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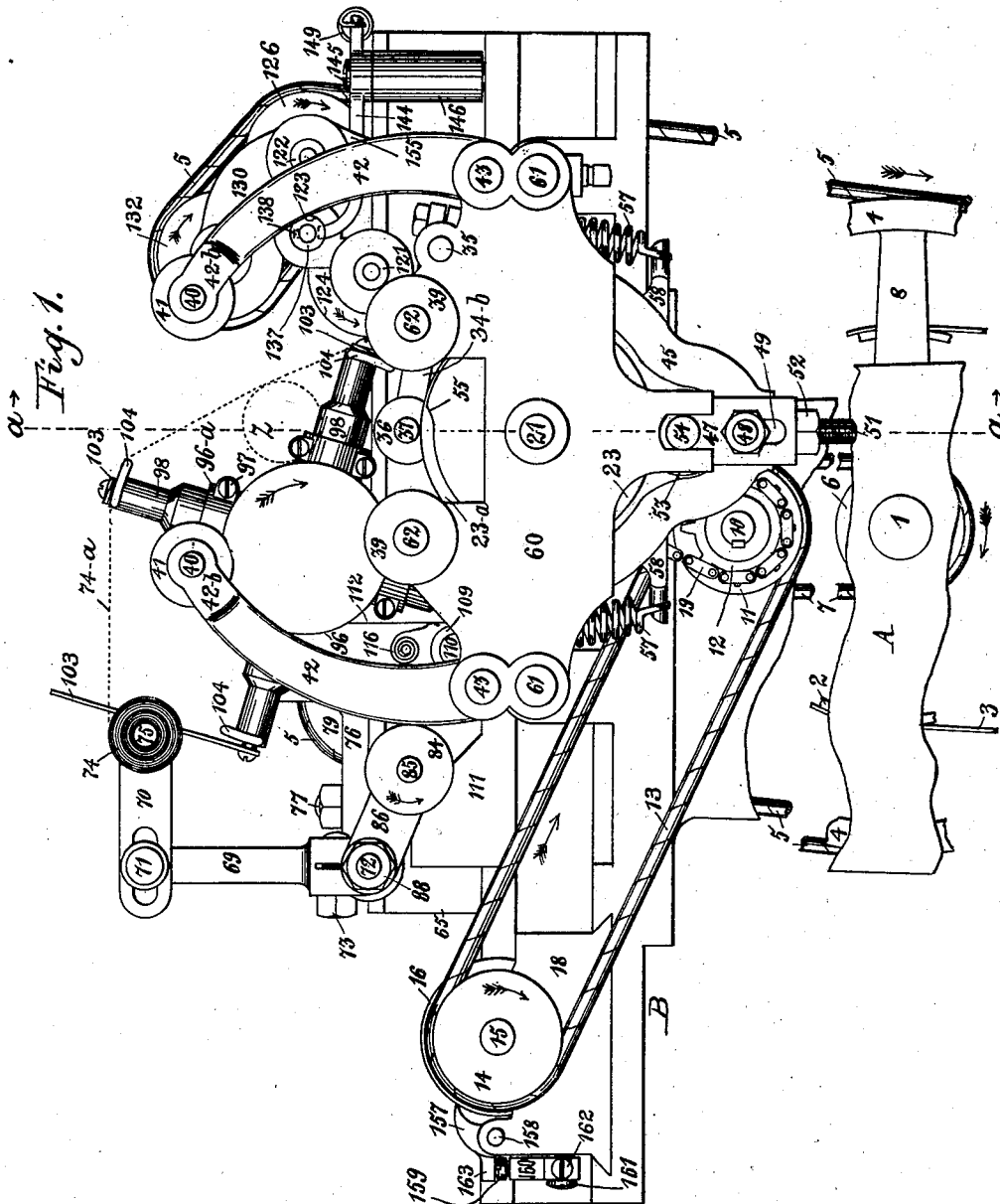
PATENTED JUNE 30, 1903.

J. F. SCHNEIDER.
BOTTLE TIN-FOILING MACHINE.

APPLICATION FILED MAR. 24, 1902. RENEWED MAY 2, 1903.

NO MODEL.

14 SHEETS—SHEET 1.



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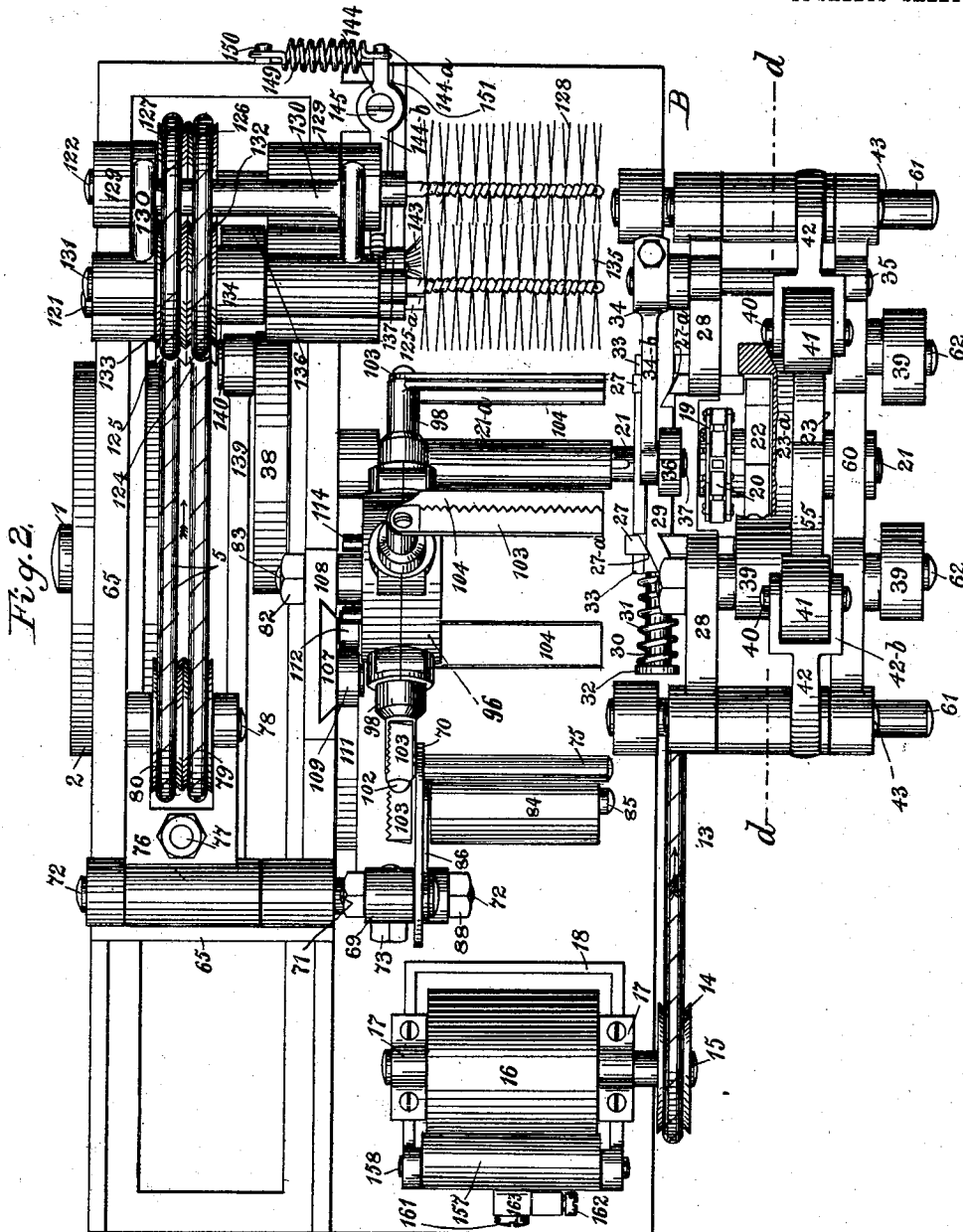
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14 SHEETS—SHEET 2.



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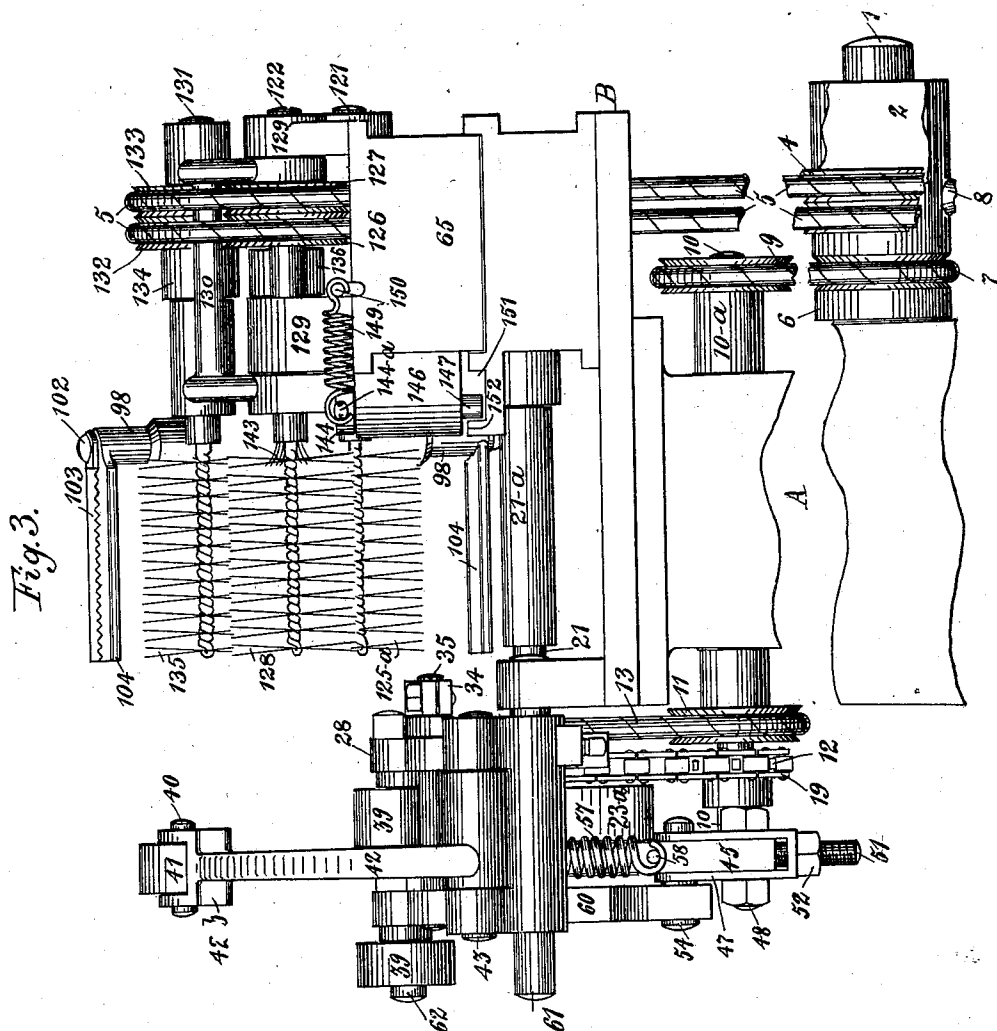
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14 SHEETS--SHEET 3.



