June 24, 1952 H. F. SUTHERS 2,601,570

FEEDING APPARATUS

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Fig. 1

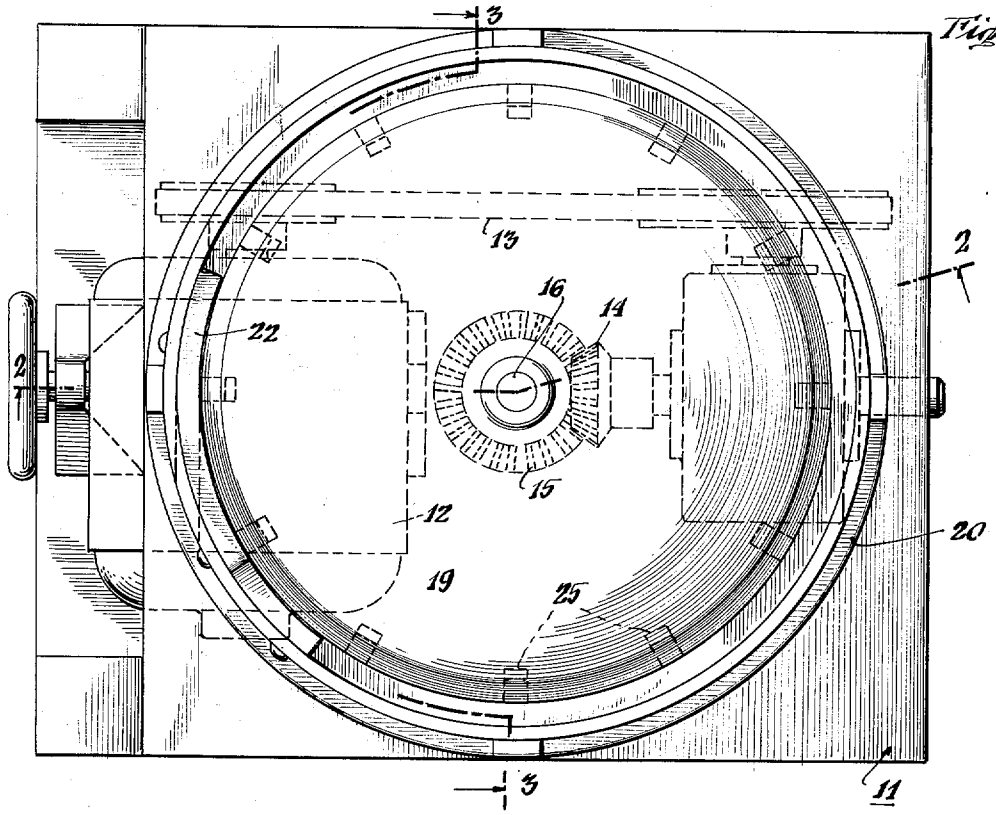
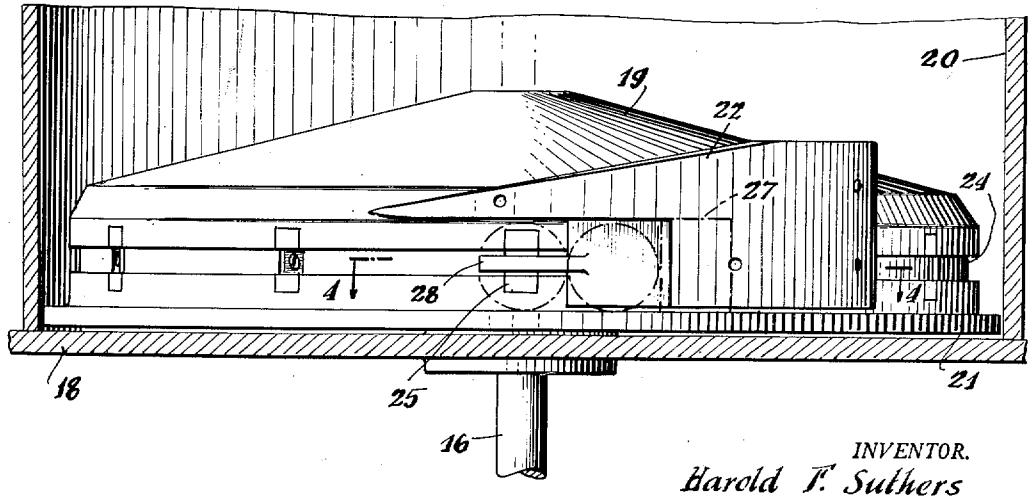


