A. A. ROSENGREN.

MACHINE FOR THE CAPSULING OF BOTTLES.

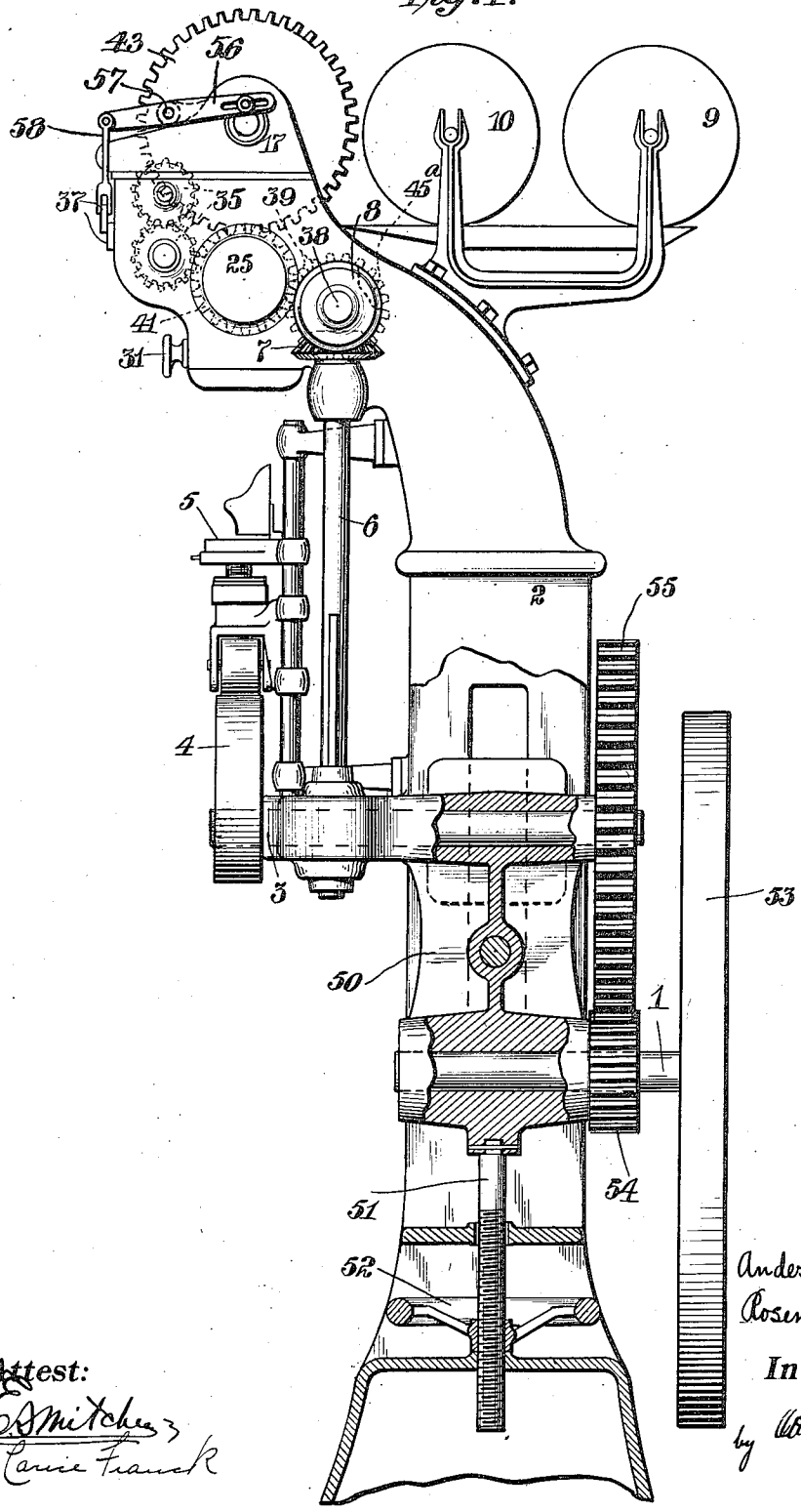
APPLICATION FILED DEC. 15, 1913.

1,271,944.

Patented July 9, 1918.

2 SHEETS—SHEET 1.

Fig. 1.



Attest:

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2 SHEETS—SHEET 2.

Fig 2.

