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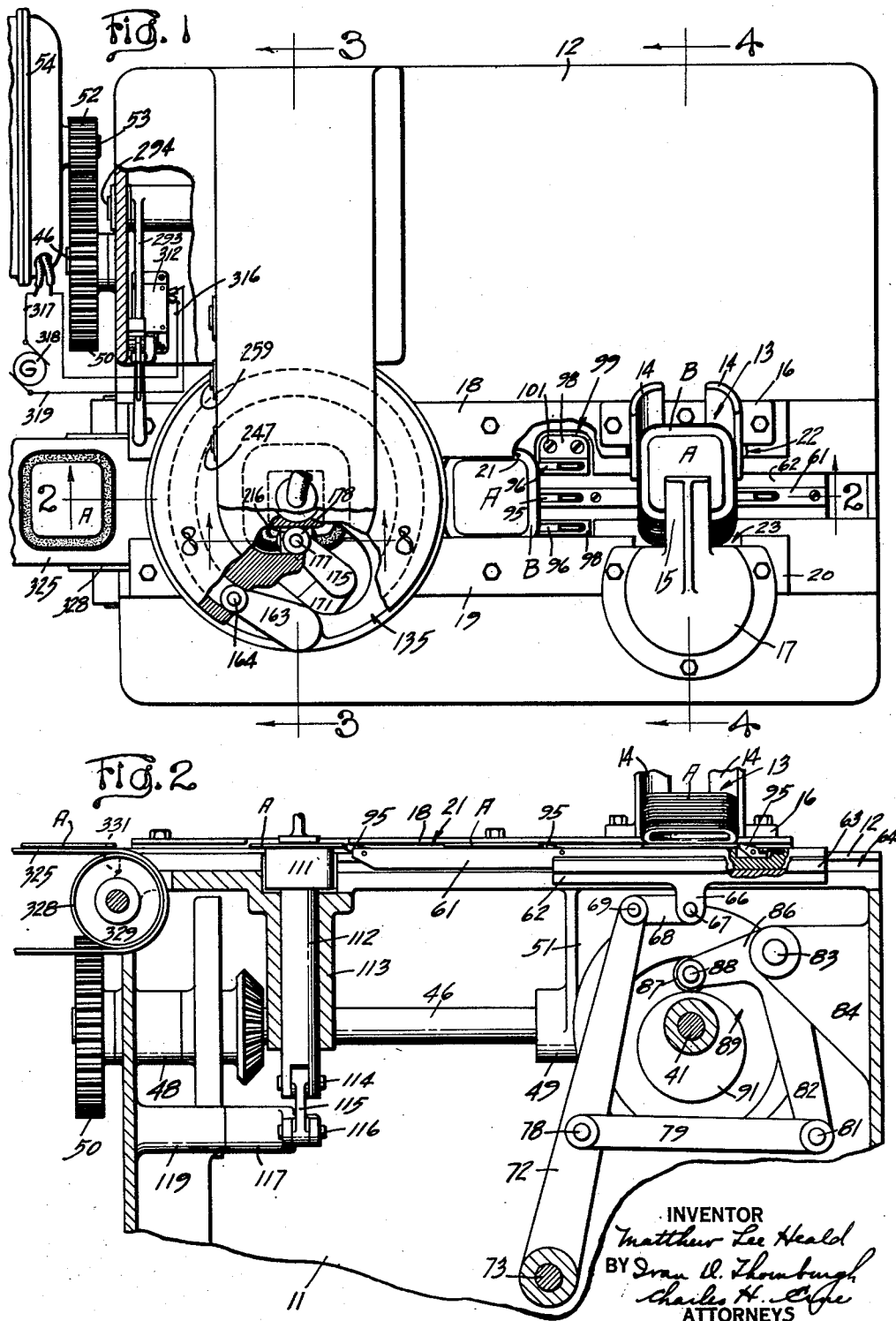
M. L. HEALD