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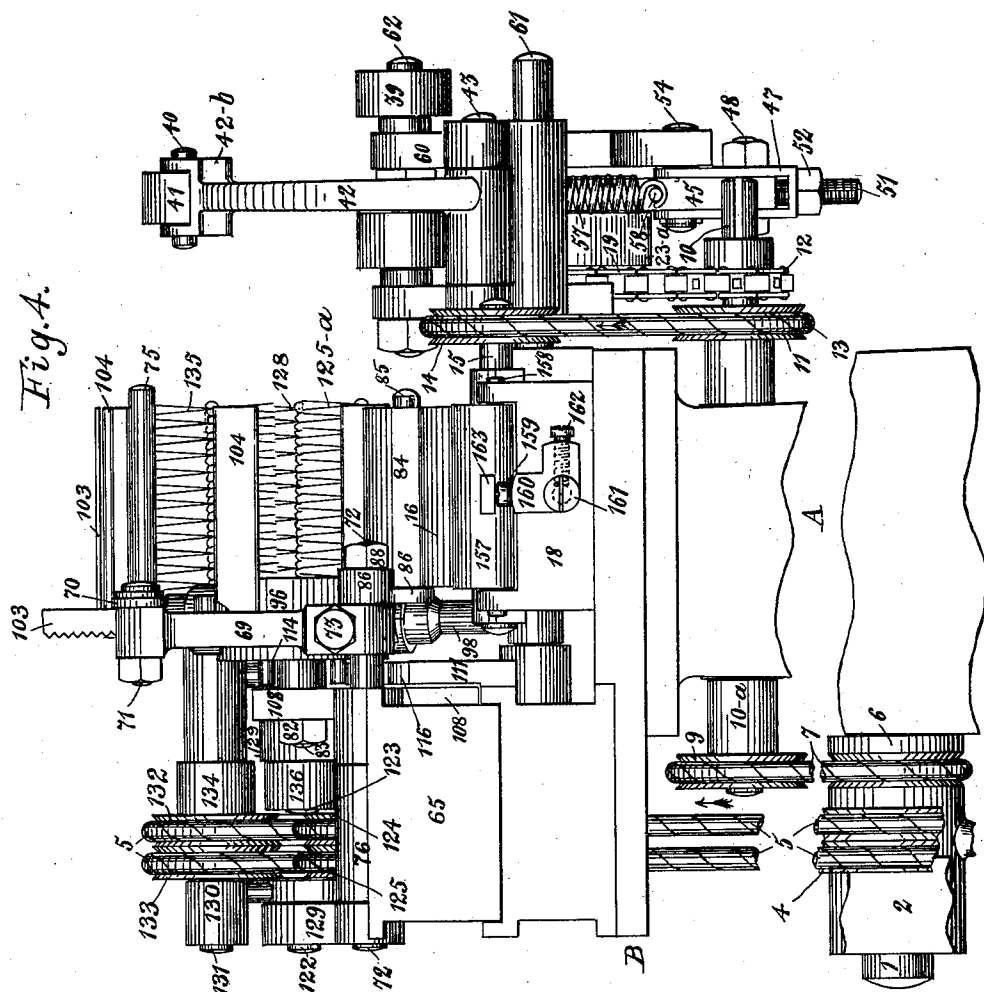
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NO MODEL.

14 SHEETS—SHEET 4.



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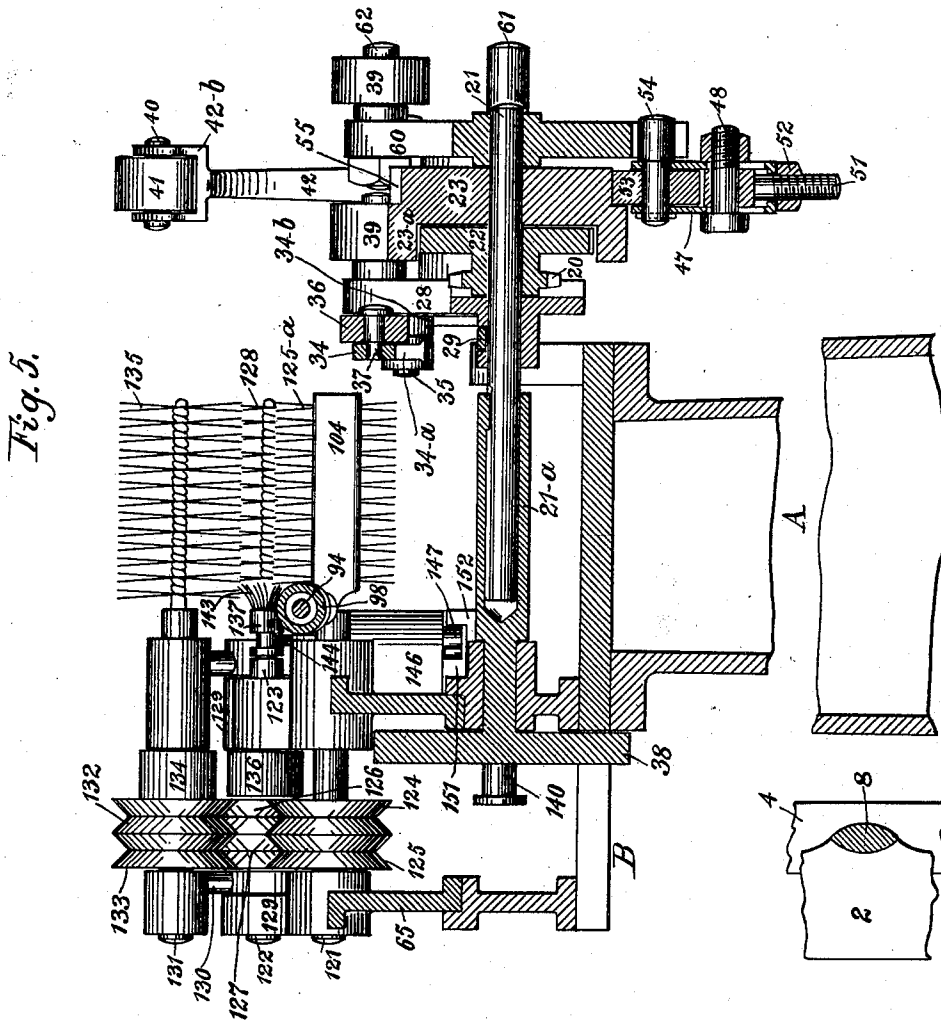
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14 SHEETS—SHEET 5.



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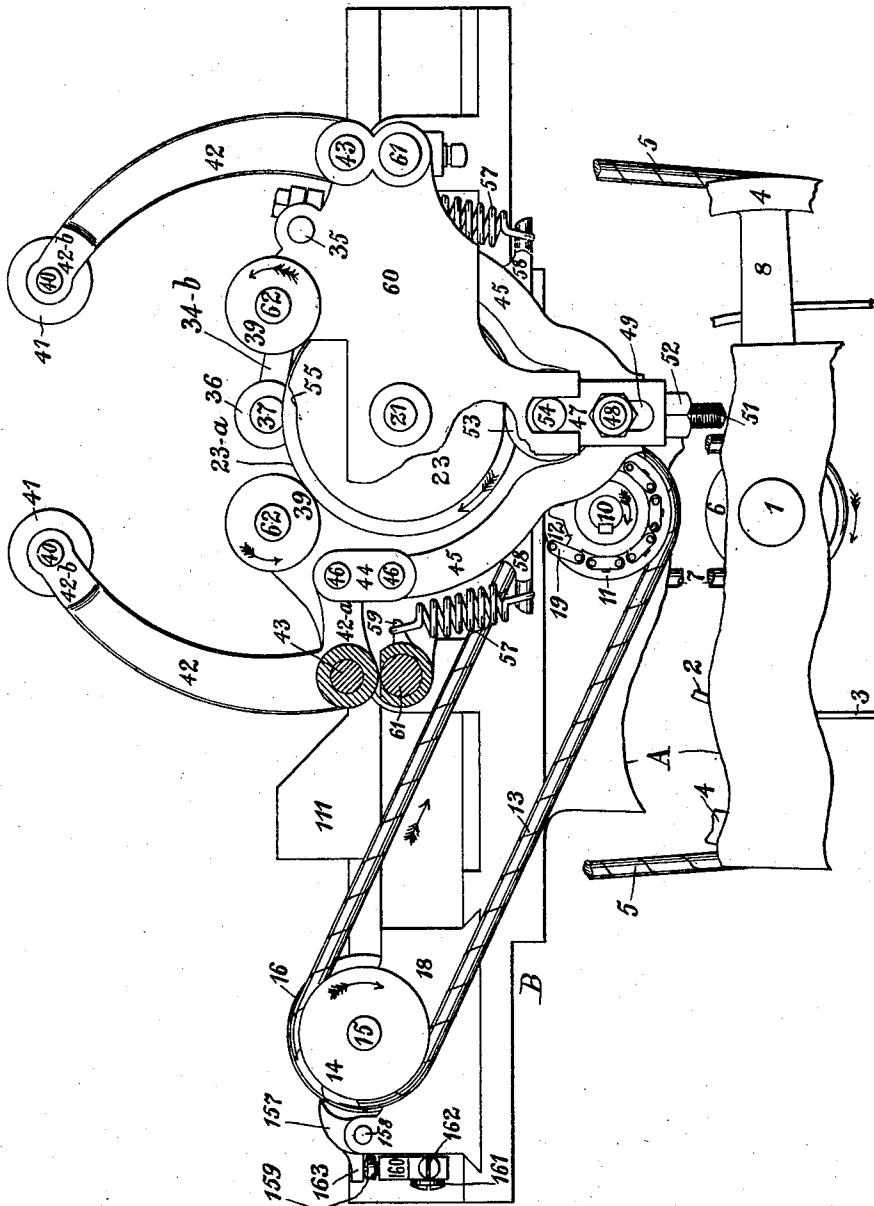
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14 SHEETS—SHEET 6.

Fig. 6.



