Oct. 12, 1971 F. A. CHIDSEY, JR 3,611,656

METHOD AND APPARATUS FOR FORMING CARRIERS FOR CONTAINER GROUPS

Filed April 24, 1970 2 Sheets-Sheet 1

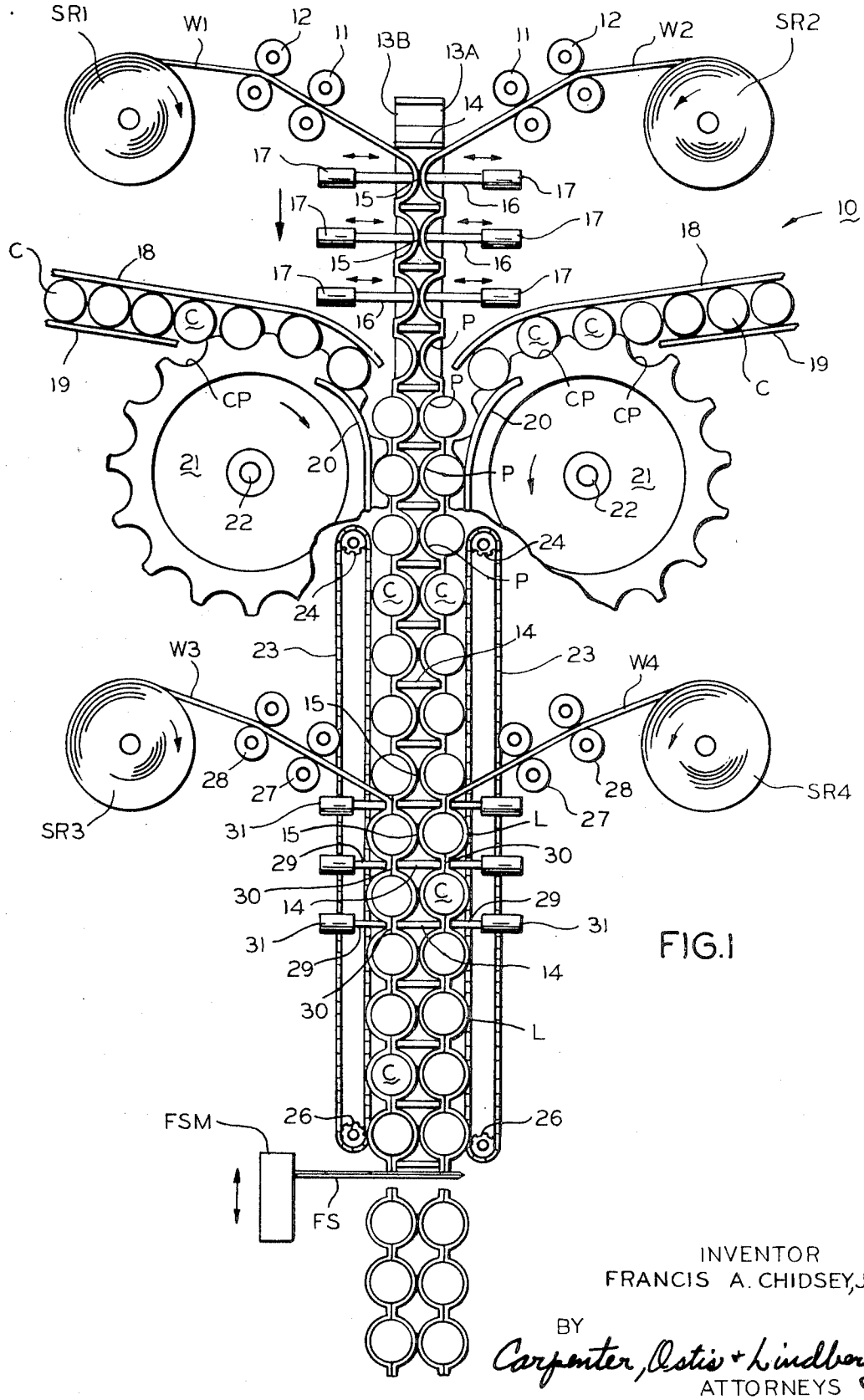

FIG.1

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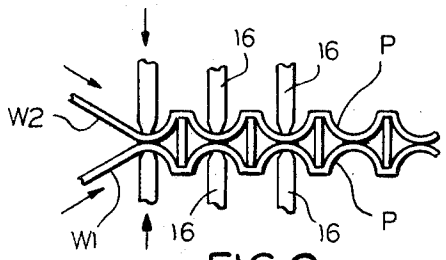

