Feb. 8, 1938. J. C. STRICKLER 2,107,311

KEY ATTACHING MACHINE

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Fig. 2

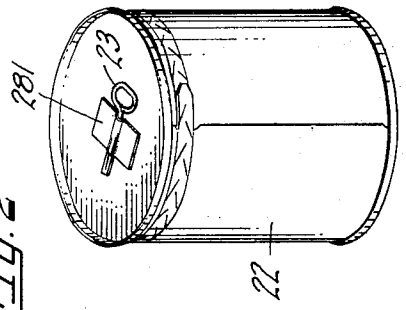



Fig. 1



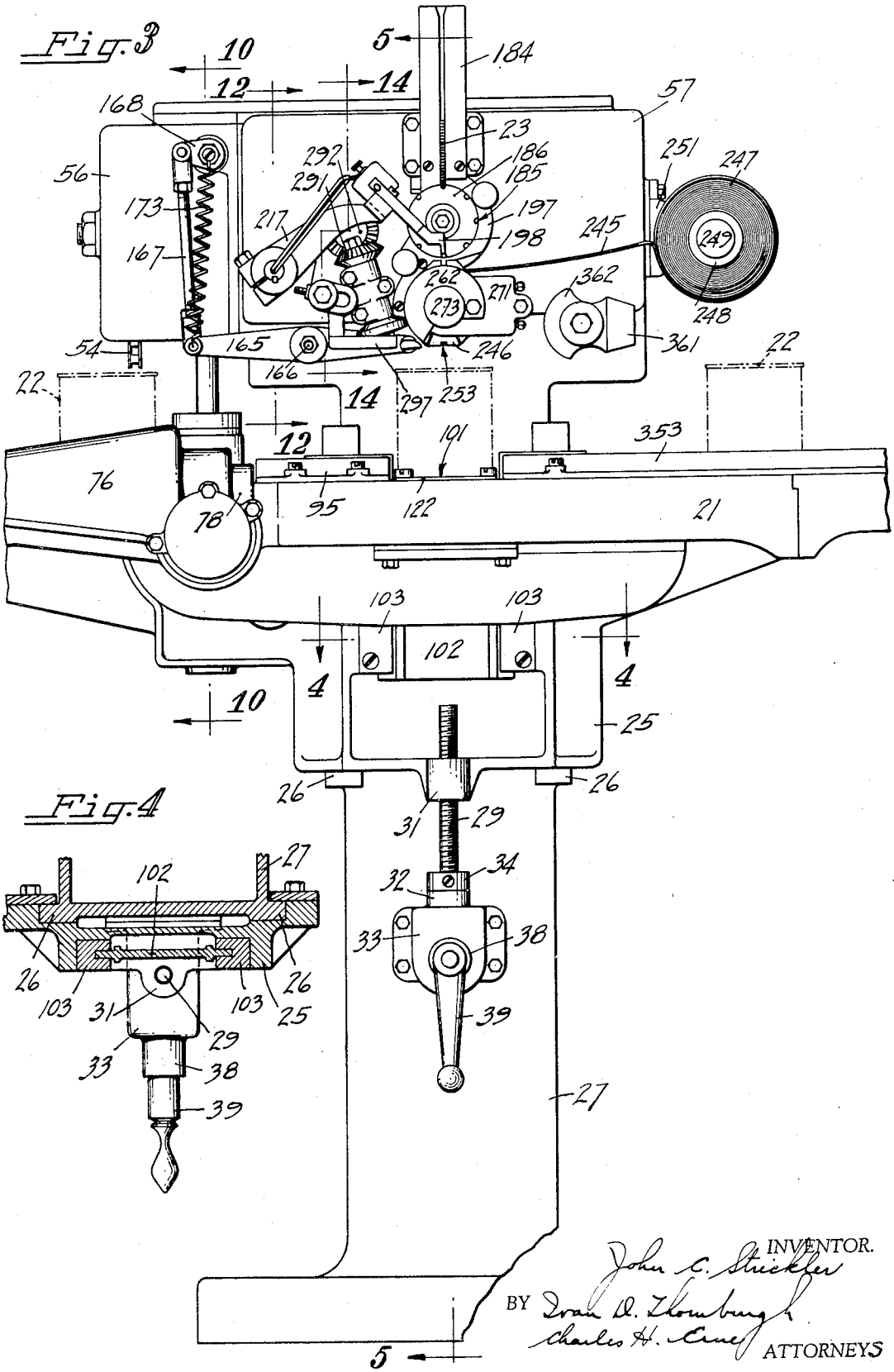

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KEY ATTACHING MACHINE

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Fig. 3



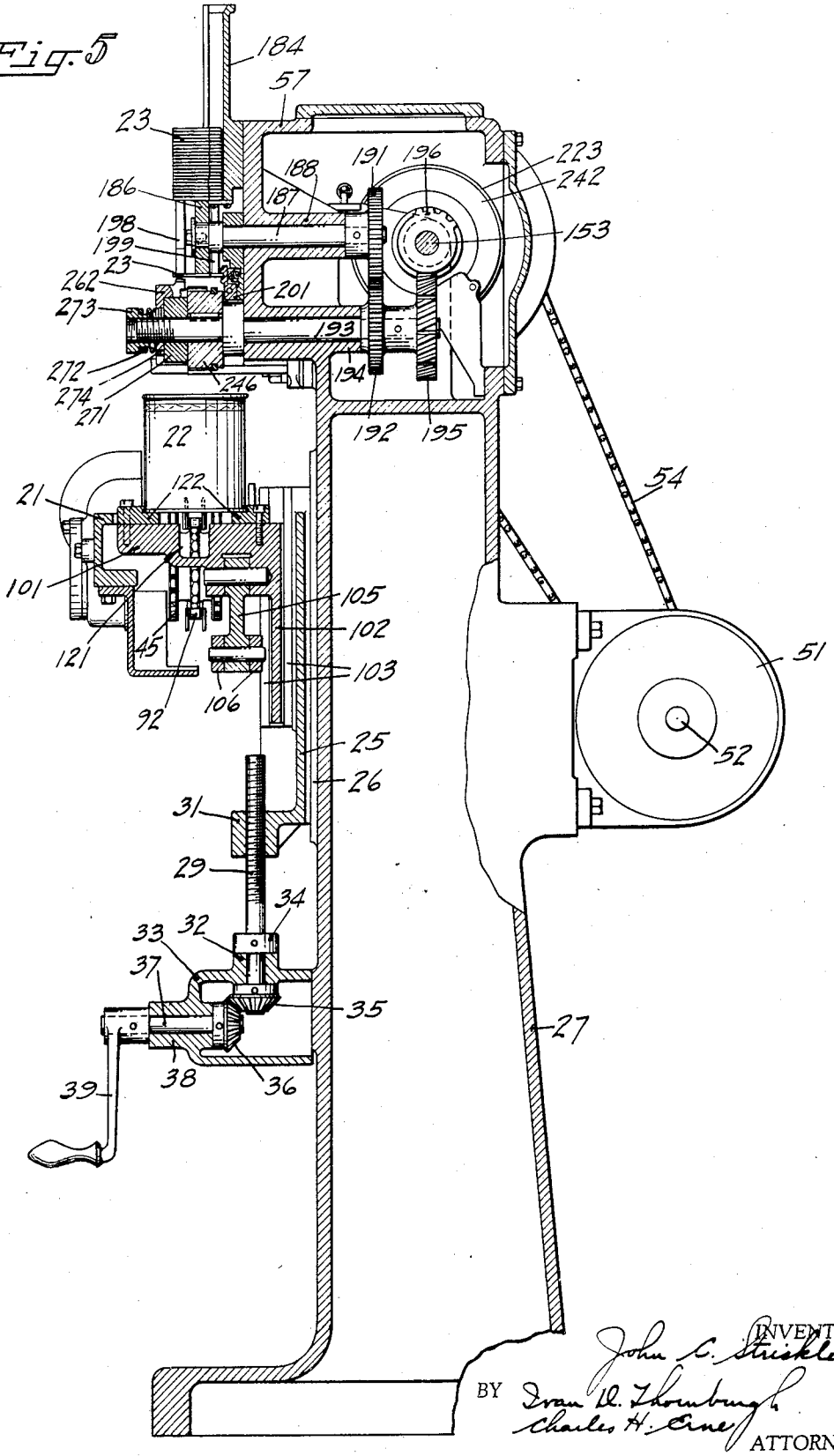

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KEY ATTACHING MACHINE

