Feb. 13, 1923. 1,445,296

R. G. CLARK

HOPPER FOR CAPPING MACHINES

Filed June 2, 1920 3 sheets-sheet 1

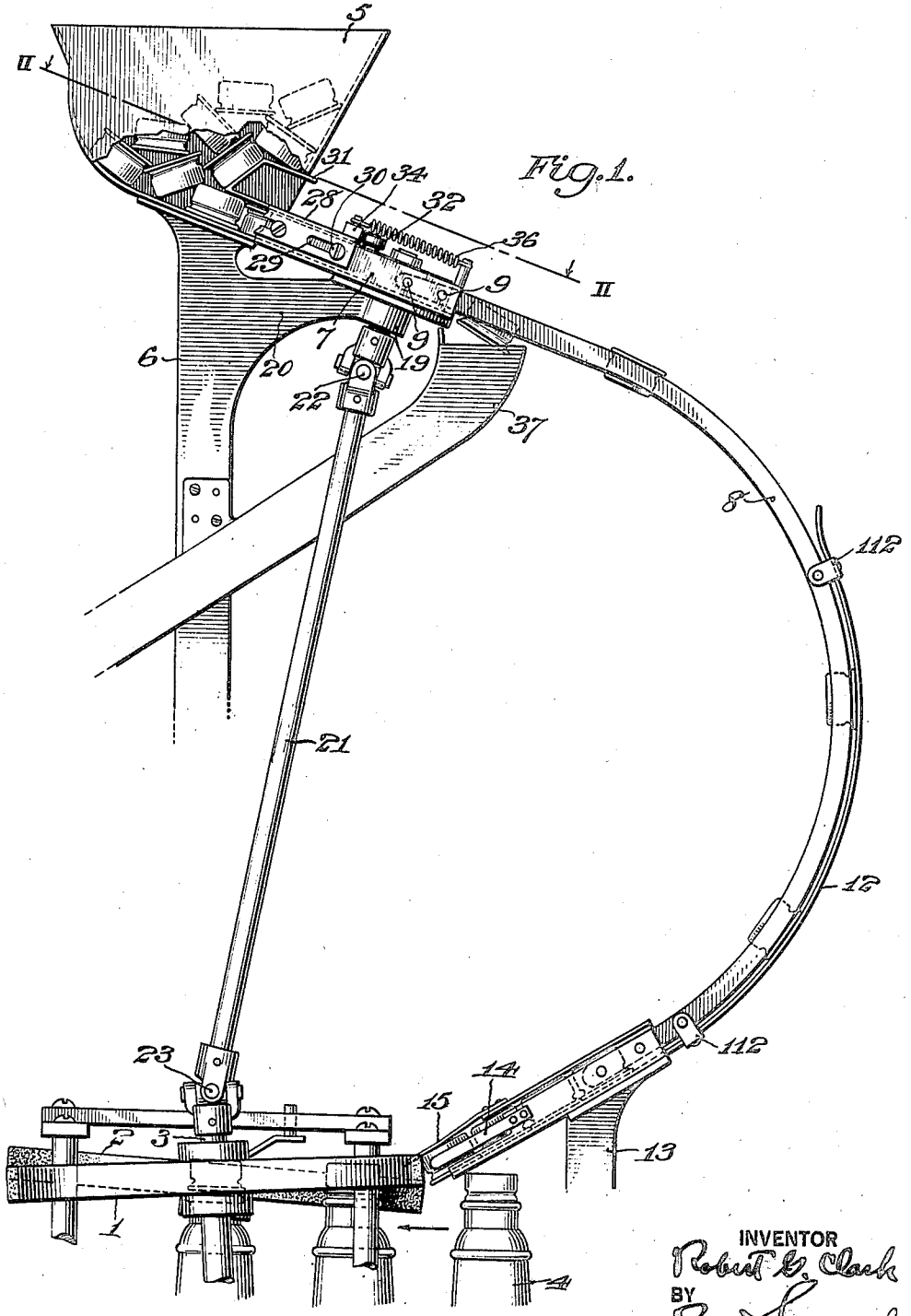


Fig. 1.