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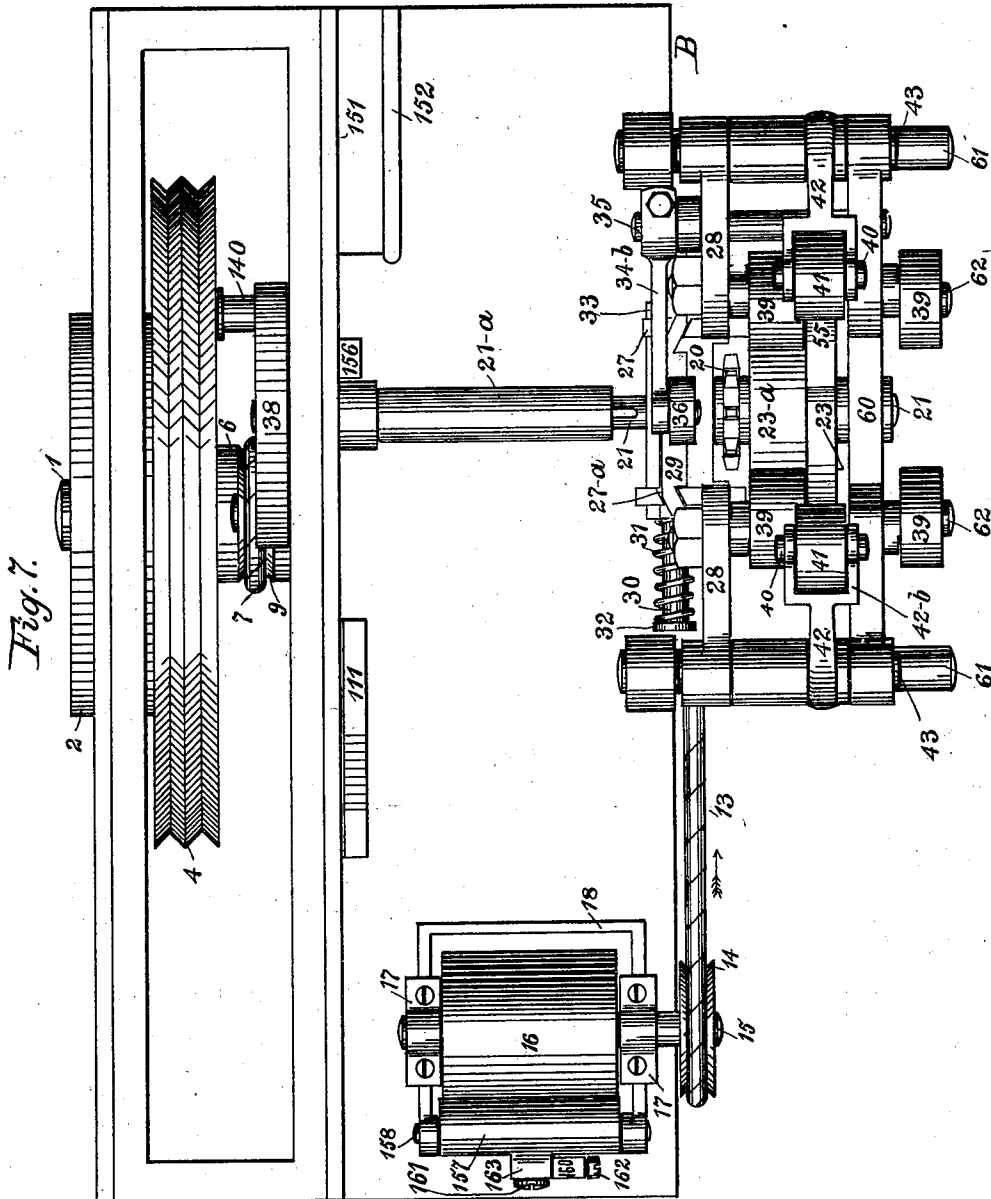
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NO MODEL.

14 SHEETS—SHEET 7.



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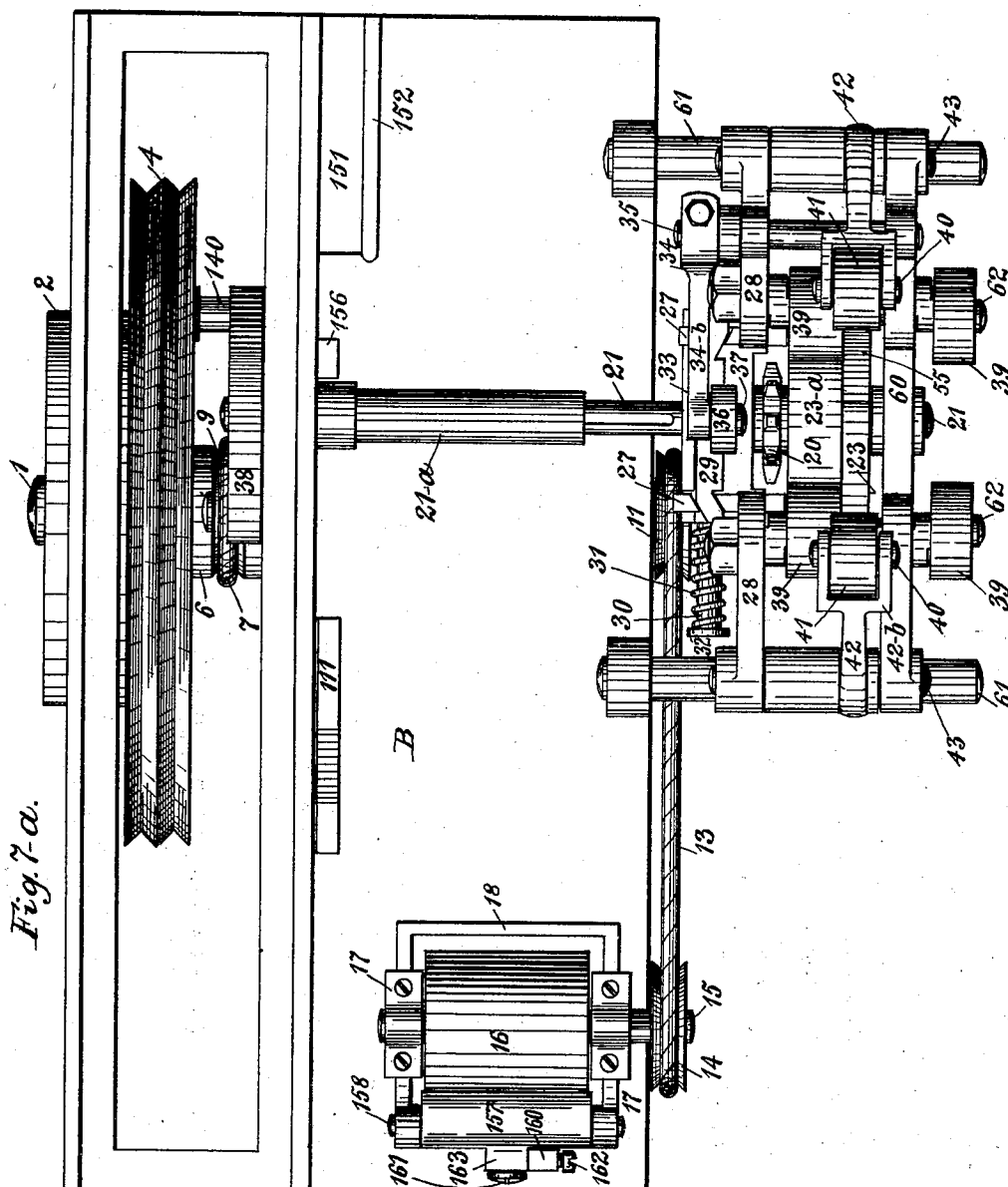
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NO MODEL.

14 SHEETS—SHEET 8.



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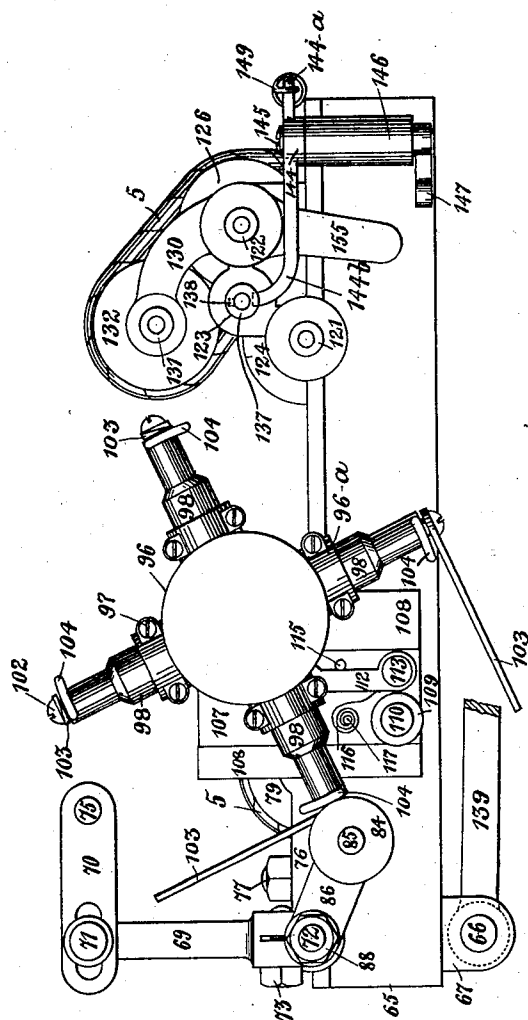
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NO MODEL.

14 SHEETS—SHEET 9.

Fig. 8.



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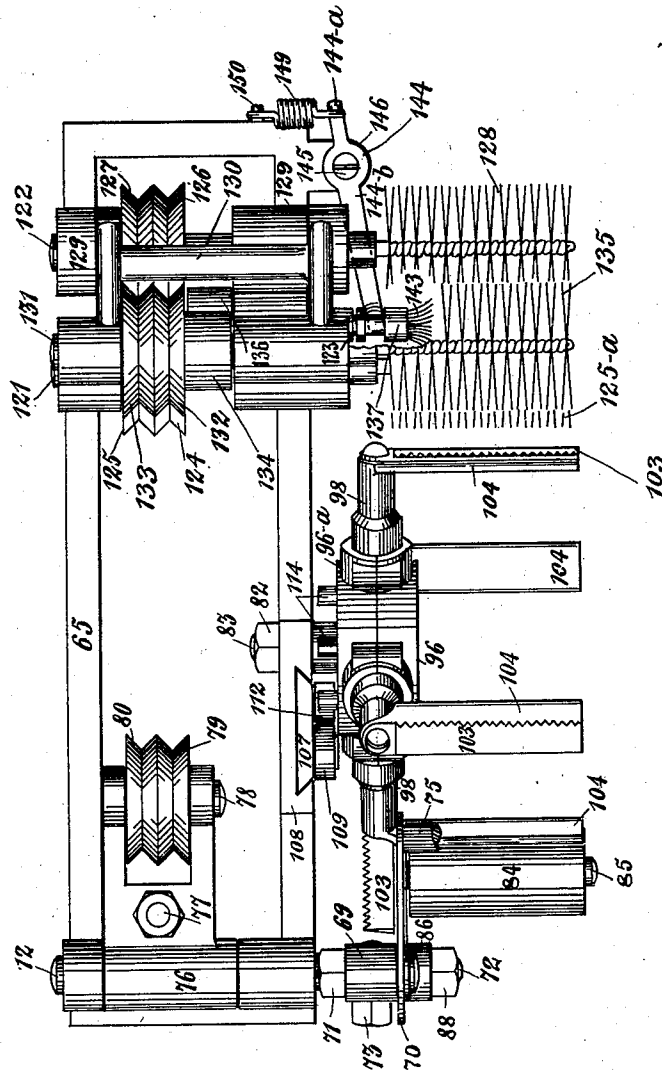
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NO MODEL.