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Fig. 5




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KEY ATTACHING MACHINE

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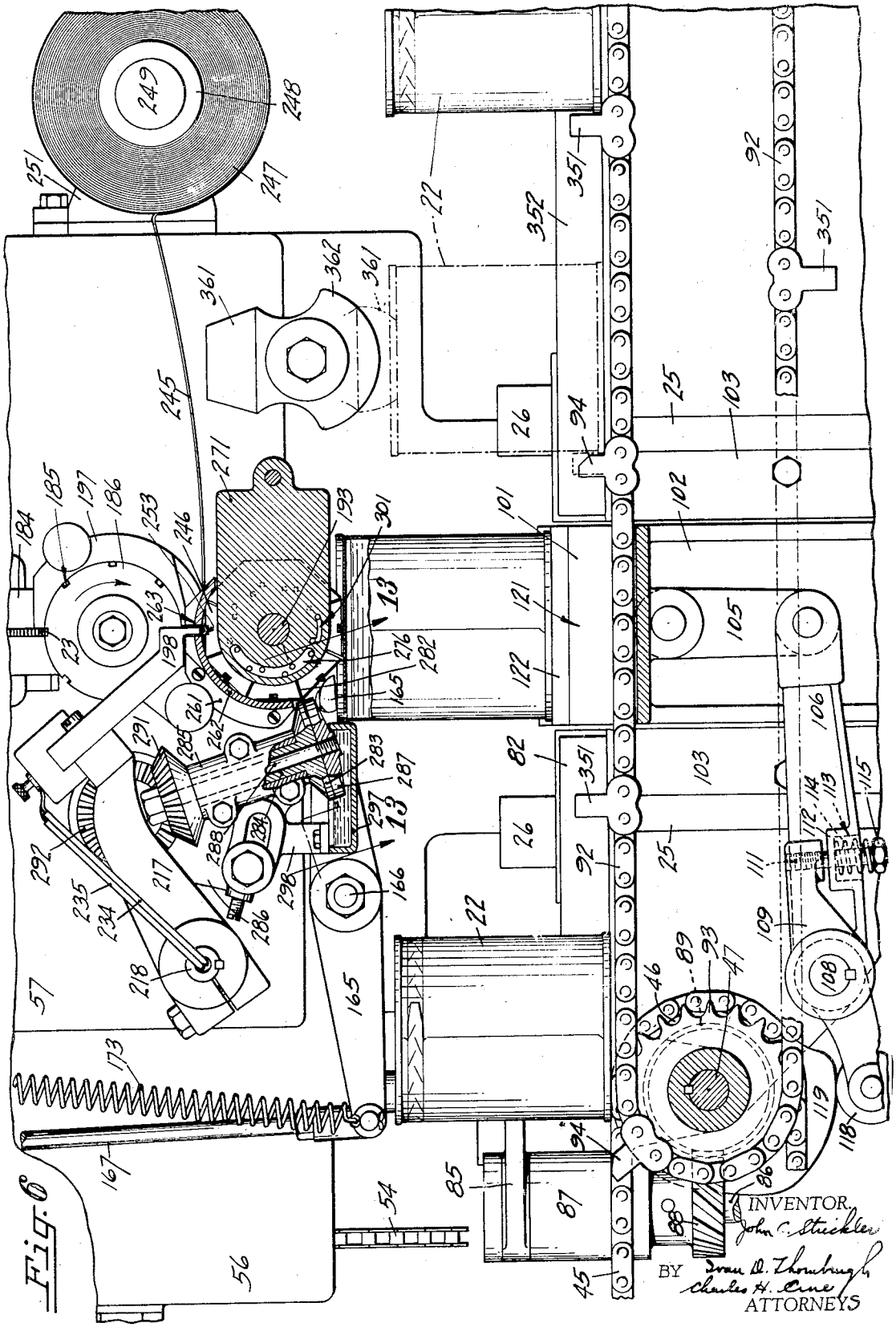


Fig. 6

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KEY ATTACHING MACHINE

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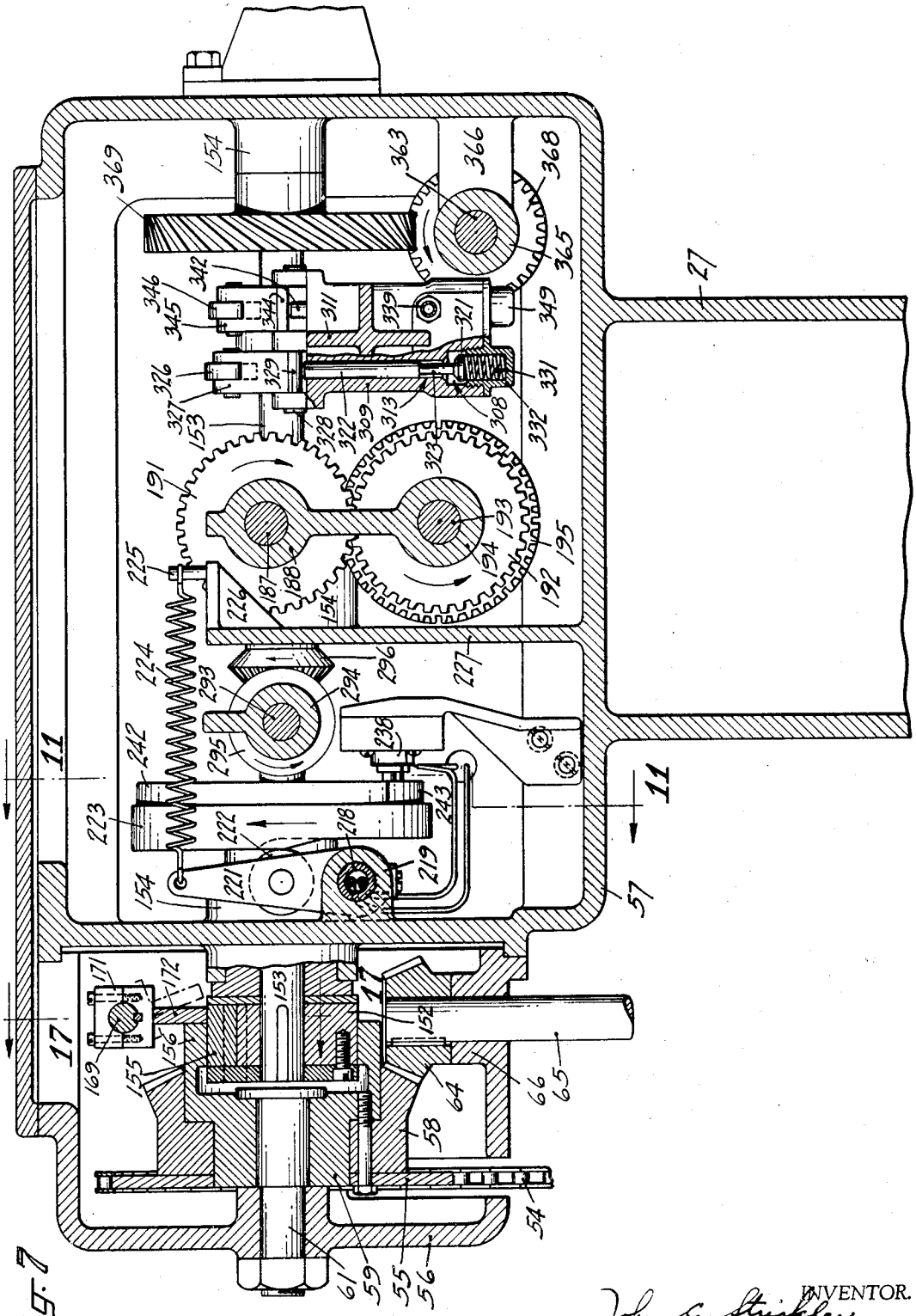



