Nov. 16, 1943. J. E. SOCKE 2,334,224

CAN SEALING MACHINE

Filed Aug. 12, 1941 5 Sheets-Sheet 1

Fig. 1

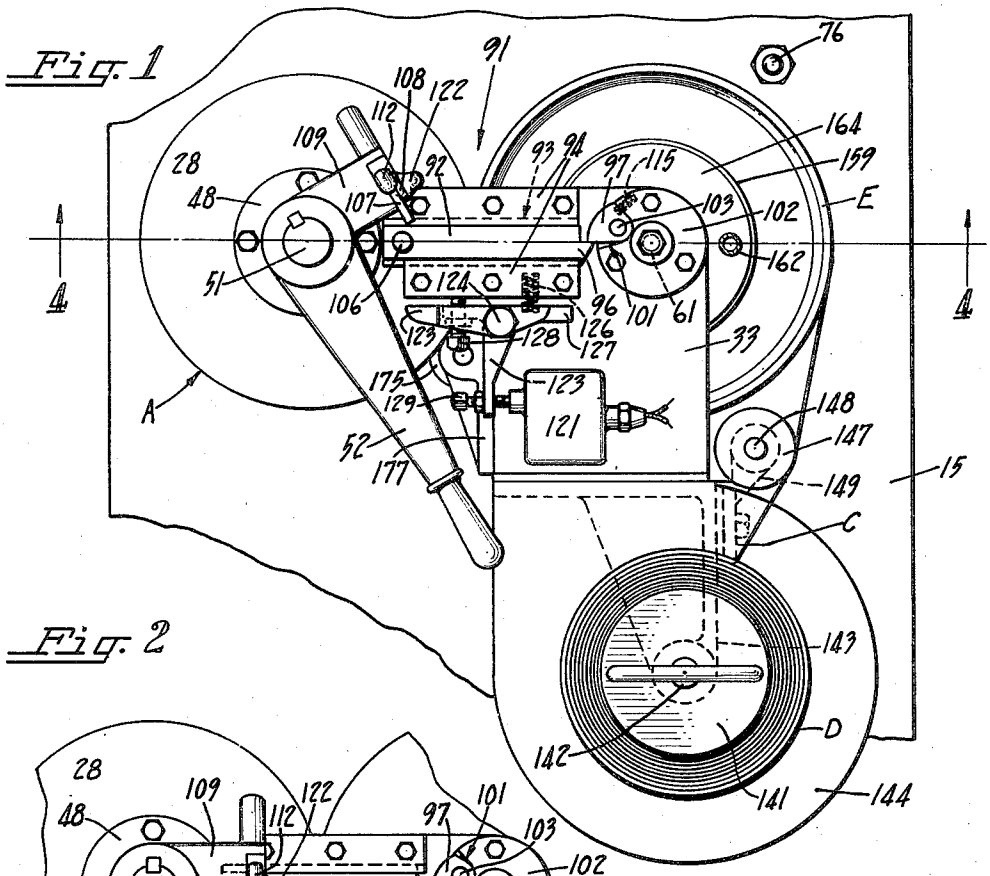


Fig. 2

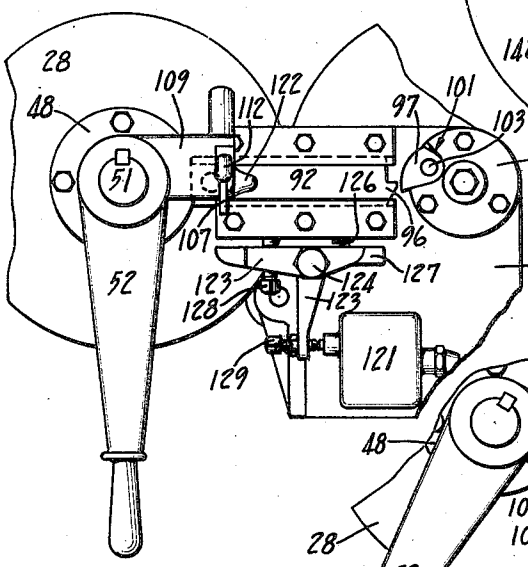
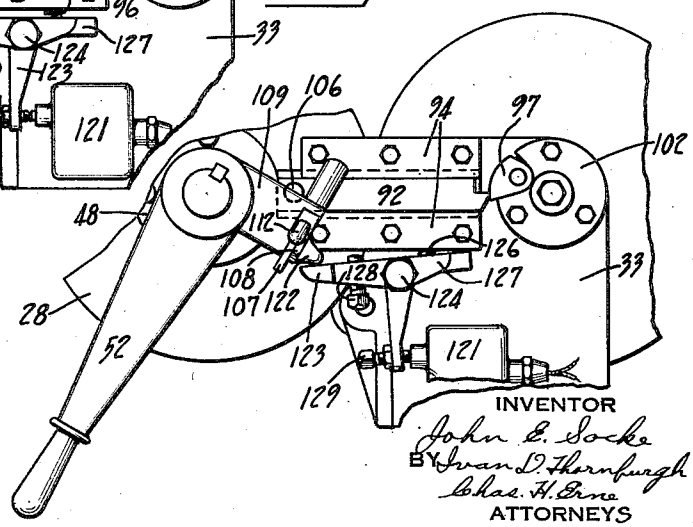


