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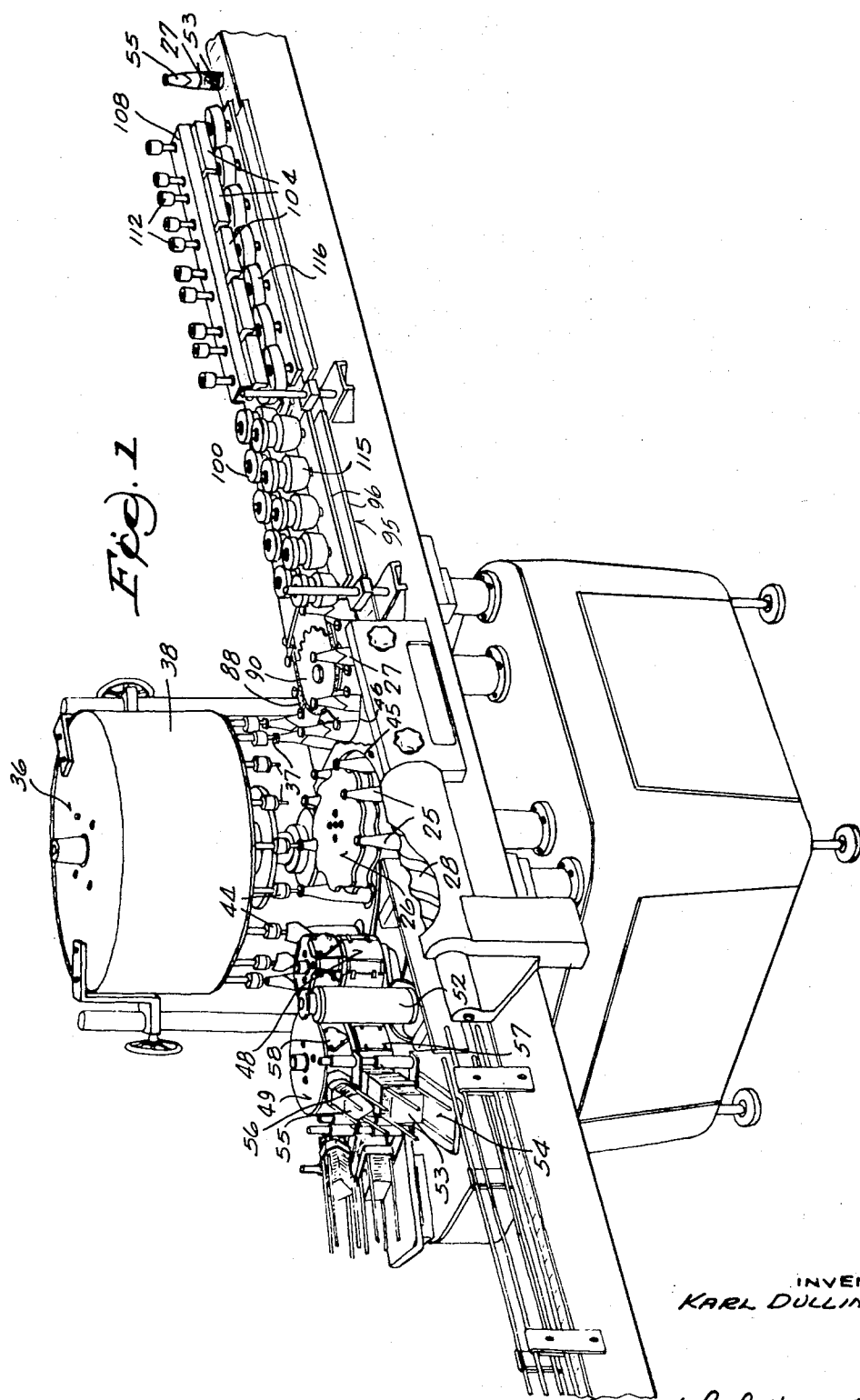
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3,707,417

