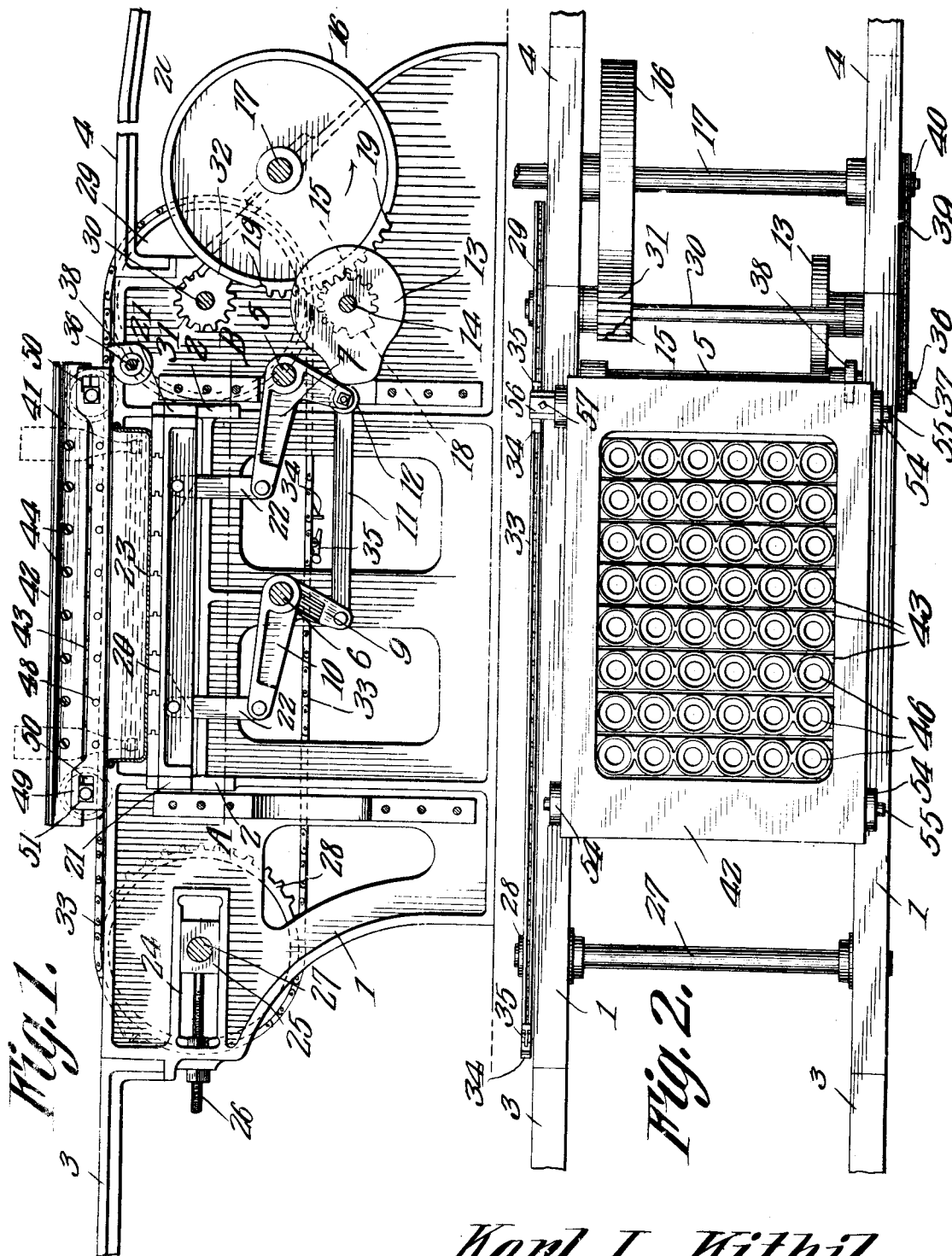


1,057,560.

Patented Apr. 1, 1913.

