March 13, 1934. A. ZIMMER 1,951,300

PAPER STUFFING MACHINE

Filed Nov. 10, 1932 7 Sheets-Sheet 1

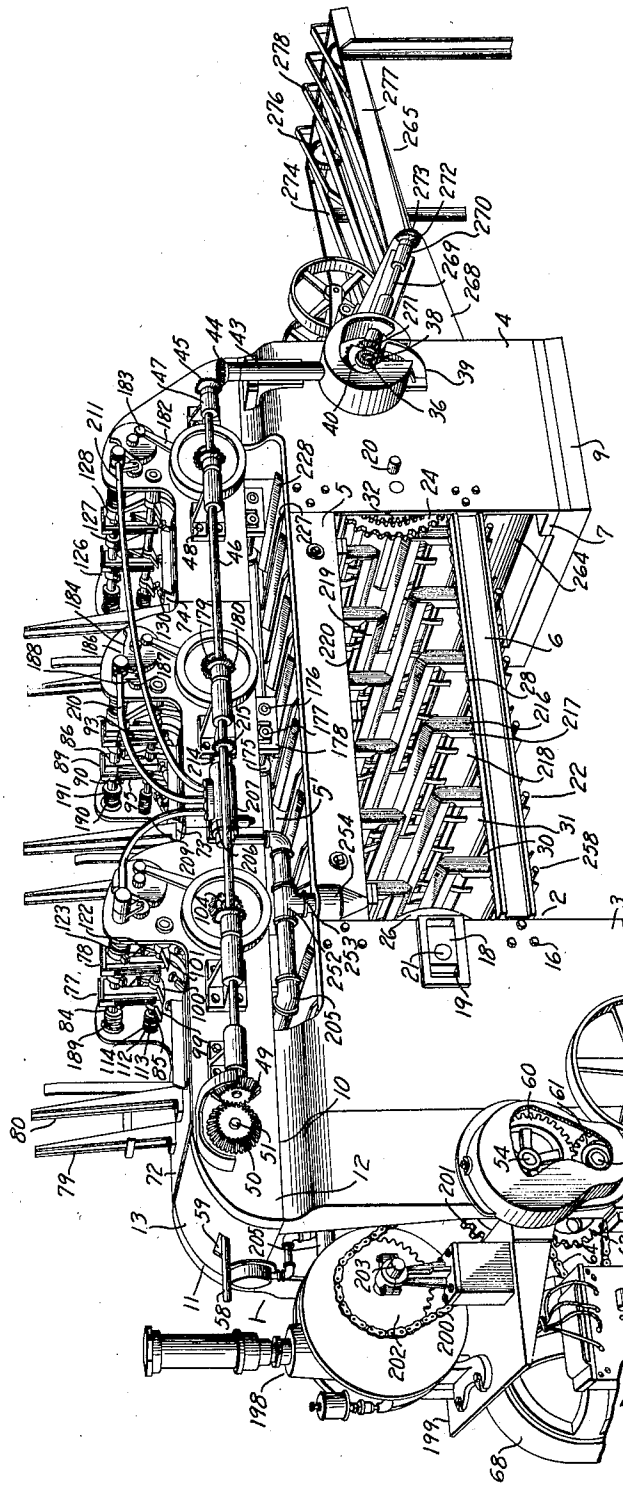


Fig. 1.

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Filed Nov. 10, 1932 7 Sheets-Sheet 2

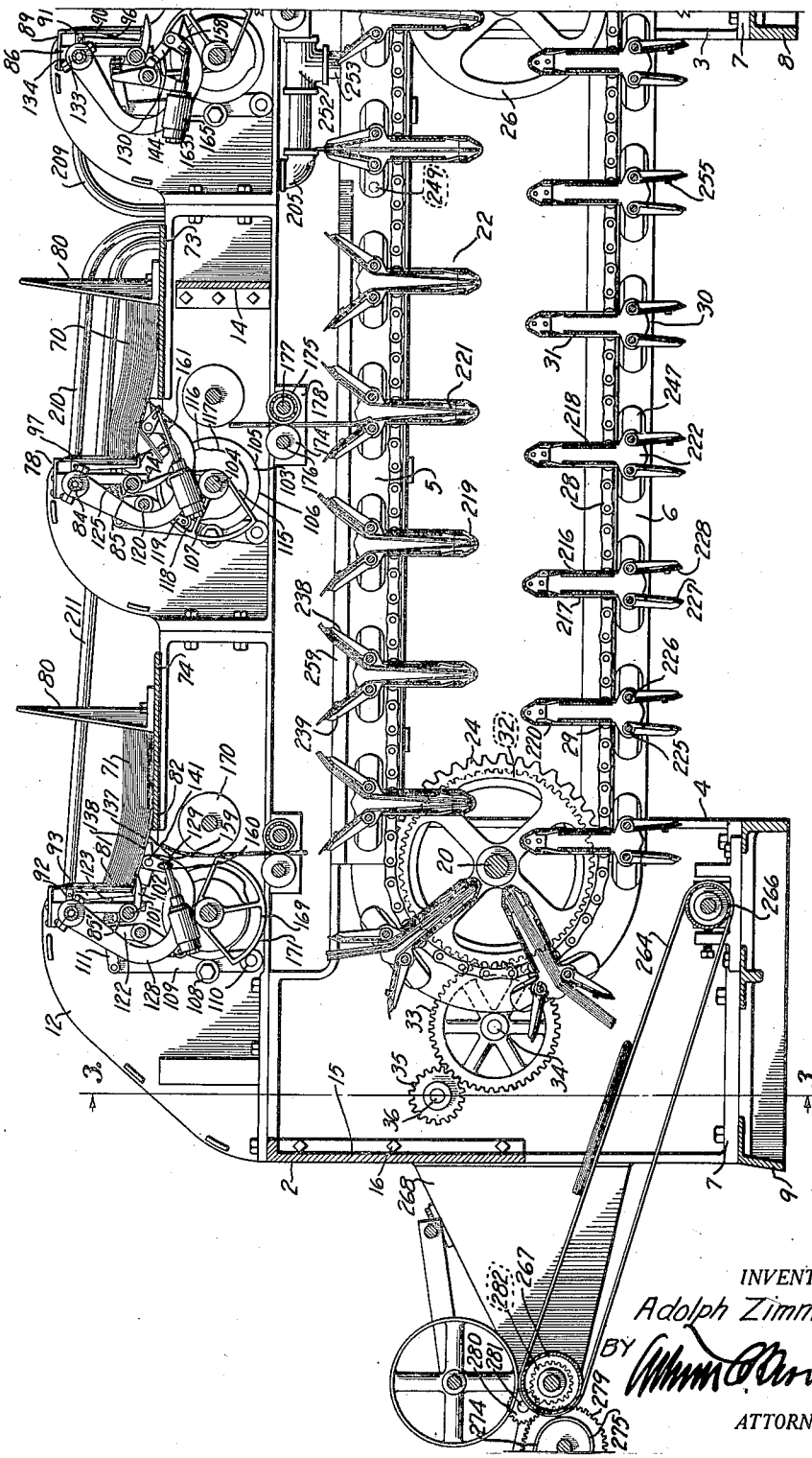


Fig. 2.

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Fig. 4.