Fig. 3



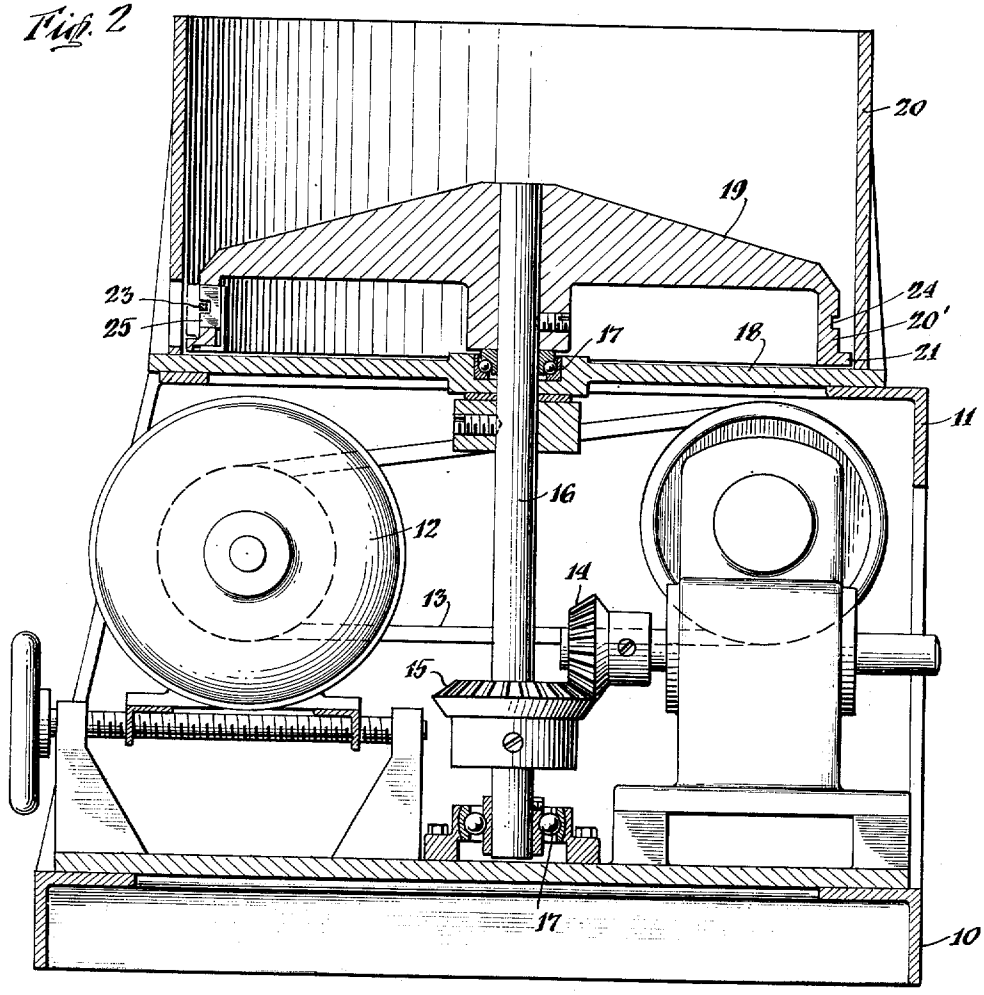
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FEEDING APPARATUS

