April 23, 1929. A. W. KATH ET AL 1,709,984

WRAPPING MACHINE

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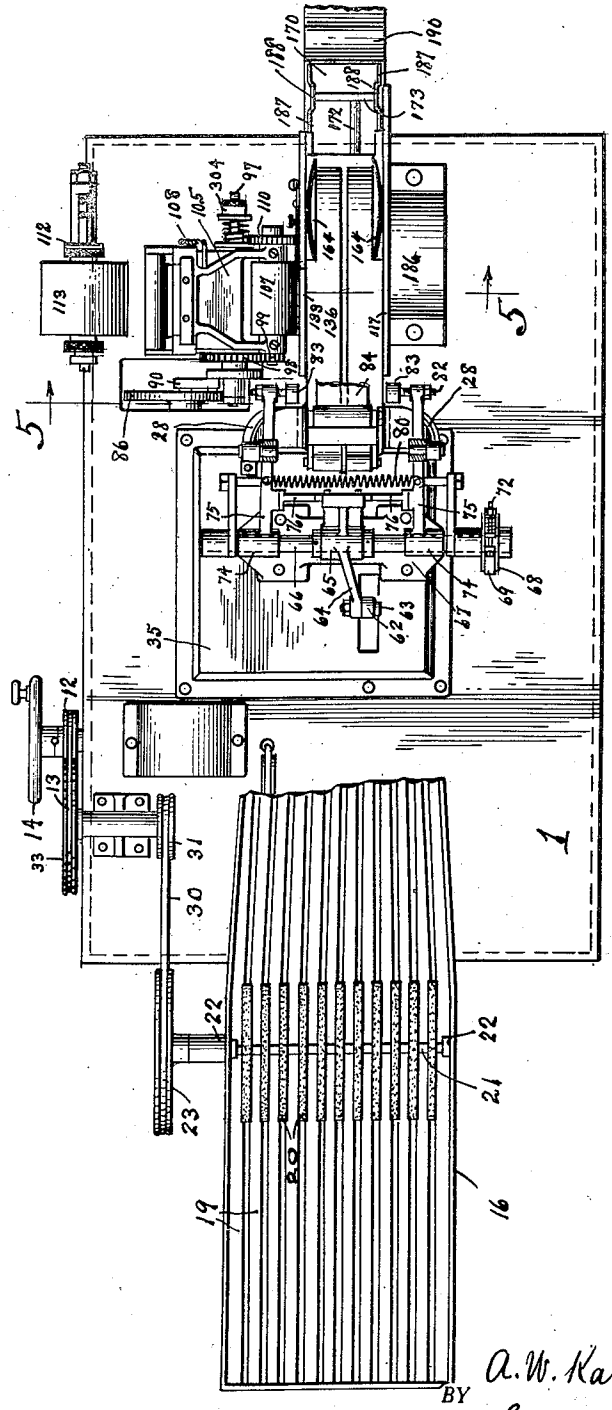


Fig. 1.

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WRAPPING MACHINE

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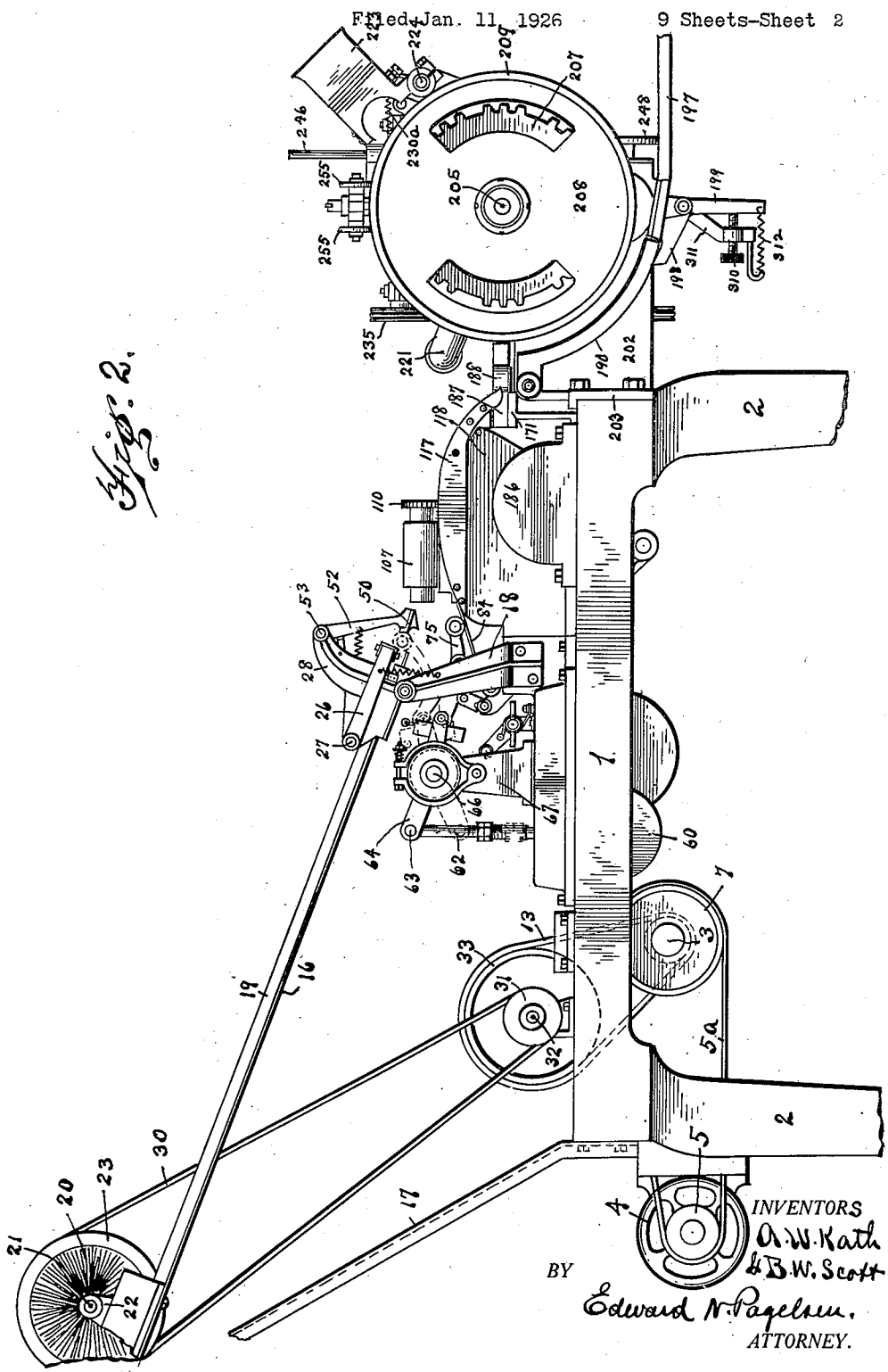


Fig. 2.

