(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 339 615 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **89107568.1**

(51) Int. Cl.[4]: **B65C 9/42**

(22) Date of filing: **26.04.89**

(30) Priority: **26.04.88 JP 103571/88**

(43) Date of publication of application:
02.11.89 Bulletin 89/44

(84) Designated Contracting States:
DE FR GB

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(54) Labeling apparatus for attaching a label onto a predetermined position on articles.

(57) A labeling system including a means to compensate for positional shifts of articles to be labeled is provided. This system includes a labeling drum for providing a label to a vessel such as a bottle, a sensor means for sensing a vessel and/or the angular position thereof on a conveyer, and a controller for controlling the labeling drum to adjust for a degree of shift between a given labeling area on the vessel and a corresponding labeling head provided on a labeling drum. A sensor means is provided at a side of the vessel conveyer and provides a signal at every passage of a vessel to a controller. The controller determines the angular position of the labeling drum in response to the signal output from the sensor means by calculating a shift parameter to align a given labeling area of a vessel with the corresponding labeling head of the labeling drum and provides pulse signals corresponding to the shift parameter to a servo motor connected to the labeling drum. The servo motor drives the labeling drum so as to advance or retard the rotation thereof to insure alignment between the labeling head and the given labeling area of the vessel.

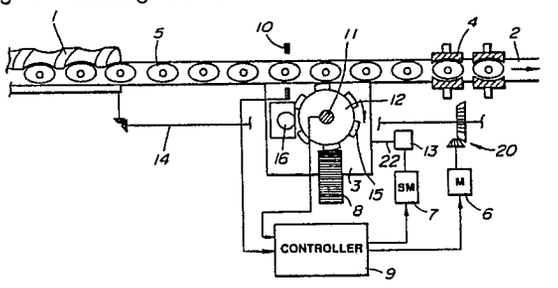

FIG.1

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LABELING APPARATUS FOR ATTACHING A LABEL ONTO A PREDETERMINED POSITION ON ARTICLES

BACKGROUND OF THE INVENTION

The present invention relates generally to a labeling system and more particularly to a labeling system including a means for adjusting a tolerance of labeling position relative to a given area on articles such as bottles in a sequential labeling operation.

A conventional labeling apparatus for attaching a label to vessels includes a vessel positioning mechanism, for example, a screw unit which is mechanically synchronized with the rotation of a labeling drum is provided at a vessel positioning station. The vessel positioning mechanism is operable to provide a constant carrying pitch between the vessels on a conveyer so as to determine a position where a label is attached to the vessel, or a relative labeling position with respect to the labeling drum. The vessels, after being positioned at a given interval, are carried to a labeling station.

At the labeling station, a label magazine provides labels to the labeling drum in sequence. The labels are backed with adhesive by an adhesion roller and then are provisionally affixed to the vessels carried on the conveyer. After labeling, the labeled vessels are fed to a final finishing section and are pressed moderately by a compression unit. This sequential labeling operation is effected by a driver which is mechanically connected to a single driving source provided in the labeling system.

In such a sequential labeling operation, the positioning of vessels with respect to the labeling drum is important. Only when the relative position of the vessel with respect to the labeling head provided on a labeling drum is determined precisely can accurate labeling be provided

However, in conventional labeling technique, relative position of the vessel with respect to the labeling head is subjected to variance due to shifting or gripping of the vessel with respect to the conveyer or backlash caused by the wear of gears in a drive mechanism for example. As a result, the label is shifted with regard to its intended position on the vessel and when attached thereon, results in the production of non-conforming vessels.

SUMMARY OF THE INVENTION

It is, accordingly, an object of the present invention to provide a labeling apparatus for attaching a label accurately to a given area on articles such as bottles in a sequential labeling operation, and a method therefor.

According to one aspect of the present invention, there is provided a labeling apparatus for attaching labels onto articles wherein a specific point defined on a label aligns with a predetermined position on an article, which comprises a first means for feeding the articles toward a labeling station at given carrying intervals, a second means, provided at the labeling station, for providing labels to articles at given labeling intervals which correspond to the given carrying intervals, a third means for determining a relative degree of shift between the predetermined position on an article fed by the first means and the specific point on a label provided by the second means, and a fourth means for adjusting the labeling interval of the second means based on the relative degree of shift so that the specific point on the label corresponds to the predetermined labeling point on the article.

In the preferred mode, the second means is a rotary labeling drum having a plurality of labeling heads at regular intervals which respectively dispose labels. The the third means includes a photo sensor for sensing an article carried by a conveyer as the first means, a sensor for detecting a degree of angular displacement of the predetermined position on the article with respect to a labeling point, and a rotary encorder for detecting the angular position of the rotary labeling drum. The labeling position is defined by the exact coincidence of the specific point on a label provided on the labeling head with the predetermined position on an article at the labeling station. The third means determines a degree of angular displacement of the rotary labeling drum based on a signal output by the rotary encorder after the labeling head passes the labeling point until another article is sensed by the photo sensor and the degree of angular displacement of the article to calculate a degree of phase shift of the angular position of the rotary labeling drum from the given labeling interval. The fourth means adjusts the rotation of said labeling rotary drum so as to implement said degree of phase shift.