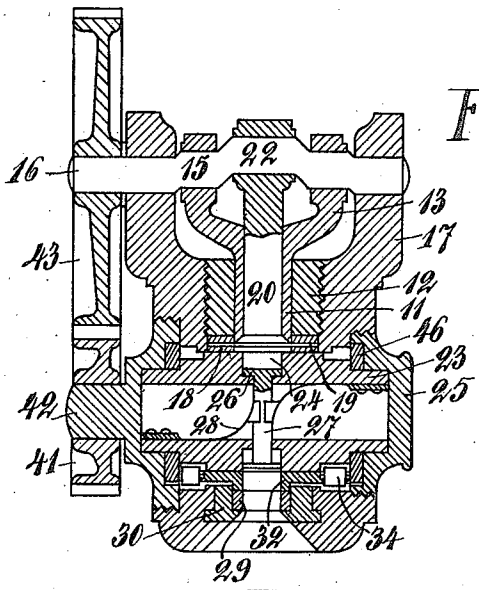


Fig. 3.

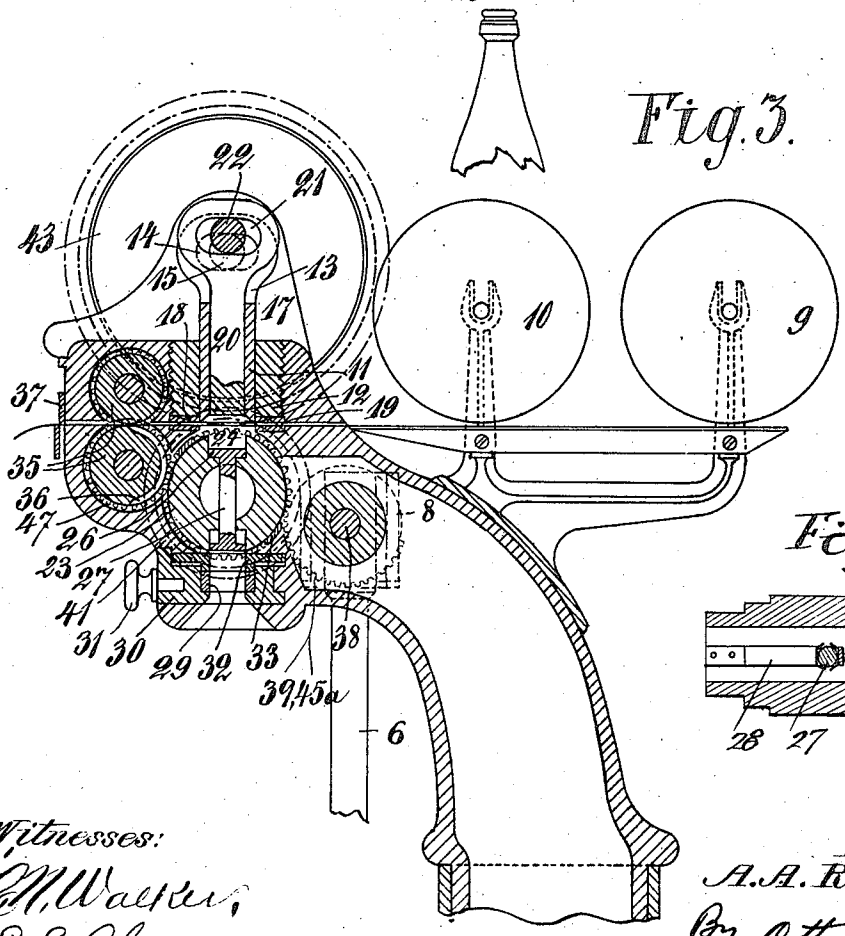
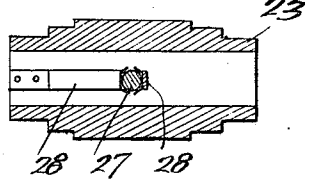


Fig. 4.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR THE CAPSULING OF BOTTLES.

1,271,944. Specification of Letters Patent. Patented July 9, 1918.

Application filed December 15 1913. Serial No. 806,873.

To all whom it may concern:

Be it known that I, ANDERS ANDERSSON ROSENGREN, a subject of the King of Sweden, and resident of 70B Södra Förstadsgatan, Malmö, in the Kingdom of Sweden, have invented certain new and useful Improvements in Machines for the Capsuling of Bottles or other Vessels, of which the following is a specification, reference being made to the accompanying drawings.

The present invention relates to machines for the capsuling of bottles or other vessels, that is to say for the closing of bottles, etc., by means of capsules, or merely for the affixing of capsules on bottles, etc., which are already closed by means of corks, or the like.