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CAN END LINING MACHINE

Filed Sept. 23, 1933

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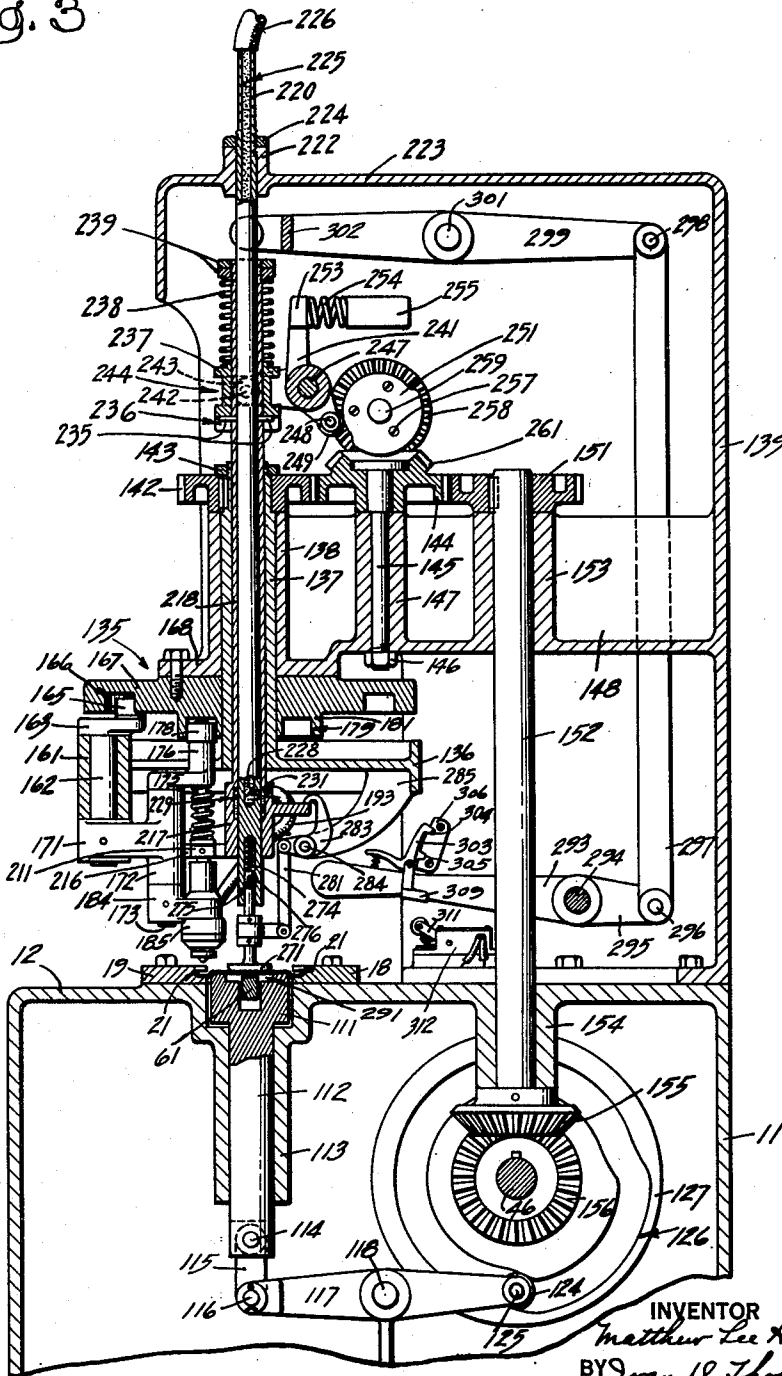
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Fig. 3



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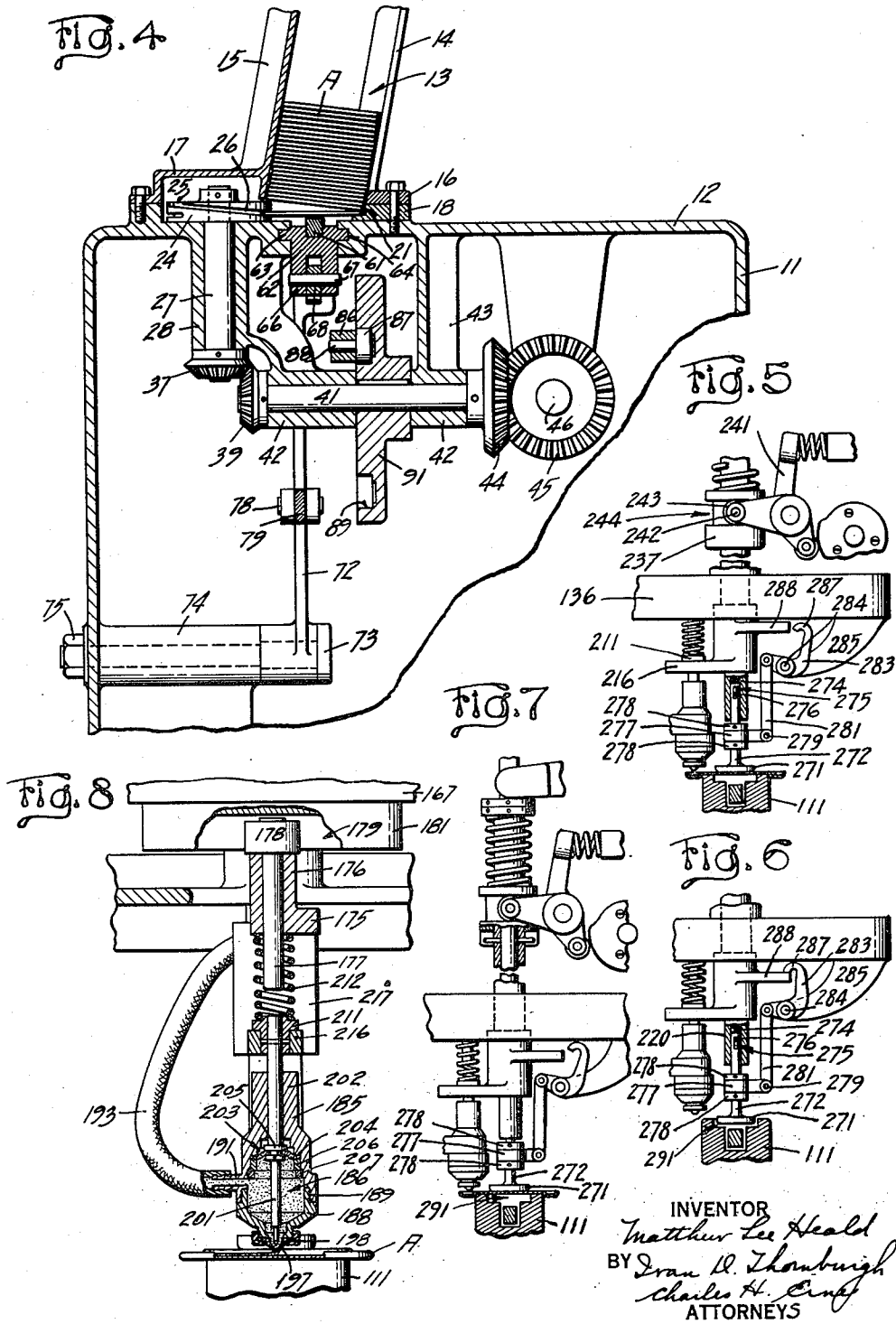
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UNITED STATES PATENT OFFICE