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WRAPPING MACHINE

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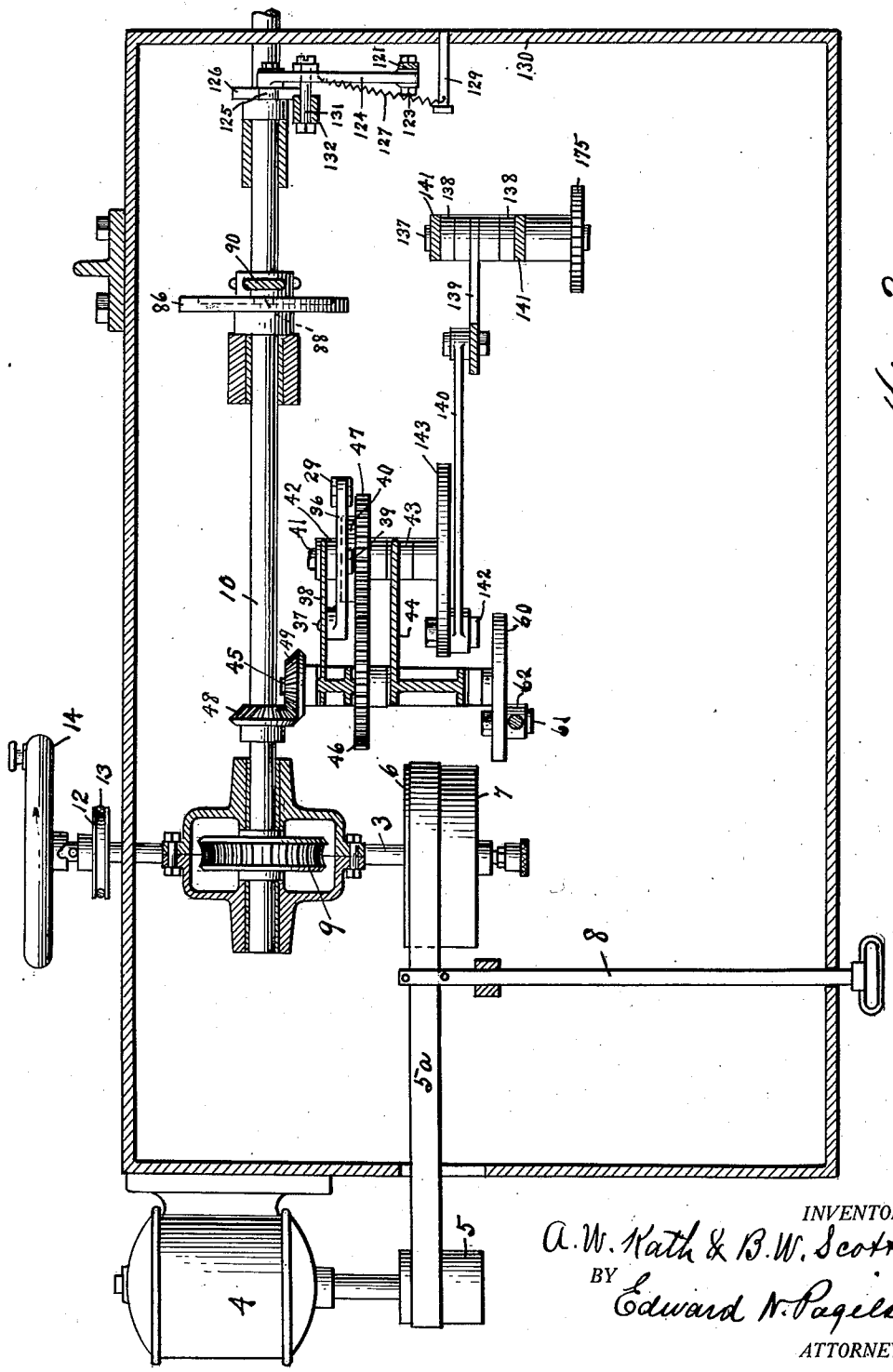


Fig. 3.

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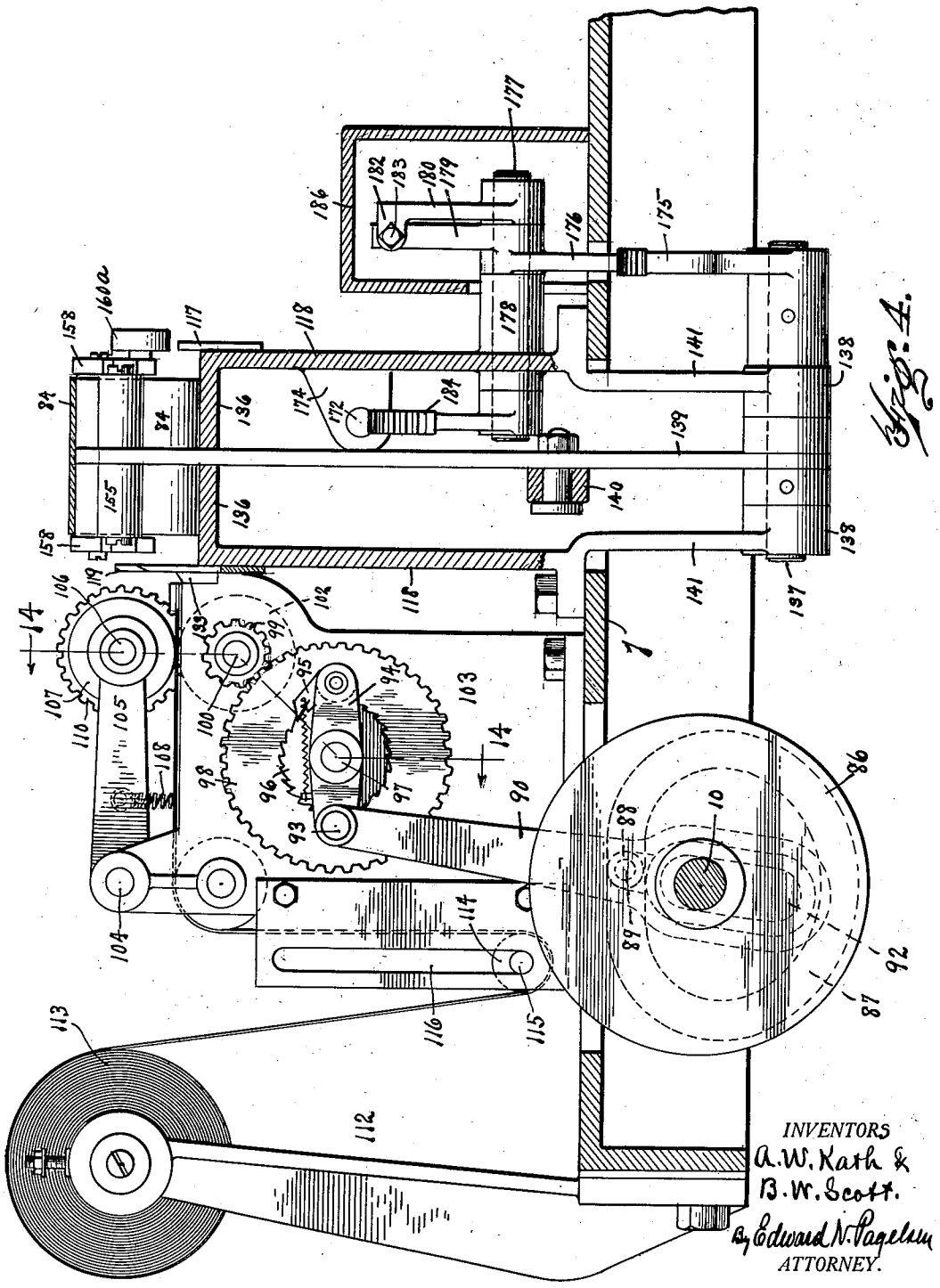


