Dec. 18, 1923. 1,478,056

J. PETERSON ET AL

PACKAGING MECHANISM

Filed March 14, 1921 7 Sheets-Sheet 1

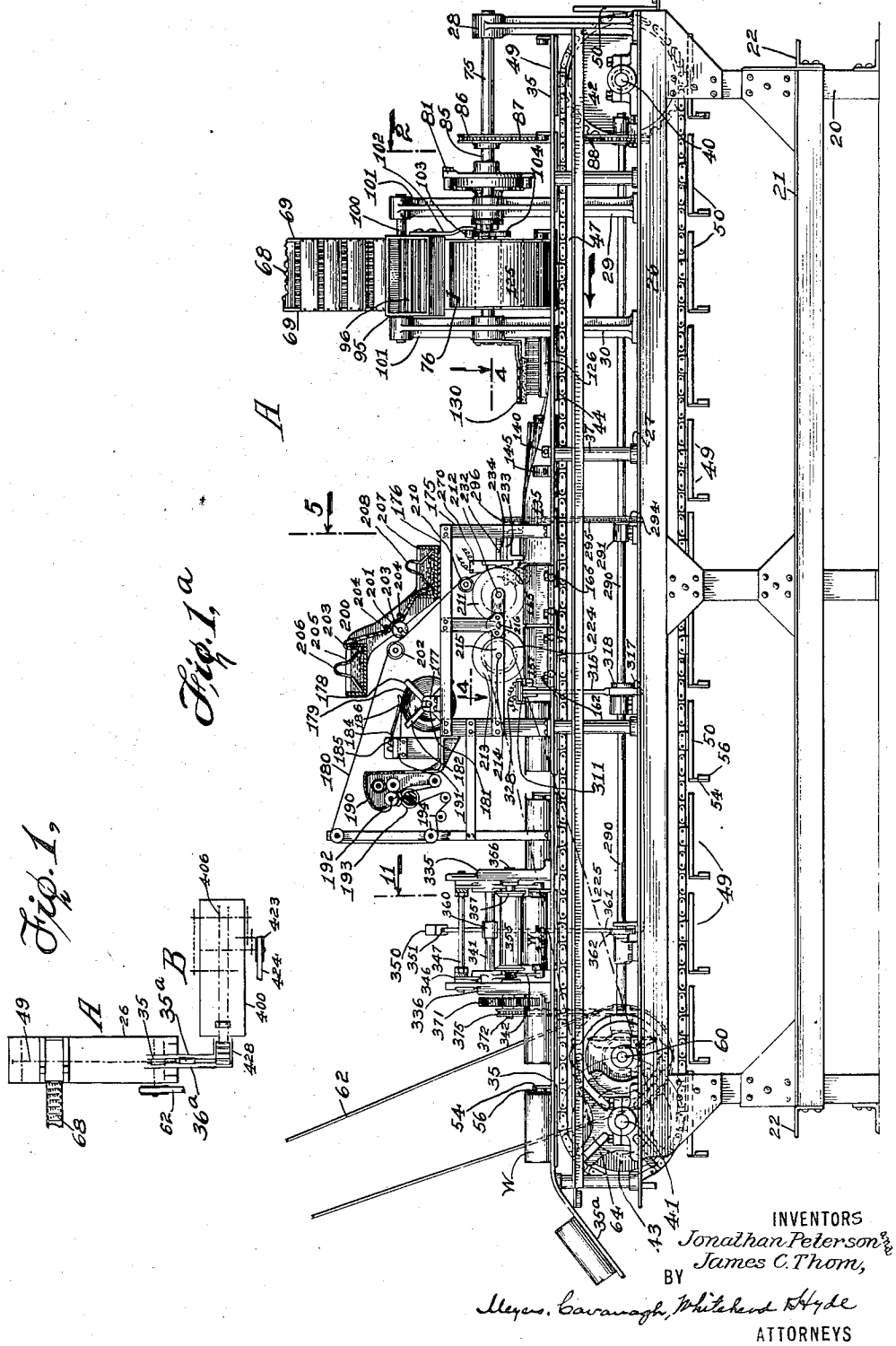


Fig. 1.

Fig. 1a

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Fig. 2

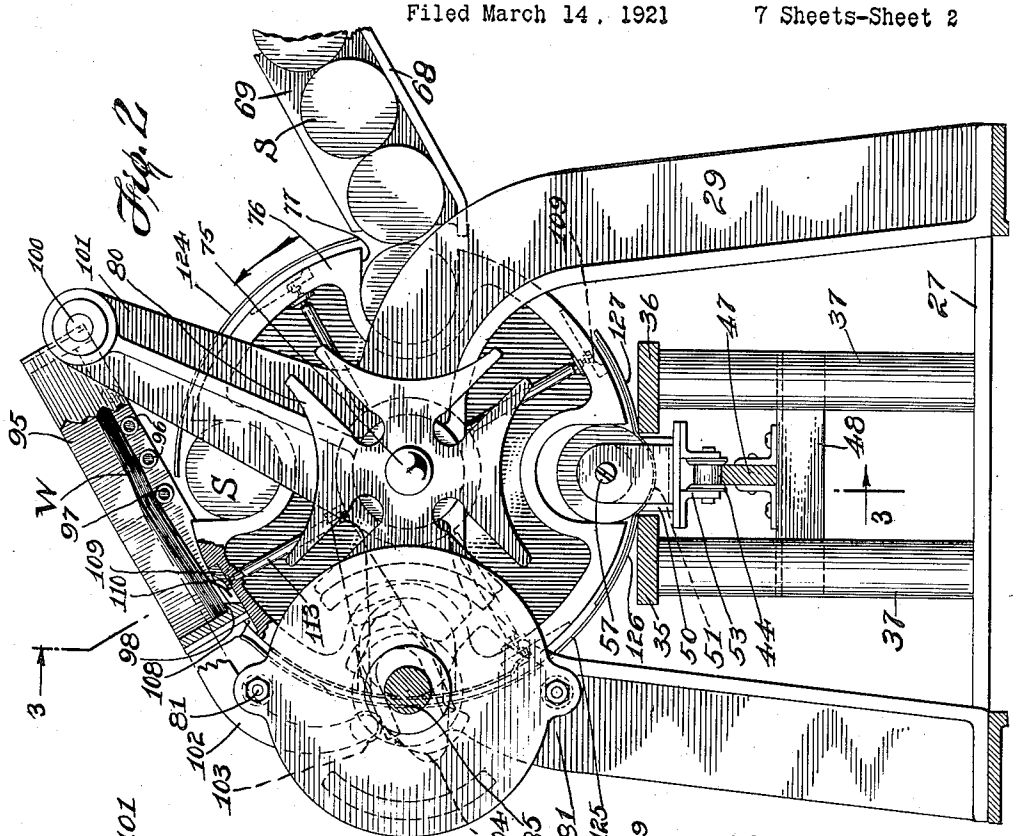
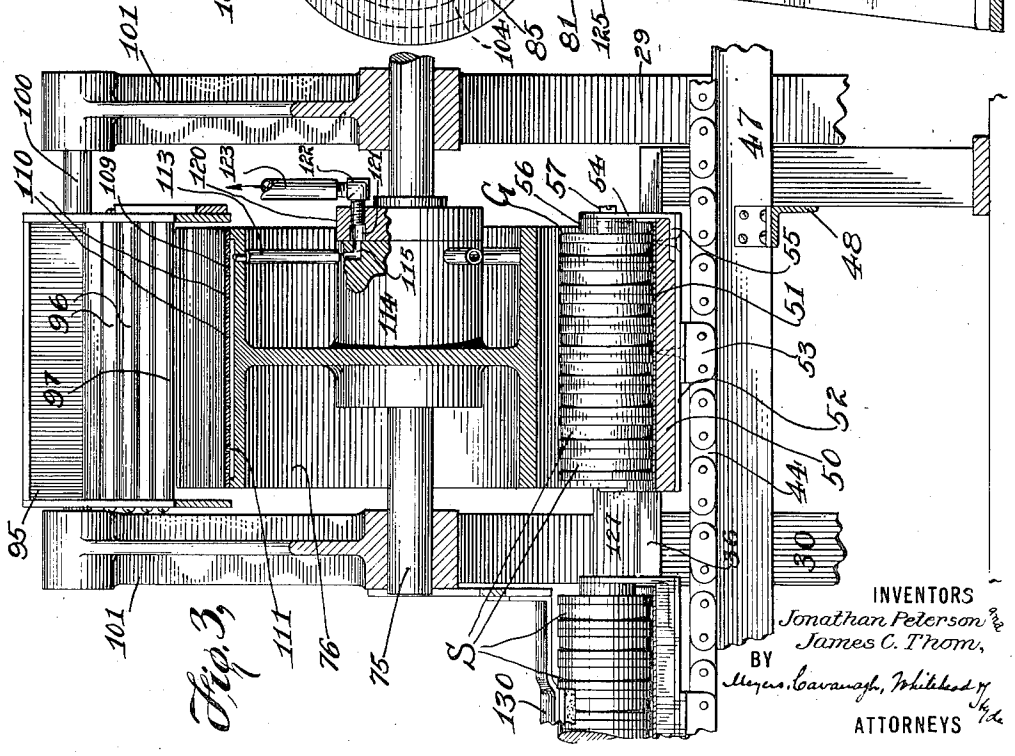


Fig. 3.



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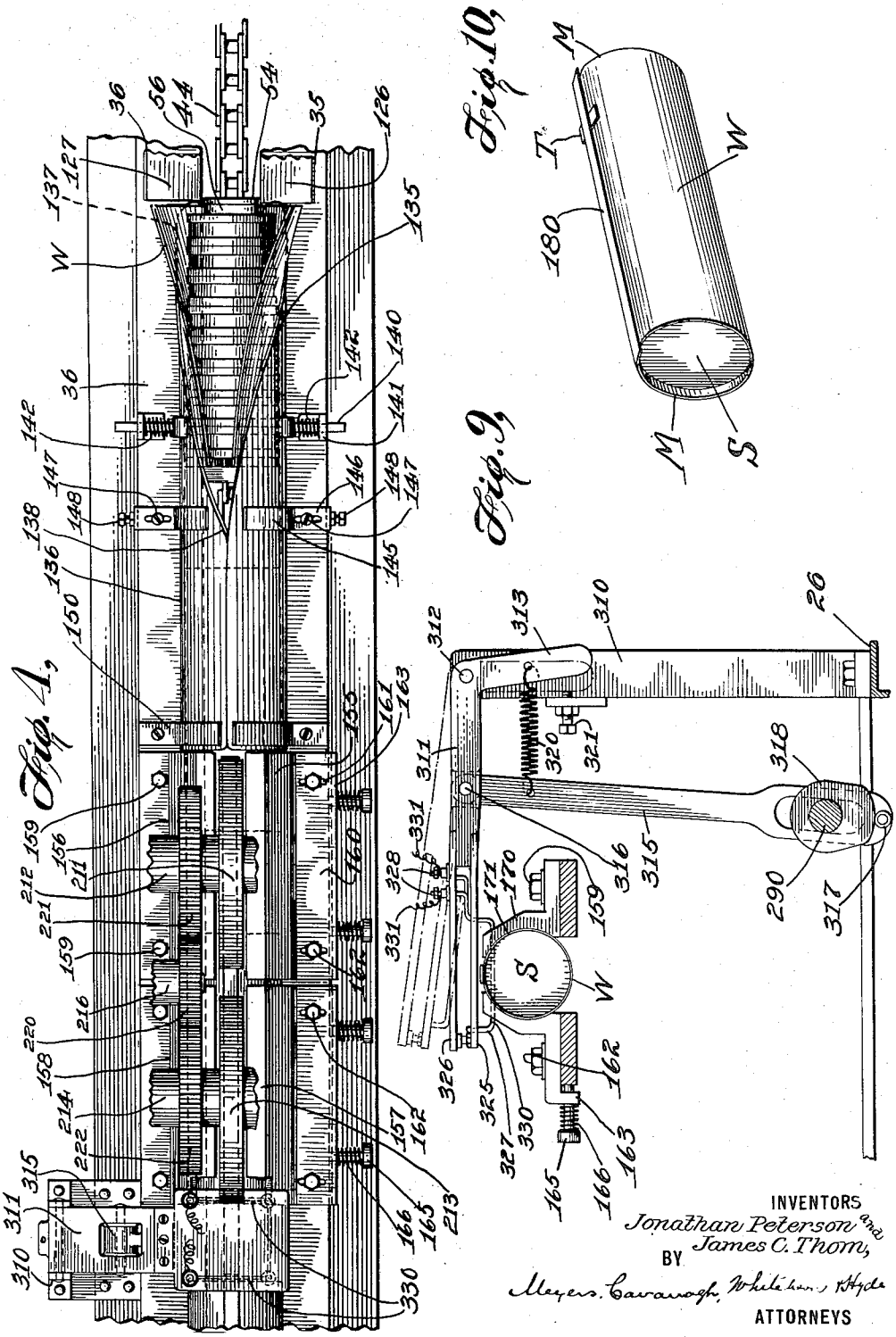


Fig. 1.