Fig. 7

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Fig. 9

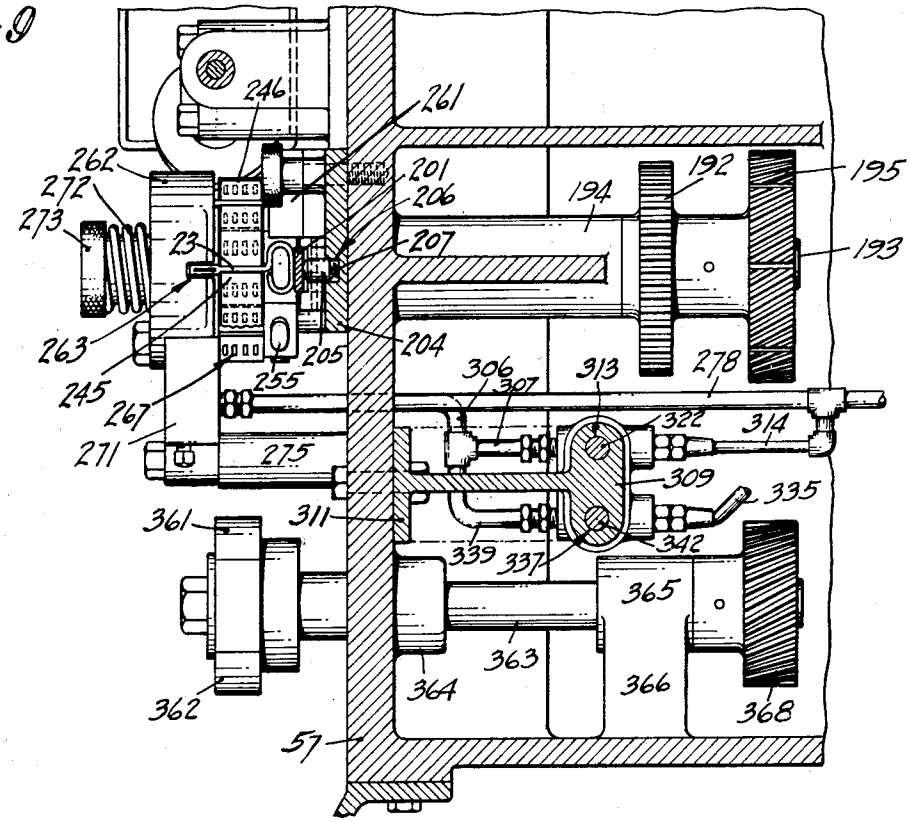
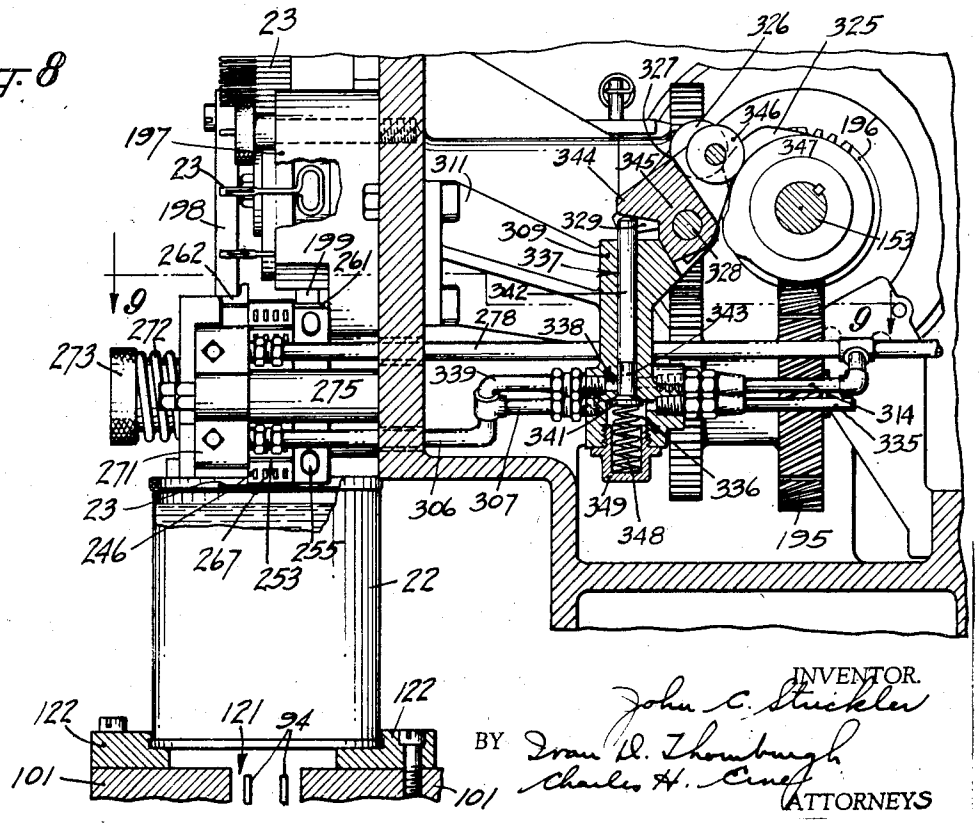



Fig. 8




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Fig. 10

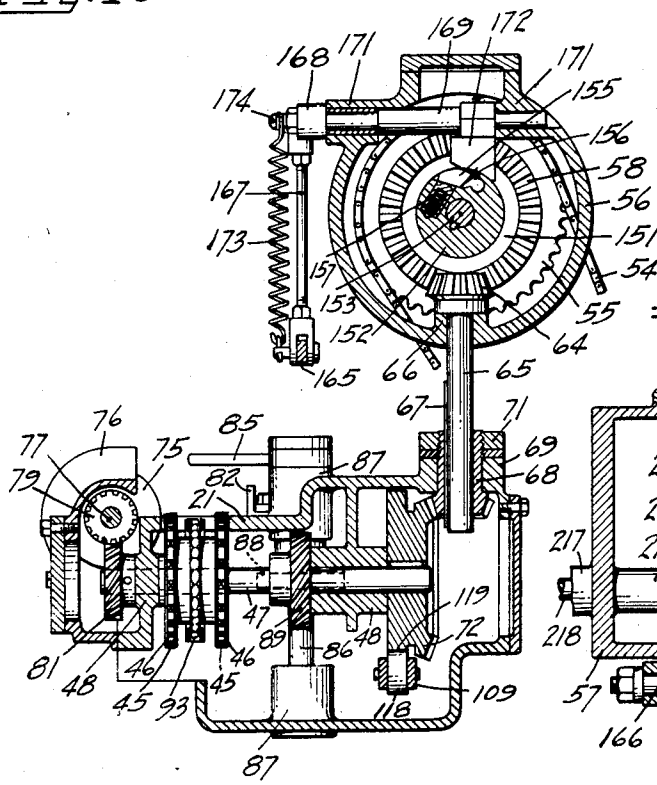



Fig. 11

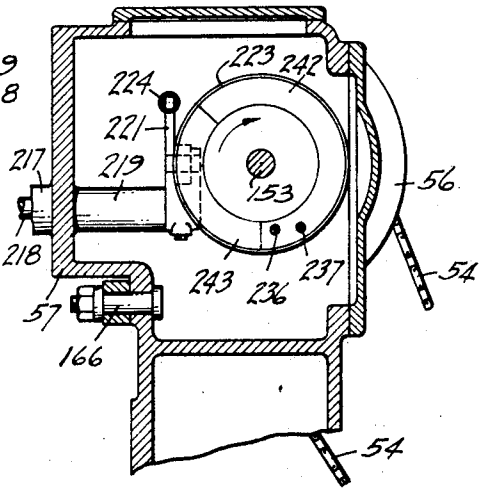



Fig. 12

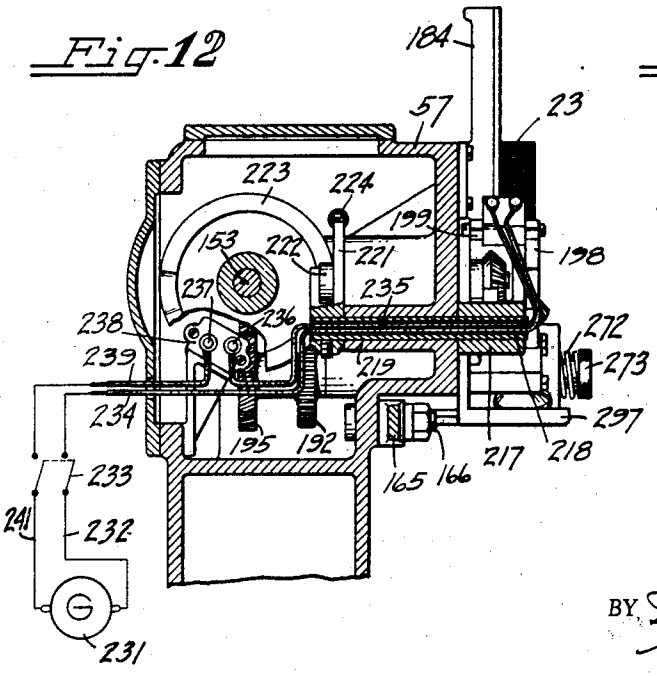
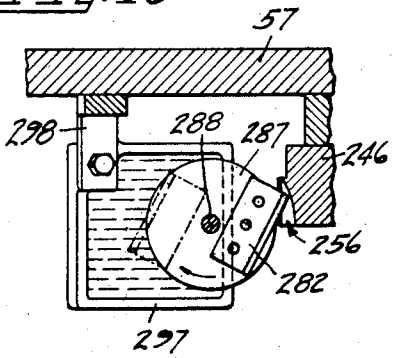



