Nov. 4, 1952 C. W. SMITH 2,616,541

AUTOMATIC FEELER MEANS TO DETECT CROWN FEEDING FAILURES

Filed Oct. 16, 1950 2 SHEETS—SHEET 1

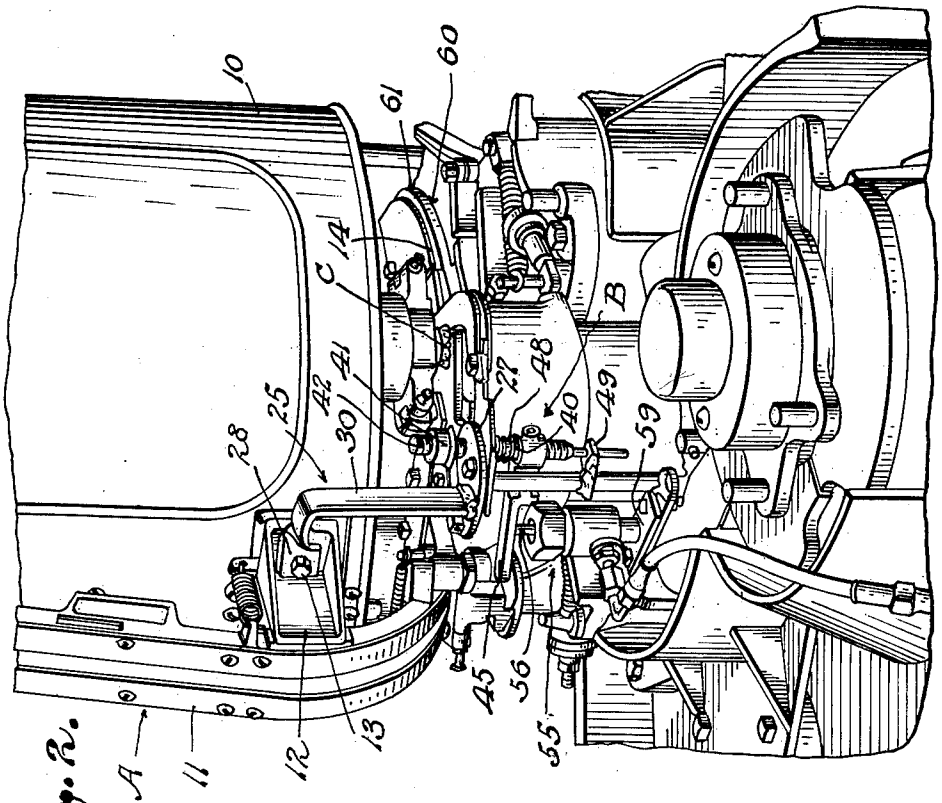

Fig. 2.

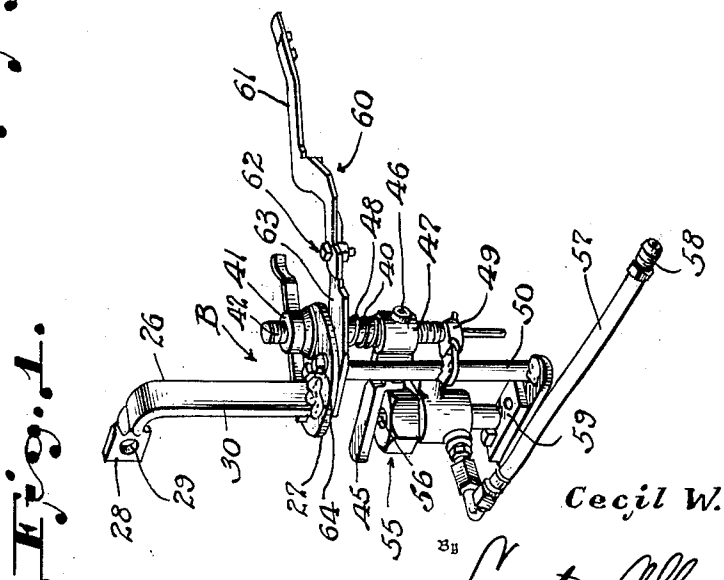

Fig. 1.