14 SHEETS—SHEET 10.

Fig. 9.



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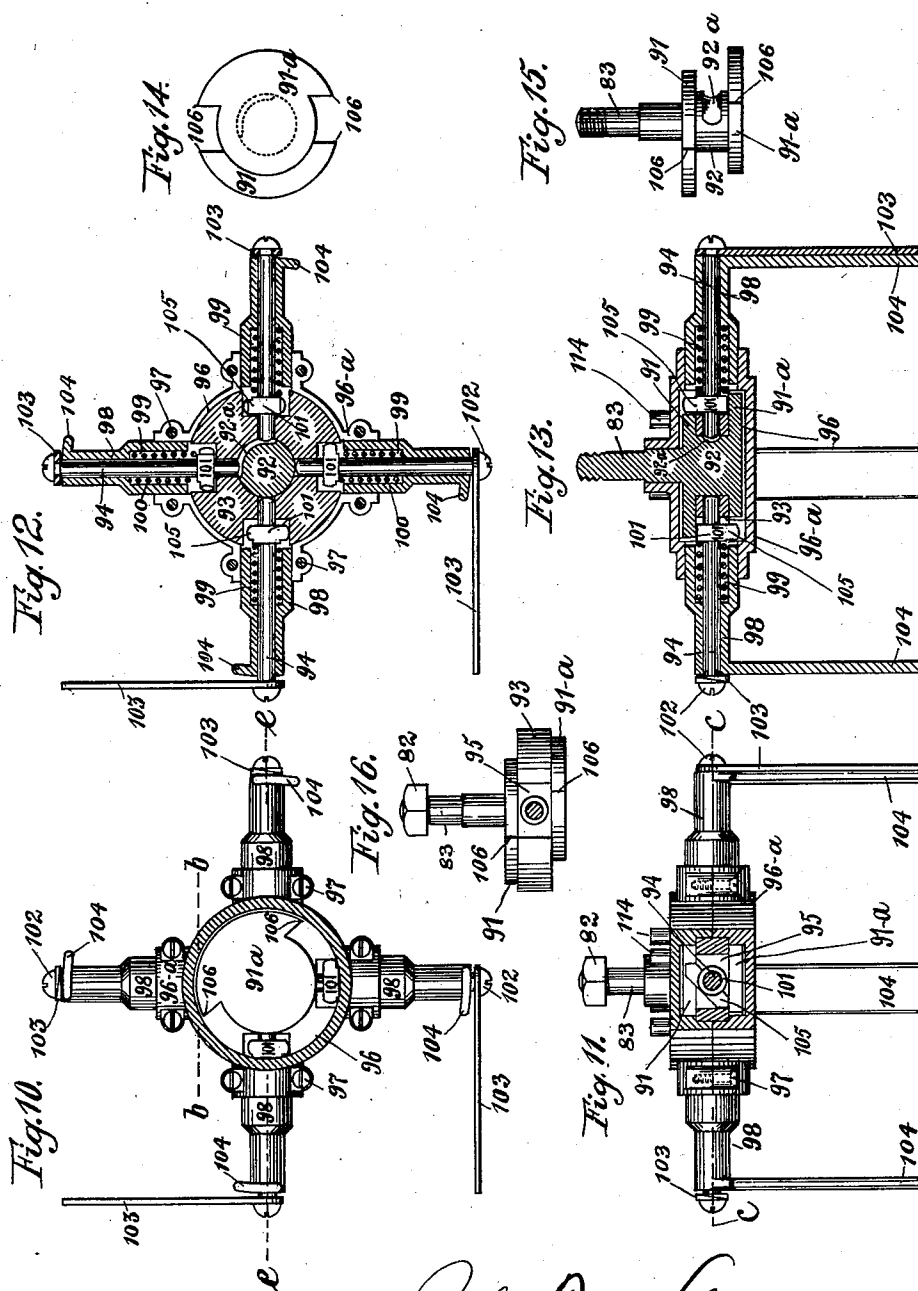
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NO MODEL.

14 SHEETS—SHEET 11.



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PATENTED JUNE 30, 1903.

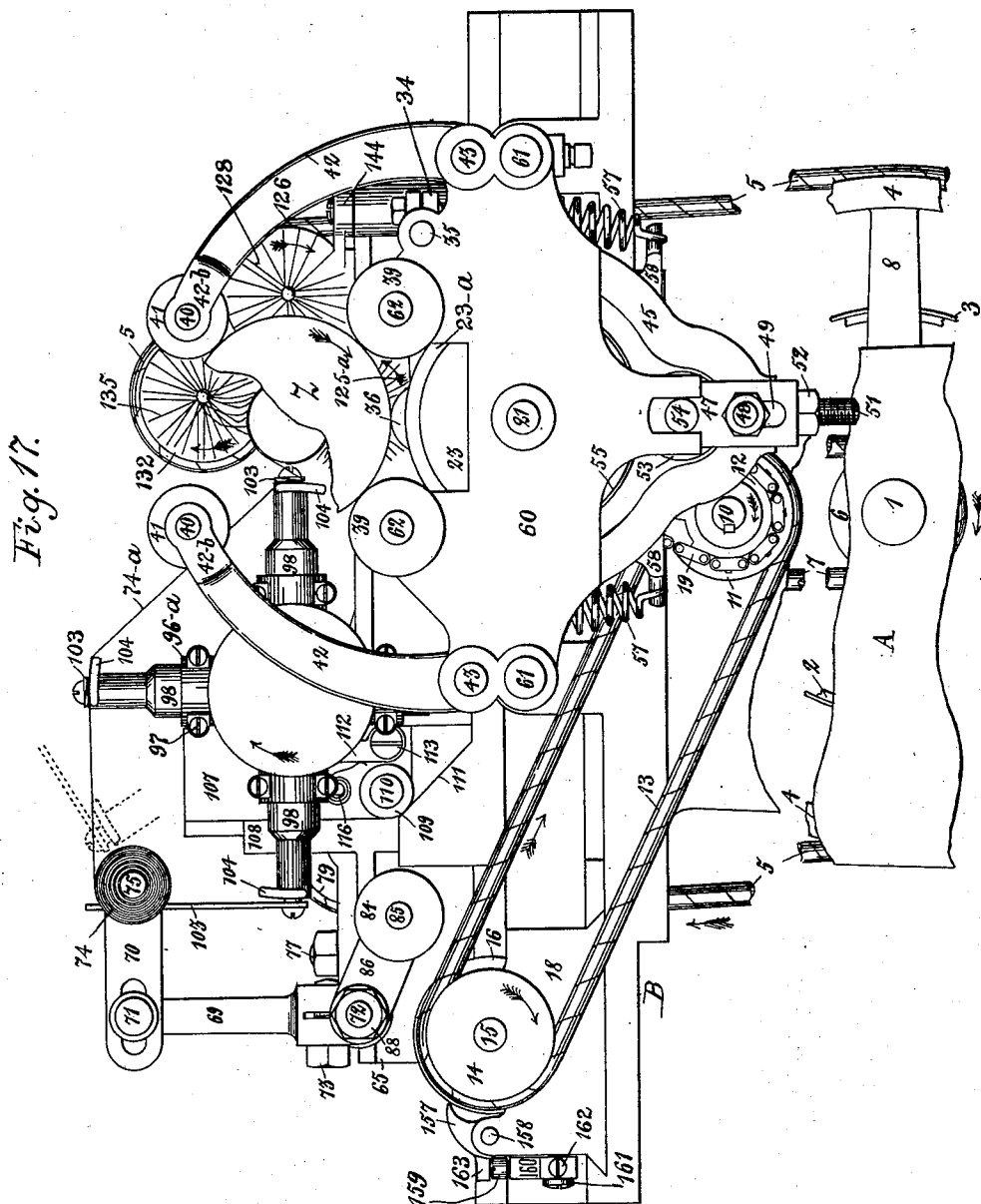
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BOTTLE TIN-FOILING MACHINE.

APPLICATION FILED MAR. 24, 1902. RENEWED MAY 2, 1903.

NO MODEL.

14 SHEETS—SHEET 12.



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PATENTED JUNE 30, 1903.

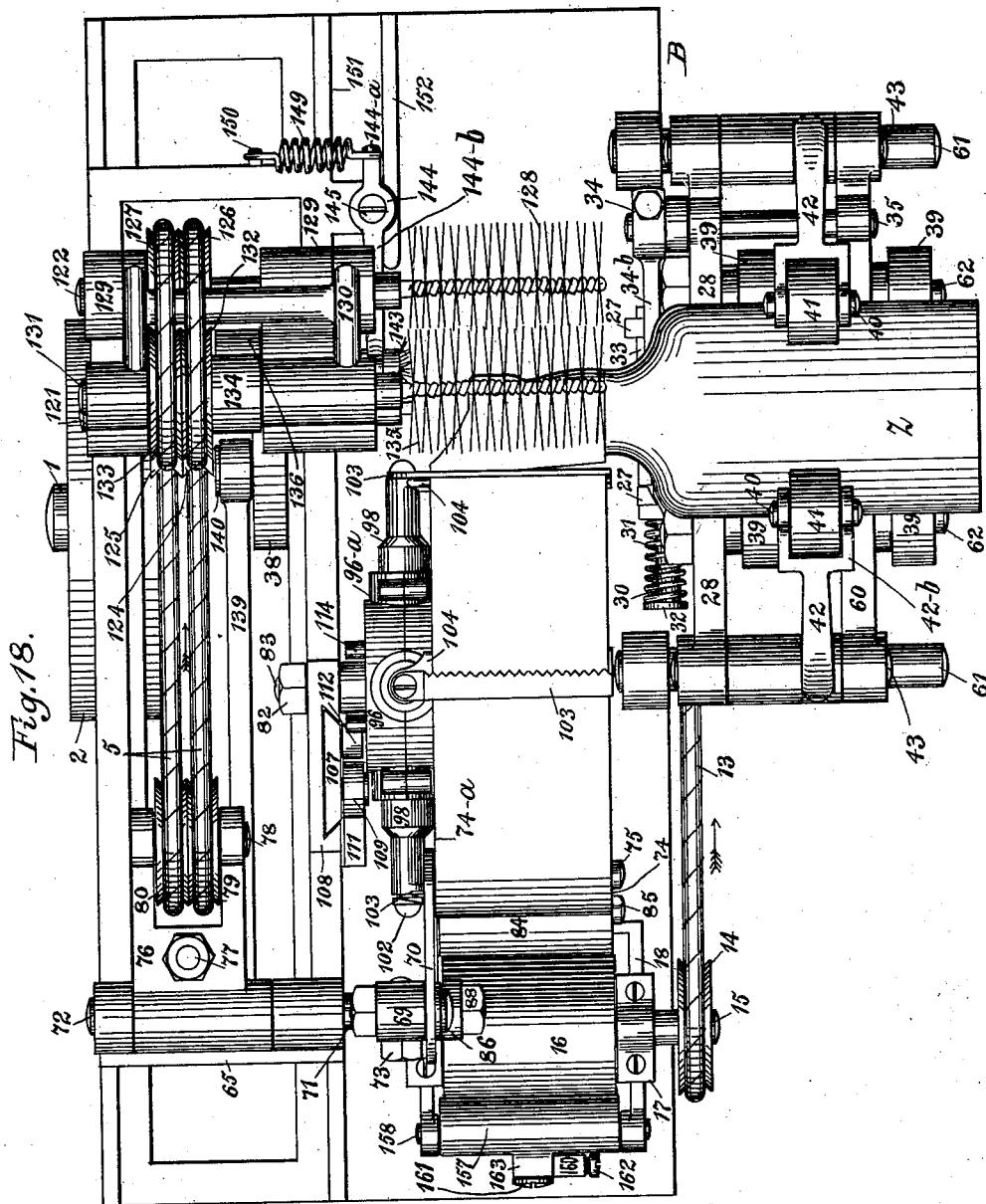
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APPLICATION FILED MAR. 24, 1902. RENEWED MAY 2, 1903.

