

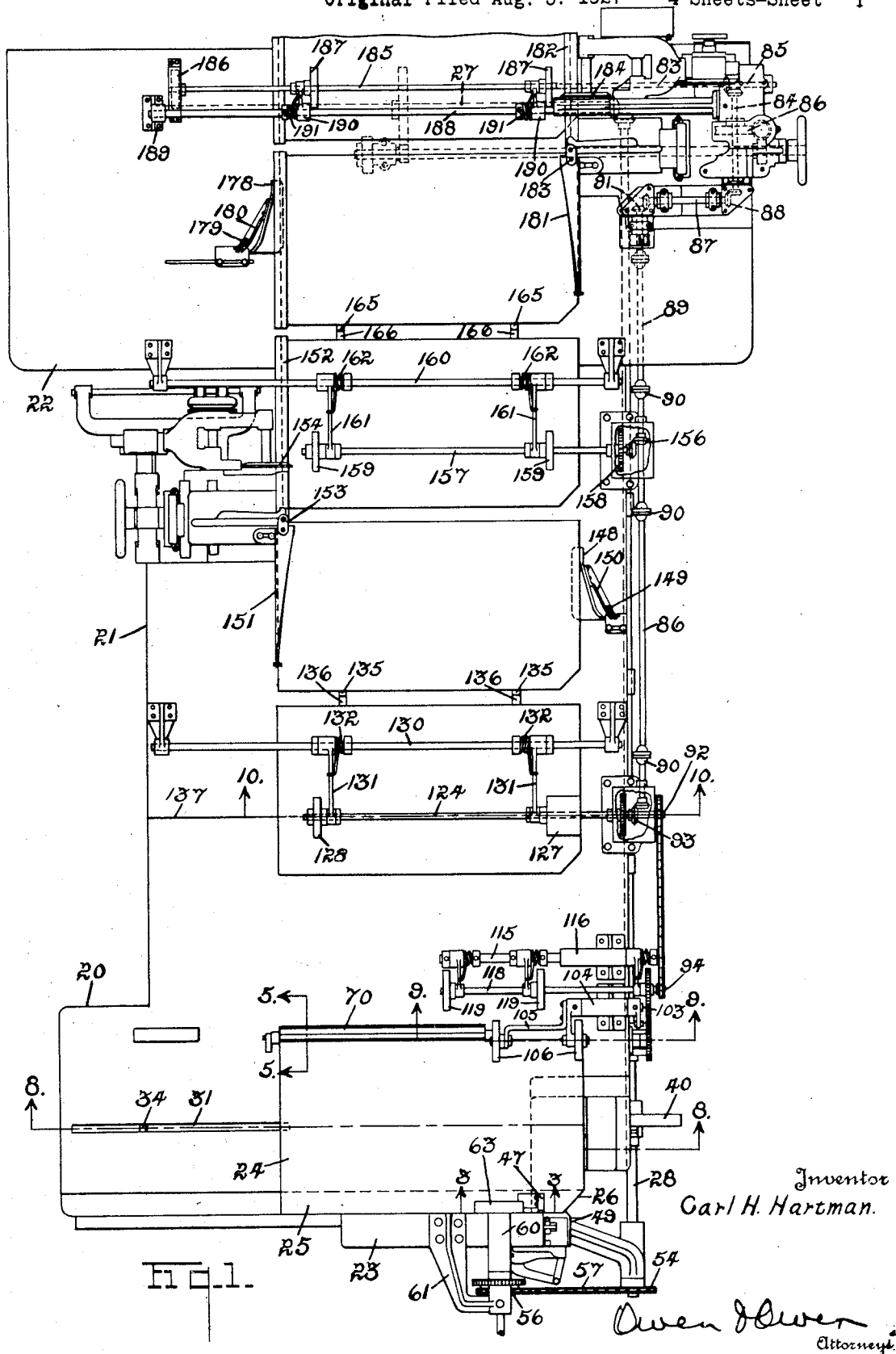
Jan. 5, 1932.