METHOD AND APPARATUS FOR FOIL WRAPPING BOTTLE NECKS

Original Filed June 25, 1969

5 Sheets-Sheet 1



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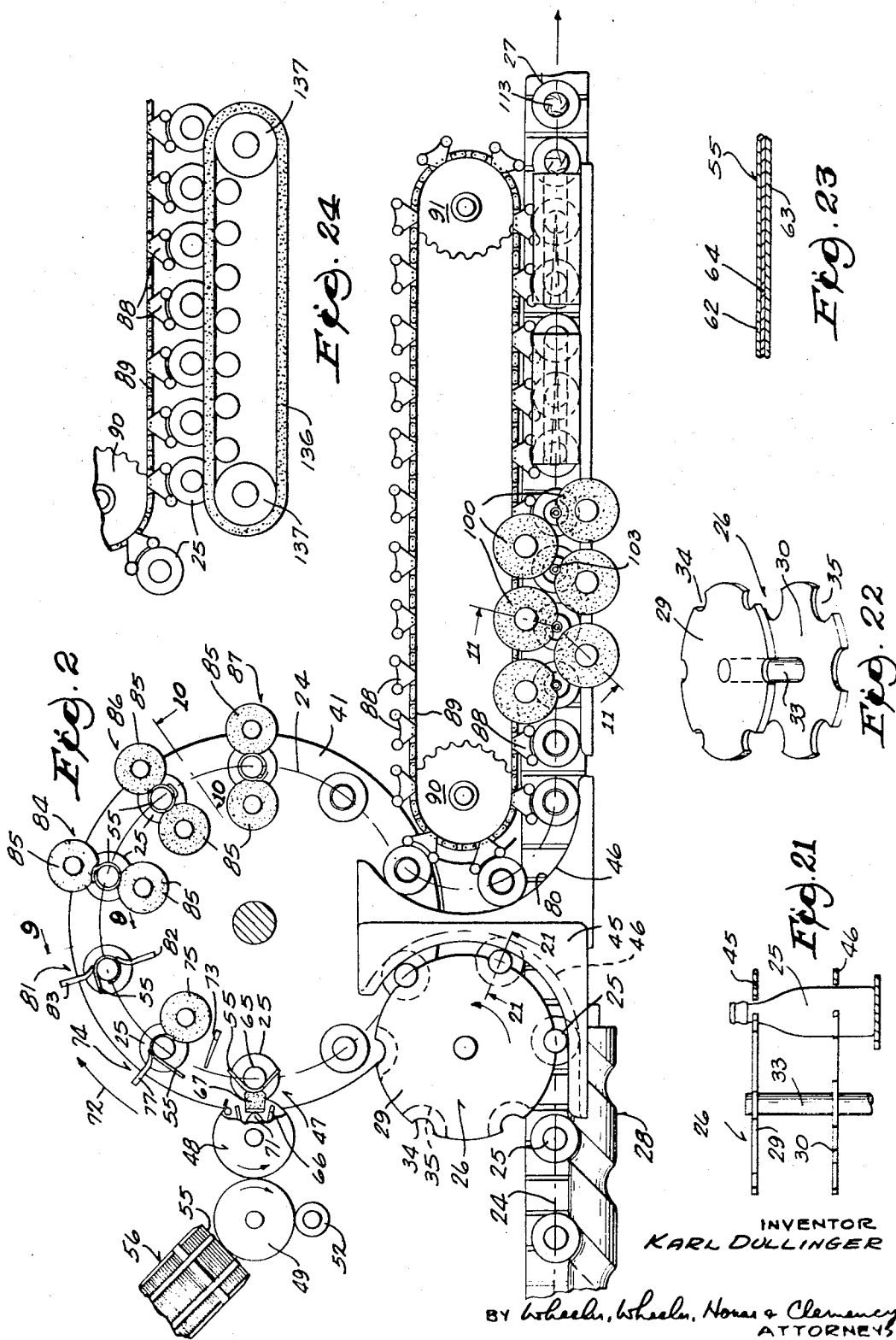
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## METHOD AND APPARATUS FOR FOIL WRAPPING BOTTLE NECKS

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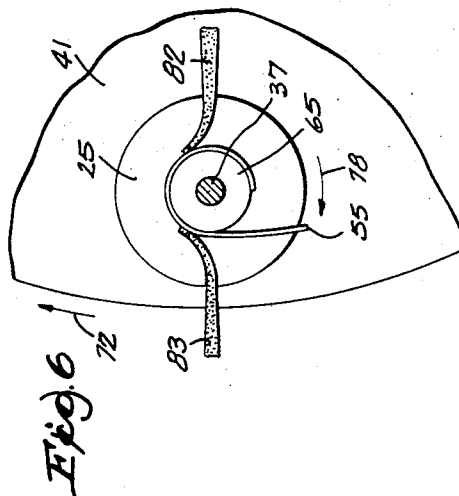
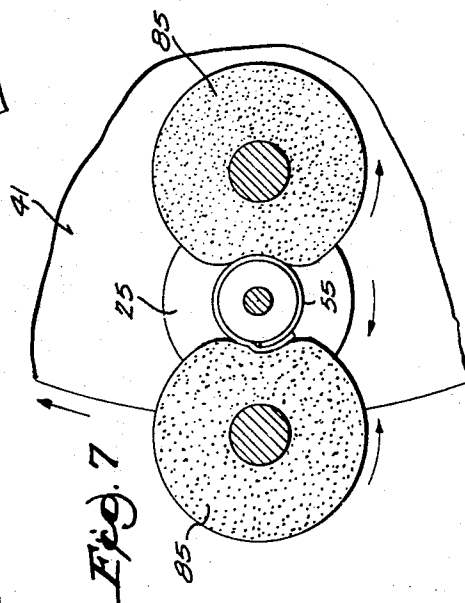
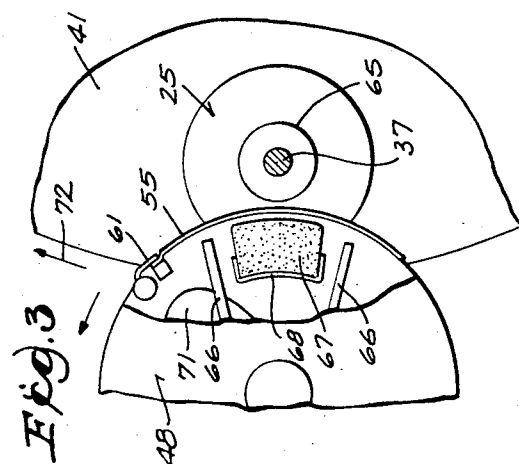
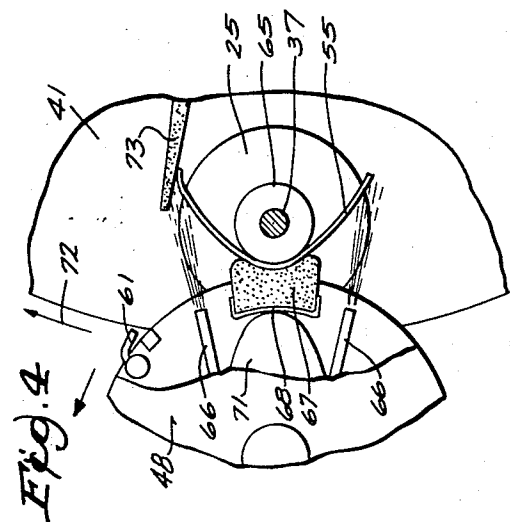
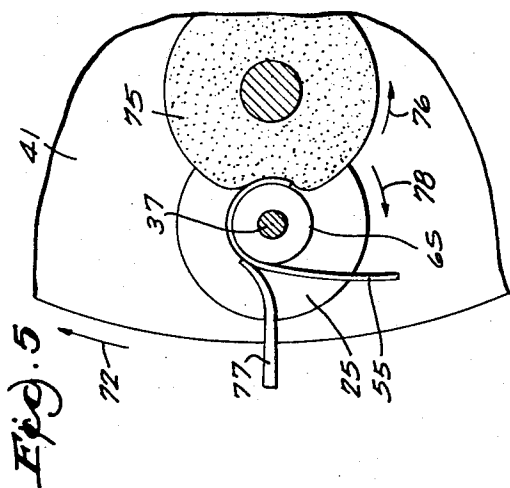
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METHOD AND APPARATUS FOR FOIL WRAPPING BOTTLE NECKS