2,052,568

CAN END LINING MACHINE

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13 Claims. (Cl. 113—80)

The present invention relates broadly to can end lining machines for rectangular and non-circular or irregular shaped can ends and has particular reference to machines that present can ends to a movable liquid compound dispensing nozzle carried in a rotating head and actuated to follow the lining channel of the end presented with a constant lineal speed of travel so that a uniform coating of such compound is deposited in the channel of the end.

The invention contemplates the control both as to movement and as to position of a traveling nozzle which is carried by a uniformly rotating head, the nozzle being caused to describe a path of travel which coincides with the lining channel of the presented can end to be lined and the nozzle is altered in its position relative to the moving head so that it passes all lineal sections of the can end channel at a uniform rate of speed.

An object of the invention is the provision of a lining machine for applying an even coating of liquid compound or other lining material to the lining channel of a properly presented can end which is automatic in its operation so that a discharge of the compound from the nozzle is made only where there is a positioned can end to receive it and in the event that an end is not properly presented at a given cycle of operation of the machine there will be no discharge from the nozzle for that cycle.

Another object of the invention is the provision of a valve control of the nozzle discharge of a lining machine including a valve locking device which prevents accidental and inadvertent nozzle opening, a properly presented can end unlocking the device for a complete cycle of lining operations.

A further object of the invention is the provision of a lining machine of the character described having both automatic and manually controlled devices for locking the nozzle valve in non-operative position which locking operation of the manual control also prevents starting of the other operations of the apparatus in addition to the nozzle discharge.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a plan view of a can end lining machine embodying the present invention, parts

being broken away, and a wiring diagram for the driving motor being shown;

Fig. 2 is a longitudinal sectional view taken substantially along the line 2—2 in Fig. 1 with parts removed;

Figs. 3 and 4 are transverse sectional views taken substantially along the lines 3—3 and 4—4 in Fig. 1, parts being broken away;

Figs. 5, 6 and 7 are fragmentary elevations of the nozzle control devices in various positions; 10 and

Fig. 8 is an enlarged sectional view of the nozzle taken substantially along the line 8—8 in Fig. 1.

The present invention contemplates the automatic lining of irregular shaped can ends and the apparatus disclosed in the drawings by way of one embodiment thereof comprises a magazine for holding stacked can ends to be lined. Can end separating devices arranged in the magazine are provided for individually cutting out the lowermost end from the stack. The same frame supports both the magazine and a vertically movable non-rotating can end support located at a lining station. The separated end is moved on to this support by a reciprocating feed bar or conveyor.

The can end support upon receiving its superimposed end lifts the end into lining position, in which position the lining channel of the end is located directly beneath a constantly moving liquid dispensing or compound lining nozzle carried in a uniformly rotating lining head, all of these parts being located at the lining station. The nozzle is carried in a compound lever unit which is pivotally supported in the head and stationary cams operating on the lever system maintain the nozzle in a path of travel which coincides with the can end lining channel.

The lifting of the can end into lining position brings it into engagement with a yieldable, vertically movable clamping latch pad and lifts the pad unlocking a valve holding device associated with the discharge valve of the dispensing nozzle. When unlocked in this manner the nozzle valve parts may be actuated for a lining operation which actuation is automatic, the nozzle valve being moved so that the lining compound is discharged from the nozzle as the latter moves with its uniform lineal travel over the can end channel.

The lining material is thus deposited in a uniform thickness on the can end. After lining the can end is returned into lowered position by the can support and into the zone of action of the

feed bar which discharges it from the machine as a fully lined end.

Provision is also made for manually preventing opening of the nozzle valve and operation of the nozzle and this manual control is associated with the other operations of the machine to the end that dripping or leaking of the lining material from the nozzle is completely obviated.

The apparatus comprises a frame or housing 11 (Figs. 1, 3 and 4) which is formed with a top or horizontal table section 12 and both the can end magazine and the lining station are located on and extend above this table top.

The irregular shaped can ends to be lined as illustrated in the drawings are designated by the letter A and are herein shown rectangular with rounded corners and these ends have a peripheral lining channel B adapted to receive the lining material which may be the usual lining compound or any suitable sealing liquid.

The ends A to be lined are stacked within a magazine 13 which includes a pair of inclined rear supports or guide members 14 and a cooperating inclined front guide 15. Each rear support 14 loosely engages a rounded rear corner of each can end in the stack (Fig. 1) and prevents lateral shifting of the stack.

