

Feb. 26, 1946.

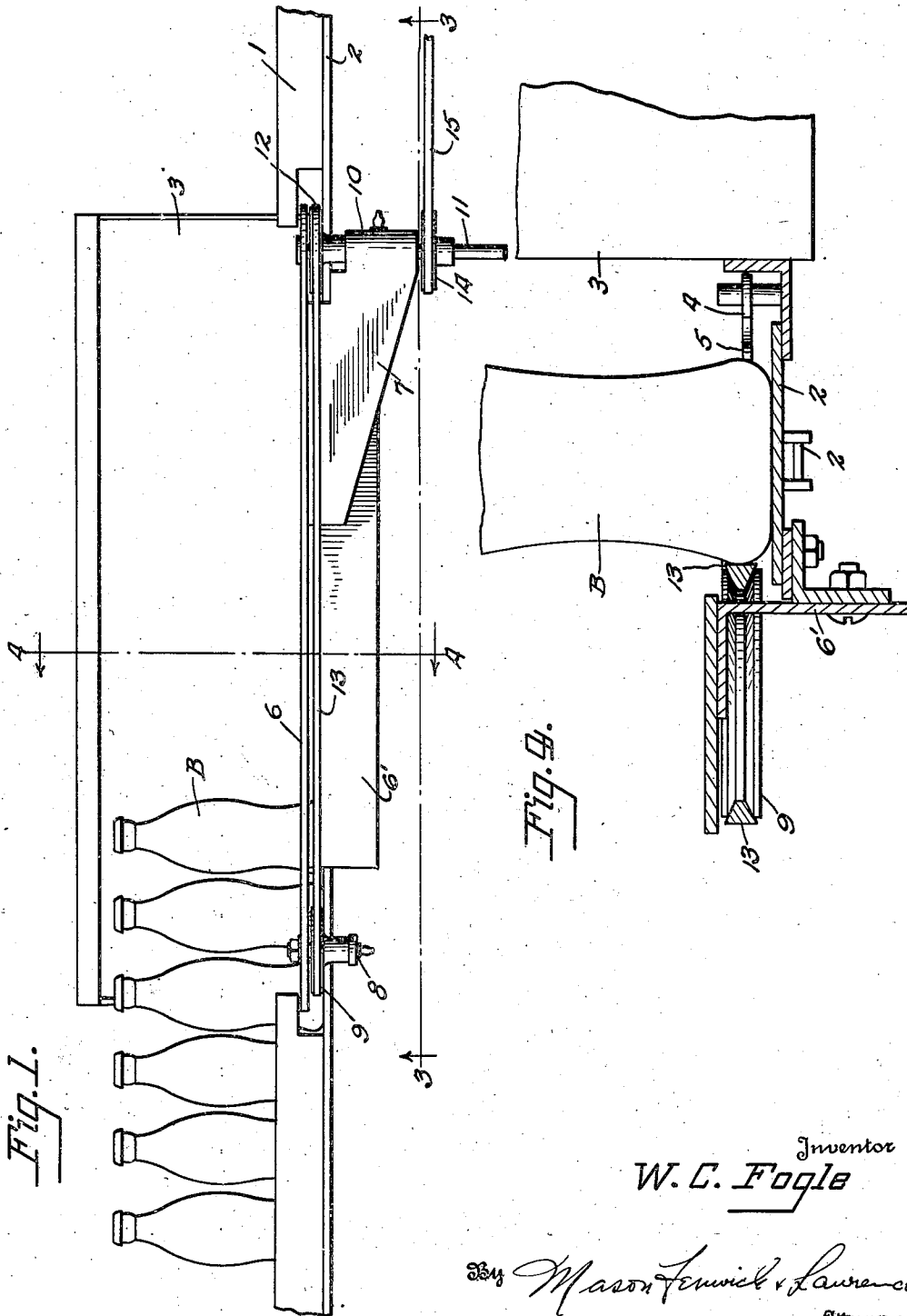
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2,395,620