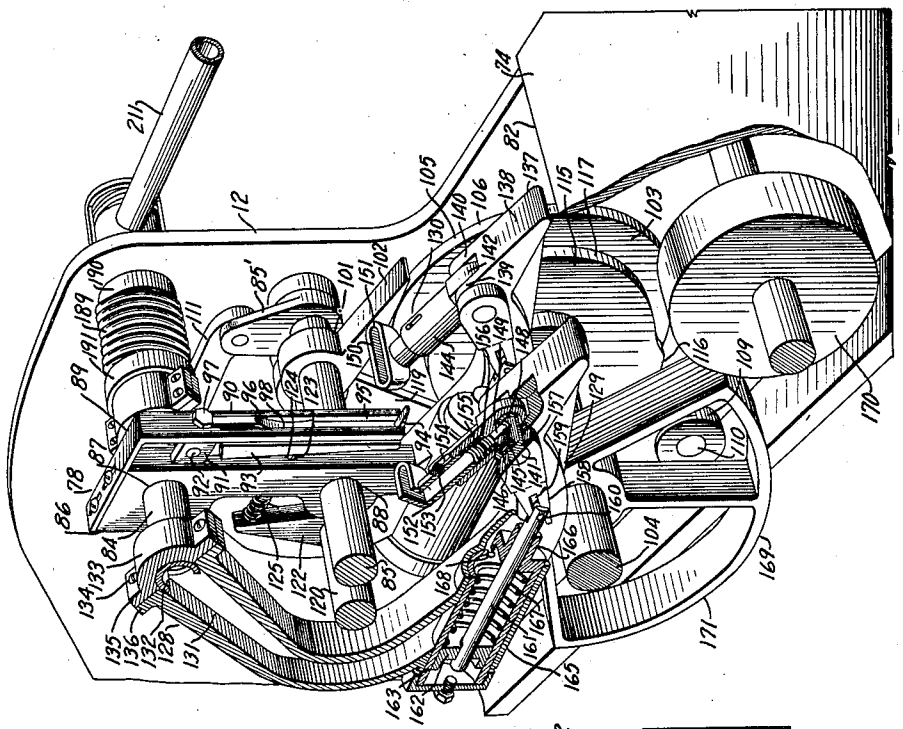
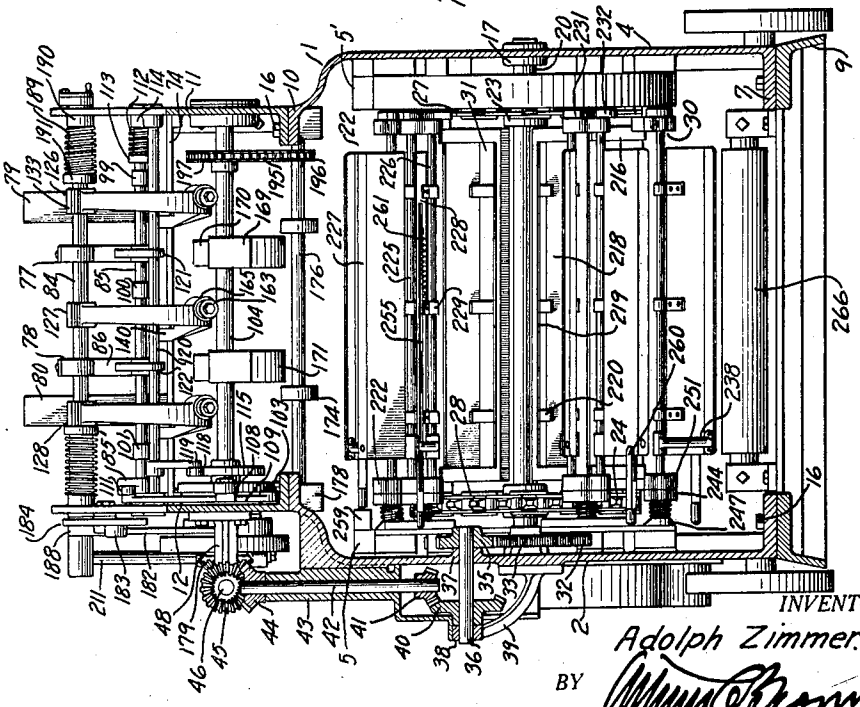


Fig. 3.



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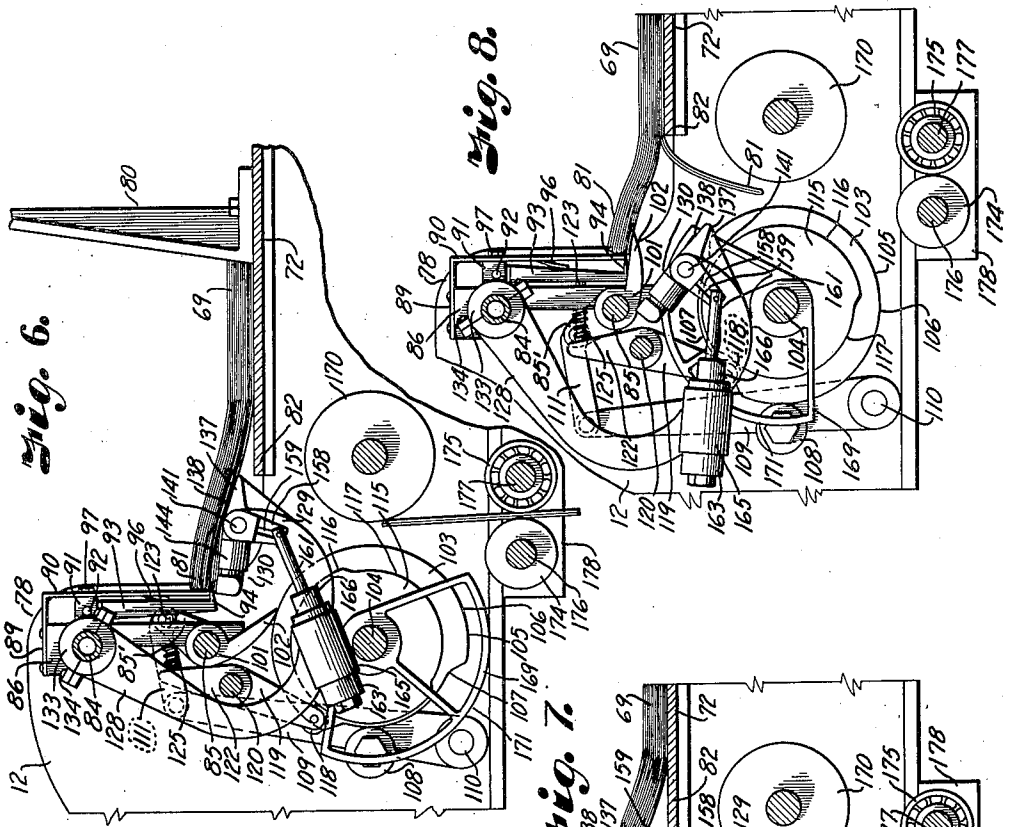


Fig. 6.

Fig. 8.

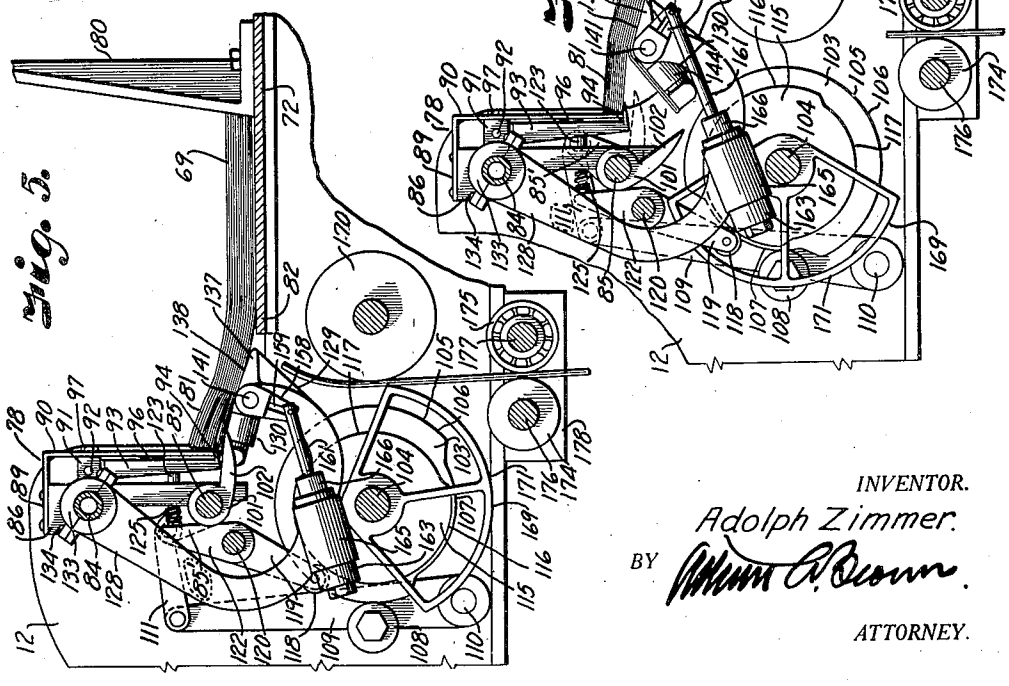


Fig. 5.

Fig. 7.