Fig. 13




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KEY ATTACHING MACHINE

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Fig. 14

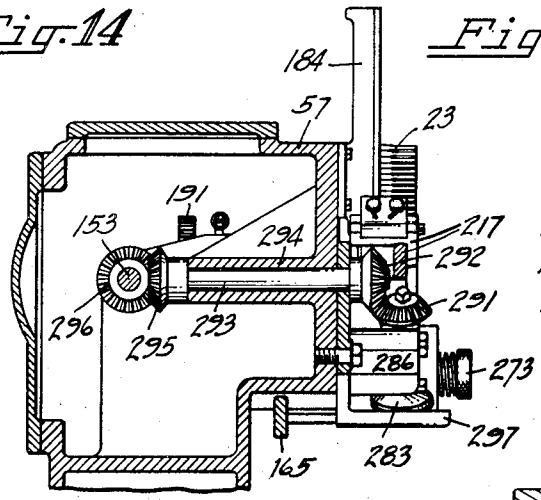



Fig. 18

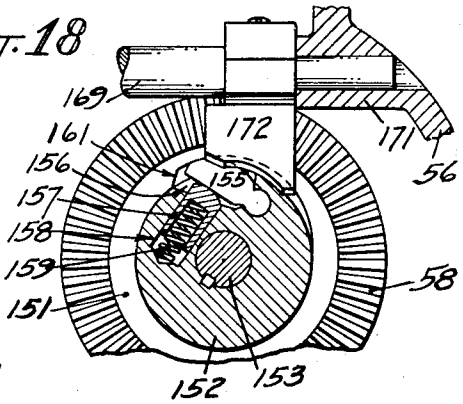



Fig. 17

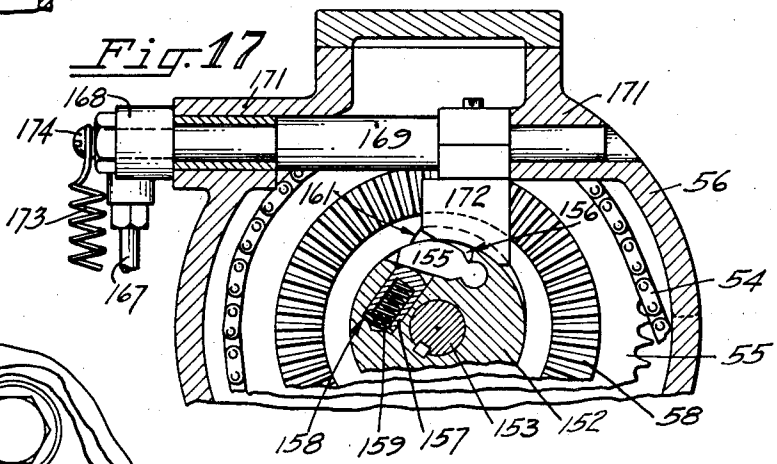



Fig. 15

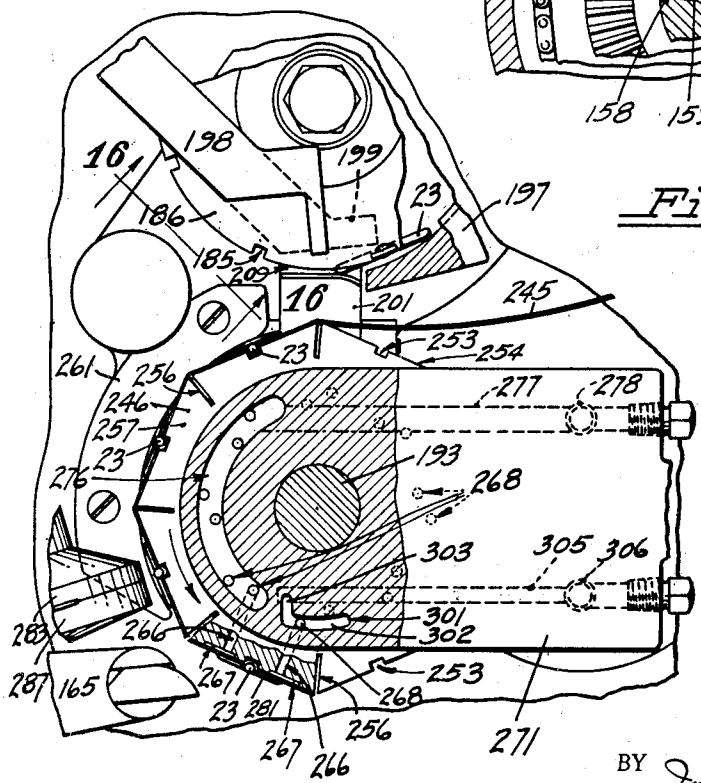
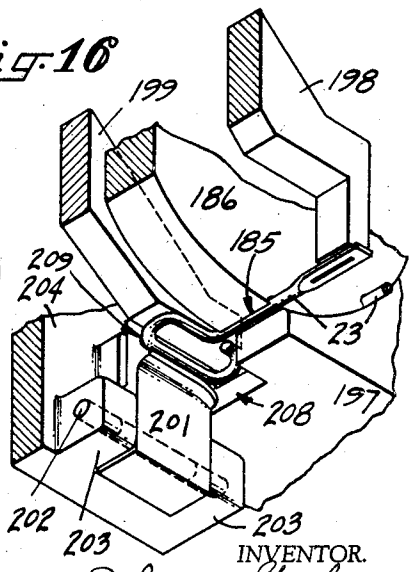



Fig. 16




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Patented Feb. 8, 1938 2,107,311

# UNITED STATES PATENT OFFICE

2,107,311

## KEY ATTACHING MACHINE

John C. Strickler, San Francisco, Calif., assignor to American Can Company, New York, N. Y., a corporation of New Jersey

Application December 24, 1936, Serial No. 117,631

17 Claims. (Cl. 216—9)

The present invention relates to a machine for attaching opening keys to containers or cans and has particular reference to devices for attaching keys to cans by means of an adhesive sticker which is readily removable to release the key for use when desired.

An object of the invention is the provision of a machine for attaching keys to cans wherein a key and a can are brought together and an adhesive sticker is applied to the can over the top of a portion of the key, so that the latter is securely fastened to the can for shipment and storage but is exposed to view and readily detachable by breakage of the sticker for use when desired.

Another object is the provision of such a machine wherein keys to be attached to cans are deposited in spaced relation on a strip or tape of adhesive coated "Cellophane" or other suitable material which is cut into short lengths each of which carries one key and each length provides a sticker which, with the key, is readily applied to a can for holding the key in place thereon.

Another object is the provision in such a machine of devices for feeding keys individually and successively from a supply of such keys and for arranging them in spaced relation on a tape of "Cellophane" or other suitable material.

Another object is the provision in a machine of this character of devices for feeding a tape of "Cellophane" or the like material from a supply roll of such tape and for holding the fed tape on the feeding devices by a vacuum pull.

Another object is the provision in such a machine of devices for transferring the sticker and key adhering thereto to the can by compressed air and for pressing the transferred sticker and key tightly against the can to cause the adhesive on the sticker to firmly bond therewith.

Another object is the provision of such a machine wherein cans continuously pass through the machine, the key feeding and tape feeding devices being intermittently actuated as through a single cycle at a time, each cycle actuation being effected to bring a key and sticker into alignment with a can by devices operable by engagement with the can as it is lifted into key receiving position.

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 top plan view of a machine embodying the instant invention, with parts broken away;

Fig. 2 is an enlarged perspective view of a can showing an opening key attached thereto by the machine illustrated in Fig. 1;

Fig. 3 is a front elevation of the machine shown in Fig. 1, parts being broken away;

Fig. 4 is a horizontal sectional detail taken substantially along the line 4—4 in Fig. 3;

Fig. 5 is a vertical section taken substantially along the line 5—5 in Fig. 3;

Figs. 6 and 7 are enlarged vertical sections, respectively, taken substantially along the broken lines 6—6 and 7—7 in Fig. 1;

Fig. 8 is an enlarged transverse sectional detail taken substantially along the line 8—8 in Fig. 1;

Fig. 9 is a horizontal sectional detail taken substantially along the broken line 9—9 in Fig. 8;

Fig. 10 is a vertical transverse section taken substantially along the line 10—10 in Fig. 3;

Fig. 11 is a transverse sectional detail drawn at a reduced scale and taken substantially along the broken line 11—11 in Fig. 7;

Fig. 12 is a transverse sectional detail taken substantially along the line 12—12 in Fig. 3;

Fig. 13 is a horizontal section taken substantially along the broken line 13—13 in Fig. 6;

Fig. 14 is a transverse vertical section taken substantially along the broken line 14—14 in Fig. 3;

Fig. 15 is a fragmentary enlarged sectional detail of a part of the mechanism shown in Fig. 6;

Fig. 16 is a fragmentary perspective view of a detail of Fig. 15, the view being taken substantially along a plane indicated by the line 16—16 in that figure; and

Figs. 17 and 18 are fragmentary transverse sections of a clutch mechanism showing the clutch pawl in clutch disengaging and engaging positions, the views being taken substantially along the line 17—17 in Fig. 7.