Fig. 3



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CAN SEALING MACHINE

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Fig. 4

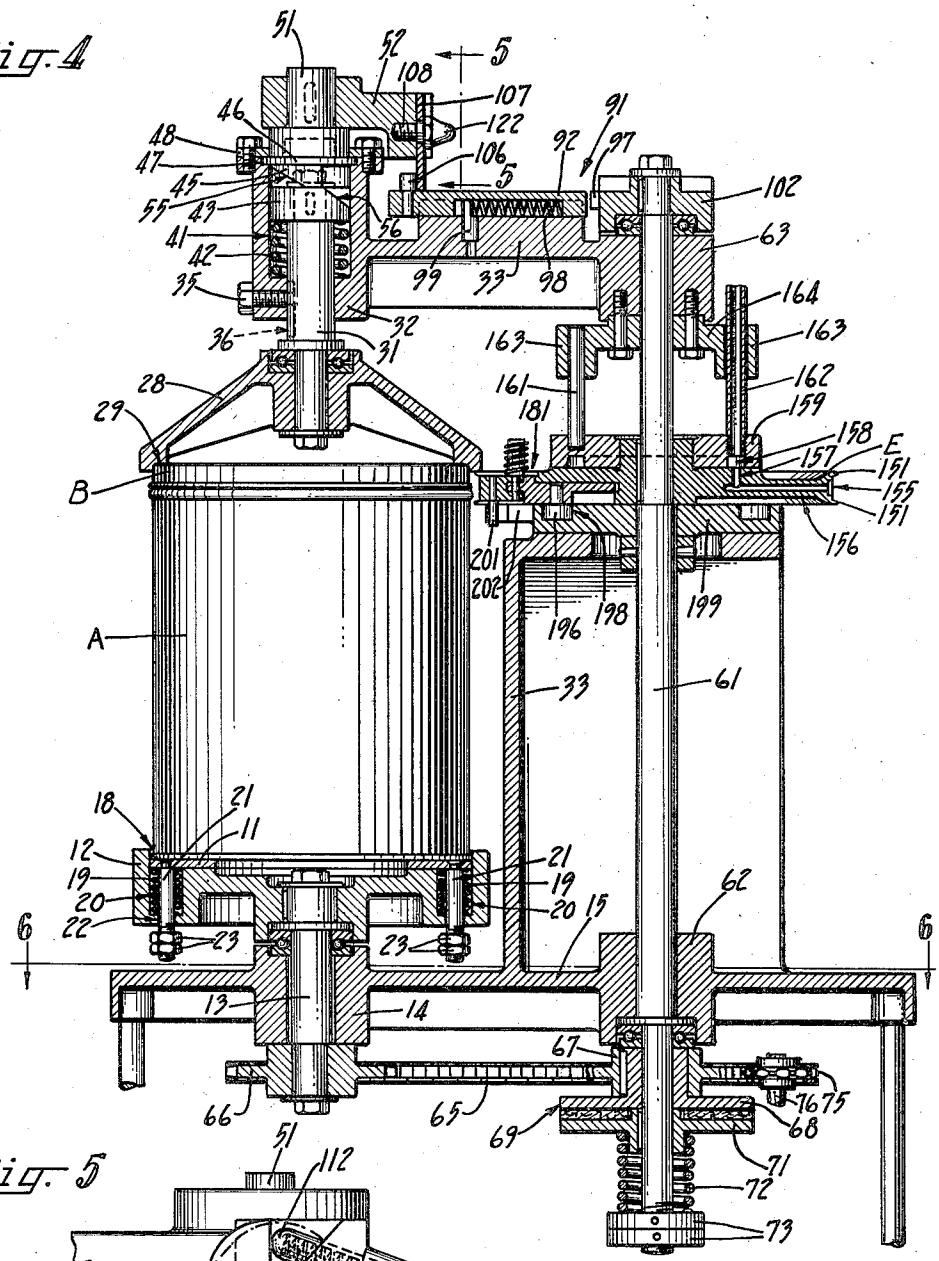
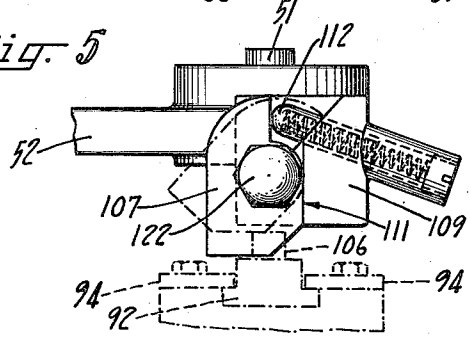