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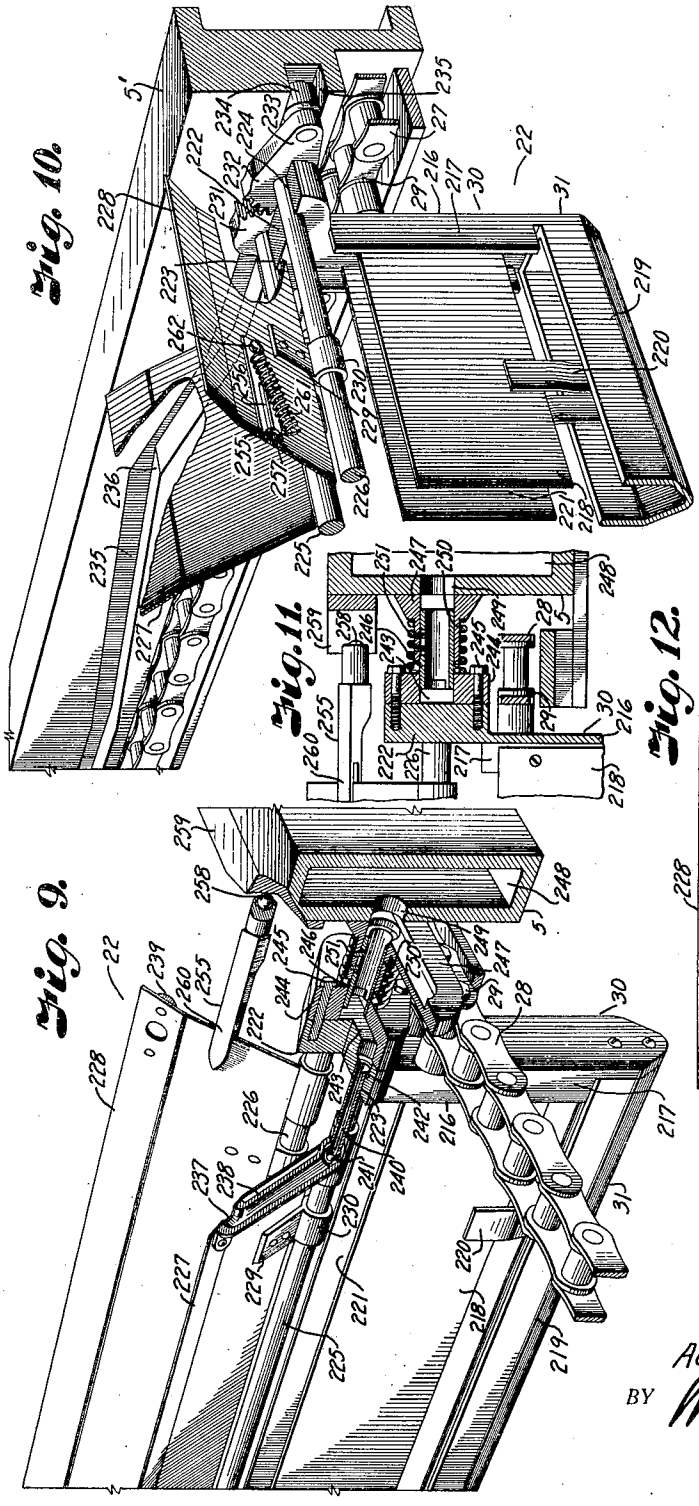


Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

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PAPER STUFFING MACHINE

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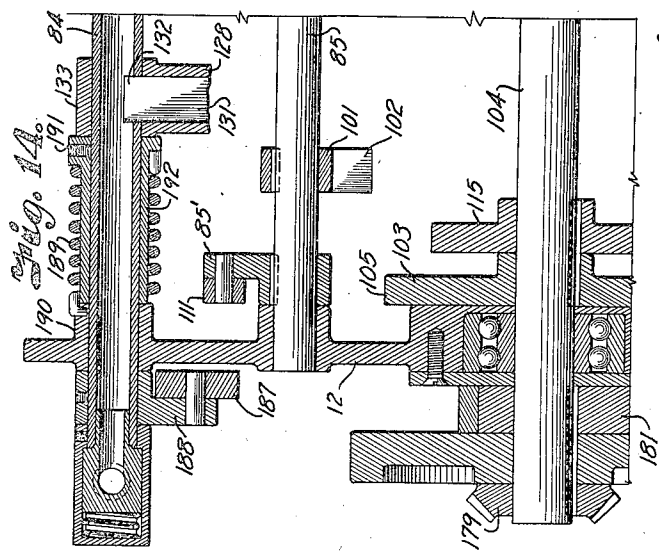


Fig. 14.

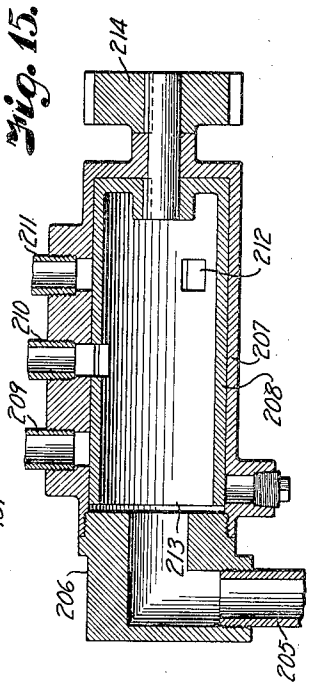


Fig. 15.

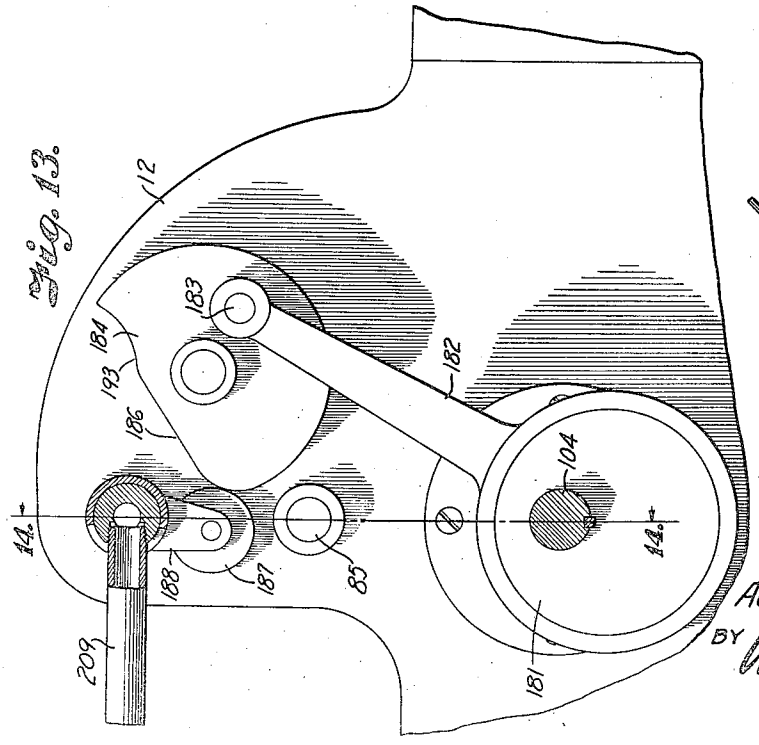


Fig. 13.

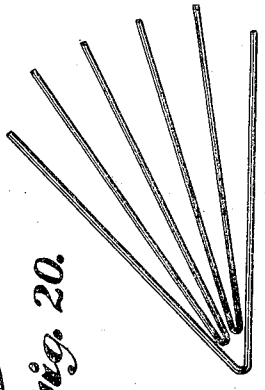


Fig. 20.

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Fig. 19.

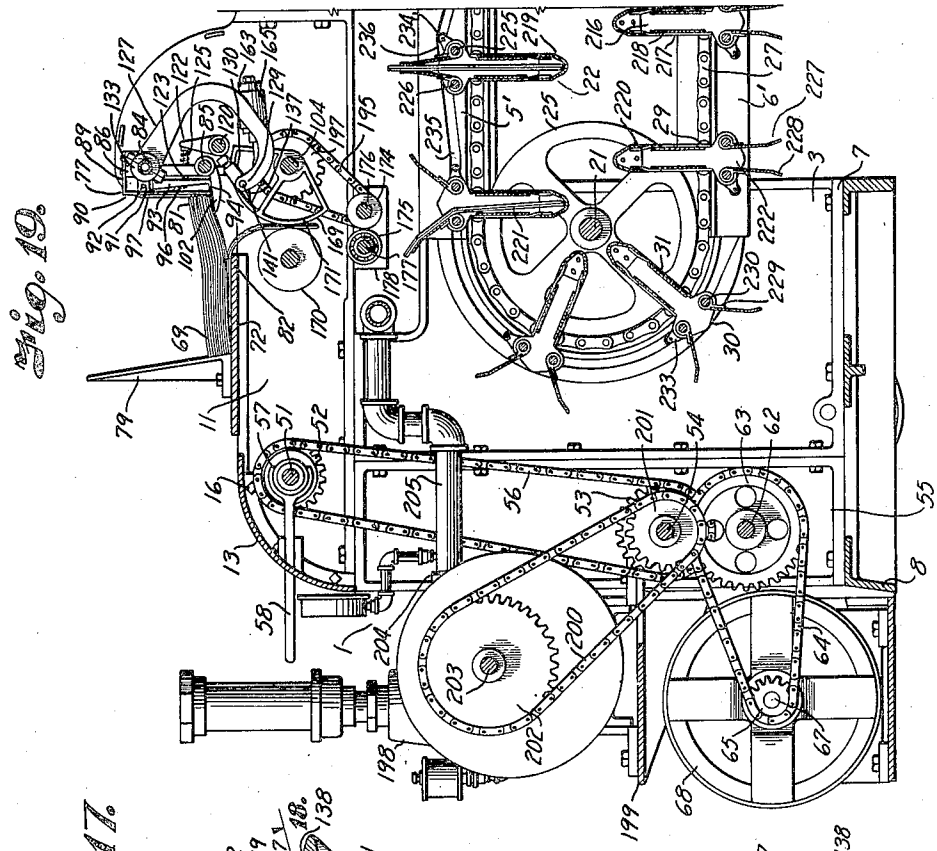


Fig. 17.