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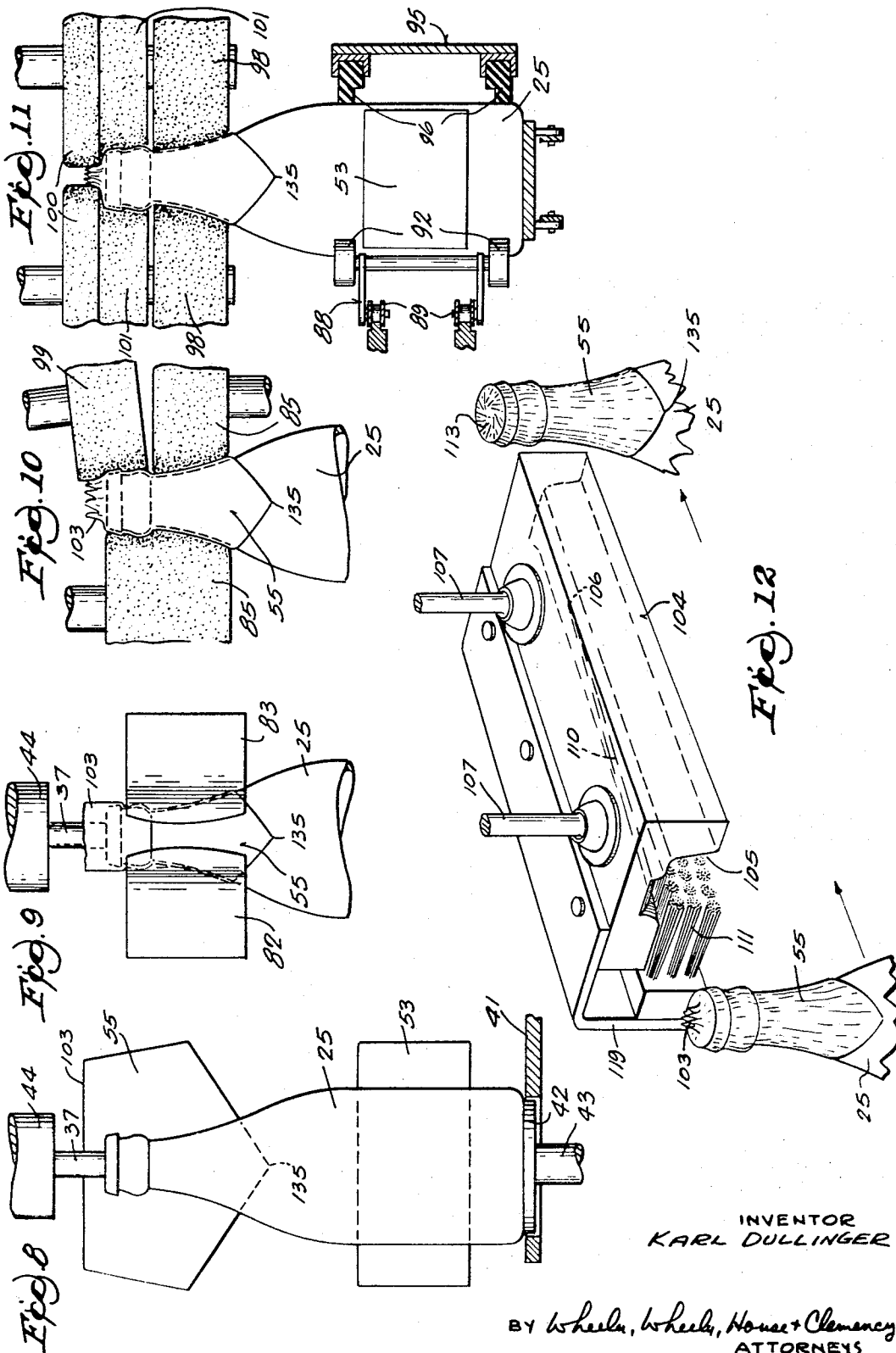
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## METHOD AND APPARATUS FOR FOIL WRAPPING BOTTLE NECKS