3 SHEETS—SHEET 1.



Witnesses

J. P. Tomlin
L. H. Wilson

Karl L. Kithil

Inventor,

by

C. A. Snow & Co.

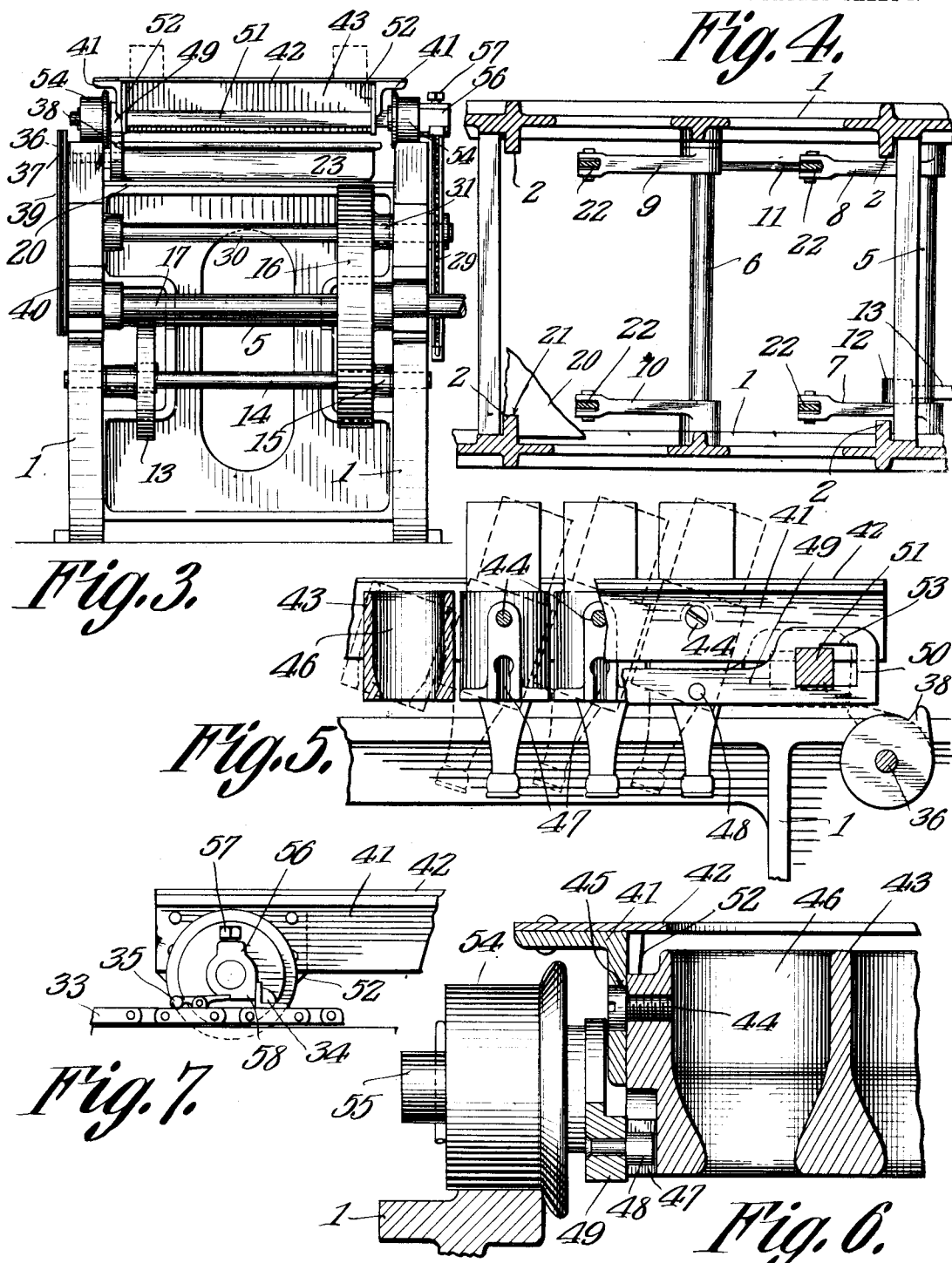
Attorneys.

K. L. KITHIL.
BOTTLE DIPPING MACHINE.
APPLICATION FILED FEB. 29, 1912.

1,057,560.

Patented Apr. 1, 1913.