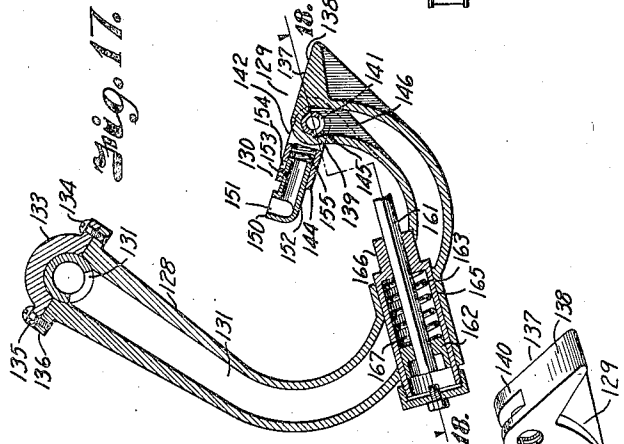


Fig. 18.

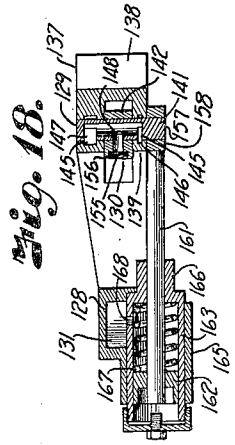
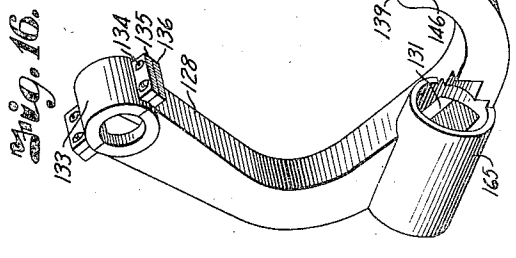


Fig. 16.



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Patented Mar. 13, 1934 1,951,300

UNITED STATES PATENT OFFICE

1,951,300

PAPER STUFFING MACHINE

Adolph Zimmer, Kansas City, Mo., assignor to The Ellsworth Machine Company, Kansas City, Mo., a corporation of Missouri

Application November 10, 1932, Serial No. 641,998

25 Claims. (Cl. 270—55)

This invention relates to paper stuffing machines and particularly to a machine of that character for assembling the folded sections of a newspaper, and has for its principal objects to provide a simple compact construction which is positive in operation and has a larger capacity than similar machines heretofore constructed.

In accomplishing these and other objects of the invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a paper stuffing machine constructed in accordance with my invention.

Fig. 2 is a vertical, longitudinal, sectional view through the machine.

Fig. 3 is a vertical, cross sectional view on the line 3—3, Fig. 2.

Fig. 4 is an enlarged detail perspective view partly in section of one of the withdrawing mechanisms for removing individual sections of the newspaper from a stack for discharge into the paper-carrying pocket members.

Fig. 5 is a side view of the mechanism illustrated in Fig. 4 showing the withdrawing nozzle in position for engaging the lowermost section in the stack and showing the separating and fold-supporting arms in functional position.

Fig. 6 is a similar view showing the supporting arm moved out of functional position for permitting the vacuum nozzle to carry the lowermost section downwardly into position to be engaged by the withdrawing disks.

Fig. 7 is a similar view showing the vacuum nozzle in the act of carrying the fold edge of the lowermost section in a stack into position ready to be engaged by the segment disk.

Fig. 8 is a similar view showing the fold of the section released by the vacuum nozzle and the vacuum nozzle in retracted position, the supporting arm having moved to position for retaining the remaining sections from drooping into the operating space of the vacuum nozzle and the separating arm moved out of contact with the stack.

Fig. 9 is an enlarged detail perspective view partly in section of one of the paper conveying members, particularly illustrating the vacuum nozzle mechanism for opening the folds of the outer or wrapper section of a newspaper.

Fig. 10 is a similar perspective view of the paper conveying member from the opposite side, particularly illustrating the cam track mechanism for actuating the paper opening wings which carry the vacuum nozzles.

Fig. 11 is a sectional view through a portion of one of the paper conveying members particularly illustrating the method of drawing a vacuum through the paper opening nozzles from the manifold extending longitudinally in the path of travel of the conveyor belts which support the paper conveying members.

Fig. 12 is a cross sectional view through the upper portion of the side frames showing the upper portion of the paper carrying members in elevation, particularly illustrating the wrapper flap-retaining means for holding the flaps in open position against the opening wings to receive the inner sections of the newspaper.

Fig. 13 is an enlarged side elevational view of the eccentric and cam mechanism for operating the withdrawal arms which carry the vacuum nozzles for effecting withdrawal of the fold portion of the lowermost section from the stack.

Fig. 14 is a detail sectional view on the line 14—14, Fig. 13.

Fig. 15 is a detail sectional view through the timing valve controlling opening and closing of the vaccum to the arms which carry the vacuum nozzles.

Fig. 16 is a perspective view of one of the withdrawal arms.

Fig. 17 is a sectional view through the arm, particularly illustrating the vacuum cylinder controlling movement of the vacuum nozzle.

Fig. 18 is a sectional view through the arm and vacuum nozzle on the line 18—18, Fig. 17.

Fig. 19 is a vertical sectional view through the rear end of the machine, particularly illustrating the driving mechanism and the vacuum pump for drawing a vacuum in the respective nozzles.

Fig. 20 is a perspective view of an assembled newspaper including an outer wrapping section and a plurality of inner sections supported between the fold of the wrapper section.

Referring more in detail to the drawings:—

1 and 2 designate respectively the right and left side frames of the machine, each including substantially rectangular-shaped end sections 3 and 4 connected by upper and lower side bars 5—5′ and 6—6′ extending longitudinally of the frame in spaced relation as best illustrated in Fig. 1. The end sections 3 and 4 are preferably provided with inwardly projecting base flanges 7 arranged for support on suitable rectangular-shaped base members 8 and 9.

Supported upon upwardly extending inset portions 10 of the end sections are spaced bed plates 11 and 12 connected at their rear ends by a curved plate 13 and at a point intermediate their length

by a vertically arranged cross plate 14 (Figs. 1 and 2). The end sections 4 are also interconnected by a vertically arranged plate 15 extending therebetween and connecting their front edges as illustrated in Fig. 2.

The various parts composing the frame-work of the machine as just described are secured together by suitable bolts or similar fastening devices 16 to provide a rigid structure.

Rotatably mounted in suitable bearings 17 in the side sections 4 and in adjustable bearings 18 slidably mounted in slotted openings 19 in the side sections 3 are spaced cross shafts 20 and 21 respectively for supporting a paper-carrying conveyor generally designated 22. The conveyor 22 includes spaced pairs of aligned sprockets 23—24 and 25—26 fixed to the shafts adjacent the inner face of the respective end sections of the side frames.

Operating over the aligned sprockets are endless chain belts 27 and 28 having their upper runs operating adjacent the lower side edge of the upper longitudinal bars 5 and 5' and their lower runs operating adjacent the lower bars 6—6' (Figs. 2 and 3). Fixed to selected links 29 of the respective chains at spaced points along their lengths are brackets 30 carrying paper-conveying pocket members 31 that extend between the chains and which are movable thereby to collect the component sections of a newspaper as later described.

In order to operate the conveyor, the shaft 18 is provided with a gear wheel 32 which is driven through an idler gear 33 meshing therewith and rotatably mounted on a spindle 34 projecting from the end section 4 of the side frame 2 (Fig. 2). The idler gear 33 is driven by a pinion 35 fixed on a counter shaft 36 having one end rotatably mounted in a bearing 37 provided in the end section 4 of the side frame 2 and its other end in an aligning bearing 38 carried by a bracket 39 supported from the outer face of the end section 4 as illustrated in Figs. 1 and 3.