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Dec. 26, 1972

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METHOD AND APPARATUS FOR FOIL WRAPPING BOTTLE NECKS

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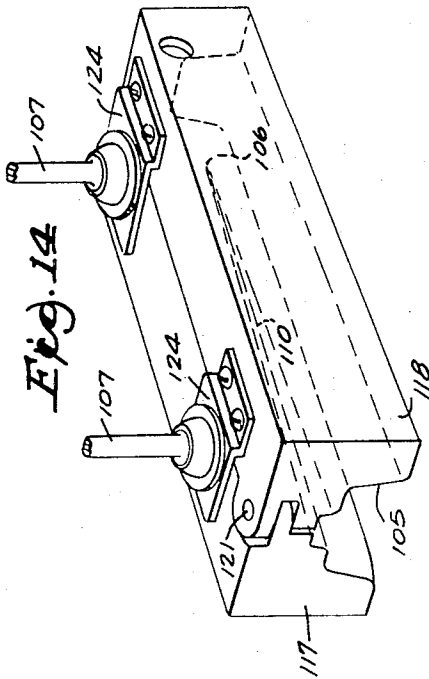


Fig. 14

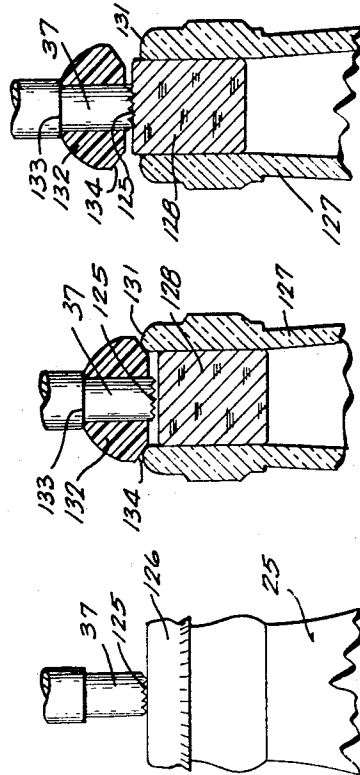


Fig. 17

Fig. 18

Fig. 19

Fig. 13

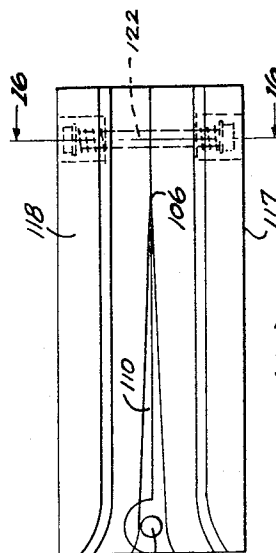
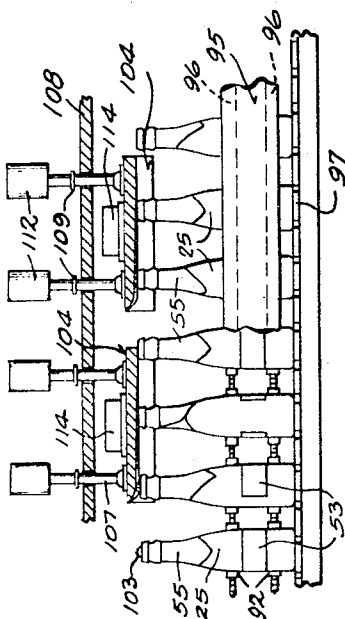


Fig. 15

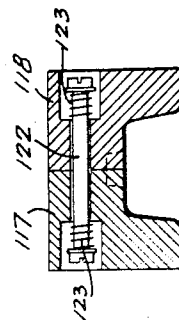


Fig. 16

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1

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## METHOD AND APPARATUS FOR FOIL WRAPPING BOTTLE NECKS

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Hermann Kronseder, Neutraubling, Germany  
Original application June 25, 1969, Ser. No. 836,285, now  
Patent No. 3,567,551, dated Mar. 2, 1971. Divided and  
this application Oct. 19, 1970, Ser. No. 81,732  
Int. Cl. B65c 3/18, 3/22  
U.S. Cl. 156—212

3 Claims

### ABSTRACT OF THE DISCLOSURE

Method and apparatus for foil wrapping bottle necks and the like with precut foil wrappers stored in a magazine and comprising advancing unwrapped bottles along a path, successively feeding individual foil wrappers from the magazine toward a bottle station along said path, applying a leading portion of the wrapper to the bottle neck, rolling the wrapper around the bottle neck to wrap the wrapper around the neck and applying the trailing portion of the wrapper to the bottle neck, exposing a top margin of the wrapper upwardly beyond the top of the bottle while rolling it onto the bottle neck, pressing the exposed top margin of the wrapper inwardly in folds, and flattening the inwardly pressed and folded wrapper margin against the bottle top. The conveyor consists of individual bottle turntables and clamping stems for holding the bottle in vertical orientation while it is rotated against flaps, pads, and brushes, etc., to smooth the wrapper onto the bottle. An infeed star wheel has spaced plates with peripheral pockets which are aligned vertically and which hold the bottle in vertical orientation.

### CROSS REFERENCE TO RELATED APPLICATION

This application is a division of my copending application Ser. No. 836,285, filed June 25, 1969 now Pat. No. 3,567,551.

### BACKGROUND OF THE INVENTION

It is known in the art to have foiling machines which apply foil wrappers to bottle necks after the bottles leave a labeling machine. In some instances such foiling machines are fed a continuous strip of thin foil material which is cut off periodically to the proper length to provide enough foil for one bottle. This foil strip will typically be very thin and delicate and have a total thickness of only about .009 to .012 mm. Such apparatus is usually designed to cut off the foil wrapper in one size only. Accordingly, it is not easily possible to change the size of the foil wrapper.

