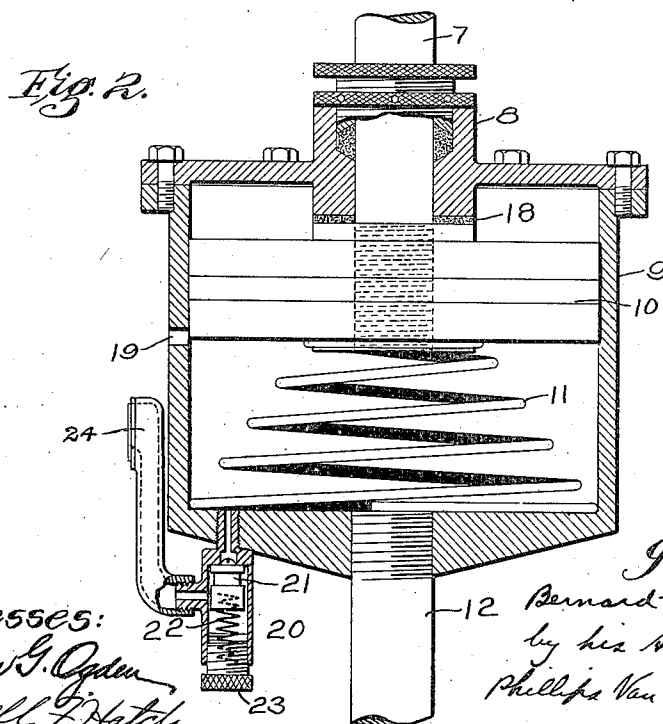
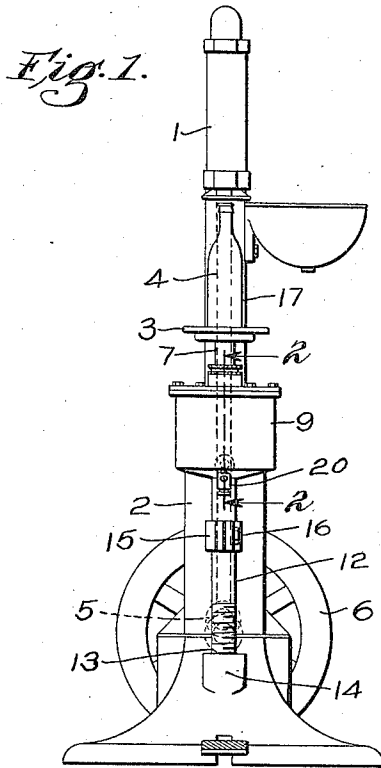


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MACHINE FOR APPLYING CLOSURES TO BOTTLES.  
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1,063,191.

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# UNITED STATES PATENT OFFICE.

BERNARD GALLAGHER, OF LYNN, MASSACHUSETTS.

MACHINE FOR APPLYING CLOSURES TO BOTTLES.

1,063,191.

Specification of Letters Patent.

Patented June 3, 1913.

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*To all whom it may concern:*

Be it known that I, BERNARD GALLAGHER, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Applying Closures to Bottles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to machines for applying closures to bottles, being applicable to any machine of the type in which a closure is affixed to a bottle by the application of pressure.

The invention is particularly applicable to machines for applying closures of the type commonly known as the "crown cork", but may be employed in connection with various other forms of closures.

The object of the invention is to produce a machine having simple and reliable means for controlling the pressure applied to a bottle so as to produce uniform results in the application of the closures and to prevent the danger of injury to the bottle, or the closure, by the accidental application of an undue degree of pressure. To this end there is employed, in connection with one of the members by which the pressure is applied to the closure and the bottle, a device for controlling the operation of this member through the action of pneumatic pressure. This device is preferably so constructed that the relative movement of the pressure-applying members acts to compress the air or other gas in the pneumatic-pressure device, while the latter is arranged to determine the amount of the pressure so produced, either by adjustment of the extent of movement to its members, or by the use of a safety valve, or in any other convenient way.

The preferred embodiment of the invention is illustrated in the accompanying drawings in which,

Figure 1 is a front elevation of a machine; and Fig. 2 is a vertical section, on a larger scale, on the line 2—2 in Fig. 1, looking in the direction of the arrows.

The illustrated embodiment of the invention is a machine adapted for applying crown corks. With the exception of the pneumatic-pressure device, the construction of the machine is not particularly illustrated,

as machines of this kind are well known.

The machine has the usual capping head 1, supported on a column 2, which head constitutes the means for applying closures to the bottle. This head may be of any ordinary form or suitable construction, such, for example, as that illustrated in the patent to William Painter, No. 473,776, dated April 26th, 1892. Cooperating with the capping head is a bottle support in the form of a horizontal table 3 upon which a bottle may be placed by hand, the bottle, during the operation of the machine, being located directly beneath the capping head, as shown in Fig. 1. Any ordinary or suitable means for moving one of the two members just described toward and from the other to affix the closure may be employed. In Fig. 1 such means are indicated by dotted lines illustrating a connecting rod 4 by which the head is vertically reciprocated within the column 2, this connecting rod being connected at its lower end, by a crank 5, through any convenient form of one-revolution clutch, with a power shaft provided with a fly-wheel 6, belted to a suitable source of power.