According to another aspect of the invention, there is provided a labeling apparatus for attaching labels to a predetermined position on articles which comprises a first means for carrying articles at given carrying intervals to a labeling station, a second means, provided at the labeling station, for attaching a label onto the predetermined position on an article at a given labeling interval, a third means for determining relative positional shift between an actual carrying position and a carrying position coinciding with the labeling interval of said second means and providing a signal indicative

thereof, and a fourth means for adjusting the labeling interval of the second means to synchronize with the actual carrying interval based on the signal from the third means in order to attach the label onto the predetermined position on articles.

The third means may be include a photo sensor for detecting an article carried by the first means to provide a signal indicative thereof. The third means determines the degree of shift in an actual carrying position from a carrying position which would coincide with the given labeling interval of the second means based on the signal from the photo sensor. The fourth means controls the labeling interval so as to implement the degree of phase shift. Therefore, the specific point defined on a label may coincide with the predetermined position on an article.

According to a further aspect of the invention, there is provided a method for attaching labels onto articles carried to a labeling station at given intervals wherein a specific point defined on a label aligns with a predetermined position on an article, which comprises the steps of: providing the labels to the articles at given labeling intervals at the labeling station; determining a relative degree of shift between the predetermined position on an article which is being fed and the specific point on a label provided by said providing step; and adjusting the labeling interval based on said relative degree of shift so that the specific point on the label corresponds to the predetermined labeling point on the article.

The determining step may include the step of detecting actual carrying positions of the articles to determine a degree of positional shift from the given carrying interval which corresponds to the given labeling interval. The adjusting step adjusts the labeling interval of the providing step at each pitch based on the degree of shift so that the specific point on a label always corresponds to the predetermined position on an article.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood from the detailed description given hereinbelow and from the accompanying drawings of the preferred embodiment which are given for explanation and understanding only and are not intended to imply limitation to the invention.

Fig. 1 is a schematic diagram which shows a labeling system according to the present invention.

Fig. 2 is a schematic representation which shows a degree of positional shift of vessels on a conveyer.

Fig. 3 is a schematic view which shows an angular sensor means suitable for box shaped vessels which detects angular misregistration thereof on the conveyer.

Fig. 4 is a schematic view which shows another type of angular sensor means as shown in Fig. 3.

Fig. 5 is an explanatory view which shows an angular and positional relationship between a vessel and a labeling head.

Fig. 6 is a schematic plan view which shows a second embodiment of a vessel carrying mechanism.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, particularly to Fig. 1, there is shown a labeling system according to the present invention. This system comprises generally an input screw unit 1 functioning as a positioner for vessels 5, a conveyer 2 for carrying vessels, a labeling station 3 for providing a label to the vessels, and compression units 4 for pressing the label attached to the vessel.

The vessels 5, such as bottles are positioned by the input screw unit 1 at a given interval and are carried on a belt of the conveyer 2 toward the labeling station 3. The labeling station includes a rotary labeling drum 12, labeling heads 15, an adhesion roller unit 16, and a label magazine 8. The rotary labeling drum 12 is rotatably supported by gearing (not shown) disposed beneath the labeling station and is driven by a drive motor 6 through a gear assembly 20 so as to be mechanically synchronized with the rotation of the input screw unit 1 via a main drive shaft 14. The synchronization determines a carrying pitch between the vessels 5 on the conveyer 2 to provide precise sequential labeling. On the circumference of the rotary labeling drum 12, labeling heads are arranged, for example, at six intervals. The label magazine provides a label to the labeling heads in sequence. The adhesion roller unit 16 provides an adhesive onto the reverse surface of the label provided on the head 15. Thereafter, this label is attached to a given area of a vessel 5 carried by the conveyer 2.

Such a sequential labeling operation is effected by the precise synchronization of the input screw unit 1 with the rotary labeling drum 12. The synchronization is however subject to slippage due to shifts in vessel position caused by gripping, or misregistration of the vessel on the conveyer 2 or backlash from the drive caused by wear of gears for example. Therefore, in the labeling system according to the invention. an means for compensat-

ing for a degree of shift of the vessel with respect to a head of a rotary labeling drum is provided. This means includes a differential gear 13, a servo motor 7 therefor, a photo sensor 10, and a controller 9. The photo sensor 10 is adapted for sensing the position of a vessel carried on the conveyer and to provide a signal indicative thereof to the controller 9. The controller determines the relative degree of shift between each vessel 5, or a predetermined position defined thereon and a corresponding head of a rotary labeling drum 12. During the labeling operation, the differential gear 13 is driven by a servo motor 7 according to the value of the relative degree of shift. The differential gear 13 is mechanically connected to a gear (not shown) disposed beneath the labeling station 3 via a shaft 22. This gear rotates the rotary labeling drum 12 so as to advance or retard the rotation thereof independent of the drive motor 6 to compensate for any shift in vessel position to maintain accurate label placement. After labeling in the labeling station, the vessel is pressed by a pair of pads at the compression unit 4 to finish the sequential labeling operation