A capsuling machine constructed in accordance with this invention comprises essentially a device, which in addition to being provided with an annular or tubular punching tool, has a part or piston movable relatively to the said tool, which part serves as a male die, and a device carrying a number of female dies, which successively cooperate with the said piston or male die for the forming of the capsules, and from which dies the finished capsules are successively expelled and applied to the vessels to be capsuled. The female dies may be provided with movable parts, which cause the expulsion of the finished capsules from the female dies, and these movable parts may be connected with one another in such a manner that when one capsule is being formed in a female die, its movable part is displaced and causes the corresponding part in another female die, containing a finished capsule, to perform its expelling movement.

In the accompanying drawings is shown by way of example a machine constructed in accordance with this invention, intended for the closing of bottles by means of capsules. Figure 1 shows the machine, the base being omitted, seen from one side, while Figs. 2 and 3 show two vertical sections, at right angles to one another, of the upper part of the machine. Fig. 4 is a detail view of the springs 28, showing their engagement with the rod 27.

The movable parts of the machine are driven from the main shaft 1, which is mounted in the frame pillar 2 in such a manner that it can be raised and lowered. The means for raising and lowering the shaft 1 are preferably constructed as follows:—Vertically slidable in the pillar 2 is a block 50 in which the shaft 3 is capable of revolving. Secured to the lower face of the block 50 is a non-rotatable screw spindle passing through a suitably threaded hand wheel 52, supported near the base of the pillar 2. The main shaft carries a pulley 53, whereby this shaft may be driven from any suitable power source (not shown). From the main shaft 1 is driven among other parts, a horizontal shaft 3 revoluble in the block 50, on which shaft is mounted an eccentric 4, carrying a support 5, on which the bottles stand during the closing operation, and to which a suitable movement in a vertical direction is communicated by the eccentric. The eccentric is so arranged that it keeps the bottles up in a certain position during the closing operation. Shaft 3 is driven from shaft 1 by means of gear wheels 54 and 55.

From the main shaft is also driven a vertical shaft 6, which at its upper end is provided with a worm 7, engaging with a worm wheel 8 hereinafter referred to. The drive of the shaft 6 from the shaft 3 is effected by a worm and worm wheel gear, which it is though unnecessary to show in the drawing.

The capsule blanks are obtained by punching them from a strip. The said strip is preferably composite, consisting of two strips, namely a metal strip, such as aluminum which is carried by a roller 9, and a strip of parchment paper, which is carried by another roller 10.

The punching of the capsule blanks out of the blank strip takes place by means of a punching tube 11, which moves up and down in a guide 12 screwed down in the frame head. From the upper end of the punching tube 11 extend two arms 13, in the free end of which there are oblong openings 14 for two cranked parts 15, of a shaft 16, which is journaled in two stands 17 on the frame head. The punching tube coöperates with a die 18, which is placed at the base of the guide 12, and which is provided with a groove 19 for the blank strip. This groove extends in both directions in the frame head, and it will be understood that the dies 18 are removable and that different dies 18 with different sized grooves 19 are

provided, to accommodate the particular strip being used.

The punching tube 11 surrounds a piston 20, which serves as a male die in forming the punched out capsule blanks into capsules. The upper end of the piston 20 is expanded and provided with an oblong opening 21 for a cranked part 22 of the shaft 16, said part 22 being between the cranked parts 15, of the shaft 16. The eccentricity of the cranked part 22 is greater than that of the cranked parts 15, so that the piston 20 is movable in relation to the punching tube 11, and moves farther down and higher up than the latter. The punching tube need not be moved lower down than that its edge just cuts through the blank strip, whereas the piston must have so great a movement that its lower end, which in cutting through the blank strip must be above or in the plane of the edge, and thereupon pass below the said plane in order to serve as a male die.

Below the punching device there is a hollow cylinder 23, which carries the female dies 24 coöperating with the piston or male die 20. The cylinder 23 has its ends rotatably journaled in two screw caps 25, which are screwed into the frame head. The female dies 24 are formed by the walls of two apertures, arranged diametrically opposite each other in the cylinder 23, and by bottom pieces 26 displaceable in the said apertures. The said bottom pieces are connected with one another by means of a rod 27, so that when one of the bottom pieces is pressed inward in one of the apertures, the other bottom piece is pressed outward in the other. The bottom pieces 26 are provided with a brake device, whereby they are prevented from being moved accidentally; the said device may—as shown—consist of springs 28 in the cylinder 23, one end of each spring resting against the rod 27 intermediate the ends of each spring 28, and preferably struck up therefrom, is a pair of oppositely disposed shoes or jaws 28^a which partially embrace the rod 27, these shoes increasing the frictional engagement between the springs 28 and the rod 27.