In the illustrated embodiment of the invention the pneumatic pressure device, hereinafter referred to, is arranged as a part of the means for supporting the bottle support 3. The bottle support is mounted upon a piston rod 7 which slides vertically in a stuffing box 8 in the head of a cylinder 9. The lower end of the piston rod is fixed to a piston 10 which works within the cylinder. Beneath the piston is a balancing spring 11, although it is not essential, which acts normally to maintain the piston, the piston rod and the bottle support in raised position, as shown in the drawings. The cylinder 9 is supported upon a rod 12 which has a threaded portion 13 at its lower end engaging a correspondingly threaded boss 14 on the frame of the machine. The threaded rod constitutes means by which the action of the pneumatic pressure device may be adjusted and by which the machine may be adjusted properly to operate upon bottles of different heights. By rotating the rod 12 the pneumatic pressure device and the bottle support may be raised or lowered, and in practice this adjustment is so performed as to bring the mouth of a bottle resting upon the bottle support about one-fourth of an inch below the capping head when the latter is in its

normal raised position. With the parts so adjusted the downward stroke of the capping head forces the bottle, the bottle support, the piston rod and the piston downward. The downward movement of the piston compresses the air or other gas in the lower part of the cylinder 9, the pressure rising progressively until the limit of the downward movement is reached. The maximum pressure applied to the bottle thus depends upon the extent of the downward movement. The area of the piston and the capacity of the cylinder and the parts are so proportioned that when the bottle support is preliminarily adjusted as hereinbefore described, in applying the closure this pressure reaches but does not exceed the predetermined maximum which is desired. In practice, a pressure of 400 lbs. is found to be suitable for the application of a crown cork. If it be desired to apply a greater pressure to the bottle closure, this may be accomplished by screwing the rod 12 upward in the boss 14, thereby bringing the mouth of the bottle nearer to the capping head in the initial position of the parts, so as to produce a longer downward movement of the piston and a greater consequent pressure on the air in the cylinder. The opposite result is produced by screwing the rod downward in the boss, thereby lowering the bottle in its initial position so that a greater part of the downward stroke of the capping head is idle. To prevent accidental rotation of the adjusting rod 12, a split ring 15 mounted on the column 2 is clamped upon the rod by tightening a binding screw 16. When the rod is to be rotated for the purpose of adjustment, the collar 15 is loosened. When the capping head rises and the pressure upon the pneumatic-pressure device is relieved, the piston rises automatically, its upward movement being limited by a cushioning device in the form of a washer 18 of suitable material interposed between the piston and the bottle and stuffing box 8. The upward movement of the piston is accomplished by the partial vacuum produced in the upper portion of the cylinder by the downward movement of the piston. The spring 11 when employed acts as a supplementary device to assist in raising the piston. In the normal uppermost position of the piston it uncovers a port 19 in the cylinder wall through which the area within the cylinder below the piston is brought into communication with the atmosphere. This port, therefore, operates to equalize the pressure within and without the cylinder, so that the action of the piston and cylinder is always uniform.

While the preferred pneumatic-pressure device operates as hereinbefore described, when the parts are suitably adjusted for a bottle of given size, to determine the pressure on the bottle during the capping opera-

tion, the accidental substitution of a larger bottle for that for which the machine is adjusted may result in the application of an undue pressure to the bottle. To prevent this a safety valve may be employed, as shown in Fig. 2, to permit the escape of air from the cylinder in case the pressure rises above the predetermined amount. This safety valve has a valve member 21, closing an escape port from the cylinder, and normally maintained upon its seat by a spring 22. The pressure of the spring 22 may be adjusted to any desired degree by means of an adjusting screw 23 threaded into the valve casing. While the safety valve is not essential to the normal operation of the machine, when applied to the machine it affords an additional safeguard against injury to the bottles or the closures. This is especially true as the escape port from the safety valve is preferably provided with a pressure indicator 24 (shown in Fig. 2) in the form of a whistle, or other sound producing instrumentality. When the safety valve is fitted with the indicator 24 the operator can determine when the proper pressure is being applied by the tone of the blast from the whistle. If the bottle support has been adjusted too high the blast will be too strong, if it has been adjusted too low there will be no blast at all. While with an indicator such as described the machine may be preliminarily adjusted, with precision, quickly by an unskilled operator the correct adjustment necessary for any particular height of bottle is soon learned by the operator and, therefore, a pressure indicating device is not essential.

It will be apparent that in the broadest aspects of the invention the pneumatic-pressure device may be interposed at any convenient point in the devices for moving or supporting the operative elements of the machine, and that other modifications may be made within the scope of the invention as defined in the following claims.

What is claimed as new, is:—

1. A machine for applying closures to bottles, having, in combination, two members constituting a closure-applying head and a bottle support, and means for supporting said members and for moving one member toward the other to affix a closure to a bottle on the bottle support, said means including a pneumatic-pressure device operated by said movement, and means for adjusting the initial distance between said members to vary the pressure transmitted by the pneumatic-pressure device, substantially as described.

2. A machine for applying closures to bottles, having in combination, two members comprising a closure-applying head and a bottle support, and means for supporting said members and for moving one member

toward and from the other to affix a closure to a bottle on the bottle support, said means including a pneumatic pressure device comprising a cylinder having an air-tight piston therein operated by said movement to control the pressure applied to the bottle, and said cylinder having a port open to the atmosphere to equalize the air pressure within and without said device before pressure is applied but closed by the movement of said piston, substantially as described.

3. A machine for applying caps to bottles, having, in combination, a bottle capping

head, a pneumatic-pressure device, a bottle support carried by said pressure device intermediate said device and the capping head arranged to transmit pressure from the device to the head, and means for adjusting the pressure device relative to the head to regulate the amount of pressure transmitted, substantially as described.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."