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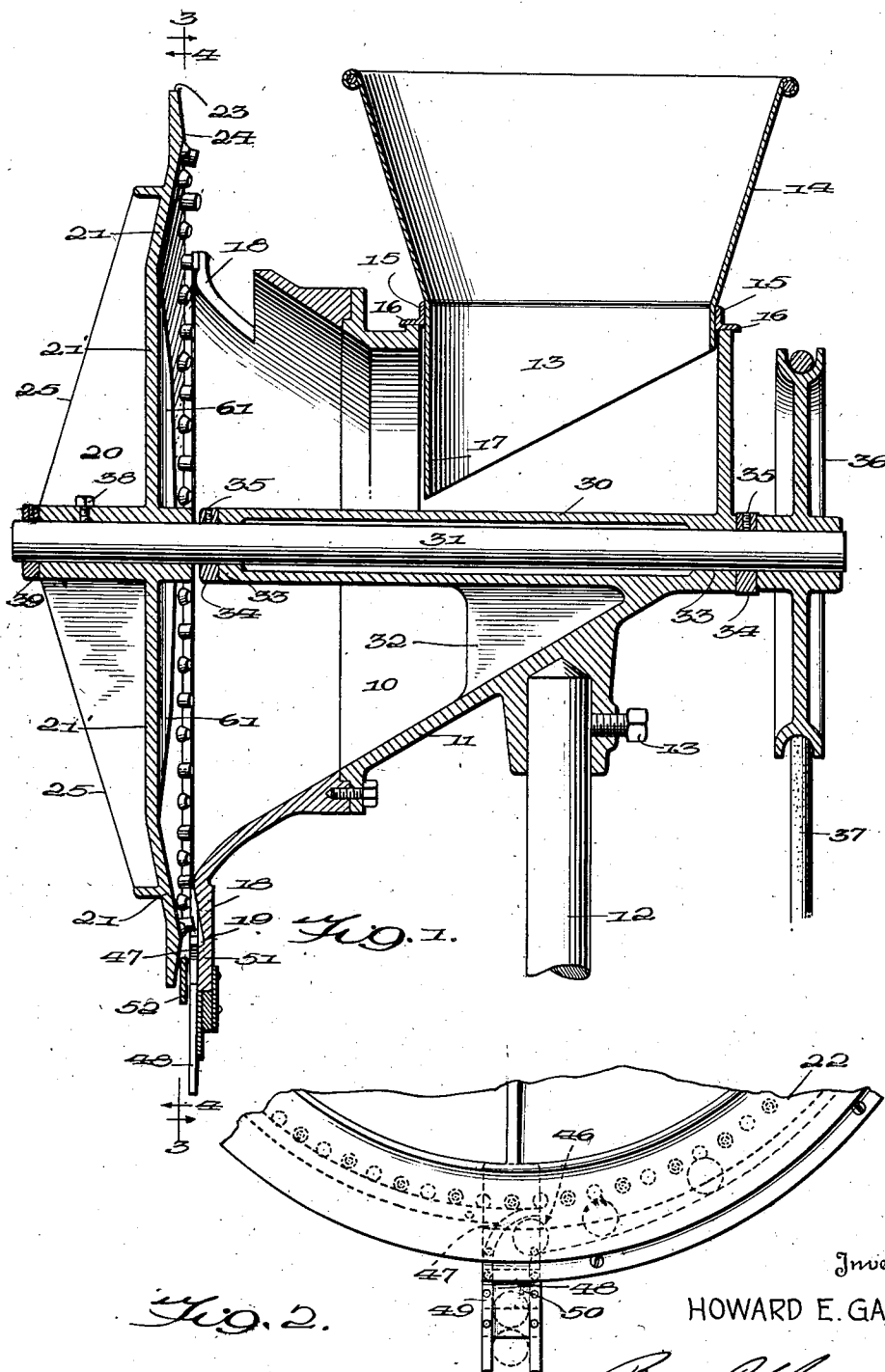
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CONTAINER COVER SELECTING AND FEEDING MECHANISM