The means further includes a rotary encoder 11. The rotary encoder 11 is installed on the rotary labeling drum 12 so as to monitor an angle of rotation thereof and provides pulse signals of an "A", a "B", and a "Z" phase indicative of the angular position of the drum to the controller 9 (As is well known in the art, a rotary encoder is adapted for providing an A phase pulse signal, a B phase pulse signal, and a Z phase pulse signal. The B phase pulse signal is shifted 90 degrees from the-A phase pulse signal. The Z phase pulse signal is a reference signal which is output every cycle). In the controller 9, an interface circuit (not shown) for the rotary encoder is provided. This circuit detects the leading edges of pulse signals of the A and B phases. The frequencies of these pulse signals are multiplied by four and counted by a sixteen bit downcounter. When the first pulse of the Z phase signal is detected, the CPU is interrupted and the downcounter is reset to "0" through the system software. It will be understood that pulse signals output from the rotary encoder are meaningless until the Z phase signal is input to the controller each cycle. Between cycles an indicator provided on a control panel of the controller shows nothing.

The downcounter receives P number of pulse signals for every cycle of the rotary labeling drum 12 and indicates a value within 0 to -(P-1) (0 to -14399). (Thus, since six labeling heads are provided on the rotary labeling drum, the angle between each corresponds to 2400 pulse signals. These 2400 pulse signals correspond to the carrying pitch of the vessels.) When the vessel 5 is carried within a detecting range of the photo sensor 10, the sensor senses the leading edge of the vessel and provides a signal to the controller 9 to interrupt the CPU. At this time, the CPU reads the value of the downcounter and can convert this value into to provide an integer value within 0 to (P-1) (0 to 14339) as the phase angle of the rotary labeling drum 12. Assuming that the integer value is "RE", the phase difference (R) is the degree of displacement of a labeling head past a labeling point defined by the exact coincidence of the labeling head with the predetermined position of the articles at the labeling station. The number of pulses defining R are counted beginning at the labeling point and ending when the photo sensor 10 encounters the leading edge of the next vessel. (as in Fig. 2) This value can be expressed as follows;

R = MOD (RE / P = 14399 / the number of heads on the rotary labeling drum.)

It will be noted that lhe R is the remainder when RE X a number of heads is divided by P. the value "R" is variable dependent on the degree of shift of the vessel with respect to the head of the rotary labeling drum. However, in view of possible error in the mounting position of the photosensor 10 with regard to labeling position, and tolerances necessary due to the different detected positions of different kinds of vessels, addition of a certain constant value to the R value is practically necessary. Accordingly, if this certain value is "C", the degree of deflection E necessary to align the labeling head 15 with the real position of the oncoming vessel 5 is obtained by the following equation.

E = R - C ----- (1)

After obtaining the deflection E, the controller 9 provides pulse signals of a number corresponding to the deflection E to the servo motor 7. The relationship between the input pulse signals from the rotary encoder 11 and the output pulse signals to the the servo motor 7 is as follows:

(a number of input pulse signals for one cycle / a number of output pulse signals for one cycle) = (P / Q)

Accordingly, the number of output pulse signals "Y" to the servo motor driving system with respect to the deflection E is as follows:

Y = (P / Q) E ---- (2)

Thus, the servo motor 7 rotates the labeling drum by an angle corresponding to Y number of pulse signals via the differential gear thereby correcting for the shift of a vessel 5 with respect to the corresponding head of the label holder 15. A sequential correction control for phase shift as described above is repeated every carrying pitch and the labeling is thus effected regularly.

In view of a malfunction of the photo sensor 10, or an abnormal status where a carried vessel passes over the control range of the labeling system, meaning the output signal Y exceeds the number of pulse signals corresponding to a range of ± 10 (mm), the CPU breaks off outputting the pulse signals at a predetermined tolerance point in order to protect the mechanical system. Taking account of the decrease in the lifespan of the driving system caused by wear thereof due to frequent adjusting operations, preferably, when the deflection E is small, (e.i., the absolute value of the deflection E is within a certain range "M") no adjusting operation is provided.

Further, in view of backlash of the differential gear 13, the following functions may be provided for a higher adjustment. The following formula replaces the above equation (2).

If Yb > 0 and E > 0, then Y = (P / Q) . E
If Yb > 0 and E < 0, then Y = (P / Q) . (E - B)
If Yb < 0 and E > 0, then Y = (P / Q) . (E + B)
If Yb < 0 and E < 0, then Y = (P / Q) . E

Wherein the "Yb" is a number of the output pulse signals at the previous adjusting operation, while the "B" is a value into which backlash as an error due to reversion of the differential gear 13 is converted and is a proper value defined by the type of differential gears employed.