NO MODEL.

14 SHEETS—SHEET 13.



Witnesses:

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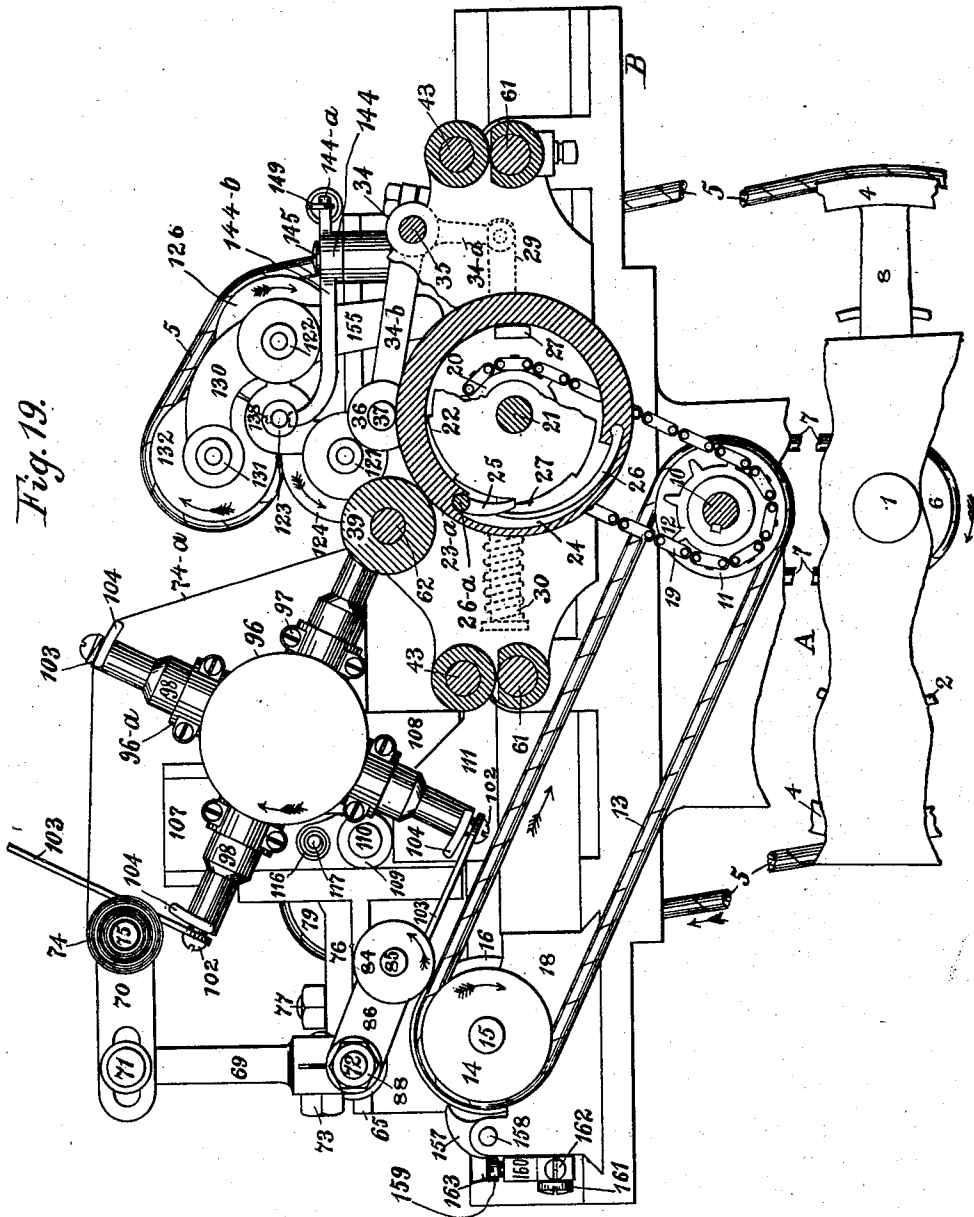
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NO MODEL.

14 SHEETS—SHEET 14.

Fig. 19.



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UNITED STATES PATENT OFFICE.

JOHN FRED SCHNEIDER, OF NEW YORK, N. Y.

BOTTLE-TIN-FOILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 732,656, dated June 30, 1903.

Application filed March 24, 1902. Renewed May 2, 1903. Serial No. 155,425. (No model.)

To all whom it may concern:

Be it known that I, JOHN FRED SCHNEIDER, of the city of New York, borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Bottle-Tin-Foiling Machines, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, wherein—

10 Figure 1 is a front elevation of my improved bottle-tin-foiling machine, the parts of the machine being shown in the position ready for inserting of a bottle; Fig. 2, a plan view of the machine in the same position as shown in Fig. 1. Fig. 3 is an end view of the machine in the same position as in Fig. 1 looking from the right side. Fig. 4 is an end view of the machine in the same position as in Fig. 1 looking from the left side. Fig. 5 20 is a sectional view of the machine on line *a a* indicated in Fig. 1 and looking to the right. Fig. 6 is a front elevation of the frame of the machine, the carriage and part of the front plate being removed. Fig. 7 is a plan view of the frame, the carriage being removed. Fig. 7^a is the same view of the machine as in Fig. 7, but showing the extensible part of its frame with the mechanism mounted thereon in such extended position. Fig. 8 is a front 30 elevation of the carriage, showing the mechanisms mounted thereon in position at the moment when one of the tin-foil supports is in contact with the gumming-roll. Fig. 9 is a plan view of the carriage, showing the parts of the machine in the same relative position as in Fig. 8. Fig. 10 is a front elevation of the spider, the front plate closing the casing being removed. Fig. 11 is a plan view, partly a sectional view thereof, on line *b b* indicated 40 in Fig. 10. Fig. 12 is a sectional view on line *c c* indicated in Fig. 11. Fig. 13 is a sectional view on line *e e* indicated in Fig. 10. Figs. 14 and 15 are front and plan views, respectively, of the spider-shaft and the cam and cam-disks integral therewith. Fig. 16 45 is a plan view of the spider-shaft with the sockets for the posts of the spider-arms in position thereon. Fig. 17 is a front elevation of the complete machine with the bottle inserted therein, the operating parts of the machine being in the position of cutting off the tin-foil wrapped around the neck and head

of the bottle, part of the bottle being broken off to disclose the operating parts of the machine. Fig. 18 is a plan view of the machine 55 in the same position and with the bottle inserted in position; and Fig. 19 is a front elevation of the machine, showing the part thereof in position immediately after the operation of the machine was completed and the tin-foiled bottle removed. In this last figure the front portion of the frame of the machine is cut off, the cut being on line *d d* indicated in Fig. 2 to disclose the mechanism starting and reversing the motion of the carriage. 65

The object of my invention is the construction of a machine performing automatically the operation of tin-foiling of the necks and heads of corked bottles.

I am aware that machines for applying capsules to filled and corked bottles are in use; 70 but the machine invented by me is not to be confounded with such capsuling-machines. In this machine, embodying my invention, the tin-foil is applied to the bottle from a flat sheet and the capsules are formed thereon, 75 as will be explained.

The machine consists of a frame with suitable driving mechanism, a carriage traveling on guideways provided in the frame, driving 80 mechanism for propelling the carriage to and fro on the frame and of the several mechanisms, hereinafter more fully described and explained, whereby the operations of the machine are performed automatically, the driving 85 and operating mechanisms being automatically started and reversed by the inserting of the bottle into the machine and by the removing thereof.

The frame of the machine, together with the 90 several stationary mechanisms, is shown in Fig. 6 in elevation and in Fig. 7 in plan view. The frame proper comprises a foot or standard A, a table or bed B, integral with the standard A and horizontally disposed thereon. 95 The bottle to be acted upon by the machine is placed horizontally on the supporting-frame. It then rests on the rollers 39 and is embraced by the roller-cranks 42, its neck projecting to the rear, so as to be engaged by 100 the brushes, as shown in Fig. 18.

Referring now more particularly to Figs. 6 and 7 of the drawings, numeral 1 designates the main driving-shaft of the machine,

mounted in suitable bearings in standard A. On the forward-projecting part of this shaft 1 is set a compound pulley, comprising belt-pulley 2, connected by belt 3 to a transmission or other source of driving power, and grooved pulley 4, from which the friction pulleys and brushes, mounted on the carriage, as will be described further on, are driven by rope 5. Belt-pulley 2 and grooved pulley 4 are connected by the same spokes 8 to their common hub 6, which is provided with a suitable groove, wherein rope 7 engages, connecting the hub with pulley 9, keyed to shaft 10, whereby this shaft 10, also mounted in the standard A, is driven. On the forward end of shaft 10 are rigidly keyed thereto the rope-pulley 11 and sprocket-wheel 12. Rope-pulley 11 is connected by rope 13 with pulley 14, set on shaft 15 of the gum-roll 16. Shaft 15 is mounted in bearings 17, set on the side walls of gum-tank 18. Sprocket-wheel 12 is connected by chain 19 with sprocket-wheel 20. The latter is integral with ratchet-wheel 22, and both are set to loosely revolve on shaft 21. Shafts 10 and 21 are telescopic shafts, their parts 10 and 21 being inserted (telescopically) in parts 10^a and 21^a, respectively. Parts 10 and 21 are provided with longitudinal keyways and parts 10^a and 21^a with splines. Cam-disk 23 is keyed to shaft 21, and its rearwardly-projecting flange 23^a encircles ratchet-wheel 22, as will be seen in Fig. 19. In this flange a recess 24 is provided, and in this recess pawl 25, suspended on pin 26^a, is set on one end thereof and spring 26 on the other. Spring 26 engages pawl 25 and presses it against the periphery of ratchet-wheel 22. Pawl 25 and ratchet-wheel 22 act as a clutch between sprocket-wheel 20 and cam-disk 23 and when engaged cause shaft 21 and cam-disk 23 to revolve. Two longitudinally-movable pins 27, (visible in Figs. 2 and 7,) having beveled ends, are set in position to engage with pawl 25. The rear ends of these pins are provided with transversely-sloping slots 27^a, wherein correspondingly-shaped abutments of slide 29 engage. This slide 29 is integral with longitudinally-movable pin 30, which is held in its normal position (shown in Fig. 2) by spring 31, slid thereon between collar 32 and one of the bearings 33. Bearings 33 are integral with parts 28. The other end of pin 30 engages with the dependent arm 34^a of crank-lever 34, oscillating on pin 35, and on the end of the other arm 34^b of this lever 34 an antifriction-roller 36 is mounted on pin 37.