The actual closing of the bottles takes place in the well-known manner by a part or parts of the wall of a capsule placed on a bottle head being pressed by means of a rubber ring into one or more grooves in the bottle head, for which purpose the rubber ring is compressed by a part, termed the compressor, acting upon it. In the machine shown in the drawings the rubber ring 29 which effects the closing is placed in an aperture in a slide 30, provided with a knob 31 movable in the frame head, and in the said aperture is the ring-shaped part of the compressor 32, which extends into engagement with and directly acts on the said ring, which is closely surrounded by the slide 30 and rests on a shoulder formed by the slide. The downward movement of the compressor required for the closing is effected by a plurality of projections or ridges 33 arranged on the female die cylinder 23, which projections act on rollers 34 placed in the compressor.

Outside the punching apparatus—beyond the rollers 9 and 10—there are journaled in the frame head two rollers 35, arranged one above the other and serving to feed forward the blank strip. The surfaces of the rollers are at a distance from one another corresponding to the thickness of the blank strip. The circumference of the lower roller is provided with a recess 36 which is at least as broad as the blank strip, whereby the forward feed of the blank strip will be intermittent, even if the roller provided with the recess rotates continuously. As it will be seen, the blank strip is pulled by the punching device; this is more advantageous than to push it by the said device, as is the case in earlier constructions.

On the front side of the frame head there are a couple of shear shanks 37, serving to cut off bit after bit of the punched out part of the blank strip projecting from the frame head. The said shear device preferably consists of a fixed shear blade or shank and a movable blade or shank, the latter being actuated from the shaft 16 by means of a lever 56, fulcrumed at 57, and a link 58 connecting the lever with the movable shear blade 37.

If the capsules are to be provided with a statement of the nature or origin of the material in the bottles or with a certain date they can be provided therewith during their formation. For this purpose the bottom pieces 26 may be provided with recesses serving as female dies or with elevations serving as male dies. The corresponding male dies or female dies are formed by a body of rubber placed on the lower end of the piston 20.

The shaft 38 on which the above mentioned worm wheel 8, driven from the main shaft of the machine, is mounted, carries a toothed wheel 39 provided with gear teeth on one half of its periphery, which is in engagement with a toothed wheel 41 in front of it. The last-named toothed wheel, which is carried by a shaft 42 extending from one of the screw caps 25, engages with a toothed wheel 43 on the shaft 16.

Two toothed rings 46 are fixed on the female die cylinder 23. The toothed rings 46 are formed as mutilated gears, only one-half of the periphery of each being toothed. These rings 46 mesh with the gears 45, and while the latter rotate continuously the rings 46 rotate intermittently, owing to the fact that they are mutilated gears.

The feeding rollers 35 are driven from the toothed rings 46 or one of them by means of toothed wheels 47.

The machine described operates in the following manner: When the punching tube moves downward, an unpierced part of the blank strip is at rest under it, so that the punching tube, on continued downward movement, punches out of the strip a circular capsule blank. When the punching tube begins to move upward, the piston 20 continues to move downward, thereby driving the capsule blank just punched-out down into one of the female dies 24, which at the time is in a position straight under the punching device and with which the lower end of the piston coöperates as a male die, forming the capsule blank into a smooth capsule. When the male die begins to move downward in the female die, the corresponding bottom-piece 26 is at the top of the female die being held there by the action of the springs 28 on the rod 27, and is subsequently pressed downward into the female die. The bottom piece of the other female die which is turned downwardly is therefore likewise moved downward, driving the previously formed capsule in the female die downward on a bottle head which by the support 5 is held in position in the closing device. Immediately thereafter one pair of the projections or ridges 33 on the female die cylinder 23 hits the rollers 34 on the compressor 32, which is therefore driven downward and compresses the rubber ring 29, by which parts of the capsule wall surrounding the bottle head are driven into the groove or grooves in the bottle head. When the piston 20 has thereupon moved upward, so that it, as well as the punching tube 11, is entirely above the blank strip, which has been at rest during the operations just stated, the strip is fed forward by the rollers 35 a required distance, and the above operations are repeated.

Machines constructed in accordance with this invention, which machines can obviously also be used for affixing capsules on such bottles as are previously closed by means of corks or the like, are distinguished particularly for their great working capacity.

Obviously capsuling machines arranged in accordance with this invention can be constructed in another way than that given by way of example, while retaining the characteristic features of the invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine for forming and applying capsules, the combination of a movable member having female die portions therein, mechanism for feeding a strip across said die portions, a punch for cutting capsule blanks from said strip, and means adapted to simultaneously form a capsule in one of said die portions and to coöperate in expelling a formed capsule from another of said die portions.