FIG.2

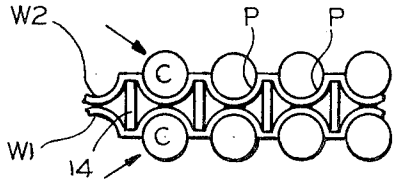

FIG.3

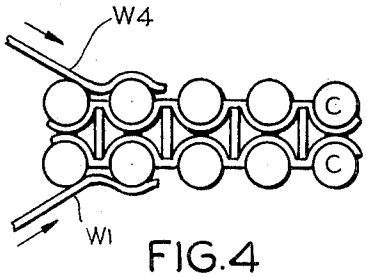

FIG.4

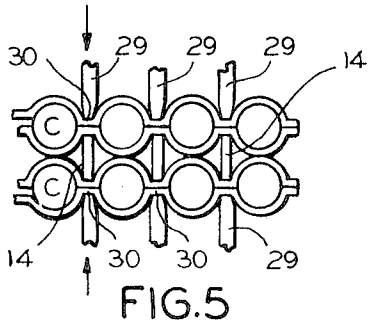

FIG.5

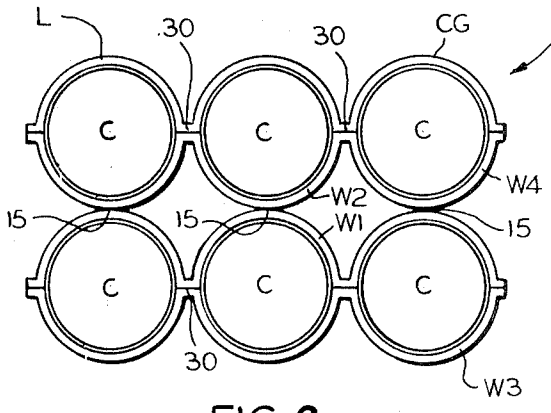

FIG.6

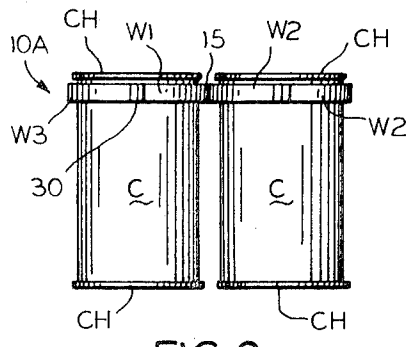

FIG.8

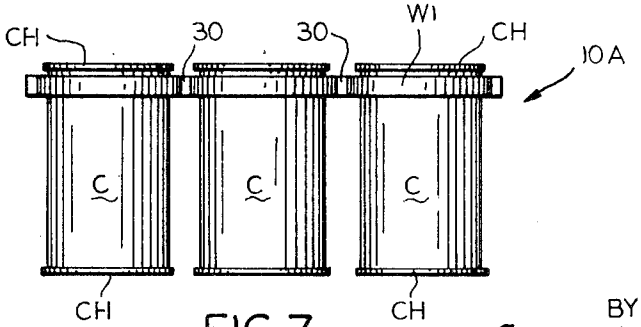

FIG.7

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3,611,656

METHOD AND APPARATUS FOR FORMING CARRIERS FOR CONTAINER GROUPS

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U.S. Cl. 53—3 12 Claims

ABSTRACT OF THE DISCLOSURE

Method and apparatus for forming a carrier for an article group. The carrier is formed from webs extending around the individual articles of the group. Apparatus is provided for feeding a pair of inner webs between two rows of the group, and structure is provided for forming the webs so that each web half encircles the articles of each row. These webs are joined at the points of conjugacy of the articles. Apparatus is also provided for feeding a pair of webs along the outer sides of each row, and for joining such outer webs to the inner webs. The webs are preferably formed from thermoplastic resins having memory characteristics, and each web is stretched prior to its application to the articles, so that the article engaging loops may subsequently contract to hold the articles tightly in the loop. Alternately, the webs may be formed of paper coated with an adhesive material and capable of being adhered.

BACKGROUND OF THE INVENTION

(1) Field of the invention

This invention relates to a method and apparatus for making an article carrier from web-like material. The resulting carrier consists of a plurality of conjugately arranged loops adapted to be fitted about a group of containers arranged in a predetermined relationship. The loops are formed in a unique method practiced in the apparatus disclosed herein.

(2) The prior art

In the packaging of beverages, for example, those commonly known as six-packs, it has been the practice to form a carrier from a web of a resinous material having memory characteristics. The web is provided with apertures through which a container extends and is engaged. After the apertured web is placed over the container group, the resinous material of the web is shrunk about the individual containers, so that they are tightly secured by the web.