Referring to Figs. 3 and 4, an angle detecting means for detecting an angular position of the vessels, (or the predetermined labeling position thereon) on the conveyer is shown. In sequential labeling operations, angular misregistration of the vessels tends to occur in addition to the above described positional shift on the conveyer. Fig 3 shows a sensor 30 suitable for box shaped vessels. This sensor is comprised of a light source 32 and a light receiving means 34. The light receiving means includes a plurality of light receiving elements sensitive to the light beam from the light source. When the vessel 5 is carried within detecting range of the sensor 30 with a correct angular position, a light beam propagated from the light source 32 is reflected on a side surface of the vessel at its center and is directed to a predetermined light receiving element of the light receiving means 34. The device 34 provides a signal indicative of the correct angular position to the controller 9. On the other hand, when the vessel 5 is carried with an angular misregistration, the light beam reflected from the surface of the vessel is shifted laterally with respect to the elements on the light receiving means. Thus, the controller 9 can determine the degree of angular displacement of the predetermined position on the vessel in response to the signal output from an element of the light receiving means.

Fig. 4 shows a sensor means 40 suitable for cylindrical vessels. A cylindrical vessel such as a bottle usually has a spot 42 for setting its angular position at a positioning section of the labeling system. The sensor means 40 includes a camera 42 and an image measuring apparatus 46 connected to the controller 9. The camera provides an image signal of the spot on the vessel carried on the conveyer 2 to an image measuring apparatus 46. The sensor means 40 can thereby detect angular misregistration of the vessel on the conveyer 2 and, if present, determine the degree of angular displacement thereof.

Referring to Fig. 5, an angular and positional relationship between the vessel and the labeling head 15 is shown. The shown vessel 5 has been displaced by a distance "x" away from the carrying direction and is shifted by a "-θ angle in the clockwise direction. Accordingly, the distance between the center of the labeling head (i.e., a specific point defined on the label provided on the labeling head) and the point of contact "C" or the arc OC is Rα, while the distance between the center of the vessel and the point of contact C, or the arc LC is -r(-θ-α). The α is set up as in the following equation. $\alpha = \sin^{-1}\{x-(r-z)\sin\theta / (R+r)\}$

However, the above equation can be considered as the following approximate equation.

$\alpha = x-(r-z)\theta / (R + r)$

Thus, the degree of shift of the label, i.e., the deflection "E" is as follows:

$R\alpha = E + r(-\theta-\alpha)$

$E = (R+r)\alpha + r\theta = (R+r)\{x-(r-z)\theta\} / (R+r) + r\theta = x + z\theta$

Wherein the x corresponds to the previous equation (1). Accordingly, from the equation (2), the number of output pulse signals Y is as follows:

$Y = (P / Q)(x + z\theta)$

The controller 9 can output Y number of pulse signals to the servo motor 7 to adjust the labeling interval of the labeling drum as necessary so that the specific point on the label aligns with the predetermined position on the vessel.

The labeling system according to the invention, as described above, is adapted for measuring the pitches between vessels carried on a conveyer and/or an angular misregistration of the vessels to calculate a degree of shift between a given labeling area of the vessel and the corresponding labeling head of the labeling drum and for driving a servo motor to adjust the angle of rotation of the rotary labeling drum. However, the present invention is not limited to the above embodiment of a carrying mechanism for vessels. For example, in a rotary type labeling system as shown in Fig. 3, a differential gear may be provided in a driver for a vessel carrying rotary table 17 and the angle of rotation of the table can be controlled to adjust for phase shift

between a vessel and a corresponding labeling head.

Although the invention has been shown and described with respect to a best mode of embodiment thereof, it should be understood by those skilled in the art that the foregoing and various other changes, omissions, and additions to the form and detail thereof may be made therein without departing from the spirit and scope of the invention.

Claims

1 A labeling apparatus for attaching labels onto articles wherein a specific point defined on a label aligns with a predetermined position on an article, comprising:
first means for feeding the articles toward a labeling station at given carrying intervals;
second means, provided at said labeling station, for providing labels to articles at given labeling intervals which correspond to the given carrying intervals;
third means for determining a relative degree of shift between the predetermined position on an article fed by said first means and the specific point on a label provided by said second means; and
fourth means for adjusting the labeling interval of said second means based on said relative degree of shift so that the specific point on said label corresponds to the predetermined labeling point on said article.

2. An apparatus as set forth in claim 1, wherein said third means includes a sensor means for detecting the actual carrying intervals of the articles to determine a degree of shift from the given carrying interval provided by said first means, said fourth means adjusting the labeling interval of said second means based on said degree of shift so that the specific point on the label corresponds to the predetermined position on the article.

3. An apparatus as set forth in claim 1, wherein said third means includes an angular sensor means for detecting an angular displacement of the predetermined position on an article fed by said first means to determine a degree of misregistration between the predetermined position on the article and the specific point on a label arising from said angular displacement, said fourth means adjusting the labeling interval of said second means based on the degree of misregistration so that said specific point on a label corresponds to said predetermined position on an article.