2. In a machine for forming and applying capsules, the combination of a rotatable member having depressions constituting female die portions, mechanism for feeding a strip across said depressions, a punch for cutting a capsule blank from said strip in a position over one of said depressions, and means adapted to simultaneously form a capsule in one of said depressions and to cooperate in expelling a formed capsule from a diametrically opposite depression.

3. In a machine for forming and applying capsules, the combination of a rotatably mounted cylinder having peripheral depressions constituting female die portions, mechanism for feeding a strip across the depressions in said cylinder, a reciprocable punching tool adapted to cut capsule blanks from said strip over the depressions in said cylinder, and reciprocable means adapted to simultaneously form a capsule in one of said depressions and to coöperate in expelling a formed capsule from a diametrically opposite depression.

4. In a machine for forming and applying capsules, the combination of a rotatably mounted cylinder having peripheral depressions constituting female die portions, of a punching tool alined with the depressions in said cylinder, means for feeding a strip between said punching tool and said cylinder across the depressions therein, and a plunger operable within said punching tool to simultaneously form a capsule in one of said depressions and to coöperate in expelling a formed capsule from another of said depressions.

5. In a machine for forming and applying capsules, the combination of a rotatably mounted cylinder having peripheral depressions constituting female die portions, a punching tool alined with the depressions in said cylinder, means for feeding a strip between said punching tool and said cylinder across the depressions therein, a plunger operable within said punching tool to simultaneously form a capsule in one of said depressions and to coöperate in expelling a formed capsule from another of said depressions, and means for successively depressing said punching tool and said plunger toward said cylinder.

6. In a machine for forming and applying capsules, the combination of a movable member having depressions constituting female die portions, of capsule supports reciprocable transversely in the die portions in said movable member, mechanism for feeding a strip across said depressions, a punch for cutting capsule blanks from said

strip over said depressions, and means adapted to simultaneously form a capsule against the capsule support in one of said depressions and to move another of said capsule supports to expel a formed capsule from the die portion in which said last named support is contained.

7. In a machine for forming and applying capsules, the combination of a rotatably mounted cylinder having peripheral depressions constituting female die portions, interconnected capsule supports movable in said depressions, mechanism for feeding a strip across the depressions in said cylinder, a reciprocable punching tool adapted to cut capsule blanks from said strip over said depressions, and a plunger adapted to simultaneously form a capsule against one of said supports and to move another of said supports to expel a formed capsule supported thereby.

8. In a machine for forming and applying capsules, the combination of a rotatable cylinder having female die portions formed in its periphery, interconnected capsule supports reciprocable in said female die portions, a punching tool reciprocable in relation to said cylinder in alinement with the female die portions therein, mechanism beyond said punching tool for feeding a strip across said female die portions, a plunger reciprocable within said punching tool, and means for successively depressing said punching tool and said plunger whereby the latter operates simultaneously to form a capsule in one of said female die members and coöperates in expelling a formed capsule from another of said die members.

9. In a machine for forming and applying capsules, the combination of a rotatably mounted cylinder having peripheral female die portions, a capsule support radially movable in each of said die portions, means rigidly connecting said supports to each other, means for feeding a strip across said die portions, a punching tool adapted to cut capsule blanks from said strip over said female die portions, and a plunger operable against said supports to simultaneously form a capsule in one of said female die portions and to coöperate in expelling a formed capsule from another of said die portions.

10. In a machine for forming and applying capsules, the combination of a movable member having female die portions therein, means for feeding a strip across said die portions, means for punching capsule blanks from said strip over said die portions, means for forming capsules in said die portions, elastic means for applying said capsules to a receptacle, and means on said movable member for compressing said elastic means.

11. In a machine for forming and applying capsules, the combination of a cylinder having female die portions therein, means for feeding a strip across said die portions, means for punching capsule blanks from said strip over said die portions, means for forming capsules in said die portions, elastic means for applying said capsules to a receptacle, and projections on the periphery of said cylinder coöperating with a portion of said elastic means to compress said elastic means.

12. In a machine for forming and applying capsules, the combination of an intermittently rotating cylinder having peripheral female die portions therein, means for feeding a strip across said die portions, means for punching capsule blanks from said strip over said die portions, means for forming capsules in said die portions, an elastic ring alined with the die portions in said cylinder, a compressor interposed between said cylinder and said ring, and projections on said cylinder adapted to engage said compressor and to compress said elastic ring.

In witness whereof I have hereunto set my hand in presence of two witnesses.

ANDERS ANDERSSON ROSENGREN.

Witnesses:
E. HEDENSKOG,
A. LARSON.