In the machine illustrated in the drawings as a preferred embodiment of the invention the keys adapted to be attached to cans are individually fed from a stack of such keys and are first successively deposited in spaced relation on a strip of "Cellophane" or other suitable tape which is unwound from a roll. Adhesive is preferably provided on the surface of the tape onto which the keys are arranged such adhesive being such as to become sticky on pressure. This adhesive holds the keys against displacement during sub-

sequent steps incidental to attaching them to the cans.

The tape with its adhering keys is carried on the peripheral surface of a turret and is held in place by suction acting through conduits formed in the turret and connected with a suitable source of vacuum. While on the turret the tape is cut into short lengths or stickers, each sticker carrying one key and still held on the turret by suction. For this purpose the turret is intermittently and indirectly rotated one cycle at a time by each can as it is brought into position to receive its key during its passage through the machine.

At the proper time a can is lifted into engagement with the key which is still adhering to the sticker. The vacuum is then cut off from this part of the turret and compressed air is substituted. The air blows the sticker away from the turret and into contact with the can, the adhesive surface of the sticker being against the can and the key being between sticker and can. The pressure thus applied makes the sticker adhere to the can top wall. The can is then lowered and passed to a station where the sticker is firmly pressed home to complete the sticking action to hold the key in place after which the can with its affixed key is discharged from the machine.

A preferred form of machine includes a horizontal table **21** (Figs. 1, 3 and 5) for cans **22** (Fig. 2) to which keys **23** are adapted to be attached. The table is provided with a depending apron **25** which is carried on vertical guides **26** (see also Fig. 4) formed on the front of a pedestal or main frame **27**. This pedestal supports the various parts of the machine.

Vertical adjustment of the table **21** and the parts carried thereon is provided so that the table may be set at a predetermined elevation in accordance with the height of the cans to be passed through the machine. This adjustment is made by means of a vertically disposed table adjusting screw **29** (Figs. 3, 4 and 5) which is threaded into a lug **31** formed on the apron **25**. The lower end of the screw is rotatably mounted in a bearing **32** formed in a housing **33** which is bolted to the front of the pedestal.

The table adjusting screw **29** is confined against vertical displacement by a collar **34** which is pinned to it adjacent the bearing **32** outside the housing **33** and by a bevel gear **35** which is secured to it inside the housing. The gear **35** meshes with a similar gear **36** mounted on one end of a short shaft **37** carried in a horizontal bearing **38** formed in the housing. A handle **39** pinned to the shaft **37** outside the housing provides means for rotating the gears and the screw to bring the table **21** into a proper vertical position.

The cans **22** are presented to the machine in untimed order and are then moved along the top of the table **21** in any suitable manner as for example, by a pair of spaced and parallel endless conveyor chains **45** (Figs. 1, 6 and 10). These chains take over spaced driving sprockets **46** which are mounted on a drive shaft **47** journaled in bearings **48** formed in the table **21**. The chains may lead from another machine or may be contained entirely within the instant machine. In either case they also may take over idler sprockets (not shown).

The sprocket drive shaft **47** is continuously rotated by gear and sprocket connection with a suitable source of power, such as an electric motor **51** (Figs. 1 and 5) which is bolted to the back of the pedestal **27**. The motor shaft, indicated by the numeral **52** carries a sprocket **53** which drives a chain **54**. This chain takes over a sprocket **55** (Figs. 7 and 10) disposed in a clutch casing **56** bolted to one end of a gear housing **57** formed on top of the pedestal **27**. The sprocket **55** drives a bevel gear **58** and both sprocket and gear are mounted on and are bolted to a clutch hub or driving member **59** which is rotated on a shouldered stud **61** secured in the clutch casing **56**.

Bevel gear **58** (Figs. 7 and 10) meshes with and drives a pinion **64** which is keyed to the upper end of a vertical shaft **65** journaled in a bearing **66** formed in the clutch casing **56**. The shaft extends down into the table **21** and at its lower end is slidably connected by a feather **67** with a bevel pinion **68** journaled in a bearing **69** formed in the table. This sliding connection between pinion and shaft permits lowering and raising of the table **21**.

A collar **71** is threaded onto the end of the pinion **68**, which projects out of the top of the bearing **69**. This holds the pinion against vertical displacement. This pinion **68** meshes with a bevel gear **72** which is keyed to the sprocket drive shaft **47**. Through the gear and sprocket trains just described power is transmitted from the electric motor **51** to the sprocket drive shaft **47** to continuously rotate the latter.

The cans **22** as they are delivered on the table **21** are brought into properly spaced and timed relation by a timing screw **75** (Figs. 1 and 10) disposed in an open side casing **76** mounted on the table to one side of the conveyor chains **45**. The timing screw is mounted on a shaft **77** which is journaled in bearings **78** formed in the casing **76**. A spiral pinion **79** mounted on one end of the screw shaft meshes with a spiral gear **81** which is pinned to the continuously rotating sprocket drive shaft **47**.

By means of this connection the timing screw is continuously rotated and cans brought into engagement with it by the moving conveyor chains **45** are properly spaced. A guide rail **82** secured to the top of the table opposite the timing screw keeps the cans in alignment and brings them into the screw.

A properly timed can as it reaches the discharge end of the timing screw **75** is moved forward, that is, ejected from the screw by a finger **85** (Figs. 1, 6 and 10). The finger is mounted on the upper end of a short vertical shaft **86** journaled in bearings **87** formed in the table **21**. Intermediate the bearings the shaft carries a spiral gear **88** which meshes with a similar spiral gear **89** mounted on the continuously rotating sprocket drive shaft **47**. Through this gear connection the finger **85** is continuously rotated in a horizontal plane adjacent the end of the timing screw at the proper time.

This ejection of the can from the timing screw **75** transfers it from the conveyor chains **45** to a position on the table where it is directly over an auxiliary conveyor chain **92** (Figs. 1 and 6) the upper run of which is slightly below the level of the top of the table. One end of the chain **92** is carried on a sprocket **93** mounted on the continuously rotating sprocket drive shaft **47** between the spaced sprockets **46**. The driving shaft **47** thus moves the auxiliary conveyor chain continuously. This chain extends along the remainder of the length of the table **21** and at its discharge end may pass over suitable sprockets not shown.

The transferred can is directly in front of one of a plurality of short conveyor lugs or dogs **94** carried on the chain. The advancing dog en-

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gages behind the can and pushes it forward along the top of the table 21 and between the guide rail 82 and a spaced, parallel short guide rail 95 (Fig. 1) which is also secured to the top of the table.

At the end of the short guide rail 95 the can still being advanced by the dog 94 passes onto a lifter pad 101 (Figs. 1, 5 and 6) which thereupon rises with the can bringing the latter into key receiving position. The lifter pad is formed with an apron 102 (see also Figs. 3 and 4) which vertically slides in guideway gibs 103 secured to the front of the table apron 25.

Lifting of the pad is accomplished by cam action the pad being connected by a link 105 to one end of an arm 106. Arm 106 is mounted on a short shaft 108 carried in suitable bearings formed in the side of the table 21. Arm 106 is also yieldably connected with one end of a lever 109 which is keyed to the shaft 108. This end of the lever carries a stud 111 which extends into a boss 112 formed on the side of the arm 106. A recess 113 formed in the boss houses a compression spring 114 which surrounds the stud 111 and is held in place by a nut 115 threaded on the end of the stud. This provides the flexible connection between the arm 106 and the lever 109 just referred to.

The opposite end of the lever carries a cam roller 118 which under the weight of the lifter pad 101 is held in engagement with an edge cam 119. The cam 119 is an integral part of the bevel gear 72 (see also Fig. 10). Thus the cam is rotated in time with the movement of the sprocket chains and, through the link and lever connection with the lifter pad, raises the latter and a can positioned thereon at the proper time.

Raising of the can is begun before it is wholly on the lifter pad 101, the dog 94 moving the can to a centralized position while the pad is rising. By the time the can is centralized on the pad it has been lifted high enough to disengage the dog, the latter thereupon passing under the can in a clearance groove 121 (Fig. 5) formed in the lifter pad for this purpose. Can guides 122 secured to the top of the pad in alignment with the guides 82, 95 hold the can on the pad.

Raising of the can 22 carries it into association with the mechanism for feeding the keys 23 and for attaching them to the top of the can. This mechanism is located above the table 21 on the front of the gear housing 57 and it is operated independently of the can moving mechanism just described by a clutch device housed in the clutch casing 56.