4. An apparatus as set forth in claim 2, wherein said third means further includes an angular sensor means for detecting an angular displacement of the predetermined position on an article fed by said first means to determine a relative degree of misregistration between the predetermined position on said article and the specific point on a label based on the degree of angular displacement as well as sensor means for determining any shift of the actual carrying interval from the given carrying interval provided by said first means, said fourth means adjusting the labeling interval of said second means based on said degree of said angular and/or carrying interval displacement so that the specific point on the label corresponds to the predetermined position on the article.

5. An apparatus as set forth in claim 1, wherein said second means is a rotary labeling drum having a plurality of labeling heads at regular intervals which respectively dispose labels, said rotary labeling drum rotating so that each labeling head corresponds to an article at the given labeling interval, said fourth means adjusting the rotation of said rotary labeling drum based on said relative degree of shift so that the specific point on a label coincides with the predetermined position on an article.

6. An apparatus as set forth in claim 4, wherein said second means is a rotary labeling drum having a plurality of labeling heads at regular intervals which respectively dispose labels, said rotary labeling drum rotating so that each labeling head corresponds to the predetermined position on an article at given labeling interval, said fourth means adjusting the rotation of said rotary labeling drum based on the relative degree of shift between the predetermined position on an article and the specific point on a label so that the specific point on the label aligns with the predetermined position on the article.

7. An apparatus as set forth in claim 1, wherein said second means is a rotary labeling drum having a plurality of labeling heads at regular intervals which respectively dispose labels and said third means includes a first sensor for sensing an article fed by said first means and a second sensor for detecting the angular position of the rotary labeling drum to provide a signal indicative thereof, said third means determining a degree of angular displacement of the rotary labeling drum based on the signal from said second sensor after the labeling head passes a labeling point, which is defined by the coincidence of the specific point on a label with the predetermined position on an article at the labeling station, until another article is sensed by said first sensor to calculate a degree of phase shift of said angular position of the rotary labeling drum from the given labeling interval, said fourth means adjusting the rotation of said labeling rotary drum so as to implement said degree of phase shift.

8. A labeling apparatus for attaching a label to a predetermined position on articles comprising:
first means for carrying articles at given carrying intervals to a labeling station;
second means, provided at the labeling station, for attaching a label onto the predetermined position on an article at a given labeling interval;
third means for determining relative positional shift between an actual carrying position and a carrying position coinciding with the labeling interval of said second means and providing a signal indicative thereof; and
fourth means for adjusting the labeling interval of said second means to synchronize with the actual carrying interval based on said signal from said third means in order to attach the label onto the predetermined position on articles.

9. An apparatus as set forth in claim 8, wherein said third means includes a first sensor means for detecting an article carried by said first means to provide a signal indicative thereof, said third means determining the degree of shift in an actual carrying position from a carrying position which coincides with the given labeling interval of said second means based on the signal from said first sensor means to provide a signal indicative thereof.

10. An apparatus as set forth in claim 9, wherein said second means is a rotary labeling drum which has a plurality of labeling heads for providing a label onto the predetermined position on an article, said labeling heads being mounted thereon at regular intervals and said third means further including a second sensor means for detecting the angular position of said rotary labeling drum to provide a signal indicative thereof, said third means also detecting the angular position of said rotary labeling drum in relation to the actual carrying interval to determine the degree of phase shift necessary to align the labeling interval of said rotary labeling drum with the actual carrying position of the next article to be labeled and sending a signal indicative thereof to said forth means for adjusting the labeling interval of said labeling means to synchronize with the actual carrying position based on the degree of phase shift determined by said third means so that the labeling head corresponds to the predetermined position on the article.

11. An apparatus as set forth in claim 10, wherein said first sensor means is a photo sensor and said second sensor means is a rotary encoder.

12. An apparatus as set forth in claim 10, wherein said first sensor means senses the leading edge of the next article provided by the first carrying means to provide a signal indicative thereof, said third means determining the angular position of said rotary labeling drum after having disposed a label in response to said signal from said first sensor means and provides a signal indicative thereof to said fourth means for adjusting the labeling interval of said second means based on said angular position of the rotary labeling drum relative to the carrying position of the next article as sensed by the first sensor means so that the labeling head is synchronized with the actual carrying position of the article.

13. A method for attaching labels onto articles carried to a labeling station at given intervals wherein a specific point defined on the label aligns with a predetermined position on the article, comprising the steps of:
providing the labels to the articles at given labeling intervals at the labeling station,
determining a relative degree of shift between the predetermined position on an article which is being fed and the specific point on a label provided by said providing step; and
adjusting the labeling interval based on said relative degree of shift so that the specific point on the label corresponds to the predetermined labeling point on the article.

14. A method as set forth in claim 13, wherein said determining step includes detecting actual carrying positions of the articles to determine a degree of positional shift from the given carrying interval which corresponds to the given labeling interval, said adjusting step adjusting the labeling interval of said providing step at each pitch based on said degree of shift so that the specific point on a label always corresponds to the predetermined position on an article.