Filed May 17, 1935

3 Sheets-Sheet 1



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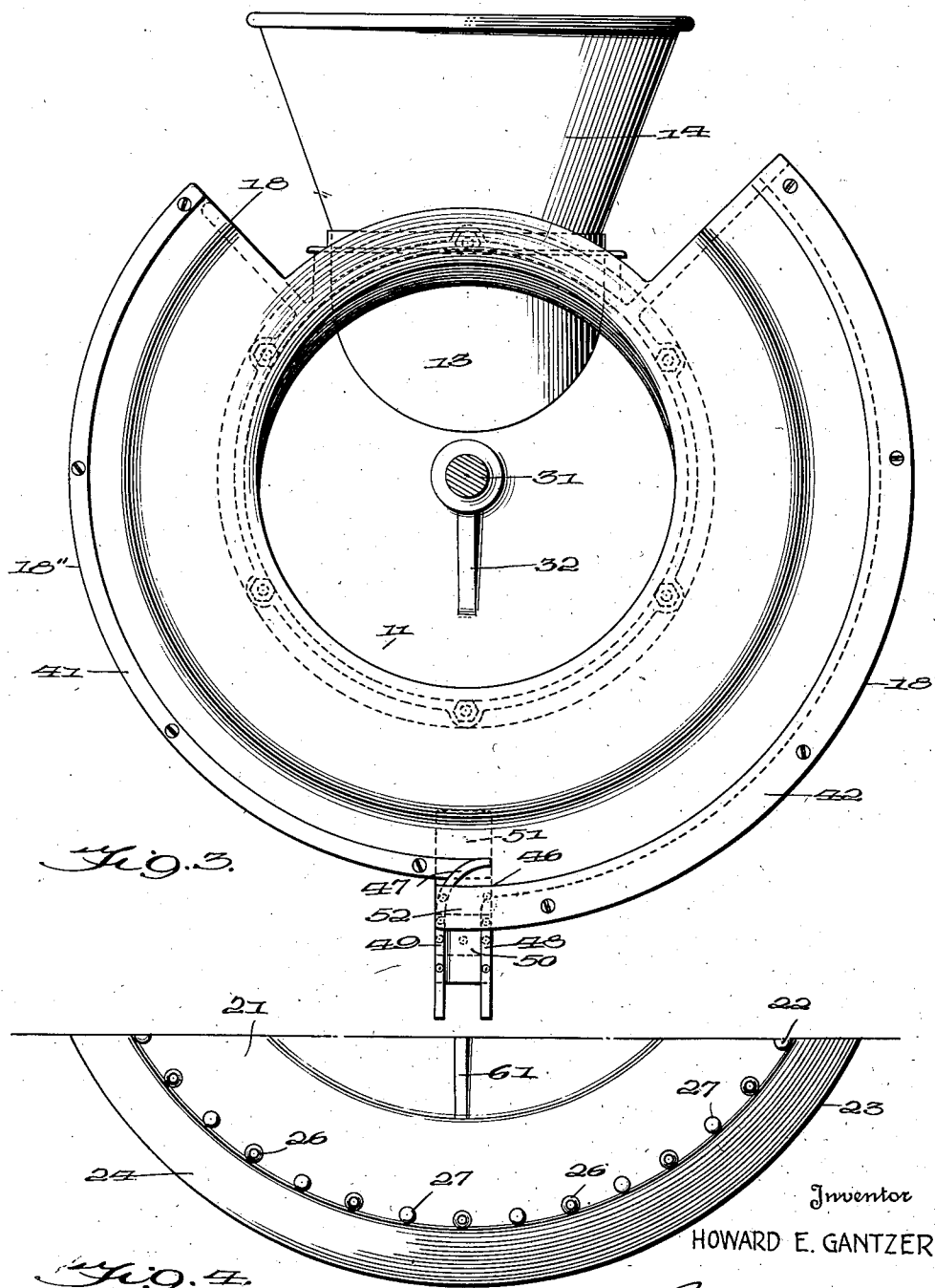
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CONTAINER COVER SELECTING AND FEEDING MECHANISM

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3 Sheets-Sheet 2



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CONTAINER COVER SELECTING AND FEEDING MECHANISM

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3 Sheets-Sheet 3

Fig. 5.