Fig. 10.

Fig. 9.

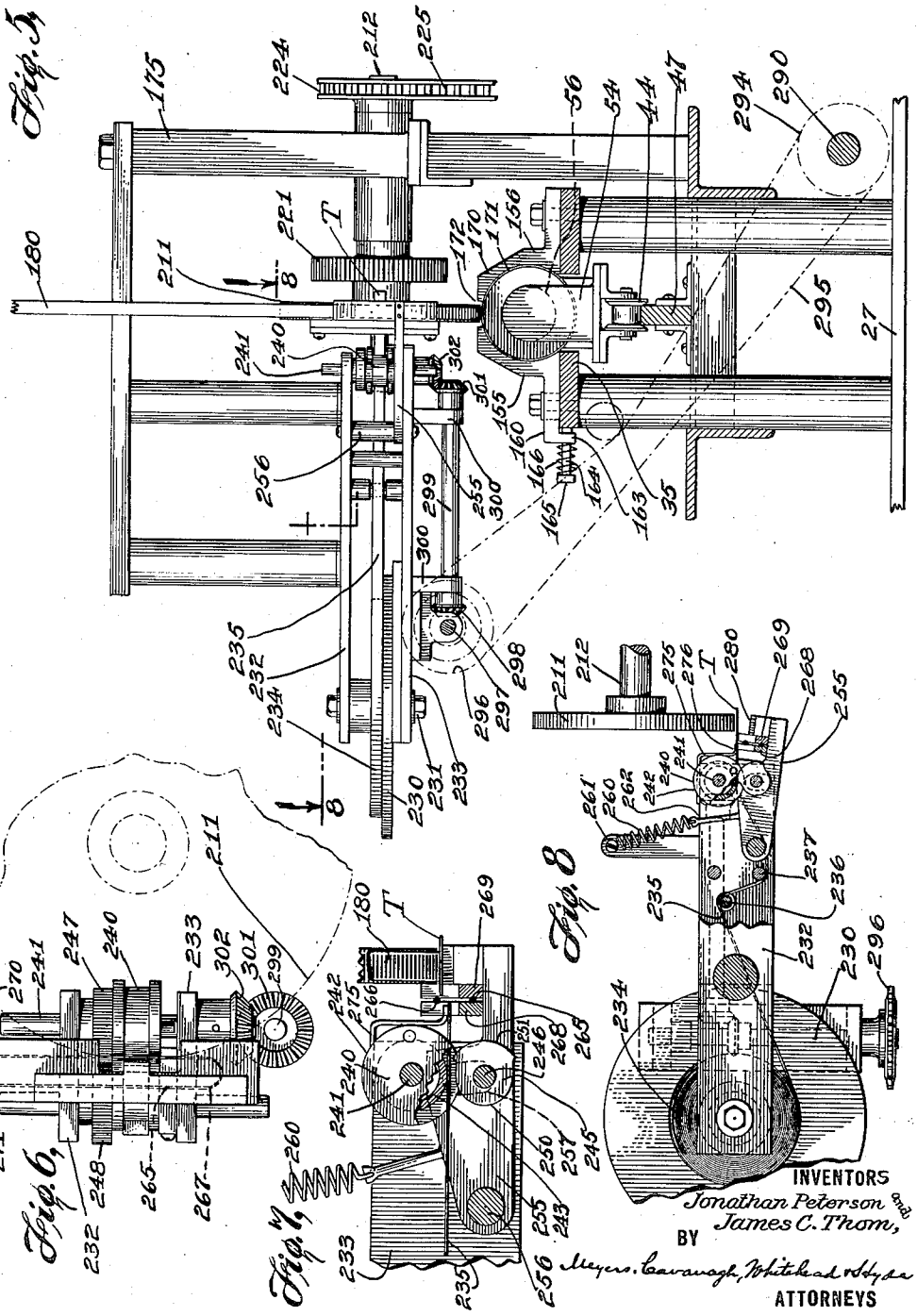
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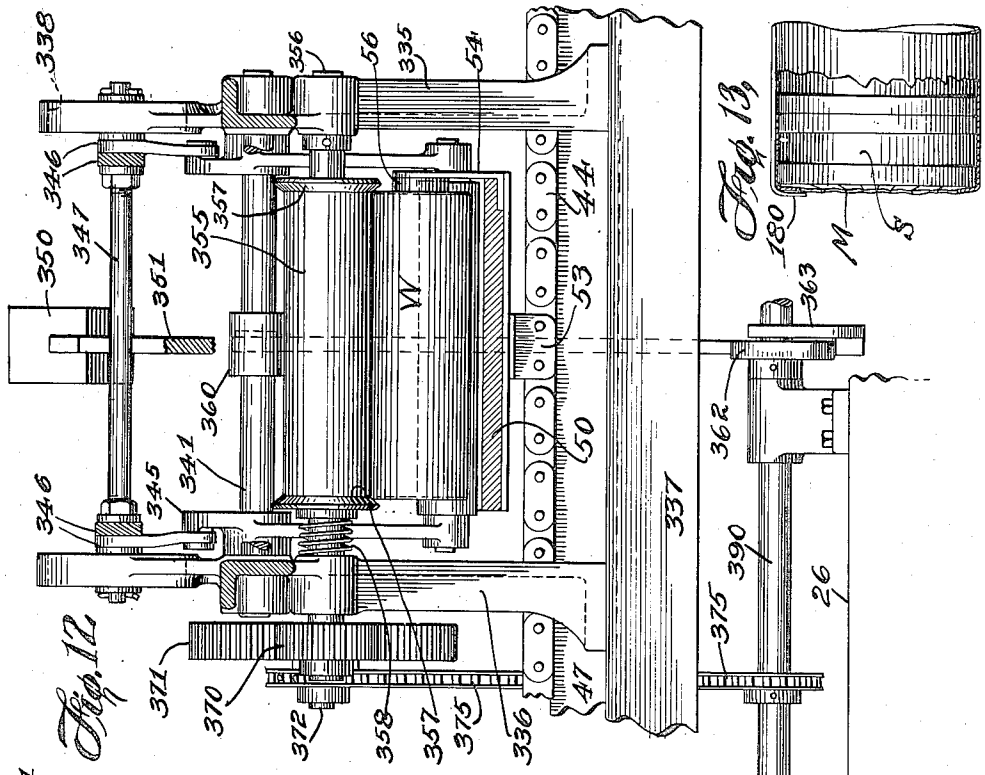