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1,840,232

VALVING AND SEWING BAG

Original Filed Aug. 5, 1927 4 Sheets-Sheet 1



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VALVING AND SEWING BAG

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4 Sheets-Sheet 2

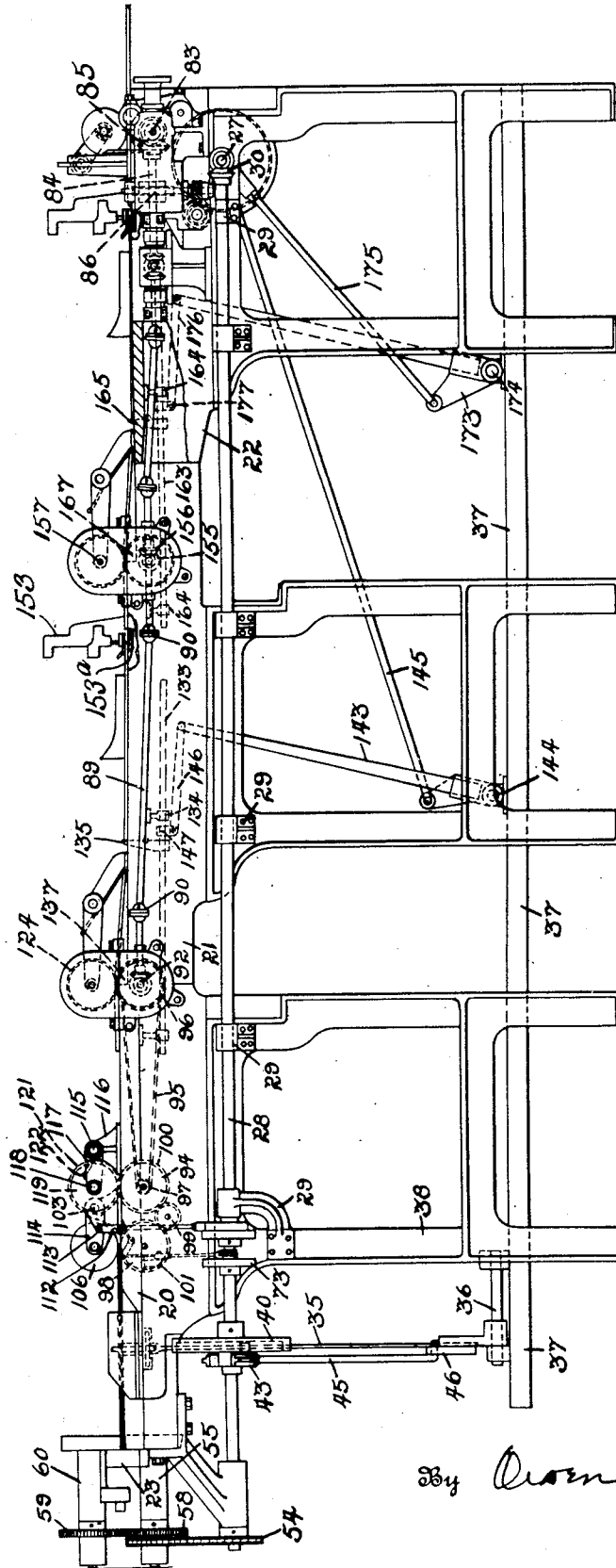


Fig. 2.