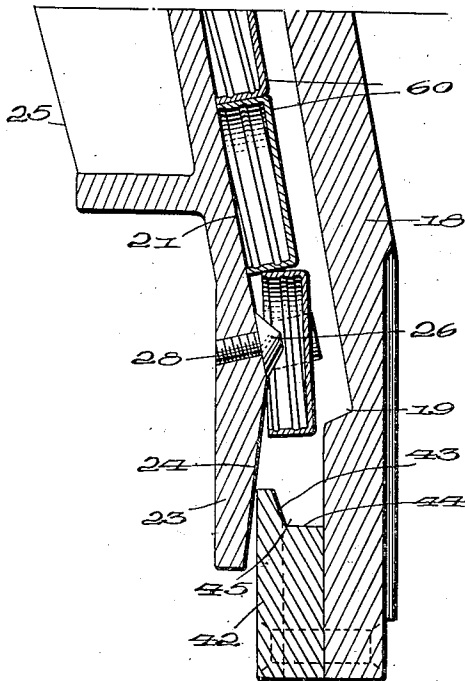


Fig. 6.

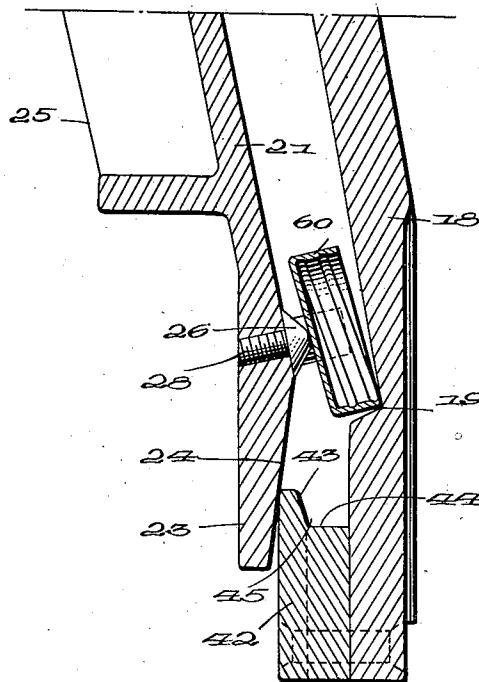
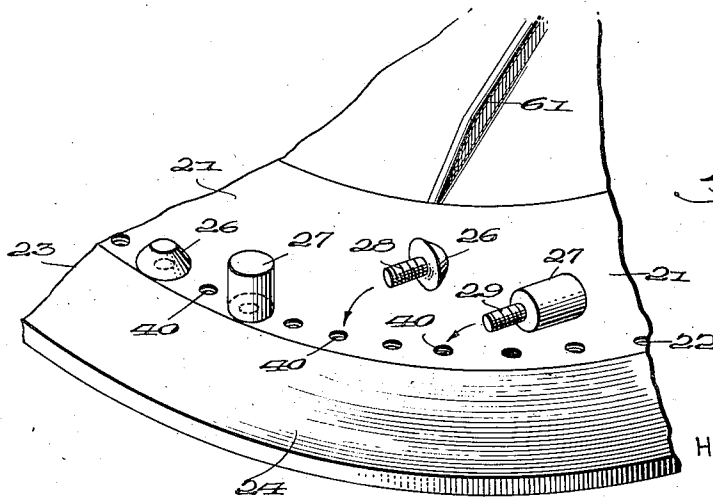


Fig. 7.

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2,073,472

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ING MECHANISMHoward E. Gantzer, Kenmore, N. Y., assignor to
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tion, Buffalo, N. Y., a corporation of New York

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7 Claims. (Cl. 226—88.1)

This invention relates to improvements in container cover selecting and feeding mechanism and more particularly to a machine for sorting and aligning cup-shaped articles, such as crown caps forming covers for containers such as bottles or cans prior to carrying on further operations on the covers or securing them to the containers which are to be covered, and is an improvement upon the invention set forth in Let-
ters Patent No. 1,716,620 issued June 11, 1929 to Lester A. Cherry.

One of the objects of this invention is to provide an improved machine of this character adapted to receive a quantity of cup-shaped articles in bulk and reliably sort and discharge them in an aligned and uniform positional arrangement so that each article is presented with its open or concave side in the same direction.