In some other instances such foiling machines utilize cut to size foil wrappers. These machines also are in addition to and follow a labeling machine which applies a paper label to the bottle. In the prior art known to me, the foil wrappers were made entirely of metal foil, such as aluminum. These wrappers are glued onto the bottle neck. Once glued to the bottles, they are very difficult to remove because they are waterproof and cannot easily be soaked off of the bottle. Prior art removal techniques included scratching off the foil wrapper or decomposing it with highly caustic solutions. Both of these removal techniques damage the high polish with which the bottle is usually provided and limit the number of times the bottle can be reused.

### SUMMARY OF THE INVENTION

In accordance with the present invention, mechanism for foiling a bottle neck is provided in the same machine which is used for applying the paper label to the bottle.

2

Accordingly, no more floor space is required than was heretofore required for ordinary labeling of the bottles. The present invention makes it unnecessary to provide a separate foiling machine. The machine is versatile in that it can apply any desired foil shape. The foil wrappers are cut to size and stored in a magazine and are applied to the bottle neck concurrently and in synchronism with the application of the paper label to the body and/or shoulder of the bottle. This results in automatic alignment of the label and the foil wrapper. A simple change in the shape of the prefabricated foil wrapper is about all that is necessary to adapt the machine for applying any desired shape of foil wrapper.

The foil wrapper itself is greatly improved over conventional wrappers in that it consists of laminated plies of metal foil and paper bonded together with a heat releasable binder, such as wax. The multi-ply laminations give the wrapper sufficient stiffness so that it can be readily handled as an individually precut label, as distinguished from the prior art machines in which the foil is very thin and is typically furnished in a continuous strip. Moreover, removal of the foil wrapper from the bottle preliminary to reuse of the bottle is facilitated because of exposure of the bottle neck and foil wrapper to ordinary hot washing solutions will soften or melt the wax binder, thus permitting the foil ply to be peeled off easily and without the necessity of resorting to scratching apparatus or the highly caustic solutions heretofore required to dissolve the foil. As soon as the metal ply is removed, the paper backing ply will become soaked by the hot washing solution and will quickly disintegrate and its glue adhesive to the bottle dissolved, all without damage to the high polish of the bottle.

In accordance with the present invention, the precut foil wrappers are glue coated and are brought to a line of continuously moving bottles in the same time sequence as the paper body or shoulder labels are applied thereto. The leading edge of the foil wrapper is blown around the bottle neck, and the trailing edge of the wrapper is rolled onto the bottle by turning the bottle and pressing the glue coating of foil wrapper to the bottle neck with brushes, rollers, or smoothing flaps. Where it is desired that the foil cover the top of the bottle, as well as its neck, the top margin of the wrapper is exposed above the bottle top and is then pressed in folds inwardly. The bottle is then passed beneath ironing bars which twist, center, and flatten the inwardly projecting and partially folded top portions of the wrapper. The sides of the wrapper are pressed against the bottle neck by smoothing brushes or rollers so that the final product has a smooth and attractive appearance.

Various details of the machine contribute importantly to the achievement of the improved foiling technique. Such details as have not already been mentioned will appear in the following disclosure and in the claims appended hereto.

Other objects, features, and advantages of the invention will appear from the disclosure hereof.

### DESCRIPTION OF DRAWINGS

FIG. 1 is a diagrammatic perspective view of a machine embodying the present invention.

FIG. 2 is a diagrammatic layout of important parts of the machine in FIG. 1. This figure illustrates successive steps in the processing of the bottles through the machine.

FIG. 3 is a fragmentary top view showing the bottle in position just prior to transfer of the foil wrapper from the wrapper applying rotor to the bottle neck. A side elevation at this same position is shown in FIG. 8.

3

FIG. 4 is a fragmentary top view similar to FIG. 3, but illustrating the foil wrapper in course of being blown around the bottle neck.

FIG. 5 is a fragmentary top view at a subsequent bottle station after the leading edge of the foil wrapper has been

FIG. 6 is a fragmentary top view at a subsequent bottle station in which the bottle has been turned through 90 degrees from its position shown in FIG. 5 and showing how flaps roll the wrapper onto the bottle neck. A side elevation of this same station is shown in FIG. 9.

FIG. 7 is a fragmentary top view at a still further and subsequent station in which the wrapper is now completely rolled around the bottle neck and is being subjected to the smoothing pressure of brushes or rollers.

FIG. 8 is a fragmentary side elevation showing the bottle, etc., substantially as also shown in FIG. 3.

FIG. 9 is a fragmentary side elevation illustrating the parts substantially as also shown in FIG. 6, and substantially along the line 9—9 of FIG. 2.

FIG. 10 is a fragmentary elevation substantially along the line 10—10 of FIG. 2.

FIG. 11 is a fragmentary elevation illustrating continued smoothing of the foil wrapper around the neck and the inward pressing of the upwardly extending margin of the wrapper to fold this margin inwardly in pleats at the top of the bottle. This view is taken substantially along the line 11—11 of FIG. 2.

FIG. 12 is a diagrammatic illustration showing the bottle in its relation to the ironing bar which flattens the foil material at the bottle top.

FIG. 13 is a fragmentary side elevation in the vicinity of the ironing bars.

FIG. 14 is a fragmentary perspective view of a modified ironing bar.

FIG. 15 is an inverted plan view of the ironing bar of FIG. 14.

FIG. 16 is a cross section taken along the line 16—16 of FIG. 15.

FIG. 17 is a fragmentary view showing a clamping stem with knurled foot engaged with the crown cap of a bottle.

FIG. 18 is a fragmentary cross section taken through a bottle having a cork instead of a crown cap and showing a spacer collar mounted on the clamping stem.

FIG. 19 is an end view of the clamping stem and spacer collar of FIG. 18.