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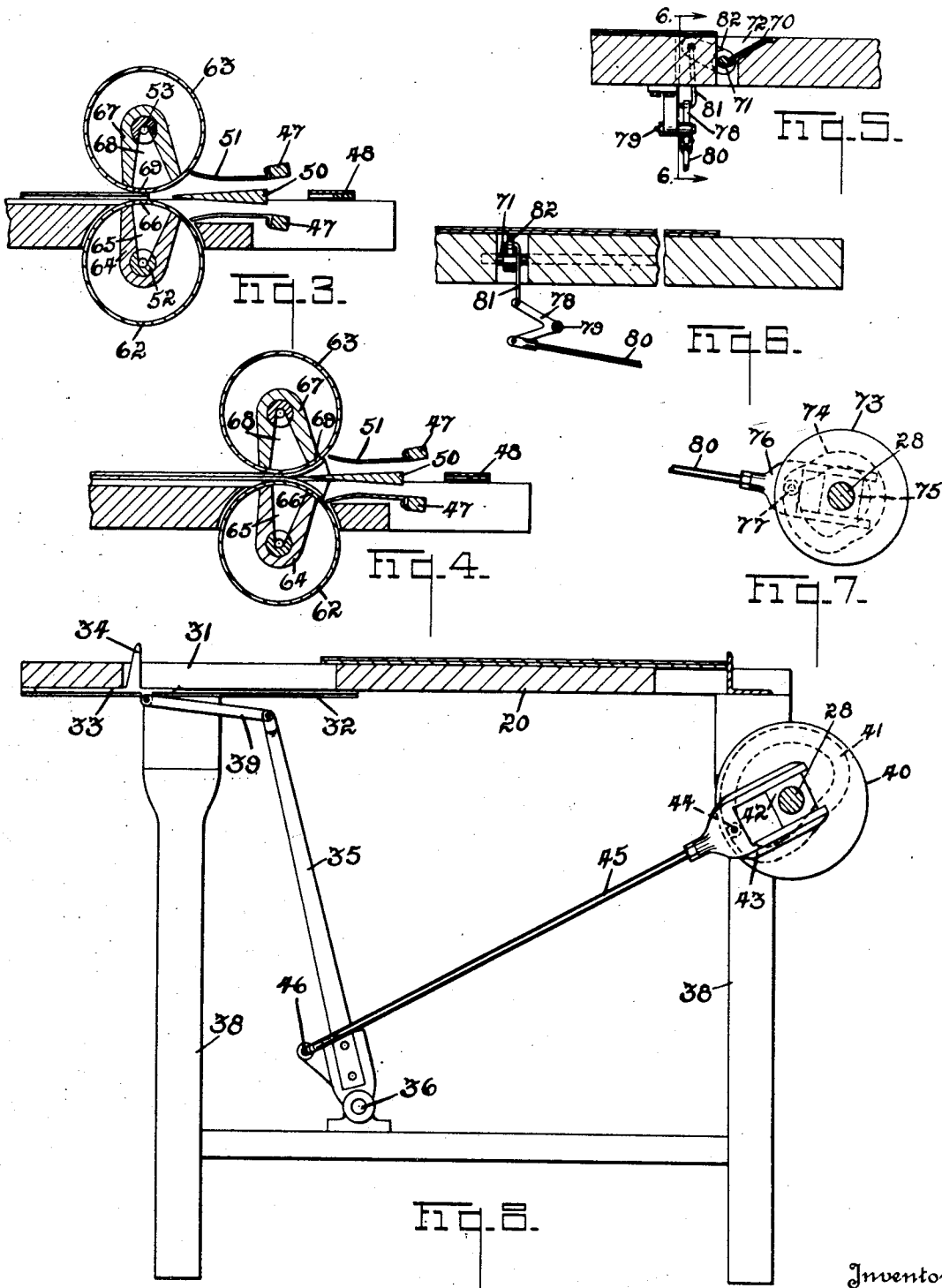
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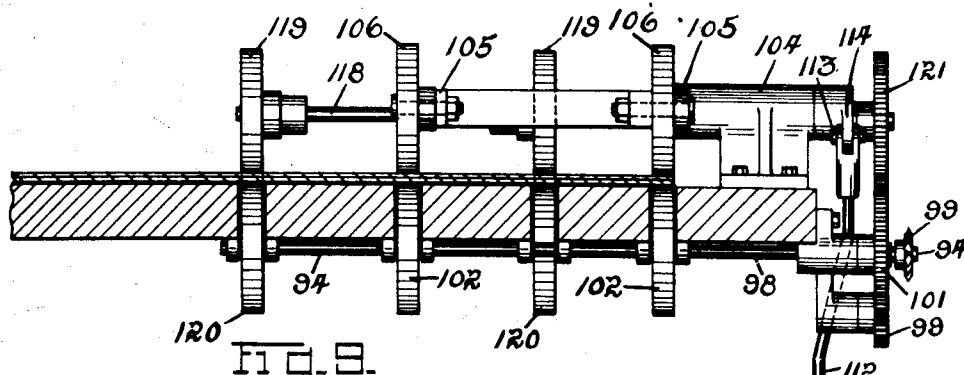
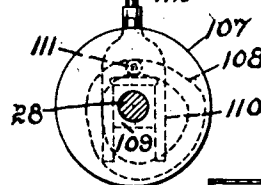
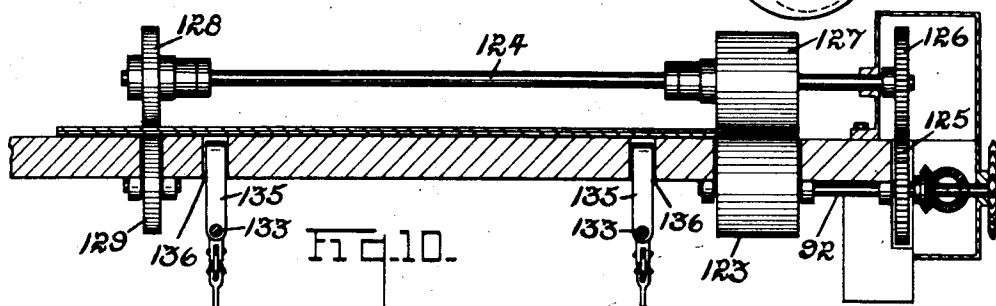
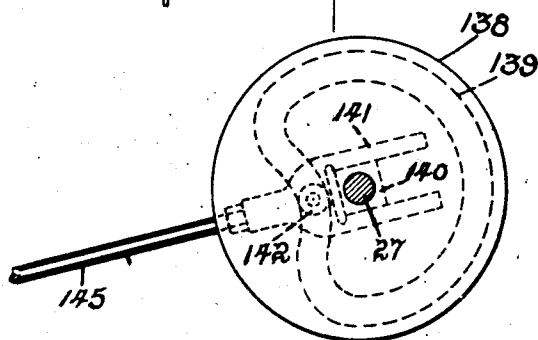
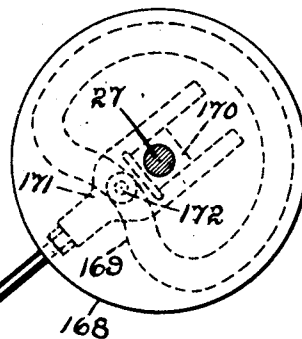
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VALVING AND SEWING BAG