Each rear guide member 14 and the front guide 15 is indirectly carried on the frame table 12 and for this purpose each rear guide is formed with a foot 16 and the front guide is enlarged into a cylindrical housing 17 part of which is bolted directly to the table.

The bottom of the magazine 13 from which the can ends A are individually removed comes between the base or feet of the guides 14, 15 and after the lowermost can end has been brought into separated position in the bottom of the magazine it is moved laterally over the table 12 as it is transferred into the lining station. Parallel guide bars or plates 18, 19, 20 mounted on the table top, provide a path of travel leading from the magazine into the lining station.

The plate 18 is bolted on the table top at the rear of the can end passage and one end extends into the bottom of the magazine. It is on this plate that the guide feet 16 rest, bolts extending through the feet of the plate and into the frame.

Plates 19, 20 are opposite to the plate 18 and rest on the front side of the can end passage. These plates form one guiding line for the can ends but are spaced apart a slight distance where they extend into the magazine. This space provides clearance for a part of the can end separating device to be hereinafter described. The enlarged base 17 of the front guide 15 rests upon and is bolted to the plates 19, 20 the whole being bolted on the table 12.

The inner opposed faces of the plates 18, 19, 20 are grooved at 21 (Fig. 1) to form a path for the flanges of the can ends and the plate 18 is partially cut away or recessed along its upper surface at 22 where it extends into the magazine 13. This recess is just as deep as the groove 21 and forms an entrance for the flange of the end as it is separated from the stack and moved into the bottom of the magazine. In a similar way the plates 19, 20 are cut away or recessed at 23 to form an entrance for the end flange along the front side of the magazine.

In the separation of the lowermost end from the stack it is pivoted along its rear side with its flange held in the recess 22 and is brought from the inclined position it assumes in the stack

into a horizontal feeding position (note the lowermost end in Fig. 4). In this pivotal movement the front side of the end first rests upon the upper surface of a rotating cut-out or separator disc 24 (Fig. 4) and as the disc turns the edge of the flange is caught in a mouth or widened section 25 of a helical groove 26 formed in the periphery of the disc. This groove advances downwardly as the disc turns and carries the engaged can end flange through the positions just described.

Disc 24 is mounted on the upper end of a vertical shaft 27 journaled in a bearing 28 depending from the under side of the table section 12 of the frame 11. The engaged part of the disc, that is, the part extending under the stack of ends, projects in the space between the plates 19, 20 and as soon as the lowermost can end passes into the groove 26 the can end next above comes into engagement with and is supported on the upper surface of the rotating disc. The disc 24 is enclosed within the enlarged base 17 of the front guide 15, as previously mentioned.

The lower end of the disc shaft 27 carries a bevel gear 37 which meshes with a gear 39 secured to one end of a horizontal shaft 41 which is journaled in front and rear bearings 42 formed in the frame of the apparatus, the front bearing which may be an integral part with the bearing 28 and the rear bearing being formed in a bracket 43 depending from the table 12.

A bevel gear 44 is secured to the end of the shaft 41 opposite the gear 39 and meshes with a gear 45 secured to a horizontal drive shaft 46 (Figs. 2 and 4). Shaft 46 is journaled in bearings 48 and 49 formed respectively in the frame 11 and in a bracket 51 depending from the frame table 12. The shaft 46 carries a gear 50 (see also Fig. 1) which is driven by a motor pinion 52 secured to the end of the motor shaft 53 of an electric motor 54. The motor constitutes the prime operating energy for the machine.

The conveying device for transferring the separated can end A resting in the bottom of the magazine to the lining station comprises a reciprocating feed bar 61 (Figs. 1, 2 and 4) which is secured to a slide 62 having laterally projecting tongues 63 at its top which are slidably engaged in grooves 64 formed in the table top 12. These grooves are parallel to and are directly beneath the can end pathway between the guide plates 18, 19 and 20.

The slide 62 is also formed with a pair of depending lugs 66 which are pivotally secured on a stud 67 to one end of a link 68. The opposite end of link 68 is pivoted on a stud 69 carried in one end of a lever 72 which is supported on a stud 73. Stud 73 is mounted in a boss 74 (Fig. 4) projected inwardly from and which may be formed integrally with the front wall of the main frame 11, the stud being further held by a nut 75.

Oscillation of the lever 72 on its pivot 73 reciprocates the slide 62 and its feed bar 61 and for this purpose the lever is connected at 78 (Fig. 2) to one end of a link 79. The opposite end of the link is pivoted at 81 to one leg of a bell crank lever 82. The bell crank lever is pivoted on a stud 83 mounted in a bracket 84 extending from an end wall of the main frame 11, and its other leg 86 rotatably carries a cam roller 87 which is mounted on a pin 88 (see also Fig. 4). The roller 87 operates in a groove 89 of a cam 91 fixed on the shaft 41 intermediate its bearings 42.

The feed bar 61 is provided with spaced spring 75

held dogs 95 (Fig. 2) which engage behind a can end when in rear position and then advance it with the forward movement of feed bar. There is an idle station intermediate the magazine and the lining stations and accordingly the ends are advanced by two steps in their passage to the lining station.