3 SHEETS—SHEET 2.



Witnesses

J. P. Tomeny
L. H. Wilson

Karl L. Kithil

Inventor,

by

Cashnow & Co.

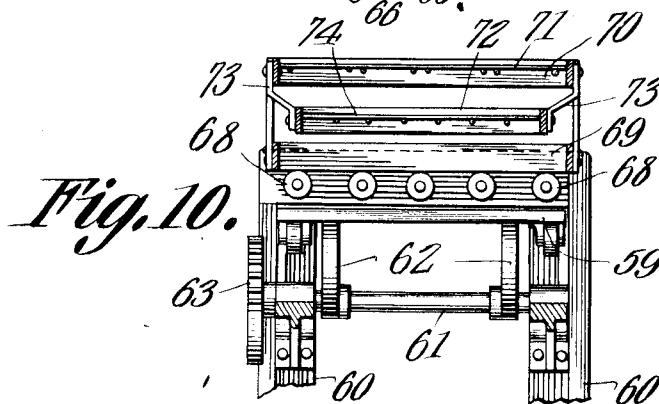
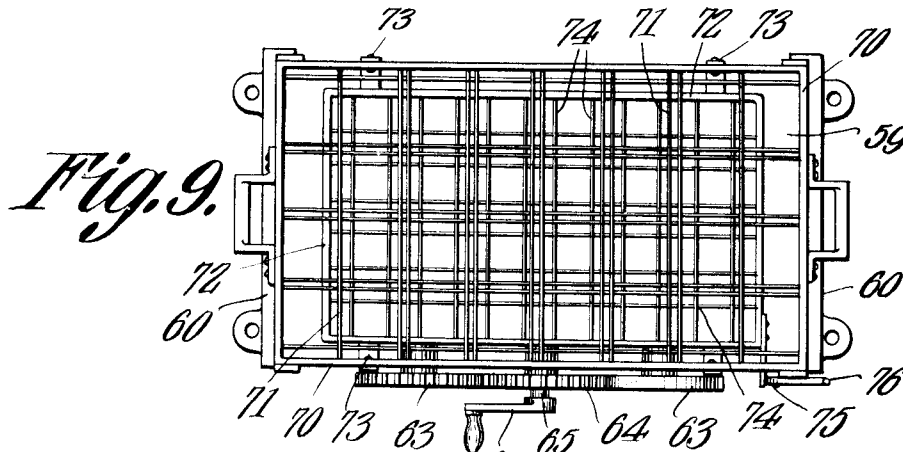
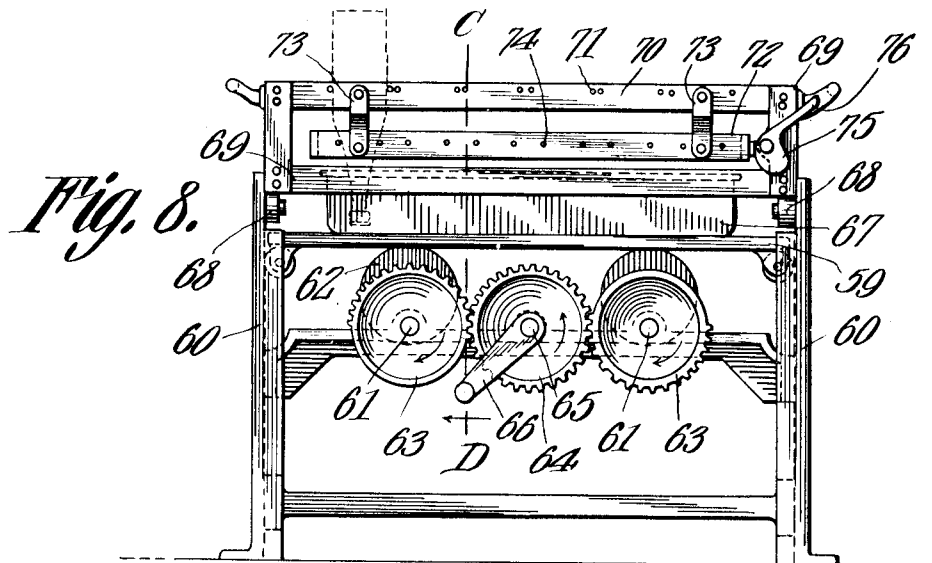
Attorneys.