Application filed August 5, 1927, Serial No. 210,903. Renewed November 28, 1931.

This invention relates to valving and sewing bags, and has for its purpose providing a method and apparatus by which paper tubes open at each end may be formed into bags closed at each end by a sewed seam, except for a valve opening at one end of one seam.

Minor features of the invention will appear as the description proceeds.

10 In the accompanying drawings forming a part of this specification, Figure 1 is a plan view of one form of apparatus embodying the invention; Fig. 2 is a side elevation of the apparatus, viewed from the right side of Fig. 1; Fig. 3 is an enlarged detail section on the line 3—3 of Fig. 1; Fig. 4 is like Fig. 3 except that it shows the parts in a different position; Fig. 5 is an enlarged detail view on the line 5—5 of Fig. 1; Fig. 6 is a sectional view on the line 6—6 of Fig. 5; Fig. 7 is a detail view of a cam operating parts shown in Figs. 5 and 6.

25 Figs. 8, 9 and 10 are enlarged sectional details on the lines 8—8, 9—9 and 10—10 respectively, of Fig. 1; Figs. 11 and 12 are enlarged detail views of cams for operating pushers shoving the bags into the sewing machines.

30 In the construction shown, the apparatus is mounted upon three tables arranged end to end. Table 20 supports a valving apparatus, table 21 supports apparatus for applying a reinforced closing seam to one end of the bag, and table 22 supports similar apparatus for closing the other end of the bag.

35 On the side of table 20 away from table 21, there is a casing 23 containing means for operating a valve-folding device. A bag 24 having a bellows fold 25 in one side is shown in position against the valver casing, and with a valve tucked in at corner 26.

40 A shaft 27 is mounted transversely of table 22, and is driven by any suitable means. A shaft 28 runs longitudinally of the machine at the right side thereof, as shown in Fig. 1, being supported in bearings 29 extending from the several tables. Shafts 27 and 28 are connected by miter gears 30.

45 At the left of the position which a bag occupies on table 20 during the valving there

is a slot 31 through the table. See Figs. 1 and 8. Beneath slot 31 there is a guideway 32 for a slide 33 which carries a pusher 34 extending upward through the slot. Beneath the slot a lever 35 is fulcrumed at 36 upon a member 37 supported upon the legs 38 of the tables. The upper end of the long arm of lever 35 is connected by a link 39 to slide 33.

A cam 40 is attached to shaft 28 and has a cam groove 41. A rectangular block 42 is mounted upon shaft 28 at one side of the cam. A forked head 43 straddles the block 42 and carries a cam roller 44 working in groove 41. Head 43 is connected by a rod 45 to a pivot 46 on the short arm of lever 35.