At the idle station stationary spring held dogs 96 (Fig. 1) similar to the feed dogs 95 catch each end brought into the station and hold it at that station while the feed bar 61 is receding on its back stroke. Dogs 96 are pivoted in brackets 98 secured to the frame table 12 and the brackets are seated in pockets 99 being held in position by screws 101. There are two such dogs and brackets, one on each side of the feed bar 61.

It is on the second forward stroke of the feed bar 61 for each can end A that the end is advanced from the idle station and moved into the lining station. The non-rotating can end support which received the end at the lining station comprises a lifter pad 111 (Figs. 2 and 3). This pad is in axial alignment with the lining head rotating above the table 12 and the can end is lifted by the pad to raise it into lining position.

Lifter pad 111 is formed with a stem 112 having sliding movement in a bearing 113 formed in and depending from the under side of the frame table 12. The lowermost end of the stem 112 is pivotally connected at 114 to one end of a short link 115, the other end of which connects at 116 to one end of a lever 117. This lever 117 is centrally pivoted on a stud 118 secured in a boss 119 formed in a vertical wall of the main frame 11.

The free end of the lever carries a cam roller 124 rotatably mounted on a stud 125. The roller 124 operates in a groove 126 of a face cam 127 mounted on the horizontal drive shaft 46 adjacent the bearing 48. Rotation of the shaft 46 is thus transmitted through the cam and lever parts just described to reciprocate the stem 112 with its pad 111 to raise the can end into lining position for the lining operation which will now be described.

The lining head, designated generally by the reference numeral 135 (Figs. 1 and 3) comprises in part a head body 136 formed as an integral part of a tubular stem 137 which extends upwardly from the body and which is journaled in a bearing 138 formed in an auxiliary frame or housing 139. This housing is supported upon and is bolted to the top or frame table 12. The body 136 is rotated at a uniform speed as long as the motor 54 is running.

The upper end of the stem 137 where it projects beyond the bearing 138 carries a gear 142 which is keyed in place and further held by a lock nut 143 threaded on the upper end of the stem. The gear 142 is driven through a gear train of three gears meshing with an intermediate idler gear 144 which turns on a vertical stud 145 held in a boss 147 by a nut 146. The boss 147 is formed in a web 148 of the auxiliary frame 139.

The intermediate gear 144 also meshes with a driving gear 151 which is keyed to the upper end of a vertical shaft 152. Shaft 152 at its top end is journaled in a bearing 153 formed in the web 148. The lower end of the shaft is journaled in a bearing 154 depending from the under side of the frame table 12. Shaft 152 below this bearing carries a bevel gear 155 which meshes with and is driven by a bevel gear 156 mounted on the horizontal drive shaft 46.

The rotating head body 136 carries the com-

pound lever unit and the lining nozzle previously referred to and is formed with a boss 161 which serves as a bearing for a short vertical shaft 162 of the lever unit. This shaft projects beyond its bearing at each end and the upper end is formed into a lever arm 163 (see also Fig. 1). Lever arm 163 carries a stud 164 on which a roller 165 is rotatably mounted and by means of which the shaft 162 is oscillated. The roller 165 operates in the outer cam groove 166 of a stationary face cam 167 which is suspended from and bolted to a flange 168 formed in the lower end of the bearing 138.

The lower end of the shaft 162 carries other parts of the compound lever unit, being pinned to an arm 171 which is extended vertically on its inner side into a boss 172. This boss is hollow and provides a bearing support for a second short vertical shaft 173. The upper end of this shaft 173 is also formed as a lever arm 175 which extends laterally and upwardly as a hollow boss 176, in the hollow of which a stud 177 tightly fits.

A cam roller 178 (see also Fig. 8) is rotatably mounted on the stud and operates in a second or inner cam groove 179 cut in a lower stepped portion 181 of the cam 167. This cam control determines the position of the lining nozzle which is directly carried by the lever system including the shaft 173 and arm 175, the nozzle being located directly below and in axial alignment with the center of the cam roller 178 as will now be explained in detail (see Figs. 3 and 8).

The lower end of the shaft 173 carries a lever arm 184 which extends laterally and in the same direction as the arm 175 and the former is swelled out and projected upwardly as a nozzle housing 185. The lower end of this housing is recessed and confines a lining chamber 186 closed at its bottom by an apertured cup member 188 which is threadedly connected at 189 to the nozzle housing. A hollow nipple 191 is formed in the housing wall and projects outwardly for connection with the end of a flexible tube 193 by means of which the lining chamber is supplied with compound.

The lower apertured cup member 188 of the nozzle is tapered and a pointed nozzle tip 197 having a small orifice in its end is held on to the lower end of the cup member by a threaded clamping ring 198. The compound in passing from the nozzle flows through the orifice in the nozzle tip. This orifice is normally held closed by a needle valve 201 which is centrally located in the nozzle and has sliding movement in a bearing 202 formed in the upper portion of the housing 185. The upper ceiling of the chamber 186 is further recessed at 203 and a flexible diaphragm 204 is located in the recess. The diaphragm is connected at its center 205 with the valve and its outer edges are clamped in the housing wall by a spacing washer 206 held in position by a lock nut 207. The diaphragm is impervious and provides a liquid tight seal preventing any leakage of the compound from the top of the chamber and at the same time allows for free vertical movement of the valve.