Fixed on the shaft 36 is a bevel gear 40 meshing with a bevel pinion 41 carried on the lower end of a vertically arranged shaft 42, the shaft 42 being rotatably mounted in a vertical bearing 43 also fixed to the outer side face of the section 4 directly above the bracket 39. Fixed on the upper end of the shaft 42 is a bevel gear 44 meshing with a similar bevel gear 45 on a horizontally arranged line shaft 46. The shaft 46 extends longitudinally of the machine alongside the bed plate 12 and is rotatably supported at spaced intervals along its length by bearings 47 carried on brackets 48 fixed to the outer side of the bed plate. The shaft 46 carries a bevel gear 49 at its opposite end which meshes with a bevel gear 50 on a cross shaft 51 rotatably mounted in the bed plates 11 and 12.

The shaft 51 carries a sprocket 52 which is actuated from a sprocket 53 fixed to a counter shaft 54 rotatably mounted in extensions 55 of the end sections 3, the sprocket 52 being actuated by a chain 56 operating over the respective sprockets. The sprocket 52 is normally free on the shaft 51 but is adapted to be operably connected therewith by a suitable clutch mechanism indicated at 57 and which is operable by a shifting lever 58 projecting forwardly of the machine and operable through a slot 59 in the curved plate 13 previously described.

The shaft 54 projects through the extension 55 and carries a gear wheel 60 meshing with a pinion 61 on a lower counter shaft 62 also rotatably mounted in the end extensions 55. The shaft 62 carries a fixed sprocket 63 which is driven by a chain 64 operating thereover and over a sprocket 65 on the armature shaft 67 of a suitable motor 68.

The respective sections of the newspapers to be assembled are arranged in individual stacks as designated 69, 70, and 71 and which may include comic, news and society sections, respectively, that are to be assembled with the society and news sections received in the fold of the comic section. The stacks are carried in spaced relation between the bed plates 11 and 12 on horizontally arranged plates 72, 73 and 74 in position to be engaged by withdrawing mechanism for successively moving the sections in the respective stacks for delivery into the paper carrying pocket members of the conveyor as they pass below the respective stacks. Each stack of paper sections is supported between fixed guides 77 and 78 and movable guides 79 and 80 carried on the plates previously described so that the folded edges 81 thereof overlap the front edges 82 of the plates to provide room for engagement of the withdrawing mechanism therewith as now to be described. The withdrawing mechanism for each stack is identical to the other and, therefore, only one of them will be described in detail.

The bed plates 11—12 are preferably built in sections, each having an upwardly extending portion located at a point adjacent each stack to form a support for vertically spaced cross shafts 84 and 85 which carry the fixed guide members 77 and 78 previously mentioned. The guide members 77 and 78 include blocks 86 having spaced apertures 87 and 88 to receive the shafts 84 and 85, respectively. Fixed to the upper face of the blocks are bars 89 having downwardly extending ends 90 spaced from the blocks 77 to provide room therebetween for brackets 91 which are carried by the depending portions of the bars.

Pivoted to the brackets 91 on pins 92 are depending arms 93 having forwardly projecting wedge-shaped fingers 94 on their lower ends which are operable through slots 95 formed in the depending portions 90 of the bars to engage between the sections of the newspaper supported in the stack. The fingers 94 are normally retained in retracted position and from engagement with the stack by flat springs 96 having one end fixed to the bolt 97 which attaches the bracket members 91 and having depending curved ends 98 pressing against the face of the arms 93 to hold the fingers in retracted position.

Fixed on the lower shaft 85 are spaced arms 99, 100 and 101, each having forwardly projecting ends 102 arranged to normally engage and support the overhanging portion of the stack to prevent the sections from drooping over the front edge of the plates 72, 73 or 74.

The shaft 85 is rocked to swing the arms to and from supporting position by a cam disk 103 fixed to a rotatable shaft 104 mounted in the bed plates 11 and 12 at a point directly below the shafts 84 and 85. The cam disk 103 has a peripheral cam track 105 having a high lobe portion 106 and a low lobe portion 107 for engaging a roller 108 fixed to a rocker arm 109. The rocker arm 109 has its lower end pivotally supported on the stud 110 projecting from the bed plate and has its upper end terminating at a point above the shaft 85 to connect with a rocker arm 85' thereon by a link 111.

In order to retain the roller 109 in contact with the cam disk 103, I provide the shaft 85

with a coil spring 112 having one end engaging a collar 113 on the shaft and its opposite end engaging a boss 114 projecting from the inner face of the bed plate 12 as best illustrated in Fig. 3, the spring being so tensioned as to move the shaft in a clockwise direction (Fig. 4) so that when the roller 108 engages the high lobe portion of the cam disk the shaft 85 is rocked in an anti-clockwise direction against tension of the spring to bring the supporting finger into position for supporting the projecting edge of the stack, and when the low lobe portion of the cam disk engages the roller 108 the spring 112 will rotate the shaft in a clockwise direction to move the arms from engagement with the bottom of the stack. When this occurs, the fingers 94 are projected toward the stack to support it when the arms 102 are moved out of functional position.

In order to actuate the fingers 94, the shaft 104 is provided with a second cam disk 115 of slightly smaller diameter than the disk 103 and having a high lobe portion 116 and a low lobe portion 117 for engaging a roller 118 on a depending arm 119 of a rock shaft 120 rotatably mounted in the bed plates. The rock shaft carries upwardly extending arms 121 and 122 located in alignment with the guide members 77 and 78 for engaging pins 123 projecting rearwardly from the arms 93 and slidable through openings 124 formed in the blocks 86 at a point between the shaft 84 and 85. Sleeved on the pins and having one end engaging against the arms 121 and their opposite ends against the blocks 86 are springs 125 for retaining the roller 118 in engagement with its cam disk 115. It is thus apparent that when the roller engages the high portion of the cam the pins are moved forwardly through the blocks to move the fingers 94 into engagement with the lowermost section in the stack to support the free edge of the stack when the arms 102 are moved out of position as later described.

Fixed on the shaft 84 adjacent the guide members 77 and 78 are downwardly and forwardly curved arms 126, 127 and 128 terminating in upwardly extending ends 129 (Figs. 4, 16 and 17) to pivotally mount vacuum nozzles 130. The arms 126, 127 and 128 are hollow to provide the channels 131 having their upper ends communicating with openings 132 in the shaft 84, the shaft 84 being tubular to provide means through which a vacuum is drawn in the channels 131 of the arms to effect operation of the vacuum nozzles as later described.

The arms are clamped to the shaft 84 so that the openings 132 are in communication with the channels 131 by a clamping cap 133 extending over the shaft and fixed to the upper ends of the arms by screws 134 extending through ears 135 on the caps and through ears 136 in the upper ends of the arms as best illustrated in Fig. 17. The free ends 129 of the arms are provided with a forwardly extending stop member 137 having a flat upper face 138 to engage against the bottom of the stack. Projecting rearwardly from the stop member 137 are spaced ears 139 and 140 between which is pivoted the vacuum nozzles previously mentioned. The vacuum nozzles are mounted on a tubular pin 141 having closed ends and which extends through the ears 139 and 140 and through an ear 142 on a tubular support 144 for slidably carrying the vacuum nozzle.

The tubular pin 141 is provided with arcuate-shaped openings 145 communicating with the channel 130 through branches 146 and 147 that are provided in the ears 139 and 140 as best illustrated in Figs. 16 and 18. The tubular pin 141 is also provided with an opening 148 communicating with a channel 149 in the ear 142 of the tubular support 144.

The vacuum nozzle 130 is telescopingly mounted within the support 144 and includes a relatively flat head portion 150 having an upwardly opening mouth 151 adapted to engage the lowermost section in the stack when in the position illustrated in Fig. 5.

The head 150 carries a tubular neck 152 which is slidably retained in the sleeve support 144 by a pin 153 carried by the neck portion and operable in a slot 154 formed in the sleeve support 144. The nozzles are retained in extended position by coil springs 155 having one end engaging against the end of the neck and its opposite end against a seat 156 formed in the support 144. In order to actuate the nozzles on their pivotal supports the projecting ends 157 of the tubular pins 141 are provided with lever arms 158 (Figs. 4 and 18).

The arms 158 have slotted ends 159 to engage pins 160 carried in the slotted ends of actuated rods 161 so that the arms may move in an arc as the rods reciprocate in a straight line. The actuating rods 161 are operable under influence of the vacuum created in the arms by means of pistons 162 fixed to the inner ends of the actuating rods, the pistons being slidably mounted in cylinders 163 pressed into tubular bosses 165 formed on the arm intermediate its ends. The piston rods are slidable through bearings 166 in the forward ends of the cylinders and are retained in retracted position by springs 167 having one end bearing against the piston and their opposite ends against the forward ends of the cylinders. The cylinders are open to communication with the vacuum channels 131 in the arms through port 168.

