19, 1899

10

2,539,627
2,558,353
2,569,396

Kindseth et al. ----- Jan. 30, 1951
Garcia ----- June 26, 1951
Bates ----- Sept. 25, 1951

FOREIGN PATENTS

Great Britain ----- Apr. 20, 1933

391,026