Another object of this invention is to provide an improved cover sorting machine which is adapted to sort and arrange cup-shaped articles of varying sizes and dimensions and which may be further adapted simply and expeditiously to accommodate a still larger variety of sizes by re-arranging certain of the machine parts.

Another object of this improved machine is the provision of a sorting element having removably mounted spacing studs and selecting pins.

A further object of this invention is to provide such an improved machine which may be operated at a high rate of speed and which will rapidly arrange and feed container covers without clogging or interruption due to deformed covers and which also will minimize abrasion of the caps.

A still further object is the provision of an improved container cover sorting machine which is of simple construction and has few parts so that the construction and maintenance cost may be low and which machine may be relied upon to operate faithfully without the continued attention of an operator.

In the accompanying drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a sectional view of a container cover selecting and feeding mechanism embodying the invention;

Fig. 2 is a fragmentary front elevation of Fig. 1;

Fig. 3 is a sectional view on line 3—3 of Fig. 1;

Fig. 4 is a fragmentary sectional view on line 4—4 of Fig. 1;

Figs. 5 and 6 are fragmentary sections showing

the position of covers in relation to the sorting projections; and

Fig. 7 is a fragmentary perspective view of the sorting wheel.

Referring to the drawings in more detail, reference character 10 designates a suitable magazine or hopper having a circular front opening or outlet through which the supply of caps or covers contained in the hopper are fed into the concave side of the sorting wheel 20. In order to facilitate the feeding of covers the bottom 11 of the hopper is inclined downwardly toward the sorting wheel so the covers are propelled by gravity in this direction. Any suitable means may be employed for mounting the hopper and sorting wheel assembly such as a standard 12 upon which the hopper is adapted to be secured by a set screw 13 or other clamping means.

The hopper is supplied with covers which are to be sorted through an opening on its upper side which is adapted to receive the throat 13 of a filling spout 14. The filling spout is removably held in place by an annular rim 15 arranged around the upper end of the throat and having an outwardly extending flange 16 adapted to engage the top of the hopper. The portion 17 of the throat 13 located next to the sorting wheel extends into the hopper to form an apron which prevents the accumulation of an excessive quantity of covers in the part of the hopper adjacent the sorting wheel and consequent interference with the free operation of the sorting wheel, but permits a large supply to be stored in the rear part of the hopper and to be gradually fed forwardly as the quantity adjacent the sorting wheel is diminished.

The hopper has a semi-circular flange member 18 partially circumscribing the front opening and containing groove 19 which is formed in angular relation with the surface of the flange as is clearly shown in Figs. 1, 5 and 6. The flange member 18 is formed with a symmetrical portion of the periphery 18' further from the axis of the sorting wheel than the remaining portion 18'' which will afford an offset 46 in the point of meeting of the two portions preferably located at the lowermost point of the periphery for the purpose described below. The flange member is adapted to cooperate with the peripheral portion of the sorting wheel 20 to form a passage or channel which will serve as an egress for the covers from the interior of the hopper.

The sorting wheel 20 has a rearwardly flaring portion 21 of substantially conical shape ex-

tending at angular relation with the central portion 21' of the wheel giving the wheel a dished or bell form into the concave side of which the covers to be sorted are fed. The degree of shape of the conical flaring section 21 with respect to the plane of the central portion 21' of the wheel may be varied in order to compensate for friction of different size covers and provide for their unrestricted passage to the periphery of the flaring section. A row 22 of projections consisting of alternate selecting pins and spacing studs is arranged on the periphery of the flaring section with their axes substantially perpendicular thereto. The sorting wheel has a rim 23 with an inside surface 24 in acute angular relation with the plane of the flared section as is clearly shown in Figs. 1, 5, 6. Triangular reinforcing webs 25 are preferably provided on the front side of the sorting wheel which extend radially outward and afford added strength and rigidity.

It is further contemplated that in machines designed to operate with some particular types of covers it may be desirable to place spaced radial webs 61 within the flared portion of the sorting wheel in order to agitate or stir the covers in the hopper.