It is thus apparent that when a vacuum is created in the arms a vacuum is drawn in the cylinders through the ports 168 to move the pistons against tension of the springs 167 to rock the arms 158 in an anti-clockwise direction (Fig. 4) for moving the nozzles away from the stack to carry the lowermost section therewith since the vacuum is simultaneously drawn through the nozzles. The movement of the nozzles in a downward direction responsive to movement of the pistons 162 carries the folded edge of the lowermost section in the stack into position to be engaged between pairs of withdrawing disks 169 and 170, the remainder of the stack being supported by the fingers 94 and the stop members 137, while the arms 99, 100 and 101 are being returned to stack-supporting position. The members 169 are preferably segmental in order to allow the edge of the sheet to drop into position to be engaged by the arcuate portion 171 of the disks which, cooperating with the full circular disks 170, feed it downwardly for withdrawal from the stack. The disks 170 are mounted on a shaft 172 extending across the bed plates in spaced relation with the shaft 104 carrying the segmental disks.

Positioned below the withdrawing disks are pairs of rollers 174 and 175 rotatably mounted on shafts 176 and 177 carried in bearings 178 projecting from the lower edges of the bed plates as best illustrated in Fig. 7 to continue feed of the sections downwardly into the paper conveying pocket members.

In order to actuate the shafts 84 and 104, the shaft 104 is provided exteriorly of the bed plate

with a bevel gear 179 meshing with a bevel gear 180 on the shaft 46 previously described. Fixed on the shaft 104 adjacent the gear 179 is an eccentric disk 181 for operating a pitman 182 having its upper end connected to a wrist pin 183 on an oscillating cam 184. The cam 184 has a cam track 186 for engaging a roller 187 on an arm 188 fixed to a projecting end of the shaft 84 to effect operation of the nozzle carrying arms 126, 127 and 128, the roller being retained against the cam by coil springs 189 sleeved on the shaft 84 and having one end engaged in a boss 190 on the bed plate and its opposite end fixed to a collar 191 carried by a sleeve 192 also sleeved on the shaft.

It is thus apparent that when the roller 187 engages the low lobe portion 193 of the cam disk 184, the shaft 84 is moved in a clockwise direction (Fig. 5) by the spring 189 to move the nozzles out of engagement with the stack.

The shaft 176 for the roller 174 is driven from the cam shaft 104 by a chain 195 running over sprockets 196 and 197 on the respective shafts (see Fig. 19).

In order to create a vacuum in the respective nozzles, I provide a vacuum pump 198 carried on a shelf 199 fixed to the extensions 55 of the end sections 3 as best illustrated in Fig. 1, the vacuum pump being driven from the shaft 54 by a chain 200 operating over a sprocket 201 on the shaft 54 and over a sprocket 202 fixed to the pump shaft 203. The inlet 204 of the pump is connected by a pipe 205 with a rotary control valve 206 (Figs. 1 and 14). The control valve includes a cylindrical housing 207 having a hollow sleeve valve 208 rotatably mounted in the housing to establish communication with branch pipes 209, 210 and 211 connected with the tubular shafts 84 of the respective heads, the sleeved valve being provided at suitable intervals around its periphery with ports 212 to establish communication with the pipe 205 leading from the pump and communicating through an open end 213 of the rotary valve.

The valve 208 is actuated by a pinion 214 meshing with a drive pinion 215 fixed on the shaft 46 (Fig. 1). It is thus apparent that the vacuum to the nozzles of the respective heads is controlled in timed relation so that the sections are delivered to the paper-carrying pockets at the proper time.

The brackets 30 include depending channel-shaped end members 216 having their flanges 217 connected by spaced plates 218 extending between aligning brackets on the respective chains. Fixed to the lower ends of the channel members 216 are trough-shaped bottoms 219 connected to the plates 218 by straps 220 at points intermediate their length to form a pocket 221 into which the paper sections are delivered from the stacks supported on the plates 72, 73 and 74. The brackets 30 carry heads 222 provided with spaced bearing openings 223 and 224 in which are rotatably mounted spaced shafts 225 and 226 having their axes located substantially in the plane of the plates 218.

Hinged to the shafts 225 and 226 are upwardly extending wings 227 and 228 forming upward extensions of the pockets 221, the wings being provided with ears 229 having sleeves 230 which are fixed on the shafts 225 and 226 as best illustrated in Fig. 10. The shafts are actuated to move the wings 227 and 228 toward and away from each other by intermeshing gear segments 231 and 232 fixed to the ends of the shaft adjacent the side rail 5'. Each gear segment 232 is provided with an arm 233 having a roller 234 operating in a cam groove 235 formed in the inner face of the rail 5' and which is provided with a high cam portion 236 between the positions of the first and second stacks over which the roller 234 moves to effect operation of the gear segments and movement of the wings 227 and 228 to close on the paper section delivered into the pocket as later described.

The wings 227 and 228 are provided with openings 237 adjacent the upper corners thereof as best illustrated in Fig. 9, and secured to the wings in alignment with the openings are vacuum nozzle arms 238 and 239 fixed to the ends of the shafts 225 and 226 at the ends opposite to the gear segments previously described. The ends of the shafts carrying the vacuum nozzles are counterbored as at 240 and the counterbores communicate with the interior of the nozzles through ports 241. The open ends 242 of the counterbores communicate with channels 243 provided in plates 244 fixed to the heads 222 by bolts 245.

The plates 244 are provided with bushings 246 extending therefrom at a point above the chains to carry vacuum shoes 247. The vacuum shoes 247 slide along the side face of the rail 5 at the right hand side of the machine (Fig. 1) and communicate with an interior channel 248 formed therein, through a port 249, located directly below the first stack of sections. In order to retain the shoes in close sliding engagement with the rail 5, the shoes are provided with tubular collars 250 telescoped over the outer ends of the bushings 246, and sleeved thereover are coil springs 251 having one end engaging the plates 244 and their opposite ends engaging against the shoes (Fig. 9). The interior channel 248 of the rail is in communication with the vacuum line 205 through a T-fitting 252 having a nipple 253 threaded into an opening 254 formed in the rail.

In order to retain the flap of the first section deposited in the pockets against the wings 228 after they have been separated by the vacuum nozzles, the wings are provided with slide bars 255 having slots 256 through which headed pins 257 project to retain the slide bars on the wings as best illustrated in Fig. 12. The outer ends of the slide bars are provided with a ball bearing 258 which engages a cam track 259 formed on the inner face of the rail 5 directly above the shoes to effect movement of the slide bar on the wings as the conveyor moves the carriers along underneath the stacks of paper sections. The ends of the slide bars are provided with hook-shaped members 260 arranged to extend over the flaps of the paper sections to retain them against the side wings.

In order to retain the slide bars in engagement with the cam track, I provide springs 261 having one end fixed to pins 262 carried on the inner ends of the slide bars and their opposite ends fixed to pins 263 carried by the ear 229 (Fig. 12).

In operating a machine constructed and assembled as described, stacks of the respective sections of a newspaper are placed in their respective heads where they are supported on the plates 72, 73 and 74, as, for example, a stack of the comic sections is placed on the plate 72, the news section on the plate 73, and the society section on the plate 74.

The vacuum nozzles 130, the arms 99, 100 and 101, and fingers 94 are adjusted to engage the overlapping portions of the bottom paper sections in the respective stacks. The other adjustments, including moving of the guides 79 and 80 into engagement with the sides of the stack, are made and the machine is started to operate the conveyor and the withdrawing mechanisms of the respective heads to successively remove the lowermost sections in the stack and to deposit them into the pockets of the carriers as they pass along their path of travel below the stacks. For example, folded edge portions of the comic sections in the stack 69 are normally supported on the arms 99, 100 and 101, and the finger 94 is in retracted position. The eccentric 181, through the cam 184, effects rocking movement of the vacuum nozzles for that stack into engagement with the lowermost comic section, as illustrated in Fig. 5. The vacuum control valve is then in position to effect a vacuum through the nozzles to engage the lowermost section in the stack. At this time the cam 103 moves into position for actuating the lever arm 109 to rock the arms 99, 100 and 101 out of supporting position relatively to the stack. The fingers 94 then move into position for supporting the remaining sections as illustrated in Fig. 6.

When the vacuum is drawn in the arms 128, the pistons 162 are actuated against tension of the springs 167 to swing the vacuum nozzles 130 downwardly into the position as shown in Fig. 7, drawing the fold of the lowermost section in the stack into position to be engaged by the segmental roller 169. The vacuum control valve then shuts off the vacuum to release the folded section of the paper which droops between the roller segments and the rollers 170. At this point the cams 115 and 103 move into position to allow the arms 99, 100 and 101 to re-engage the bottom of the stack and the fingers 94 to be disengaged from the stack, after which the arms 126, 127 and 128 are returned to their retractive position. The arcuate portions of the segmental disks then move into engagement with the fold to move the section downwardly through the rollers 174 and 175 to withdraw the section from the stack.