BOTTLE INSPECTION DEVICE

Filed Dec. 21, 1943

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

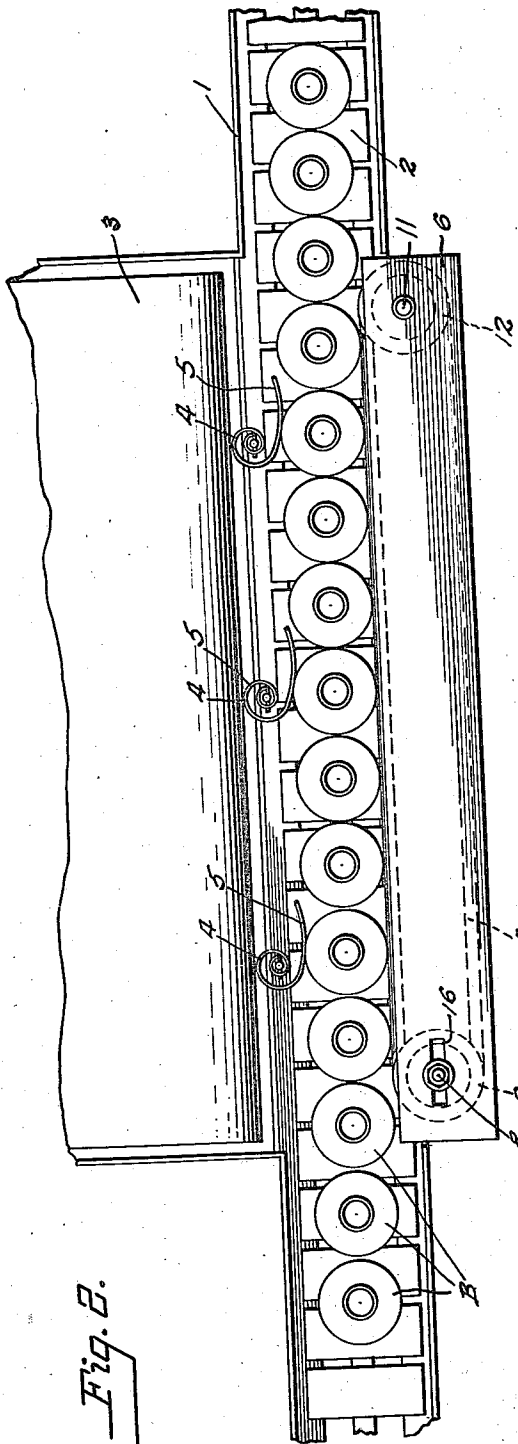


Fig. 2.

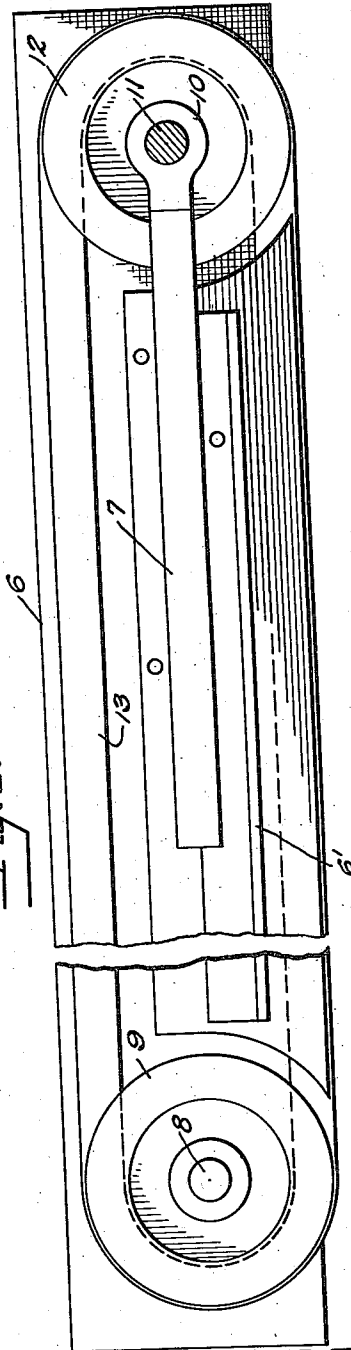


Fig. 3.

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UNITED STATES PATENT OFFICE

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BOTTLE INSPECTION DEVICE

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2 Claims. (Cl. 88—14)

This invention relates to apparatus for inspecting filled bottles.

It is customary in the bottling business and more particularly in connection with the bottling of soft drinks and similar beverages to pass the filled bottles before a source of strong light so that an inspector can observe any impurities in the contents or defects in the bottles and remove such defective containers.

Variations in the light transmitted through such filled containers due to the curvature of the bottles renders such inspection inadequate to detect, for instance, imperfections in the sides of the bottles on either side of the line of sight or impurities in certain portions of the contents.

The object of the present invention is to provide an improved means in the form of a simple attachment that can be readily applied to the structure now generally in use, which will greatly improve the accuracy of the inspection without increasing the time required by producing successive partial turns of each bottle as it passes in front of the source of light, so that the inspector can observe the bottles and their contents presented on different diameters and thus greatly improve the thoroughness of the inspection.

The invention consists in the novel construction, arrangement and combinations of parts hereinafter more particularly described and claimed.

Two sheets of drawings accompany this specification as part thereof, in which like reference characters indicate like parts throughout.