The sorting wheel is mounted to rotate in spaced relationship to the hopper flange 18 and it is desirable to mount the sorting wheel so that the spacing may be varied to adapt the machine to covers having flanges of different lengths. A convenient manner of mounting the sorting wheel is illustrated in the drawings wherein a longitudinal housing 30 is positioned within the hopper and adapted to support a driving shaft 31 by which motion is imparted to the sorting wheel. As shown in Fig. 1 the housing may be made integral with the hopper and suitably reinforced by a vertical web 32 extending to the inclined bottom 11 thereof. The driving shaft may be journaled in this housing in any suitable manner as by providing bearings 33 and is held against longitudinal displacement by two retaining collars 34 secured by set screws 35 on opposite ends of the housing 30. Power may be transmitted to the shaft in any well known manner as by keying a pulley 36 on the end of the shaft opposite the sorting wheel which is adapted to receive a driving belt 37 driven from any suitable source of power. Adjustment of the width of the passageway formed between the sorting wheel and flange 18 may readily be obtained within certain limits by securing the sorting wheel to the forward part of the shaft by the use of a set screw 38 and collar 39 or other securing means so that the wheel may be afforded longitudinal movement and the width of the passage between the sorting wheel and hopper flange may thus be adjusted for covers with flanges of varying lengths.

When the sorting wheel is in place the row of projections 22 comprising the alternate selecting pins 26 and spacing studs 27 located on the periphery of the flared section 21 is located adjacent the flange groove 19 and serves as an impediment in the passageway formed between the sorting wheel 20 and the hopper flange 18 described above.

The selecting pins 26 consist of studs having shank sections 28 by means of which they are secured to the sorting wheel. As illustrated in Fig. 7 the projections 26 preferably have frusto-conical heads, it being thought preferable not to

have the sharp points of completely conical heads which would tend to abrade the surfaces of the caps.

The spacing studs 27 are preferably cylindrical in form and have shanks 29 which serve as a means of securing them in place on the sorting wheel. These studs will preferably project a greater distance from the surface of the flared section 21 than the selecting pins although for operation with certain type covers they may be made the same height or shorter than the selecting pins. The shanks 28 and 29 may be threaded to removably engage threads tapped in the holes 40 which are spaced on the periphery of the flared section 21, or the selecting pins and spacing studs may be attached in any other well known manner such as by extending the threaded shanks through holes in the sorting wheel and securing them with nuts. In some instances it may be desirable to secure the studs and pins by riveting, brazing or other known methods. The spacing studs 27 are positioned a distance apart to assure that the covers will make positive contact with the interpositioned selecting pins 26 during their passage between the spacing studs.

In order that the sorting wheel may be readily adjusted to accommodate a wider range of cover sizes than is possible to sort with a single arrangement of the spacing studs and selecting pins, it is contemplated that the sorting wheel 20 may contain a number of holes exceeding the number of studs and pins used. By rearranging the selecting pins and spacing studs in the holes, the machine may be quickly adjusted to accommodate a wide variety of cover sizes and shapes without the necessity of machining operations or the substitution of parts.

An arcuate retaining member 41 is secured along the portion of the periphery on the front of the hopper flange 18' which is symmetrical with the axis of the sorting wheel and a grooved member 42 is secured along the symmetrical portion 18' of the hopper flange. The grooved member 42 consists of an arcuate strip having a groove formed by the beveled surface 43 and the surface 44 and when the member 42 is secured adjacent the hopper flange 18 it forms therewith a retaining channel 45 for the container covers. Member 42 may be secured in any known manner such as by screws shown in Figs. 5 and 6.

A preferred means of discharging the sorted covers to a capping machine or a machine to perform some further operation upon them comprises terminating the retaining member 41 at its lowest point at the top of the offset 46 and bevelling it to fit an arcuate deflecting member 47 which is secured adjacent thereto. The groove member 42 terminates at the lowest portion of the off-set 46 and a guide-rail 48 is secured to extend therefrom in a direction substantially perpendicular to the tangent of the groove 19. Located substantially parallel with the guide-rail 48 and spaced to accommodate the covers, is another guide-rail 49 which connects with the deflecting member 47 to form a passageway 50 for the container covers in order that they may be discharged from the lowest portion of the retaining channel 45. The arcuate guide member 47 and guide-rails 48 and 49 may be secured in place in any conventional manner. A convenient way of doing this is to secure them to a bossing or other reinforcement of the hopper flange 18 as is indicated by the reference numeral 51 in Fig. 1. The reinforcing member extends beneath the discharge

passageway 50 and serves as a bottom member therefor. Ungrooved portion 52 of member 42 extends across the top of the guide-rails 48 and 49 substantially tangent to the grooved member 42 in order to aid the covers in passage and to strengthen the structure.

