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O. DREHER

STAR WHEEL FEEDER

Filed March 26, 1923

FIG. 1

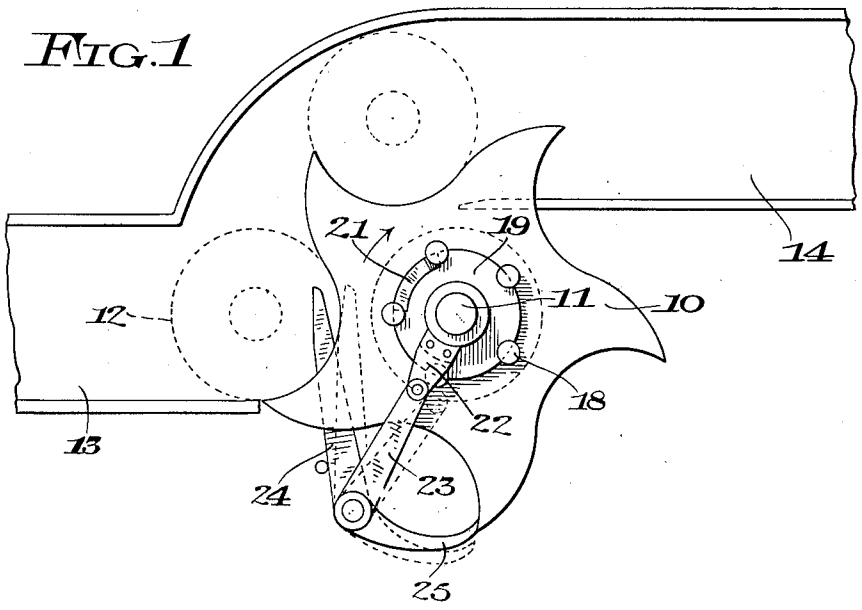


FIG. 2

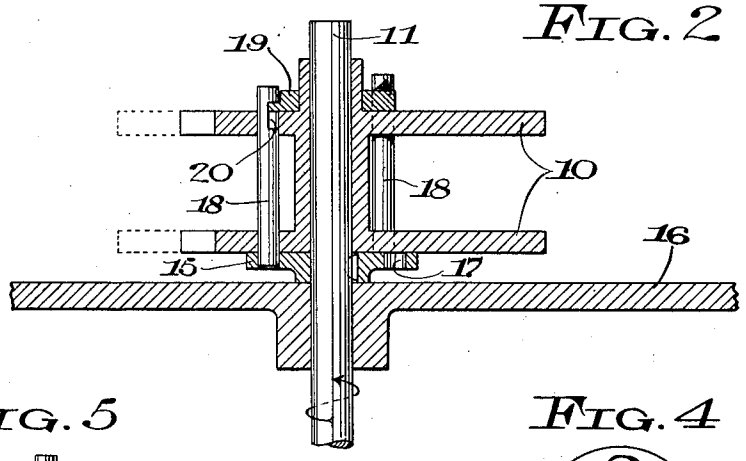


FIG. 5

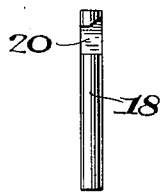


FIG. 3

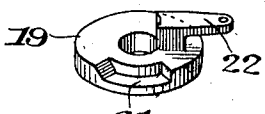
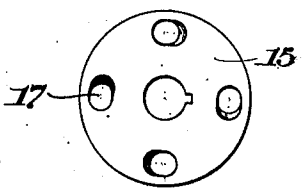


FIG. 4



WITNESSES

M. E. Downey

C. L. Maal

INVENTOR

Otto Dreher.

By R. S. Caldwell

ATTORNEY

Patented May 18, 1926. 1,585,238

UNITED STATES PATENT OFFICE.

OTTO DREHER, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO GEO. J. MEYER MANUFACTURING COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

STAR-WHEEL FEEDER.

Application filed March 26, 1923. Serial No. 627,750.

This invention has for its object to provide a star wheel feeding mechanism for bottle filling machines and the like which will be incapable of being blocked by bottles becoming lodged between the points of the star wheel and the bottle guide.

Another object of the invention is to accomplish this purpose by providing the star wheel with a clutch controlled by the presence of the bottles in the spaces between the points of the star wheel and automatically stopped in position to receive the bottles, making its feed movement intermittent and dependent on the supply of bottles thereto.

Another object of the invention is to perfect details of construction of a bottle operated pin clutch controlled star wheel feed of bottle handling mechanisms and the like.

With the above and other objects in view the invention consists in the star wheel feeder for bottle filling machines and the like as herein claimed and all equivalents.