The needle valve 201 extends above its diaphragm connection as an enlarged stem and the top of the stem is pinned to and carries a flanged collar 211 which is held under compression from above by a spring 212. Spring 212 surrounds the lower protruding end of the stud 177 which is in axial alignment with the valve stem.

The flanged collar 211 rests on and extends between the arms of a bifurcated projection 216

(Figs. 3, 5 and 8) which extends laterally from a hollow hub end 217 of a vertical sleeve 218 carried inside of the rotating head stem 137.

A stationary vertical shaft 220 extends in the center throughout the length of the sleeve 218 and protrudes both above and below. At the top the shaft is held on the frame 139 being threadedly secured in a boss 222 formed in a top horizontal wall 223 of the frame. A lock nut 224 threadedly engages a reduced end of the shaft at this point and rigidly clamps the parts together.

Shaft 220 is hollow for the greater part of its length and is used to conduct the liquid compound from any suitable source of supply into the machine so as to be available in the nozzle chamber 186. A hollow bore 225 is thus provided in the shaft and its upper end connects with the interior of a flexible tube 226 which is positioned over the shaft end and which leads from the source of supply. The bottom of the bore 225 communicates with a lateral aperture 228 cut through one side of the shaft and this aperture joins the shaft interior with a chamber 229 surrounding the shaft at this position and formed inside of the hollow hub 217 of the sleeve 218. The wall of this chamber is tapped at 231 to receive one end of the flexible nozzle tube 193 by means of which the compound is conducted to the nozzle chamber 186 (Fig. 8).

The nozzle valve 201 is raised to effect the discharge of lining compound from the nozzle chamber 186 and through the orifice of the nozzle tip by a lifting of sleeve 218 and against the resistance of the spring 212. Sleeve 218 adjacent its upper end carries two aligned pins 235 (Fig. 3) which project out from its sides and these are engaged within a slot 236 of a grooved collar 237 mounted on the sleeve. The collar is loose on the sleeve and is held down over the pins by a spring 238 surrounding the upper part of the sleeve just above the collar. The upper end of the spring is held by a pair of lock nuts 239 threadedly secured to the sleeve.

The grooved collar 237 is positively raised at each cycle of operation as long as the apparatus is operating and such action may or may not lift the sleeve 218 through the spring 238. The bifurcated end of a three arm bell crank lever 241 (Figs. 3 and 5) effects such movement and each of the forked ends of the bifurcated arm of the lever carries a stud 242 on which a roller 243 is rotatably mounted. The two rollers 243 project into a groove 244 of the collar 237.

The bell crank lever 241 is pivoted on a stud 247 secured in a side wall of the auxiliary frame 139 (Fig. 1) and the second arm of the lever carries a stud 248 (Figs. 3 and 5) which rotatably supports a cam roller 249. Roller 249 oscillates the lever and rides upon the cam surface of an edge cam 251. The third arm of the bell crank lever 241 is a substantially vertical arm 253 which engages one end of a spring 254, the other end of which is held by a lug 255 formed as a projection in one side wall of the auxiliary frame 139. This spring resists pivotal movement of the lever 241 and always holds the roller 249 against the cam 251.

The cam 251 is secured by screws 257 to the face of a bevel gear 258 (Fig. 3) mounted on a horizontal shaft 259 journaled in a bearing formed in the side wall of the auxiliary frame 139 (see Fig. 1). The gear 258 meshes with a bevel gear 261 (Fig. 3) which may be integrally formed with the intermediate gear 144.

If the lifting of the collar 237 is transmitted

through the spring 238 to lift the sleeve 218 the needle valve of the nozzle is correspondingly lifted but if the sleeve 218 is held down and prevented from raising the spring 238 takes up the stroke, the collar sliding on the sleeve at such a time. The sleeve is held locked against movement until it is unlocked by a properly positioned can end on the lifter pad 111.

Such a locking device is located adjacent the lower end of the sleeve 218 and is connected with a stationary end clamping head 271 (Figs. 3, 5, 6 and 7) which engages the can end as it is raised into lining position by the lifter pad. The clamping head 271 is formed with a vertical stem 272 which extends into the bottom of a bore 273 formed in the lower end of the stationary shaft 220. The stem 272 is normally held down by the pressure of a spring 274 also located in the bore 273. A pin 276 extends across the bore and passes through a vertical slot 275 cut through the stem 272 near its top end. The ends of the pin are seated in the shaft 220. This provides a limited sliding connection between the clamping head and the stationary shaft.

The locking device comprises a collar 277 which surrounds the stem 272 adjacent the clamping head and this collar rotates with rotation of the lining head 136 on the stationary stem being held between spaced collars 278 pinned on the clamping head stem. Collar 277 is pivoted at 279 to a link 281, the other end of which is pivoted to a hooked lever 283 mounted on a stud 284 held in a curved bracket 285 depending from the under side of the lining head body. The lever 283 has a vertically extending hook arm 287 which provides the latch element for the locking device and this engages a shelf-like projection 288 extending out from the hub end 217.

