Feb. 17, 1959 W. E. ERICKSON 2,873,842

IN-LINE SPOTTER WITH BOTTLE POCKETING CONTROL

Filed Sept. 13, 1957

Fig. 1

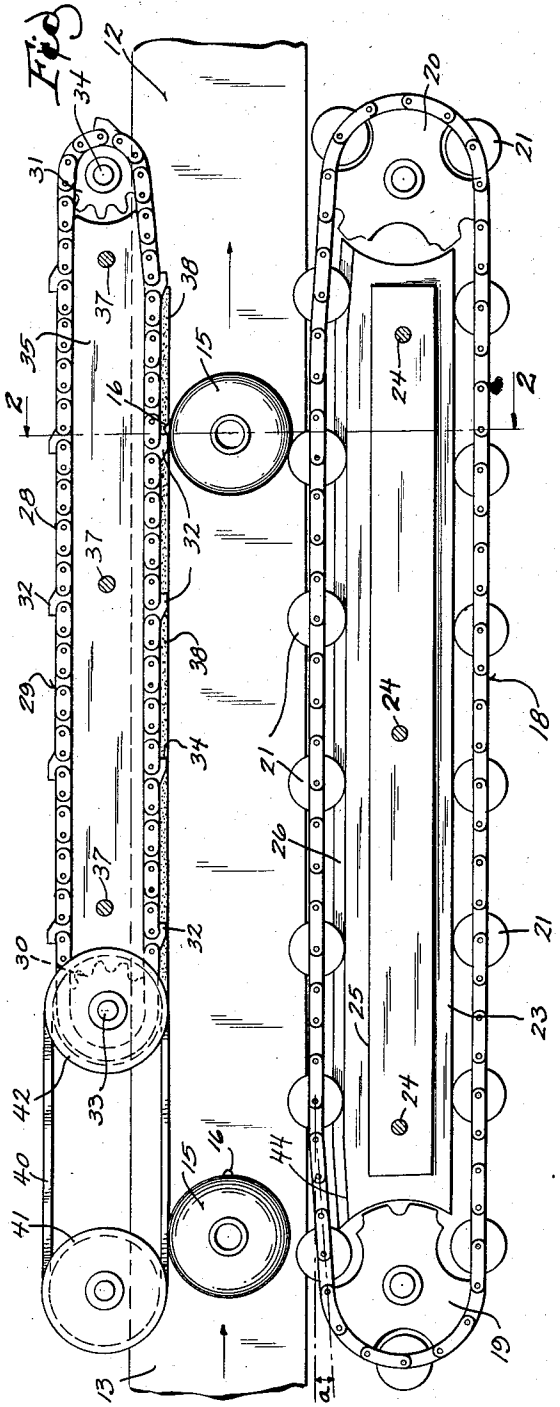


Fig. 3

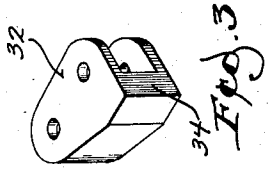
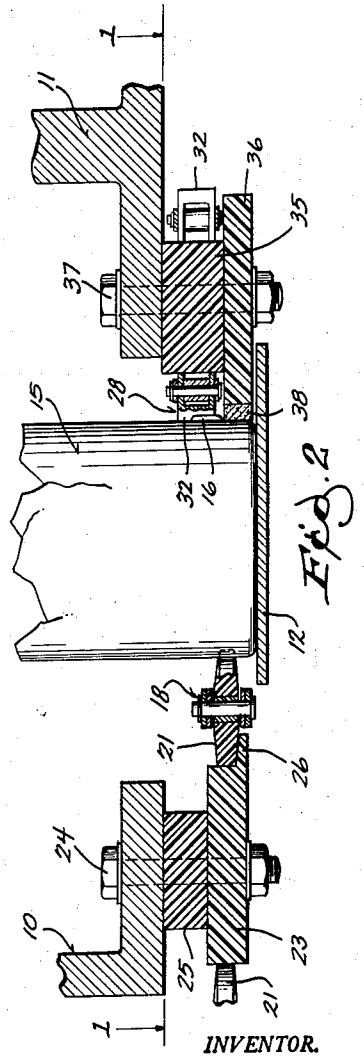


Fig. 2



INVENTOR.
WARREN E. ERICKSON
BY
Andrus, Scales & Starke
ATTORNEYS

United States Patent Office 2,873,842 Patented Feb. 17, 1959

2,873,842

IN-LINE SPOTTER WITH BOTTLE POCKETING CONTROL

Warren E. Erickson, Madison, Wis., assignor to Gisholt Machine Company, Madison, Wis., a corporation of Wisconsin

Application September 13, 1957, Serial No. 683,754

9 Claims. (Cl. 198—33)

This invention relates to machines for conveying and orienting bottles or the like to present a proper surface for the attachment of a label thereto.