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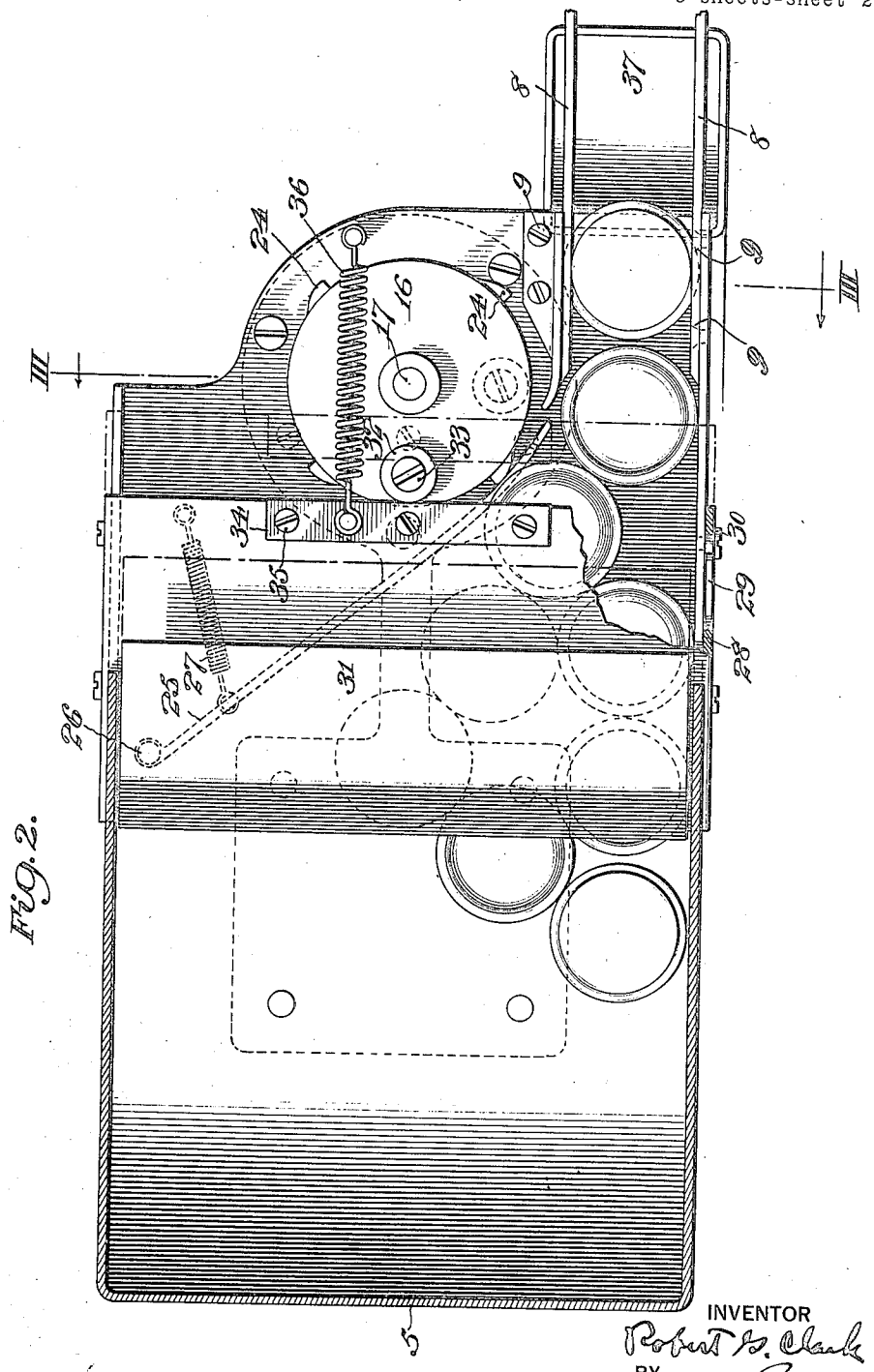


Fig. 2.

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Fig.3.