Fig. 12

Fig. 13

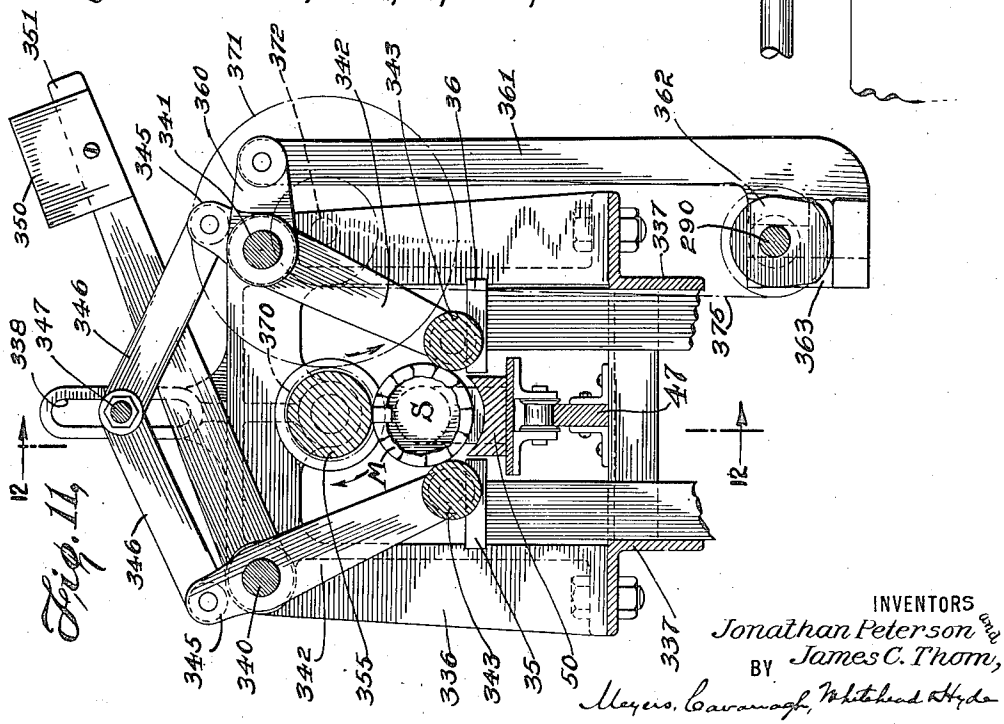


Fig. 11

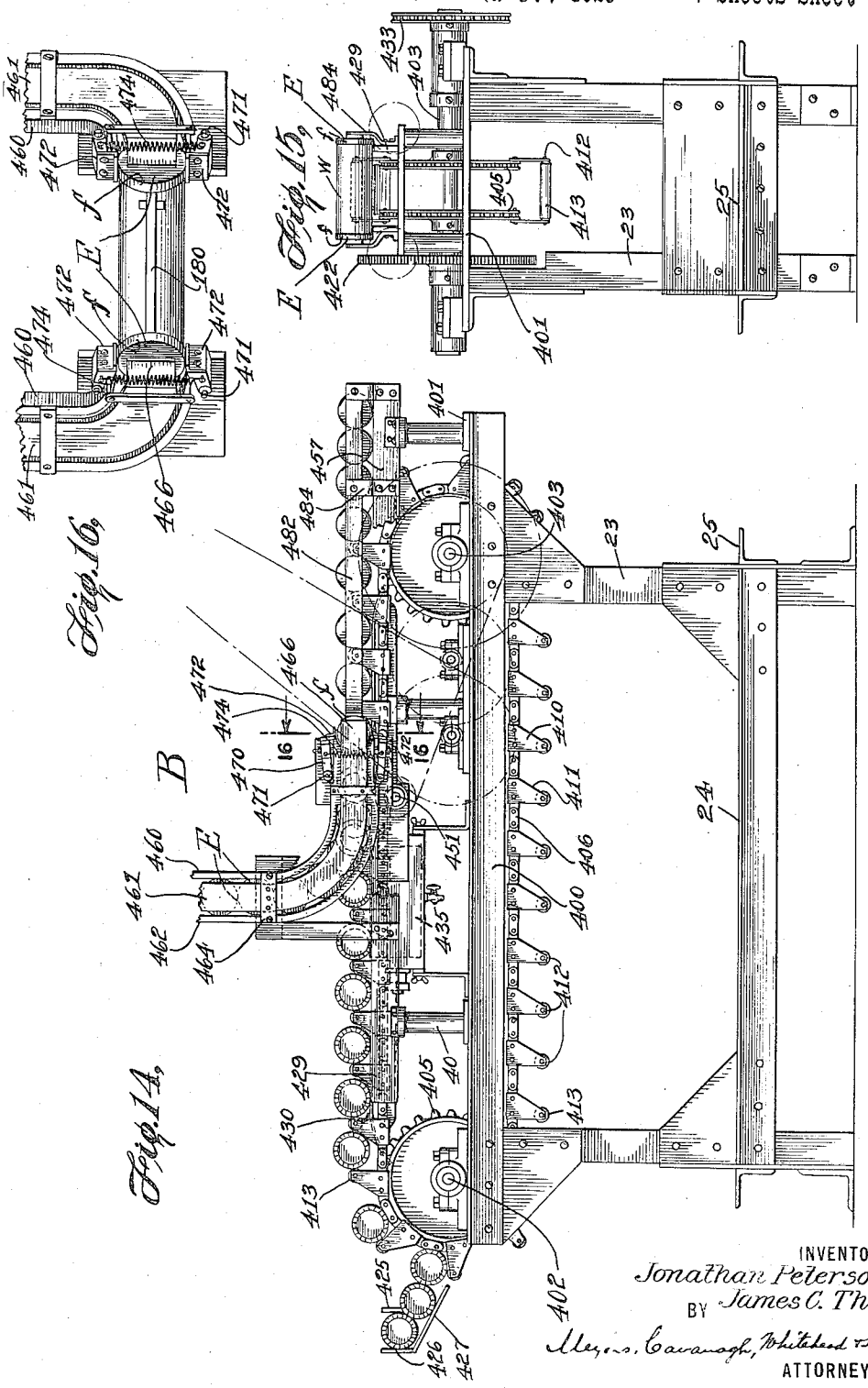
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PACKAGING MECHANISM

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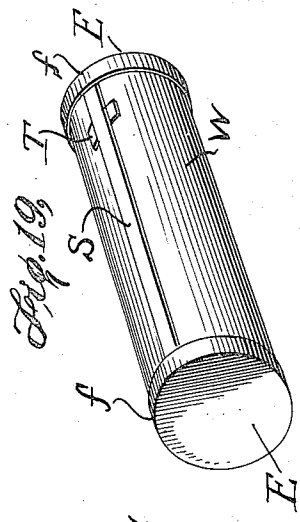
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PACKAGING MECHANISM

Filed March 14, 1921 7 Sheets-Sheet 7



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Patented Dec. 18, 1923. 1,478,056

UNITED STATES PATENT OFFICE.

JONATHAN PETERSON, OF BROOKLYN, NEW YORK, AND JAMES C. THOM, OF CHICAGO, ILLINOIS, ASSIGNORS TO COMBINATION MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

PACKAGING MECHANISM.

Application filed March 14, 1921. Serial No. 452,028.

To all whom it may concern:

Be it known that we, JONATHAN PETERSON and JAMES C. THOM, citizens of the United States, and residents of Brooklyn and Chicago, respectively, in the counties of Kings and Cook, respectively, and States of New York and Illinois, respectively, have invented certain new and useful Improvements in Packaging Mechanism, of which the following is a specification.

The general object of the invention is to provide mechanism for rapidly and economically forming packages, usually of approximately cylindrical form, and especially adapted to the enclosing of a row or column of similar articles in each package.

As here exemplified the invention is especially adapted to the production of packages of the class described in the previous application of James C. Thom, Ser. No. 434,639 filed January 3, 1921, and the machine is also designed to operate generally in accordance with the production method disclosed in such application.

In a particular adaptation, therefore, the machine is adapted to position successive rows or columns of individual articles or packages, such as short cylindrical snuff boxes, with the same number of articles in each column or group, and associate each group of articles with a longitudinal wrapper, form or fold the wrapper about the article column, secure the longitudinal edges of the wrapper by applying a sealing strip continuously to a succession of the embryo packages, and usually also insert a tearing tab under the sealing strip on each package, sever the sealing strip between adjacent packages, turn in projecting margins of the wrapper at the ends of the article column, and adhesively apply cupped or flanged end caps to complete the packages.

The individual articles or packages to be enclosed or wrapped by the mechanism may vary considerably, and in fact the contents of each package may be a single cylindrical or approximately cylindrical object of considerable length, instead of a number of shorter articles.

The invention consists in instrumentalities designed, arranged and operated to produce the desired results. The characteristics of the invention are best understood in connection with a detail description of the accompanying drawings, which show one exemplifying embodiment of the invention. After considering these, it will be understood that many variations may be made in the different instrumentalities, combinations and subcombinations of parts; also that certain parts and groups of parts have utility apart from the general combination; and we contemplate the employment of any instrumentalities and mechanisms that are properly within the scope of the appended claims.

In the drawings:—

Figure 1 is a diagrammatic plan of the complete machine.

Figure 1ª is a right-side elevation of Figure 1, showing all of the machine except the end cap applying mechanism.

Figure 2 is an enlarged detail mainly in vertical section on the plane 2 (Fig. 1ª), with parts broken away to show other sections.

Figure 3 is a section in general on the line 3—3, Figure 2.

Figure 4 is a top plan of the wrapper forming mechanism and adjacent parts of the sealing strip applying mechanism.

Figure 5 is a vertical section substantially in the plane 5, Fig. 1ª, with some parts omitted, showing mainly mechanism for applying the sealing strip, and for inserting and cutting off the tying tabs.

Figure 6 is an enlarged detail in end elevation of the tearing tab supply and cutting off mechanism.

Figure 7 is a view on the same scale partly in plan and partly in horizontal section.

Figure 8 is a view of parts of the mechanism of Fig. 5 on the horizontal section line 8—8.

Figure 9 is an enlarged detail in a vertical section plane of sealing strip severing mechanism.

Figure 10 is a perspective view of a partly completed package.

Figure 11 is a vertical section, enlarged, at 11, Fig. 1ª, showing end margin crimping mechanism.

Figure 12 is a left side elevation of the same with some parts in section.

Figure 13 is a detail view partly in section of one end of a package after the wrapper end margins are turned in.

Figure 14 is a side elevation of the end cap applying mechanism.

Figure 15 is a right-hand end elevation of the same.

Figure 16 is an enlarged detail on the section plane 16, Fig. 14.

Figure 17 is a top plan of the capping mechanism on a larger scale.

Figure 18 is a transverse section at 18, Fig. 17.

Figure 19 is a perspective view of a completed package.

Figure 1 sufficiently indicates, by means of a diagrammatic plan, the general organization and arrangement of the complete machine, which comprises a main section A shown in side elevation in Figure 1ª, for performing all operations up to the point of applying end caps, and a main section B shown in side elevation in Figure 14, for applying the caps. Although each section of the machine is capable of separate use to perform its particular functions, they are preferably combined in a single organization, as here described, for the complete packaging operation.

Each main section of the machine is built upon and around a main frame, this comprising, for section A, legs 20 and various longitudinal and transverse members 21 and 22; and for section B, legs 23 and longitudinal and transverse members 24 and 25.

In machine section A the main frame includes longitudinal side members 26 connected by various cross members such as cross pieces 27, Figure 2. Near the feed end of the machine (at the right in Figure 1ª), are frame yokes 28, 29 and 30 substantially bridging longitudinal members 26 and supported on them. Running within these yokes above the level of frame members 26, from end to end of machine section A, are parallel package supporting and guiding rails 35 and 36 supported by various pairs of uprights 37 resting on transverse frame members such as member 27. The inner edges or surfaces of these guide rails are spaced apart as shown in Figures 2, 4 and 5. Near each end, frame members 26 support in suitable bearings conveyor shafts 40 and 41 respectively. These shafts carry sprockets 42 and 43 respectively and a conveyor chain 44 of the usual block and side link construction runs on these sprockets with its upper stretch somewhat below guide rails 35 and 36. This stretch of the conveyor chain is supported and guided by rail 47, which engages the chain blocks between the side links. This rail is carried by suitable cross pieces 48 connected to uprights such as uprights 37.

At regular intervals, package carriers 49 are connected to the chain. Each of these comprises, as sufficiently shown in Figures 1ª, 2 and 3, a base or support 50, the outer side or top of which, with relation to the position of the supports along the upper stretch of the conveyor, is formed with a part-cylindrical curvature 51 (Figure 2), this transverse curvature of the upper surface conforming to the transverse form of the package. Each of the supports rests on a plate 52 and ears 53 connected to these plates are riveted to side links of the chain, or otherwise specially formed side links may be provided for this purpose. At the rear end each carrier has an upright extension 54 provided with an angular base 55 secured to plate 52; and extension 54 is provided with a disk or washer 56, which may be detachably secured as for example by a screw 57. The disk or block 56 serves as a positive pusher piece for the row of articles to be placed on the carrier, and by providing pusher pieces of different thicknesses, the article row may be properly centered with respect to the carrier, with due regard to variations in the length of the row as will later appear. Bases or supports 50 and particularly uprights 54 and pusher blocks 56 are of such width in a transverse direction of the machine, that they pass freely between the inner faces of guide rails 35 and 36. The curved supporting surfaces 51 of the supports 50 are arranged so that their edges are quite close to the inner edges of the guide rails.

The conveyor 44 with its series of carriers is driven intermittently by suitable mechanism, such as the following: Near the delivery end of machine section A, frame members 26 carry in suitable bearings a shaft 60, which may be the initial drive shaft of the machine, driven by a pulley and a belt 62 from any suitable line shaft or in any other convenient manner. Shaft 60 drives conveyor shaft 41 through any suitable intermittent drive mechanism, in this instance Geneva mechanism 64, arranged so that at each half turn of shaft 60 shaft 41 is moved one quarter turn and the upper stretch of the conveyor chain is thus moved in the direction of the arrow (Figure 1ª) a distance equal one feed space of the conveyor.

Near the feed end of the machine an inclined chute 68 having side walls 69 is arranged to supply articles to be packaged. These articles may be almost any cylindrical object or package such as a filled carton, of a length nearly equal to the length of carrier supports 50, but in the present particular case the machine is designed for the packaging of short, cylindrical articles such as filled snuff boxes, which are desirably to be packaged in groups, each group consisting of a number of the boxes, in the present instance eight, in endwise or column arrangement, one of these groups G consist-

ing of individual boxes S being shown in position on a carrier in Figure 3. Accordingly the articles S are arranged in parallel rows in the chute 68, each row consisting of eight articles, and the article rows advance by gravity toward the initial feed mechanism of the machine from any suitable source of supply. In the present case the chute 68 leads from a machine in which individual snuff boxes are filled or otherwise handled and arranged in row formation.