The clutch device includes a continuously rotating drive member 151 (Figs. 7, 10, 17 and 18) and a driven member 152. The drive member is formed as a part of the clutch hub 59. The driven member is carried within the drive member and is mounted on one end of a clutch driven shaft 153 which is supported in bearings 154 formed in the gear housing 57. This shaft is the main driving or clutch shaft of the key feeding and attaching mechanism.

One rotation of the clutch shaft 153 takes place for one operating cycle of the key feeding and attaching mechanism and this occurs each time a can is presented for a key. For effecting the rotation of the shaft 153 the clutch members 151, 152 are locked together by a pawl 155 which is pivotally located in a recess 156 formed in the member 152. A spring barrel 157 disposed in a bore 158 formed in the driven member houses a compression spring 159 which exerts its force against the pawl and thereby projects the latter if not resisted into a notch 161 formed in the member 151.

Locking of the clutch members is effected by each can as it is raised into position with the lifter pad 101. The rising can engages against and lifts the free end of a lever 165 (Figs. 3, 6 and 10) which is mounted on a pivot bolt 166 secured in the front wall of the gear housing 57. The free end of the lever is connected to the lower end of a link 167 (see also Fig. 10) which at its upper end is secured to an arm 168.

The arm 168 is mounted on one end of a rock shaft 169 carried in bearings 171 formed in the top of the clutch casing 56. This arm carries a depending clutch actuating member or flapper 172 which is normally held by a tension spring 173 in a substantially perpendicular position against the face of the clutch drive member 151 and in the path of the clutch locking pawl 155, as shown in Fig. 7. One end of the spring is secured to the link end of the lever 165 while its opposite end is fastened to a screw 174 on the end of the rock shaft 169.

The flapper 172 as long as it remains in perpendicular position, pushes the clutch locking pawl 155 into its recess 156 each time the pawl passes the notch 161 of the clutch drive member 151 and therefore the driven member 152 is not clutched with the drive member. The key feeding and attaching mechanism remains inoperative so long as this continues.

When a can is lifted into key receiving position the rock shaft 169 turns and this moves the flapper 172 sidewise into the dotted line position of Fig. 7. This positions the flapper out of the path of the locking pawl 155 which accordingly snaps into the clutch drive member notch 161 when the driven member passes. This is a usual press clutch construction. With the clutch members locked together the key feeding and attaching mechanism moves through one cycle. During this cycle a key is attached to the can and the can is returned to its original lowered position on the table 21. While the can is descending another key is brought into position for the next following can. Lowering of the can disengages the clutch members and the mechanism stops thus completing the one cycle.

The keys 23 to be attached to the cans are housed in stack formation within a magazine 184 (Figs. 1, 3, 5 and 14) which is secured to the front wall of the gear housing 57. A key is withdrawn or picked off from the bottom of the magazine at each revolution of the clutch shaft 153. The lowermost key in the stack rests in one of a plurality of equally spaced transverse notches 185 formed in the peripheral surface of a key feeding turret 186. This turret is mounted on one end of a shaft 187 which is journalled in a bearing 188 formed in the gear housing 57.

The turret 186 is rotated in a step by step movement by the clutch shaft 153 through a connecting gear train. This includes a gear 191 pinned to the opposite end of the turret shaft 187 which meshes with a similar gear 192 pinned near one end of a parallel shaft 193 journaled in a bearing 194 formed in the gear casing 57, this shaft being directly below the shaft 187. Gear 192 is formed integrally with an interrupted spiral gear 195 which meshes with a similar gear 196 mounted on the main drive shaft 153. Thus every time the clutch shaft 153 is rotated through its cycle the key turret moves through its step or partial rotation.

Such step rotation of the key turret 186 ad-

vances a notch 185 one space at the same time picking off the lowermost key 23 from the bottom of the magazine. A curved guide 197 disposed adjacent the periphery of the turret holds each fed key in its individual notch during this first and succeeding movements of the turret until the key approaches the bottom of the turret.

At the time of reaching this bottom position, the key is brought under a pair of spaced transfer fingers 198, 199 (Figs. 1, 6, 15 and 16) which are magnetized, the former engaging and magnetically holding the shank of the key, the latter the key head. At about the same time the shank of the key moves off the end of the curved guide 197.

In addition to the magnetic hold on the key head a yieldable guide 201 (see also Figs. 5 and 9) frictionally engages the head of the key. This guide is mounted on a pivot pin 202 secured in spaced lugs 203 formed in a plate 204 which is fastened to the front wall of the gear housing 57. A spring barrel 205 is disposed in a bore 206 formed in the plate and the barrel houses a compression spring 207 which constitutes the yieldable backing for the guide. In coming into place the head of the key also moves into a cut-out portion 208 formed in the end of the curved guide 197 and snaps into a horizontal groove 209 formed in the face of the yieldable guide. This positively supports the key in a horizontal position and in the turret notch 185 at the bottom of the turret.

The magnetic transfer fingers 198, 199 are bolted to an arm 217 (Figs. 6 and 12) which is mounted on one end of a sleeve 218 carried in a bearing 219 (see also Figs. 7 and 11) formed in the front wall of the gear housing 57.

The opposite end of the sleeve 218 extends into the gear housing and carries an arm 221 having a cam roller 222 which operates on a cam 223 mounted on the clutch shaft 153. A tension spring 224 holds the cam roller against the cam. One end of the spring is secured to the free end of the arm 221 while its opposite end is fastened to a pin 225 which is secured in a bracket 226 formed on a web 227 of the gear housing 57. This cam control is used to bring the magnetized fingers 198, 199 into the right position for engagement with the fed key and for further handling of the key as will be more fully explained.

The fingers 198, 199 are magnetized only as needed to hold the key. Magnetism is impressed by electric energy which is supplied from any suitable source of power such as a generator 231, diagrammatically shown in Fig. 12. The magnetic circuit includes a generator wire 232, service switch 233, wire 234, connecting with the fingers, a return wire 235, contact buttons 236, 237 of a switch 238, a wire 239, service switch 233 and a return generator wire 241. The switch 238 makes and breaks the circuit.

The contact buttons of switch 238, when the switch is open, engage against a ring segment 242 (Figs. 7 and 11) composed of insulating material which is secured to the back of the cam 223. A shorter ring segment 243 of brass or copper is also secured to the cam 223 adjacent the ring segment to complete the ring and provides for electrical connection to close the magnetic circuit. Thus rotation of the cam passes the brass segment into engagement with both of the switch contact buttons when the fingers are magnetized to hold the key.

A strip of suitable tape such as "Cellophane" 245 (Figs. 6 and 15) is partially looped at one end over the peripheral surface of a many sided assembling turret 246 which is located directly below the feeding turret. The magnetically held key is brought down on this tape by a lowering of the transfer fingers 198, 199 accompanied by a breaking of the magnetic circuit and a demagnetizing of the fingers.

The transfer fingers 198, 199 are thereupon lifted to their original position by an upward movement of the arm 217, leaving the key deposited in a transverse position on the outer surface of the tape 245. This engaged surface of the tape preferably carries an adhesive coating and the deposited key therefore clings to it. The assembling turret 246 is keyed to the shaft 193 and is therefore rotated in unison with the feeding turret 186 so that as a new key is moved into assembling position a new portion of the tape is presented. In this manner successive keys are placed on the tape at equally spaced intervals along its length.

The adhesive coated tape is most conveniently supplied from a roll 247 which is carried on a bushing 248 rotatably mounted on a headed pin 249 secured in a bracket 251 fastened to the side of the gear housing 57.

A key 23 when deposited on the tape is more positively located by being forced, with the contacting section of the tape, into a transverse groove 253 (Figs. 6, 8 and 15) provided in a flat face 254 constituting one of the many sides of the turret 246. At the same time the key head is impaled over a boss 255 formed on the turret face. Each flat face is bounded or separated by radial slots 256 which divide the turret into individual turret sectors 257. The shank and head of the key both extend beyond the edges of the tape.

Curved guide members 261, 262 (Figs. 6, 8, 9 and 15) are mounted adjacent the periphery of the assembling turret and confine the head and shank ends of the key within the groove 253 as the turret rotates. The guide 261 extends up to near the top of the turret and is fastened to the housing plate 204. The guide 262 extends over the top of the turret but is cut away in a slot 263 (Fig. 9) at its top to provide the necessary clearance for the transfer of the key in assembling. The guide bar 262 is mounted on a valve block unit provided for controlling vacuum on the turret as will now be explained.

Some resistance against unwinding of the sticky tape from the supply roll 247 is encountered and accordingly vacuum holding of the tape on the turret during its rotation is resorted to. For this purpose each sector 257 of the turret is formed with a plurality of conduits 266 (Fig. 15) which at their outer ends communicate with elongated recesses 267 (see also Figs. 8 and 9) formed in the flat faces 254 of the turret 246. At their inner ends the conduits communicate with transverse bores 268 which are formed in the turret. These bores open out on the outer surface of the turret.