Inventor
Cecil W. Smith
By
Lancaster, Allwine & Rommel
Attorneys

Nov. 4, 1952 C. W. SMITH 2,616,541

AUTOMATIC FEELER MEANS TO DETECT CROWN FEEDING FAILURES

Filed Oct. 16, 1950 2 SHEETS—SHEET 2

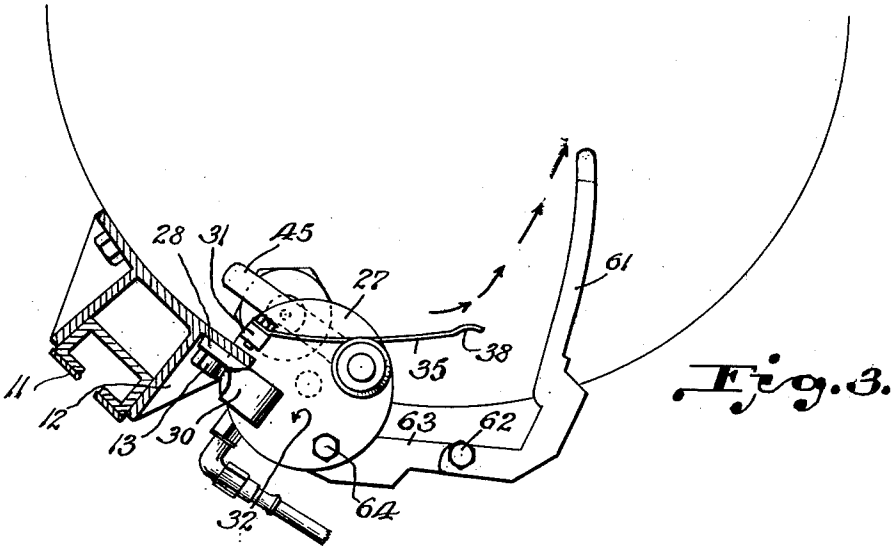

Fig. 3.

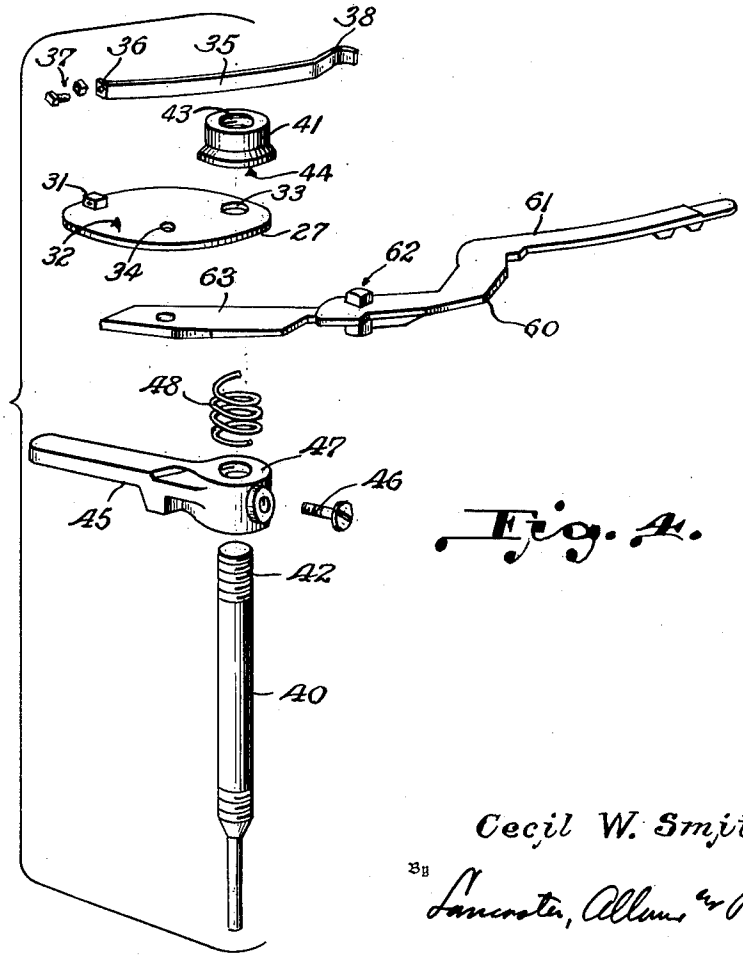

Fig. 4.

Inventor
Cecil W. Smith
By Lancaster, Allen & Rommel
Attorneys

Patented Nov. 4, 1952

2,616,541

UNITED STATES PATENT OFFICE

2,616,541

AUTOMATIC FEELER MEANS TO DETECT CROWN FEEDING FAILURES

Cecil W. Smith, Brownwood, Tex., assignor of one-half to Charles C. Lockwood, Brownwood, Tex.