Frame yokes 28, 29 and 30 support in bearings a shaft 75 which carries a feed wheel 76 provided with a suitable number, in the present case four, pockets 77, each of which has a semi-cylindrical bottom and is adapted to receive a row of articles as it comes opposite chute 68, the pocket being of such depth that the outer surfaces of the articles are substantially in line with the circular contour of the wheel. The feed wheel is driven intermittently by any suitable mechanism such as the Geneva mechanism 80 and 81, carried by shaft 75 and by a drive shaft 85 supported in a bearing on frame yoke 29. Shaft 85 is driven in any convenient way, specifically, in the present instance, by a sprocket 86 and chain 87 connected to a sprocket 88 on a longitudinal shaft 290 which is continuously driven from shaft 60, as explained hereafter. The Geneva mechanism 80 and 81 in the present case is arranged so that shaft 75 is driven one quarter turn at each half turn of shaft 290, but this arrangement may be modified as may be necessary or desirable, and the ratio of drive connections to shaft 290 may also be designed accordingly.

The initial feed mechanism is desirably arranged to effect the initial assembly of a wrapper sheet with each article group, as the group is placed on a carrier. For this purpose a wrapper feed-box 95 is located above the feed wheel. This box has side and end walls which receive and guide a stack of wrapper sheets W, usually of rather thin paper. The stack is supported by transverse rollers 96 journalled in side walls of the wrapper box. These rollers extend in spaced relation from one end of the box (the right-hand end in Figure 2) to a point somewhat beyond the longitudinal center of the box, and the last roller 97 at that point may be slightly elevated to create an upward "hump" in the sheet stack. From roller 97 to the left-end of the box as used in this figure, that is to the sheet delivery end, the bottom of the box is substantially open, but a ledge 98 is provided at the left-hand end of the box at the bottom to support the forward end of the wrapper stack. The wrapper feed box is pivotally mounted at one end on a shaft 100 carried by arms 101 extending upward from frame yokes 29 and 30. The other end of the box has an arm 102 terminating in a cam roller 103 which rests on a cam 104 mounted on shaft 85. To correspond with the Geneva arrangement above mentioned, this cam has two projecting lobes, so that at each half revolution of shaft 85 the lower end of the wrapper feed box is moved toward and from the feed wheel, the box being retracted just before the wheel is moved, and returned into engagement with the wheel just after the wheel comes to rest.

In advance of each of the pockets 77 the feed wheel has in its surface a depression 108. The forward part of each of these depressions accommodates the lower edge of the lower end wall of the wrapper feed box in the position shown in Figure 2, and the rearward part of each depression accommodates a suction strip 109 having a curved outer face, and having a row of perforations 110 in its thin forward part. The perforated portion of the suction strip lies over an air channel 111 cut in the bottom wall of the corresponding depression 108. From each of the air channels 111 a tube 113 leads to a hub 114 on shaft 75. Each tube is connected with an air channel 115 bored in the hub, each of these channels terminating in the right-hand flat face of the hub as viewed in Figure 3. A disk 120 is mounted on shaft 75 and is held in stationary position, with its flat left-hand surface fitting close but movably against the flat surface of hub 114. The inner face of this disk is provided with an air channel 121 extending in a semi-circular arc about the axis of the disk, so that suction may be applied to seize and hold a sheet during substantially one-half turn of the feed wheel. Air channel 121 is connected by a suitable fitting 122 with a pipe 123 leading to any suitable means for exhausting air from the air passages above described, such as a tank from which air is exhausted by a pump. Certain guide plates are desirably provided about the periphery of the feed wheel 76. Guide plate 124 freely overlies the segment of the wheel between chute 68 and the wrapper feed box, to prevent any possible dislocation of articles S from the wheel pockets. Guide plate 125 surrounds the peripheral portion of the wheel from the lower end of the wrapper feed box to the inner edge of guide rail 35. This plate guides a wrapper and an associated row of articles from the point of association to the point where the wrapper and article row are placed upon a carrier. The portion of plate 125 lying substantially above rail 35 is extended forward from the initial feed mechanism, this extension 126 being best shown in Figure 1a, and such portions of the guide plate form a sliding support for the sheet as it moves forward to the point where it is formed or folded

about the article row. Another plate 127 located substantially above guide rail 36 cooperates with plates 125 and extension 126 to support the sheet and guide it in its forward movement.

The driving connections for the article and sheet feed mechanism above described are such that feed wheel 76 is moved intermittently in properly timed relation to the movement of feed chain 44.

As each of the wheel pockets 77 comes to rest opposite chute 68, a row of articles S moves by gravity into the pocket. With the next movement of the wheel this row is carried to the uppermost position of Figure 2. With the wheel at rest, cam 104 drops the lower end of the wrapper feed box 95 into wheel depression 108. At this moment air is being exhausted through pipe 113 from transverse air channel 111 and through perforations 110 of suction strip 109, and the forward edge of the lowermost wrapper sheet W is thus drawn down off of ledge 98 and is held by external pressure tightly against the curved surface of the suction strip. The sheet feed box is then elevated by its cam and wheel 76 moves forward, drawing the wrapper sheet out from the bottom of the stack over rollers 96 and 97. The wrapper sheet passes under guide plate 125 and overlies the row of articles in the adjacent pocket. The next quarter turn of the wheel brings the pocket in question to the bottom position of Figure 2. As this position is approached the article row moves outward and downward into engagement with the wrapper sheet and finally the wrapper sheet is pulled across support 50 which is held in stationary position by conveyor chain 44, and the sheet is substantially centered with respect to the support and the group of articles G is located and retained upon the support, the central portion of the wrapper sheet being depressed by the weight of the articles to conform to the curvature of support 50. Side portions of the wrapper rest upon the adjacent guide plates 126 and 127. At about this moment the end of air passage 115 passes away from the end of semi-circular air channel 121. The suction which secured the wrapper sheet to the wheel is thus broken, and the sheet is released. The conveyor chain is now moved forward one step by its intermittent driving mechanism before wheel 76 commences to move. The cycle of operations is then repeated indefinitely.

As the initially assembled article row and the wrapper move away from the feed mechanism, the articles of the row are desirably brought firmly together or compacted longitudinally by a suitable device, such as a brush or other rubbing device 130 secured to frame yoke 30 and arranged to frictionally retard the upper surfaces of the articles and move them into compact row formation and positive engagement with pushing disk 56. The wrapper sheet is of such length that marginal portions extend at each end of the article row, and the arrangement of the pushing member 56 of the carrier is such that the rear margin of the wrapper sheet freely passes into position as previously described, without interference with upright 54 of the carrier.

The wrapper sheet is now to be folded about the article row and secured in position. For this purpose, the rear ends of sheet guide plates 126 and 127 terminate above the forward ends of longitudinal wrapper folding plates 135 and 136 (Figures 1[a] and 4). The lower inner edges of these guide plates lie along the inner edges of guide rails 35 and 36 respectively. The forward ends 137 of the guide plates are flared outward to receive the advancing edge of the wrapper which is presented in only slightly curved position by plates 126 and 127. The upward and inner curvature of plates 135 and 136 increases progressively from their forward ends to the point 138, where the upper edge of plate 135 is brought over the adjacent edge of plate 136, so that these edges slightly overlap, and from that point on to the rear end of the plates they are in approximately cylindrical form, except for the space at the bottom which accommodates the article carriers. The described formation of the guide plates turns or folds the projecting sides of the wrapper up and around the cylindrical column of articles and finally presses the wrapper firmly in position about the articles, with one longitudinal edge of the wrapper slightly overlying the adjacent edge. Desirably a certain flexibility of action is provided for the folding plates. For this purpose they are supported at some distance back from their forward ends by plungers 140 which pass through lugs 141 on rails 35 and 36 respectively. Springs 142 are compressed against the lugs and urge the forward portions of the guide plates yieldably inward. At points beyond the yieldable mounting of the plates they are desirably supported movably by clips 145 secured to the plates and having slotted members 146 resting on rails 35 and 36. Screws 147 pass through the slots of members 146, and set screws 148 may be provided bearing against outer edges of the guide rails to limit inward movement of the guide plates. The rear ends of the guide plates are firmly secured in position by strips 150 secured to the plates and to guide rails 35 and 36 respectively.

As each embryo package is discharged from the rear end of the folding channel provided by plates 135 and 136, it passes between guiding and wrapper retaining

members consisting in the present case of pairs of blocks 155 and 156, and 157 and 158. There may be two of these pairs of blocks, and they are substantially similar. In each pair one of the blocks may be firmly secured to the guide rail 36 by screws 159, and the other block 155 may be movably secured and spring actuated to exert yielding pressure against the package. For this purpose the block has a flange 160 resting on guide rail 35, and this is provided with lateral slots 161 through which screws 162 pass and engage screw holes in the rail. The flange has a downwardly turned edge 163 overlying the outer edge of the guide rail and spring rods 164 pass through holes in these downwardly turned flanges and are screwed into the guide rail. The rods have heads 165 and springs 166 are compressed between the heads and the outer faces of flanges 163, so that the block 155 is yieldingly urged inward to engage with the package. Blocks 155 and 156 each have vertical portions 170, the inner surfaces 171 of which are formed in part-cylindrical contour to agree with the form of the package and the upper edges of the vertical members are spaced apart to provide a longitudinal channel 172 along the upper surface of the package.

As the embryo packages pass between the pairs of blocks 155, 156, 157 and 158, a continuous sealing strip is to be applied to them and pressed down, and at the same time tearing tabs are to be positioned, one on each package under the sealing strip, to facilitate subsequent opening of the package. This is provided for in the present case as follows:

Adjacent to the yielding blocks just described an elevated frame 175 (Figures 1[a] and 5 to 9 inclusive) is provided connected to suitable members of the main frame. On upper longitudinal members 176 of this frame bearing sockets 177 are provided for a spool 178 arranged to support a roll 179 of sealing material in the form of a strip 180, usually of paper of moderate width. For convenience the spool may comprise a shaft 181 which may be easily placed in and removed from the socket bearings 177, and radial arms 182 extending at each side of the paper roll 179. A tension spring 184 secured to a frame member at 185 has its free end 163 bearing upon the periphery of the strip roll to apply proper feed tension. It is often desirable to imprint suitable data or indicia upon the package and conveniently this imprint may be made upon the sealing strip. Particularly in the present case, where the machine may be used for packaging snuff, it is desirable to provide means for indicating the date of packaging, so that purchasers will know that the age of the package is not sufficient to cause deterioration of the contents. We therefore provide suitable printing mechanism 190 carried by a frame bracket 191, and specifically this printing mechanism may be date-imprinting mechanism for imprinting the date of manufacture repetitiously upon the surface of the sealing strip which is to be outward after application. The printing mechanism, therefore, comprises a date imprinting roll 192 so constructed and arranged that the date type may be easily changed, and this cooperates with an abutment 193. From the printing mechanism the sealing strip passes over suitable guide rolls 194 to mechanism for rendering one surface of the strip adhesive, this being of course the surface that is to be applied to the package. Such mechanism is indicated at 200. When the sealing strip is supplied in uncoated condition, the mechanism 200 will be any suitable mechanism for applying suitable adhesive, such as glue, to the proper surface of the strip. More desirably however the sealing strip is usually supplied with one surface glue-coated; and the mechanism therefore is arranged to moisten the glued surface. In the present case the moistening mechanism desirably comprises a moistening roll 201 and a guide roll 202. The periphery of the moistening roll is engaged by a moisture conveying device, specifically in this case a wick 203 held in proper contact with a portion of the roll periphery by pins 204. The upper end of the wick dips in a trough 205 containing water, and is held in readily detachable position by a spring clip 206. The lower end of the wick rests in a trough 207 and is detachably held by a spring clip 208. By combined force of gravity and capillary attraction water is drawn from the upper trough and supplied continuously to the moistening roll in sufficient quantity to properly moisten the glued surface of the strip, and excess water is caught in the lower trough 207. The printed and moistened strip now passes over a guide roll 210 and about the periphery of an applying roll 211 mounted on a shaft 212 (see particularly Figures 4, 5 and 8). To the rear of roll 211 is a strip pressing roll 213 mounted on a shaft 214. Shafts 212 and 214 are mounted in bearings in frame members 215. Between the two shafts is another shaft 216, and this shaft carries an idler pinion 220, coupling gears 221 and 222 on shafts 212 and 214 respectively. Shaft 214 also carries a sprocket 224 connected in any suitable way, as for instance by a chain 225, to any suitable driving device, for example conveyor shaft 41, which has an intermittent motion, so that the strip applying and pressing rolls 211 and 213 are driven in accordance with movement of the packages. As the packages advance roll 211 first applies and presses the adhesive face of the

sealing strip upon the package over the lapped edges of the wrapper, and roll 213 again presses and secures the strip in position. For a certain part of their travel at least two packages are usually most conveniently connected by the continuous sealing strip, these being the two packages which are substantially under the applying and pressing rolls 211 and 213 as best shown in Figure 1ª.