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Fig. 2



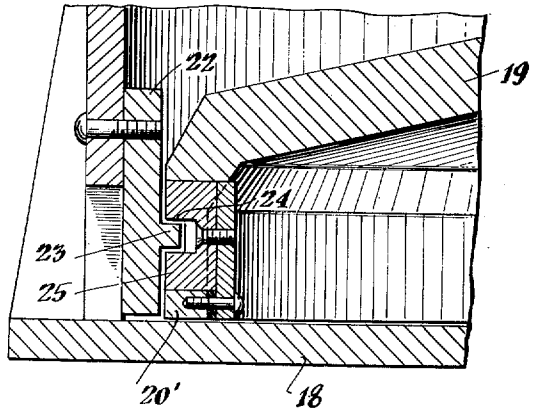


Fig. 8

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FEEDING APPARATUS

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Fig. 4

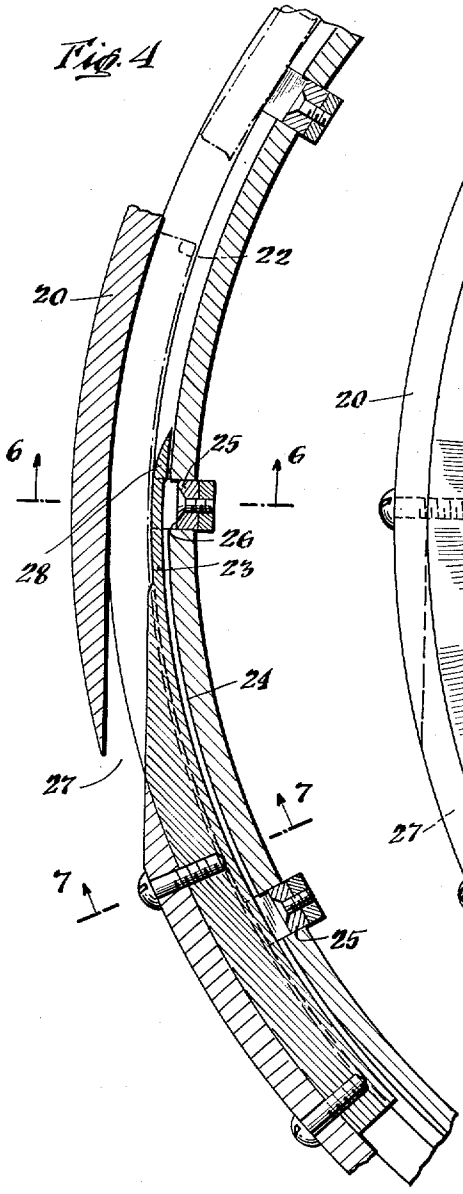


Fig. 5

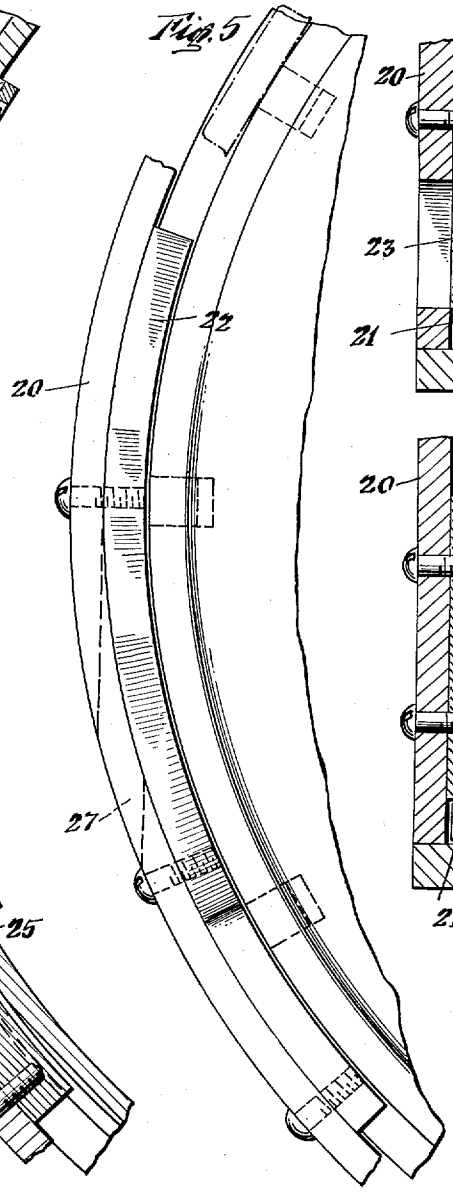
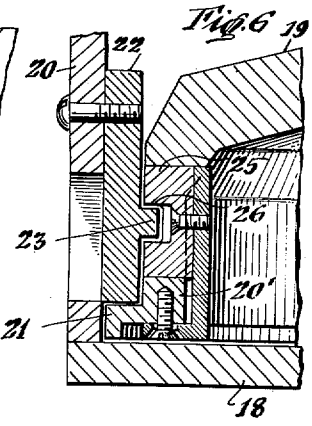