A stationary valve block 271 (Figs. 1, 5, 6, 8, 9 and 15) constitutes the valve block unit just referred to and is mounted on the shaft 193 alongside of and in the front of the turret 246. The adjacent face of this block is held in frictional and airtight engagement with the turret by a compression spring 272 which surrounds the shaft. The compression of the spring may be altered by a knurled nut 273 threaded on the end of the shaft 193, while a washer 274 (Fig. 5) is interposed between the spring and the valve

block. This permits free turning of the spring and nut as a unit with the shaft. The valve block is held stationary by connection with a lug 275 (Figs. 1 and 8) which is formed on the front wall of the gear housing 57. The outer curved key guide 262 is secured to this valve block.

The valve block 271 has a curved groove or valve channel 276 (Figs. 6 and 15) cut in the inner face where it contacts the outer front surface of the turret 246 and is adapted to communicate selectively with the open ends of the bores 268 as the turret rotates. One end of the groove connects with one end of a vacuum passageway 277 extending transversely of the valve block. The opposite end of the passageway opens into a pipe 278 (see also Figs. 8 and 9) which is threaded into the valve block. This pipe constitutes a lead connecting with a suitable source of vacuum and is therefore constantly vacuumized. Through this connection the curved valve groove or channel 276 is also kept vacuumized.

The valve channel 276 is located in the valve block in such a position that its upper end will communicate with the bores 268 of each turret sector 257 as soon as the turret begins its step rotation after a key has been deposited on the tape and pressed into the turret groove 253 of that sector. Thus a vacuum is drawn or the air removed from the bores 268, conduits 266 and recesses 267 of that sector thereby holding the tape tightly against the sector face 254 and preventing its shifting. The channel is long enough to vacuum hold the tape on four of the sectors at the same time which means for each sector until a key on its tape section reaches the bottom of the turret.

While on the turret 246 the tape 245 is cut at a place between adjacent adhering keys to provide stickers 281 (Figs. 1 and 15) which with the keys form the key attaching units. This cutting is done in the interim between two step movements of the turret and during the third stop after the key is received on the tape, see Fig. 6.

The tape is severed by a sharp knife blade 282 secured to a rotatable head 283 which is a part of a sleeve 284 carried in a vertically inclined bearing 285 formed in a bracket 286 (see also Fig. 14). The bracket is adjustably mounted on the front wall of the gear housing 57. The blade is clamped against the head by a plate 287 which is drawn up tight by a long bolt 288 threaded therein and extending through the sleeve.

The knife head 283 is rotated a complete revolution for each of the turret's movements and pauses. The upper end of the sleeve 284 carries a bevel gear 291 (Figs. 1, 3, 6 and 14) which is driven by a similar meshing gear 292. Gear 292 is mounted on one end of a horizontal drive shaft 293 carried in a bearing 294 formed in the gear housing 57. A bevel gear 295 mounted on the opposite end of the drive shaft meshes with a similar bevel gear 296 (see also Fig. 7) carried on the clutch shaft 153.

In this manner the knife blade 282 passes across the tape and sweeps into and through the adjacent slot 256 of the then immovable turret 246, as shown in Figs. 6 and 13. The angular position of the cutting device provides proper alignment with the slot. The sticker thus severed from the tape is still held in place on the turret by the continued vacuum pull. Each sticker has a length substantially equal to the distance across a turret face 254 between slots and the key 23 is centrally located and is still retained within the transverse locating groove 253.

After cutting the blade 282 dips into a liquid bath of water or other solvent contained in a shallow tray 297 (Figs. 6, 13 and 14) supported on a lug 298 formed on the adjustable bracket 286. This cleans the blade and removes any adhering adhesive which may have been picked up from the tape during the cutting action. The blade being wet therefore when it effects the severance of the tape makes a cleaner, sharper cut.

Just prior to the turret coming to rest with the sticker and its key at the bottom, the vacuum holding feature is changed, the bores 268 for that section being moved beyond the channel 276 and coming into register with a vacuumized channel 301 (Figs. 6 and 15) which is also formed in the valve block 271.

The channel 301 is L shaped having a substantially horizontal curved portion 302 terminating in a vertical leg 303 this construction resulting in quick cut-off action. The channel 301 is substantially the same width as the diameter of the vacuum bores 268 formed in the turret. The two bores of each sector are at different distances from the center of the turret and the shape of the channel 301 permits transferring at different times of the vacuum pull on the sticker by way of the bores when changing from channel 276 to channel 301. This prevents interruption of the holding action. When the turret comes into its rest position as shown in Fig. 6, one bore 268 is in communication with the vertical leg portion 303 of the channel 301 while the other bore is in communication with the curved portion 302.

Vacuum is drawn on the channel 301 from the main vacuum supply pipe 278 through a by-pass system containing a cam controlled valve unit. This system includes a passageway 305 (Fig. 15) formed in the valve block 271 and connecting the channel with a pipe 306 (see also Figs. 8 and 9) which is threaded into the valve block. Pipe 306 is connected with a by-pass pipe 307 which leads into a valve cavity 308 of a valve unit (Fig. 7) located in a valve block 309 formed as a part of a bracket 311 (Figs. 8 and 9) secured to the gear housing 57. The valve cavity opens into a vertical bore 313 which communicates with one end of a pipe 314 threaded into the valve block 309. The pipe 314 connects with the main vacuum supply pipe 278. By means of this connection the channel 301 is vacuumized to hold the sticker key unit in position to be applied to a can.

This bringing of successive sticker key units to the bottom of the turret 246 is synchronized with the lifting and lowering of cans. As previously mentioned the sticker key unit is brought into its bottom position near the end of the key feeding cycle and at the time a raised can, which has already received its key, is being lowered to its original position. The positioned sticker key unit is then applied when the following can is raised by the lifter pad 101 and the can is brought into engagement with the sticker as shown in Fig. 6. The key thereupon rests on top of the can with its sticker looped over the key and also engaging the can wall.

At this time the vacuum connection is cut off from the channel 301 by the closing of a valve 321 (Fig. 7) housed in the valve cavity 308 and

constituting in part the valve unit of the by-pass system. The valve is formed on the lower end of a stem 322 which is carried in the vertical bore 313. A reduced diameter portion 323 of the stem formed in the valve end provides for passage of air in the clearance around the stem by way of the pipe 314 when the valve is open.

Opening of the valve is properly timed by means of a cam 325 (Fig. 8) which is mounted on the clutch shaft 153. A roller 326 (see also Fig. 7) engages the periphery of the cam and is mounted in an arm 327 carried on a pivot pin 328 secured in the valve block 309. A lug 329 formed on the arm 327 rests on the top of the valve stem 322 which extends above the top of the valve block. A spring 331 is housed in a plug 332 which is threadedly held in the valve block and exerts an upward pressure tending to close the valve (Fig. 8). This closing takes place when the cam 325 permits lifting of the valve stem and valve.

Provision is made for positively ejecting the sticker 281 from the face of the tape turret 246 and for pressing it on the top of the can for temporarily holding the key in place. As soon as the vacuum is cut off from the valve channel 301 as just described the channel is opened to a source of compressed air which passes through the turret bores 268, conduits 266 and recesses 267 to the back or top surface of sticker and key thereby making the transfer from turret to can.

The air is received under pressure from any suitable source of supply as by way of a supply pipe 335 (Figs. 8 and 9) one end of which communicates with a valve cavity 336 which opens into a vertical bore 337 formed in the valve block 309 of the valve unit. This bore communicates with a short horizontal bore 338 which leads into one end of a pipe 339 which joins with the pipe 306. The air passing through the pipe 306 and the passageway 305 (Fig. 15) comes into the valve channel 301.

The flow of compressed air is cut off by a valve device which structurally simulates the vacuum valve and which includes a valve 341 which is disposed in the valve cavity 336. The valve is formed on the lower end of a stem 342 disposed in the vertical bore 337 and is reduced in diameter adjacent the valve end as at 343 to permit passage of the air through the cavity and around the stem when the valve is open. The upper end of the stem extends beyond the valve block 309 and engages against a lug 344 formed on an arm 345 which is similar to the vacuum valve arm 327.

The arm 345 is mounted on the pivot pin 328 and carries a cam roller 346 which engages against an edge cam 347 keyed to the clutch shaft 153. A spring 348 housed in a plug 349 which is threaded in the valve block 309 at the lower end of the valve cavity 336, presses against the bottom of the valve and holds the valve stem against the lug 344, and thereby holds the cam roller in engagement with its cam 347. Thus rotation of the cam allows the spring 348 to open the valve 341 and to permit the passage of air through the valve as already described. This opening of the valve action is only momentary so that a puff of air strong enough to insure ejection of the sticker 281 from the tape turret 246 escapes from the recesses 267.