65 The exact construction and operation of the valver mechanism forms no part of this invention, and need not be described in detail; but the form of valver somewhat diagrammatically indicated in this application comprises clamps 47 for gripping the side of the bag at a short distance from the end, spreaders 48 for spreading apart the gusset-fold between the clamps and the end of the bag, a tucking finger 49 for tucking the gusset-fold in between the spread apart sides at the corner, and means for operating these devices in timed relation.

70 A wedge 50 extends into the gusset-fold to spread apart the fold so that the spreaders 48 will be received in the fold. Guide plates 51 are attached to clamps 47 for guiding the edges of the bag between the clamps. A vacuum pipe 52 extends from a point at one side of the valve casing to a point beneath the gusset-fold of the bag, and a similar pipe 53 extends parallel with pipe 52 to a point above the gusset-fold of the bag. Around each of these pipes there is a rotatable sleeve, which is not shown in the drawings, but the location of which will readily appear from the following description.

75 There is a sprocket wheel 54 on the end of shaft 28. The aforementioned sleeve surrounding pipe 52 is mounted in a bearing 55, and the outer end of this sleeve carries a sprocket wheel 56 which is connected to sprocket wheel 54 by a chain 57. A gear 58 on the sleeve surrounding pipe 52 meshes with a gear 59 mounted on the sleeves sur- 100

rounding the upper pipe, which sleeve is rotatable within bearing 60. A bracket 61 is shown extending from the edge of table 20 to support the outer ends of the vacuum pipes.

Rollers 62 and 63 are provided on the ends of the aforementioned sleeves beneath and above the gusset-fold of the bag respectively. The end of vacuum pipe 52 carries a suction member 64 within roller 62, suction member 64 being provided with a wedging vacuum chamber 65 opening into the pipe. A hole 66 in roller 62 passes chamber 65 during each revolution of the roller.

There is provided on the end of vacuum pipe 53 a similar suction member 67 having therein a chamber 68 connected to the vacuum pipe, and there is a hole 69 in roller 63 similar to hole 66 in roller 62.

An oscillating guide plate 70 is mounted on a pivot 71 within a slot 72 in table 20, and in position to guide the edge of a bag opposite to the side in contact with the valver casing. A cam 73, shown in Fig. 7, is mounted on shaft 28 and is provided with a groove 74. A block 75 mounted upon shaft 28 is enclosed by a forked head 76 which carries a roller 77 working in groove 74. A V-shaped lever 78 fulcrumed at 79 has its lower arm pivoted to rod 80 extending from head 76 and its upper arm connected by a link 81 to an arm 82 extending from pivot 71.

For convenience, the operation of the apparatus thus far described will be stated before describing the remainder of the apparatus.

With the parts in the position in which they are shown in Figs. 1 and 8, a bag is placed upon the table with its sides between casing 23 and plate 70, and with its ends between pusher 34 and roller 63. Thereafter as shaft 28 rotates finger 34 pushes the bag until the end enters between rollers 62 and 63, and at the same time cam 73 actuates plate 70 to bring the side of the bag snugly against the valver casing. The parts are so timed that when the front end of the bag enters between rollers 62 and 63, holes 66 and 69 will be rotated to the position in which they are shown in Fig. 3 and thereby provide for the exhaustion of the air from the upper and lower surfaces of the gusset-folded portion of the bag. As the bag continues to move forward the rollers rotate carrying the sides of the gusset-fold to the positions in which they are shown in Fig. 4, at which time the vacuum will be broken, as readily appears from that figure, and the ends of the gusset-folded portion enter between wedge 50 and plates 51. It will be readily understood that as the bag is shoved along from the position in which it is shown in Fig. 4, the ends of the gusset-fold enter between clamps 47 and pass outside of spread-

ers 48, so that the corner of the bag is properly positioned for valving.

Immediately upon the bag reaching proper position the valving apparatus is operated by connections not shown, so that the bag has its valve tucked in and is in proper condition for closing.

