United States Patent

Woelbel

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[54] LABEL REGISTRATION FOR HELICALLY WOUND CONTAINER BODIES

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[52] **U.S. Cl.** **93/80**, 93/94

[51] **Int. Cl.** **B31c 1/00**

[58] **Field of Search** 93/80, 94

[56] **References Cited**

UNITED STATES PATENTS

2,737,091	3/1956	Robinson	93/80 UX
3,264,956	8/1966	Glasby et al.	93/94

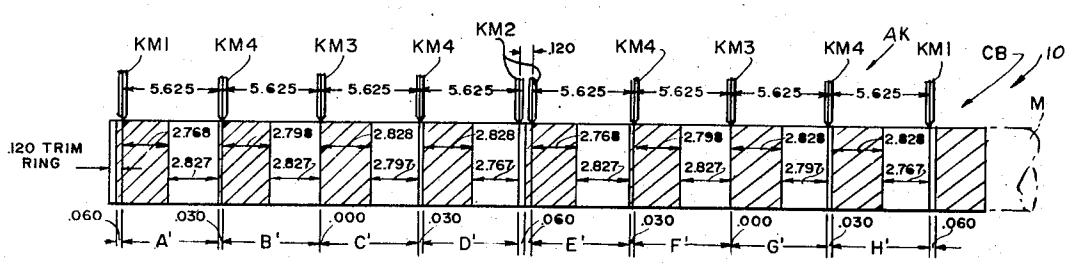
Primary Examiner—Bernard Stickney

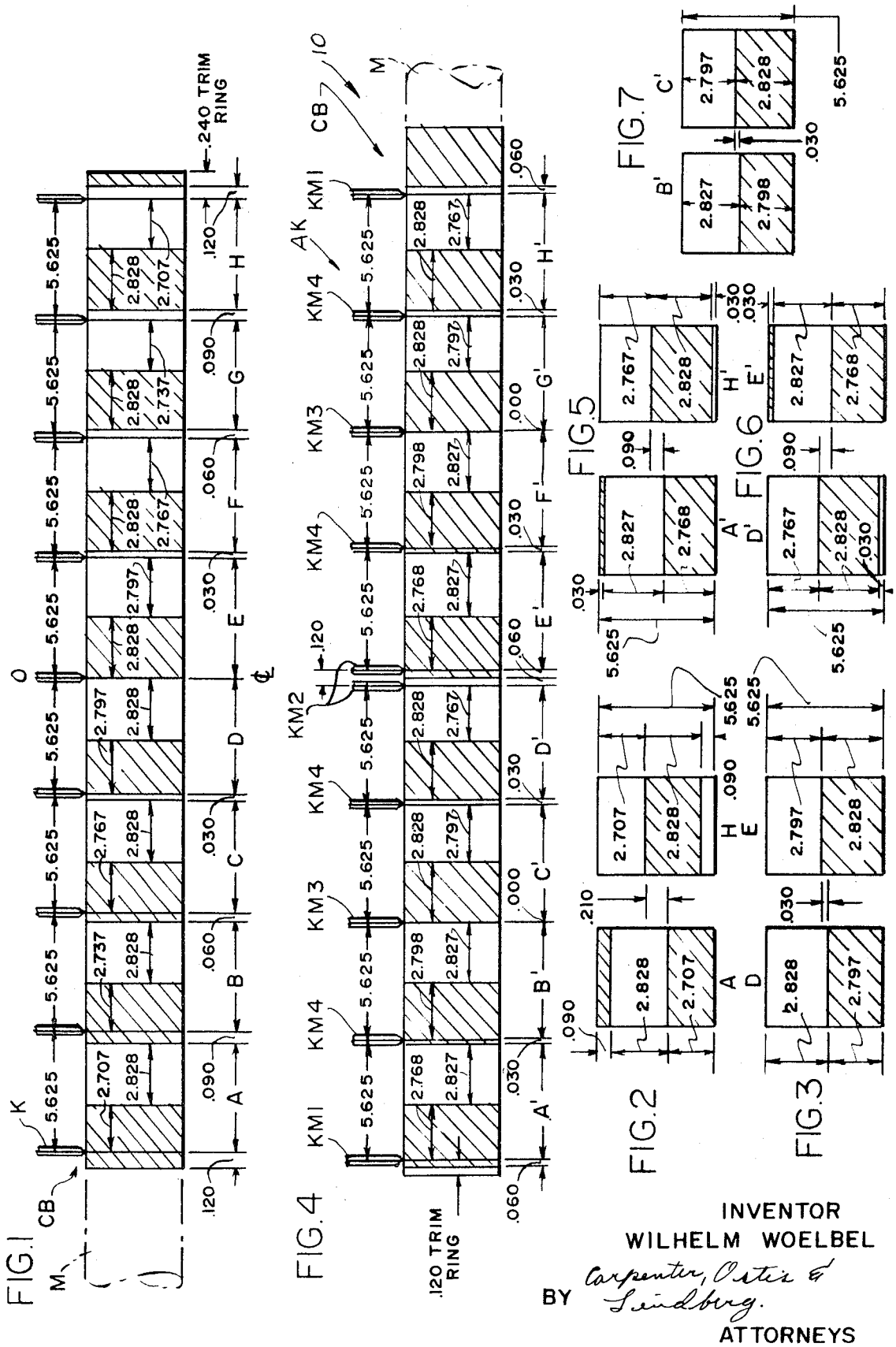
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[57] **ABSTRACT**