Fig. 5



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CAN SEALING MACHINE

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Fig. 6

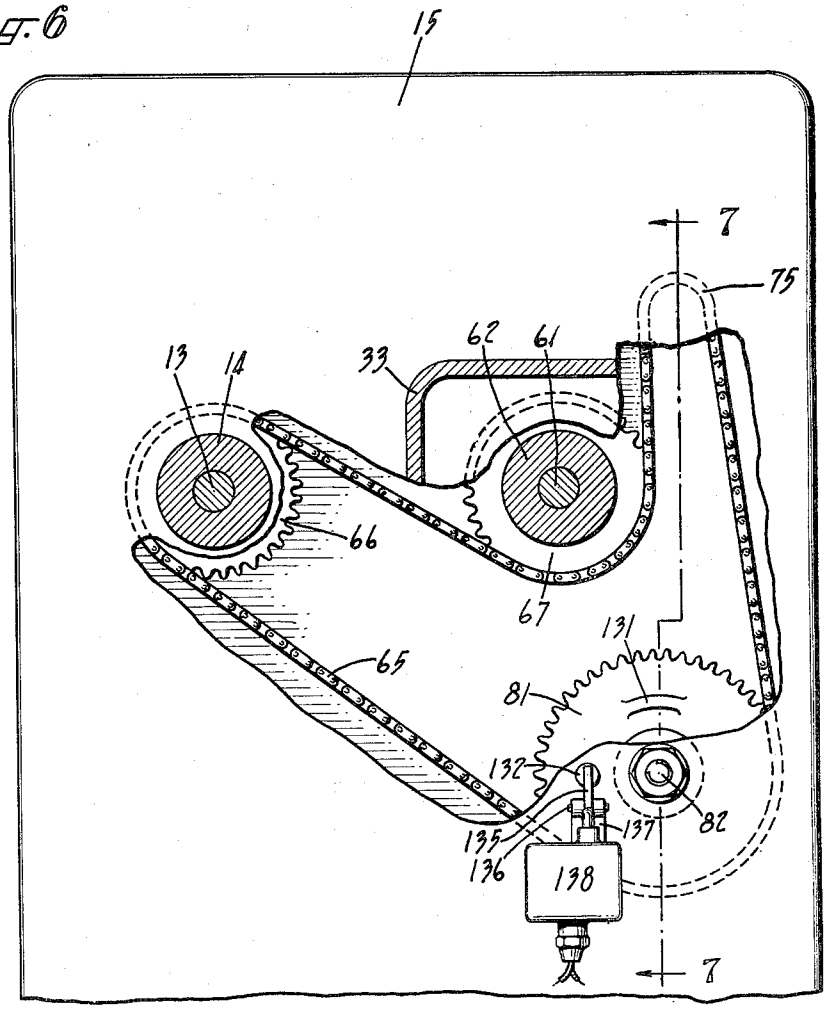
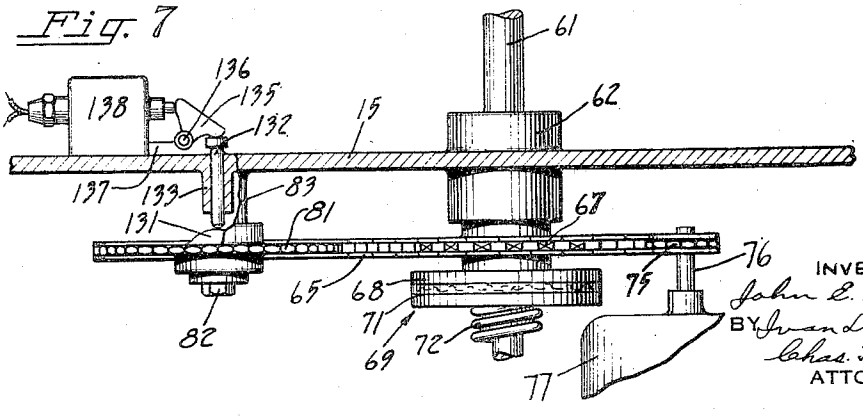


Fig. 7



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CAN SEALING MACHINE

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Fig. 8

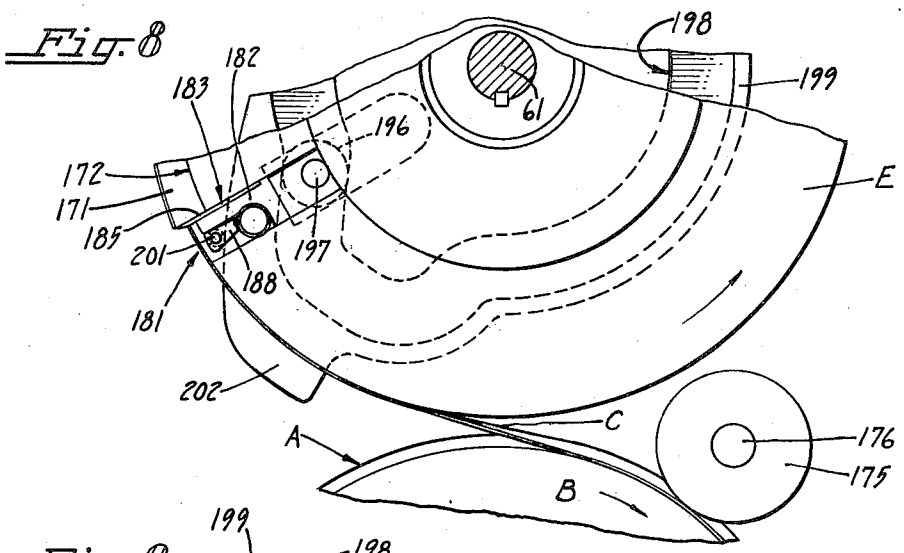


Fig. 9

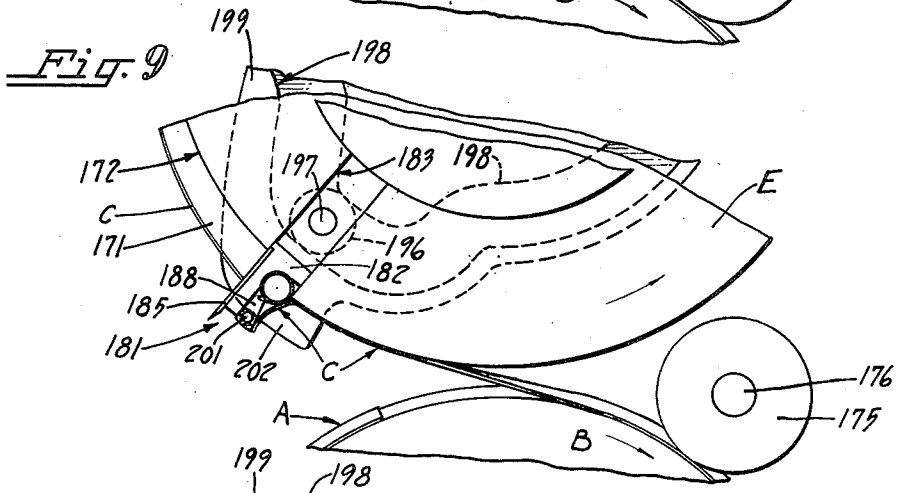
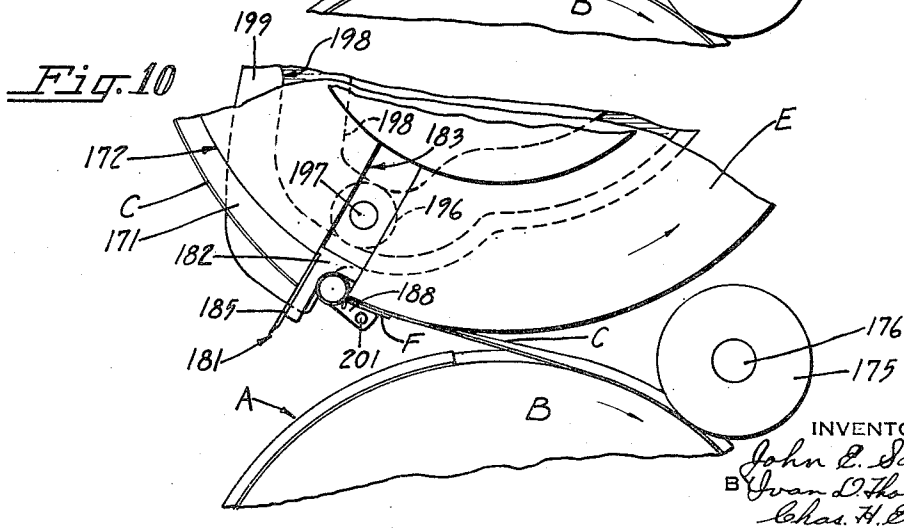