Positioning onto the can of the sticker 281 and the key carried thereon is followed by the lowering of the can into its original level with the top of the table 21. One of a plurality of dogs 351 (Fig. 6) secured to the continuously moving auxiliary conveyor chain 92 thereupon moves into engagement with the lowered can and slides it off the lifter pad 101 and onto the table. These dogs 351 are located at spaced intervals along the chain alternating with and disposed between the shorter dogs 94. The dog 351 moves its engaged can along the top of the table and between guide rails 352, 353 (Figs. 1, 3 and 6) mounted thereon.

During this movement of the can across the table it passes instrumentalities which press down on top of the sticker 281 and firmly squeeze it against the top of the can so that the adhesive on the sticker will make a proper bond with the top of the can and thus permanently hold the key securely in place. The pressing is done by a rubber pad 361 (Figs. 1, 3, 6 and 9) which is secured to a counter-balance weight arm 362. The arm is mounted on a horizontal shaft 363 carried in a bearing 364 formed in the front wall of the gear housing 57 and in a bearing 365 formed in a bracket 366 formed integrally with a side wall of the same housing (see also Fig. 7).

The horizontal shaft 363 is rotated in time with the cyclic rotation of the key and assembling turrets 186, 246 so that the rubber pad 361 will engage the sticker on the cam at the proper time. For this purpose the inner end of the shaft carries a helical gear 368 (Figs. 7 and 9) which meshes with a similar gear 369 mounted on the clutch shaft 153.

With the sticker 281 thus pressed home holding the key 23 tightly on top of the can, the auxiliary chain 92 further conveys the can toward the end of the table where it may be ejected or brought into any suitable 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 attaching keys to containers, the combination of a key feeding device, and a tape feeding device, said feeding devices arranged to deliver a key and the tape into assembled relation onto a container with the tape over the top of the key for securing it in place on the container.

2. A machine for attaching keys to containers, the combination of a key feeding device, a tape feeding device, and a cutter for severing the tape to provide a sticker, said feeding devices arranged to deliver a key and the sticker into assembled relation onto a container with the sticker over the top of the key for securing it in place on the container.

3. A machine for attaching keys to containers, the combination of a key feeding device, an adhesive tape feeding device, a cutter for severing the adhesive tape to provide a sticker, said feeding devices arranged to deliver a key and the sticker into assembled relation onto a container positioned adjacent thereto with the sticker over the top of the key, and means for pressing the sticker onto the container for temporarily securing the key in place.

4. A machine for attaching keys to containers, the combination of a key feeding device, an adhesive tape feeding device, a cutter for severing the adhesive tape to provide a sticker, said feeding

devices arranged to deliver a key and the sticker into assembled relation onto a presented container with the sticker applied over the top of the key for temporarily securing it in place on the container, and instrumentalities operable by engagement with the container for setting said feeding devices in motion only when the container is properly presented.

5. A machine for attaching keys to containers, the combination of a key feeding device, an adhesive tape feeding device, a cutter for severing the adhesive tape to provide a sticker, and means for cleaning said cutter prior to each severing operation, said feeding devices being arranged to deliver a key and the sticker into assembled relation onto a presented container with the sticker over the top of the key for securing it in place on the container.

6. A machine for attaching keys to containers, the combination of a key feeding device, a tape feeding device, and means for bringing a container into key receiving position adjacent said feeding devices, said feeding devices being arranged to deliver a key and the tape into assembled relation onto the presented container with the tape over the top of the key for sticking it in place on the container.

7. A machine for attaching keys to containers, the combination of a key feeding device, an adhesive tape feeding device, a cutter for severing the adhesive tape to provide a sticker, and means for bringing a container into key receiving position adjacent said feeding devices, said feeding devices being arranged to deliver a key and the sticker into assembled relation onto the presented container with the sticker over the top of the key for sticking it in place on the container.

8. A machine for attaching keys to containers, the combination of a tape feeding device for advancing a tape having adhesive applied to one surface thereof, a key feeding device arranged to convey a key into juxtaposition with the adhesive surface of the tape, instrumentalities for transferring the positioned key from the key feeding devices to the tape, and a cutter adjacent said tape feeding device for cutting off a portion of the tape carrying the key thereby providing a separated sticker having a key adhering thereto, said tape feeding device delivering the sticker and key carried thereon into position onto a container with the sticker applied over the top of the key for securing it in place on the container.

9. A machine for attaching keys to containers, the combination of a tape feeding device for advancing a tape having adhesive applied to one surface thereof, a magazine for holding a supply of keys, a key feeding device for removing keys from said magazine individually and for conveying them successively into juxtaposition with the adhesive surface of said tape, means for actuating said feeding devices in unison, transfer instrumentalities for removing the positioned keys from the key feeding device and for depositing them successively in spaced relation on said tape, a cutter for severing said tape between the keys adhering thereto to provide individual stickers each carrying a single key, and means for moving containers in succession into key receiving position adjacent said tape feeding device, said tape feeding device being arranged to deliver the sticker and the key adhering thereto onto said container with the sticker over the top of the key for holding the latter in place.

10. A machine for attaching keys to containers, the combination of a key feeding device, an adhesive tape feeding device, a cutter for severing the adhesive tape to provide a sticker, and vacuum means for holding said tape and said sticker in position on said tape feeding device, said feeding devices arranged to deliver a key and the sticker into assembled relation onto a container positioned adjacent thereto with the sticker applied over the top of the key for temporarily securing it in place on the container.

11. A machine for attaching keys to containers, the combination of a key feeding device, an adhesive tape feeding device, a cutter for severing the adhesive tape to provide a sticker, said feeding devices being arranged to assemble a key and a sticker for attachment onto a container, and fluid pressure means for delivering said assembled sticker and key onto a container positioned adjacent said tape feeding devices with the sticker applied over the top of the key for securing the latter in place.

12. A machine for attaching keys to containers, the combination of a key feeding device, an adhesive tape feeding device, electro-magnetic instrumentalities for transferring keys from said key feeding device to said tape feeding device and for depositing the transferred keys onto said tape, means for magnetizing and de-magnetizing said electro-magnetic instrumentalities at the proper time to effect the transfer of the key, and a cutter for cutting off the portion of the tape which carries the key to provide a sticker, said tape feeding device being arranged to deliver the sticker and key onto a positioned container with the sticker over the top of the key to hold the latter in place.

13. A machine for attaching keys to containers, the combination of a key feeding device, an adhesive tape feeding device, transfer instrumentalities for assembling a fed key with the fed tape, means on said devices for properly locating the key transversely of the tape before and after its transfer, and a cutter for cutting off the portion of the tape which carries the key to provide a sticker, a said feeding device being arranged to deliver the sticker and key onto a positioned container with the sticker over the top of the key to hold the latter in place.

14. A machine for attaching keys to containers, the combination of a key feeding device, an adhesive tape feeding device including a rotatable turret having a plurality of radial slots cutting across its periphery and setting off a plurality of faces each of which is provided with a tape and key receiving and locating notch, transfer instrumentalities for assembling a fed key with the fed tape and for pressing the shank of the key with the tape into a said notch for holding the key in a predetermined position relative to the tape, elements on said turret disposed adjacent said faces for receiving the head of the key to locate the key transversely of the turret and tape, and a cutter arranged to sweep through the radial slots in said turret for cutting the tape into portions providing stickers each of which carries a key, a said feeding device being arranged to deliver the sticker and key onto a positioned container with the sticker over the top of the key to hold the latter in place.

15. A machine for attaching keys to containers, the combination of a key feeding device, a tape feeding device, said feeding devices being arranged to deliver a key and the tape into assembled relation onto a container with the tape over the top of the key, and fluid pressure means for

pressing the tape against the container for temporarily holding the key in place.

16. A machine for attaching keys to containers, the combination of a key feeding device, a tape feeding device, said feeding devices being arranged to deliver a key and the tape into assembled relation onto a container with the tape over the top of the key, fluid pressure means for pressing the tape against the container for temporarily holding the key in place, and instrumentalities for further pressing the tape into tight engagement with the container for permanently securing the key in place.

17. A machine for attaching keys to containers, the combination of a key feeding device, an adhesive tape feeding device, a cutter for severing the adhesive tape to provide a sticker, said feeding devices being arranged to assemble a key and a sticker for attachment onto a container, fluid pressure means for delivering said assembled sticker and key onto a container positioned adjacent said tape feeding devices with the sticker applied over the top of the key for temporarily holding the latter in place, and instrumentalities for pressing the sticker into tight engagement with the container for permanently securing the key in place.

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