Application October 16, 1950, Serial No. 190,345

5 Claims. (Cl. 192—125)

1

This invention relates to power stop controls and more specifically to automatic feeler means to detect the failure of the feeding of articles and, thereupon, suspend operations associated with such feeding. An example is a detector to suspend the operations of an automatic bottle crowner upon failure of the feeding of the crowns to the crowner head.

The general method of determining whether or not an automatic bottle crowner is crowning all the bottles fed to it is by constant visual inspection on the part of the attendant. Failure of crowns to feed into the crowner head or heads is then determined by seeing the uncrowned bottle emerge from under the crowner head. This may continue for a few bottles or for many bottles depending on how soon it is discovered by the machine attendant.

On the other hand, there has been provided uncrowned bottle detectors which may be interposed in the conveyor line leading from under the crowner head or heads, but these are activated only after several uncrowned bottles pass from under the crowner head.

The principal object of my invention is to provide a crown detector that immediately and automatically cuts off power to the crowning machine when the first crown fails to deliver to a crowner head.

Another important object is to provide a crown detector which may be mounted directly to the crowner assembly and is supported thereby.

A further important object is to provide such a mechanism which is adapted, without detaching it from the crowning machine, to detect failure of crowns fed to bottles of different heights. The mechanism automatically adjusts itself to such differences.

Yet another important object is to provide a light weight but efficient crown detector and one which may be manufactured and installed at low cost. It contains no complicated parts, nor parts apt to get out of order or require adjustment.

A further important object is to provide a compact assembly to form a crown detector for association with a conventional crowning machine and one in which horizontally-projecting parts extend away from the machine operator.

Other objects and advantages of the invention will be apparent during the course of the following detailed description of the invention, taken in connection with the accompanying drawings, forming a part of this disclosure, and in which drawings:

Figure 1 is a perspective of the new crown detector detached from a machine.

2

Figure 2 is a perspective of a portion of a crowning machine, including a crowner head, with the new crown detector attached thereto.

Figure 3 is a top plan of the crown detector in use.

Figure 4 is an exploded view, in perspective, of the major parts of the new crown detector.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention and wherein similar reference characters designate corresponding parts throughout the several views, the letter A designates a crowning machine generally, the letter B the new crown detector, and C a crown.

The crowning machine A, shown in Figures 1 and 3, is of conventional construction and includes a housing 10 with a crown chute 11 extending therealong and along a crown chute guide bracket 12 which is secured to the housing 10 as by a screw 13 which extends through a suitable opening in the bracket and into the housing. This bracket is near both the lower end of the housing and the discharge end 14 of the chute 11. There is also a crown track 15 to which the lower end of the crown chute 11 opens and along which the crowns C travel to the crowner.

As for the new crown detector B, it includes support means 25 which preferably comprises a bracket or arm 26 and a bearing plate 27.

The bracket or arm 26 may be a suitable rigid metallic strap formed into an eyed portion 28 providing a shank-receiving opening 29 (Figure 1) with a substantially horizontal axis and a substantially J-shaped portion 30 which may extend downwardly from the portion 28 and is secured, as by welding, to the plate 27, preferably at the edge portion of the latter. The portion 28 is the only part of the new detector secured directly to the machine A and may be detachably secured thereto by suitable means as the shank of the screw 13 extending through the opening 29, thence through the opening in the guide bracket 12, and into the screw threaded socket provided for the screw 13 in the housing 10.

The plate 27 of the support means 25 may be of metal similar to that of the arm 26, and is provided with an apertured lug 31 (Figure 4) extending from, preferably, its upper face 32 and with its opening normal to the vertical axis of the plate 27 and, when the new crown detector B is in use, extending toward the crowning machine A. This lug is preferably adjacent an edge portion of the plate and the latter is also provided with a plunger-receiving opening 33 therethrough, also preferably adjacent the edge por-

tion of the plate and spaced about 170° from the lug 31. A second or bolt shank-receiving opening 34, preferably much smaller than the opening 33, is also provided through the plate 27 and may be spaced about 90° from the opening 33.