The operation of the machine is as follows:

The caps 60 are introduced into the hopper through the filling opening and are carried down by gravity into the concave portion of the sorting wheel 20 which is rotated by the drive shaft in a counterclockwise direction. Upon falling into the sorting wheel the covers are engaged by the sorting pins and spacing studs. Since the studs are spaced to allow the covers to pass therebetween and over the interpositioned sorting pins, the pins may either pass within the concave portion of each of the covers, as is shown in detail in Fig. 5 or if the covers are presented in the opposite way their tops will make contact with the sorting pins and the covers will be angularly elevated so that the groove 19 in the hopper flange 18 will serve as a stop or lodge for the cover, as is shown in Fig. 6. Thus only those covers presenting their concave sides to the sorting projections will pass through the passageway between the hopper flange 18 and the sorting wheel.

The flared section 21 of the sorting wheel enables a plurality of covers to be positioned ready to pass between the spacing studs as is shown in Fig. 5 and due to the absence of obstructions on the flared section the covers will be so directed, due to gravity and the rotation of the wheel, as to maintain the space between the spacing studs filled with covers at all times. Thus by using a concave sorting wheel with the spacing studs and selecting pins mounted on the periphery of the flared section, a plurality of covers may be brought into position and passed between a single couple of spacing studs during a revolution of the sorting wheel if they are correctly presented to pass over the selecting pins which results in an increased output.

The covers 60 passing the selecting pins are free to slide downwardly by gravity in the channel 45 until being deflected by deflecting member 47 into the discharge passage 50 as is shown in Fig. 2. Those covers which are presented with their convex surface toward the sorting projections and are trapped by the groove 19, are carried around until they fall by gravity from between the spacing studs back into the hopper. Since the covers have little surface in contact with the spacing studs they will readily fall back into the receptacle, which feature is important when deformed caps are encountered since their expeditious removal prevents clogging and abrasion of other covers.

As disclosed above my invention is adapted to sort and align covers of varying diameters within certain limits without the need of changing the position of the selecting pins and spacing studs, and when it is desired to operate with covers of widely different dimensions the sorting projections and studs may readily be rearranged on the sorting wheel with the expenditure of little time and expense as described above. Furthermore by rendering the sorting wheel longitudinally adjustable on the driving shaft, the machine may be adjusted to operate on covers differing widely in depth and thickness. In addition I have provided smooth and even surfaces which will afford less opportunity for abrasion and deformation of the covers. It will be seen that my invention con-

sists of a machine constructed with parts of simple design which may be each constructed and assembled to form a machine which will faithfully operate with little attention and care.

In accordance with the patent statutes I have now described what I believe to be the best embodiments of the invention, but I do not wish to be understood thereby as limiting myself or the scope of the invention, as many changes may be made without departing from the spirit of the invention; all such I aim to include in the scope of the appended claims.

I claim:

1. A cover sorting and feeding machine comprising the combination of a receptacle adapted to contain covers and having an outlet, an annular flange member having a groove therein located adjacent the outlet of said receptacle, a rotatable sorting wheel substantially closing said outlet, and alternate cylindrical spacing studs and frusto-conical selecting pins mounted adjacent the periphery of said wheel, said flange and sorting wheel forming an annular passage for the covers from the interior of the receptacle, in which passage the spacing studs and selecting pins coact with said groove to prevent the passage of covers presented with their convex faces toward the selecting pins.

2. A cover sorting and feeding machine comprising the combination of a receptacle adapted to contain covers and having an outlet, an annular flange member having a groove therein located adjacent the outlet of said receptacle, a rotatable sorting wheel substantially closing said outlet, and alternate cylindrical spacing studs and frusto-conical selecting pins mounted adjacent the periphery of said wheel, said flange and sorting wheel forming an annular passage for the covers from the interior of the receptacle, in which passage the spacing studs and selecting pins coact with said groove to prevent the passage of covers presented with their convex faces toward the selecting pins, said spacing studs projecting a greater distance from the surface of said wheel than said selecting pins.