Fig. 10



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Fig. 11

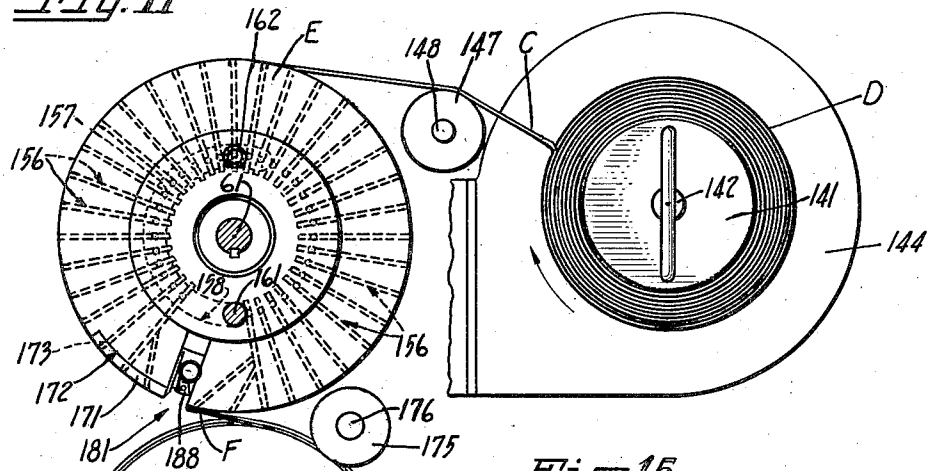


Fig. 15

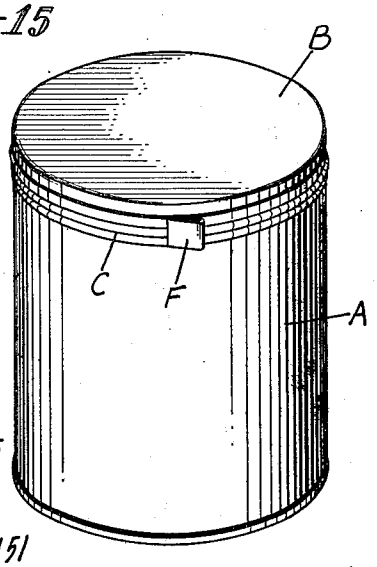


Fig. 12

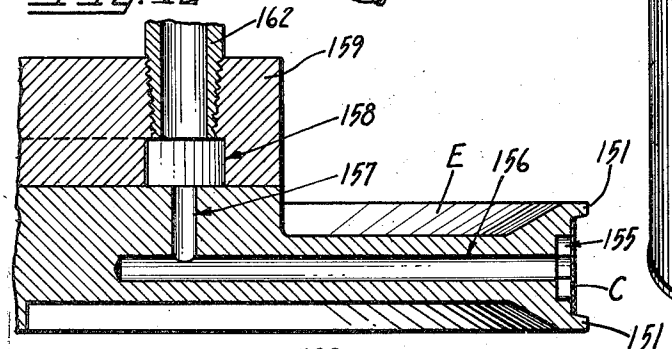


Fig. 14

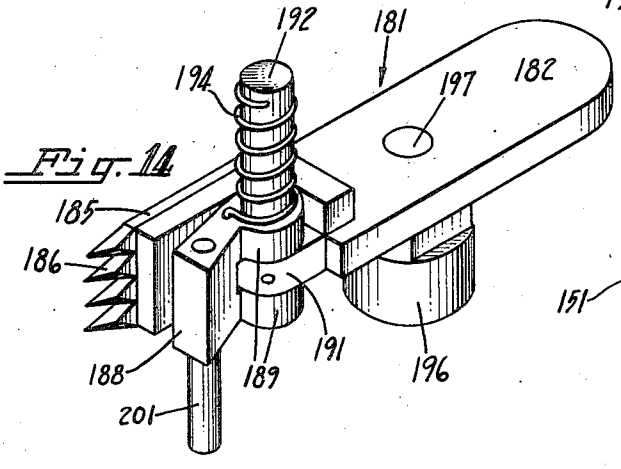
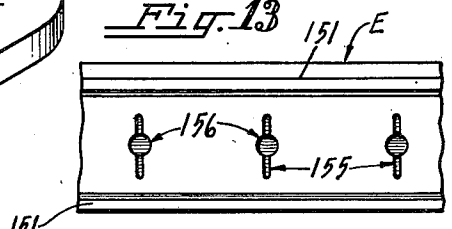


Fig. 13



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UNITED STATES PATENT OFFICE

2,334,224

CAN SEALING MACHINE

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Application August 12, 1941, Serial No. 406,565

12 Claims. (Cl. 216—21)

The present invention relates to container or can sealing machines and has particular reference to applying a sealing strip or tape to a can or container.