Fig. 6



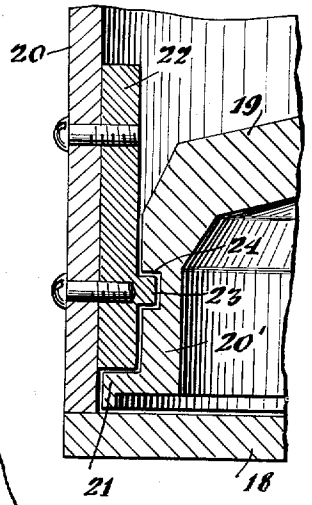


Fig. 7

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Patented June 24, 1952

2,601,570

UNITED STATES PATENT OFFICE

2,601,570

FEEDING APPARATUS

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Application June 25, 1949, Serial No. 101,455

5 Claims. (Cl. 222—9)

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This invention relates to a structurally and functionally improved crown cap feeding apparatus.

It is an object of the invention to positively grip and propel crowns to effectively feed them to an assembly, a spot, counting machine, etc.

Additional objects are those of reducing mutilation of the crowns as they are moved in a single file and that of providing a hopper which is not limited to use in a horizontal position.

A further object is that of achieving the desired results by a relatively simple, inexpensive structure and which will have a long, effective life.

With these and other objects in mind, reference is had to the attached sheets of drawings illustrating practical embodiments of the invention and in which:

Fig. 1 is a plan view of a hopper assembly;

Fig. 2 is a sectional side view along the lines 2—2 and in the direction of the arrows as in Fig. 1;

Fig. 3 is a view taken along the lines 3—3 and in the direction of the arrows as also indicated in Fig. 1;

Fig. 4 is an enlarged fragmentary view of a portion of the apparatus taken along the lines 4—4 and in the direction of the arrows as indicated in Fig. 3;

Fig. 5 is a similar plan view;

Figs. 6 and 7 are transverse sectional views taken along the lines 6—6 and 7—7 respectively and in the direction of the arrows as indicated in Fig. 4; and

Fig. 8 is a view similar to Fig. 6 but showing an alternative form of the structure.

In these views there has generally been shown a hopper assembly. As will be understood, the particular design is one accepted type. As will be apparent from a reading of the following specification, the invention might be embodied in other types of apparatus. Therefore, except where otherwise indicated in the claims the present description and drawings are to be taken in an illustrative rather than a limiting sense.

Thus, referring primarily to Figs. 1 and 2 the numeral 10 indicates a suitable base upon which the supporting structure 11 is disposed. Within the enclosure provided by this structure a motor 12 and drive 13 may be arranged to operate a gear 14 in turn driving a gear 15 and a shaft 16 attached thereto. The latter may be suitably supported in bearings 17 and at its upper end may extend through a plate 18 mounted on the supporting structure 11.

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Secured to the upper end of the shaft 16 is a rotating element 19 of the hopper assembly. Encircling this element is the stationary shell 20. While not shown in the drawings, it will be understood that a hopper structure may be disposed above the element 19 and extend into the shell. This and other parts may, as afore brought out, embody various designs best calculated to produce the desired functional results in an assembly of which they form a part.

As shown to best advantage in Figs. 6 and 7 the edge portion of the rotating element extends downwardly as indicated at 20'. It may terminate in an outwardly extending rim 21. As shown, especially in Fig. 8, the periphery of the rotor or element 19 may be formed so as not to include a rim portion 21. In any event, the shell conveniently mounts an arcuate strip 22 adjacent the surface 20' of the element and this strip may have an inward flange or rib 23 riding within a groove 24 formed in the edge adjacent the rotor surface. Accordingly, except in the zone of the strip, a space for the reception of crowns exists between the element 19 and the adjacent face of the shell 20.