Fig. 4.

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WRAPPING MACHINE

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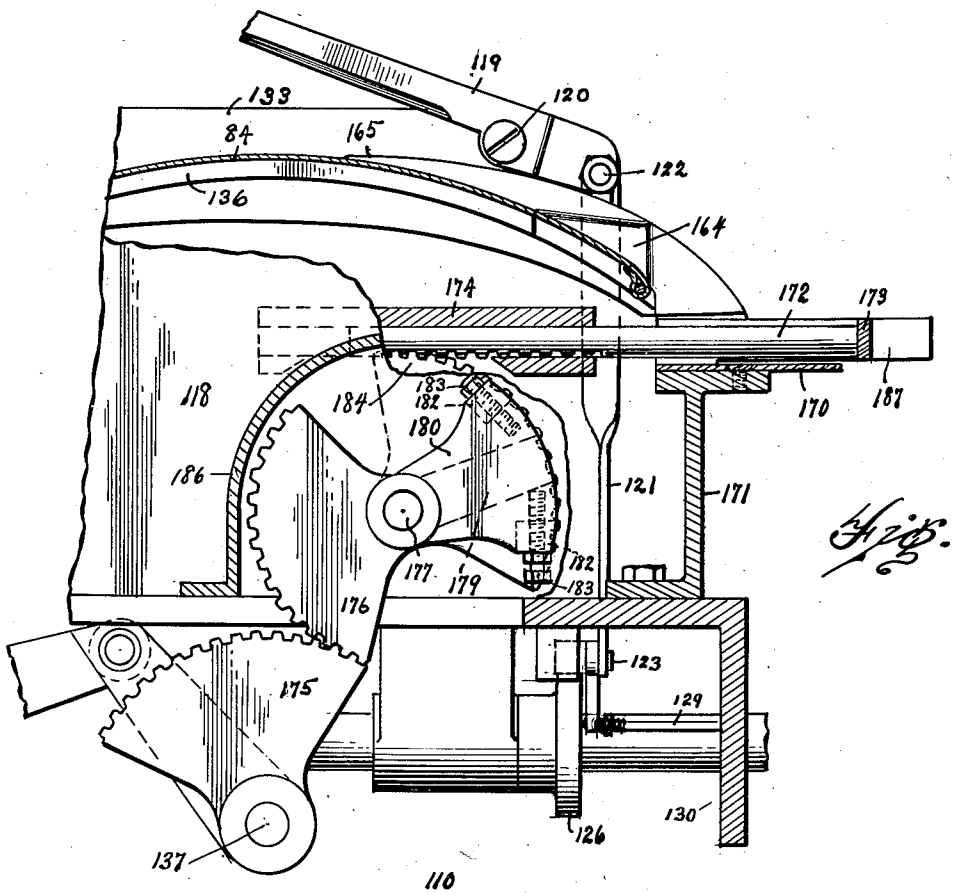


Fig. 5.

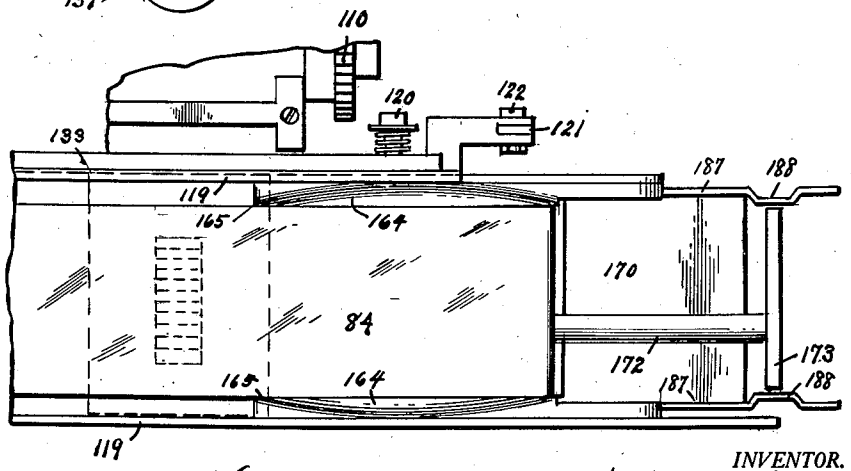


Fig. 6.

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WRAPPING MACHINE

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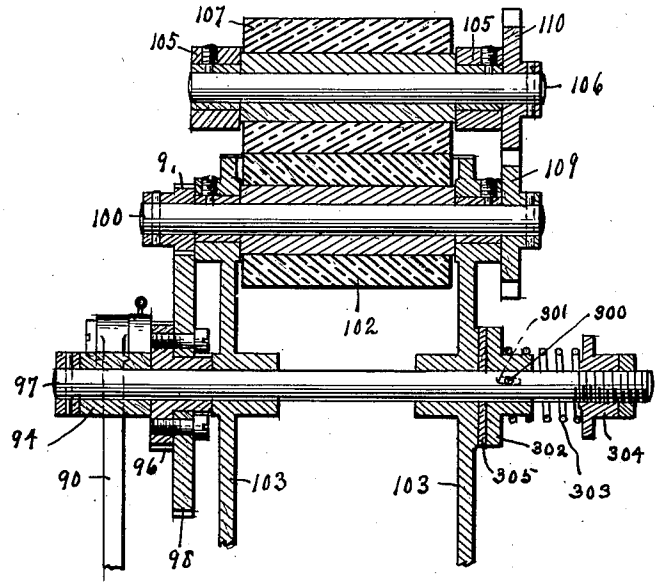


Fig. 9.