When pin 30 is in its normal or starting position (shown in Fig. 2 and Fig. 19) and before a bottle is inserted in the machine, the arm 34^b of lever 34, carrying the antifriction-roller 36, is so located that the roller 36 is above roller 39. When a bottle is inserted in the machine, its weight, acting on roller 36, presses lever 34 downwardly, thus causing the dependent arm 34^a of lever 34 to swing to the right. By this motion pin 30 and slide

29 (integral therewith) are moved in the same direction, (to the right,) and thereby the pin 27, located on the right side from shaft 21, is withdrawn from engagement with pawl 25, thus permitting it to engage with ratchet-wheel 22, and the other pin 27 on the left side of shaft 21 is projected. Sprocket-wheel 20 and cam-disk 23 are thereby clutched and revolved with shaft 21, which is keyed to disk 23. Crank-disk 38, (see Fig. 2,) secured to part 21^a of shaft 21, revolves with them. They all make one-half of a revolution—namely, until pawl 25 strikes against the end of pin 27 on the left side of shaft 21—whereby it is again disengaged from ratchet-wheel 22, whereupon their rotary motion is stopped. The object of this arrangement will be explained further on.

Connecting-rod 139 is pivoted to crank-disk 38 by pin 140, and its other end is pivotally connected to a movable frame, which I designate "the carriage," which is thus reciprocated upon the table or bed B of the frame.

When the half-revolution of shaft 21 is completed, pin 27 on the left side of shaft 21 disengages, as said above, the ratchet 25 from ratchet-wheel 22 and the carriage, which was thereby moved from the right to the left hand end of bed B, is stopped. The carriage remains in that position until the bottle is removed from the machine, whereupon spring 31, reacting, shifts pin 30 and slide 29 again to its normal (starting) position. By this shift of slide 29 pin 27 on the left side of shaft 21 is drawn inwardly, releasing pawl 25 to again engage with ratchet-wheel 22. Shaft 21 and the parts connected therewith then again describe one-half revolution, whereby the carriage is returned to the right side of the frame. Pin 27 on the right side of shaft 21 was projected at the same time when the other pin 27 on the left of shaft 21 was withdrawn. This pin disengages pawl 25 from ratchet-wheel 22 and stops the revolving motion of shaft 21 when the carriage reaches the right-hand (starting) end of frame B. The carriage then remains in this position until another bottle is inserted.

The bottle Z when set in the frame and after depressing lever 34 rests on antifriction-rollers 39, (see Fig. 17,) which are in frictional contact with cam-disk 23 and receive therefrom a revolving motion, rotating in the directions indicated by arrows in Fig. 6 of the drawings. The bottle Z is pressed upon the rollers 39 by rollers 41, loosely revolving on pins 40, set in the forked ends of curved arms 42^b of crank-levers 42, and which are drawn together and upon the bottle by the cam 55. (Shown in Fig. 6 of the drawings.)

Levers 42 are pivoted on shafts 43, and their other arms, designated in the drawings 42^a, (see Fig. 6,) are connected by links 44 and pins 46 to stirrup 45. In the apex of stirrup 45 is secured thereto by bolt 48 bearing-block 47. Bolt 48 is fitted into a bore provided in stirrup 45, and bearing-block 47 is

provided with a slotted aperture 49 to permit of its vertical adjustment relatively to stirrup 45. This adjustment is effected by screw-nut 52, screwed upon set-screw 51, which latter is firmly secured in the apex of stirrup 45 or integral therewith. Screw-nut 52 supports bearing-block 47 in adjusted position. Pin 54, set in bearing-block 47, supports roller 53, loosely revolving thereon and engaging with cam 55, secured to cam-disk 23 and rotating with it when the latter is set in motion, as hereinbefore explained.

Stirrup 45 is movable vertically and is drawn upwardly by springs 57, one of these springs being provided on each side of it. Each of the springs 57 is connected with one end to one of the pins 58, which are integral with stirrup 45, and with the other end to one of the pins 59, projecting from and integral with frame 60, supported on stationary rods 61. In this frame 60 shafts 43, which are the fulcrum-pivots of bell-crank levers 42 and also shafts 62, whereon rollers 39 rotate, are mounted. By drawing stirrup 45 upwardly springs 57 keep roller 53 constantly in contact with cam 55. The termini of stirrup 45 are connected by links 44 to arms 42^a of the bell-crank levers 42, and thus the action of springs 57 has also the effect of holding the curved arms 42, supporting rollers 41, apart from each other. While these parts of the machine are in this "open" condition a bottle may be inserted into or removed from the machine.

The shape of cam 55 is shown in Fig. 6. It will be seen that little more than one-half of the periphery of the cam 55 is receded. Cam 55 is secured to disk 23 in such position that the receded portion of the cam is in contact with roller 53 during the last part of the forward (to the left) and during the entire return motion (to the right) of the carriage, whereas the protruding part of the periphery of cam 55 is in contact with roller 53 during the larger part of the forward motion (toward the left-hand end of the frame of the machine) of the carriage. This period of contact of the protruding part of the periphery of the cam 55 with the roller 53 is illustrated in Fig. 17, whereas in Figs. 1 and 6 of the drawings roller 53 is in contact with the receded portion of the periphery of the cam 55. These figures show the different positions of the arms of crank-levers 42 during these two periods.

The coaction of cam 55 with roller 53 operates the bell-crank levers 42 to alternately hold and release the bottle Z, to cause rollers 41 press the bottle upon rollers 39, to hold it in contact therewith, and to produce the rotating motion of the bottle required for the application of the tin-foil upon the head and neck thereof, as will be explained more fully hereinafter.

When the bottle is inserted in the machine and the mechanism actuated thereby, as above described, effects the clutching of the

ratchet-wheel 22 with the cam-disk 23, the rotation of this cam-disk and of the cam 55, rigidly secured thereto, causes the protruding part of the periphery of this cam to come in contact with roller 53. Thereby stirrup 45 is depressed, and this motion being transmitted by links 44 to bell-crank levers 42 the latter are drawn together and rollers 41 are pressed down upon the bottle, thus holding it in contact with rollers 39, and cause it to revolve. After the cam-disk made nearly one-half of its revolution the receded part of the circumference of the cam 55 comes again in contact with roller 53. Stirrup 45 is thereby released and drawn up by springs 57 into its uppermost position, whereby bell-crank levers 42 are moved apart from each other and rollers 41 lifted from the bottle, which then may be removed. Frame 60, whereon this mechanism is mounted, rests, as hereinbefore explained, on shafts 61 and is longitudinally movable thereon. Fig. 7^a shows the frame 60 and the mechanism mounted thereon in such extended position. The object of this arrangement is to enable the machine to be adjusted to various lengths of bottles to be tin-foiled in the machine, it being necessary to have the head of the bottle always in proper position relatively to the other parts of the machine acting thereon, as will be described further on, while the body of the bottle must rest safely upon rollers 39.

The carriage or movable frame 65 is reciprocated, as hereinbefore described, by the revolutions of the crank-disk 38, to which it is connected by connecting-rod 139, hung on pin 66, set in the downwardly-projecting boss 67. Upon this carriage are mounted the several mechanisms coöperating in the application of the tin-foil to the bottle. This carriage is shown separately in Figs. 8 and 9 of the drawings, showing also the arrangement and relative positions of the several mechanisms mounted thereon. Commencing on the left-hand end of the carriage-frame the tin-foil rack, comprising upright 69 and arm 70, adjustably secured thereto by screw 71, is set on the forward projecting end of shaft 72, being clamped thereto by screw 73. In the arm 70 of the rack is screwed or otherwise secured stud 75, (see Fig. 17,) whereon a roll of tin-foil 74 is set to loosely revolve. On the same shaft 72 the oscillating bearing-block 76 is hung, being clamped thereto by screw-bolt 77. In this bearing-block shaft 78 is set, and on this shaft loosely revolve rope-pulleys 79 and 80. Bearing-block 76 swings on shaft 72 and together with shaft 78 and pulleys 79 and 80 constitutes an idler, whose function is to maintain ropes 5 taut during the to-and-fro motions of the carriage.

The forward end of shaft 72 is recessed and screw-threaded, and on this recessed part is slid bracket 86 and secured thereto by screw-nut 88. In the other end of bracket 86 is rigidly secured stud 85, projecting forwardly, and on this stud is set roller 84, loosely re-

volving thereon. This roller 84 contacts with gum-roll 16 every time when the carriage is reciprocated to the left-hand end of the frame of the machine and is revolved thereby, at the same time receiving from this gum-roll a coating of gum in a manner like in printing-presses one ink-roll obtains a coating of ink from another when brought in contact therewith.

- At a suitable distance from the tin-foil rack is secured to the frame of the carriage by screw-nut 82, (see Fig. 9,) set on the rearward end of shaft 83, a mechanism which I designate "spider." The function of this mechanism is to draw a piece of tin-foil from roll 74, bring it in position, where it is applied to the head of the bottle to assist by its motion in winding the tin-foil around the head of the bottle, and finally to cut off the part of the strip of tin-foil applied to the bottle.

- The spider is shown in front elevation in Fig. 8, in plan view in Fig. 9, in side view in Fig. 4. Figs. 1, 17, and 19, respectively, show this mechanism in front elevation in positions different from that shown in Fig. 8 and disclose also the mechanism for operating it. The detail constructions of this mechanism and of all its parts are shown in Figs. 10 to 16. The mechanism is shown also in other figures of the drawings; but only these mentioned above need be referred to in following its description. For better understanding of the construction of this mechanism the brief description of Figs. 10 to 16 may be recited here. Fig. 10 is a front elevation of the spider, the front plate closing the casing being removed. Fig. 11 is a plan view, partly a sectional view thereof, on line *b b*. (Indicated in Fig. 10.) Fig. 12 is a sectional view on line *cc*. (Indicated in Fig. 11.) Fig. 13 is a sectional view on line *ee*. (Indicated in Fig. 10.) Figs. 14 and 15 are front and plan views, respectively, of the spider-shaft and the cam and cam-disks integral therewith. Fig. 16 is a plan view of the spider-shaft with the sockets for the posts of the spider-arms in position thereon.

- Cam-disks 91 and 91^a and cam 92, all of which are made in one piece, and sockets 93, are set in casing 96, closed by cover 96^a and secured thereto by screws 97. Hollow arms 98 are screwed in casing 96. Sockets 93 are provided with bores 95, into which posts 94 are snugly fitted. These posts are inserted and longitudinally movable in the hollow arms 98 and rest with their inner ends, which are slightly rounded, upon cam 92. In the lower parts of arms 98 recesses 99 are provided, and in these recesses coil-springs 100 are set, bearing with one end against arms 98 and with their other ends against collars 101, thus pressing posts 94 into sockets 93 and against cam 92. Cross-pins 105 are set in or made integral with collars 101. The upper ends of posts 94 are squarely recessed, (see Fig. 12,) and upon the recessed portions

of these posts 94 cutters 103 are set. Screws 102 hold cutters 103 in position.