At a number of points spaced around the periphery of flange 20' of element 19, recesses are provided. These recesses receive permanent magnets 25 which extend flush with the outer edge of the rotor or element and are secured in position in any desired and acceptable manner. They may each be slotted as at 26 to accommodate the rib 23.

As shown particularly in Figs. 4 and 5 the shell 20 may be formed with an opening providing a delivery chute or aperture 27. In line with that opening unit 22 is interrupted and a stripper and plow structure 28 is mounted to extend in advance of these openings and into the grooves 24 and 26 of the edge portions and magnets.

In operation it will be appreciated that the crowns are delivered in any suitable manner into the shell 20. With the rotor or element 19 turning at proper speed the crowns will be moved radially. They will pass over the edge of the rotor and then downwardly on to the periphery 20' of that element. They will remain in positions adjacent the magnets until they reach points in advance of the delivery chute 27. At that point the stripper and plow 28 will function to definitely separate them from the peripheral edge 20'. Incident to the momentum of the parts they will further pass sequentially through that chute and be received or, if desired, they will be

transported beyond the same in any acceptable manner.

As a consequence of the foregoing construction it will be appreciated that the crowns are gripped securely and maintained against movement with respect to the rotor. They will be positively propelled to the chute. Therefore a continuous and acceptable feeding operation is achieved by means of a simple and desirable structure.

Also, it will be apparent by this structure that the hopper may be used in a horizontal position or at any desired angle between horizontal and vertical. In this connection, it will be understood that the hopper may be placed at an angle of 45°. Under these circumstances the magnetic force will attract and retain the crowns and the latter may be discharged at an elevated position. For clarity of illustrating the drawings show the apparatus in merely a conventional position but the factor of angular disposition is to be kept in mind when considering these drawings.

Thus, among others, the several objects of the invention as aforenoted are achieved. Obviously numerous changes in construction and rearrangement of the parts might be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. An apparatus of the character described including in combination a rotatable element presenting a peripheral edge portion formed with recesses, magnets mounted within said recesses, said peripheral portion and the magnets mounted thereon being disposed with aligned uninterrupted grooves, and a stripper disposed adjacent said element and extending into said grooves.

2. An apparatus of the character described including in combination a rotatable element presenting a peripheral edge portion formed with recesses, magnets mounted within said recesses, said peripheral portion and the magnets mounted thereon being disposed with aligned grooves, a stripper extending into said grooves, a shell encircling said element and formed with an opening through which crowns are to be delivered, and means for securing said stripper to said shell to extend forwardly of said opening.

3. A feeding apparatus for bottle caps comprising in combination a rotating element, a shell encircling said element and spaced beyond the periphery thereof a distance in excess of the height of the caps to be fed, magnets carried by said element and extending adjacent its periphery whereby caps will move over the upper surface of the element and be magnetically secured to its periphery to rotate therewith in the space intervening such periphery and the inner face of the shell, said shell presenting an opening, the periphery of said element being formed with an uninterrupted groove, and a stripper secured to said shell to extend into said groove and detach caps from the element and divert them through said opening.

4. A feeding apparatus for bottle caps comprising in combination a rotating element, a shell encircling said element and spaced beyond the periphery thereof a distance in excess of the height of the caps to be fed, magnets carried by said element and extending adjacent its periphery whereby caps will move over the upper surface of the element and be magnetically secured to its periphery to rotate therewith in the space intervening such periphery and the inner face of the shell, said shell presenting an opening, the ends of said magnets being grooved and the periphery of said element being also formed with a groove continuous with said magnet grooves, and a stripper secured to said shell and extending into said groove to detach caps from the periphery of said element and divert them through said opening.

5. A feeding apparatus for bottle caps comprising in combination a rotatable element, a shell enclosing said element and formed with an opening, a rim extending outwardly from said element and disposed adjacent the lower edge of said opening, said rim serving as a support for caps intervening the periphery of said element and the inner face of said shell, magnets carried by said element adjacent the periphery of the same, and cap stripping means carried by said shell at a point adjacent its opening and extending in proximity to the periphery of said element.

HAROLD F. SUTHERS.

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