K. L. KITHIL.
BOTTLE DIPPING MACHINE.
APPLICATION FILED FEB. 29, 1912.

1,057,560.

Patented Apr. 1, 1913.

3 SHEETS—SHEET 3.



Witnesses

J. T. Tomlin
J. W. Snow

Karl L. Kithil

Inventor,

by

C. A. Snow & Co.

Attorneys.

UNITED STATES PATENT OFFICE.

KARL LUDWIG KITHIL, OF MORGANTOWN, WEST VIRGINIA.

BOTTLE-DIPPING MACHINE.

1,057,560.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed February 29, 1912. Serial No. 680,776.

To all whom it may concern:

Be it known that I, KARL L. KITHIL, a citizen of the United States, residing at Morgantown, in the county of Monongalia and State of West Virginia, have invented a new and useful Bottle-Dipping Machine, of which the following is a specification.

This invention relates to machines for dipping bottles in a sealing liquid, one of its objects being to provide means whereby a number of bottles can be simultaneously dipped thereby to form caps or seals upon the heads of the bottles and which serve as substitutes for and improvements upon the ordinary tin-foil caps, tin caps and the like commonly employed.

A further object is to provide means whereby, after the dipping operation, the surplus liquid upon the heads of the bottles will be caused to drain from the sides of the heads, thus to prevent the accumulation of surplus liquid at undesirable points upon the heads.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings the preferred forms of the invention have been shown.

In said drawings:—Figure 1 is a side elevation of the machine, one of the side members being removed. Fig. 2 is a plan view of the machine. Fig. 3 is an end elevation. Fig. 4 is a section on line A—B Fig. 1. Fig. 5 is an enlarged longitudinal section through a portion of the carriage, parts of the carriage being shown in elevation and certain of the holders of the carriages containing bottles, the positions of the bottles during the draining operation being indicated by dotted lines. Fig. 6 is an enlarged transverse section through one side portion of the carriage. Fig. 7 is an enlarged side elevation of a portion of the carriage and of the conveying chain. Fig. 8 is a side elevation of a modified form of machine. Fig. 9 is a plan view thereof. Fig. 10 is a section on line C—D Fig. 8.

Referring to the figures by characters of reference 1 designates the upstanding frame members of the machine, the same being suitably connected and each being provided with parallel vertically disposed guide strips 2 arranged in pairs. The upper edges of the frame members 1 constitute a track for supporting a carriage such as will be hereinafter described and rails 3 lead up to these upper edges at the feed end of the machine while additional rails 4 extend from the other ends of said upper edges and are preferably inclined downwardly away from the frame members.

Parallel shafts 5 and 6 are journaled, at their ends, within the frame members 1 and fixedly connected to the shaft 5 adjacent its ends are bell crank levers 7 and 8 respectively. Another bell crank lever 9 is fixedly connected to one end portion of the shaft 6 while an arm 10 is fixedly connected to said shaft adjacent its other end. This arm 10 is arranged directly opposite the upper arm of the bell crank lever 9. The lower arm of the bell crank lever 9 is connected to a bar 11 which, in turn, is pivotally connected to the lower arm of the bell crank lever 8. A roller 12 is journaled upon and extends laterally from the lower arm of the bell crank lever 7 and projects into the path of a cam 13 mounted for rotation with a shaft 14 which is journaled at its ends within the frame members 1. A gear 15 is secured to and rotates with the shaft 14 and is adapted to be engaged intermittently by a mutilated gear 16 which is secured to and rotates with the drive shaft 17 of the machine. Gear 15 is mutilated in that it is provided, at one point on its periphery, with a blank extension 18 adapted, after the toothed portion of gear 16 has moved out of mesh with the teeth of gear 15, to contact with the smooth peripheral portion of gear 16 and thus hold gear 15 against further rotation until its teeth are again engaged by the teeth on gear 16. Gear 16 is designed to produce one complete rotation of gear 15 during each rotation of the shaft 17. Recesses 19 are formed in the periphery of gear 16 at the ends of the series of teeth on said gear so as to permit the blank 18 to swing away from gear 16 when the teeth on said gear are brought into mesh with the teeth on the gear 15.