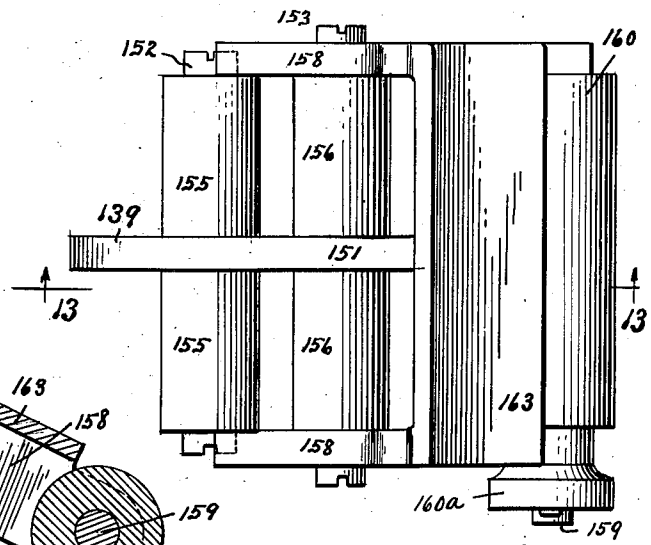


Fig. 7.

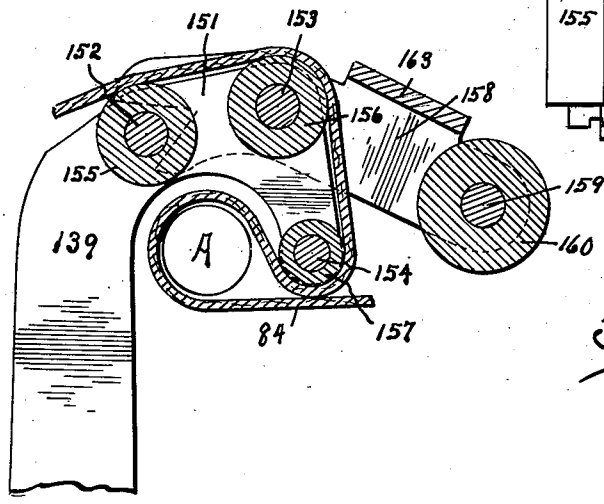


Fig. 8.

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WRAPPING MACHINE

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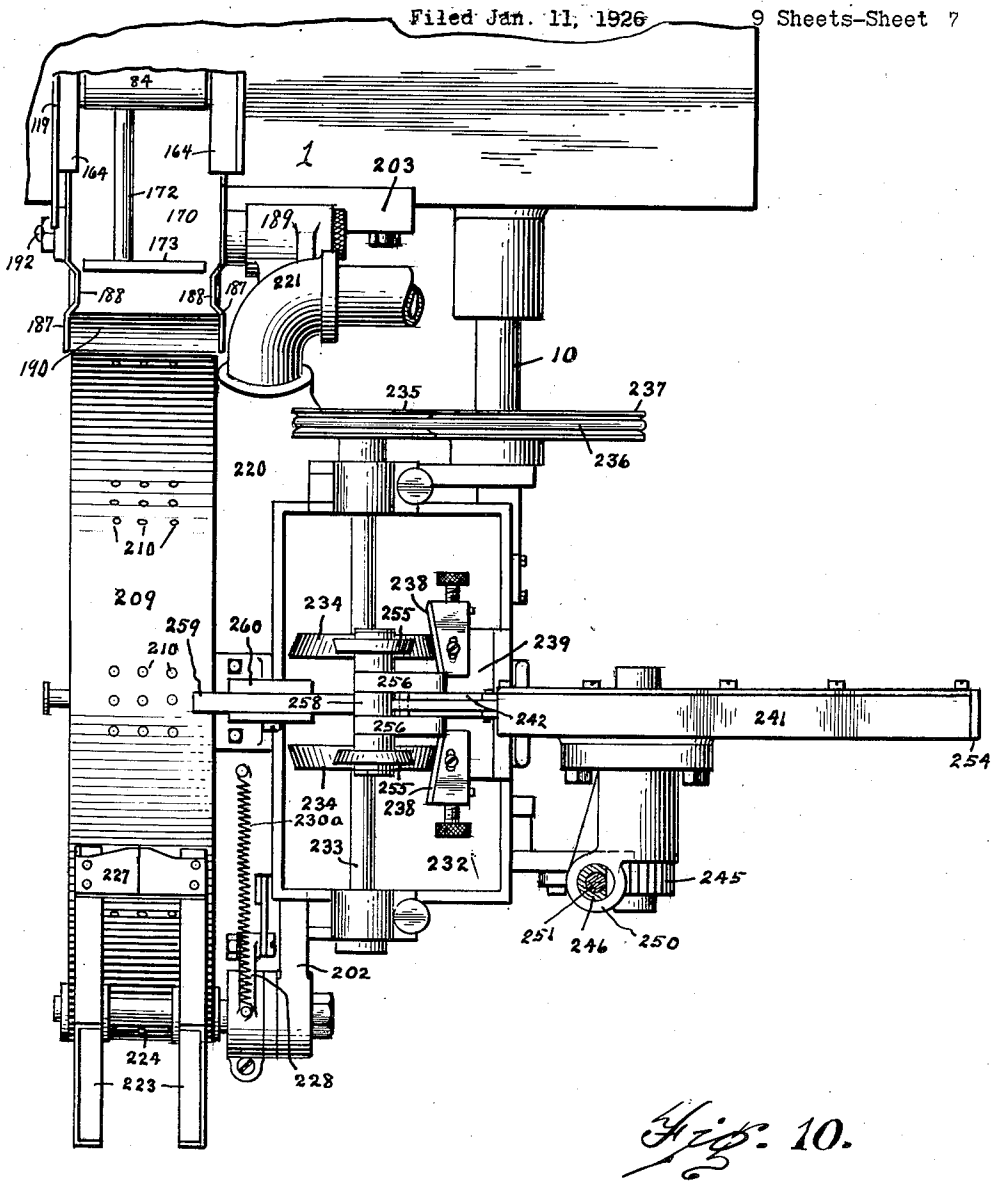


Fig. 10.

