

G. KIRKEGAARD.
BOTTLE FILLING AND CAPPING MACHINE.
APPLICATION FILED FEB. 20, 1907.

926,424.

Patented June 29, 1909.

2 SHEETS—SHEET 1.

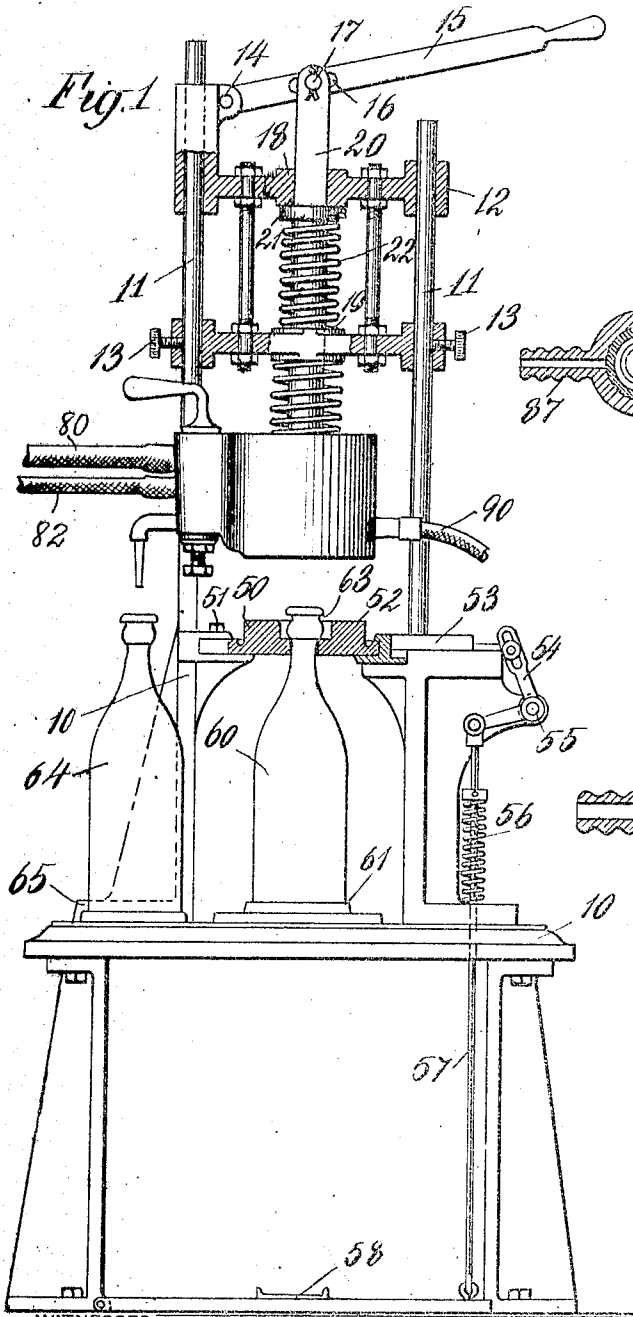


Fig. 4.

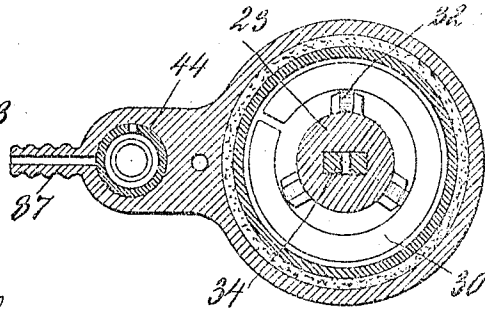


Fig. 5.

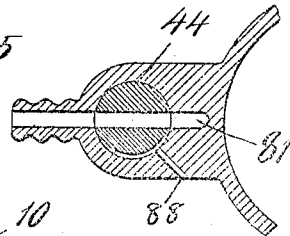
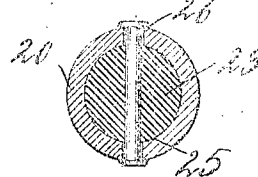


Fig. 6.



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2 SHEETS—SHEET 2.

Fig. 2.