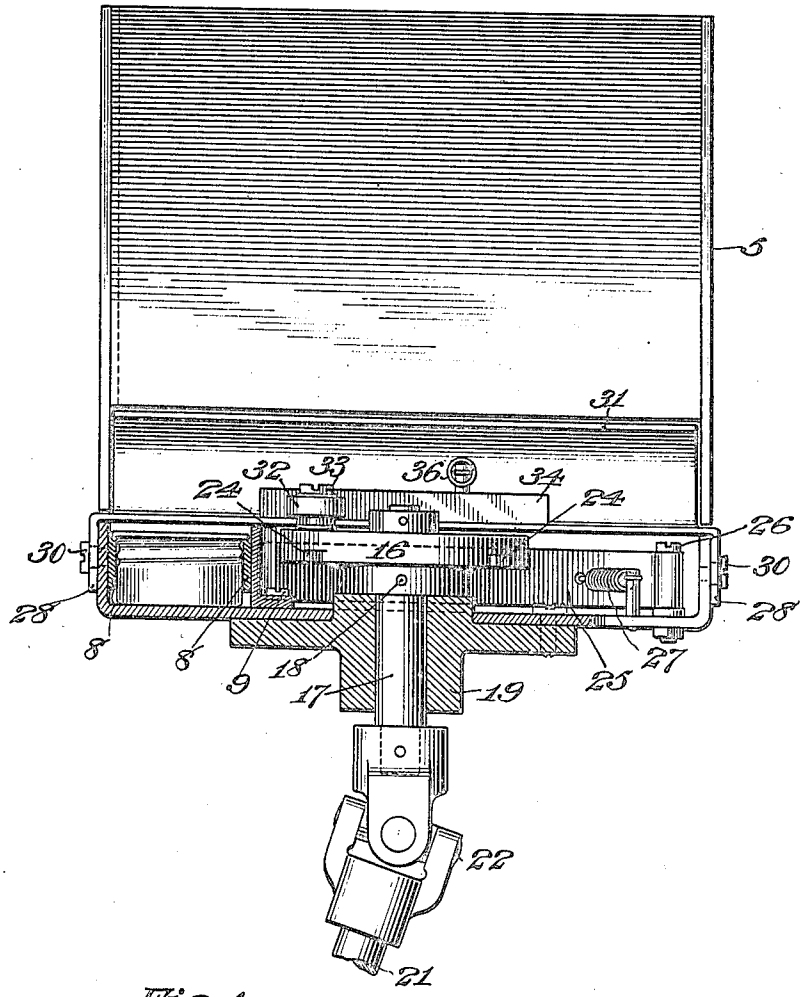


Fig.4.

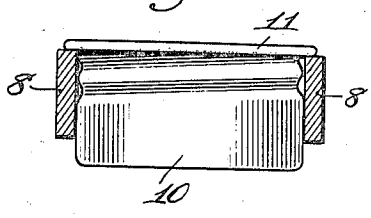
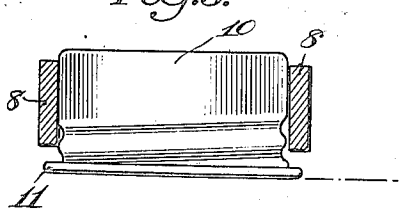


Fig.5.



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Patented Feb. 13, 1923. 1,445,296

UNITED STATES PATENT OFFICE.

ROBERT G. CLARK, OF BROOKLYN, NEW YORK, ASSIGNOR TO PARAGON CAN & CAP COMPANY, INC., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

HOPPER FOR CAPPING MACHINES.

Application filed June 2, 1920. Serial No. 386,103.

To all whom it may concern:

Be it known that I, ROBERT G. CLARK, a citizen of the United States, and resident of the borough of Brooklyn, in the city and State of New York, have invented a new and useful Improvement in Hoppers for Capping Machines, of which the following is a specification.

This invention relates to a hopper for bottle capping machines, which hopper feeds the caps into position on the bottles for the operation of the capping machine, and is particularly designed for use in connection with the machine shown in my co-pending application, Serial No. 373,922, filed April 14, 1920.

An object is to provide such an apparatus which is adapted to receive caps deposited in the hopper indiscriminately and in bulk, which apparatus includes mechanism for agitating and arranging the caps so that they will pass into the chute from the hopper in a predetermined position.

Another object consists in providing such an apparatus which is arranged to cause caps that are fed into the chute in other than the desired position, to escape from the chute without being fed to the bottles.

Another object consists in providing certain improvements in the form, construction and arrangement of the several parts whereby the above named and other objects may be effectively attained.

A practical embodiment of my invention is represented in the accompanying drawings, in which:

Fig. 1 represents a side elevation of the apparatus partly in section.

Fig. 2 represents an enlarged detail section taken in the plane of the line II—II of Fig. 1, looking in the direction of the arrows.

Fig. 3 represents a detail vertical section, on the same scale as Fig. 2, taken in the plane of the line III—III of Fig. 2, looking in the direction of the arrows.

Fig. 4 represents a detail view, on a still larger scale, showing a cap in the proper position in the chute.

Fig. 5 represents a similar view showing a cap in the wrong position in the chute.

The apparatus is designed to be secured to and operated from a capping machine, such as that shown in my application already mentioned and it is thus represented in Fig. 1, in which the discs for screwing the caps on the bottles are denoted by 1, 2, and the shaft for driving the disc 1 is indicated by 3. The bottles 4 are fed in a path as indicated by the arrow, so that they pass under the discharge end of the chute of the hopper to receive the caps, and thence between the discs 1, 2, to have the caps screwed thereon.