In the packaging of certain products it is sometimes desirable to use slip cover sheet metal cans so that the can may be easily opened and readily closed when the contents are not used at one time. Such slip covers are sometimes sealed in place by the application of a sealing strip, tape or the like such as "Cellophane" or other similar material.

The instant invention contemplates a machine for applying the sealing strip to the cans and for forming a loose tab on the outer end of the strip so that the latter may be readily removed when it is desired to open the can.

An object therefore of the invention is the provision of a can sealing machine wherein a sealing strip, tape or the like is applied to a slip cover can to form a seal between the can body and its cover to seal the can for storage and shipment.

Another object is the provision of such a can sealing machine wherein a loose tab is formed on an end of the sealing strip so that the latter may be readily removed when it is desired to open the can.

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 sealing machine embodying the instant invention, with parts broken away;

Figs. 2 and 3 are detail views of the machine starting mechanism showing the moving parts in different positions, with parts broken away;

Fig. 4 is a vertical sectional view taken substantially along the line 4—4 in Fig. 1, with parts broken away, and showing a can in place to be sealed with a tape;

Fig. 5 is an enlarged detail side elevation as viewed substantially along a plane indicated by the line 5—5 in Fig. 4, with parts broken away;

Fig. 6 is a horizontal section taken substantially along the line 6—6 in Fig. 4, with parts broken away;

Fig. 7 is a vertical section taken substantially along the line 7—7 in Fig. 6, with parts broken away;

Figs. 8, 9 and 10 are enlarged fragmentary schematic views showing various steps of cutting off the tape as it is being wound on a can and also showing bending it back to form a removing tab;

Fig. 11 is a schematic view showing how the tape is wound in sealing position on a can;

Fig. 12 is an enlarged fragmentary vertical section of the tape winding wheel used in the machine;

Fig. 13 is an elevational view of a portion of the outer periphery of the tape winding wheel;

Fig. 14 is an enlarged perspective view of the tape cut-off knife and tab forming finger used in the machine; and

Fig. 15 is a perspective view of a sheet metal can having a cover sealed in place by tape applied by the machine of the instant invention.

As a preferred embodiment of the instant invention the drawings illustrate a machine for sealing a sheet metal can A (Fig. 15) having a removable slip cover B, with a sealing tape C which has one side coated with a suitable adhesive. The can preferably is of the character disclosed in United States Patent 1,954,568, issued April 10, 1934, to W. J. Kenny on Container. The tape preferably is of the character known as "Cellophane" although other suitable tapes also may be used.

In the machine the tape C is taken from a supply roll D (Fig. 11) of such tape and is guided into place onto the cam A by a rotatable horizontally disposed applying or winding wheel E over which the tape passes. A can A to be sealed is placed adjacent the applying wheel and as the wheel rotates it wraps the tape around the can, cuts the tape off at the proper time and folds the cut off end of the tape back on itself to provide a loose tab F which may be readily gripped to remove the tape when it is desired to open the can.

A can A to be sealed is placed in the machine manually and is removed from the machine in the same manner after sealing. The can is received in an upright position on a yieldable disc 11 (Fig. 4) located in a rotatable table 12, supported on a vertical shaft 13 carried in a bearing 14 formed in a frame 15 which constitutes the main frame of the machine.

The disc 11 is disposed in a recess 18 in the top of the table 12 and is backed up by compression springs 19 located in sockets 20 in the table. The disc is retained in place by studs 21 which are fixed in the disc and which extend down centrally of the springs and through holes 22 in the bottom of the table. These studs carry lock-

nuts 23 on their lower ends to limit the vertical travel of the disc.

The can A is clamped in place on the table 12 by a clamping head 28 having an annular recessed step 29 which engages over the cover B on the can and which locates the can in the head. The head is mounted for rotation on the lower end of a stem 31 carried in a bearing 32 of a sub-frame 33 which is formed on the main frame 15 and which extends upwardly adjacent the can. A setscrew 35 in the bearing extends into a groove 36 in the stem and thus prevents rotation of the stem.

The upper end of the clamp head stem 31 extends into a recess 41 in the bearing 32 and is surrounded by a compression spring 42. The spring presses upwardly against a collar 43 secured on the end of the stem. The spring thus normally holds the clamp head 28 in raised position and away from the can so that the latter may be placed on and removed from the table 12.

However, when the head is in clamping position on the can, it is held down by an annular cam 45. The cam is formed on a disc 46 which is retained in a seat 47, in the top of the bearing 32, by means of a ring 48 which overlaps the disc and which is bolted to the bearing. The disc is formed with an upright shank 51 which carries an operating handle 52 (see also Figs. 1, 2 and 3).

The cam 45 is formed with a bevel face 55 which normally engages against a bevel face 56 on the collar 43 of the stem 32. Hence when the handle 52 is turned from its normal position in Fig. 1, to the position shown in Fig. 2, it rotates the cam 45 relative to the collar 43. This cam thereupon rides up onto the collar and depresses the latter and its stem 31 and this moves the head 28 down into clamping position on the can, as shown in Fig. 4.

The tape applying wheel E is located adjacent the can A to be sealed and is disposed in a horizontal position in a plane which passes through the terminal edge of the can cover B. The wheel is mounted on a vertical shaft 61 (Fig. 4) carried in a bearing 62 in the main frame 15 and in a bearing 63 in the sub-frame 33.