Rotation of the rollers 174 and 175 feeds the withdrawn section into one of the pockets of the conveyor which has moved into position under the stack. The roller for that pocket is then operating in the low portion of the cam track 235 and the wings are in open position to receive the section. As the pocket carrying the section continues along the rails, the roller engages the high portion 236 of the track 235 to swing the wings inwardly to engage the opposite sides of the section. At this point the shoe on that pocket registers with the opening 249 and the vacuum is drawn through the nozzles 238 and 239 to draw the flaps of the section against the wings.

As soon as the roller 234 moves off the high portion of the cam track, the wings swing to open position, opening the flaps of the section. At this time the slide bar 255 for that pocket engages the high portion of the cam track 259 to move the holding finger 260 over the opened flap of the section resting against the wing 228 to retain the sections open after the vacuum to the nozzles 238 and 239 is broken. As the pocket carrying the opened section passes under the remaining heads, the news section and the society section are deposited within the open flaps of the first section.

As the pockets carrying the assembled sections move through the arc formed by the sprockets 24 of the conveyor, the sections drop by gravity onto a delivery belt 264 and onto a stack table 265 (Fig. 1). The belt 264 preferably operates at a faster speed than the speed of the assembling conveyor to space the deposited sections on the belt 264. The belt 264 operates on rollers 266 and 267 rotatably mounted on the base 9 and in brackets 268 projecting from the end of the machine.

The roller 267 is driven from the shaft 36 by a counter shaft 269 which is rotatably mounted on one of the extensions 268 in bearings 270. The counter shaft 269 is provided with bevel gears 271 and 272 meshing with the bevel gear 40 on the shaft 36 and with a gear 273 on the shaft of the roller 267, respectively.

The stacking table includes spaced belts 274 operating over rollers 275 and 276 carried on a frame 277 (Fig. 1) to move the assembled sections against stop bars 278 where the assembled sections are stacked for removal from the machine, the rollers 275 being driven by a gear 279 meshing with an idler gear 280 on a stub shaft 281, and the idler gear being driven from the shaft of the roller 267 by a gear 282.

What I claim and desire to secure by Letters Patent is:

1. In a machine of the character described, means arranged to support a plurality of stacks of folded sections in consecutive order, a pocket member positioned transversely to the order of the stacks, means for bodily moving the pocket member under the stacks in successive order, and means associated with said supporting means for removing and depositing the lowermost section of each stack into the pocket member at the time the pocket member passes under the respective stacks.

2. In a machine of the character described, means arranged to support a plurality of stacks of folded sections in consecutive order, a pocket member positioned transversely to the order of the stacks, means for bodily moving the pocket member under the stacks in successive order, and vacuum means associated with said supporting means for removing and depositing the lowermost section of each stack into the pocket member at the time the pocket member passes under the respective stacks.

3. In a machine of the character described, means arranged to support a plurality of stacks of folded sections in consecutive order, a pocket member positioned transversely to the order of the stacks, means for bodily moving the pocket member under the stacks in successive order, means associated with said supporting means for removing and depositing the lowermost section of each stack into the pocket member at the time the pocket member passes under the respective stacks, and means on the pocket member and movable therewith for opening the first section deposited therein whereby the other sections are deposited and nested within the opened section.

4. In a machine of the character described, means arranged to support a plurality of stacks of folded sections in consecutive order, a pocket member positioned transversely to the order of the stacks, means for bodily moving the pocket member under the stacks in successive order, vacuum operated means associated with said supporting means for initially removing the lowermost section of each stack, rotary means associated with said vacuum operated means for completing withdrawal of said sections to deliver them into the pocket member at the time the pocket member passes under the respective stacks, and

means on the pocket member for opening the first section deposited therein whereby the other sections are deposited and nested within the opened section.

5. In a machine of the character described, means arranged to support a plurality of stacks of folded sections, a pocket member, a pair of carrier members for supporting the pocket member, an actuator for the carrier members to effect bodily movement of the pocket member under the stacks in successive order, means associated with said stack supporting means for removing and depositing the lowermost section of each stack into the pocket member at the time the pocket member passes under the respective stacks, vacuum actuated means on the pocket member for opening the first section deposited therein whereby the other sections are deposited and nested within the opened section, and means positioned in the path of said carrier members to render said vacuum actuated means effective.

6. In a machine of the character described, means arranged to support a plurality of stacks of folded sections, a pocket member, means supporting the pocket member for bodily movement under the stacks in successive order, means associated with said stack supporting means for removing and depositing the lowermost section of each stack into the pocket member at the time the pocket member passes under the respective stacks, vacuum actuated means on the pocket member arranged to open the first section deposited therein, and a latch member carried by the pocket member to retain the section opened.

7. In a machine of the character described, means arranged to support a plurality of stacks of folded sections in consecutive order, a pocket member, a pair of carriers supporting the pocket member, an actuator for the carriers to effect bodily movement of the pocket member under the stacks in successive order, means associated with said supporting means for removing and depositing the lowermost section of each stack into the pocket member at the time the pocket member passes under the respective stacks, means on the pocket member arranged to open the first section deposited therein, and a latch member on the pocket member to retain the section opened.

8. In a machine of the character described, means arranged to support a plurality of stacks of folded sections in consecutive order, a pocket member, a pair of carriers supporting the pocket member transversely to the order of the stacks, an actuator for the carriers to bodily move the pocket member under the stacks in successive order, means associated with said supporting means for removing and depositing the lowermost section of each stack into the pocket member at the time the pocket member passes under the respective stacks, vacuum actuated means on the pocket member for opening the first section deposited therein whereby the other sections are deposited and nested within the opened section, means cooperating with the pocket member for removing the nested sections therefrom, and means cooperating with said removing means to stack the sections.

9. In a machine of the character described, means arranged to support a plurality of stacks of folded sections, means associated with the supporting means and arranged to effect removal of the lowermost sections in the respective stacks, a conveyor movable under the stacks, a pocket member carried by the conveyor, pivoted wings carried at the upper edges of the pocket member, means on the supporting means to effect opening of the wings as the pocket member passes under the first stack to receive the folded section removed therefrom, vacuum nozzles carried by the wings, means on the supporting means to effect closing of the wings on the section to render the vacuum nozzles effective to engage the flaps of the folded section, a second means on the supporting means to effect opening of the wings to open the flaps of the section to receive the sections removed from the succeeding stacks whereby said sections are nested within the opened section, and means on the wings to retain the flaps open.

10. In a machine of the character described, means arranged to support a plurality of stacks of folded sections, means associated with the supporting means and arranged to effect removal of the lowermost sections in the respective stacks, a conveyor movable under the stacks, a pocket member carried by the conveyor and movable under the stacks in successive order, wings movably mounted on the upper edges of the pocket member, a cam track on the supporting means and means on the wings and engageable with the cam track to effect opening of the flaps of the section delivered from the first stack whereby the sections removed from the remaining stacks are deposited within the opened section.

11. In a machine of the character described, means arranged to support a plurality of stacks of folded sections, means associated with the supporting means and arranged to effect removal of the lowermost sections in the respective stacks, a conveyor movable under the stacks, a pocket member carried by the conveyor and movable under the stacks in successive order, wings movably mounted on the upper edges of the pocket member, a cam track on the supporting means, means on the wings engaging the cam track for moving the wings, means on the wings for engaging the flaps of the section delivered from the first stack for opening the flaps in the pocket member whereby the sections removed from the remaining stacks are deposited within the opened section, and means on the wings to retain the flaps open.

12. In a machine of the character described, a frame, means on the frame arranged to support a plurality of stacks of folded sections, an arm located adjacent each stack, means for moving the arms to and from the stacks, means carried by the arms for engaging the stacks to effect initial movement of the lowermost sections from the respective stacks, means on the frame for completing the removal, a conveyor movable under the stacks, a pocket member carried by the conveyor and movable under the stacks in successive order, wings carried on the upper edges of the pocket member, and means on the wings to effect opening of the flaps of the section delivered from the first stack whereby the sections removed from the remaining stacks are deposited within the opened section.

13. In a machine of the character described, a frame, means on the frame arranged to support a plurality of stacks of folded sections in consecutive order, means on the frame below the stacks arranged to alternately engage and support the folded portions of the sections, a pocket member positioned transversely to the order of the stacks, means for bodily moving the pocket member under the stacks in successive order, vacuum operated means on the frame for engaging and removing the lowermost section of each stack, means for actuating said vacuum means in synchronism

with said fold engaging means, and rollers on the frame for depositing the removed sections into the pocket member at the time the pocket member passes under the respective stacks.