The parts just mentioned are fully set forth in my said application, and as they constitute no part of this particular invention, they will not be further described.

The hopper proper is represented by 5 and is supported on a suitable bracket 6 that may be connected to the capping machine or any other convenient support. The hopper is of somewhat conventional form in that it has its side walls inwardly inclined, and it is mounted at an angle on the bracket 6 so that caps deposited therein will tend to move, under the force of gravity, toward one side of the bottom thereof. At this side of the bottom, the hopper has an extension 7 fitted to receive one end of a chute 8, said end of the chute being secured to the extension in any desired manner, as by screws 9. This chute is composed of a pair of rails which are similar in size and shape, and which are spaced apart a sufficient distance to receive with a free sliding fit the bodies of caps intended to be fed through the chute. The chute is curved in form, as clearly shown in Fig. 1 and extends through about a semi-circle, with the result that the caps are inverted as they traverse from one end of the chute to the other.

The caps which are designed to be fed by this apparatus are represented by 10, and it will be seen that their edges are rolled or wired into a laterally extending flange 11, which is of greater diameter than the body of its cap. This flange is utilized to support the cap as it travels along the rails of the chute, as is clearly shown in Fig. 4; and it is in this position that the caps are intended to be fed from the hopper 5 into the chute 8. As this is an inverted position of the cap, the chute is made of the curved formation just described so that the cap will be right side up at the time it is discharged from the chute onto the bottle. As a result of the structure of cap and chute just described, it will be seen that, except for the flange 11, there would be nothing

to hold the cap in the chute and, therefore, a shield 12 is secured to the chute 8 along its outer face which shield extends throughout substantially the lower half of the chute. This shield is attached to the chute by means of clips 112 and it serves to prevent the caps from falling out of the chute as they move from their inverted position toward and into right side up position for application to the bottles.

The lower end of the chute is supported on a standard 13 which uprises from the capping machine or any other suitable support; and the said end of the chute is provided with a pair of side spring members 14 and a top spring member 15 for yieldingly holding each cap as it is about to be taken from the chute by an oncoming bottle, the spring 15 also serving to press the cap down onto the bottle as the cap is withdrawn from the chute. The construction and operation of the spring members is fully set forth in my above named application and, therefore, will not be further described.

As will be understood from the foregoing, it is essential for the proper operation of this apparatus that the caps be fed from the hopper 5 to the chute 8 in up side down position, in order that the flange 11 of each cap may rest upon the top of the rails which constitute the chute and thereby support the cap as it travels along in the chute. Mechanism is provided for arranging the caps in this position and in succession in the hopper so that they will slide down through the extension 7, under the influence of gravity, into the chute in the desired position. This mechanism will now be described.

A rotary agitator which takes the form of a disc 16 is secured to a spindle 17 by means of a pin 18 which passes through the hub of the said agitator. The spindle 17 is journaled in a bearing 19 that is formed on the end of a projection 20 extending laterally from the bracket 6. A shaft 21 is connected by universal joints 22 and 23 to the spindle 17 and the shaft 3 of the capping machine respectively so that, as the capping machine is operated, the shaft 21 and hence the agitator 16 will be rotated. This agitator has a series of lugs 24 arranged on its periphery that are intended to engage an arm 25 which is pivoted at 26 on the bottom of the hopper 5. A rectractile coil spring 27 serves to yieldingly draw the arm 25 toward the agitator 16, so that the combined action of the lugs 24 and spring 27 is to oscillate the arm 25 on its pivot 26 as the agitator 16 is rotated. This movement of the arm 25 will intermittently shove the caps with which it comes in contact toward the side of the hopper from which the extension 7 projects and will also impart a general agitation to the mass of caps in the hopper.