The error occurring in helically winding container bodies having a label pattern repeated thereon is minimized to an extent whereby the placement of the container closures at the ends thereof gives substantially similar appearance to all the containers irrespective from the point on the wound "stick" where they originate.

6 Claims, 7 Drawing Figures





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LABEL REGISTRATION FOR HELICALLY WOUND CONTAINER BODIES

THE PRIOR ART

The prior art is exemplified by the following patents:

Robinson	2,737,091	Mar. 6, 1956	93/93
Brigham	3,158,074	Nov. 24, 1964	93/80
Brigham	3,220,320	Nov. 30, 1965	93/80
Glasby et al.	3,264,956	Aug. 9, 1966	93/94

The current practice for forming helically wound container bodies from a plurality of laminae having a repetitive helically wound label thereon is customarily referred to in the art as the "hidden trim method." This practice is exemplified in Robinson U.S. Pat. No. 2,737,091. The practice results in discrete container bodies of a uniform height, but the resulting bodies have the labels thereon positioned nonuniformly. This nonuniformity of the placement of the label arises from the fact that the winding process is not exactly uniform by reason of the fact that the helically wound labels introduce a winding error in that each helically wound label does not conform in dimension exactly to the height of the container body.

In correcting for such error a trim ring is cut from the "stick" after the winding operation, and the error introduced by each label is proportioned in such a fashion that the resulting individual labeled container bodies vary slightly in appearance.

The trim ring is generally cut from the leading end of the "stick," and its dimension is the difference between the proper length of a stick of a container bodies and the total length of the labeled stick as wound. In distributing the error by the hidden trim method, the stick is severed centrally thereof along a proper line of demarcation between the labels of a pair of adjoining container bodies. Since the label dimension is different from the desired proper length of the container body, the error accumulates from the center of the stick to each side thereof. The resulting container bodies contiguous to the central cutting thereof thus have a different appearance from those container bodies at each end of the stick.

It is to the correction of this problem that this invention is primarily directed, and the practice thereof results in the formation of container bodies which have a minimum difference in appearance.

FIELD OF THE INVENTION

In the practice of the invention herein a pair of trim rings are cut from the formed stick, each of such trim rings representing one-half the total error in the formation of the stick. One of said trim rings is cut from the center of the stick, and the other is cut from the trailing end of an already formed stick, or from the leading end of a stick being formed. By reason of cutting of a pair of trim rings, the resulting container bodies have a substantially uniform appearance. The invention, then,may be termed "improved hidden trim" method.

SUMMARY OF THE INVENTION

The structure according to the present invention comprehends the formation of container bodies in a helical winding operation, the container bodies being uniform in height, and being substantially identical in appearance to all the other bodies formed in the winding operation. The error in the label which appears at the ends of each of the container bodies is of such a dimension that it may be effectively concealed when the end members are placed on the container body.

The invention herein will be described by a comparison of the prior art "hidden trim" method, and the improved method according to the present invention.

THE DRAWING

FIG. 1 is a schematic elevational view showing the manner in which container bodies are formed in accordance with the hidden trim method of the prior art;

FIG. 2 is an elevational view of a pair of identically sized container bodies formed by the apparatus seen in FIG. 1, showing the differences in appearance of bodies cut from opposite ends of a "stick;"

FIG. 3 is a view similar to FIG. 2 showing the appearance of a pair of container bodies severed from the center of the "stick;"

FIG. 4 is a view similar to FIG. 1 illustrating the structure and method according to the present invention;

FIG. 5 is an elevational view of a pair of container bodies cut from opposite ends of the stick seen in FIG. 4;

FIG. 6 is a view similar to FIG. 5 showing the appearance of container bodies cut from the center of the stick seen in FIG. 4; and

FIG. 7 is a view of container bodies cut from other portions of the stick.

FIG. 1 shows the formation of container bodies in accordance with the teachings of Robinson U.S. Pat. No. 2,737,091, which is commonly called the "hidden trim method." As is known in the prior art, and as seen in FIG. 1, a connected group of container bodies CB are helically wound about a mandrel M. In the formation of the bodies CB they are also wound with a repetitive label L, which for purposes of convenience in description consists of a blank portion and a shaded portion.