On the upper ends of arms 98, and preferably integral therewith, are provided supports 104. These supports project forwardly in a line parallel to the axis of the spider and also parallel to the axis of the tin-foil roll 74. They remain always in this position, whereas the cutters 103, secured, as hereinbefore explained, to posts 94, are movable and are oscillated forwardly and backwardly by turning posts 94 from a position parallel with supports 104 to a position at right angles thereto and back again. These motions of cutters 103 are effected by cam-disks 91 and 91^a, acting upon cross-pins 105 when casing 96, wherein arms 98 are set, is rotated on shaft 83. Cam-disks 91 91^a are, as hereinbefore explained, integral with shaft 83 of the spider fixed in the position shown in Fig. 10. Their relative position is illustrated in Fig. 14. Pins 105 project beyond the width of sockets 93 and are acted upon alternately by points 106 of cam-disks 91 and 91^a when the spider rotates. This action at one point turns posts 94 a quarter of a turn to one side and at the other point back again, and by this motion cutters 103 are alternately brought into and out of parallel position with the supports 104. The object of this operation will be explained in the description of the operation of the machine and of the successive actions of its different parts.

The ends of posts 94 resting against cam 92 are rounded to glide smoothly over the surface of the cam. In cam 92 a groove 92^a is provided, extending approximately over two-fifths of its circumference. The purpose of this arrangement is to utilize cutters 103, affixed to the ends of posts 94 for holding the strip of tin-foil to the supports 104, or rather to press the strip of tin-foil upon the gummed upper surface of the supports.

While the ends of the posts 94 rest on the not-recessed part of the cam 92, they stand higher or project farther from the arms, and there is a clearance between cutters 103 and supports 104 produced thereby. When any one of the posts 94 reaches the groove 92^a, spring 100 forces it farther into the arm to the extent of the depth of the groove. Thereby the cutter 103, attached to that post, is pressed upon the tin-foil spread over the gummed surface of support 104. Spider-shaft 83 is so set in the frame of the carriage that cam 92 and disks 91 and 91^a, integral therewith, are in the position shown in Fig. 10.

Referring now to Fig. 17, showing the same position of the arms of the spider as Fig. 10, it will be seen that in that position cutter 103 of the arm approaching the tin-foil roll 74 is removed some distance from the support and stands at a right angle to and forward of it. The cutter was brought in this position by the action of the cam-disks 91 and 91^a when it was moved to cut off the strip of tin-foil

while that arm swung from the position now occupied in Fig. 17 by the arm diametrically opposite it. It will also be seen that there is a sufficient clearance between the cutter 103 and support 104 of the arm to which they belong when the arm and cutters are in this position.

Fig. 19 of the drawings shows how far this same position of the cutter 103 relatively to the support 104 continues. When the arm is swung farther approximately to the position indicated in dotted lines in Fig. 17, the inward end of post 94, supporting the cutter, reaches the groove 92^a, while shortly before pin 105 of that post came in contact with point 106 of the cam-disk 91^a. The contact of the pin 105 with point 106 of cam-disk 91^a causes post 94 to describe a quarter-turn from right to left, thus bringing the cutter 103 in a line parallel with the support 104, and, the post reaching about the same time, when its turn is completed, groove 92^a slides inwardly by action of spring 100, so that shortly before the arm reaches the position of the one next to the right from the position indicated in dotted line in Fig. 17 cutter 103 rests upon the strip of tin-foil, holding it between it and the support 104. As the rotary motion of the spider progresses farther the pull exerted upon the strip of tin-foil causes it to unwind from roll 74, so that by each quarter of the revolution of the spider a new strip of tin-foil is drawn off of the roll 74 and brought into the required position to be applied to the bottle.

The rotating motion of the spider from left to right is produced by pawl 112, set on stud 113 in slide 107 and engaging with one of the pins 114, set concentrically in the back of casing 96, at each upward motion of slide 107. Slide 107 is set movably in plate 108 and is actuated by roller 109, revolving on stud 110, set in it. Pawl 112 is held in proper position by pin 115, fixed in slide 107 on one side (see Fig. 8) and on the other side by spring 116, affixed on pin 117 and holding pawl 112 against pin 115. The point of pawl 112 (not shown in the drawings) is slanted to facilitate the sliding off of the pawl of one of the pins 114 after turning the spider the required part of its rotation. Spring 116 facilitates the disengagement of the pawl from one of the pins 114 by permitting the pawl to recede to the left.

At every reciprocation of the carriage to the left roller 109 comes in contact with the inclined plane 111, whereby slide 107 is moved upward and the spider turned one-quarter of a turn from left to right until pin 114, engaged by pawl 112, passes out of alinement therewith. Pawl 112 and slide 107 drop to their normal position during the return motion of the carriage toward the right-hand end of the frame of the machine. On the other end of the carriage-frame are mounted in suitable bearings shafts 121, 122, and 123. (See Figs. 4 and 5.) Shaft 121 carries rope-pulleys 124 and 125, rigidly secured thereto,

and wire brush 125^a, set on its forward end and rotating with it. Shaft 122 carries rope-pulleys 126 and 127, also rigidly secured thereto, and brush 128, set on its forward end. In addition this shaft 122 carries the bearings 129 of the oscillating frame 130, wherein shaft 131 is supported. Shaft 131 carries rope-pulleys 132 and 133, friction-pulley 134, rigidly secured thereto, and brush 135, set on its forward end. Shaft 123 carries friction-pulley 136, rigidly secured thereto, and on its end the head 137, set longitudinally movable thereon and coupled thereto by spline 138, set in the shaft and engaging with a corresponding groove in the bore of the head. To this head brush 143 is secured.

Head 137 is operated by lever 144, secured to shaft 145, set in bearing 146, located on the extreme right-hand end of the carriage. On the other end of shaft 145 foot 147 is also rigidly secured thereto. The rearwardly-projecting arm 144^a of lever 144 is connected by spring 149 to pin 150, set in the carriage-frame. Spring 149 draws arm 144^a rearwardly, and thereby tends to project arm 144^b forwardly. Arm 144^b engages in a circular groove provided in the head 137, to which brush 143 is affixed.

Foot 147 travels in groove 151, provided in the frame of the machine. (See Figs. 2, 3, 5, 7, and 18.) Foot 147 presses against flange 152, and is thereby held in position receding brush 143. When foot 147 reaches the end of flange 152, (visible in Fig. 18,) spring 149 draws in the arm 144^a of lever 144 and causes brush 143 to be projected. Thereby the brush is brought in action.

Shafts 121, 122, and 131 are driven by rope stretched (see Fig. 1 of the drawings) over pulley 4, set on the main shaft, over pulleys 126, 127, 132, and 133, then over pulleys 124 and 125, and then over idle pulleys 79 and 80, loosely revolving in shaft 78, and from there back to rope-pulley 4 on the main shaft. Shaft 123 is driven by friction-pulley 134, which engages with friction-pulley 136, set on this shaft 123, when the frame 130, oscillating on shaft 122, is swung, as will be explained hereinafter, so as to bring these two friction-pulleys in contact with each other. The directions of the rotation of the brushes are indicated by arrows in Figs. 17 and 19. Brush 125^a rotates oppositely to the brushes 128 and 135.

Shafts 121, 122, and 131 and the brushes mounted thereon are constantly in motion while the machine operates, whereas shaft 123 rotates only during that period while friction-pulley 134 is brought in contact with friction-pulley 136 by the forward swing of frame 130. For this purpose lever 155 is secured to or made integral with frame 130. This lever projects downwardly from shaft 122 and when the carriage is reciprocated toward the left-hand end of the frame of the machine comes in contact with the abutment 156, provided on the frame of the machine.

This abutment stops the motion of lever 155, and as the carriage is carried on farther the abutment forces lever 155 to swing to the right, whereby frame 130 is swung in opposite direction and friction-pulleys 134 and 136 are pressed in contact with each other.

As shown in Fig. 19, gum-roll 84 comes in contact with gum-roll 16 when the carriage approaches the left-hand end of the frame of the machine. Gum-roll 16 is kept in constant rotation in the direction indicated on pulley 14 in Fig. 19 and when gum-roll 84 comes in contact therewith causes it to rotate in the direction indicated by an arrow thereon, at the same time transmitting to it a layer of gum. The position of roll 84 is such that at the moment when roller 109, actuating slide 107, reaches the inclined plane 111 and the rising of the slide 107 commences the support 104 of the arm then located in line with roll 84 comes in contact therewith, the corresponding cutter 103 having been previously turned in a position at right angles thereto. As the rotary motion of the spider continues the support scrapes off of the gum-roll the gum spread thereon. In this manner a layer of gum is transmitted from the gum-roll 16 successively to each one of the supports 104 of the spider-arms. Fig. 8 of the drawings shows the position of the parts of the machine when the gum-roll 84 is in the last stage of its contact with one of the supports 104.

To avoid an excess of gum to be transmitted to roll 84 and to the supports 104, a scraper 157 is provided. This scraper is pivoted on shaft 158, set in bearings provided in the sides of gum-tank 18, near the left-hand end thereof. Its form is shown in Figs. 1, 2, 4, 6, and 7. The form of this scraper is so proportioned relatively to shaft 158 that it will have a tendency to recede from the gumming-roll 16. Its weight rests on screw 159, set in block 160, which is movably mounted on screw-bolt 161 and secured thereto by set-screw 162. Set-screw 159 acts against the abutment 163, secured to or integral with the scraper 157. By setting screw 159 the position of scraper 157 relatively to the gum-roll 16 is adjusted.