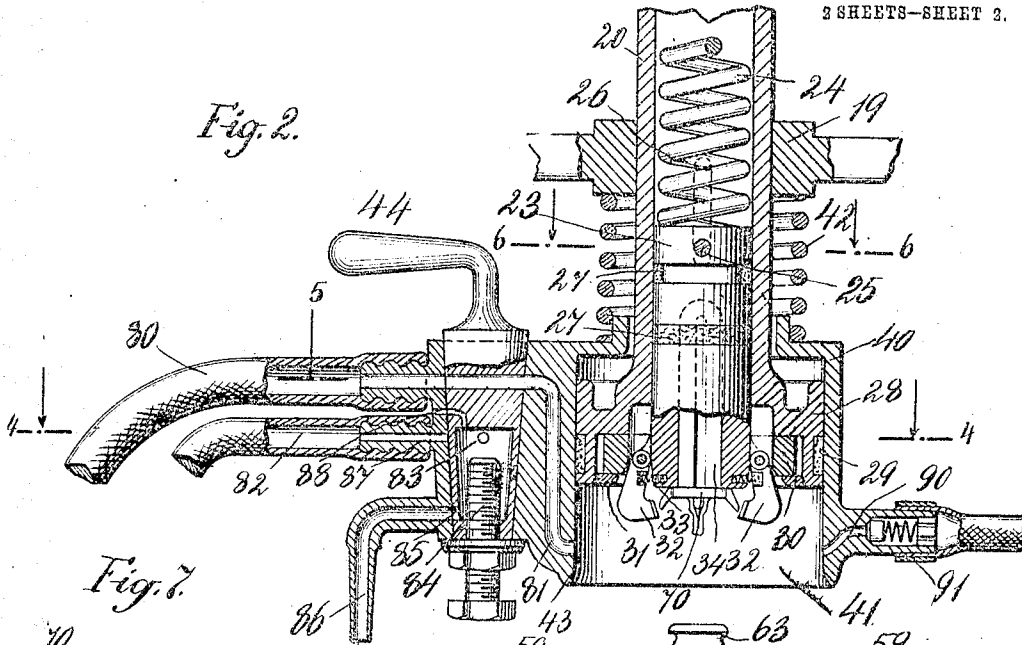


Fig. 7.

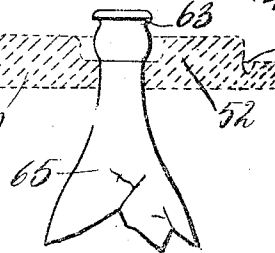
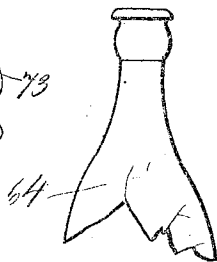
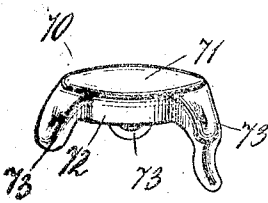
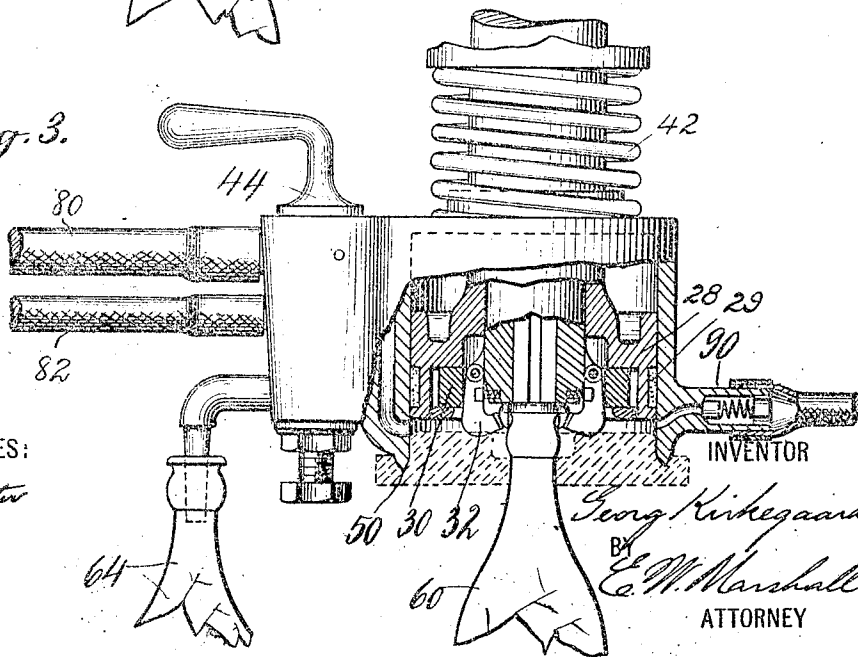


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORG KIRKEGAARD, OF NEW YORK, N. Y., ASSIGNOR TO IMPERIAL STOPPER COMPANY,
A CORPORATION OF MAINE.

BOTTLE FILLING AND CAPPING MACHINE.

No. 926,424.

Specification of Letters Patent.

Patented June 29, 1909.

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To all whom it may concern:

Be it known that I, GEORG KIRKEGAARD, a citizen of the United States, and a resident of the city of New York, in the county of New York, State of New York, United States of America, have invented certain new and useful Improvements in Bottle Filling and Capping Machines, of which the following is a specification.

My invention relates to a bottle filling and capping machine and its object is to provide a simple and efficient apparatus for filling bottles under pressure and applying caps thereto.