15. A method as set forth in claim 13, wherein said determining step includes detecting an angular displacement of the predetermined position on an article which is being carried with respect to the labeling point at the labeling station to determine a relative degree of shift between the predetermined position on the article and the specific point on a label based on said angular displacement, said adjusting step adjusting the labeling interval based on the relative degree of shift so that the specific point on the label corresponds to the predetermined position on the article.

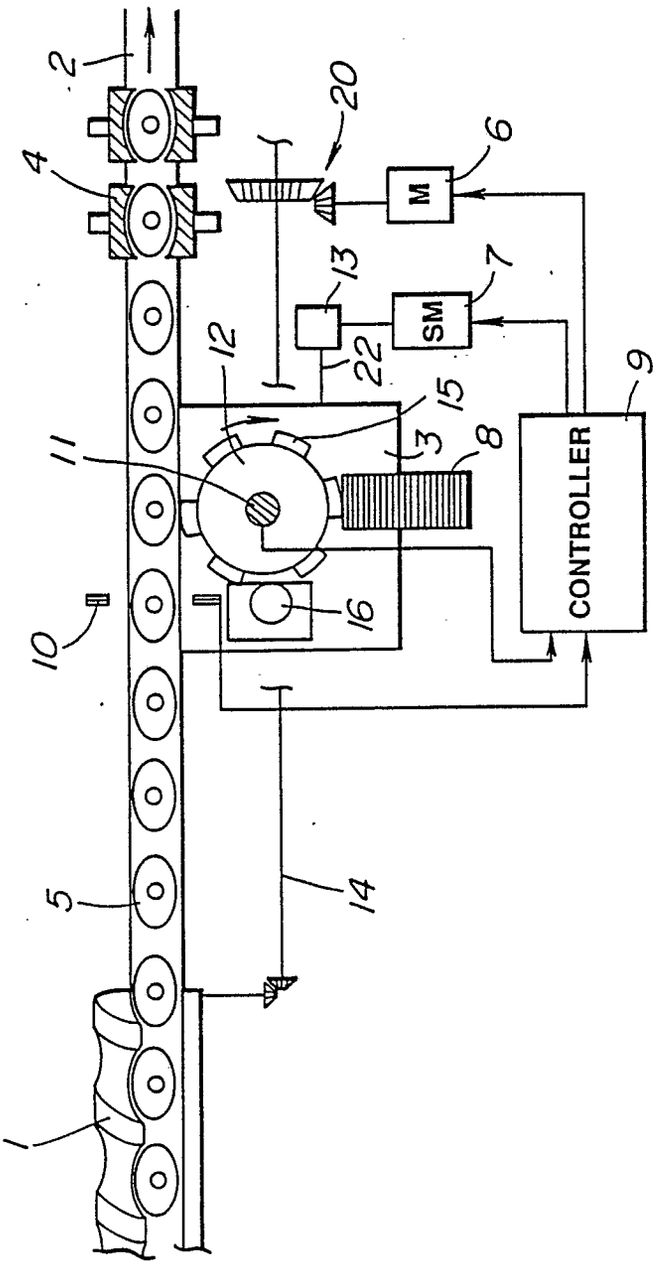


FIG.1

FIG.2

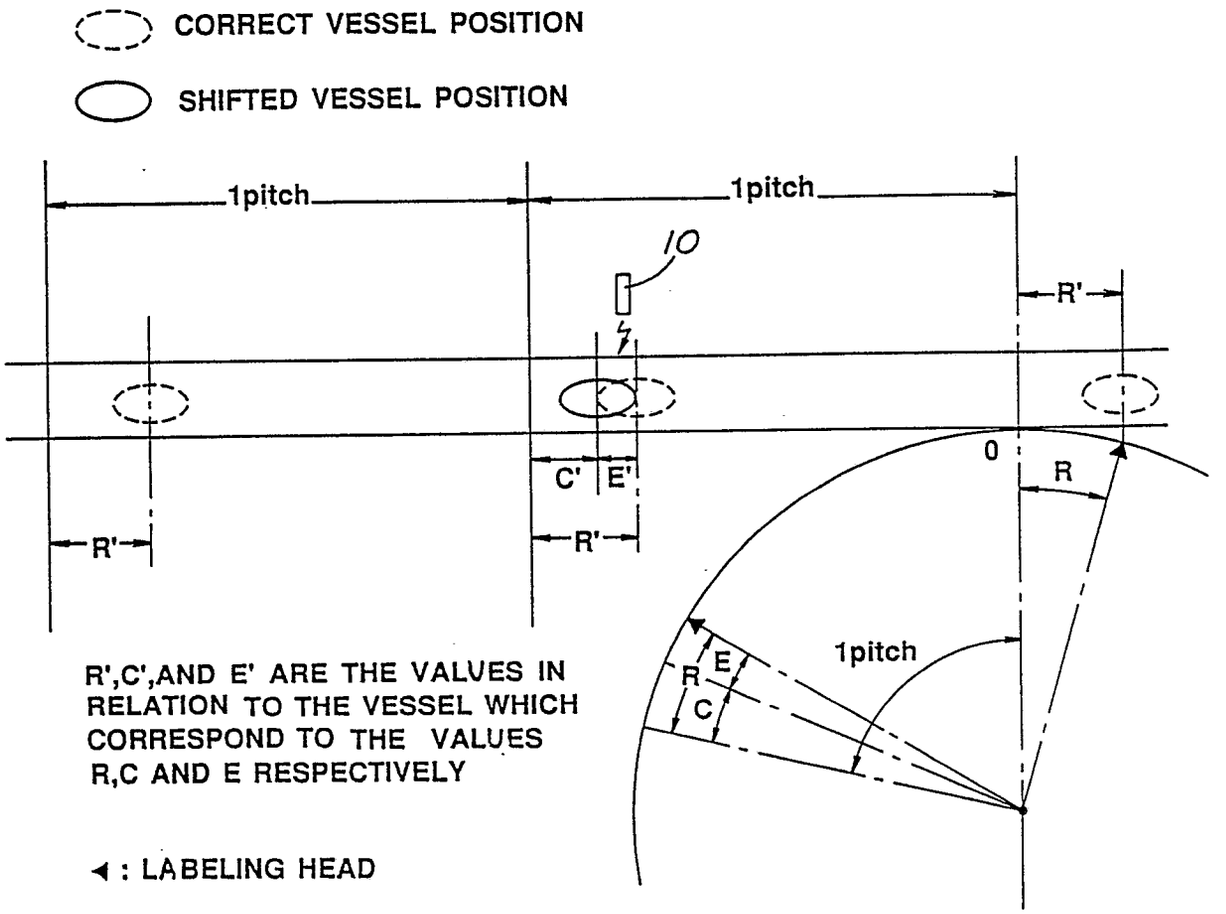

CORRECT VESSEL POSITION
SHIFTED VESSEL POSITION
1pitch
1pitch
10
R'
R'
C'
E'
R'
R'
0
R
1pitch
E
R
C
R',C',AND E' ARE THE VALUES IN RELATION TO THE VESSEL WHICH CORRESPOND TO THE VALUES R,C AND E RESPECTIVELY
◄ : LABELING HEAD