A table 20 is interposed between the side

members 1 and has its corner portions cut away, as at 21 so as to receive the guide strips 2. Links 22 are pivotally connected to the table and extend downwardly therefrom to the upper arms of the bell crank levers 7, 8 and 9 and to the arm 10 respectively. Thus it will be seen that when shaft 5 is rotated all of the links 22 will be moved upwardly so as to elevate the table or downwardly so as to produce a corresponding downward movement of the table. The table 20 supports a tank 23 adapted to contain the sealing liquid. It is to be understood that under normal conditions the table 20 is in its lowermost position and the upper edges of the tank 23 are thus held below the paths of the bottles being supplied to the machine.

Slots 24 extend into the frame members 1 at one end thereof and constitute guideways for bearing boxes 25 provided with adjusting screws 26 whereby said boxes can be shifted longitudinally of the slots. A shaft 27 is journaled in these boxes and has a sprocket 28 secured to one end. Another sprocket 29 is secured to one end of a shaft 30 journaled in the frame members 1 above shaft 14 and carrying a gear 31 which is similar to the gear 15 and is adapted to be intermittently actuated by the mutilated gear 16. This gear 31 likewise has a blank portion 32 on its periphery designed to engage the smooth peripheral portion of gear 16 after each complete rotation of gear 31 by the teeth on gear 16.

The sprockets 28 and 29 are located adjacent the outer face of one of the frame members 1 and carry an endless chain 33 certain links of which are provided with brackets 34. Gravity latches 35 are mounted on certain of the links adjacent the brackets 34 and cooperate with said brackets for the purpose hereinafter set forth. The upper run of the chain 33 extends slightly above the upper edge of the adjacent side member 1, as shown particularly in Fig. 1.

A short shaft 36 is journaled in that frame member 1 farthest removed from the chain 33 and has a sprocket 37 secured to its outer end portion and a tappet 38 secured to its inner end portion. A chain 39 serves to transmit motion to sprocket 37 from a sprocket 40 on shaft 17.

The carriage used in connection with the machine is made up of angular side strips 41 connected by a rectangular top plate 42. Parallel holding bars 43 are mounted under the plate 42 and between the side strips 41, each of these bars having screws 44 extending into the end portions thereof adjacent the top of the bar, the cylindrical heads of the screws being journaled in openings 45 formed in the side strips 41. Each holding bar 43 is preferably formed in a single casting having a series of openings 46 extend-

ing downwardly therethrough and adapted to receive the neck and shoulder portions of bottles to be dipped, the bottles being thus held inverted. Grooves 47 are formed in the bars 43 at one end and receive studs 48 extending inwardly from a shifting bar 49. This bar has slots 50 in its end portions and through which extend the angular axles 51 of the carriage, these axles being attached to the side strips 41 by means of connecting plates 52 or the like through which the axles extend. One of the slots 50 has an axle receiving recess 53 in its upper edge at one end so that, when the bar 49 is pushed longitudinally in one direction, the recess 53 will be brought above one of the axles 51, thus permitting the bar 49 to drop downwardly so that the axle will be received within the recess and the bar will thus be held against further longitudinal movement until raised out of engagement with the axle. This bar 49 is arranged at one side of the carriage and the tappet 38 normally extends into the path of the bar. The supporting wheels 54 of the carriage are mounted on the rounded terminals 55 of the axles and are adapted to travel along the upper edges of the side members 1 of the frame and also along the rails 3 and 4. The rounded portion 55 of one of the axles has a block 56 secured thereto by means of a set screw 57 or the like and this block has an extension 58 on its lower face adapted to be engaged by a bracket 34 and latch 35 in the manner hereinafter set forth.