Feeler means comprises a resilient member which comprises a suitable length of springy metal to form a leaf spring 35 having an inner end portion 36 containing an opening to receive suitable means as a bolt and nut assembly 37 to attach it to the lug 30 by extending the shank of this bolt through the opening in the lug 31. The outer or free end portion 38 of the spring 35 is preferably bowed and is constructed and arranged to ride slightly into the crown track 14 of the crowned mechanism A in light contact with successive crowns C on the crown track, but when a space occurs, because of crown feed failure, the free end portion 38 of the spring 35 will spring into this space.

Associated with the feeler means just described is a power stop control means actuator means. This last means includes a vertically-reciprocating plunger 40 slidable through the opening 33 and which plunger may be a rod of metal provided with means at one end portion thereof to cooperate with means of an apertured enlargement 41 to secure the two together. This means may be exterior screw threads 42 upon the plunger 40 and interior screw threads 43 of the apertured enlargement 41. Preferably the latter has a flared end portion of a circumference greater than that of the plunger 40 and a flat lower or bottom end face 44 which normally rests upon one edge of the spring 35 while the opposite edge of the spring contacts the face 32 of the plate 27. Thus the spring is held, intermediate the ends of the latter, by slight friction of the enlargement 41 against this upper edge. However, it is due to the contact of the free end portion 38 of the spring with the crowns C which prevents any decided movement of the spring, and the small arcuate space between the peripheries of two adjacent crowns is not sufficient to cause the spring to move from its contact with the enlargement 41.

Another portion of the power stop control means actuator means is mounted upon the plunger 40, preferably intermediate its ends, and comprises a contact portion such as a substantially horizontally-extending member or arm 45 which may be adjustable along the plunger since it may be provided with a set screw means 46 extending through an eyed portion 47 of the arm 45 embracing the plunger. Resilient means, as an expansion spiral spring 48 may be provided to urge the plunger downwardly since one end of the spring 48 bears against the plate 27 and the other ends bears against the eyed portion 47. The opposite end portion of the plunger 40 may be reduced in circumference and slide through a guide member 49 fixed to a member as a rigid rod 50 welded to the plate 47, as at its axial center.

The crowner mechanism power stop control means 55 is shown, by way of example, as a conventional air valve provided with a valve stem or movable control portion 56 which is disposed in the path of the descending arm 45 to be depressed and actuate the air valve to release air from a conventional clutch diaphragm (not shown) or like crowner mechanism shut off device operatively connected with the actuator 56 as by the air hose 57 in communication with the chamber of the air valve and having a conventional coupling member 58 at its outer end, so that the crowner mechanism will stop. The actuator 56 may be carried by a bracket 59 fixed to and extending from the member 50.

Since crowns in a crowner head lie very loosely and can be moved by the slightest pressure, the leaf spring 35 may slightly displace a crown C occasionally, although the pressure of the leaf spring is slight, so pusher means is provided to cause the slightly displaced crown to resume its proper place in order that it will be in a position for subsequent crowning of a bottle. This means may comprise a jointed arm member 60 having an outer arm portion 61 which may be manually adjusted by the pivot means, which is preferably a nut and bolt assembly 62, carried by a second arm portion 63 which, in turn, is supported by the plate 27 as by a bolt and nut assembly 64 with the shank of the bolt extending through the opening 34 in the plate 27. The shank of the nut and bolt assembly 62 extends through suitable openings in the adjacent end portions of the arm portions 61 and 63. The outer end part of the arm portion 61 is preferably rounded and adapted to extend over the edge of the crown track 14 sufficiently so as to be in the path of any displaced crown C and, as the latter travels toward the crowner, push the crown C back into place. The crown must be centered exactly over the bottle opening so that when the crowner head lowers itself over a bottle the crown is crimped on evenly and not one sided. Thus, the feeler 35, while it may cause a crown to slide slightly out of line, does not displace the crown sufficiently to allow the feeler to leave its position under the enlargement 41.

The normal path of travel of the centers of the crowns, after they leave the lower open end or mouth of the crown chute 11, is shown by the arrows in Figure 3.

From the above, it is clear that the entire crown detector B may be supported by the crowning machine A at the eyed portion 28 of the former and that it is possible to so support it without altering (such as by drilling any sockets or the like) the structure of the machine A.

The leaf spring 35 has been discovered as superior to a pivoted rigid member, not only because the path of the crowns is substantially horizontal instead of inclined, but because the crowns C are relatively light weight and may be readily moved. The light touch of the leaf spring does not generally displace them but, when there is a feed failure of even one crown, the spring will respond and result in stoppage of the machine A.