3. A cover sorting and feeding machine comprising the combination of a receptacle adapted to contain covers and having an outlet, an annular flange member having a groove therein located adjacent the outlet of said receptacle, a rotatable sorting wheel substantially closing said outlet and having a concave shape formed by a conical flaring section and provided with a plurality of holes near the periphery thereof, and a plurality of alternate cylindrical spacing studs and frusto-conical selecting pins removably mounted in said holes, the number of holes exceeding the total number of spacing studs and selecting pins in order that said studs and pins may be selectively positioned to accommodate various sizes of caps, said flange and sorting wheel forming an annular passage for the covers from the interior of the receptacle, in which passage the spacing studs and selecting pins coact with said groove to prevent the passage of covers presented with their convex faces toward the selecting pins.

4. A cover sorting and feeding machine comprising the combination of a receptacle adapted to contain covers and having an outlet, an annular flange member having a groove therein located adjacent the outlet of said receptacle, a rotatable sorting wheel substantially closing said outlet and having a concave shape formed by a conical flaring section and provided with a plu-

5 reality of holes near the periphery thereof, and a plurality of alternate cylindrical spacing studs and frusto-conical selecting pins removably mounted in said holes, the number of holes exceeding the total number of spacing studs and selecting pins in order that said studs and pins may be selectably positioned to accommodate various sizes of caps, said flange and sorting wheel forming an annular passage for the covers
 10 from the interior of the receptacle, in which passage the spacing studs and selecting pins coast with said groove to prevent the passage of covers presented with their convex faces toward the selecting pins.

15 5. A cover sorting and feeding machine comprising the combination of a receptacle adapted to contain covers and having an outlet, an annular flange member having a groove therein located adjacent the outlet of said receptacle, a
 20 rotatable sorting wheel substantially closing said outlet, and alternate cylindrical spacing studs and frusto-conical selecting pins mounted adjacent the periphery of said wheel with their longitudinal axes substantially perpendicular to the
 25 plane of the surface of said flaring section, said flange and sorting wheel forming an annular passage for the covers from the interior of the receptacle, in which passage the spacing studs and selecting pins coast with said groove to prevent
 30 the passage of covers presented with their convex faces toward the selecting pins.

35 6. A cover sorting and feeding machine comprising the combination of a receptacle adapted to contain covers and having an outlet, an annular flange member having a groove therein located adjacent the outlet of said receptacle, a
 40 rotatable sorting wheel substantially closing said outlet and having a concave shape formed by a conical flaring section and provided with a plurality of holes near the periphery thereof, and a plurality of alternate cylindrical spacing studs

and frusto-conical selecting pins removably mounted in said holes with their longitudinal axes substantially perpendicular to the plane of the surface of said flaring section, the number of holes exceeding the total number of spacing
 5 studs and selecting pins in order that said studs and pins may be selectably positioned to accommodate various sizes of caps, said flange and sorting wheel forming an annular passage for the covers from the interior of the receptacle, in
 10 which passage the spacing studs and selecting pins coast with said groove to prevent the passage of covers presented with their convex faces toward the selecting pins.

15 7. A cover sorting and feeding machine comprising the combination of a receptacle adapted to contain covers and having an outlet, an annular flange member having a groove therein located adjacent the outlet of said receptacle, a
 20 rotatable sorting wheel substantially closing said outlet and having a concave shape formed by a conical flaring section and provided with a plurality of holes near the periphery thereof, and a plurality of alternate cylindrical spacing studs
 25 and frusto-conical selecting pins removably mounted in said holes with their longitudinal axes substantially perpendicular to the plane of the surface of said flaring section, the number of holes exceeding the total number of spacing
 30 studs and selecting pins in order that said studs and pins may be selectably positioned to accommodate various sizes of caps, said flange and sorting wheel forming an annular passage for the covers from the interior of the receptacle, in
 35 which passage the spacing studs and selecting pins coast with said groove to prevent the passage of covers presented with their convex faces toward the selecting pins, said spacing studs projecting a greater distance from the surface of
 40 said wheel than said selecting pins.

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