The wheel E and the table 12 are rotated in unison by an endless drive chain 65 (Figs. 4, 6 and 7). The chain operates over a sprocket 66 which is keyed to the lower end of the table shaft 13. From this sprocket the chain extends around an applying wheel sprocket 67 which is keyed to a fixed disc 68 of a slip clutch 69 mounted on the lower end of the applying wheel shaft 61. The disc 68 frictionally engages against a driving disc 71 which is keyed to the applying wheel shaft. A compression spring 72 is interposed between the driving disc 71 and a pair of collars 73 on the shaft and maintains the discs 68, 71 in frictional driving engagement.

From the applying wheel shaft sprocket 67, the drive chain 65 extends around a drive sprocket 75 which is mounted on a motor shaft 76 of a driving motor 77. The driving chain 65 also operates over a timing sprocket 81 mounted on a stud 82 secured in a boss 83 depending from the bottom of the main frame 15. This completes the path of travel of the chain.

The machine is started and stopped for each can to be sealed, the machine remaining in operation for only one cycle and automatically stopping at the end of the cycle. Starting of the machine is effected by a one revolution clutch device 91 which is tripped by way of the handle 52 and upon the same stroke that clamps the can in position for sealing.

The clutch device 91 includes a horizontal slide member 92 (Figs. 1, 2, 3 and 4) which slides in a slideway 93 located between the handle 52 and the applying wheel shaft 61. The slideway is formed by gibs 94 bolted to the top of the sub-frame 33.

The end of the slide 92 nearest the applying wheel shaft 61 is formed with a latch hook 96 which normally engages a pawl 97, as best shown in Fig. 1. This engagement is maintained by a compression spring 98 (Fig. 4) which is disposed in a groove in the bottom of the slide. The spring is interposed between the slide at one end of the groove and a pin 99 which extends up into the groove from the sub-frame 33. The pawl 97 projects from a recess 101 formed in a collar 102 keyed to the upper end of the wheel shaft. The pawl is also mounted on a pivot pin 103 secured in the collar.

The opposite end of the slide 92 carries an operating pin 106 which projects upwardly into the path of travel of an operating finger plate 107 (see also Fig. 5) carried on a pivot stud 108 threaded into a lug 109 on the handle 52. The finger plate is held against a stop ledge 111 in the lug 109 by a spring barrel 112 in the lug so that the finger can swing in only one direction on its pivot stud.

Hence when the handle 52 is shifted from its position in Fig. 1 to clamp the can in the machine, the finger plate 107 engages a side of the operating pin 106 of the slide 92 and thus draws the slide outwardly against the resistance of the spring 98, as shown in Fig. 2. This movement of the slide shifts its latch hook 96 away from the pawl 97 and hence releases it. This permits a compression spring 115 in the collar 102 to press the released pawl forward in its recess 101 where it is out of alignment with the hook 96 on the slide.

Continued movement of the handle 52 in the same direction shifts the finger plate 107 out of engagement with the operating pin 106 in the slide 92 and this permits the spring 98 to return the slide inwardly. However, this return of the slide brings its latch hook 96 into pressing engagement with the top of the pawl 97 but not in locking engagement therewith, as shown in Fig. 3, so that the pawl remains released.

At the termination of this starting stroke of the handle 52 (Fig. 3) the handle, as it reaches such extreme position, operates an electric start switch 121 which controls the starting of the electric motor actuating the machine. This is brought about by a projection or button 122 on the finger plate pivot stud 108 which engages and shifts a bell crank 123 mounted on a pivot stud 124 secured in the sub-frame 33 adjacent the switch 121.

The bell crank 123 normally is maintained in one position under pressure of a compression spring 126 interposed between one of the slide gibs 94 and a lug 127 on the bell crank. A setscrew 128 in one leg of the crank limits the inward travel of crank, while a setscrew 129 in the other leg engages against the movable element of the electric switch 121.

This actuation of the electric switch 121 and the starting of the electric motor 77 rotates the table 12 through the drive chain 65. This carries the can A and turns the shaft 61 and its applying wheel E in unison through one revolution of

the wheel. It is during this revolution of the wheel E and this circular travel of the can A, that the latter is sealed by the application of the tape C, as will be hereinafter explained. The rotation of the wheel shaft revolves the collar 102 and its pawl 97 and when the wheel has completed its single revolution, the pawl again engages the latch hook 96 on the slide 92. This stops the rotation of the applying wheel E and its shaft 61.

It will be understood that a conventional electrical circuit will be used for maintaining electrical energy in the electric motor 77 until the entire cycle of operation is completed. The handle 52 therefore need be held in the position shown in Fig. 3 only momentarily. The release of the handle under the action of the spring 126 immediately opens the switch 121, the handle assuming the position of Fig. 2. Following this the holding circuit provides for the full cycle of operation.

Simultaneously with the engaging of the pawl 97 and the latch hook 96 on the slide 92, the electric motor 77 stops. This is brought about by a cam projection 131 on the timing sprocket 81 (Figs. 6 and 7). At the completion of a machine cycle this projection engages and lifts a vertically disposed pin 132 carried in a boss 133 on the main frame 15. The upper end of the pin engages and shifts a rocker plate 135 mounted on a pivot pin 136 carried in a bracket 137 secured to the main frame. The rocker plate engages and presses in a movable element of an electric stop switch 138 secured to the main frame and it is the operation of this switch that cuts out the motor and thus stops further actuation of the machine.

Upon the stopping of the machine, the handle 52 is shifted back manually into its original position (Fig. 1), in order to prepare for again starting the next cycle. In shifting back to this position, the finger plate 107 (Fig. 5) rides over the operating pin 106 of the slide 92 against the resistance of the spring barrel 112. The dotted outline in Fig. 5 of the finger plate discloses this returning position of the plate. The return shift of the handle also unclamps the can A so that it may be removed from the machine.