FIG. 20 is a view showing the cork of FIG. 18 at a higher elevation in which the cork is engaged by the knurled foot of the clamping stem.

FIG. 21 is a fragmentary cross section taken along line 21—21 of FIG. 2 and illustrating the manner in which the bottle is guided by the infeed star wheel.

FIG. 22 is a diagrammatic perspective view illustrating details of the infeed star wheel.

FIG. 23 is an enlarged cross section through the multiple foil wrapper.

FIG. 24 is a diagrammatic plan view showing a modified belt form of wrapper smoothing apparatus.

### PREFERRED EMBODIMENTS

Although the disclosure hereof is detailed and exact to enable those skilled in the art to practice the invention, the physical embodiments herein disclosed merely exemplify the invention which may be embodied in other specific structure. The scope of the invention is defined in the claims appended hereto.

FIG. 1 shows a typical combined labeling and foiling machine embodying the invention. Unlabeled and unfoiled bottles 25 are fed into the machine about an infeed star wheel assembly 26 and are conveyed on a path 24 (FIG. 2) by various conveying means which move the bottles 25 past successive positions or stations where work is done, as will hereinafter be described. The finished

4

labeled and wrapped bottles 27 leaves the machine as indicated near the right hand end of FIG. 1.

As is conventional, the bottles are initially spaced near the infeed end of the machine by a spacing screw 28. The infeed star wheel assembly 26 consists of vertically spaced top and bottom wheels 29, 30, mounted on a common shaft 33 to rotate in unison. The periphery of wheel 29 is provided with small indents or pockets 34 which receive the neck of the bottle 25. Wheel 30 is provided at its periphery with somewhat larger indents or pockets 35 which receive the body portion of the bottle 25. Corresponding pockets 34, 35 are vertically aligned so as to hold the bottle 25 perfectly aligned vertically as the bottle is transferred from the vicinity of the star wheel assembly 26 to the vicinity of the rotating turret 36.

Turret 36 is provided inside its housing 38 with a head (not shown) which carries a peripheral series of clamping stems 37 which have mechanism within the head to lift and lower the stems 37 in time with the rotation of the turret. The turret has a floor 41 (FIG. 8) which rotates with the head and into which is set a series of turntable pads 42. Mechanism is provided to turn the turntables 42 through their mounting posts 43 at appropriate stations along the path 24 of the bottles, as will hereinafter be described. The clamping stems 37 are free to rotate in swivel couplings 44 so that the clamping stems 37 can turn with the bottles 25, as rotated by turntables 42.

The star wheel assembly 26 presses the bottles 25 lightly against upper and lower curved guide rails 45, 46 (FIG. 21) to hold the bottle in perfect vertical orientation until the bottle moves on its path 24 over one of the turntables 42 on turret floor 41 and the top of the bottle is directly beneath one of the stems 37. Mechanism is then actuated to advance the clamping stem 37 vertically against the top of the bottle and press the bottle tightly against the turntable, so that powered rotation of the turntable 42 will rotate the bottle. As the turret rotates in the direction of arrow 72, the bottle will leave the vicinity of the infeed star wheel assembly 26, and the bottle will thenceforth be guided by the combined action of the turntable 42 and the clamping stem 37.

The infeed star wheel assembly 26 insures that the bottle will be vertically positioned at the time it is clamped between stem 37 and turntable 42. This is important so that the bottle turns on its true upright axis at all subsequent positions in turret 36.

As in labeling machines heretofore manufactured by applicant's assignee, the bottle will be brought to an initial labeling station 47 (FIG. 2) at which the bottle is directly opposite the label applying rotor 48. Label applying rotor 48 cooperates with a label transfer rotor 49 which rotates past a glue applying roller 52. Rotors 48, 49 are double decked. The corresponding upper decks handle the foil wrappers 55 and the corresponding lower decks handle the paper body labels 53. Rotor 49 picks paper labels 53 out of an oscillating label magazine 54 and picks prefabricated, cut to size foil wrappers 55 out of an oscillating wrapper magazine 56.

The lower deck label pad 57 and the upper deck wrapper pad 58 on the rotor 49 rotate in unison and pick up films of glue from the glue roller 52. As the pads sweep past the oscillating magazines 54, 56, they will respectively pick up a paper label 53 and a foil wrapper 55. As illustrated in FIG. 1, there may be multiple sets of oscillating magazines 54, 56. These are actuated by cams, etc. (not shown) for alternate coaction with the transfer rotor 49. Continued rotation of the transfer rotor 49 will bring the label 53 and wrapper 55 adjacent suitable clamping fingers 61 (FIGS. 2 and 3) on applying rotor 48. The fingers 61 are actuated to transfer the label and wrapper to the applying rotor 48, and rotor 48 will turn to the position shown in FIG. 3. The glue coating is on the outwardly facing side of the label and wrapper.

5

An important characteristic of the foil wrapper 55 is illustrated in FIG. 23. Each wrapper consists of laminated plies. There is ply 62 of thin metal foil, such as aluminum. Metal ply 62 is backed by a paper ply 63, adhered thereto by an intervening ply 64 of heat releasable binder, such as wax. The metal ply 62 is desirably in the range of .009 to .012 mm. thick. The paper ply 63 adds considerable stiffness to the thin metal ply 62 and facilitates handling the wrappers 55 as individually precut pieces. Moreover, the wax ply 64 will soften and release when exposed to the heat of ordinary bottle washing solutions, so that the metal ply 62 can be readily stripped off. The washing solution will then soak through the paper ply 63 to dissolve the glue and disintegrate the paper to permit ready removal of the paper ply 63 from the bottle neck. This is unlike the typical prior art foil wrapper which consist entirely of metal foil which is waterproof and which must be removed by either scratching or soaking the bottle neck in a highly caustic solution which will dissolve the aluminum. Either the scratching or dissolving technique prematurely damages the high polish on the bottle and limits reuse of bottles which are subjected to this rough treatment.