The connected container bodies CB, known in the art as a "stick," are severed into discrete container bodies identical in length. In their formation the outer wrap comprising the label L generally can not have precisely the same length as a discrete body. The reasons for same are well known by those skilled in the art.

For purposes of illustration of the prior art the stick being formed on the mandrel M will be considered as consisting of eight connected bodies each having a height of 5.625 inches. In the winding of the stick it accumulates an error 0.240 inch, this error being that introduced by the accumulated error in the labels L as they are helically wound. For purposes of discussion of the prior art, each discrete label will be considered as having a total height of 5.655 inches, each label thereby introducing an error of 0.030 inch which must be accounted for in the severing of the stick into discrete container bodies.

In the formation of such bodies they are severed while on the mandrel M by a plurality of rotating knives K arranged into an array as seen in FIG. 1, each such knife K being spaced a distance 5.625 inches, the prescribed height of the container body. The centermost of the knives K is arranged to cut the labels L at a point exactly on the line separating two contiguous labels.

In the operation of the knives K a trim ring 0.240 inch in width is cut from the leading end of the stick.

As a result of the operation of the knives K, the discrete container bodies will vary in appearance. These variations in appearances are indicated by the dimensions on each label, and the error which is accumulated is indicated also with reference to each label on the stick.

The discrete container bodies formed on the mandrel M are identified by the letters A through H, and it will be noted in FIG. 2 that there is a considerable difference in appearance between container body A at one end of the stick and container body H at the opposite end thereof. This difference is indicated as being 0.210 inch, and the labels of such bodies A & H, instead of having the appearances of a single blank area and a single shaded area, differ as follows. In the case of body A, one end thereof has a narrow shaded band 0.030 inch in width, and a wider shaded band 2.767 inches at the opposite end thereof, these two bands being separated by a blank band 2.828 inches (one-half the height of a container body). Body H has, on the other hand, band widths of opposite shading. As seen in FIG. 2, this introduces a disparity of .210 inch, readily discernible to the end user. Moreover, by reason of the widths of the narrow bands (0.090 inch), end closures applied to the bodies do not cover these entirely, and the resulting closed container body is not uniform in appearance.

Those bodies D and E cut from the center of the stick seen in FIG. 1 have disparity of the order of 0.030 inch. However, in the array of container bodies formed in accordance with the teachings of the prior art as exemplified in FIG. 1 there is throughout the length of the bodies formed a wide disparity in appearance.

On the other hand, by the structure and method according to the present invention there is but a small disparity in appearance. Also, the placing of the end closures on the bodies will not result in the appearance of a narrow area of unwanted narrow band areas, the closures concealing such areas.

FIG 4 shows the structure for carrying on the "improved hidden trim" method according to the present invention. Such structure is referred to generally by the reference numeral **10**. The dimensions obtaining with the method according to the prior art are employed in illustrating the improvements according to this invention. As with the prior art seen in FIG. 1, the container bodies CB are wound upon the mandrel M, and each has a repetitive label L.

As seen in FIG. 4, there is shown structure for severing the stick into discrete bodies, said structure consisting of a knife array AK arranged to provide a central trim ring of 0.120 inch, width and a second trim ring of 0.120 inch width either the leading or trailing ends of the stick. Knife array AK consists of first knife means KM1 at each end of the group for cutting the same to a predetermined length. Each of knife means KM1 is spaced from a second knife structure KM2 disposed at the center of the stick to cut the central trim ring. The distance between knife means KM1 and each of the knives of knife means KM2 is equal to the length of four container bodies CB.

A third knife structure consists of third knife means KM3 disposed midway between knife means KM1 and KM2, and each is disposed to sever the stick exactly on the line between the labels L of adjacent container bodies CB.

Each of the last named knife means KM3 is flanked by additional severing structure in the form of knife means KM4 spaced a distance from knife means KM3 equal to the desired height of a container body CB.

In the operation of the mechanism seen in FIG. 4, knife means KM1 cuts a trim ring having a width equal to 0.120 inch, at the leading end of the stick. The center knife means KM2 cuts a trim ring having a width also equal to 0.120 inch. As will now be seen, the provision of the two trim rings of identical dimension, and the disposition of the knife means KM1 through KM4 result in the formation of container bodies which are substantially identical in appearance.

There are only slight differences in appearance between container body A^1 and container body H^1 severed from opposite ends of the stick, and seen in FIG. 5. The maximum disparity between the label sections L of the two bodies A^1 and H^1 is equal to 0.090 inch. Moreover, the narrow bands at each end of the container bodies (not over 0.030 inch in width) can be substantially concealed by the end closure members affixed to each body.