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WRAPPING MACHINE

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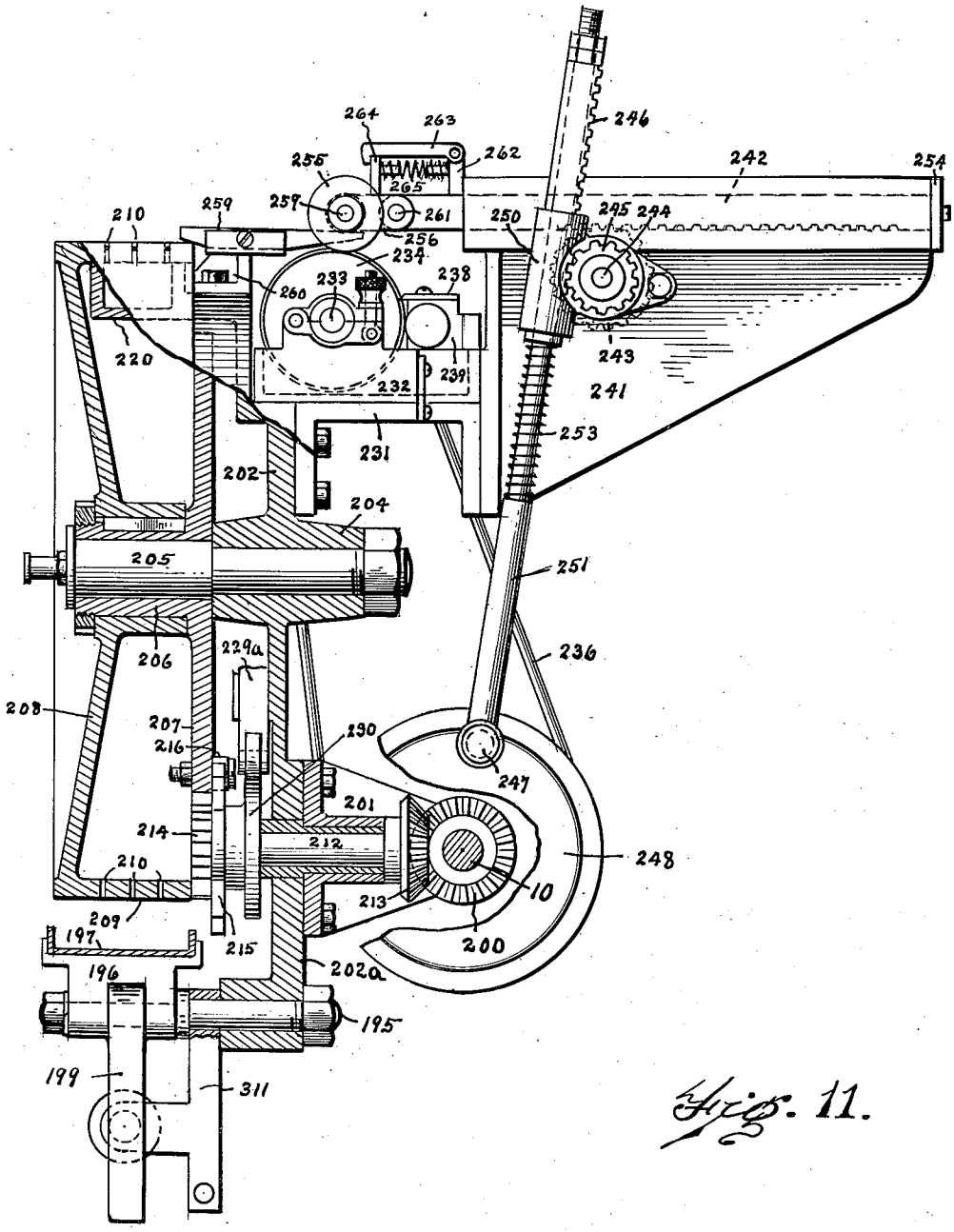


Fig. 11.

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WRAPPING MACHINE

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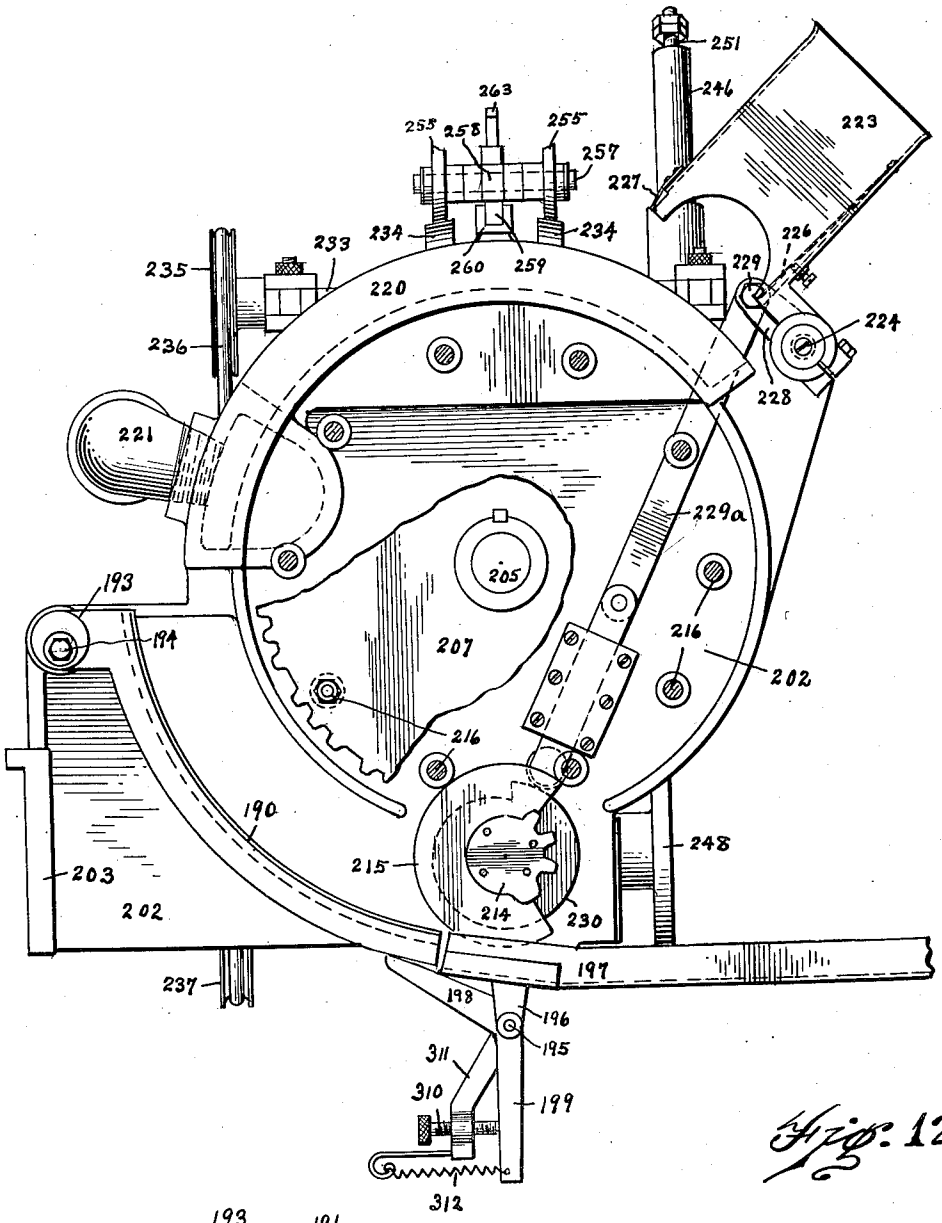


Fig. 12.