At station 47 the wrapper 55 is applied to the bottle neck 65 by means of air jet nozzles 66 and the outward pressure of a sponge pad 67. Pad 67 has a metal back or cage 68 against which a cam 71 on rotor 48 presses at the same time that air is jetted through the nozzles 66. This blows the adhesive side of the wrapper 55 against the bottle neck 65 (FIG. 4). Where the wrapper 55 is also to cover the bottle top, the wrapper will be oriented, as shown in FIG. 8, so that its top margin 103 is above the level of the bottle top.

Continued movement of the turret in the direction of arrow 72 will wipe a fixed flap 73 of gum rubber or the like against the leading edge of the wrapper 55, as indicated in FIG. 4. This action curls the leading portion of the wrapper 55 around the bottle neck 65 to its position shown in FIG. 5.

FIG. 5 shows the next station 74 at which a free turning sponge pad or brush 75 rolls in the direction of arrow 76 against the wrapper 55 as the bottle is turned by its turntable 42 in the direction of arrow 78. At this station another fixed wiper flap 77 contacts the opposite side of the bottle neck and rolls the wrapper onto the neck as the turntable 42 is rotated in the direction of arrow 78 to turn the bottle through 90°.

FIG. 6 shows the next station 81, at which station there are two stationary wiper flaps 82, 83 which smooth the wrapper 55 onto the bottle neck as turntable 42 rotates in the direction of arrow 78. As shown in FIG. 9, the upper margin 103 of the wrapper simply stands free of the bottle. At station 84 (FIG. 7), turntable 42 further rotates the bottle while sponge pads 85 rotate freely thereagainst, thus completing the rolling-on of the wrapper 55 about the bottle neck. While rollers 75, 85 are described as free turning, these can be powered, if desired, to enhance their smoothing action.

At stations 86 and 87 (FIG. 2), there are additional sets of rollers or brushes 85. At each such station the turntable 42 will rotate the bottle, thus to cause additional smoothing and pressing-on of the wrapper against the neck of the bottle. At any one or more of these stations top rollers (99 in FIG. 10) may be inclined or otherwise project inwardly (as roller 100 in FIG. 11) to press the top margin 103 of the wrapper 55 inwardly as shown in FIG. 10. To permit maximum inward movement of the wrapper margin 103, clamping stem 37 is made with a small cross section, desirably only about 10% of the area of the bottle top.

At the outfeed of the turret 36 the clamping stems 37 are lifted and the bottles 25 are diverted by curved edge 80 of plate 46. Here the bottles are picked up by conveyor cradles 88 of a conveyor chain 89 which is trained about spaced sprockets 90, 91. The cradles 88 desirably have the construction best shown in FIGS. 2 and 11. Each

6

cradle consists of upper and lower cradle plates which support an array of four rollers 92 which embrace the body of the bottle 25. With this arrangement, bottles of different sizes can be handled without changing the cradles.

At the intersection of turret 36 and guide rail 46, the cradles 88 press the bottles lightly against the curved edge 80 to divert the bottles on a curved path about the axis of sprocket 90. Where the bottles run beyond the ends of the guide 46, there is a side rail 95 (FIG. 11) which acts as a continuation of the guide rail 46. The side rail 95 has upper and lower tracks 96 which are desirably made of sponge rubber or the like. As the conveyor 89 pushes the bottles 25 along the side rail 95, the bottles will roll along the tracks 96, thus to turn the bottles on their upright axes.

Adjacent the necks of the bottles there will be additional freely rotating pads or brushes 98, 100, 101. Some of these may be inclined (as shown at 99 in FIG. 10). Some of the pads may be thin, for example pads 100, 101. Some of the thin rollers 100 project over the top of the bottle in order to press inwardly and fold over the top marginal portion 103 of the wrapper 55, as shown in FIG. 11. Rollers 100, 101 can be either separate or physically part of the same roller. The incline and overhang of the various rollers and brushes can be adjusted to suit the circumstances.

There are desirably several successive sets of rollers along rail 95. Each successive set brings the intumed and folded wrapper at the top of the bottle more to a peak, as shown at 103 in FIG. 12. As the bottles are passing between rollers 98, 100, 101, they continuously roll along the track rails 96. Thus the brushes 98, 100, 101 smooth the foil against the bottle neck and press the top part of the wrapper over the crown cap of the bottle.

FIG. 24 illustrates a modification in which a relatively thick sponge rubber belt 136 may be substituted for rollers 98, 100, 101 at the same side of the bottles as the side rail 95. Belt 136 runs about end rollers 137. Belt 136 may run free or it may be driven, and it performs the same function as rollers 98, 100, 101, except that it engages the foiled neck of the bottle continuously, rather than intermittently, as do the rollers 98, 100, 101.

Various materials can be incorporated in the rollers and belt 136. The materials should be flexible and elastic, thus to conform to the bottle shape, and to exert smoothing and forming pressure on the foil wrapper 55.