Parallel with shaft 27 beneath table 22 there is a shaft 83. At the right of table 22 a short shaft 84 is connected to shaft 83 by means of miter gears 85, and is driven by any suitable power means, such as indicated at 86. A short shaft 87 parallel with the right end of shaft 83 is connected to shaft 84 by means of miter gears 88. Mounted upon tables 20, 21 and 22, and substantially parallel with shaft 28, there is a sectional shaft 89, the various sections being connected by universal joints 90. Shaft 89 is connected by miter gears 91 with shaft 87.

Beneath table 21 there is a transverse shaft 92 driven by miter gear 93. Beneath table 20 there is a transverse shaft 94. A chain 95 passes around a comparatively large sprocket 96 on shaft 92, and a comparatively small sprocket 97 on shaft 94, thereby driving shaft 94 at a materially higher speed than shaft 92. Parallel and adjacent to shaft 94 there is a shaft 98. An idler gear 99 connects gear 100 on shaft 94 with gear 101 on the shaft 98, so that shafts 94 and 98 are driven in the same direction and at the same speed. Shaft 98 carries rollers 102 working through slots in the table and adapted to contact the under side of a bag resting on the table.

A rock shaft 103 is mounted in bearing 104 above the table parallel with and in a vertical plane between shafts 92 and 94. Rock shaft 103 carries a forwardly extending bracket 105 on which are mounted rollers 106 directly above rollers 102. A cam 107 on shaft 28 is provided with a groove 108, and a box 109 on the shaft is enclosed by a forked head 110 carrying a roller 111 working in groove 108. A rod 112 connects head 111 with a pivot 113 on an arm 114 extending from rock shaft 103.

A bearing rod 115 is mounted in a bracket 116 substantially parallel with rock shaft 103. Arms 117 pivoted upon rod 115 carry a shaft 118. Mounted on shaft 118 there are rollers 119 directly above rollers 120 mounted upon shaft 94. A gear 121 on shaft 118 meshes with gear 100 on shaft 94. Springs 122 normally hold arms 117, and thereby rollers 119, firmly against the upper side of any bag resting upon the table beneath them.

As shown in Fig. 10, the inner end of shaft 92 carries a roller 123. Above and parallel with shaft 92 there is a longer shaft 124. A gear 125 on shaft 92 meshes with and drives a gear 126 on shaft 124. A roller 127 on shaft 124 mates with roller 123. A roller 128 is mounted upon the end of shaft 124 in position to contact a bag adjacent the opposite end

from that contacted by roller 127. An idler roller 129 is mounted in a slot in the table directly beneath roller 128. A transverse rod 130 is mounted upon table 21 parallel with shaft 124. Arms 131 mounted on rod 130 are pivoted to shaft 124, and springs 132 constantly tend to depress arms 131 and thereby hold rollers 127 and 128 in close contact with any bag therebeneath.

The operation of the bag feeding rollers thus far described will be stated before describing the remainder of the apparatus.

As will readily appear from Fig. 9, the groove in cam 107 is so formed that rollers 106 will be raised above the table and above a bag resting thereon a considerable portion of the time. During this time the bag is fed into the valver and the valve tucked in at one corner thereof. The apparatus is so timed that, immediately after the formation of the valve, shaft 103 is rocked so as to lower rollers 106 against the upper surface of the bag and press the bag down onto constantly operating rollers 102. At the same time guide plate 70 is rocked to the position in which it is shown in Fig. 5 so as to leave the bag free to move away from the valver. Thereupon the bag is quickly moved from the valver and between rollers 119 and 120, which move at the same speed as rollers 102 and rapidly feed the bag forward until its advance edge enters between rollers 123 and 127, when it is released by rollers 119 and 120. Rollers 123 and 127 operate at a less speed than rollers 102 and 106, and feed the bag forward at a less speed until it drops from table 20 onto the slightly lower table 21.

Beneath tables 21 and 22 there are rods 133 supported in brackets 134. A pushing finger 135 extends upward from each of these rods through a slot 136 in the table thereabove. The fingers preferably extend above table 21 to about the same distance as table 20 extends above table 21 at their meeting line 137.

Shaft 27 carries a cam 138 (see Fig. 11) having a groove 139. A block 140 on shaft 27 adjacent cam 138 is enclosed by a forked head 141 which carries a roller 142 working in groove 139. A lever 143 is fulcrumed at 144 upon support 37 beneath the tables. A rod 145 connects head 141 with the short arm of lever 143. The long arm of lever 143 is connected by a link 146 with a collar 147 upon rod 143. Preferably there are two cams and levers, one for each rod and pushing finger. It is obvious that one cam might be connected to a rock shaft carrying two rock arms connected with the rods 133, or the two rods could be connected together so as to be moved by one lever.