The following patents are illustrative of the prior art relating to carriers of the general type just discussed and formed in the manner recited: Poupitch, 2,874,835, Poupitch, 2,997,169, Fisher, 3,044,230, Poupitch, 3,086,-651, Whyte, 3,232,422, Cunningham, 3,268,070, Wanderer, 3,269,530, Beart, 3,307,321.

In the formation of carriers as disclosed in the above patents, a moving web must be punched to provide the container receiving apertures, resulting in an inordinate amount of waste material.

Other forms of carriers made from resinous materials are shown in the following patents: Whiteford, 3,224,576, Stern et al., 3,250,564, Wanderer, 3,269,530.

Structures of the kind disclosed in the just previously mentioned patents require the use of the complicated moulding equipment which cannot function in continuous uninterrupted cycles.

The following patents illustrate carriers formed from a flat sheet of resinous material having the property of being shrinkable about the containers. These carriers are formed with a minimum amount of loss in scrap material: Biesecker et al., 2,994,426, Curry et al., 3,186,544, Wozniak, 3,385,626.

SUMMARY OF THE INVENTION

A carrier constructed according to the method and apparatus of present invention consist of conjugately arranged loops, each having an axial extent which is considerably greater than the thickness of the material forming the loops. The tube-like elements are formed from a plurality of webs fed to moving container groups and adhered together between the containers of the group to provide a plurality of loops, each loop being adapted to hold tightly therein a container of the container group.

THE DRAWINGS

FIG. 1 is a plan view of apparatus for carrying out the method according to the present invention;

FIGS. 2 to 5 inclusive are schematic plan views showing the steps employed in forming an article carrier in the apparatus seen in FIG. 1;

FIG. 6 is a plan view of a container group held within a carrier formed by the appaartus and method according to the present invention;

FIG. 7 is a side view thereof; and

FIG. 8 is an end view thereof;

The improved apparatus and method according to the present invention is referred to generally by the reference numeral **10** and is adapted to form an article carrier **10A** about an article or container group CG comprised of individual articles or containers C which may be of the type having upper and lower chimed ends CH.

The structure for forming the carrier **10A** about the container group CG seen in FIGS. 6 to 8 inclusive is seen in FIG. 1, and includes a pair of supply reels SR1 and SR2, these respectively supplying inner webs W1 and W2. The webs are preferably made of resinous material having memory characteristics for a purpose as will appear. In the several views seen the thickness of the webs is exaggerated to enable the invention to be described more readily. The webs W1 and W2 are preferably made of thermoplastic material and self-adhere by the application of heat.

It may be noted that the webs disclosed herein may be of paper with coatings capable of adhering generally by the application of heat.

The two webs W1 and W2 are adapted to be fed between paired spaced rollers **11** and **12**, rollers **11** turning a greater peripheral speed than rollers **12** so that the length of the webs therebetween is stretched a slight amount. The two webs W1 and W2 move in side-by-side relationship by a flight conveyor **13A** having flights **14** thereon, these standing erect from the individual flight members **13B** comprising conveyor **13**. The webs W1 and W2 are spaced by the flights **14**.

The two webs W1 and W2 are adhered together by means of heated welding members **16** movable to and fro laterally of the direction of the movement of the flight conveyor **13A** by means of air cylinders **17**. Structure, not shown, is provided for heating the members **16**, and details of such structure are well-known and need not be described in detail herein. Upon closing of the two laterally moving webs members **16** with the webs W1 and W2 therebetween a weld **15** is made in webs W1 and W2 midway between a pair of upstanding flights **14**.

It may be noted that the welding operation referred to takes place with such speed in the ordinary case that the welding members **16** and the actuating cylinders **17** do not need to move with the flight conveyor **13**, and that the time of contact of the two webs W1 and W2 during such welding operation is such a short interval that a "flying" type of device is not necessary. It may be noted also, that the welds **15** are made three at a

time, and that the operation of the welding members **16** and cylinders **17** are timed according to the movement of conveyor **13A**.

The two inner webs W1 and W2 are shown as extending in rather semi-circular fashion between adjacent flight **14**. Actually each web W1 and W2 is stretched a slight amount between flights **14** by reason of the operation of the welding members **16, 16**.