I will describe my invention in the following specification and point out the novel features thereof in claims.

Referring to the drawings Figure 1 is a side elevation of a bottle capping machine made according to my invention, certain of the parts being broken away and shown in section. Fig. 2 is a sectional side elevation of an improved bottle filling and cap applying head. Fig. 3 is a side elevation, partly in section, of the parts shown in Fig. 2, this figure showing the parts in different relative positions. Fig. 4 is a sectional plan view, the section being taken through the line 4—4 of Fig. 2. Fig. 5 is a sectional plan view of a valve mechanism, the section being taken through the line 5 of Fig. 2. Fig. 6 is a sectional plan view showing the operating spindle and compression shaft, the section being taken through the line 6—6 of Fig. 2. Fig. 7 is a perspective view of a bottle cap which I have invented and which may be used to advantage with this apparatus.

Like characters of reference designate corresponding parts in all of the figures.

10 designates a base or framework upon which the various parts of my apparatus are mounted. 11, 11 are vertical standards connected with this framework and arranged to support certain of the parts. 12 designates a head or supporting carriage slidably mounted upon these standards and arranged to be held at a desired height by means of hand screws 13, 13. At a point 14 on the supporting-carriage is pivoted a hand lever 15. 16 designates a slot in this hand lever. A pin 17 is arranged to pass through the slot 16.

20 designates a spindle mounted in the supporting-carriage 12 at the points 18 and 19. The upper end of this spindle is con-

nected with the lever 15 and the pin 17 passes through the spindle to connect the latter with the lever.

21 is a collar attached to the spindle 20. A compression spring 22 between the portion 19 of the carriage 12 and the collar 21 serves the purpose of normally maintaining the spindle and its associated parts in their upper position. The collar 21 striking upon the portion 18 of the supporting-carriage limits the upward movement of these parts. The spindle is hollow and is arranged to carry a compression shaft 23 which is pressed outward from the spindle by means of a compression spring 24. A pin 25 passes through this compression shaft 23 and through a slot 26 in the side of the spindle. This pin prevents the compression shaft from being pushed down out of the spindle but allows of a certain vertical movement of the compression shaft within the spindle.

27, 27 designate two packing rings about the compression shaft to prevent the upward flow of liquid from the filling chamber into the spindle 20. The lower end of the spindle is constructed to form a piston 28 which is provided with a packing ring 29.

30 designates a split cam ring which is arranged to be held within the lower end of the spindle 20 by means of a shoulder 31 which may be secured onto the bottom of the spindle.

32, 32 designate locking-pawls or fingers which are pivoted to the lower end of the compression shaft and pressed outward by means of springs 33. The lower end of the compression shaft may be provided with a recess and a magnet 34 placed therein.

40 designates a casing which is constructed to form a cylindrical filling chamber 41, the upper portion of this casing extending over the enlarged lower end of the spindle 20 and a spring 42 being interposed between the upper surface of the casing and the portion 19 of the supporting-carriage. The lower edge of the casing 40 is provided with a sharp annular rim 43 which is adapted to engage with a package which I will describe later. Associated with this casing 40 is a valve 44 which is arranged to control various ports.

50 designates a packing-collar which is attached at 51 to a portion of the base of frame 10, and 52 designates a similar packing-collar which is movably supported

upon a slide 53 which slide is also supported in the frame 10. This slide may be actuated by means of a bell-crank lever 54 which is pivoted at 55 and which is normally pressed to move the slide 53 outward by means of a spring 56, but which may be moved in the opposite direction by means of a vertical connecting-rod 57 which is connected with a treadle 58.

A bottle 60 may be placed upon a bottle-support 61, which is a part of the base or frame 10, with a portion of its neck against the packing-collar 50. When the treadle 58 is depressed the slidable packing-collar 52 will be moved inward against the neck of the bottle so that the two packing-collars will together surround the neck of the bottle tightly. These packing-collars are preferably made of rubber or other resilient material. Another bottle 64 may be placed upon another bottle-support 65 upon the base or frame, after which the supporting-carriage 12 with its connected parts may be lowered upon the vertical standards 11, 11 until the lower edge 43 of the casing fits into circular grooves 59 which are provided in the packing-collars 50 and 52. The casing and the packing-collars will thus form a filling chamber about the mouth of the bottle.

70 designates a bottle cap which I have invented and which comprises a flat disk 71 having a depending annular flange 72 and depending lugs or fingers 73. One of these caps may be placed upon the lower end of the compression shaft 23 and will be held thereon by the magnet 34. The cap should be placed upon the end of the compression shaft before the casing has been lowered into contact with the packing-collars.