In addition to the agitating device just described, there is a slide 28 which is substantially U shaped in cross section and fits over the top and sides of the extension 7. This slide has its depending sides provided with slots 29 fitted to receive screws 30 that are set into the sides of the extension 7, whereby the slide 28 may be reciprocated on the said extension. This slide enters an opening which is formed in the hopper 5 immediately above the extension 7 and has its inner end bent upwardly at a receding angle and then backwardly substantially parallel with the body of the slide as indicated at 31, to form a nose for contact with the caps 10, in order to push them and tumble them backwardly in the hopper 5, and thus automatically urge them into position for sliding movement into the extension 7. It will be noted that the nose 31 of the slide 28 extends the full width of the hopper 5 so that it will act opon a large number of the caps, and that its lowermost part is spaced a distance above the bottom of the hopper 5 which is slightly greater than the height of a cap. Hence this nose 31 will act upon and move any cap which is substantially above the bottom of the hopper or which, though resting on the bottom of the hopper, is not resting thereon in a flat position, that is, either on its top or bottom. A contact roller 32 is mounted on a screw 33 which is on top of the agitator 16, which roller is intended to contact with a cross piece 34 that is secured by screws 35 on the top of and at the outer edge of the slide 28. A retractile coil spring 36 yieldingly draws the slide 28 toward the roller 32 and thus serves to keep it in contact with the roller as the latter travels around during the rotation of the agitator 16, thus imparting a reciprocating motion to the slide 28 and causing its nose 31 to intermittently impinge against and disturb the caps in the hopper 5 other than those which are lying flat on the bottom of the hopper.

The combined action of the agitating devices results in arranging the caps continually in flat position on the bottom of the hopper so that they slide successively into the extension 7 and thence into the chute 8; and it will be noted in this connection that the position of the arm 25 when taken in connection with the side of the hopper from which the extension 7 projects, imparts to that portion of the hopper a sort of funnel shape so as to guide the caps toward the extension. Those caps which are fed into the chute right side up, that is with their flanges 11 downwardly, have nothing to support them in the chute and, therefore, immediately drop into a conduit 37 and thence into a suitable receptacle (not shown) from which they may be returned to the hopper 5. Those caps which are fed into the chute

up side down ride along into the chute with their flanges 11 resting on the rails thereof and thence pass downwardly between the chute and the shield 12 until they reach the discharge end of the chute and are removed therefrom by the oncoming bottles. As already mentioned, this travel of the caps in the chute inverts them so that they are right side up when taken from the discharge end.

In operation, the caps are dumped into the hopper 5 in bulk, and the capping machine set in operation. The rotation of the shaft 3 of the capping machine serves to actuate the agitating mechanism of the hopper, while the bottles are fed along in their path indicated by the arrow by the feeding apparatus of the capping machine. The combined action of the oscillating arm 25 and the slide 28, 31, under the influence of the agitator 16, serves to sort the caps and arrange them flat on the bottom of the hopper from which they slide successively into the extension 7 and thence into the chute 8. Those caps which are received by the chute in the desired position (upside down) travel along in the chute under the influence of gravity until they reach the discharge end thereof, from which they are taken by the oncoming bottles. Those caps which enter the chute right side up immediately drop into the conduit 37 and are led away to a convenient receptacle from which they may be removed and again placed in the hopper 5. The supply of caps in the hopper may be constantly replenished as the apparatus continues in operation, and it will be clear that when the capping machine comes to rest, the hopper apparatus will also stop.

I desire it to be understood that various changes may be resorted to in the form, construction and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not intend to be limited to the details herein shown and described, except as they may be included in the claims.

What I claim is:

1. Apparatus of the character described comprising, a hopper, a chute leading therefrom, said chute comprising a pair of rails upon which a cap is designed to be supported by its rim in an up side down position, said rails being elevated above the adjacent floor of the hopper so that when a cap enters the chute right side up, its rim will enter below the rails and the cap will escape from the chute.

2. Apparatus of the character described comprising, a hopper, a chute leading therefrom, said chute comprising a pair of rails upon which the cap is designed to be supported by its rim in an up side down position, said rails being elevated above the adjacent floor of the hopper so that when a cap enters the chute right side up, its rim will enter below the rails and the cap will escape from the chute, said chute being curved so as to discharge in a right side up position those caps which it supports in an up side down position.

3. Apparatus of the character described comprising, a hopper, a chute leading therefrom, and means for agitating the caps in the hopper so as to cause them to pass from the hopper to the chute, said agitating means including a rotary element, a swinging element and a reciprocating element, said swinging and reciprocating elements being actuated by the rotary element.

4. Apparatus of the character described comprising, a hopper, a chute leading therefrom, and means for agitating the caps in the hopper so as to cause them to pass from the hopper to the chute, said agitating means including a rotary disk, a slide, and a pivoted arm, said disk being provided on one surface with means engaging the slide and on its periphery with means engaging the arm, whereby the rotation of the disk will reciprocate the slide and oscillate the arm about its pivot.

In testimony, that I claim the foregoing as my invention, I have signed my name this 27th day of May, 1920.

ROBERT G. CLARK.