Apparatus of this type is used to convey circular packages, such as bottles, to a labeling machine which applies the labels to the bottle. Often two labels are supplied to the bottle and they must be positioned correctly relative to one another, and relative to certain surfaces of the bottle. For this purpose a "spotter" device is used to orient the bottle correctly before it is engaged by the label applying mechanism. A reference "spot" is usually molded into the bottle, either as a projection on the periphery, or as an indentation therein and this spot is engaged by a feeler on the spotting machine to hold the bottle in a correct predetermined position.

These bottles are delivered to the conveyor in any order, that is, with no particular spacing therebetween, and prior art conveyors and spotters of this type usually used metering wheels or spring loaded metering devices to properly space the bottles on the conveyor so as to prevent breakage of the bottles due to jamming. It has been a problem to place the bottles in the pockets formed by these metering devices without causing binding between the parts or allowing more than one bottle to enter any one pocket.

For example, devices have been proposed, and used with considerable success, which use a pair of spaced endless members each having a portion of their endless flights operating in parallelism to one another and between which the bottles are adapted to be conveyed. One of these endless members comprises a flexible member having rollers spaced along its length and which engage the bottles to push them along their intended path and cause them to be rotated against an opposite friction rail at the same time. The other one of these endless members may comprise a flexible member, such as a chain, having a plurality of feeler members which are adapted to engage the reference spot on the bottle when the latter has been rotated sufficiently to a properly oriented position. Both endless members must move at the same linear speed to convey the bottle properly without causing it to rotate due to a twisting force couple. Difficulty has been encountered, in devices of this particular type, at the entry end between the pair of flexible endless members and due primarily to the roller contacting the bottle on dead center and forcing it tightly against the opposite rail. If jamming does not result, the trapped bottle usually jumps back into the next succeeding pocket, not only leaving the preceding pocket empty, but perhaps jamming in the following pocket with the next bottle.

It is a general object of the present invention to provide an improved spotter mechanism of the above type which requires no metering wheels to space the containers prior to their entry into the spotter.

According to the present invention, an in-line spotter mechanism is provided which prevents binding of the containers between the inlet ends of endless conveying

members and which insures that only one container is positioned in any one pocket.

These and other objects and advantages will appear hereinafter as this disclosure progresses, reference being had to the accompanying drawings in which:

Figure 1 is a plan view, of an in-line spotter device made in accordance with the invention, certain parts being in section and broken away for clarity of the drawings;

Figure 2 is an elevational, sectional view, taken on line 2—2 of Figure 1, but on an enlarged scale; and

Figure 3 is a perspective, enlarged view of one of the spot "feelers" shown in Figures 1 and 2.

Referring more particularly to the drawings, the supporting framework of the machine includes the stationary frame members **10** and **11**. These frame members are on opposite sides of a surface **12**, which may be fixed, as shown, adapted to receive the article at its inlet end **13**. For purposes of illustration, the article to be oriented has been shown as a bottle **15** having a spot **16** in the form of a projection adjacent its lower end which is formed integrally in the bottle.

An endless flexible band **18** in the form of a chain is trained around the spaced sprockets **19**, **20** which are rotatably mounted on the frame member **10**. A plurality of projection means in the form of rollers **21** are secured at spaced locations on the chain and are preferably of non-metallic material, for example, a plastic such as synthane. The roller chain **18** is driven, by means not shown, and the rollers act to engage the bottles **15** and push them along the conveyor surface **12**. The spacing between the rollers is such so as to accommodate only one bottle in the "pocket" formed therebetween.

Between the sprockets **19**, **20** is the guide member **23** which is secured to frame member **10** by bolt means **24** which extends through the guide **23** and spacer **25**. Both the guide and spacer are preferably made of synthane also. The inner side of the guide has a shelf portion **26** on which the rollers **21** are adapted to slide while in the conveying area. Thus the rollers are steadied and prevented from any tipping movement as they contact the bottle and push it along the conveyor.

The other flexible endless member **28** comprises a chain **29** which is trained over the spaced apart sprockets **30**, **31** and which are rotatably mounted on the shafts **33**, **34** rotatably mounted in frame member **11**. A plurality of projecting means or "feelers" **32** are carried by the chain **29** and are spaced so as to correspond with the number of rollers **21** and positioned one adjacent each of the rollers. These "feelers" are shown in Figure 3 and have a spot engaging edge **34** which is adapted to contact the spot **16** on the bottle when the bottle has rotated sufficiently to reach the predetermined oriented position. In other words, the feeler acts to prevent further rotation of the bottle once it has reached its oriented position, and the chain assembly **28** is called a stop chain.