Container bodies D and E cut from the center of the stick of FIG. 4 will result in a difference of 0.060 inch in height of the labels L. Moreover, the narrow bands at the ends thereof can also be concealed by the end closures.

Container bodies B^1 and C^1 (which correspond also to F^1 and G^1) have only 0.030 inch difference in label height with no narrow bands at the ends of the bodies.

As contrasted to the forms seen in FIG. 1, an array of containers formed by the method and structure of FIG. 4 have no substantial difference in appearance between the bodies of an array.

I claim:

1. In a device for forming a plurality of tubular container bodies from a tube comprised of connected bodies having a helically wound strip of material with a repeated pattern thereon, and wherein the winding of said patterned strip creates an accumulation of pattern errors throughout the connected bodies on said tube; the improvement which comprises structure for severing said tube into discrete container bodies of predetermined length, each being of substantially uniform appearance irrespective of the position on said tube from which each body is severed, said structure including means for severing said tube into discrete container bodies of uniform length comprising:

a. first knife means at the ends of said tube for cutting said tube to predetermined length, and for severing therefrom a trim ring having a dimension equal to one-half the total accumulated pattern errors of said tube;

b. second knife means operable to sever said tube approximately at a point midway of the length thereof between adjacent of the repeated patterns of said strip, and

c. including knife elements spaced from each other to cut a trim ring having a dimension equal to one-half the total accumulated pattern errors of said tube;

d. third knife means spaced from each end of said tube by distances equal to said predetermined length of a container body and multiples thereof.

2. In a device for forming a plurality of tubular container bodies from a tube comprised of connected bodies having a helically wound strip of material with a repeated pattern thereon, and wherein the winding of said patterned strip creates an accumulation of pattern errors throughout the connected bodies on said tube; the improvement which comprises structure for severing said tube into discrete container bodies of predetermined length, each being of substantially uniform appearance irrespective of the position on said tube from which each body is severed, said structure including means for severing said tube into discrete container bodies of uniform length including:

a. first knife means at the ends of said tube for cutting said tube to predetermined length, and for severing therefrom a trim ring having a dimension equal to one-half the total accumulated pattern errors of said tube;

b. second knife means operable to sever said tube length midway of the length thereof;

c. said second knife means including knife elements spaced from each other to form a trim ring having a dimension equal to the other half of the total accumulated pattern errors of said tube length; and

d. third knife means spaced from each end of said tube length a distance equal to one-quarter the length of said tube;

3. The invention according to claim **2** wherein said third knife means includes additional knife means located to each side thereof, said additional knife means being spaced from said third knife means by a distance equal to the desired length of a container body.

4. In the method of forming a plurality of tubular container bodies from a tube comprised of connected bodies having a helically wound strip of material with a repeated pattern thereon, and wherein the winding of said patterned strip creates an accumulation of pattern errors throughout the connected bodies on said tube; said method including severing said tube into discrete container bodies of predetermined length, each being of substantially uniform appearance irrespective of the position on said tube from which each body is severed: the improvement in said method comprising the steps of:

a. severing said tube into discrete container bodies of uniform length including the step of severing said tube at the ends thereof for cutting said tube to predetermined length;

b. severing therefrom a trim ring having a dimension equal to one-half the total accumulated pattern errors of said tube;

c. severing said tube approximately at a point midway of the length thereof between adjacent of the repeated patterns of said strip,

i. said step including severing said tube at points spaced from each other to cut a trim ring having a dimension equal to one-half the total accumulated pattern errors of said tube;

d. severing said tube at points spaced from each end of said tube length by distances equal to said predetermined length and multiples thereof.

5. In the method of forming a plurality of tubular container bodies from a tube comprised of connected bodies having a helically wound strip of material with a repeated pattern thereon, and wherein the winding of said patterned strip creates an accumulation of pattern errors throughout the connected bodies on said tube; said method including severing said tube into discrete container bodies of predetermined length, each being of substantially uniform appearance irrespective of the position on said tube from which each body is severed: the improvement in said method comprising the steps of:

a. severing said tube group into discrete container bodies of uniform length including the step of severing said tube at the ends thereof for cutting said tube to predetermined length;

b. severing therefrom a trim ring having a dimension equal to one-half the total accumulated pattern errors of said tube;

c. severing said tube at a point midway of the length thereof between adjacent of the repeated patterns of said strip,

i. said step including severing said tube at points spaced from each other to cut a trim ring having a dimension equal to one-half the total accumulated pattern errors of said tube;

d. severing said tube at a point therealong to each side of the midway point where said trim ring is severed a distance equal to one-quarter the desired length of said tube.

6. The method according to claim 5 including the step of severing said tube at points equal in distance from the points where said tube is severed in last named severing step.

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