United States Patent

[11] 3,626,817

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[21] Appl. No. **815,457**
[22] Filed **Apr. 11, 1969**
[45] Patented **Dec. 14, 1971**
[73] Assignee **Phillips Petroleum Company**

[54] **CONTAINER MANUFACTURE**
3 Claims, 4 Drawing Figs.

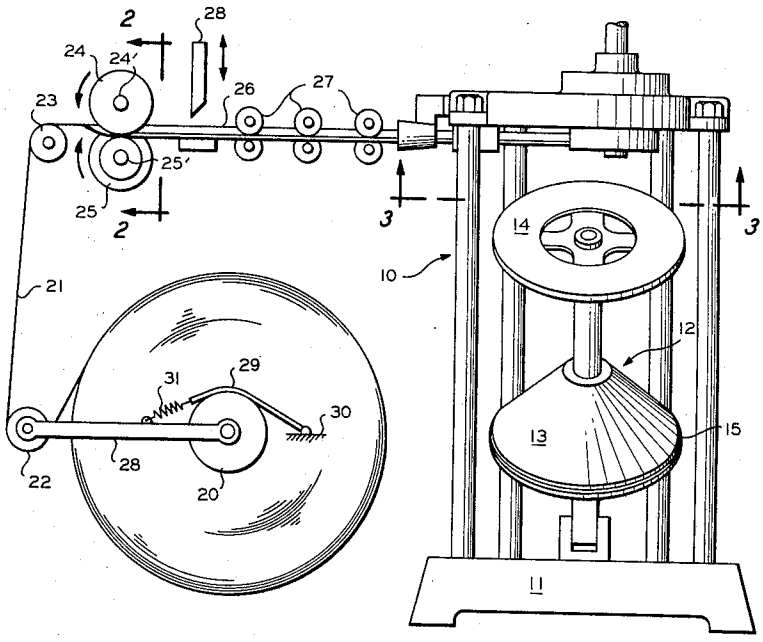
[52] **U.S. Cl.** ..... **93/36.5 R,** 29/243.52, 93/51 R, 93/55.1 M, 93/94 M, 113/120 XY
[51] **Int. Cl.** **B31b 1/72,** B31b 17/74, B23p 19/04
[50] **Field of Search** ..... 93/36.5, 49, 51, 55.1, 94 M; 29/243.52, 511; 113/120 XY

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ABSTRACT: Containers are formed of side and end members which are joined by crimped end rings. The rings are formed by bending a flat strip of material to form a channel member. The channel members are then bent and crimped to secure the container members together.