At the right of the path of the bag on table 21, as viewed on Fig. 1, there is a positioning guide 148 pivoted at 149 and urged by a spring 150 towards the left, so as to

position the bag firmly against a combined stop and tape guide 151 mounted at the left side of the path of the bag. A tape 152 is applied to the end of the bag by guide 151, and the end of the bag with the tape applied thereto moves from the guide beneath a suitable sewing machine indicated diagrammatically at 153, the sewing machine being provided with a usual type of work-feeding means, indicated by feed dog 153* shown diagrammatically in Fig. 2. A tape cutter 154 is located in position to sever the tape between the bags after it has been sewed thereto. Approximately at the meeting line between tables 21 and 22 there is a transverse shaft 155 beneath the tables and connected by miter gear 156 with shaft 89. Above and parallel with shaft 155 there is a shaft 157 driven by a gear 158 meshing with a similar gear upon shaft 155. Shaft 157 carries rollers 159 in position to engage the upper surface of a bag as it is fed from the sewing machine.

A transverse rod 160 is mounted above table 22 parallel with shaft 157. Arms 161 are pivoted on rod 160 and shaft 157, and are normally pressed downward by springs 162. There are rollers on shaft 155 directly beneath rollers 159 on shaft 157, so that the bags are moved by these rollers from table 21 to table 22.

Rods 163 are supported beneath tables 21 and 22 by brackets 164. Each rod 163 carries a finger 165 working through a slot 166 in tables 21 and 22. The end of finger 165 comes above table 22, but does not come above table 21, where it jogs above table 22 at 167.

A cam 168 on shaft 27 (see Fig. 12) has a groove 169. A block 170, on shaft 27 adjacent cam 168, is enclosed by a forked head 171 which carries a roller 172 working in groove 169.

A lever 173 is fulcrumed at 174 upon support 37. A rod 175 connects head 171 with the short arm of lever 173. The long arm of lever 173 is connected by a link 176 with a collar 177 upon rod 163. It will be noted that the construction for moving fingers 165 is similar to the construction for moving fingers 135, and similar variations in this construction are obvious.

There are mounted upon table 22 devices similar to those on table 21, but for applying the closure to the other end of the bag. A positioning guide 178 is pivoted to table 22 at 179 and is urged by a spring 180 towards the right side of the table, as viewed in Fig. 1. At the right of the table there is a stop and tape guide 181 adapted to apply a tape 182 to the right end of the bag, and feed it in position beneath sewing machine 183. A cutter 184 is provided for cutting tape 182 between the bags after it is sewed thereto.

Adjacent the edge of table 22 there is a shaft 185 above the table. This shaft is in the same vertical plane as shaft 83 below the

table. A gear 186 on shaft 185 meshes with a similar gear therebeneath on shaft 83. Rollers 187 on shaft 185 co-operate with similar rollers therebeneath on shaft 83. A rod 188 is supported above the table parallel with shaft 85 by brackets 189. Arms 190 connect rod 188 with shaft 185, and springs 191 normally depress arms 190 and thereby rollers 187 are pressed firmly upon any bag therebeneath.

The operation of this apparatus is fairly apparent from the above description, but may be briefly reviewed as follows.

The apparatus is preferably so timed that when a bag is fed by rollers 123, 127, 128 and 129 from table 20 onto table 21, fingers 135 will be in slots in the edge of table 20, so that the bag will drop on the side of these fingers towards sewing machine 153. Immediately thereafter rods 133 are reciprocated to move the bag against guide 148 which presses it endwise firmly against stop 151. The fingers move far enough to feed the bag into sewing machine 153. After the corner of the bag is fed into sewing machine 153, the feeding mechanism 153* of the machine is sufficient to continue the motion of the bag, and guide 151 maintains the bag at right angles to the face of the guide, so that a seam is sewn in a straight line across the end of the bag. Before the bag leaves the sewing machine it passes beneath rollers 159 which feed it forward onto table 22, cutter 154 severing the tape behind the bag immediately after the bag passes the cutter.