FIG. 3

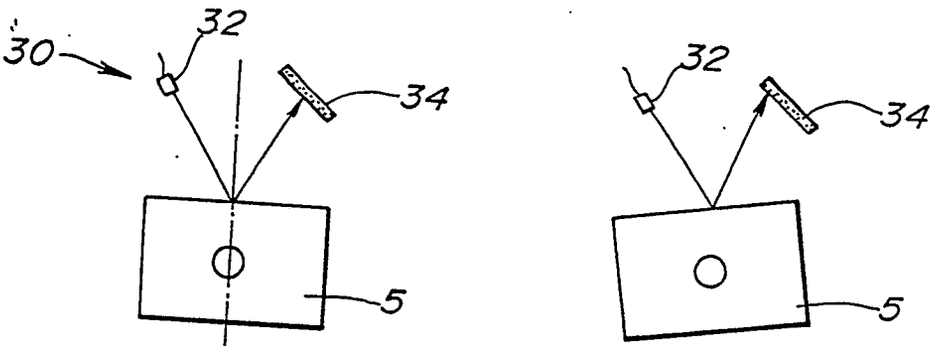


FIG. 4

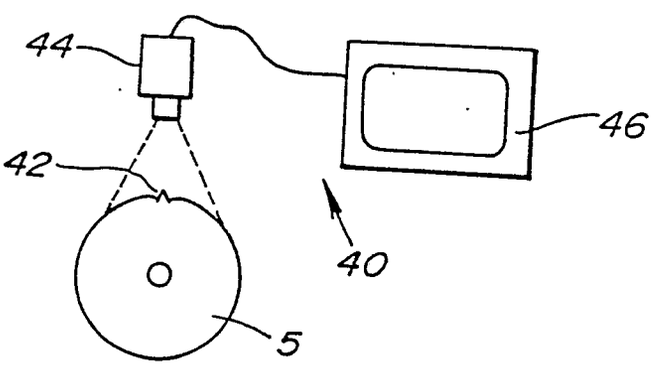
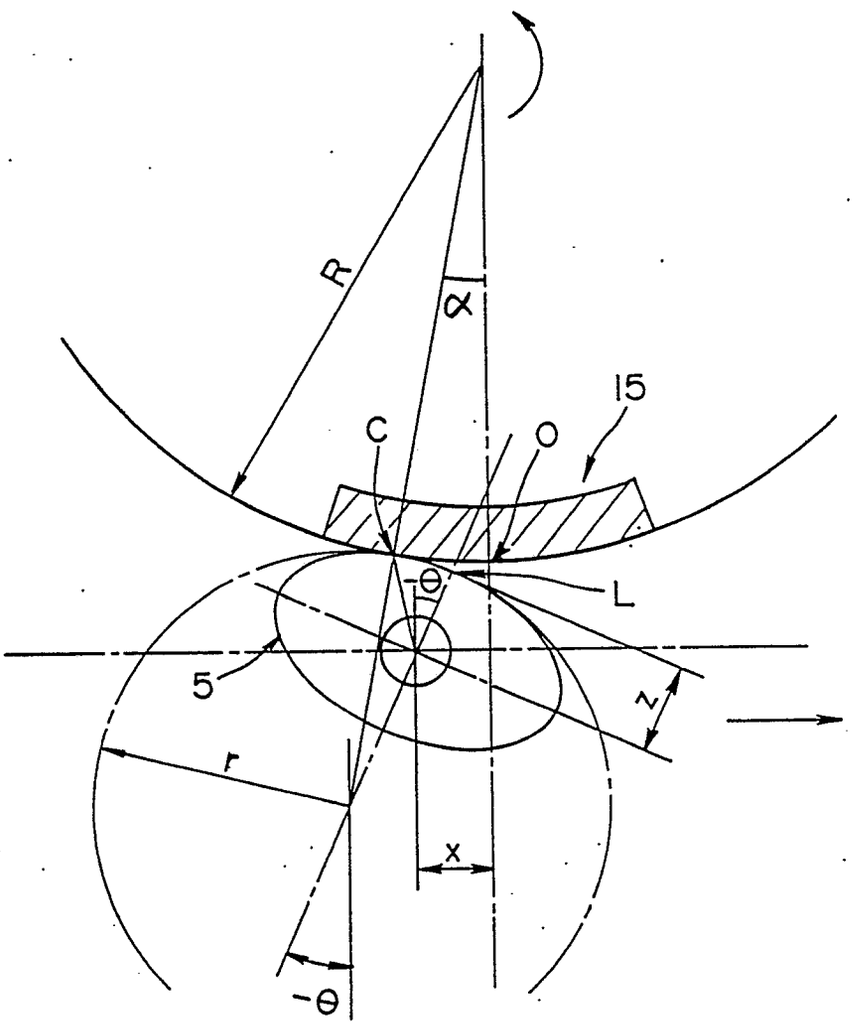


FIG.5



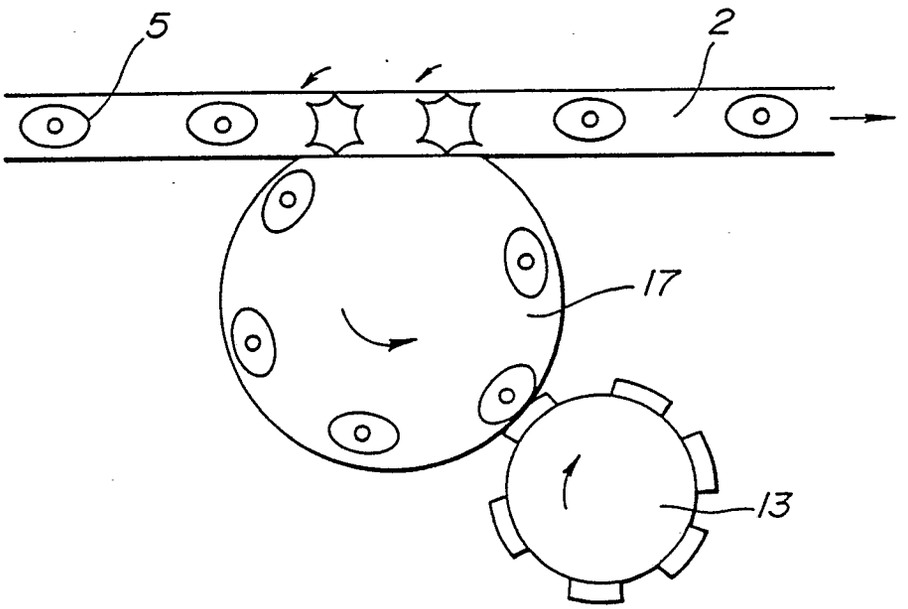


FIG.6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 10 7568

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	EP-A-0 033 609 (DATAFILE LTD) * Claims 11,17,19,24,25; page 2, lines 25-29; page 23, lines 19-30; page 30, lines 2-5; figures 6-9 *	1,2,8,9,13,14	B 65 C 9/42
Y		5-7,10-12	
Y	FR-A-1 247 933 (WEISS MACHINENFABRIK UND APPARATEBAU) * Page 4, lines 35-51; figure 1 *	5-7,10-12	
Y	GB-A-2 187 318 (MONARCH MARKING SYSTEMS INC.) * Figure 6 *	11,12	
A	FR-A-2 436 725 (KRODSS) * Page 7, line 10 - page 8, line 6 *		

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 65 C
B 65 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18-07-1989	VAN DEN BOSSCHE E.J.N.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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