A properly positioned can end coming into lining position on the rising lifter pad 111 engages and lifts the clamping head and in so doing raises the collar 277, rocking the lever 283 in a clockwise direction from the position shown in Fig. 3 through that of Fig. 7 and into the position of Fig. 5. This action disengages the hook 287 from the shelf 288. The sleeve 218 is now unlocked and when the collar 237 moves up in the next cycle of the machine the sleeve 218 moves with it and this opens the needle valve 201. The liquid compound flowing from the nozzle discharges into the can end channel B as the nozzle moves along the channel path at a uniform rate of travel, and the flow being uniform the amount of lining is correspondingly even.

If there is no can end in position on the lifter pad 111 when it is raised, the clamping head 271 remains stationary as there is nothing to engage it. The lifter pad 111 is recessed at 291 and this permits full lifting action of the lifter pad without unlatching the nozzle locking device.

Brief mention has been made of a manual lock for the needle valve 201 to prevent any inadvertent nozzle discharge and this lock also stops and prevents operation of the machine. An operating handle lever 293 (Figs. 1 and 3) is provided for the manual lock device and is pivoted on a stud 294 secured in the side wall of the auxiliary frame 139.

A lever arm 295 is an integral part of the handle lever and is pivotally connected at 296 to the lower end of a vertical link 297. The upper end of the link is connected at 298 to one end of a lever 299 pivoted at its center on a stud 301 mounted in the side wall of the auxiliary frame

139. The free end 302 of the lever 299 is bifurcated and its arms straddle the shaft 220 just beneath the frame wall 223. A spring held locking pawl 303 pivotally connected with the handle lever 299 engages one or the other of a pair of notches 304, 305 cut in the edge of a plate 306 screwed to a side wall of the frame 139.

When the handle is in the position shown in Fig. 3 the locking pawl 303 is in the notch 304, this being an unlocked or machine operating position. When the handle is depressed into its locking position the pawl is engaged in the notch 305. Movement of the handle into this latter position brings the bifurcated end parts 302 of the lever 299 into engagement with the lock nuts 239 (as shown in Fig. 7) and as long as this position is maintained the sleeve 218 and its associated needle valve 201 cannot be raised nor the nozzle opened.

The second function of the handle lever 293 which has to do with preventing operation of the machine as mentioned above is suitably associated with the driving motor 54. By way of example there is graphically indicated in the drawings an electric motor circuit which is broken so that an electric current cannot flow into the motor for actuating it as long as the handle lever is in its depressed or locking position.

The mechanical features for such performance comprise a boss or projection 309 (Figs. 1 and 3) carried on the handle lever which strikes against and depresses a lever 311 of an electric switch 312 mounted on the auxiliary frame 139.

The switch 312 is located in the electric motor circuit. This circuit is diagrammatically shown in Fig. 1 and comprises a wire 316 connecting one side of the switch with one side of the motor. The opposite motor wire of the circuit comprises a wire 317 which extends from the motor 54 to one side of a suitable source of electric energy illustrated in the diagram as a generator 318. The other side of this generator is connected by a wire 319 to the switch 312. When the switch lever 311 is depressed by the projection 309 of the handle lever in its locking position, the motor circuit is opened at the switch and the machine may not be operated.

After a can end A has been lined, the lifter pad 111 is returned to its lowered position bringing the can end down on the feed bar 61. Upon the next forward stroke of the bar its last dog 95 engages behind the lined end and sweeps it from the lifter pad moving it to a suitable place of deposit. The drawings disclose for this purpose a discharge belt 325 (Figs. 1 and 2) which at the machine end operates over a pulley 328 mounted on a shaft 329 journaled in brackets 331 formed as a part of the main frame 11 and carries the lined ends A to any convenient place of discharge.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A machine for lining non-circular can ends, comprising in combination, a non-rotating can end support for holding the can ends to be lined, a rotating lining head mounted above said support, a shaft for rotating said head and disposed in axial alignment with the can ends to be lined,

a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of a said held can end, means for guiding said nozzle in a path coincident with the lining channel of said held can end as the nozzle is carried around with said rotating head, and means for retarding or advancing said nozzle movement along its guided path for controlling the speed of travel of said nozzle to cause it to move along said can end channel with a uniform rate of lineal speed.

2. A machine for lining irregular shaped can ends, comprising in combination, a non-rotating can end support for holding the can ends to be lined, a rotating lining head mounted above said support, a shaft for rotating said head and disposed in axial alignment with the can ends to be lined, a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of a said held can end, a stationary cam track for holding said nozzle over and for guiding it in a path coincident with said can end channel as it is carried around with said rotating head, and a second stationary cam track for altering the position of said nozzle relative to said can end channel to insure a uniform rate of lineal speed of the nozzle in respect to the surface being lined.

3. A machine for lining irregular shaped can ends, comprising in combination, a non-rotating can end support for holding the can ends to be lined, a rotating lining head mounted above said support, a compound lever unit pivotally connected to said head, a dispensing nozzle carried by said lever unit for dispensing a lining material into the channel of a said held can end, means for shifting said nozzle relative to said lever unit to guide it in a path coincident with said can end channel, and means for pivotally moving said lever unit relative to said rotating head to cause it to move with a uniform rate of lineal speed along the can end surface being lined.