The so-connected webs W1 and W2 thus have pockets P therein between the adjacent flights **14**, and structure is provided for introducing a container C to each side-by-side pocket P. These are fed in a chute defined by side rails **18** and **19**, and the containers C are properly spaced by star wheels **21** located one to each side of the flight conveyor **13A**, and turning in timed relationship with the pockets P and flight conveyor **13A** upon a shaft **22**. Each of the star wheels **21** has a container pocket CP therein, and in being guided to the pockets P formed side-by-side webs W1 and W2, each individual container C moves additionally past a side rail member **20**.

The containers C move with the flight conveyor **13A** in side-by-side relationship with each container held in a pocket P formed in the inner webs W1 and W2, and the containers C are each constrained toward the pocket C by endless orbitally movable strands **23** trained at their upstream end around a sprocket **24** and at their downstream end around second sprocket **26**. The strands shown herein are in the form of endless sprocket chains but they equally well may be endless belts trained between tail and head pulleys **24** and **26**.

Downstream from the point where the containers C are moved to the individual pockets P, a pair of outer webs W3 and W4 are trained along side the outer faces of the articles C, and are joined respectively to the webs W1 and W2, as will now appear.

Each of the webs W3 and W4 is supplied from respective supply reel SR3 and SR4, and the webs W3 and W4 are additionally moved between spaced paired rollers **27** and **28** which stretch the webs W3 and W4 slightly in the same fashion as the webs W1 and W2.

Structure is provided for adhering the webs W3 and W4 to the respective webs W1 and W2, and to this end welding members **29** movable by cylinders **31** cause the webs W3 and W4 to be adhered respectively to webs W1 and W2 to provide a closed and stretched loop L about each container body C. As with the heater members **16** and the actuating cylinders **17** providing for adherence of webs W1 and W2, welding members **29** and actuating cylinders **31** may be mounted in such a fashion as to perform the sealing function in a "flying" manner. Unless the container body C moves at a very great speed a "flying" arrangement is not necessary, so long as a good seal is made between the moving webs.

At the completion of the placement of the loops L about the container bodies C, a container group CG is separated from the moving line of containers by a flying shear FS operated by a shear mechanism FSM. The resultant group then appears as seen in FIGS. 6 to 8.

I claim:

1. Apparatus for forming article carriers comprising:
(a) means for feeding a pair of inner webs in side-by-side relationship;
(b) means for adhering the same together at longitudinally spaced points therealong;
(c) means for spacing the webs laterally so as to define an article receiving pocket between each point of adherence of said webs;
(d) means for delivering an article to each of said pockets so that said articles move in side-by-side rows;
(e) means for feeding a pair of outer webs along the outer sides of said articles;

(f) means for forming said last named webs about said articles and for adhering the same to corresponding inner webs to define article encircling loops which are connected together.

2. Apparatus according to claim **1** wherein said inner web spacing means includes an endless conveyor having web engaging flights extending therefrom.

3. Apparatus according to claim **1** wherein said means for forming said outer webs about said articles includes means movable against said inner web spacing means with one of said inner and outer webs engaged therebetween.

4. Apparatus according to claim **1** wherein said webs are formed from resinous materials having memory characteristics.

5. Apparatus according to claim **4** wherein the means for feeding said inner webs includes means for stretching said webs whereby the memory characteristics of said resinous material causes said webs to engage said articles snugly.

6. Apparatus according to claim **4** wherein the means for forming the outer webs around said articles stretches said outer webs whereby the memory characteristics of said resinous materials causes said outer webs to engage said articles snugly.

7. The invention according to claim **1** wherein means are provided for severing said article carrier at regular intervals to provide discrete article groups.

8. The invention according to claim **1** wherein said webs are formed of thermoplastic materials and wherein the adhering means are adapted to heat said webs for adhesion.

9. A method of forming article carriers which comprises the steps of:
(a) feeding a pair of inner webs in side-by-side relationship;
(b) adhering same together at longitudinally spaced points therealong;
(c) spacing the adhered webs laterally between the points of adherence thereof to define article receiving pockets in each web;
(d) delivering an article to the pockets of each web so that said articles move in side-by-side rows;
(e) feeding a pair of outer webs along the outer side of said articles;
(f) forming said outer webs about said articles and adhering the same to corresponding inner webs to define article encircling loops which are connected together.

10. A method according to claim **9** which includes the step of stretching said webs to rely on the memory characteristics thereof to cause the article engaging loops to firmly engage said articles.

11. A method according to claim **9** which includes the step of severing said webs at intervals defining said articles as article groups.

12. A method according to claim **9** wherein said webs are formed from thermoplastic material and said webs are adhered by pressure and heat.

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U.S. Cl. X.R.

53—29, 48, 183, 198 R; 206—65 C