An abutment means or friction rail **38** in the form of a leather strip is secured to the inner edge of member **36**, and the bottles are urged against this rail by the rollers **21**.

The space between the rollers **21** and the opposite rail **38** is such as to prevent the bottle from passing therebetween.

Frictional engagement of the bottle against the rail causes the bottle to rotate until the spot **16** engages the corresponding feeler.

The linear speed of the stop chain and the roller chain are the same and when the bottle has been oriented, the roller and its corresponding feeler act together to push the bottle along the conveyor surface.

The stop chain **29** is adapted to travel around the guide members **35** and **36** which are secured to the frame member **11** by bolt means **37**. Thus the inside of the chain bears against member **35** and is accurately located, particularly in the bottle conveying area. The guide member **36** acts to support the weight of the chain which slides along its upper surface.

The properly oriented bottle is thus pushed along without rotating by the conjoint action of the feeler and roller to the discharge end of the conveyor, where the bottle is picked up by another conveyor, not shown.

Trouble has been experienced in the past at the inlet end of such an orienting conveyor. For example, a bottle entering between the endless conveyors could become jammed between the rail **38** and the roller **21**, if the roller engaged the bottle on dead center or slightly behind dead center. In such a case, the moving roller would either crush the bottle against the rail or the bottle would jump back into the following pocket. Breakage or jamming of bottles obviously causes damage and downtime to such a machine.

In accordance with the present invention, a rotary member in the form of a flexible, endless V-belt **40** is positioned at the entry end of the orienting device and at the side opposite the roller chain. This belt is trained around pulleys **41**, **42** which are rotatably mounted on the frame of the machine. Pulley **42** is mounted on the same shaft as is sprocket **30** and is also rotatably driven by this shaft.

The outside diameter of the V-belt as it encircles the pulley **42** is larger than the pitch diameter of the chain sprocket **30**. Therefore, the linear speed of the V-belt is greater than that of the stop or the roller chain.

It should also be noted that the roller chain enters the conveying area at a slight angle *"a,"* as shown in Figure 1. In other words, the rollers enter the conveying area at a slight angle so that the roller gradually approaches any bottle that is in the area. This slight angling approach is effected by the guide **23** extending inwardly sufficiently far to cause the rollers to follow the inwardly inclined portion **44** of the guide and then extend well inwardly past the periphery of the sprockets **19**, **20**.

With the above construction and arrangement, as a bottle approaches the entry of the orienting device, the roller more gradually approaches the bottle than it otherwise would if the roller simply traveled around the sprocket and immediately entered its line of contact with the bottle. In other words, the projecting means **21** have a substantial component of movement in the direction of the path of article movement before actual contact with the article. As the bottle is pushed against the V-belt, the latter, because of its faster travel, forces the bottle to a position ahead of the roller and definitely into the pocket ahead of the roller. Thus the bottle will never be hit dead center by a roller and crushed against the opposite rail. There is no metering wheel required at this area as the V-belt positions only one bottle in any one pocket and prevents any binding between the roller and opposite rail.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. In a conveying and orienting device for circular articles; a friction member arranged along a path of movement of articles; conveying means located in spaced relation to said friction member and carrying projecting means adapted to contact an article to convey said article and press said article transversely against said friction member to cause the article to rotate as it is conveyed, said conveying means adapted to gradually approach said path of movement so as to prevent dead center contact with said articles; a second contact member located on the same side of the path of movement as the friction member and movable in synchronism with the conveying means along said friction member to contact said article at a predetermined point to arrest rotation of the article; and a rotary member located adjacent the entry end of said device and having a peripheral linear speed greater than that of said conveying means, said rotary member being located on the same side of said path as said friction member.

2. In a conveying and orienting device for circular articles; a friction member arranged along a path of movement of articles; conveying means located in spaced relation to said friction member and carrying projecting means adapted to contact an article to convey said article and press said article transversely against said friction member to cause the article to rotate as it is conveyed; means for said conveying means whereby the latter is guided to gradually approach said path of movement; a second contact member located on the same side of the path of movement as the friction member and movable in synchronism with the conveying means along said friction member to contact said article at a predetermined point to arrest rotation of the article; and a rotary member located adjacent the entry end of said device and having a peripheral linear speed greater than that of said conveying means, said rotary member being located on the same side of said path as said friction member.

3. In a conveying and orienting device for circular articles; a friction member arranged along a path of movement of articles; conveying means located in spaced relation to said friction member and carrying projecting means adapted to contact an article to convey said article and press said article transversely against said friction member to cause the article to rotate as it is conveyed; guide means for said conveying means whereby the latter gradually approaches said path of movement; a second contact member located on the same side of the path of movement as the friction member and movable in synchronism with the conveying means along said friction member to contact said article at a predetermined point to arrest rotation of the article and relieve the pressure between the article and friction member; and an endless member located adjacent the entry end of said device and having a peripheral linear speed greater than that of said conveying means, said endless member being located on the same side of said path as said friction member.