Under ordinary conditions the holding bars 43 of the carriage are suspended with the axes of the openings 46 vertical. The bottles to be sealed are placed, in inverted positions, within the openings 46 and the carriage is moved along the rails 3 to the upper portions of the side members 1 so as to bring the front axle 51 of the carriage into position above the upper run of the chain 33. When shaft 17 is set in motion it will rotate in the direction of the arrow in Fig. 1 and the teeth on gear 16 will move against the blank portion 32 of gear 31, thus causing the said gear 31 to make one complete rotation until the blank portion 32 is returned to the smooth peripheral portion of gear 16. During this complete rotation of the gear 31 the chain 33 is actuated so as to bring one of its outstanding brackets 34 against the block 56 on the front axle of the carriage. The gravity latch 35 passes under the block and moves automatically into engagement with the extension 58 so that the block becomes locked to the chain as indicated in Fig. 7. This operation occurs at the beginning of the movement of the chain and such movement is sufficient to draw the carriage along the frame members 1 until the bottles are positioned directly above the tank 23 whereupon the rotation of gear 31

ceases. The teeth on gear 16 which have moved into engagement with gear 15 and actuated said gear, now cause the cam 13 to move against the roller 12, and the shaft 5 and consequently, the shaft 6 is thus rotated, causing the links 22 to push upwardly on table 20 and thereby elevate tank 23 so as to immerse the necks of the bottles within the contents of the tank. As the cam passes the roller 12 all of the parts move back by gravity to their initial positions, the tank 23 and its contents moving away from the bottles. As soon as the tank has been removed from the bottles in this manner, the shaft 36 which has been rotating in properly timed relation to the other shafts, brings the tappet 38 against the end of the side bar 49, thereby shifting said bar longitudinally and causing the recessed portion 53 to drop down onto the axle 51 and thus lock the bar against further movement. This actuation of the bar causes all of the holding bars 43 to tilt simultaneously, thus bringing the bottles to the positions indicated by dotted lines in Fig. 5. Surplus liquid adhering to the bottles will thus drain therefrom at one edge of the mouth of each bottle thereby leaving a smooth surface across the mouth of the bottle and along the wall of the neck. After the bottles have been held in this inclined position above the tank 23 for a predetermined length of time, the teeth on gear 16 again move into engagement with gear 31, thereby giving said gear another complete rotation. This movement of the gear will be sufficient to convey the carriage from above the tank 23 and onto the inclined rails 4, another carriage, at the same time, being brought by the chain 33 into position above the tank. The bottles can afterward be left to dry and it will be seen that by providing a filled carriage always in readiness for engagement by the chain 33, the operation of dipping and draining the bottles will be carried on continuously. The capacity of the machine is practically unlimited, it being understood that the mechanism can be actuated at almost any speed desired and the carriages and tanks can be of any proportions.

Instead of providing a machine adapted to be driven by a motor or the like, a modified form of machine such as shown in Figs. 8, 9 and 10 may be employed, this machine being primarily designed to be actuated by hand. The table 59 is mounted to move vertically between the side members 60 but instead of utilizing links and bell crank levers, as shown in Fig. 1, parallel shafts 61 are journaled between the side members 60 and carry cams 62 on which the table rests. These shafts have gears 63 secured to them and meshing with a gear 64 secured to the actuating shaft 65, any suitable means, such as a crank 66, being provided for rotating

this shaft. A tank 67 is mounted on the table 59 and rollers 68 are mounted on the inner faces of the side members 60 and support the carriage 69. This carriage includes an upper frame 70 in which are arranged crossed wires 71. Another frame 72 is suspended from the frame 70 by links 73 and crossed wires 74 are arranged in this lower frame. The bottles to be dipped are inverted and placed between the wires in the two frames, the neck portions of the bottles being located between the wires in the lower frame 72. A cam 75 is mounted at one side of the frame and has a handle 76 extending therefrom whereby, by shifting the cam, the lower frame 72 can be caused to swing relative to frame 70, thus tilting all of the bottles and permitting them to drain in the manner hereinbefore described. It is to be understood that by rotating shaft 65, cam 62 can be caused to push the table 59 upwardly, thereby bringing the contents of the tank 67 around the necks of the bottles. After the tank has been lowered, cam 75 can be actuated so as to shift the lower frame 72 and thereby tilt the bottles so as to permit them to drain properly. After the draining operation the carriage can be removed and another one substituted therefor whereupon the foregoing operation may be repeated.