Sealing of the can A by the tape C, while the machine is in operation, now will be explained. It will be remembered that the tape is unwound from a supply roll D. This supply roll is carried on a reel 141 (Figs. 1 and 11) mounted on a pin 142 disposed in a bearing bracket 143 bolted to a side of the sub-frame 33. A horizontal platform 144 secured to the side of the sub-frame supports the reel and the tape carried thereon.

From the roll D, the tape C passes over an idler roller 147 and then onto the applying wheel E. The idler roller is mounted on a short vertical pin 148 carried in a bracket 149 bolted to the bearing bracket 143. Spaced and parallel flanges 151 (see also Fig. 12) formed on the wheel guide the tape into position thereon.

The tape C is held in place on the applying wheel E by vacuum. For this purpose the outer periphery of the wheel is formed with a plurality of elongated vertical slots 155 (Figs. 12 and 13) which communicate with radial bores 156 in the wheel. The bores 156 communicate with short vertical holes 157 which open into a main vacuum groove 158 formed in a stationary plate 159 seating against the top of the applying wheel.

The plate 159 is held against rotation with the wheel by a rod 161 and a pipe 162 (Figs. 4 and 11) which are anchored in the plate and which extend up into bosses 163 formed on a holding member 164 bolted to the bottom of the bearing 63 in the sub-frame 33. One end of the pipe 162 communicates with the main groove 158 and its opposite end leads from a suitable source or supply of vacuum.

The main vacuum groove 158 is curved as best shown in Fig. 11 and extends substantially halfway around the plate 36 in which it is formed. The groove begins in line with a place where the tape first engages the wheel and terminates in line with a place where the tape is applied to a can.

Hence as the wheel rotates, it brings the holes 157 into communication with the groove 158 and thus draws a vacuum on the connecting bores 156 and slots 155 to cause the tape to adhere to the wheel as it is drawn off the reel.

The tape thus held on the applying wheel E, is carried around with the wheel toward the can A, as schematically shown in Fig. 11. At one place in the periphery of the wheel there is a resilient insert 171 which is secured in a recess 172 in the wheel and which projects slightly beyond the periphery of the wheel. This insert is made preferably of rubber and is formed with holes 173 which communicate with the radially disposed vacuum bores 156 so that the tape will be held in place against the rubber by the vacuum drawn through the bores.

When the wheel E and the can commence rotating through a cycle, as hereinbefore explained, the rubber insert 171 comes adjacent the can and presses the forward end of the tape C against the can so that it covers the terminal edge of the cover B. The side of the tape which engages the can is the side that carries the adhesive and hence the tape sticks to the can. As the wheel and the can continue to rotate in unison the tape is wrapped around the can so that it completely encircles it once with a slight lap-over. A pressure roller 175 (Figs. 1 and 11) presses the tape against the can as it is applied and this insures a tighter seal. This roller may be made of soft rubber or other resilient material and will press the tape firmly against the can wall regardless of slight irregularities in the wall surface. In the drawings the body wall is shown as being beaded and the cover is curled. Such a roller is mounted on a pivot pin 176 carried in a bracket 177 secured to the sub-frame 33.

Near the completion of this wrapping of the tape C around the can, the tape is cut while still on the wheel so that just sufficient tape is obtained to peripherally encircle the can. The desired length of tape is measured on the circumference of the wheel which is of the proper diameter to fit the tape to the can being sealed. The cutting is performed adjacent the forward edge of the rubber insert 171 and is effected by a cut-off device 181 (Fig. 14) located adjacent the insert.

The cut off device 181 includes a slide 182 (Figs. 4, 8 and 14) which is disposed in a radial slideway 183 formed in the applying wheel E adjacent the rubber insert 171. The outer end of the slide carries a radially disposed cut-off knife 185 having a serrated cut-off edge 186. Adjacent the knife the slide carries a tab forming finger 188 having a pair of spaced hinge lugs 189 which straddle a lug 191 in the slide. The finger is mounted on a vertical pivot pin or pintle 192 which extends through the lugs 189, 191 and is

secured in the slide lug 191. The finger is retained under tension of a spring 194 which is coiled around the pivot pin. One end of the spring is secured in the pin while the opposite end is fastened in the finger so that the finger will tend to move toward the right as viewed in the drawings.

As this cut-off device 181 is carried around with the wheel, it is maintained in a retracted position within the wheel by a cam roller 196 which is carried on a pin 197 fixed in the bottom of the slide 182. The roller operates in a cam groove 198 of a stationary horizontal face cam 199 disposed directly below the applying wheel and secured to the subframe 33.

Near the completion of a cycle of the rotating wheel and as the cut-off device moves toward the can being sealed, the cam 199 shifts the slide outwardly, as shown in Fig. 8. This outward movement forces the serrated knife 185 through the tape C and thus cuts it through. The cut-off rear end of the tape is still held to the wheel by the vacuum.

The slide 182 continues to move outwardly under the action of the cam 199. The tab forming finger 188 at that time is held against turning through its spring 194, by a pin 201, which is mounted on and which extends downwardly from the finger, coming into engagement with a stationary edge cam section 202. This edge cam section is formed on the periphery of the cam 199. The pin and the cam thus hold the finger against turning while the slide and finger continue to move radially outwardly. This radial movement pushes out the cut-off end of the tape C, as shown in Fig. 9.

When the slide 182 is fully out, i. e., at the moment it reaches the end of its outwardly radial movement, the pin 201 passes beyond and abruptly rides off the edge cam section 202. This permits the spring 194 to rotate the finger toward the right, as viewed in the drawings, which movement of the finger folds the pushed-out end of the tape rearwardly upon itself against the outer periphery of the wheel as in Fig. 10. This brings the adhesive coated surfaces of the tape into engagement thus producing the tab F which is of sufficient length to be gripped easily by the fingers.