4. In a conveying and orienting device for circular articles; a friction member arranged along a path of movement of articles; conveying means located in spaced relation to said friction member and carrying projecting means adapted to contact an article to convey said article and press said article transversely against said friction member to cause the article to rotate as it is conveyed; guide means for said conveying means whereby the latter gradually approaches said path of movement, said guide means including a supporting shelf for said projection means which is inclined toward said path of movement in a forward direction in respect to the direction of article movement; a second contact member located on the same side of the path of movement as the friction member and movable in synchronism with the conveying means along said friction member to contact said article at a predetermined point to arrest rotation of the article and relieve the pressure between the article and friction member, and an endless flexible belt located adjacent the entry and of said device and having a peripheral linear speed greater than that of said conveying means, said endless belt being located on the same side of said path as said friction member.

5. In a conveying and orienting device for circular articles; means presenting a substantially horizontal surface to receive said articles; a friction member arranged along a path of movement of the articles; an endless chain conveying means located in spaced relation to said friction member carrying projecting means adapted to contact an article to convey said article and press said article transversely against said friction member to cause

the article to rotate as it is conveyed; guide means for said conveying means whereby the latter gradually approaches said path of movement; a second endless chain located on the same side of the path of movement as the friction member and movable in synchronism with the conveying means along said friction member and having feelers adapted to contact said article at a predetermined point to arrest rotation of the article and relieve the pressure between the article and friction member, and an endless member located adjacent the entry end of said device and having a peripheral linear speed greater than that of said conveying means, said endless member being located on the same side of said path as said friction member and adapted to contact said articles.

6. In an in-line spotter for circular articles of the type having abutment means arranged along the path of movement of said articles, conveying means located in spaced relation to said abutment means and carrying projecting means adapted to contact and convey said articles and also press said articles transversely against said abutment means to thereby cause said articles to rotate as they are conveyed, and a second contact member located on the same side of the path of movement as the abutment means and movable in synchronism with the conveying means along said abutment means to contact said article at a predetermined point to arrest rotation of the article; the improvement residing in a rotary member located adjacent the entry end of said spotter on the same side of said path as said abutment means and having a peripheral linear speed greater than that of said conveying means.

7. In an in-line spotter for circular articles of the type having abutment means arranged along the path of movement of said articles, conveying means located in spaced relation to said abutment means and carrying projecting means adapted to contact and convey said articles and also press said articles transversely against said abutment means to thereby cause said articles to rotate as they are conveyed, and a second contact member located on the same side of the path of movement as the abutment means and movable in synchronism with the conveying means along said abutment means to contact said article at a predetermined point to arrest rotation of the article; the improvement residing in, a rotary member located adjacent the entry end of said spotter on the same side of said path as said abutment means and having a peripheral linear speed greater than that

of said conveying means, and said conveying means adapted to gradually approach said path of movement so as to prevent dead center contact with said articles.

8. In an in-line spotter for circular articles of the type having abutment means arranged along the path of movement of said articles, conveying means located in spaced relation to said abutment means and carrying projecting means adapted to contact and convey said articles and also press said articles transversely against said abutment means to thereby cause said articles to rotate as they are conveyed, and a second contact member located on the same side of the path of movement as the abutment means and movable in synchronism with the conveying means along said abutment means to contact said article at a predetermined point to arrest rotation of the article; the improvement residing in, an endless flexible belt located adjacent the entry end of said spotter on the same side of said path as said abutment means and having a peripheral linear speed greater than that of said conveying means, and guide means for said conveying means whereby the latter gradually approaches said path of movement.

9. In an in-line spotter for circular articles of the type having abutment means arranged along the path of movement of said articles, conveying means located in spaced relation to said abutment means and carrying projecting means adapted to contact and convey said articles and also press said articles transversely against said abutment means to thereby cause said articles to rotate as they are conveyed, and a second contact member located on the same side of the path of movement as the abutment means and movable in synchronism with the conveying means along said abutment means to contact said article at a predetermined point to arrest rotation of the article; the improvement residing in, a rotary member located adjacent the entry end of said spotter on the same side of said path as said abutment means and having a peripheral linear speed greater than that of said conveying means, and a supporting shelf for said projecting means and inclined gradually towards said path of movement whereby said projecting means are prevented from tilting and gradually approach said articles so as to prevent dead center contact therewith.

References Cited in the file of this patent

UNITED STATES PATENTS

1,172,447	Forte	Feb. 22, 1916
2,706,031	Capstack	Apr. 12, 1955