The operation of the machine is started from the position shown in Fig. 1 and is as follows: In this "starting position" of the machine the carriage is on the right-hand end of the frame, standing still. Pin 27 on the right side of shaft 21 is projected and holds pawl 25 disengaged from ratchet-wheel 22. The spider-arms are in the position shown in this figure, and a strip of tin-foil 74^a, unwound from roll 74, is stretched over the supports 104 of the arms of the spider, inclined toward the brushes. Its end is fastened by gum to the support of the spider-arm nearest to the right. The strip of tin-foil is indicated in dotted line in Fig. 1. The bottle to be tin-foiled is then inserted in the machine, its head and neck, as far as the same is to be

covered with tin-foil, being set beneath (to the left of) the strip of tin-foil approximately in the position indicated by the dotted circle in Fig. 1 and its body being laid on rollers 39 and 36. The weight of the bottle depresses the arm of lever 34, thereby shifting slide 29, withdrawing pin 27 on the right side of shaft 21, and projecting the other on the opposite side. Immediately after pin 27 is withdrawn spring 26 causes pawl 25 to come in engagement with ratchet-wheel 22, thus clutching sprocket-wheel 20 and cam-disk 23. Thereby the motion of the carriage toward the left-hand end of the machine is started. Cam 55 turning with disk 23 forces stirrup 45 downwardly and, closing arms 42^b, presses rollers 41 upon the bottle to hold it firmly in position and cause it to rotate. By the motion of the carriage toward the left-hand end of the frame of the machine the strip of tin-foil is bent around the neck of the bottle. As the motion of the carriage progresses, brushes 125 and 128 come in contact with it and by their rotary action stretch and press the tin-foil upon the bottle. The directions of the rotations of the brushes are indicated by arrows in Fig. 17. Brush 135 is also brought in contact with the tin-foil at this period; but its action thereon is then only slight and thus far confined only to holding the strip of tin-foil stretched and to the neck of the bottle, which, as will be remembered, is caused to revolve in the direction indicated by the arrow in Fig. 17 while the tin-foiling operation is going on. When the carriage has progressed to the point where lever 155 comes in contact with abutment 156, (which stops its progress and forces frame 130, supporting the bearings of the brush 135, to swing downwardly,) brush 135 is brought more forcibly in contact with the tin-foil on the neck of the bottle. By the same motion friction-roll 134, set on the shaft of brush 135, is brought in contact with the friction-roll 136, set on the shaft of the head brush 143, and thereby a rapid rotary motion is imparted to this latter brush. Heretofore this brush 143 was receded and not in position to contact with the head of the bottle. After foot 147, which heretofore traveled in the groove 151 and in contact with flange 152, (holding lever 144 in the position shown in Fig. 2 of the drawings,) reaches the end of flange 152 it slips off and then spring 149 acts upon lever 144, whereby head brush 143 is projected. This occurs when the brush approaches the head of the bottle. The carriage still continues on its motion toward the left-hand end of the frame of the machine, the head of the bottle passing transversely across the face of brush 143, the bottle at the same time revolving. This enables brush 143 to fold the part of the strip of tin-foil projecting over the head of the bottle and to press it upon the corked opening thereof. During the progress of this operation the carriage reaches the point of its path where roll 109 comes in contact with the inclined plane

111. Then the spider is turned (one-fourth of a turn) in the direction indicated by arrows in Fig. 17. This rotary motion of the spider completes the folding of the strip of tin-foil around the neck of the bottle, while the cutter of the post, set in that arm of the spider which is now nearest the neck of the bottle, is moved from its parallel position with the support 104 into a position at right angles thereto and in a forward direction. By this motion of the cutter the strip of tin-foil wound around the neck of the bottle is cut off. The end of the tin-foil strip remaining on the support is held thereto by the gum. It will be noted in Fig. 17 that the strip of tin-foil is cut on a line approximately dividing the width of support 104. The object of doing this is to have the end of the piece of tin-foil cut off by the cutter and applied to the bottle, also covered with gum, so as to insure its proper closing. The tin-foiling operation is completed when the carriage reaches the left-hand end of the frame B of the machine, where it stops. The pin 27, to the left of shaft 21, having been projected by the action of lever 34 when the bottle was inserted in the machine now disengages pawl 25 from ratchet-wheel 22, and the motions of the different mechanisms of the machine co-acting in the tin-foiling operation stop, except that brushes 125, 128, 135, and 143 continue to rotate and brush the tin-foil. Arms 42^b are again spread apart, the bottle ceases to revolve and is then in position to be removed. The spider is then in position shown in Fig. 1, a new strip of tin-foil being held spread between its arms projecting to the right.

When the bottle is removed from the machine, spring 31, reacting, forces pin 30 and slide 29 to the left, whereby the pin 27 on the left of shaft 21 is receded to permit pawl 25 to again come in contact with ratchet-wheel 22, thus clutching the latter to the cam-disk 23, and the other pin 27 on the right of shaft 21 projected. This starts the carriage on its return motion toward the right-hand end of the machine, where it stops again. The next operation of the machine is then started by inserting the bottle, as hereinbefore explained.

It is necessary to have the arms of the spider of sufficient length so a strip of tin-foil sufficiently long to cover the neck of the bottle and have the edges thereof overlapped may be held between the arms. The arms 98 of the spider and posts 94 can be made adjustable; but it is more advantageous to have each machine provided with a number of such spiders, having dimensions corresponding to the different sizes of necks of bottles to be tin-foiled thereon.

It is not necessary to change or readjust the spiders when there is only a small difference in the circumference of the neck of the bottle; but care must be taken that the dimensions of the spider are sufficient or more

to fully cover the neck of the bottle with tin-foil. If the circumference of the bottle be smaller than the distance between the arms of the spider, this would not cause any trouble, because the motions of the parts of the machine are calculated to produce a slight excess of the actions required for affixing and smoothing out the tin-foil on the neck of the bottle. Therefore an excess in the length of the strip of tin-foil to be applied to the bottle would not impair the quality of the work produced, though of course it would not be economical, as more tin-foil would be used than actually required for the purpose.

To meet the differences in the size of the body of the bottle, the adjustment in the position of the roller 53, as hereinbefore explained, is provided. The higher roller 53 is set relatively to the stirrup 45 the farther apart will be arms 42, and the larger space will be provided for inserting a bottle therein.

The gumming mechanisms hereinbefore described could be omitted and instead the head of the bottle before inserting it in the machine could be dipped in a weak solution of mucilage or gum or a layer of gum could be applied to the supports 104 by a hand-brush; but the arrangement of the gumming mechanism described will be found much better and more satisfactory.

I claim as my invention—

1. A bottle-tin-foiling machine, comprising a stationary frame, a support for the bottle, mechanism for holding the bottle upon the support and for imparting a rotary motion thereto, a reciprocating frame and driving mechanism mounted on the stationary frame; a tin-foil rack, mechanism for unwinding, drawing in position, holding and cutting the tin-foil, rotary brushing devices and mechanism for operating them, mounted on the reciprocating frame, and means for actuating the mechanism for unwinding, drawing in position, holding and cutting the tin-foil to be applied to the bottle.

2. A bottle-tin-foiling machine, comprising the combination of a frame; shafts and driving-gears; a support for holding a bottle, and a reciprocating frame mounted on the frame and operatively connected with the driving-gears, of a mechanism for drawing and holding in position a strip of tin-foil to be applied to the bottle, mounted on the reciprocating frame, and means for actuating the mechanism by the reciprocating motions of the frame; brushing devices, and mechanisms, driven by one of the shafts of the machine, for operating the brushing devices also mounted on the reciprocating frame, and of means for actuating the brushing devices and to move them, automatically, in position to act upon the tin-foil in the order required for the tin-foiling operation, by the motions of the reciprocating frame.

3. A bottle-tin-foiling machine, comprising a stationary frame, a support for the bottle, mechanism for holding the bottle upon the

support and for imparting a rotary motion thereto, a stationary gum-tank, a reciprocating frame and a driving mechanism mounted thereon, a tin-foil rack, mechanism for unwinding, gumming, drawing in position, holding and cutting the tin-foil to be applied to the bottle, rotary brushing devices and mechanism for operating them mounted on the reciprocating frame, and means for actuating the mechanism for unwinding, gumming drawing in position, holding and cutting the tin-foil to be applied to the bottle.

4. A bottle-tin-foiling machine, comprising a stationary frame, a driving-shaft, an intermediate shaft and a driven shaft set in the stationary frame, driving-gears set on the shafts, a clutch intermediate between the driven shaft and the gear set thereon; mechanism for operating the clutch, a support for the bottle set on the stationary frame, friction-rollers frictionally engaging with the gear set upon the driven shaft, movable arms having antifriction-rollers mounted on their ends, and mechanism for operating the arms to press the rollers upon the bottle when deposited on the support, and for removing them again; mounted upon the support; a movable frame set on the stationary frame, mechanism for reciprocating the movable frame upon the stationary frame; a tin-foil rack, and mechanism substantially as herein described, for unwinding the tin-foil, for drawing in position, holding and separating from the rest the part of the tin-foil to be applied to the bottle, rotary brushes and mechanism for operating them, mounted on the movable frame, means for actuating the mechanism for unwinding, drawing in position, holding and cutting the tin-foil to be applied to the bottle concurrently with the reciprocating motions of the movable frame, and means for shifting the brushes in requisite positions to act on the tin-foil applied to the bottle.

5. A bottle-tin-foiling machine, comprising a stationary frame, a driving-shaft, an intermediate shaft and a driven shaft set in the stationary frame, driving-gears set on the shafts, a clutch intermediate between the driven shaft and the gear set thereon; mechanism for operating the clutch; a gum-tank and a support for the bottle set on the stationary frame, a rotary cylinder set in the gum-tank and means for rotating the cylinder; rollers frictionally engaging with the gear set upon the driven shaft, movable arms having antifriction-rollers mounted on their ends, and mechanism for closing the arms upon the bottle when deposited on the support, and for drawing them apart again after the tin-foiling operation is completed, mounted upon the support; a movable frame, set on the stationary frame, mechanism for reciprocating the movable upon the stationary

frame; a tin-foil rack, and mechanism substantially as herein described, for unwinding the tin-foil from a roll set on the rack, for drawing it in position, holding and separating the part of the tin-foil to be applied to the bottle; a gum-roll mounted on the movable frame in position to engage with the cylinder revolving in the gum-tank at each reciprocation of the movable frame, and in position to engage with the mechanism for the tin-foil provided on the mechanism for holding, unwinding, drawing and holding it in position; rotary brushes and mechanism for operating them, also mounted on the movable frame, means for actuating the mechanism for unwinding, drawing in position, holding and cutting the tin-foil to be applied to the bottle, concurrently with the reciprocating motions of the movable frame, and means for shifting the brushes in requisite positions to act on the tin-foil applied to the bottle.

6. A support for the bottles for a tin-foiling machine, comprising a frame, a shaft set in the frame and a cam set on the shaft; antifriction-rollers mounted on the frame in position to engage with the gear on the shaft, bell-crank levers pivoted to the frame, opposite each other, and having antifriction-rollers set in their upwardly-projecting arms; a stirrup, pivotally connected to the other arms of the bell-crank levers; means for connecting the stirrup to the frame and for drawing it against the arms of the bell-crank levers; a bearing-block secured to the stirrup in the apex thereof, a pin set in the bearing-block, a roller mounted to loosely revolve thereon and in contact with the cam set on the shaft and means for imparting rotary motion to the cam.

7. The mechanism for unwinding, drawing and holding in position a strip of tin-foil, and for separating the part of it applied to a bottle, the mechanism comprising a casing, provided with radial apertures, a stationary shaft, a cam, cam disks and sockets set on the cam, set in and inclosed in the casing; hollow arms with laterally-extending supports set in the radial apertures of the casing, posts, having collars with cross-pins set thereon, set in the arms and the sockets, and resting on the cam; springs set on the posts to press them against the cam, cutters secured to the outer ends of the posts and means for rotating the casing intermittently upon the shaft.

In witness that I claim the improvements described in the foregoing specification I have signed my name in the presence of two subscribing witnesses.

JOHN FRED SCHNEIDER.

Witnesses:

M. A. HELMKE,
JOHN A. PAULSON.