80 designates a pipe from a suitable source of fluid supply, such, for example, as carbonated fluid under pressure, which may be connected with the filling chamber 41 through passage 81 by opening valve 44. This will cause the filling chamber and the bottle to be filled under pressure. The spindle 20 may then be lowered by means of lever 15 and the compression shaft will move with the latter until the cap 70 meets the top of the bottle 60. This will arrest the movement of the compression shaft 23. These caps are generally provided with a packing material such as cork and the spring 24 will cause this packing to be compressed firmly against the mouth of the bottle. A further movement of the spindle 20 will cause the forming ring 30 to be moved down over the locking fingers 32, 32 and cause the latter to be pressed inward. These fingers are arranged to be opposite the depending lugs 73, 73 on the bottle cap and will cause the latter to be pushed in and under the annular rim or bead 63 upon the bottle 60. In the foregoing action the

piston 28 descends in its cylindrical cavity thereby displacing most of the liquid beneath the piston into the outlet 90, where it is led away for subsequent use. At the instant when the bottle is capped and sealed, the piston has descended nearly into engagement with the packing blocks 50, 52, so that there is substantially no clearance and no fluid lost and wasted when the packing blocks are separated from the filling head. It may be seen that during this portion of the operation the pressure in the bottle may be increased by simply closing the passage 81 by the valve 44.

90 designates an outlet passage in which is a safety valve 91 which will prevent the pressure in the bottle becoming too great.

82 designates a pipe from a second source of fluid supply which is arranged to be connected through the valve 44 with the receiving chamber 83 when said valve is in its closed position. This receiving chamber is provided with a regulating screw 84 which may be adjusted to measure the amount of fluid which said chamber can receive. The lower portion of the valve 44 is provided with a port 85 which is arranged to open a passage 86 when the passage 81 is opened to the filling chamber 41; at the same time the passage 87 from the supply pipe 82 into the receiving chamber 83 is closed and an air-vent 88 is opened into the top of this receiving chamber. Thus it may be seen that any liquid which may have been introduced into the receiving chamber 83 may flow through the passage 86 into the bottle 64 which is directly under it. This arrangement is utilized for filling a syrup of a certain measured quantity into the bottle 64 while bottle 60 is being charged under pressure by the apparatus which I have described. While the valve 44 is turned to close passage 81 into the filling chamber 41 the passage 87 is opened into the receiving chamber 83 and the amount of liquid which will flow into this chamber is dependent upon the position of the regulating screw 84.

When the bottle 60 has been filled and sealed as above described the lever 15 may be released and the spring 22 will cause the spindle 20 and its connected parts to be raised. The carriage 12 may then be raised up above the packing-collars and the spring 56 allowed to move the packing collar 52 away from the bottle. The filled and sealed bottle 60 may then be removed, the bottle 64 put in its place, and a new bottle put in place of the bottle 64 which has just been charged with a measured supply of syrup.

I have described a portion of this apparatus as constructed for use in conjunction with a specific form of bottle cap which I have invented, but it may, of course, be applied to other forms of bottle caps if desired.

The apparatus for measuring and filling

syrups and for charging a bottle under pressure may also be modified to suit various conditions.

What I claim is.—

5 1. In a bottle filling machine, a carriage having a cylindrical bore, a spindle having a piston movable in said bore, a fluid inlet pipe communicating with the lower portion of said bore, and a plurality of blocks slidable
10 laterally to close about the neck of a bottle, said blocks having a depression to receive the usual beaded top of the neck of a bottle, whereby the clearance between said piston
15 and said blocks is made a minimum when the piston is depressed.

2. In a bottle filling machine, a carriage having a bore, a spindle having a piston working in said bore, means for admitting fluid to said bore, and a pair of flexible
20 blocks adapted to close about the neck of a bottle, said blocks having a depression to receive the usual bead at the top of a bottle neck, whereby the clearance between said piston and said blocks is made a minimum.

25 3. In a bottle filling machine, a filling head, a cock in said filling head and having a passage controlling the flow of fluid to said filling head, said cock having an interior cav-

ity and a passage extending thereto through which said cavity may be filled, a screw
30 threaded into the end of said cock and itself constituting a plunger to vary the capacity of said cavity, and a discharge pipe for emptying said cavity when the cock is turned to a certain position.

35 4. In a bottle filling machine, a carriage having a cylindrical portion with a cylindrical bore and a lower sharpened edge, a piston working in said bore and having a substantially flat lower face, and a pair of
40 blocks adapted to move together to close about the neck of a bottle, said blocks having a cylindrical annular groove to receive said sharpened edge of the carriage, and having
45 a central depression to receive the usual bead at the top of the neck of a bottle, whereby the clearance between said piston and said blocks is made a minimum amount when the piston is depressed.

In testimony whereof I have signed my
50 name to this specification in the presence of two subscribing witnesses.

GEORG KIRKEGAARD.

Witnesses:

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ELLA TUCH.