Figure 1 is a front elevation of the present invention applied to a conveyor for filled bottles;

Figure 2 is a top plan view of the device of Figure 1;

Figure 3 is a bottom plan view of the belt attachment;

Figure 4 is a transverse cross-section on an enlarged scale, taken on line 4—4 of Figure 1.

In the drawings, Figure 1 identifies a trough of which the endless conveyor belt 2 forms the bottom arranged to convey a plurality of filled bottles in lineal alignment past a light box 3 in which are arranged suitable sources of light, with reflectors, if desired, to throw a stream of light forwardly and transversely of the conveyor belt 2 through such of the filled bottles B as are in front of the light box 3.

It will be understood that an inspector will be stationed in front of the belt 2 and the light box 3 to observe the filled bottles as they are passed through this stream of light to detect any foreign

matter in the contents of the bottles or any defects in the bottles themselves.

The structure thus far described is common practice in the bottle art and it is now proposed to apply to such structure an attachment designed to rotate each of the filled bottles by successive partial revolutions on their vertical axes during the period that each bottle requires for passing through the stream of light at the inspection station.

To accomplish this result a shelf 6 is secured to the supporting framework of the conveyor by suitable angle brackets 6', as the structure of the framework may require, the shelf 6 being provided adjacent one end with a longitudinally extending slot 16 through which is passed a bolt spindle 8 to rotatably mount pulley 9. Adjacent the other end of the shelf 6 and secured to the under face thereof is a bracket 7 having at its outer end a vertical journal 10 to receive the vertical spindle 11 to the upper end of which is secured a pulley 12, while adjacent the lower edge of the bracket is secured to the spindle 11 a driving pulley 14.

The pulleys 9 and 12 carry an endless belt 13, the inner stretch of which is positioned over the forward edge of the conveyor belt 2 and closely adjacent to said belt, as illustrated in Figure 4.

Power is transmitted to pulley 14 as through belt 15 connected to any suitable part of the conveyor structure to drive pulley 12 and belt 13, it being important that the speed of belt 13 be different from the speed of the conveyor 2. Preferably, the belt 13 will be driven so that the inner stretch of the belt over conveyor 2 will be driven in the same direction with conveyor 2 and at a speed in excess of that of the conveyor. A similar result but with less efficiency could be obtained by driving the belt 13 at a lower speed than the conveyor 2, as will be apparent.

To secure the successful rotation of the filled bottles a plurality of presser devices are positioned adjacent the remote side of conveyor 2 and between the conveyor and the light box 3. As herein illustrated, these presser devices are formed as spiral springs 4, the free ends of which 5 are directed over the conveyor 2 in such manner that as the bottles B advance with the conveyor they will successively contact the spring arms 5 and be deflected by said arms transversely of conveyor 2 and against the inner stretch of belt 13. As the belt 13 is advancing at a speed different from that of conveyor 2, it will be apparent that it will engage and rotate each of the bottles successively as such bottles pass the

spaced resilient arms in front of the light box, thus assuring the rotation of each bottle a part turn at successive steps along the conveyor in front of the light box so that the inspector is provided an opportunity to observe the bottles and their contents from a plurality of different diameters of each bottle.

The number of the spring members can be varied, but practical experience indicates that three such members afford quite satisfactory inspection and it will be understood that the speed of the belt 13 with relation to the speed of the conveyor 2 will be so adjusted as to secure the desired annular rotation of each bottle at each successive point of contact at the inspection station.

Various modifications in the precise construction of the attachment will readily suggest themselves to those skilled in the art, depending on the structural features of the conveyor device, but all within the scope of the present invention, as claimed.

Having thus fully described my invention, I claim:

1. Inspection device for examining filled bottles and the like, comprising a conveyor, a source of light adjacent to and back of the conveyor, an endless belt having one stretch positioned ad-

5 jacent and parallel with the forward edge of the conveyor in front of the source of light, means for driving that stretch of the belt in the same direction as the conveyor and at a speed greater than that of the conveyor and resilient members spaced longitudinally of the belt intermediate the source of light and the conveyor arranged to successively engage bottles standing on the conveyor and press same against the belt where-
10 by they are successively rotated a fractional part of one revolution only.

2. Inspection device for examining filled bottles and the like, comprising in combination with a conveyor for advancing a line of bottles, means for directing light transversely of the conveyor through the bottles, a belt having a stretch ar-
15 ranged parallel with and adjacent the side of the conveyor away from the source of light, means for driving said stretch of belt in the same direction as and at a speed different from that of the conveyor, and a plurality of spring arms spaced longitudinally of the belt to bear successively against the bottles as they pass said
20 arms to force the bottles into engagement with the belt to partially and slowly rotate said bottles successively.

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