The tearing tabs previously referred to are most desirably applied to the packages by associating them with the sealing strip as the latter approaches the point of application, and the tearing tab is also desirably supplied in the form of a continuous strip and portions are severed to form the individual tabs at about the moment of association with the sealing strip. Devices for these purposes are provided in the present case as follows: (Figures 5 to 8 inclusive.)

At a point about horizontally opposite applying roll 211, a horizontal circular roll supporting plate 230 is revolubly mounted on a vertical shaft 231 carried by horizontal frame members 232 and 233. A roll 234 of paper in strip form is supported on plate 230, and a continuous tearing strip 235 is fed from this roll over suitable guide rolls 236 and 237. At a point adjacent to the periphery of applying roll 211, a strip feed roll 240 is revolubly mounted between frame members 232 and 233 on a vertical shaft 241. This roll is provided with flanges 242. The strip-engaging central portion or tread of the roll between the flanges is provided with a yielding surface 243 of rubber composition. A cooperating feed roll 245 is mounted on another vertical shaft 246, and the two shafts are rotated together at proper speed by gears 247 and 248. Roll 245 has a part circular peripheral portion 250, and another part-circular peripheral portion 251 of greater radius, the radius of this portion being great enough to engage the tearing strip against the tread 243 of roll 240 and compress the flexible tread somewhat to firmly grip the strip and advance it from roll 234. A movable arm 255 is located adjacent to frame member 233, and is pivoted on vertical bar 256. This arm is slotted at 257 to embrace shaft 246 and permit oscillation of arm 255 without interference with the shaft. The arm is urged in a direction to engage roll 245 with roll 240 by spring 260 connected at one end to a frame strut 261 and at the other end connected to a stem 262 extending from the arm.

Arm 255 near its outer end carries a cut-off device for the tearing strip, consisting in this instance of an electrically heated wire, bent substantially in U-form as best shown in Figure 6, so that the wire has straight portions 265 and 266 connected by a loop or curved portion 267. The straight stretches of the wire are secured between two clamping members 268 and 269 of insulating material, these members being shaped, as shown in Figure 6, with a cut-out portion which is spanned by a free part of the heated wire. The ends of wire members 254 and 266 are connected to suitable binding posts 270 on one of the holding members 268 or 269, and conductors 271 of any suitable electric circuit are secured to the binding posts to heat the wire. The active cutting portion of the wire may be arranged to move close to an abutment 275 which has an outwardly turned foot 276 over which the tearing strip slides as it approaches the point of application, and the free wire is arranged to move close to the end of this foot. The abutment member 275 may be suitably insulated, or frame member 233 may be made of insulating material if necessary or desirable.

At a point substantially opposite the periphery of roll 211, arm 255 carries a presser 280 which desirably has a yielding surface of rubber composition or other suitable material, this presser being substantially of a length equal to the width of the face of roll 211, and having a vertical face dimension slightly less than the width of the tearing strip 235.

The feed rolls 240 and 245 are driven by any suitable means, but specifically in the present case by connection with a longitudinal shaft 290 (Figures 1ª and 5) supported in bearings 291 on one of the longitudinal frame members 26. At its forward end, this shaft is connected by bevel gears to conveyor shaft 60, so that shaft 290 is driven continuously. The sprocket 294 on shaft 290 is connected by chain 295 with a sprocket 296 mounted on shaft 297 carried in bearings below frame member 233. This shaft is connected by bevel gears 298 with a longitudinal shaft 299 carried in bearings 300 depending from frame member 233, and the inward end of the shaft is connected by a bevel gear 301 to a bevel gear 302 on the lower end of shaft 241. The various gears and other driving connections are arranged so that shaft 299 turns at the proper speed in relation to other parts of the mechanism, to feed a section of the tearing strip to form a tearing tab for each package.

At a proper time in the advance of each section of the tearing strip 180 which corresponds with the length of one package, the enlarged portion of feed roll 245 presses tearing strip 235 against the tread of feed roll 240, and the combined movement of the two rolls draws a section of the tearing strip from roll 234 over the guide rollers, and projects the outward end of the strip slightly beyond the right-hand face of the

sealing strip roll 211 as viewed in Figure 8, so that the portion of the tearing strip to be cut off is substantially centered with respect to the face of the roll and the gummed sealing strip which overlies the periphery of the roll at this point. At this time the cutting wire is retracted, since its carrying arm 255 is swung back by engagement of enlarged feeding portion 251 of roll 245 with the roll. When the rolls rotate slightly farther than the position shown in Figure 8, the enlarged portion of roll 245 passes away from engagement with roll 240. Spring 260 thereupon moves arm 255, so that the hot cutting wire engages and cuts off a tearing tab T from strip 235, and at about the same moment presser 280 engages the tab and presses it firmly against the gummed surface of the sealing strip, as best shown in Figure 7. As roll 245 approaches the next feed position, its enlargement 251 by engagement with the tread of roll 240, causes retraction of arm 255. The feed and cut-off cycle of this mechanism is repeated for each advancing package. By properly adjusting the drive connections of the tearing tab mechanism, the tab may be applied to almost any longitudinal portion of the package.

Figure 10 shows an embryo package after application of a sealing strip 180 with a tearing tab T inserted under the strip near one end of the package. A plurality, or at least two, adjacent packages are however connected by continuous portion of the tearing strip, and it is desired now to sever this strip so that the packages can be further manipulated individually.

At a point just beyond pressing roll 213, cutting mechanism is arranged as shown in Figures 1ª and 9. One of the frame members 26 supports an upright 310, and on an upper portion of this an arm 311 is pivoted at 312. This arm has an angular portion 313. A link 315 is pivoted to arm 311 at 316, and the lower end of this link is slotted to embrace shaft 290, and the lower end of the link is provided with a cam roller 317. Adjacent to the link, the shaft has a cam 318 acting on the cam roller. A spring 320 tensioned between link 315 and arm 313 serves to hold the cam roller against the cam, and to return arm 311 to elevated position after depression by the cam. Upright 310 is provided with an adjustable stop 321 which cooperates with arm 313 to limit upward movement of arm 311. The free end of arm 311 is provided with two spaced parallel plates 325 and 326 of insulating material. These plates carry a cutting wire 327, the free ends of which are connected to binding posts 328 on plate 326. The wire is continuous from one binding post to the other, and is formed with two parallel cutting portions 330 extending transversely in relation to the package travel, and spaced apart a distance substantially equal to the space between packages. The wire is heated by connection to any suitable electric circuit, circuit conductors 331 being shown connected to binding posts 328.

When the operating cam 318 of the cutting mechanism has only a single lobe, one rotation of shaft 290 corresponds to one package movement; so that a cut may be made between each two packages; and in this case shaft 290 is of course driven at proper speed for this purpose by properly proportioning its driving gears. For example, if the Geneva mechanism connecting shafts 60 and 41 is arranged so that each rotation of shaft 60 imparts two movements to shaft 41, as indicated in Figure 1ª, then shaft 290, when cam 318 has a single lobe, should be driven at one-half the speed of shaft 60.

At each movement of the conveyor chain, a pair of packages is brought to rest with their adjacent ends centered in relation to the cutting off mechanism, and the cam therupon operates to depress arm 311, bringing the cutting wires in contact with the sealing strip, to not only sever the strip, but in the present case to exercise a superfluous portion between the packages. The embryo package is then in the position shown in Figure 10, with the wrapper fully formed and secured tightly about the row of articles S, and secured by the severed sealing strip 180, and with end margins M of the wrapper extending somewhat beyond adjacent ends of the contained articles. It is now desired to turn or crimp in the end margins of the wrapper, and incidentally the projecting ends of the sealing strip. The embryo packages are carried on by the conveyor chain to mechanism for this purpose shown in Figures 1ª, 11 and 12.

Frame yokes 335 and 336 rest on longitudinal frame members 337, and straddle the conveyor and article carriers. The upper cross members of these yokes are provided with vertical guide slots 338. Parallel shafts 340 and 341 are mounted in suitable bearings in the two yokes. Each of these shafts carries a pair of depending lever arms 342, and package engaging rollers 343 are provided, one being rotatably mounted between the lower ends of the two arms 342 at each side of the package column. Each of the lever arms 342 has a short extension 345 in line with arms 342, and these extensions are connected by links 346 with a bar 347, the ends of which enter the vertical guide slots 338. By the described linkage, lever arms 342 are compelled to move together to engage and raise and rotatably support the package. The arms are retracted by suitable means, such as a weight 350 on an arm 351 connected to shaft 340. An abutment and

crimping roll 355 is arranged above the package, and rotatably mounted on a shaft 356 supported by yokes 335 and 336. At each end of roll 355 is a crimping flange 357, and at least one of these is desirably separate from the roll and arranged to move longitudinally on the shaft and urged toward the opposite flange by suitable means, such as a spring 358 located about the shaft. The crimping flanges have their inward faces somewhat bevelled, and are arranged to overlap the outer surfaces of the end articles in the article row and to turn and crimp the projecting margins of the wrapper tightly against the under surfaces of the articles. Shaft 341 has an arm 360 connected by a link 361 with suitable operating mechanism, such as a cam 362 on shaft 290. The lower end of the link is guided in relation to the cam by suitable means, such as a guide piece 363 cooperating with the shaft. Roll 355 is continuously driven at considerable speed. For this purpose one end of its shaft 356 outside of one of the frame yokes is provided with a pinion 370 engaging a large gear 371 on a stub shaft 372 supported in a bearing on frame yoke 336. Shaft 372 is connected by sprockets and a chain 375 with shaft 290, so that the roll is driven by step-up gearing from the constantly driven shaft 290. Package guide rails 35 and 36 are interrupted adjacent to the end crimping mechanism to provide for the necessary movement of rolls 343. Just after the package is positioned in the crimping mechanism, as shown in Figures 11 and 12, cam 362 operates the linkage and lever mechanism described so that the rolls 343 move inward and engage opposite sides of the package somewhat below its center, and lift the package from its support and engage it with the under surface of roll 355. The package is thereupon rapidly rotated upon its revoluble supports, and it is at the same time brought between the crimping flanges, which yieldably engage it and crimp the wrapper margins firmly down upon the ends of the package, as shown in Figure 13. In this action, one of the flanges 357 may move longitudinally to a certain extent, and the package is free to move longitudinally slightly to properly adjust itself to the flanges. After the crimping action, rollers 343 are retracted and the package drops again on its support 50 and is carried on over guide rails 35 and 36. At a point approximately above shaft 41, supports 50 of the package carriers drop away to permit the packages to rest entirely upon the rails. At a point somewhat beyond the end of the conveyor the guide rails are bent downward to form inclined rail sections 35a and 36a; and as pushing members 56 of the carriers are withdrawn from engagement with the ends of the packages, the packages are pushed by them upon the inclined rail portions, over which they descend by gravity to machine section B (Figures 14 to 18 inclusive), where end caps are applied to the packages.