Any suitable sealing medium may be employed in connection with the apparatus, it being preferred to use a quick drying sealing fluid such as disclosed, for example, in an application for United States Letters Patent filed by me jointly with J. B. Krak, on November 20, 1911, said application bearing Serial No. 661,357.

What is claimed is:—

1. A machine including conveying means for holding a bottle inverted, means for holding a sealing liquid, means for momentarily immersing the neck portion of the bottle in the liquid, and means for tilting the bottle relative to the conveying means subsequent to its immersion.

2. A machine including conveying means for holding a bottle inverted, means for holding a sealing liquid, means for momentarily immersing the neck portion of the bottle in the liquid, means for tilting the bottle relative to the conveying means subsequent to its immersion, and means for locking the bottle in tilted position.

3. A machine including means for holding a bottle inverted, means for holding a sealing liquid, means for momentarily immersing the neck portion of the bottle in the liquid, means for tilting the bottle subsequent to its immersion, and means for locking the bottle in tilted position.

4. A machine including conveying means for holding a bottle inverted, a tank for holding a sealing fluid, means for raising and lowering the tank to momentarily im-

merse the neck portion of the bottle within the sealing fluid, and means for tilting the bottle relative to the conveying means subsequent to said immersion.

5 5. A machine including conveying means for holding separate series of inverted bottles, means for holding a sealing fluid, means for simultaneously immersing the neck portions of all the series of bottles within the fluid, and means for simultane-
10 ously tilting all of the series of bottles relative to said conveying means subsequent to said immersion.

6. A machine including conveying means
15 for holding a bottle inverted, a table, a tank thereon for holding a sealing fluid, means for successively raising and lowering the table to momentarily immerse the neck portion of the bottle within the fluid, and means
20 for tilting the bottle relative to the conveying means subsequent to its immersion.

7. A machine including frame members, guides thereon, a table engaging the guides, a tank mounted on the table for holding a
25 sealing fluid, conveying means for holding a bottle inverted above said tank, means for raising and lowering the table to momentarily immerse the neck portion of the bottle within the fluid, and means for tilting
30 the bottle relative to the conveying means subsequent to its immersion.

8. A machine including a movably supported carriage, means thereon for holding a bottle inverted, means below the path of
35 movement of the carriage for holding a sealing fluid, means for momentarily immersing the neck portion of the bottle within the fluid, and means for actuating said bottle holding means to tilt the bottle relative to
40 the carriage subsequent to its immersion.

9. A machine including a tank for holding a sealing liquid, a carriage movably mounted above the tank and into and out of position thereover, a holder movably connected to the carriage for supporting an inverted bottle, means for immersing the neck
45 portion of the bottle within the contents of the tank, and means for shifting the bottle holder relative to the carriage subsequent to said immersion to tilt the bottle.
50

10. A machine including a table, a tank thereon for holding a sealing fluid, a carriage movable across the top of the tank, means carried thereby for holding a bottle
55 in an inverted position, means for immersing the neck portion of the bottle within the fluid, and means for shifting the bottle holding means relative to the carriage to tilt the bottle subsequent to its immersion.

60 11. A machine including a tank for holding a sealing fluid, a carriage movable across the top of the tank, means movable with the carriage for holding an inverted bottle, means for raising and lowering the tank to momentarily immerse the neck portion of
65

the bottle, and means for shifting the bottle holding means relative to the carriage to tilt the bottle subsequent to its immersion.

12. The combination with a tank for holding a sealing fluid, of a carriage movable across the top of the tank, means carried thereby for holding a bottle in an inverted position, a drive shaft, and means operated thereby for successively moving the carriage to position above the tank, momentarily immersing the neck portion of the bottle within the contents of the tank, tilting the bottle subsequent to its immersion, and finally removing the carriage from above the tank.
70
75
80

13. The combination with a tank for holding a sealing fluid, of a carriage movable over the tank and including means for holding a bottle inverted, a drive shaft, and means operated by said shaft for successively bringing the carriage into position above the tank, elevating the tank to submerge the neck portion of the bottle, lowering said tank, tilting the bottle relative to the carriage, and finally removing the carriage from above the tank.
85
90