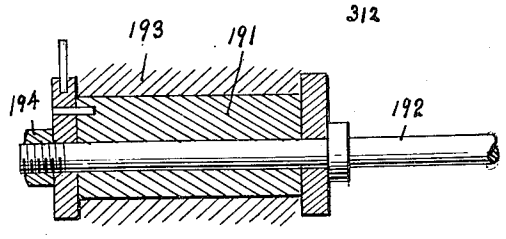


Fig. 13.

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Patented Apr. 23, 1929. 1,709,984

UNITED STATES PATENT OFFICE.

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WRAPPING MACHINE.

Application filed January 11, 1926. Serial No. 80,449.

This invention consists of novel co-operating means for arranging a predetermined number of circular discs or lozenges of metal, confectionery or other materials into a cylinder or stack, wrapping a sheet of any desired material, preferably metal foil, around the stack, the sheet being of sufficient length to permit its edges to be folded in onto the end lozenges of the stack to prevent the escape thereof.

It further consists of means for wrapping and securing a label around the already wrapped stack of lozenges.

It also consists of the details of construction illustrated in the accompanying drawings and particularly pointed out in the claims.

In the accompanying drawings, Fig. 1 is a plan of this improved wrapping machine with a portion of the assembling and carrying devices omitted. Fig. 2 is a side elevation of the machine. Fig. 3 is a plan of the driving mechanism beneath the table which is broken away. Fig. 4 is a section on the line 4—4 of Fig. 1, on a larger scale. Fig. 5 is a partial longitudinal section showing the rear end of the wrapping belt and Fig. 6 is a plan thereof. Fig. 7 is a plan of the rollers for folding the wrapping belt around the articles to be wrapped. Fig. 8 is a section on the line 13—13 of Fig. 7. Fig. 9 is a section on the line 14—14 of Fig. 4. Fig. 10 is a plan of the labeling mechanism. Fig. 11 is a vertical section of the label carrier and of the driving mechanism therefor. Fig. 12 is a side elevation thereof. Fig. 13 is a longitudinal section of the support for the guide plate.

Similar reference characters refer to like parts throughout the several views.

The present machine is composed of a rack or receiver for the discs to be wrapped embodying a series of converging troughs; a carrier which engages the two end discs of the stack to be wrapped and, pressing the discs together, conveys the stack to a wrapping belt; means to feed a strip of metal foil onto this belt and sever the strip to leave a sheet on the belt; means to roll the stack of discs into this sheet by means of the belt and carry the stack onward between folders which fold the ends of the sheet onto the ends of the stack, the stack within the fold of the belt continuing to the discharge end of the belt; a label holder and a wheel provided with suction holes to take the lowest label from the holder and carry it to the wrapped stack of discs just discharged from the wrapping belt, the ends of the label being coated with cement before it reaches the stack of discs, the label continuing around with the wheel; means to cause the stack to roll on the surface of the wheel and thus wrap the label around it; and mechanism to cause the several devices to operate harmoniously and in order.

All of this mechanism is mounted on the top and on the lower side of the table 1 which may be supported on legs 2, and is shown to be driven by a cross shaft 3 (Fig. 3). Any desired means may be employed to drive this shaft, an electric motor 4 being shown provided with a pulley 5 from which a belt 5^a runs to the tight and loose pulleys 6 and 7 on the cross shaft, a shifter 8 for the belt being supplied. This cross shaft is provided with a worm (not shown) which meshes with a worm wheel 9 on the main shaft 10. A pulley 12 for the round belt 13 is also mounted on this cross shaft. A hand wheel 14 may be employed to turn the cross shaft but this is preferably normally disengaged by sliding it along the shaft to relieve the machine of the inertia of this wheel. The main shaft 10 makes one rotation for each operation of the machine.

The receiver for the discs to be wrapped is shown in Figs. 1 and 2 and consists of an inclined plate 16 supported by brackets 17 and 18 and having a series of ribs or partitions 19 on its upper surface, which ribs may be parallel at their upper ends but converge lower down. The discs are dumped onto the upper end of the receiver and are caused to assume vertical positions in the spaces between these ribs by means of the rotating brushes 20 on the shaft 21 mounted in bearings 22 that are carried by the receiver, the pulley 23 on this shaft being driven by a belt 30 running to the pulley 31 on a small counter shaft 32 (Fig. 2) and a second pulley 33 on this countershaft receives the belt 13.

The discs fill the troughs between the ribs

19 and roll down until stopped by spring held fingers carried by a cross bar mounted on the arms 26. These arms are pivoted on the shaft 27 mounted in the brackets 28 at the lower end of the receiver and are swung up and down by the link 29. (Fig. 3.) This link connects to a small lever 36, pivoted at 37 to a bracket 38 (Fig. 3) which extends down from a platform 35 on the table 1. This lever carries a roller 39 which runs on the cam 40 mounted on the shaft 41 carried in bearings 42 and 43, formed on the brackets 38 and 44. This shaft connects to the shaft 45 by means of similar gears 46 and 47, and the latter shaft is driven from the main shaft 10 by means of similar gears 48 and 49. At each rotation of the main shaft therefore, a row of discs is permitted to run down until they are stopped by the swinging stop bar 50 which is carried by arms 52 mounted on the shaft 53 carried by the brackets 28.

The carrier to transfer the stack of discs from above the apron 56 to the wrapping belt is indicated in Figs. 1, 2 and 3. A crank disc 60 on the end of the shaft 45 (Fig. 3) carries a crank pin 61 which extends through the lower end of the connecting rod 62, and the shaft 45 makes one turn for each cycle of the machine. The connecting rod 62 is attached to the pin 63 at the end of the crank arm 64 attached to the hub 65 which is rotatable on the shaft 66 carried by a pedestal 67. A brake drum 68 on one end of this shaft, engaged by a band 69 carried by the pedestal 67, restrains the rotation of this shaft. The friction is controlled by a bolt 72, and a spring shown in Fig. 2.

Loose on the shaft 66 are the hubs 74 to which the arms 75 connect. Cam plates 76 are attached to the inner sides of these arms, which are normally drawn toward each other by the spring 80 shown in Fig. 1.

When the rod 62 moves down the cam plates 76 will cause the arms 75 to separate, and they are then swung up separated until they reach the position shown in dotted lines in Fig. 2. The spring 80 pulls the arms 75 toward each other. The screw threaded and adjustable pins 82 at the ends of these arms have large heads 83 which engage the outer discs of the stack resting against the cross bar 50 and the spring 80 presses the discs together to constitute a stack. The arms 75 swing down to the position shown in Fig. 2, placing the stack of discs on the wrapping belt 84. The arms separate while at their lower position to release the stack on the belt 84 and come together at the upper position to take up the stack of discs. They are separated sufficiently to pass the cross bar 50 when they move up, but when they come down, they simply swing these supports out of the way the arms 52 carrying the cross bar 50 being swung out, as shown in Fig. 2.