Beyond the rollers 98, 100, 101 there are successive floating ironing bars 104, desirably of plastic material. Each ironing bar 104 contains a tapered groove 110 which is relatively large in cross section at the entrance 105 to the bar, but which tapers to a point before it runs out of the bar, as illustrated at 106 in FIG. 12. Beyond the run-out point 106, the bar is flat. The ironing bars 104 are supported by rods 107 slidably suspended through suitable holes in overhanging channel bracket 108 (FIGS. 1 and 13). Each stem 107 may have a stop collar 109 to limit downward movement of the bar 104. The top of each stem 107 is desirably provided with a weight 112 to provide gravity bias against upward movement of the bar 104. Two rods are provided for each bar, to provide fore and aft rocking motion as the bottle rides under the bar. One or both sides of the bar 104 may optionally be provided with a smoothing brush 111, supported by a hanger bracket 119.

As the bottle 25 with its peaked foil cap 103 continues to be conveyed by the chain 89 and continues to be rotated by pressure against the side rails 96, the peaked foil wrapper portion 103 will slide along the tapered groove 110 of the ironing bar. As the bottle moves along the ironing bar toward the narrow end 106 of groove 110, the peaked material 103 will be twisted, centered, and ultimately flattened against the crown cap of the bottle. The flattened wrapper top is shown at 113 in FIG. 12.

The sliding suspension of the floating irons 104 per-



mits considerable rise and fall of the irons. Accordingly, bottles of different heights can easily be processed on the machine.

As indicated at FIG. 1, there are desirably several successive bars 104 for repeated ironing treatment of the peaked foil 103. Only two bars 104 are shown in diagrammatic FIG. 2. Moreover, the bars 104 may be optionally be provided with vibrators 114, thus to vibrate the bars 104 and produce a pulsating pressure against the peaked foil 103 for purposes of enhancing the folding and flattening effect of the ironing bars. While the bottles pass through the bars 104, the foil wrapper continues subject to the smoothing action of brushes 111.

The body label 53 is desirably concurrently smoothed onto the bottle by successive rollers 115, 116 (FIG. 1) which are at the level of the body of the bottle as it is rolled along side rail 95.

FIGS. 14, 15, and 16 show an alternate form of the ironing bar. In this instance, the bar is made of two complementary parts 117, 118. These are hinged together by pintle 121 at one end of the bar. Near its other end, the bar parts 117, 118 are held together with a transverse pin 122 under the closing bias of coil springs 123. Accordingly, the ironing bar halves 117, 118 are free to expand laterally as the bottle progresses therebeneath, subject of the spring bias of the springs 123.

In the embodiment of FIGS. 14, 15, and 16, the ironing bar is supported on stems 107 which are connected to one of the iron halves 118 on hanger brackets 124, thus to leave the other iron half 117 free to swing about the pintle 121.

It is an advantageous feature of the invention that the clamping stem 37 be provided with a foot 125 which is roughened, as by knurling, as shown in FIGS. 17-20. Accordingly, the stem will have good gripping contact with the crown cap 126 of the bottle and will not tend to release its grip on the bottle under pressure of rolling the bottle against the flaps, rollers, etc.

FIGS. 18 and 20 also illustrate the fact that the invention is not limited to the processing of crown capped bottles. In these figures the bottle neck 127 is stopped with a cork 128. FIG. 20 illustrates a situation where the cork 128 projects upwardly a slight distance above the lip 131 of the bottle neck 127. In this event, knurled foot 125 of the stem 37 grips the cork 128.

However, in a case where the cork 128 might be somewhat loose in the bottle mouth or tend to be forced downwardly below the level of the lip 131, the stem 37 is provided with a stop collar 132 which has a bevel 134 which seats against a shoulder 133 on the stem 37. Thus the collar 132 grips the lip 131 and insures good engagement between the stem 37 and the bottle, even though the foot of the stem 37 does not engage the cork 128 (FIG. 18).

Bottles having other closures are also adapted for processing on this machine. For example, a bottle having a screw cap will function in about the same way as the crown capped bottle hereinbefore described.

While the drawings illustrate a foil wrapper 55 having a pointed bottom, the shape of the foil wrapper can

easily be changed, as desired. Some foil wrappers are rectangular, others are round, etc. By incorporating the foiling apparatus in the same machine as the labeling machine apparatus, it is unnecessary to furnish a separate foiling machine. As the bottles 27 (FIG. 1) emerge from the machine, they are both labeled and foiled. Accordingly, a great saving of space can be effectuated in the bottling plant, with a corresponding reduction in labeling cost and cost of transfer of bottles from one machine to another.

Moreover, because the labels 53 and the foil wrappers 55 are applied concurrently to the bottle at station 47, the peak 135 (FIG. 11) on wrapper 55 will inherently be symmetrical with respect to the body label 53 and the finished bottle and will present a good attractive appearance.

The present invention is also well adapted for incorporation into certain existing labeling machines, with relatively minor modifications thereto. The parts necessary to add the foil wrappers are merely added to certain existing labeling machines, and it is not necessary to buy an entirely new machine to add the foil wrapped feature.

What is claimed is:

1. A method of foil wrapping bottle necks and the like with precut foil wrappers stored in a magazine and comprising:

advancing bottles along a path,  
successively feeding individual foil wrappers from said magazine toward a bottle station along said path,  
applying a leading portion of the wrapper to the bottle neck,  
rolling the wrapper around the bottle neck with a top margin of the wrapper exposed upwardly beyond the top of the bottle to wrap the wrapper around the neck and apply a trailing portion of the wrapper to the bottle neck,  
pressing the exposed top margin of the wrapper inwardly in folds,  
and flattening the inwardly pressed and folded wrapper margin against the bottle top with an iron.

2. The method of claim 1 in which the iron has a tapered groove in which the inwardly pressed and folded wrapper margin slides.

3. The method of claim 1 in which the iron is vibrated.

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U.S. Cl. X.R.

156—215, 233, 447, 468, 560; 215—100; 229—5.8, 89