Fingers 165 move the bag forward on table 22 in the same way that fingers 135 move the bag on table 21. Guide 178 moves the bag endwise against guide 181, and the fingers move it forward far enough to be caught by sewing machine 183 which in turn feeds it forward until it is seized by rollers 187 and the mating rollers therebeneath on shaft 83. These rollers feed the bag forward to the edge of table 22, tape 182 being cut by cutter 184 immediately after the bag passes that cutter, so that the bag is completely closed at both ends, except for the valve, and is discharged from table 22 onto any desired receiving device. As will be seen from the spacing of the bags shown in Fig. 2, the drive of rollers 123 and 127 and the rollers beneath rollers 159, and of fingers 135 and 165, is arranged to move the bags at about the same speed as the work-feeding means of the sewing machines, altho exact synchronism is not necessary, as the various feeding means operate chiefly in succession.

It will be readily understood that various changes may be made in the individual parts of the described apparatus, and that, while the entire device described is preferably used in combination, there are certain features which are capable of use independently of the construction of the other portions of the

apparatus. It is unnecessary to indicate the modifications which can be made in the apparatus within the scope of the invention, as that is apparent from the appended claims.

What I claim is:

1. In apparatus of the character described, a device to tuck in one corner of a bag to form a valve, a sewing machine, means to transfer the bag from the valving device to a position between the tucking device and the sewing machine, means to feed the bag from said position to and through the sewing machine and means driving said transfer means and feeding means in timed relation and with the transfer means moving the bag more rapidly than does the feeding means.

2. In apparatus of the character described, a device to tuck in one corner of a bag to form a valve, a sewing machine spaced from said device, means for moving a bag away from said device and towards said machine to a position out of the way of a bag in operative relation with said device, means for moving a bag from said position to said machine, and means for operating said moving means in timed relation and operating the first said moving means faster than the second said moving means.

3. In combination, mechanism for tucking in the corner of a bag, a sewing machine, means for positioning a bag in operative position to said tucking mechanism, means to move the bag at a high rate of speed from said tucking mechanism, and means to thereafter move the bag at a lesser rate of speed to and through the sewing machine.

4. In apparatus of the character described, a valving table, a valving device at one side of said table adapted to fold in one corner of the bag to form a valve, a sewing table at the other side of said valving table, the top of the sewing table being lower than the top of the valving table, and means to move the bag sidewise from the valving device off of the valving table onto the sewing table.

5. In apparatus of the character described, a valving table, a valving device on said table adapted to tuck in one corner of the bag to form a valve, a sewing table at one side of said valving table and having its top lower than the top of the valving table, a sewing machine on said sewing table, means to transfer a bag from valving position on the valving table toward the sewing table at a certain rate of speed, and means to move the bag at a slower rate of speed through the sewing machine.

6. In apparatus of the character described, a valving table, a valving device on said table adapted to tuck in one corner of the bag to form a valve, a sewing table at one side of said valving table and having its top lower than the top of the valving table, a sewing machine on said sewing table, means to transfer a bag from the valving table to the sewing machine.

ing table, there being registering slots in the meeting edges of the valving table and sewing table, and a pushing finger reciprocable horizontally in said slots, the upper end of said finger being above the surface of the sewing table and not above the surface of the valving table.

7. In apparatus of the character described, a valving table having a valving device at one side thereof adapted to tuck in the corner of a bag to form a valve, a sewing table at the other side of the valving device, the surface of the sewing table being lower than the surface of the valving table, and feed rollers substantially at the juncture of the two tables and adapted to feed a bag from the valving table to the sewing table.

8. In apparatus of the character described, a sewing table, a feeding table having its surface higher than that of the sewing table, means to move a bag from the feeding table onto the sewing table, there being registering slots in the adjacent edges of the tables, a finger, means to reciprocate the finger horizontally in said slots, the upper end of the finger extending above the sewing table but not above the feeding table, a sewing machine on the sewing table, and guides guiding the bag into said sewing machine when pushed by said finger.

9. In apparatus of the character described, a sewing machine having feeding means therein, a guide plate in line with the end of a bag fed to said sewing machine, means to move the bag against said guide and towards the sewing machine until the feeding device of the sewing machine engages the bag, and means on the other side of the sewing machine to engage said bag before it is disengaged by the feeding means of said sewing machine and to continue the movement of the bag after it is disengaged by said feeding means.

In testimony whereof I have hereunto signed my name to this specification.

CARL H. HARTMAN.