Immediately following this tab forming operation, continued rotation of the wheel E passes the slide member cam roller 196 along an inwardly inclined portion of the cam groove 198 of cam 199 and the slide 182 is thereby rapidly retracted into its original position within the wheel. As the slide moves in, the knife and the tab finger thus are drawn back into the slideway and inside of the periphery of the wheel. The wheel continues to rotate until the cut-off end of the tape is rolled down on the can. Just as the tape is released from the wheel E, the cycle terminates leaving the moving parts of the machine in the proper position for the commencement of the next sealing operation. This also leaves the tab F adhesively free of and projecting slightly outwardly from the can A. The can is then removed from the machine.

It will be evident, by reference to Fig. 15, that the tab F is in the proper position for convenient manual engagement to pull the tape off the can, when it is desired to open the latter. This is done by stripping off the tape which is thus removed as an integral unit. The disengaged slip cover B may then be opened as in the instance of the usual slip closure can of the nature illustrated.

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. In a machine for applying a tape to a container, the combination of means for rotating a container, an applying wheel adjacent the container and carrying a tape to be applied to the container, instrumentalities on said wheel for cutting off a predetermined length of the tape, and devices for rotating said wheel in time with said means so that the tape will be transferred from the wheel to the container.

2. In a machine for applying a tape to a container, the combination of means for rotating a container, an applying wheel adjacent the container and carrying a tape to be applied to the container, elements on said wheel for forming a tab on the tail end of said tape, and devices for rotating said wheel in time with said means so that the tape will be transferred from the wheel to the container.

3. In a machine for applying a tape to a container, the combination of means for rotating a container, devices adjacent said container for applying a tape thereto while it rotates, and elements for forming a tab on the tail end of the tape so that the tape may be readily removed from the container when desired.

4. In a machine for applying a tape to a container, the combination of means for rotating a container, an applying wheel adjacent the container and carrying on its periphery a tape to be applied to the container, a radial slide in said wheel, a cam for actuating said slide in timed relation with the wheel, a knife having a serrated cutting edge on said slide for piercing and cutting through the tape carried on the wheel to set off a predetermined length thereof, and devices for rotating said wheel in time with said means so that the tape will be transferred from the wheel to the container.

5. In a machine for applying a tape to a container, the combination of means for rotating a container, an applying wheel adjacent the container and carrying on its periphery a tape to be applied to the container, a radial slide in said wheel, a cam for actuating said slide in timed relation with the wheel, a knife on said slide for cutting the tape so that a predetermined length will be applied to the container, a spring held finger on said slide for turning back on itself the tail end of the cut-off tape to provide a loose tab for removing the tape from the container when desired, and devices for rotating said wheel in time with said means so that the tape will be transferred from the wheel to the container.

6. In a machine for applying a tape to a container, the combination of means for rotating a container, a clamp head for clamping the container in position on said rotating means, an applying wheel adjacent the container and carrying a tape to be applied to the container, actuating devices for rotating said wheel in time with said means so that the tape will be transferred from the wheel to the container, instrumentalities controlling the starting of said actuating devices, and a manually operable handle connecting with said clamp head for actuating said head and for operating said controlling in-

strumentalities simultaneously to set said container rotating means and said wheel in motion.

7. In a machine for applying a tape to a container, the combination of means for rotating a container, an applying wheel disposed adjacent the container and carrying a strip of tape to be applied to the container, means for supplying said tape strip to said wheel devices for rotating said wheel in time with said rotating means so that the tape will be transferred from the wheel to the container and means carried by said wheel for severing a length of tape during its transfer from said wheel to said container.

8. In a machine for applying a tape to a container, the combination of means for rotating a container, a tape applying wheel disposed adjacent the container and having a piurality of openings in its periphery connecting with passageways leading from a source of vacuum for retaining on its periphery a tape to be applied to the container, devices for rotating said wheel in time with said container rotating means so that the tape will be transferred from the wheel to the container, and means carried by said tape applying wheel for severing a length of tape therefrom during application of the tape to said container.

9. In a machine for applying a tape to a container, the combination of means for rotating a container, a tape applying wheel disposed adjacent the container and having a plurality of openings in its periphery connecting with passageways leading from a source of vacuum for retaining on its periphery a tape to be applied to the container, valve means disposed between said passageways and the source of vacuum for cutting off the vacuum from the passageways as they come into position adjacent the container to free the tape from the wheel, devices for rotating said wheel in time with said container rotating means so that the tape will be transferred from the wheel to the container, and means carried by said tape applying wheel for severing a length of tape therefrom during such transfer and application of the tape to said container.

10. In a machine for applying a tape to a container, the combination of means for rotating a container, a tape applying wheel disposed adjacent the container and carrying on its periphery a tape to be applied to the container, means on said wheel for bringing an end of said tape into engagement with the container, devices for rotating said wheel in time with said container rotating means so that the tape will be transferred from the wheel to the container, and means carried by said tape applying wheel for severing a length of tape therefrom during such transfer and application of the tape to said container.

11. In a machine for applying a tape to a container, the combination of means for rotating a container, a tape applying wheel disposed adjacent the container and carrying on its periphery a tape to be applied to the container, a resilient insert in the periphery of the wheel for pressing the forward end of the tape against the container, devices for rotating said wheel in time with said container rotating means so that the tape will be transferred from the wheel to the container, and means carried by said tape applying wheel for severing a length of tape therefrom during such transfer and application of the tape to said container.

12. In a machine for applying a tape to a container, the combination of means for rotating a container, a tape applying wheel disposed adjacent the container and carrying a tape to be applied to the container, devices for rotating said wheel in time with said container rotating means so that the tape will be transferred from the wheel to the container, a one revolution clutch for controlling the rotation of said applying wheel for a single tape applying cycle, and cutting means carried by said applying wheel for severing a length of tape therefrom during such transfer and application of the tape to said container, whereby a predetermined length of tape is applied to said container.

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