Referring to the accompanying drawings, in which like characters of reference indicate the same parts in different views,

Fig. 1 is a plan view of a star wheel feeder constructed in accordance with this invention;

Fig. 2 is a sectional view thereof;

Fig. 3 is a perspective view of the clutch cam;

Fig. 4 is a plan view of the clutch drive disk, and

Fig. 5 is a view of one of the clutch pins.

In these drawings, 10 indicates a star wheel of a bottle filling machine or the like loosely mounted on a drive shaft 11 and adapted to receive the bottles 12 from a guide 13 and carry them through the feeding zone of the machine and discharge them into a bottle guide 14.

A clutch drive disk 15 is keyed on the drive shaft 11 and is positioned between the star wheel 10 and the table 16. As shown, the drive disk is provided with four openings 17 to receive clutch pins 18 slidably mounted through the star wheel.

A clutch cam 19 is loosely mounted on the projecting hub of the star wheel so as to be capable of oscillating thereon. The cam 19 is of a disk shape, as shown in Fig. 1, and its edge passes through notches 20 formed in the side of the clutch pins 18, thereby holding said pins out of engagement with the openings 17 of the drive disk 15.

At one portion the edge of the cam, however, is provided with a recess 21, into which the pins may drop so as to enter an opening 17 of the drive disk in the manner shown in Fig. 2.

An arm 22 on the cam 19 is raised to clear the ends of the clutch pins and extends outwardly to connect with an arm 23 of a clutch operating lever 24 which is pivotally mounted to move between the positions shown in full lines and the positions shown in dotted lines of Fig. 1.

In the full line position the clutch operating lever stands in the path of the bottles as they enter the spaces between the points of the star wheel so as to be pressed rearwardly thereby and cause the arm to turn the cam 19. In so doing the recess 21 is brought into register with one of the clutch pins, which is thereby permitted to drop and engage an opening in the clutch disk to move the star wheel.

As the cam 19 does not turn with the star wheel, the engaged clutch pin soon reaches the inclined end of the recess 21 and rides up said incline, withdrawing its end from the opening in the drive disk.

The shoulder on the clutch pin 18 above the notch 20 is beveled to co-operate with the inclined end of the recess 21 in withdrawing the clutch pin, and the openings 17 in the drive disk have inclined approaches leading to them to facilitate the engagement of the pins therewith.

When the clutch pin engages the inclined end of the groove 21 it first causes the cam 19 to turn with it and so restore the clutch operating lever 24 to its full line position of Fig. 1 before being lifted out of its clutch engagement with the drive disk.

Immediately after the time the clutch pin is disengaged from the drive disk the star wheel is positively stopped in position to receive the next bottle by a stop arm 25 carried by the clutch operating lever 24 engaging one of the points of the star wheel, as shown in Fig. 1.

The pressure of the oncoming bottle against the clutch operating lever 24 swings it to the dotted line position, turning the cam disk 19 to bring the recess 21 beneath the next clutch pin, which is then ready to drop into the next opening 17 when it arrives and so cause the operation of the star wheel another step and this operation is

repeated with each bottle, the lever 24 being forced rearwardly by the oncoming bottle to engage the clutch and being returned by the engagement of the pin with the inclined end of the recess just before the clutch pin rides out of the recess at the end of the movement of the star wheel.

With a five point star wheel, as shown, the clutch drive disk 15 is preferably provided with four equally spaced openings 17 so that there is very little loss of time between the unclutching of one pin and the clutching engagement of the next pin if the oncoming bottles are in regular succession. Thus by slightly speeding up the drive shaft 11 with respect to the timing of the operations of the bottle filler or other machine, of which the star wheel constitutes the feed, the timing of the operations of the star wheel may be made to correspond with that of the machine, allowing for the pauses between the clutch engagements.

The star wheel of this invention constitutes a safety feeding device which will prevent a bottle being fed at a time that it would be liable to catch between a point of the star wheel and the guide.

What I claim as new and desire to secure by Letter Patent is:

1. A star wheel feed for bottle machines and the like comprising a star wheel, a drive shaft therefor, a clutch member carried by the drive shaft, clutch pins on the star wheel for engaging the clutch member, cam means for controlling the clutch pins, and a clutch operating lever in position to be engaged by the bottles when they enter the spaces between the points of the star wheel for moving the cam to a position for engaging one of the clutch pins with the clutch member.

2. A star wheel feed for bottle machines and the like comprising a star wheel, a drive shaft therefor, a clutch member carried by the drive shaft, clutch pins carried by the star wheel corresponding in number to the number of points of the star wheel, a cam disk loosely mounted on the star wheel and engaging the clutch pins to hold them out of engagement with the clutch member, there being a cam recess in the cam disk for permitting one pin at a time to engage the clutch member for an arc of travel less than the angle between the star points, and a clutch operating lever in position to be engaged and moved by a bottle when the bottle enters a space between the star points, said clutch operating lever being connected with the cam disk for moving it to bring the recess into position for permitting the engagement of one of the clutch pins, said clutch pin at the end of its travel in the recess serving to return the cam disk and the clutch operating lever before riding out of said recess to become unclutched.