Before taking up the wrapping belt, the mechanism for placing the sheet of tin, aluminum or other metal foil onto the belt will be first described. It is to be understood, however, that any other mechanism for supplying wrapping material may be employed.

Referring to Fig. 3, a cam disc 86 is mounted on the shaft 10, this disc being shown in Fig. 4 to have a groove 87 to receive the roller 88 on a pin 89 carried by the rod 90 which has a slot 92 to receive the shaft 10 whereby it is held in proper position. This rod connects to the pin 93 on the arm 94 which carries a pawl 95 in engagement with the ratchet wheel 96. This wheel is mounted on the shaft 97 and turns the gear 98 which meshes with the pinion 99 on the shaft 100 of the lower feed roller 102. This shaft is mounted in a small frame 103 on the table 1. A shaft 104 carries the arms 105 in whose free ends is mounted the shaft 106 of the upper feed roller 107, the arms being pulled down by the spring 108 and the rollers being operatively connected by gears 109 and 110. The brackets 112 carry the supply 113 of foil, and the slack is taken up by a roller 114 whose reduced ends 115 slide in slots 116.

The foil is stopped by a small plate 117 carried by the pedestal 118 on which the wrapping belt is supported. It is cut off by a blade 119, Fig. 5, mounted on a pin 120 and actuated by a link 121 attached to the pin 122 on the blade and to the pin 123 at one end of the lever 124 whose other end carries a roller 125 that rides on the disc cam 126 mounted on the shaft as shown in Fig. 3. The disc 126 has a notch into which the roller 125 is pulled by the spring 127 extending from an arm on this lever to the pin 129 projecting from the flange 130 on the table. The lever 124 is mounted on a pin 131 extending from a small bracket 132 (Fig. 3) projecting down from the table top. When the roller 125 is pulled into its notch, the free end of the shear member 119 is swung down to coact with the stationary shear member 133 attached to the edge of the frame 103. The shaft 97 (Fig. 9) which carries the ratchet wheel 96 and gear 98 of the feeding mechanism for the wrappers is preferably provided with a restraining device, consisting of a pin 300 extending through the shaft 97 and the slot 301 in the hub 302, the spring 303, and the nut 304 to regulate the pressure between this hub 302 and the friction disc 305.

The wrapping belt.

The pedestal 118 has an arcuate two-piece top 136 whose axis is that of the shaft 137 supported in bearings 138 carried by the arms 141 extending down from the pedestal 118 (Fig. 5). The top is slotted longitudinally of the machine to permit the passage of the arm 139 which is secured to this shaft to swing under the thrust of the link 140 connected to the crank pin 142 on the crank 143 of the shaft

41. The wrapping belt 84 lies on the top 136.

The arm 139 has a curved neck 151 (Figs. 7 and 8) which carries the pins 152, 153 and 154, on which the pairs of rollers 155, 156 and 157 are mounted. The ends of the pin 153 carry the side plates 158 of a small frame which supports the shaft 159 of the roller 160 which functions to roll down the sheet of foil which has been deposited on the belt as before described. The plates 158 are formed with notches 162 to receive the ends of the shaft 152 whereby the movements of the roller 160 are limited. The side plates 158 may be connected by a bridge 163. This roller 160 may be omitted when stiff foil is used. The use of the guide roller 160ª on one end of the shaft 159 will be explained later on.

When a stack of discs has been placed on the belt by the arms 75, the arm 139 is at the forward end of its stroke. The arm 139 then swings rearwardly, the belt slipping over the rollers 155, 156 and 157, as shown in Fig. 8, forming a loop around the stack of discs A, at which instant the arms 75 separate to permit the discs to be rolled along on the two-part top 136.

The two curved bars 164 are attached to the top 136 near its discharge end and they fold in the projecting edges of the wrapper. Their forward ends 165 have substantially no height while the height of their rear ends is substantially the diameter of the discs.

The final movements of the arm 139 and the rollers carried thereby and of the wrapping belt serve to drop the wrapped stack of discs on a small table 170 supported on a bracket 171 (Fig. 5), and the stack is rolled on this table to the labeling mechanism by the push rod 172 having a cross bar 173 at its outer end, which rod is slidable in the guide 174 extending from one side of the pedestal 118 (Fig. 4). In order that the wrapped stack may become free of the belt and particularly of the roller 160, a side plate 117 is so formed with an extension 164 (Fig. 7) that the roller 160ª on the shaft of the roller 160 will be elevated relatively to the table top 136. These rollers 160 and 160ª may be omitted when the wrapping foil is comparatively heavy.

A segment 175 is attached to the shaft 137 and meshes with a segment 176 loose on the shaft 177 mounted in a boss 178 on the pedestal 118. An arm 179 is connected to the segment 176 and extends up adjacent to the plate 180 attached to the shaft 177. This plate carries lugs 182 and screws 183 whereby the lost motion between the arm 179 and plate 180 is controlled. A segment 184 attached to this shaft 177 meshes with the teeth on the push rod 172 which, therefore, moves back and forth with the arm 139 but in opposite directions, and the small cross bar 173 is therefore back under the discharge end of the belt 84 when the wrapped stack rolls off it onto the table 170. This mechanism is, to a large extent, enclosed by a shield 186.

In order to prevent the wrapped stack from passing to the labeling mechanism before the time for doing so, the two plates 187 of spring metal are attached to the pedestal 171 and are formed with humps 188 which hold the stack until it is pushed out by the cross bar 173.

The labels are carried by a drum 209 (Fig. 2) and the wrapped stacks of discs are held against this drum by an arcuate guide 190 mounted on an eccentric sleeve 191 carried by the pin 192 extending from boss 189 on the plate 202 which is attached to the table 1. The guide is formed with a boss 193 of sufficient size to receive this sleeve 191, and when the nut 194 on this pin is slacked up and the sleeve 191 is turned, the distance between the upper end of the guide and the drum 209 is increased or diminished.

The plate 202 also has a downwardly extending arm 202ª which carries a pin 195 on which the boss 196 on the receiving end of the chute 197 is mounted. This boss is notched to receive a lever, one arm 198 of which extends below the discharge end of the chute 190. The other arm, 199, extends down and is engaged by a screw 310 carried by an arm 311 extending down from the pin 195. The spring 312 holds the arm 199 against this screw whereby the discharge end of the chute 190 may be accurately adjusted relative to the drum 209. As the upper end may be adjusted by the eccentric sleeve 191, the pressure between the label carrier and the wrapped discs may be accurately predetermined.

The labeling mechanism.