14. The combination with a tank for holding a sealing fluid, of a carriage movable across the top of the tank, means thereon for holding a bottle inverted, means for raising the tank to immerse the neck portion of the bottle in the sealing fluid, means for shifting the bottle holding means to tilt the bottle subsequent to its immersion, means for locking the bottle in tilted position, and means for moving the carriage out of position above the tank.
95
100

15. The combination with a carriage, and means thereon for holding a bottle in inverted position, of a tank supported below the path of the carriage, means for raising and lowering the tank to immerse the neck portion of the bottle in the contents of the tank, an endless actuating element, means thereon for engaging a portion of the carriage to shift the carriage into or out of position above the tank, a drive gear, means operated thereby for successively shifting the carriage into position above the tank, raising and lowering the tank, shifting the carriage away from the tank, and additional means for tilting the bottle subsequent to its immersion and prior to its removal from above the tank.
105
110
115

16. A machine of the class described including a carriage, means for moving the same intermittently, means on the carriage for holding the bottle in an inverted position, means for immersing a portion of the neck of the bottle during a pause in the movement of the carriage, and means for tilting the bottle during such pause.
120
125

17. In a machine of the class described the combination with a carriage, of means for moving the same intermittently, a tank
130

for holding a sealing fluid, means for immersing the neck of the bottle in the fluid during a pause in the movement of the carriage, means for tilting the bottle during such pause, and means for locking the bottle in tilted position.

18. In a machine of the class described the combination with a tank, of a carriage, means for moving the carriage intermittently across the top of the tank, means on the carriage for holding a bottle in an inverted position, means for elevating and lowering the tank during a pause in the movement of the carriage to momentarily immerse the neck of the bottle, and means for tilting the bottle during such pause and subsequent to the immersion.

19. The combination with a tank for holding a sealing fluid, of a carriage including a wheel supported structure, a bar suspended therein and mounted for rotation, said bar having a series of bottle receiving openings, means movably mounted on the carriage for rotating the bar to tilt the bottles therein, and means for locking the bottles in tilted position, and means for immersing the bottles prior to their tilting, within the fluid in the tank.

20. In a machine of the class described a carriage including a wheel supported frame, a bar mounted for swinging movement therein and having bottle receiving openings, a slide mounted on the frame and engaging the bar, and cooperating means upon the slide and frame for locking the slide out of normal position.

21. In a machine of the class described a carriage including a movably supported frame, a bar mounted for swinging movement therein and having bottle receiving openings, a slide connected to the bar, cooperating means upon the slide and a portion of the carriage for locking the slide and bar out of normal positions, and means in the path of the slide for shifting said slide relative to the carriage.

22. In a machine of the class described, a

tank for holding a sealing fluid, a carriage mounted to travel across the top of the tank, said carriage including a movably supported frame, a bar mounted to swing within the frame and having bottle receiving openings for holding bottles inverted, a slide connected to the bar and carried by the frame, cooperating means upon the slide and a portion of the carriage for locking the slide and bar out of normal position, means for immersing the neck portions of the bottles within the fluid, and means for shifting the slide relative to the carriage out of normal position subsequent to said immersion.

23. In a machine of the class described, a carriage including a movably supported frame, parallel bars mounted for swinging movement within the frame and each having a plurality of bottle receiving openings for holding inverted bottles, a slide mounted on the frame and movably connected to the bars, cooperating means upon the slide and carriage for locking the slide and bars out of normal position.

24. In a machine of the class described, a carriage including a movably supported frame, parallel bars mounted for swinging movement within the frame and each having a plurality of bottle receiving openings for holding inverted bottles, a slide mounted on the frame and movably connected to the bars, cooperating means upon the slide and carriage for locking the slide and bars out of normal position, a tank for holding the sealing fluid below the path of the carriage, means for immersing the necks of the bottles within the fluid in the tank, and means for shifting the slide out of normal position subsequent to said immersion.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

KARL LUDWIG KITHIL.

Witnesses:

ALEXANDER GAW,

JAMES N. TIMMERMANN.