Moreover, once the new crown detector B causes stoppage of the machine A, there will be no accidental starting of the same because the detector B must be manually reset before the machine will start. This is a simple operation for the operator need but grasp the enlargement 41 with thumb and finger of one hand and raise it up, carrying the plunger 40 with it, then push the leaf spring 35 under the projecting portion of the enlargement and allow the lower flat end face 44 of the latter to come to rest upon the upper edge of the spring. The latter, when it contacts the periphery of the nearest crown C will then remain in its position with respect to the enlargement until the next crown feeding failure.

The pusher means is found to be a desirable adjunct of the crown detector since, now and

then, a crown may become slightly displaced by the feeler means.

The compact assembly provided, where the feeler means, power stop control means actuator means, power stop control means and pusher means are all carried by the one support means **25**, is such that it is out of the way so that the feeler means or the shut off device control actuator means are not apt to become accidentally operated by the clothing of the machine operator coming into contact therewith. As may be seen in Figure 3 the projecting portions, such as the leaf spring **35**, arm **45** and jointed arm member **60** of the new crown detector B extend away from the operator and toward the machine.

Various changes in the shape, size and arrangement of parts may be made to the form of invention herein shown and described without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. A power stop control for association with a feeder of like elements, with their centers normally equally spaced apart, and with said elements moving from said feeder along a fixed path, said power stop control including support means, feeler means carried by the support means and including an elongated resilient member with a first portion thereof normally in light contact with like portions of successively fed elements, power stop control means including a movable control portion, and power stop control means actuator means including a plunger provided with an enlargement and a contact portion with said plunger slidably carried by said support means, said enlargement normally in frictional contact with said elongated resilient member at a second portion spaced from said first portion thereof, and said movable control portion being disposed within the path of travel of said contact portion upon sliding movement of said plunger in one direction, the resiliency of said resilient member being such that when a gap appears between successively fed like elements said first portion of said resilient member will enter said gap, said second portion will move from its frictional contact with said enlargement and said plunger will slide in said one direction and move said control portion to operate said control means to stop said feeder.

2. A power stop control for association with a feeder of like elements, with their centers normally equally spaced apart, and with said elements moving from said feeder along a fixed substantially horizontal path, said power stop control including support means, feeler means carried by the support means and including an elongated resilient member with a first portion thereof normally in light contact with like portions of successively fed elements and said resilient member being disposed substantially horizontally, power stop control means including a movable control portion, and power stop control means actuator means including a substantially vertically moving plunger provided with an enlargement and a contact portion with said plunger slidably carried by said support means, said enlargement normally in frictional contact with said elongated resilient member at a second portion spaced from said first portion thereof, and said movable control portion being disposed within the path of travel of said contact portion upon sliding movement of said plunger in one direction, the resiliency of said resilient member being such that when a gap appears between successively fed like elements said first portion of said resilient member will enter said gap, said second portion will move from its frictional contact with said enlargement and said plunger will slide in said one direction and move said control portion to operate said control means to stop said feeder.

3. A power stop control according to claim 2 in which said support means includes a substantially horizontally disposed surface, said resilient member is disposed with a part of one side edge thereof at said first portion upon and in frictional contact with a portion of said support surface, and said enlargement is normally disposed with a portion of said enlargement upon a portion of the opposite side edge of said resilient member at said second portion of said resilient member.

4. A power stop control according to claim 2 in which said support means includes a bracket carried by said feeder and a plate carried by said bracket and having a smooth substantially horizontally disposed upper surface, said resilient member is disposed with a part of one side edge thereof at said first portion upon and in frictional contact with a portion of said support surface, and said enlargement is normally disposed with a portion of said enlargement upon a portion of the opposite side edge of said resilient member at said second portion of said resilient member.

5. A power stop control according to claim 2 in which said support means includes a bracket carried by and depending from said feeder and a plate carried at the lower end of said bracket and having a smooth horizontally disposed upper surface, said resilient member is carried at one end of said resilient member by said plate with a part of one side edge at said first portion of said resilient member being disposed upon and in frictional contact with a portion of said support surface, and said enlargement is normally disposed with a portion of said enlargement upon a portion of the opposite side edge of said resilient member at said second portion of said resilient member.

CECIL W. SMITH.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,462,512	Loew et al.	July 24, 1923
1,835,335	Risser	Dec. 8, 1931
2,124,674	Ray	July 26, 1938
2,499,564	Bincock	Mar. 7, 1950