4. A machine for lining irregular shaped can ends, comprising in combination, a non-rotating can end support for the can ends to be lined, means for clamping a can end in lining position, a rotating lining head mounted above said support, a shaft for rotating said head at a uniform speed of travel, said shaft being disposed centrally of the head in axial alignment with the can ends to be lined, a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of a said held can end, means cooperating with said head rotating means for holding said nozzle over the can end lining channel, and means cooperating with said last mentioned means and with said rotating head for shifting the nozzle relative to said head and for effecting a uniform speed of said nozzle along the surface being lined.

5. A machine for lining irregular shaped can ends, comprising in combination, a non-rotating can end support for holding the can ends to be lined, a rotating lining head mounted above said support, a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of said held can end, means for holding said nozzle over and for guiding it in a path coincident with said channel while it is being moved by said rotating head, means for rotating said head at a uniform speed of travel, means for shifting the position of said nozzle relative to said head and while moving in its path coincident with said can end channel to insure uniform rate of speed of the nozzle, and

conveying means for advancing said can ends to said can end support.

6. A machine for lining irregular shaped can ends, comprising in combination, a non-rotating can end support for holding the can ends to be lined, a rotating lining head mounted in axial alignment with and above said support, a compound lever unit pivotally connected to said head, a dispensing nozzle carried by said lever unit for dispensing a lining material into the channel of said held can end, means operating through a part of said lever unit for holding said nozzle in a path coincident with said can end channel, means operating through other parts of said lever unit for shifting said nozzle along its path to insure its uniform speed of travel around said can end channel, means for raising said can end support to position its held can end adjacent said nozzle, and conveying means for advancing said can ends to said can end support.

7. A machine for lining irregular shaped can ends, comprising in combination, a non-rotating can end support for holding the can ends to be lined, a rotating lining head mounted in axial alignment with said support, a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of said held can end, means for holding said nozzle over and for guiding it in a path coincident with said channel, means for rotating said head at a uniform speed of travel, means for shifting the position of said nozzle relative to said head to insure uniform rate of lineal speed of the nozzle, means for raising said can end support to position its held can end for lining, and means operating subsequent to such can end raising for opening said nozzle to discharge its lining material.

8. A machine for lining irregular shaped can ends, comprising in combination, a magazine for holding can ends in stack formation, a non-rotating can end support for holding individual can ends to be lined, conveying means for advancing a said can end from said stack and for placing it on said support, a rotating head mounted above said support, a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of a said held can end, means for controlling the position of said nozzle during its rotation with said head to position it over said can end channel, and means for controlling the rate of lineal speed of said nozzle in all positions of its rotation around said can end channel path to insure uniform deposit of the lining material therein.

9. A machine for lining irregular shaped can ends, comprising in combination, a magazine for holding can ends in stack formation, a non-rotating can end support for holding individual can ends to be lined, means for separating individual can ends from said stack and for delivering them to a position in the bottom of said magazine, conveying means for advancing a said separated can end from said stack and for placing it on said support, a rotating head mounted above said support, a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of a said held can end, means for lifting said can end support to raise a superimposed end thereon into lining position, means for controlling the position of said nozzle during its rotation with said head to po-

sition it over said can end channel, and means for controlling and imparting a uniform rate of lineal speed to said nozzle around said can end channel path to insure uniform deposit of the lining material therein.

10. A machine for lining irregular shaped can ends, comprising in combination, a non-rotating can end support for holding individual can ends to be lined, a rotating head mounted above said support, a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of a said held can end, means for moving said nozzle radially with respect to said rotating head, means for lifting said can end support to raise a superimposed end thereon into lining position, a valve for said nozzle, a locking device for holding said valve closed while said rotating head and nozzle continue their rotary movements to prevent discharge from said nozzle, said device being unlocked by the raising of a properly positioned can end, and actuating means for opening said valve after the unlocking of said locking device.

11. A machine for lining irregular shaped can ends, comprising in combination, a non-rotating can end support for holding individual can ends to be lined, a rotating head mounted above said support, a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of a said held can end, means for moving said nozzle radially with respect to said rotating head, means for lifting said can end support to raise a superimposed end thereon into lining position, a valve for said nozzle, a locking device for holding said valve closed to prevent discharge from said nozzle while said rotating head and nozzle continue their rotary movements, said device being unlocked by the lifting of said can end on its support, and a manual control lever also operable to prevent opening of said valve independent of the holding feature of said locking device.

12. A machine for lining irregular shaped can ends, comprising in combination, a non-rotating can end support for holding individual can ends to be lined, a rotating head mounted above said support, a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of a said held can end, means for moving said nozzle radially with respect to said rotating head, a valve for said nozzle, a manual control lever for locking said valve against movement to prevent discharge of the lining material from said nozzle, and means associated with said control lever for preventing operation of the machine.

13. A machine for lining irregular shaped can ends, comprising in combination, a non-rotating can end support for holding individual can ends to be lined, a rotating head mounted above said support, a dispensing nozzle carried by said rotating head for dispensing a lining material into the channel of a said held can end, means for moving said nozzle radially with respect to said rotating head, a valve for said nozzle, a manual control lever for locking said valve against movement to prevent discharge of the lining material from said nozzle, an electric motor for operating said machine, and means including an electric switch located in said motor circuit and operable by said control lever for breaking said motor circuit and preventing operation of the machine.

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