The stack of discs has applied to it a label or wrapper by the mechanism illustrated in Figs. 2 and 10 to 13 inclusive. This mechanism is actuated by the shaft 10 which extends through the flange 130, as shown in Fig. 3, and carries a bevel gear 200 near its rear end, the shaft being journaled in a bracket 201 attached to the main supporting plate 202 which is provided with a flange 203 adapted to be attached to the end of the table 1, as shown in Figs. 2 and 12. A boss 204 on this plate 202 carries a pin 205 on which the hub 206 of the mutilated gear 207 is journaled. On this hub is secured the web 208 of the drum 209 which is formed with groups of suction holes 210.

The bracket 201 also supports a bearing for the short shaft 212 on one end of which is mounted the bevel gear 213 which meshes with the bevel gear 200 on the shaft 10, and on the other end is mounted the mutilated pinion 214 (Fig. 12) which engages with the gear 207, and the notched disc 215 which engages the stop pins 216 on the gear 207. These pins are all shown in Fig. 12, although most of the gear is broken away. The shaft

212 rotates constantly, causing an intermittent movement of the gear 207 and of the drum 209, the distance traveled by the periphery of the drum being the spacing of the groups of holes 210 therein, and one movement occurring for each cycle of the machine.

The drum is omitted in Fig. 12 in order to show the suction chamber 220 from which a pipe 221 extends to any desired type of pump. The chamber 220 is a cylindrical channel with open periphery and the outer edges of its sides are so close to the inner surface of the drum 209 that sufficient suction is had at the holes 210 to withdraw a label from its holder and hold it against the drum until it is in contact with a stack of discs, or about one-third the circumference of the drum.

The labels are placed in a holder 223 which is mounted on a shaft 224 carried by the main plate 202 and the labels are held in the holder by springs 226 and 227 from falling out through the open bottom. An arm 228 attached to this shaft carries a pin 229 (Fig. 12) from which a two-piece connecting rod 229[a] extends to a cam 230 on the shaft 212, which cam permits the holder to swing down under pull of the spring 230[a] (Fig. 10) to press the lowermost label against the drum 209, and as there is suction at that point, the next holes 210 will cause this label to slide out of the holder and travel with the drum.

Attached to one side of the plate 202 (Fig. 11) is a bracket 231 which supports a glue box 232 over which a shaft 233 is rotatably mounted. On this shaft are the rollers 234 which dip into the glue and the pulley 235 which receives the belt 236, passing around the pulley 237 on the shaft 10, whereby these rollers are turned. Scrapers 238 carried by a bracket 239 mounted on the glue box determine the thickness of the coating of glue on these rollers. The bracket 231 also supports a plate 241 (Fig. 11) along whose upper edge is a guide for a rack bar 242 meshing with a gear 243 on the shaft 244 on whose outer end is a gear 245 meshing with the rack sleeve 246 which is slidable on the rod 251 whose lower end is mounted on a pin 247 carried by a crank 248 on the rear end of the shaft 10. The rack sleeve 246 is slidable in a sleeve 250 pivoted on the shaft 244 and is held up by a spring 253, sufficiently stiff to cause the rack bar 242 to move across the label carrier, but yields when this rack bar contacts with the stop plate 254, which positions the small rollers 255 on the rollers 234 during a part of the rotation of the shaft 10.

The rack bar 242 carries a pin 261 on which the parallel links 256 are mounted and these carry the shaft 257 for the rollers 255. Between these links is a roller 258 which runs on the support 259 carried by a bracket 260 and the suction chamber 220. A small post 262 on the rack bar 242 carries a latch 263 adapted to engage the post 264 on the links 256, a spring 265 tending to separate these posts and press down the rollers 255.

When no glue is desired on the labels, the links 256 are swung up so that the latch 263 holds the rollers 255 in raised position. When the latch is swung up to release the post 264, then the spring 265 presses the rollers 255 down onto the label carrier each time these rollers are moved out beyond the support 259.

Glue is applied in two narrow lines to the ends of each label during the time the drum 209 is at rest and the label is in such position when the push rod 172 pushes a wrapped stack against the drum 209 that one of these lines of glue will be engaged by the stack. As the drum immediately turns and as the suction is released at that point, the wrapped stack will roll a label around itself and continue this rolling until the discharge end of the guide 190 is reached.

The operation of this machine has been explained as the various parts were described. The proportions and details of these parts may all be changed by those skilled in the art without departing from the spirit of our invention as set forth in the following claims.

We claim:—

1. In a wrapping machine for stacks of discs, an intermittently rotatable cylindrical label carrier provided with groups of holes, means to cause a suction through said holes, a label container, means to press the labels therein against said carrier so that the lowermost labels may be withdrawn therefrom one by one by said suction, means to apply a cement to the labels on the carrier, a cylindrical guide extending partially around the carrier, and means to place wrapped stacks of discs one by one at the entrance of the space between the guide and carrier so said stacks may be drawn into said space and roll therein on the carrier and the labels thereon so that the stacks may cement the labels to themselves.

2. In a wrapping machine for stacks of discs, an intermittently rotatable cylindrical label carrier provided with groups of holes, means to cause a suction through said holes, a label container, means to press the labels therein against said carrier so that the lowermost labels may be withdrawn therefrom one by one by said suction, means to apply a cement to the labels on the carrier, a cylindrical guide extending partially around the carrier, means to place wrapped stacks of discs one by one at the entrance of the space between the guide and carrier so said stacks may be drawn into said space and roll therein on the carrier and the labels thereon so that the stacks may cement the labels to themselves, and means to adjust the space between the guide and carrier so as to prevent slippage between the stacks and the carrier.

3. In a wrapping machine for stacks of

discs, an intermittently rotatable cylindrical label carrier provided with groups of holes, means to cause a suction through said holes, a label container, means to press the labels therein against said carrier so that the lowermost labels may be withdrawn therefrom one by one by said suction, means to apply a cement to the labels on the carrier, a cylindrical guide extending partially around the carrier, and means to place wrapped stacks of discs one by one at the entrance of the space between the guide and carrier so said stacks may be drawn into said space and roll therein on the carrier and the labels thereon so that the stacks may cement the labels to themselves, said cement applying means comprising a pair of wheels spaced so as to engage the ends of the labels, means to move said wheels across the face of the carrier and means to apply cement to said wheels.

4. In a wrapping machine for stacks of discs, an intermittently rotatable cylindrical label carrier provided with groups of holes, means to cause a suction within the carrier at such holes, a movable label container adjacent the carrier, means to so move said container against the carrier that the labels therein may be sucked therefrom by said carrier, and a guide for wrapped stacks of discs extending around a portion of the carrier to cause the stacks and labels to be rolled around between said guide and the carrier, and means for applying an adhesive to each label while on the carrier during a period of rest of the carrier to secure one end thereof.

5. In a wrapping machine, an intermittently rotating label carrier provided with groups of suction holes, a label holder adjacent the carrier from which the labels may be drawn against the carrier by suction, a cement coated roller, means to move said roller across the carrier and the labels thereon during the rest periods of the carrier, and means to cause rotatable objects to travel with the carrier to receive labels therefrom.

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