The main frame of machine section B comprises longitudinal side members 400 connected by suitable cross members, such as cross pieces 401. Near the feed end of the capping mechanism (at the left in Figure 14), frame members 400 support in suitable bearings a conveyor shaft 402 and near the other end the frame members support a conveyor shaft 403. Each of these shafts carries a pair of sprockets 405, and the sprockets on each shaft are spaced apart a distance somewhat less than the length of a package. Conveyor chains 406 run over the sprockets and at regular intervals opposite links of each chain are provided with outwardly extending arms 410, which have their rearward faces 411 angularly formed. The roller shaft 412 is mounted in bearings in the ends of each opposite pair of arms, and a roller 413 is revolubly mounted on each shaft. The two conveyor chains thus support a spaced series of package engaging rollers 413. The conveyor is driven in any convenient way, specifically in the present instance by reduction gearing 420, 421, 422, the initial member of which is driven by pulley 423 and a belt 424 from a line shaft, which may also be the same line shaft that drives belt 62 of machine section A, so that the two machine sections are driven in proper relation to each other. Any other desirable driving arrangement may be employed. The final member 422 of the reduction gearing is carried by conveyor shaft 403.

The packages coming from machine section A in longitudinal relation on guide rails 35a and 36a (Figure 17) pass between lateral guide plates 425 and 426 into a gravity feed chute having an inclined bottom 427 and side walls 428 spaced apart a distance slightly greater than the length of the packages. The packages line up in the feed row, and one of them is delivered by gravity in front of each ascending feed roll 413, as shown in Figure 14. As each package is carried around by its feed roll to a point above shaft 402, the converging movement of adjacent feed rolls causes the package to be forced up on the inclined rear face 411 of the arms 410 in front of it.

At about this point the end portions of the packages are brought over horizontal supporting rails 429, the forward ends of which are bevelled or curved downward at 430 for gradual engagement with the advancing packages. From this point on the packages are rotated on their horizontal axes by their rolling contact with the rails and rollers 413.

Glue is now applied to end edge portions of the wrapper, to secure the subsequently applied end caps. For this purpose a glue tank 435 is located transversely below the upper stretch of the conveyor. This has a central horizontal upper wall 437, forming a connection between the two open side portions of the tank, which are defined by vertical inner walls 439 and outer tank walls 441. Longitudinally arranged in each side tank portion is a gluing roll 443 having a yieldable surface 444 of felt or rubber composition. Each roll is supported on a shaft 446 mounted in bearings in ends of the tank. These shafts extend rearward beyond the rear tank wall, and are provided with bevel pinions 448 engaging similar pinions 449 on a transverse shaft 451 mounted in bearings and in suitable frame members and driven by sprockets and a chain 453 from shaft 403 previously mentioned. Rails 429 are interrupted substantially at the front ends of the gluing rolls, or may be otherwise arranged so that as the rotating packages approach the gluing rolls, their end edges encounter the roll surfaces, as best understood in Figure 18; and the combined rotary movements of the packages and the rolls as the packages are advanced cause annular stripes 455 of the glue to be applied to the end edges of the packages. When the packages leave the gluing rolls, they are again engaged by suitable guide rails which extend substantially to the rear end of the machine.

Vertical chutes 460, composed of side strips 461 and end strips 462 secured together by plates or bands 464, direct columns of end caps E to points of application at either side of the package row. These caps have side walls or flanges *f*, and they are made of cardboard or fiber or other suitable material. Near their lower ends the cap chutes are curved, so that their discharge ends are directed horizontally and are brought inward diagonally very near the ends of the packages. The outer strip 461 of each of the chutes terminates at 466 close to the ends of the approaching packages, and the inner side plates terminate at 468 nearer to the front end of the machine section. The strips 460 and 462 carry arms 470 pivoted at 471 and provided with adjustable inwardly projecting jaws 472, which engage the peripheries of the advancing caps and center them and also retard them, preferably at the point of application. The centering arms are urged together by springs 474 connected to ears on the respective arms. The caps are fed by gravity to the centering jaws, which after the passage of each package retain a cap in a vertical angular position at each end of the next approaching package with the open side of the cap directed inward and with its flange *f* in the line of advance of the approaching package end. The approaching package then encounters the cap and withdraws it from the centering jaws, and the package with the initially applied caps moves rotatably onward. At about the time that the forward edges of the caps leave the ends 466 of side strips 461, the forward edges of the cap surfaces come between the outwardly curved forward ends 480 of end guide rails 482. The curved rail portions 480 force the caps finally into position on the package ends, and the straight portions of the rails retain the caps in position during further travel of the packages, and the glue stripes 455 during this time are set sufficiently to make the cap assembly permanent. End guide rails 482 are carried by uprights 484 secured to rails 457. As the packages proceed between guide rails 482, the conveyor rolls 413 drop away commencing at a point above shaft 403, and the packages are then brought together in a solid row and so advanced to the end of the channel provided for them on rails 457 between rails 484, and may be removed and further handled in any desired manner.

One of the packages thus completed by operations of the machine is shown in Figure 19. The row of individual articles or packages, such as snuff boxes, is enclosed by the side wrapper W whose linear edges are joined by the sealing strip S. The inwardly crimped end margins of the wrapper are covered by end caps E, whose flanges *f* overlie the sides of the package, and these caps are secured by adhesive to end portions of the wrapper. A tearing tab T underlies the sealing strip. The characteristics and advantages of such packages are more fully described in our previous application, above identified.

We claim:

1. In packaging mechanism, means for advancing a wrapper associated with superposed package contents consisting of a substantially cylindrical column of similar articles, in the axial direction of said column, means for folding the wrapper about the article column, and means for applying flanged caps to the ends of the package.

2. In packaging mechanism, means for associating substantially cylindrical package contents with a wrapper, means for advancing the package assembly in the direction of the axis of said contents, means for folding the wrapper about the contents, means for sealing the wrapper, and means for applying flanged caps to the ends of the package.

3. In packaging mechanism, means for producing an assembly comprising a row of articles and a wrapper, means for advancing the assembly in the axial direction of the ar-

ticle row, means for folding the wrapper about longitudinal sides of the article row, and means for sealing the wrapper.

4. In packaging mechanism, means for associating a row of articles with a wrapper, means for advancing the assembly in the axial direction of the article row, means for folding the wrapper about the article row, and means for sealing the wrapper.

5. In packaging mechanism, means for feeding successive rows of similar articles from a support, means for associating a wrapper sheet with each row, means for advancing the successive assemblies in the axial direction of the article rows, means for concurrently folding the wrapper about the sides of the rows, and means for sealing the wrappers.

6. In packaging mechanism, means for advancing successively rows of similar articles in a lateral direction, means for associating a wrapper sheet with each row, means for advancing successive assemblies in the longitudinal direction of the rows, means for folding the wrappers about the sides of the article rows, and means for sealing the wrappers.

7. In packaging mechanism, means for advancing a substantially cylindrical column of similar articles, means for placing a wrapper along one longitudinal side of the column, means for folding the wrapper about the column, and means for applying a sealing strip to the wrapper.

8. In a packaging mechanism, means for advancing a substantially cylindrical column of similar articles, means for placing a wrapper along one longitudinal side of the column, means for advancing the article column and wrapper, means for folding the wrapper about the column, and means for applying a sealing strip over a longitudinal edge of the wrapper to secure it in place.

9. In packaging mechanism, means for associating substantially cylindrical rows of similar articles each with a wrapper, means for folding each wrapper about its article row, and means for applying a continuous sealing strip to adjacent wrappers.

10. In packaging mechanism, means for associating successive cylindrical rows of similar articles, each with a wrapper, means for advancing each associated row and wrapper, means for folding each wrapper about its longitudinal row, means for applying a continuous sealing strip to seal adjacent wrappers, and means for severing the sealing strip between the adjacent embryo packages.

11. In packaging mechanism, means for advancing a substantially cylindrical column of similar articles, means for placing a wrapper along one longitudinal side of the column, means for folding the wrapper about the column, means for advancing a tearing tab and a sealing strip adjacent to the wrapper, and means for applying the sealing strip to the wrapper with the tearing tab under the sealing strip.

12. In packaging mechanism, means for associating successive cylindrical rows of similar articles, each with a wrapper, means for folding each wrapper about its article row, means for advancing a continuous sealing strip in proximity to adjacent wrappers, means for advancing tearing tabs adjacent to the sealing strip, and means for applying the sealing strip to the wrappers with a tearing tab located on each wrapper beneath the sealing strip.

13. In packaging mechanism, means for advancing a substantially cylindrical column of similar articles, means for placing a wrapper along one longitudinal side of the column, means for folding the wrapper about the column, means for advancing a sealing strip, means for advancing a continuous tearing strip, in proximity to the sealing strip, means for connecting a section of the tearing strip to the sealing strip and severing the tearing strip to produce an individual tearing tab, and means for applying the sealing strip carrying the tearing tab to the wrapper.

14. In packaging mechanism, means for associating successive cylindrical rows of similar articles, each with a wrapper, means for folding each wrapper about its article row, means for advancing a continuous sealing strip adjacent to the wrapped packages, means for advancing a continuous tearing strip in proximity to the sealing strip, means for connecting sections of the tearing strip to the sealing strip at package intervals, means for severing the tearing strip to produce individual tearing tabs, and means for applying the sealing strip to successive wrappers with a tearing tab located between the sealing strip and each wrapper.

15. In packaging mechanism, means for advancing a cylindrical row of similar articles, means for associating the article row with a longitudinal wrapper to form an initial package assembly, means for advancing the assembly and concurrently forming the wrapper about longitudinal sides of the article row, means for adhesively conditioning the surface of a continuous sealing strip, and means for applying the adhesive surface of the strip to specific assemblies during their longitudinal movement to seal the wrappers.

16. In packaging mechanism, means for advancing a cylindrical row of similar articles, means for associating it with a longitudinal wrapper to form an initial package assembly, means for advancing the assembly, means for forming the wrapper about longi-

consisting of a row of similar articles and a wrapper, means for advancing the assemblies, means for forming each wrapper about its article row, means for sealing the wrapper, means for rotating the assembly, means for concurrently turning in projecting end margins of the wrappers, means for advancing the assemblies laterally, and means for applying a flanged cap at each end of the assembly during its lateral movement.

27. In packaging mechanism, means for producing successive initial assemblies each consisting of a row of similar articles and a wrapper, means for advancing the assemblies, means for forming each wrapper about its article row, means for sealing the wrapper, means for turning in projecting end margins of the wrappers, means for advancing the assemblies laterally and simultaneously rotating them, and means for applying a flanged cap at one end of the assembly during its rotative advance.