14. In a machine of the character described, means arranged to support a stack of folded sections, a carrier movable under the stack, means associated with said supporting means for bending the folded edge of the lowermost section of the stack downwardly, a rotary segmental disk arranged to engage said folded edge, a rotary disk member cooperating with the segmental disk to withdraw said section from the stack, and means associated with said disks for depositing the section in the carrier.

15. In a machine of the character described, means arranged to support a stack of folded sections, a carrier movable under the stack, vacuum operated means associated with said supporting means for bending the folded edge of the lowermost section of the stack downwardly, a rotary segmental disk arranged to engage said folded edge, a rotary disk member cooperating with the segmental disk to withdraw said section from the stack, and means associated with said disks for depositing the section in the carrier.

16. In a machine of the character described, means for supporting a stack of folded sections, an arm movable to and from the bottom of the stack, means for actuating the arm, a vacuum nozzle pivoted on the arm to engage the lowermost section in the stack adjacent its folded edge, vacuum actuated means carried on the arm for moving the vacuum nozzle to carry said folded edge downwardly, and means supported below the stack for engaging said folded edge to effect withdrawal of the section from the stack.

17. In a machine of the character described, a support for mounting a plurality of stacks of folded sections in consecutive order with the folds thereof positioned transversely to the order of the stacks, means carried by the support for removing the lowermost sections from the stacks, pairs of sprockets rotatably mounted at the ends of the support, a pair of conveyor chains running over aligned sprockets of the pairs and having their upper runs extending below the stacks at opposite sides thereof, and a pocket member having its ends fixed to said chains and movable under the respective stacks in parallel relation to the folds to collect the sections removed therefrom.

18. In a machine of the character described, a support for mounting a plurality of stacks of folded sections in consecutive order with the folds thereof positioned transversely to the order of the stacks, means carried by the support for removing the lowermost sections from the stacks, pairs of sprockets rotatably mounted at the ends of the support, a pair of conveyor chains running over aligned sprockets of the pairs and having their upper runs extending below the stacks at opposite sides thereof, a pocket member having its ends fixed to said chains and movable under the respective stacks in parallel relation to the folds to collect the sections removed therefrom, means carried by the pocket member to effect opening of the first section deposited therein, and means on the support for rendering said opening means effective.

19. In a machine of the character described, a support for mounting a plurality of stacks of folded sections in consecutive order with the folds thereof positioned transversely to the order of the stacks, means carried by the support for removing the lowermost sections from the stacks, a pair of conveyor chains running over aligned sprockets of the pairs and having their upper runs extending below the stacks at opposite sides thereof, a pocket member having its ends fixed to said chains and movable under the respective stacks in parallel relation to the folds to collect the sections removed therefrom, vacuum nozzles carried by the pocket member for opening the first section deposited therein whereby the other sections are deposited in the opened section, means carried by the support for rendering said nozzles effective, and a second means carried by the pocket member for retaining the section open when the vacuum nozzles are not effective.

20. In a machine of the character described, a support for mounting a plurality of stacks of folded sections in consecutive order with the folds thereof positioned transversely to the order of the stacks, means carried by the support for removing the lowermost sections from the stacks, pairs of sprockets rotatably mounted at the ends of the support, a pair of conveyor chains running over aligned sprockets of the pairs and having their upper runs extending below the stacks at opposite sides thereof, a pocket member having its ends fixed to said chains and movable under the respective stacks in parallel relation to the folds to collect the sections removed therefrom, wings hinged on the upper edges of the pocket member for movement to and from each other, means on the support between the first two of said stacks to close the wings on the section removed from the first stack, means on the wings for engaging flaps of said section, and means on the support for opening said wings to open the flaps of the section whereby the remaining sections removed from the other stacks are deposited in the opened section.

21. In a machine of the character described, a support for mounting a plurality of stacks of folded sections in consecutive order with the folds thereof positioned transversely to the order of the stacks, means carried by the support for removing the lowermost sections from the stacks, pairs of sprockets rotatably mounted at the ends of the support, a pair of conveyor chains running over aligned sprockets of the pairs and having their upper runs extending below the stacks at opposite sides thereof, a pocket member having its ends fixed to said chains and movable under the respective stacks in parallel relation to the folds to collect the sections removed therefrom, wings hinged on upper edges of the pocket member in the direction of said folds, gear segments interconnecting said wings for simultaneous movement to and from each other, a lever arm on one of the gear segments, a cam track on the frame engaging the lever arm to effect movement of the wings toward each other to close on the first section deposited in the pocket member and to open the wings, and means carried by the wings to engage flaps of the section to effect opening thereof whereby the remaining sections removed from the other stacks are deposited in the opened section.

22. In a machine of the character described, a support for mounting a plurality of stacks of folded sections in consecutive order with the folds thereof positioned transversely to the order of the stacks, means carried by the support for removing the lowermost sections from the stacks, pairs of sprockets rotatably mounted at the ends of the support, a pair of conveyor chains running over aligned sprockets of the pairs and having their upper runs extending below the stacks at

opposite sides thereof, a pocket member having its ends fixed to said chains and movable under the respective stacks in parallel relation to the folds to collect the sections removed therefrom, wings hinged on upper edges of the pocket member in the direction of said folds, gear segments interconnecting said wings for simultaneous movement to and from each other, a lever arm on one of the segments, a cam track on the support engaging the lever arm to move the wings toward each other to close on the first section deposited in the pocket member and to open the wings, a vacuum manifold carried by the support and having a port adjacent the point of closing of the wings, a vacuum shoe carried by the pocket member having a channel movable over said port, vacuum nozzles carried by the wings, and means connecting the nozzles with the port in the vacuum shoe to draw a vacuum in the nozzles when the wings engage the flaps of the section to effect opening of the flaps upon opening of the wings whereby the remaining sections removed from the stacks are deposited in the first section.

23. In a machine of the character described, a support for mounting a plurality of stacks of folded sections in consecutive order with the folds thereof positioned transversely to the order of the stacks, means carried by the support for removing the lowermost sections from the stacks, pairs of sprockets rotatably mounted at the ends of the support, a pair of conveyor chains running over aligned sprockets of the pairs and having their upper runs extending below the stacks at opposite sides thereof, a pocket member having its ends fixed to said chains and movable under the respective stacks in parallel relation to the folds to collect the sections removed therefrom, wings hinged on upper edges of the pocket member in the direction of said folds, gear segments interconnecting said wings for simultaneous movement to and from each other, a lever arm on one of the segments, a cam track on the support engaging the lever arm to move the wings toward each other to close on the first section deposited in the pocket member and to open the wings, a vacuum manifold carried by the support and having a port adjacent the point of closing of the wings, a vacuum shoe carried by the pocket member having a channel movable over said port, vacuum nozzles carried by the wings, means connecting the nozzles with the port in the vacuum shoe to draw a vacuum in the nozzles when the wings engage the flaps of the section to effect opening of the flaps upon opening of the wings whereby the remaining sections removed from the stacks are deposited in the first section, a finger member on one of the wings for retaining the section open when the vacuum shoe passes said port, and means on the support for actuating the finger.

24. In a machine of the character described, a support for mounting a plurality of stacks of folded sections in consecutive order with the folds thereof positioned transversely to the order of the stacks, means carried by the support for removing the lowermost sections from the stacks, pairs of sprockets rotatably mounted at the ends of the support, a pair of conveyor chains running over aligned sprockets of the pairs and having their upper runs extending below the stacks at opposite sides thereof, a pocket member having its ends fixed to said chains and movable under the respective stacks in parallel relation to the folds to collect the sections removed therefrom, vacuum nozzles carried by the pocket member for opening the first section deposited therein whereby the other sections are deposited in the opened section, and means carried by the support for rendering said nozzles effective.

25. In a machine of the character described, a support for mounting a plurality of stacks of folded sections in consecutive order with the folds thereof positioned transversely to the order of the stacks, means carried by the support for removing the lowermost sections from the stacks, a pair of conveyor chains running over aligned sprockets of the pairs and having their upper runs extending below the stacks at opposite sides thereof, a pocket member having its ends fixed to said chains and movable under the respective stacks in parallel relation to the folds to collect the sections removed therefrom, vacuum nozzles carried by the pocket member for opening the first section deposited therein whereby the other sections are deposited in the opened section, means carried by the support for rendering said nozzles effective, a second means carried by the pocket member for retaining the section open when the vacuum nozzles are not effective, and a conveyor member at the end of the support to receive the sections as the pocket member moves about the sprockets at that end of the support.

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