3. A star wheel for bottle machines and the like comprising a star wheel, a drive shaft therefor, a clutch member carried by the drive shaft, clutchpins carried by the star wheel corresponding in number to the number of points of the star wheel, a cam disk loosely mounted on the star wheel and engaging the clutch pins to hold them out of engagement with the clutch member, there being a cam recess in the cam disk for permitting one pin at a time to engage the clutch member for an arc of travel less than the angle between the star points, a clutch operating lever in position to be engaged and moved by a bottle when the bottle enters a space between the star points, said clutch operating lever being connected with the cam disk for moving it to bring the recess into position for permitting the engagement of one of the clutch pins, said clutch pin at the end of its travel in the recess serving to return the cam disk and the clutch operating lever before riding out of said recess to become unclutched, and a stop arm carried by the clutch operating lever and adapted to engage one of the points of the star wheel when the clutch operating lever is so returned.

4. A star wheel feed for bottle machines and the like comprising a suitably driven drive shaft, a clutch member thereon having pin-engaging openings, a star wheel loosely mounted on the shaft, clutch pins passing through the star wheel for engaging the openings of the clutch member, the number of clutch pins corresponding with the number of star points and the number of pin-engaging openings being less than the number of clutch pins, a cam disk loosely mounted on the star wheel and engaging notches in the clutch pins for holding them out of engagement with the clutch member, said cam disk being provided with a recess for permitting one clutch pin at a time to engage the clutch member, an arm on the cam disk, a clutch operating lever in position to be engaged and moved by a bottle entering a space between points of the star wheel and having connection with the arm of the cam disk, and a stop arm carried by the clutch operating lever for engaging one of the points of the star wheel.

5. A star wheel feed for bottle machines and the like comprising a star wheel, a rotating drive shaft therefor, a clutch for effecting engagement between the drive shaft and the star wheel for a partial rotation of the star wheel, a cam controlling the clutch and moved thereby, and an operating lever connected with the cam and in position to be engaged by the bottles when they enter the spaces between the points of the star wheel to operate the clutch and returned to its position by the movement of the cam produced by the clutch.

6. A star wheel feed for bottle machines and the like comprising a star wheel, a rotating drive shaft therefor, a pin clutch connecting the drive shaft with the star wheel, a movable but non-rotating cam for operating the clutch pin, and a clutch-operating lever in a position to be engaged by the bottles when they enter the spaces between the points of the star wheel and connected with the cam for effecting the engagement of the clutch, said cam being operative by the movements of the star wheel for disengaging the clutch and restoring the clutch operating lever.

7. A star wheel feed for bottle machines and the like comprising a star wheel, a rotating drive shaft therefor, a clutch for connecting the drive shaft with the star wheel, a swinging cam controlling the clutch, and a clutch-operating lever in position to be engaged by the bottles when they enter the spaces between the points of the star wheel and connected with the cam, said cam being operated by the movements of the star wheel for disengaging the clutch and for restoring the clutch-operating lever, said clutch-operating lever when restored constituting a stop for limiting the movement of the star wheel.

8. A star wheel feed for bottle washing machines and the like comprising a star wheel, a drive shaft therefor, a clutch member carried by the drive shaft, clutch pins on the star wheel for engaging the clutch member, cam means for controlling the clutch pins, and a clutch-operating lever in position to be engaged by the bottles when they enter the spaces between the points of the star wheel for moving the cam to a position for engaging one of the clutch pins with the clutch member, said cam means serving to restore the clutch-operating lever and to disengage the clutch pin from the clutch member when the star wheel has completed its feed movement.

9. A drive shaft, a driven star wheel, a clutch member on the shaft, a clutch pin on the star wheel, a cam member controlling the engagement of the clutch pin with the clutch member and moved thereby, and a lever connected with the cam member for moving it and returned thereby.

10. A star wheel feed for bottle machines and the like comprising a star wheel, a rotating drive shaft therefor, a movable cam, a clutch controlled thereby for connecting the shaft with the star wheel, and a lever connected with the cam to operate the clutch, said lever being positioned to be engaged by the bottles as they enter the star wheel and said cam being returned by the clutch and thereby returning the lever.

11. A star wheel feed for bottle machines and the like comprising a star wheel, a rotating drive shaft therefor, a clutch pin carried by the star wheel to engage the shaft, a swinging cam operating the clutch pin, and a bottle-engaged lever connected with the cam for moving it in one direction, said cam being moved in the opposite direction by the clutch pin and serving to return the lever.

In testimony whereof, I affix my signature.

OTTO DREHER.