28. In packaging mechanism, means for producing successive initial assemblies each consisting of a row of similar articles and a wrapper, means for advancing the assemblies, means for forming each wrapper about its article row, means for sealing the wrapper, means for rotating the assembly, means for concurrently turning in projecting end margins of the wrappers, means for advancing the assemblies laterally and simultaneously rotating them, and means for applying a flanged cap at each end of the assembly during its rotative advance.

29. In packaging mechanism of the class described, means for advancing successive rows of similar articles, a holder for a stack of wrappers, means for taking a wrapper from the holder and associating it with each successive article row, a conveyor arranged to receive the successive assemblies and advance them in the direction of their longitudinal axes, means for forming the wrappers about the article rows, and means for sealing the wrappers during their advance in said axial direction.

30. In packaging mechanism of the class described, means for advancing successive rows of similar articles, a holder for a stack of wrappers, means for taking a wrapper from the holder and associating it with each successive article row, a conveyor arranged to receive the successive assemblies with the article row of each assembly resting on the wrapper, means for moving the conveyor to advance the assemblies in the longitudinal direction of the article rows, means for forming the wrappers closely about the cylindrical article rows, and means for sealing the wrappers while the packages are longitudinally positioned.

31. In packaging mechanism of the class described, means for advancing successive rows of similar articles, a holder for a stack of wrappers, means for taking a wrapper from the holder and associating it with each successive article row, a conveyor arranged to receive the successive assemblies with side portions of the wrapper extending at each side of the article row, means for moving the conveyor to advance the assemblies in the longitudinal direction of the article rows, means for forming the wrappers closely about the cylindrical article rows, and means for sealing the wrappers while the packages are longitudinally positioned

32. In packaging mechanism of the class described, assembly mechanism comprising a rotary pocketed member, means for supplying rows of articles to the pockets, a holder for a stack of wrapper sheets, sheet grasping means on the pocketed member for connecting a sheet from the holder to the rotary member, withdrawing it from the holder and locating it adjacent to an article row in one of the upward pockets, and a conveyor having spaced assembly carriers, each adapted to receive an assembly with the article row resting on the wrapper sheet.

33. In packaging mechanism of the class described, assembly mechanism comprising a rotary pocketed member, means for supplying rows of articles to the pockets, a holder for a stack of wrapper sheets, means for moving the holder toward and from the pocketed member, sheet grasping means on the pocketed member for connecting a sheet from the holder to the rotary member and withdrawing it from the holder and locating it adjacent to an article row in one of the upward pockets, and a conveyor having spaced assembly carriers, each adapted to receive an assembly with the article row resting on the wrapper sheet.

34. In packaging mechanism of the class described, a conveyor having spaced assembly carriers and assembly mechanism comprising a rotary pocketed transfer wheel, means for directing rows of articles to the wheel pockets at one position of the wheel, a holder for a stack of wrapper sheets adjacent to the wheel, sheet grasping means carried by the wheel in advance of each pocket to withdraw a sheet from the holder and locate it about the wheel over an upper pocket containing an article row, and means for releasing the sheet grasping means after the sheet has been placed upon one of the carriers with the article row resting on the sheet.

35. In packaging mechanism of the class described, a conveyor having spaced assembly carriers and assembly mechanism comprising a rotary pocketed transfer wheel, means for directing rows of articles to the wheel pockets at one position of the wheel, a holder for a stack of wrapper sheets ad-

tudinal sides of the article row, means for making a repetitious date imprint on the outer surface of a continuous sealing strip, means for adhesively conditioning the inner surface of the strip, means for advancing the strip in proximity to advancing assemblies, and means for applying the strip adhesively to successive assemblies to seal their wrappers.

17. In packaging mechanism, means for advancing a cylindrical row of similar articles, means for associating it with a longitudinal wrapper to form an initial package assembly, means for advancing the assembly, means for forming the wrapper about longitudinal sides of the article row, means for adhesively conditioning a surface of a continuous sealing strip, means for applying the adhesive surface of the strip to successive assemblies to seal their wrappers, and means for severing the sealing strip between adjacent assemblies.

18. In packaging mechanism, means for advancing a cylindrical row of similar articles, means for associating it with a longitudinal wrapper to form an initial package assembly, means for advancing the assembly, means for forming the wrapper about longitudinal sides of the article row, means for making a repetitious date imprint on the outer surface of a continuous sealing strip, means for adhesively conditioning the inner surface of the strip, means for advancing the strip in proximity to advancing assemblies, means for applying the strip adhesively to successive assemblies to seal their wrappers, and means for severing the sealing strip between adjacent assemblies.

19. In packaging mechanism, means for advancing a cylindrical row of similar articles, means for associating it with a longitudinal wrapper to form an initial package assembly, means for advancing the assembly, means for forming the wrapper about longitudinal sides of the article row, means for adhesively conditioning a surface of a continuous sealing strip, means for applying the adhesive surface of the strip to successive assemblies to seal their wrappers, and means for excising portions of the sealing strip between adjacent assemblies.

20. In packaging mechanism, means for advancing a cylindrical row of similar articles, means for associating it with a longitudinal wrapper to form an initial package assembly, means for advancing the assembly, means for forming the wrapper about longitudinal sides of the article row, means for making a repetitious date imprint on the outer surface of a continuous sealing strip, means for adhesively conditioning the inner surface of the strip, means for advancing the strip in proximity to advancing assemblies, means for applying the strip adhesively to successive assemblies to seal their wrappers, and means for excising portions of the sealing strip between adjacent assemblies.

21. In packaging mechanism, means for producing successive initial assemblies, each consisting of a column of similar cylindrical articles and a wrapper, means for advancing the assemblies in the axial direction of the article columns, means for forming each wrapper about its article column, means for sealing the wrappers, and means for turning in projecting end margins of the wrappers upon circular margins of end articles in the column.

22. In packaging mechanism, means for producing successive initial assemblies, each consisting of a row of similar articles and a wrapper, means for advancing the assemblies in the longitudinal direction of the article rows, means for forming each wrapper about its article row, means for sealing the wrappers, and means acting in the longitudinal advancing position of the assemblies for rotating them and concurrently turning in projecting end margins of the wrappers.

23. In packaging mechanism, means for producing successive initial assemblies, each consisting of a row of similar articles and a wrapper, means for advancing the assemblies in the longitudinal direction of the article rows, means acting during such advance for forming each wrapper about its longitudinal row, means for sealing the wrappers, means for turning in projecting end margins of the wrappers, means for moving the assemblies laterally, and means acting during such lateral advance to apply end caps to the assemblies.

24. In packaging mechanism, means for producing successive initial assemblies, each consisting of a row of similar articles and a wrapper, means for advancing the assemblies in the longitudinal direction of the article rows, means for forming each wrapper about its row, means for sealing the wrappers, means for rotating the assemblies and concurrently turning in projecting end margins of the wrappers, means for moving the assemblies laterally, and means acting during such lateral movement for applying flanged caps to the ends of the assemblies.

25. In packaging mechanism, means for producing successive initial assemblies each consisting of a row of similar articles and a wrapper, means for advancing the assemblies, means for forming each wrapper about its article row, means for sealing the wrapper, means for turning in projecting end margins of the wrappers, means for advancing the assemblies laterally, and means for applying a flanged cap at an end of the assembly during its lateral movement.

26. In packaging mechanism, means for producing successive initial assemblies each

jacent to the wheel, means for moving the holder to and fro, sheet grasping means carried by the wheel in advance of each pocket to withdraw a sheet from the holder and locate it about the wheel over an upper pocket containing an article row, and means for releasing the sheet grasping means after the sheet has been placed upon one of the carriers with the article row resting on the sheet.

36. In packaging mechanism of the class described, a conveyor having spaced assembly supports and assembly mechanism comprising a rotary pocketed transfer wheel, a chute to deliver successive rows of articles to the wheel, a wrapper sheet holder adjacent to an upper portion of the wheel, pneumatic sheet grasping devices located one in advance of each pocket, a guide plate adjacent to the wheel periphery to guide the sheet and article row, and means for controlling the action of the pneumatic sheet grasping means.

37. In packaging mechanism of the class described, a conveyor having spaced assembly supports and assembly mechanism comprising a rotary pocketed transfer wheel, a chute to deliver successive rows of articles to the wheel, a wrapper sheet holder adjacent to an upper portion of the wheel, pneumatic sheet grasping devices carried one in advance of each pocket, a guide plate adjacent to the wheel periphery to guide the sheet and article row, means for intermittently rotating the wheel, and means for controlling the action of the pneumatic sheet grasping means.

38. In packaging mechanism of the class described, a conveyor provided with a plurality of spaced, substantially trough-shaped holders each adapted to receive an assembly comprising a wrapper sheet and a row of similar articles placed thereon with the article row substantially in line with the direction of conveyor movement, a guide rail at each side of the conveyor to additionally support the assembly, and means for forming and placing successive assemblies on the holders.

39. In packaging mechanism of the class described, a conveyor provided with a plurality of spaced, substantially trough-shaped holders adapted to receive an assembly comprising a wrapper sheet and a row of similar articles placed thereon with the article row substantially in line with the direction of conveyor movement, a guide rail at each side of the conveyor to additionally support the assembly, means for forming and placing successive assemblies on the holder, and additional sheet supporting and guiding means adjacent to the assembly-forming means.

40. In packaging mechanism, a conveyor having a plurality of spaced carriers each adapted to support a row of similar articles, and including a pushing member, and means for retarding the row of articles moved by the conveyor to locate it against the pushing member.

41. In packaging mechanism, a conveyor having a plurality of spaced carriers each adapted to support a row of similar articles, and including a pushing member, and means frictionally engaging edge surfaces of the individual articles to consolidate the row and locate it against the pushing member.

42. In packaging mechanism of the class described, means for advancing a succession of assemblies each consisting of a wrapper sheet and a substantially cylindrical row of superposed similar articles, and wrapper forming mechanism comprising a channel of substantially cylindrical internal form arranged to fold a wrapper sheet about the article row with one edge of the wrapper overlying the adjacent edge.

43. In packaging mechanism of the class described, means for advancing a succession of assemblies each consisting of a wrapper sheet and a substantially cylindical row of superposed similar articles, and wrapper forming mechanism comprising a channel of progressive, approximately cylindrical curvature arranged to fold a wrapper sheet about the article row with one edge of the wrapper overlying the adjacent edge.

44. In packaging mechanism of the class described, means for advancing a succession of assemblies each consisting of a wrapper sheet and a substantially cylindrical row of superposed similar articles, and wrapper forming mechanism comprising internally curved plates adapted to substantially enclose the assembly and fold the wrapper closely about the article row.

45. In packaging mechanism of the class described, means for advancing a succession of assemblies each consisting of a wrapper sheet and a substantially cylindrical row of superposed similar articles, and wrapper forming mechanism comprising progressively curved plates adapted to substantially enclose the assembly and fold the wrapper tightly about the article row with one longitudinal edge of the wrapper overlying the adjacent edge.

46. In packaging mechanism of the class described, means for advancing a succession of assemblies each consisting of a wrapper sheet and a substantially cylindrical row of superposed similar articles, and wrapper forming mechanism comprising curved plates adapted to substantially enclose the assembly and fold the wrapper closely about the article row, and means yieldably supporting the forward ends of the plates.

47. In packaging mechanism of the class described, means for advancing a succession of assemblies each consisting of a wrapper

sheet and a substantially cylindrical row of superposed similar articles, and wrapper forming mechanism comprising curved plates adapted to substantially enclose the assembly and fold the wrapper closely about the article row, means yieldably supporting the forward ends of the plates, and fixed supports for the rear ends of the plates.

48. In packaging mechanism of the class described, a conveyor having spaced, substantially trough-shaped assembly carriers, each adapted to support an assembled wrapper sheet and a substantially cylindrical row of articles with the article row substantially in line with the direction of conveyor movement, means for forming the sheet about the article row, and subsequently located wrapper sheet retaining and pressing means.

49. In packaging mechanism of the class described, a conveyor having spaced, substantially trough-shaped assembly carriers, each adapted to support an assembled wrapper sheet and a substantially cylindrical row of articles with the article row substantially in line with the direction of conveyor movement, means for forming the sheet about the article row, and subsequently located wrapper sheet retaining and pressing blocks having part-cylindrical package engaging surfaces.

50. In packaging mechanism of the class described, a conveyor having spaced, substantially trough-shaped assembly carriers, each adapted to support an assembled wrapper sheet and a substantially cylindrical row of articles with the article row substantially in line with the direction of conveyor movement, means for forming the sheet about the article row, and subsequently located wrapper sheet retaining and pressing means, said means including a movable pressing member and means for yieldingly urging it into engagement with the assembly.

51. In packaging mechanism of the class described, a conveyor having spaced, substantially trough-shaped assembly carriers, each adapted to support an assembled wrapper sheet and a substantially cylindrical row of articles with the article row substantially in line with the direction of conveyor movement, means for forming the sheet about the article row, and subsequently located wrapper sheet retaining and pressing blocks having part-cylindrical package engaging surfaces, one of the blocks being movably mounted, and means for yieldingly urging said block into engagement with the assembly.

52. In packaging mechanism of the class described, means for forming and advancing a series of embryo packages each comprising a row of similar articles and a longitudinal wrapper, means for folding the wrappers about the article rows, means for applying a continuous sealing strip to successive packages to secure longitudinal edges of the wrappers, and means for severing the strip between adjacent packages.

53. In packaging mechanism of the class described, means for forming and advancing a series of embryo packages each comprising a row of similar articles and a longitudinal wrapper, means for folding the wrappers about the article rows, means for feeding a continuous sealing strip, means for applying portions of the sealing strip to successive packages, and means for excising portions of the strip between adjacent packages.

54. In packaging mechanism of the class described, means for forming and advancing a series of embryo packages each comprising a row of similar articles and a longitudinal wrapper, means for folding the wrappers about the article rows, means for feeding a continuous sealing strip, means for applying portions of the sealing strip to successive packages, means for rendering the package engaging surface of the strip adhesive prior to application, and means for severing the sealing strip between adjacent packages.

55. In packaging mechanism of the class described, means for advancing a series of packages each comprising a row of similar articles and a longitudinal wrapper, means for feeding a continuous sealing strip, means for applying portions of the sealing strip to successive packages, means for making a date imprint at intervals on the outer surface of the sealing strip prior to application, and means for severing the sealing strip between adjacent packages.

56. In packaging mechanism of the class described, means for forming and advancing a series of embryo packages each comprising a row of similar articles and a longitudinal wrapper, means for folding the wrappers about the article rows, a strip applying roll engaging the packages, means for supplying a continuous sealing strip to the roll, and means for rendering the package engaging surface of the strip adhesive prior to passing under the roll.

57. In packaging mechanism of the class described, means for advancing a series of packages each comprising a row of similar articles and a longitudinal wrapper, means for feeding a continuous sealing strip, means for applying portions of the sealing strip to successive packages, means for rendering the package engaging surface of the strip adhesive prior to application, means for feeding a continuous tearing strip in proximity to the sealing strip, and means for applying successive portions of the tearing strip to the adhesive surface of the sealing strip and severing such portions.

58. In packaging mechanism of the class described, means for advancing a series of

packages each comprising a row of similar articles and a longitudinal wrapper, a strip applying roll engaging the packages, means for supplying a continuous sealing strip to the roll, means for rendering the package engaging surface of the strip adhesive prior to passing under the roll, means for feeding a continuous tearing strip in proximity to the sealing strip, and means for applying successive portions of the tearing strip to the adhesive surface of the sealing strip and severing such portions.

59. In packaging mechanism, means for forwarding successive packages, means for supplying strip material to the packages, and a heated device for severing the material strip between packages.

60. In packaging mechanism, means for forwarding successive packages, means for supplying strip material to the packages, a heated device for severing the material strip between adjacent packages, and means for moving the device.

61. In packaging mechanism, means for forwarding successive packages, means for supplying strip material to the packages, a hot wire, and means for moving the wire to sever the material strip between packages.

62. In packaging mechanism, means for forwarding successive packages, means for supplying strip material to the packages, and an electrically heated strip severing wire located and arranged to sever the strip between adjacent packages.

63. In packaging mechanism, means for forwarding successive packages, means for supplying strip material to the packages, an electrically heated strip severing wire, and means for moving the wire to sever the strip between adjacent packages.

64. In packaging mechanism, means for forwarding successive packages, means for supplying strip material to the packages, parallel spaced heated severing members, and means for moving the members to excise portions of the strip between adjacent packages.

65. In packaging apparatus, a conveyor for forwarding successive packages, a strip applying roll adjacent the conveyor, a sealing strip passing about the roll for application to the packages, a tearing strip roll holder, a tearing strip feed roll, a cooperating feed roll, a movable support for the latter, and a severing device carried by the movable support.

66. In packaging apparatus, a conveyor for forwarding successive packages, a strip applying roll adjacent the conveyor, a sealing strip passing about the roll for application to the packages, a tearing strip roll holder, a tearing strip feed roll, a cooperating feed roll, a movable support for the latter, and a presser carried by said support for applying the tearing strip to the sealing strip.

67. In packaging apparatus, a conveyor for forwarding successive packages, a strip applying roll adjacent the conveyor, a sealing strip passing about the roll for application to the packages, a tearing strip roll holder, a tearing strip feed roll, a cooperating feed roll, a movable support for the latter, a presser carried by said support for applying the tearing strip to the sealing strip, and a severing device carried by the movable support.

68. In packaging apparatus, a conveyor for forwarding successive packages, a strip applying roll adjacent to the conveyor, a sealing strip passing about the roll for application to the packages, a tearing strip roll holder, a tearing strip feed roll, a cooperating feed roll, a movable support for the latter, and an electrically heated severing wire carried by said movable support.

69. In packaging apparatus, a conveyor having a spaced series of article carriers, each carrier having a substantially trough-shaped upper surface and a pushing element extending above said surface, the carriers being arranged parallel to the direction of movement of the conveyor, means for producing a series of embryo packages, each consisting of a row of substantially similar cylindrical articles and a wrapper sheet having margins projecting at each end of the article row, means for placing the embryo packages successively on successive carriers with the article row superposed upon its sheet, means for folding the wrappers about the article rows during the conveyor movement, and means operating upon the successive embryo packages while arranged in axial alinement with the conveyor to turn in the wrapper margins against the end packages in the article rows.

70. In packaging apparatus, means for forwarding a series of packages each comprising substantially cylindrical package contents and a wrapper having projecting margins at the ends of the contents, in the axial direction of the contents, and means for rotating the successive packages and simultaneously crimping in said margins.

71. In packaging apparatus, means for forwarding a series of packages each comprising substantially cylindrical package contents and a wrapper having projecting margins at the ends of the contents, and means for lifting each successive package, rotating it and simultaneously turning in the wrapper margins.

72. In packaging apparatus, a conveyor having spaced package carriers adapted to support substantially cylindrical packages each comprising a wrapper having margins extending at the ends of the package con-

tents, rolls arranged one at each side of the carriers, means for moving the rolls to engage and lift and rotatably support a package, and a cooperating roll located above the package, means for driving the last named roll, and means for crimping in the wrapper margins while the package is supported and rotated by said roll.

73. In packaging apparatus, a conveyor having spaced package carriers adapted to support substantially cylindrical packages each comprising a wrapper having margins extending at the ends of the package contents, rolls arranged one at each side of the carriers, means for moving the rolls to engage and lift and rotatably support a package, and a cooperating roll located above the package, means for driving the last named roll, and crimping flanges at the ends of the last named roll.

74. In packaging apparatus, a conveyor having spaced package carriers adapted to support substantially cylindrical packages each comprising a wrapper having margins extending at the ends of the package contents, rolls arranged one at each side of the carriers, means for moving the rolls to engage and lift and rotatably support a package, and a cooperating roll located above the package, means for driving the last named roll, crimping flanges at the ends of the last named roll, one of said flanges being arranged to move endwise, and means for yieldably urging the movable flange to package engagement.

75. In packaging mechanism, means for producing embryo packages each comprising substantially cylindrical contents and a wrapper having inturned end margins, means for moving the embryo packages laterally, and means for applying a flanged end cap to each of successive packages during their lateral advance.

76. In packaging mechanism, means for producing embryo packages each comprising substantially cylindrical contents and a wrapper having inturned end margins, and means for advancing the packages laterally and simultaneously applying end caps.

77. In packaging mechanism, means for producing embryo packages each comprising substantially cylindrical contents and a wrapper having inturned end margins, means for advancing the packages laterally and simultaneously rotating them, and means for applying end caps during such rotative advance.

78. In packaging mechanism, means for producing embryo packages each comprising substantially cylindrical contents and a wrapper having inturned end margins, means for advancing the packages laterally, a cap supply chute adjacent to one side of the advancing package roll, and means for delivering an end cap from the chute to each package and pressing the cap in place.

79. In packaging mechanism, means for producing embryo packages each comprising substantially cylindrical contents and a wrapper having inturned end margins, means for advancing the packages laterally, a cap supply chute adjacent to one side of the advancing package roll, and means for delivering an end cap from the chute to each package and pressing the cap in place, said means including yieldable cap engaging members substantially at the point of application.

80. In packaging mechanism, means for producing embryo packages each comprising substantially cylindrical contents and a wrapper having inturned end margins, and means for applying adhesive to end edges of the advancing packages.

81. In packaging mechanism, means for producing embryo packages each comprising substantially cylindrical contents and a wrapper having inturned end margins, means for advancing the packages laterally, and glue applying devices engaging end edges of the packages during their advance.

82. In packaging mechanism, means for producing embryo packages each comprising substantially cylindrical contents and a wrapper having inturned end margins, means for advancing the packages laterally and simultaneously rotating them, means for applying adhesive to end edges of the packages during such advance, and means for applying end caps.

83. Packaging mechanism, comprising means for forming and advancing a series of packages each consisting of substantially cylindrical contents and a wrapper having an edge to be sealed, means for applying a continuous sealing strip to successive packages to seal their wrappers, and means for severing the strip between consecutive packages.

84. Packaging mechanism, comprising means for advancing a series of packages each consisting of substantially cylindrical contents and a wrapper having an edge to be sealed, means for applying a continuous sealing strip to successive packages to seal their wrappers, and means for excising portions of the strip between adjacent packages.

85. Packaging mechanism, comprising means for forming and advancing a series of packages, each consisting of substantially cylindrical contents and a wrapper having an edge to be sealed, means for adhesively conditioning and applying a continuous sealing strip to successive packages to seal their wrappers, and means for severing the strip between consecutive packages.

86. Packaging mechanism, comprising means for advancing a series of packages

each consisting of substantially cylindrical contents and a wrapper having an edge to be sealed, means for adhesively conditioning and applying a continuous sealing strip to successive packages to seal their wrappers, and means for excising portions of the strip between adjacent packages.

Signed at Brooklyn, in the county of Kings and State of New York, this 12th day of March, A. D. 1921.

JONATHAN PETERSON.

Signed at Chicago, in the county of Cook and State of Illinois, this 9th day of March, 1921.

JAMES C. THOM.