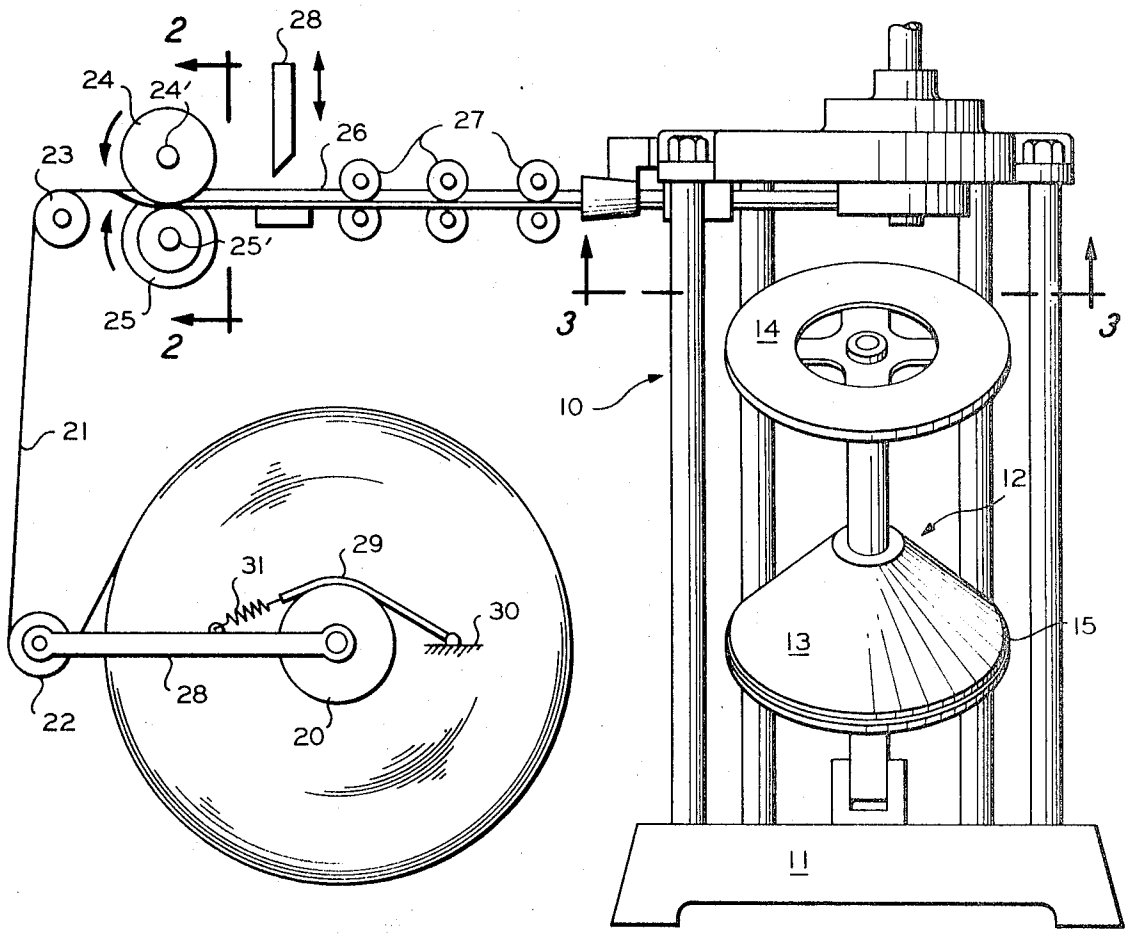


FIG. 1

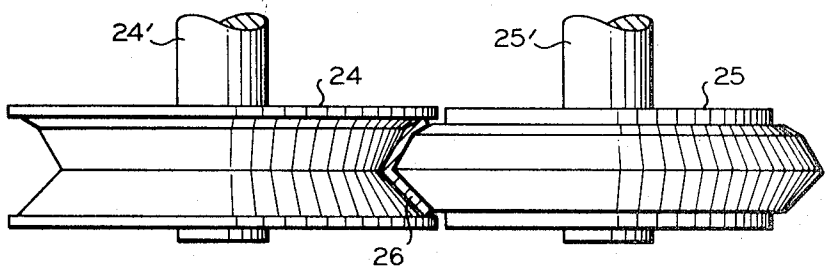


FIG. 2

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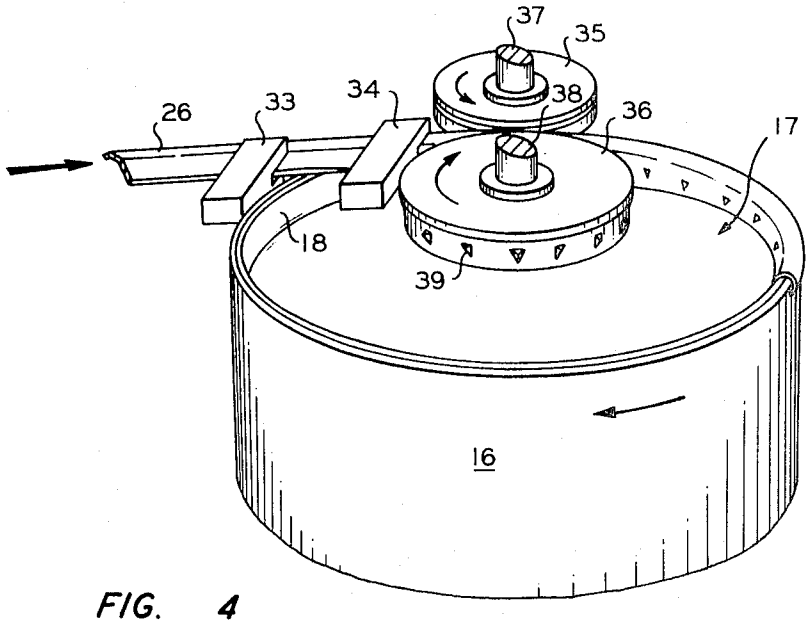


FIG. 4

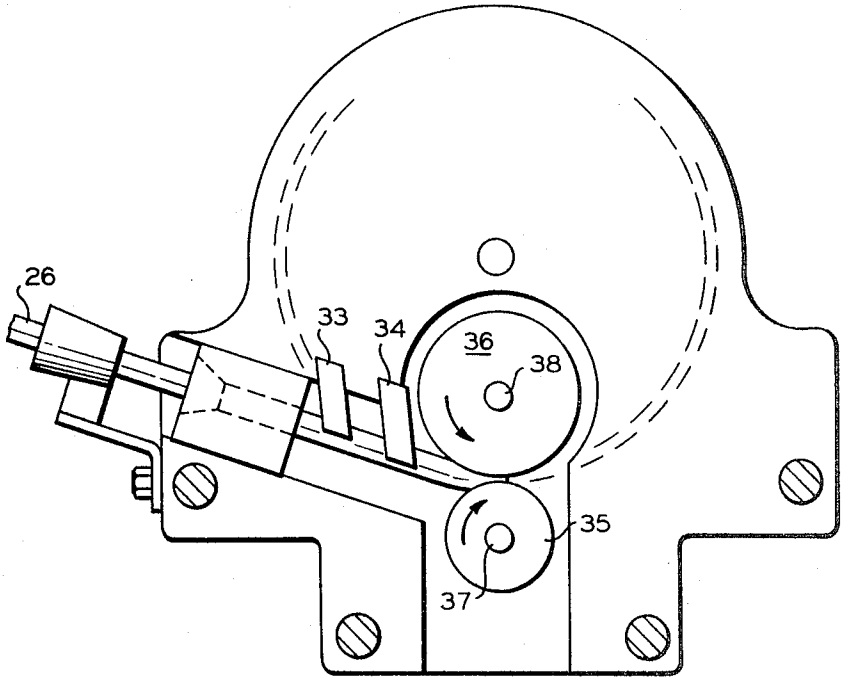


FIG. 3

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CONTAINER MANUFACTURE

It is common practice in the food industry to package relatively large quantities of potato chips, pretzels and similar materials in cylindrical fiberboard containers. These containers are usually manufactured by securing a circular end member to a hollow cylindrical side member. The end member is formed with a flanged edge which is aligned with the end of the cylindrical side member when the container is assembled. A metal ring is then positioned over the two edges and crimped to secure the two members together. The metal ring thus serves to fasten the two members of the container and to protect the bottom edge of the container during shipment and use. In order to avoid transporting relatively large empty containers from the point of manufacture to the filling plant, it is common practice to assemble the containers at the filling plant. The side members of the containers are folded and shipped, together with the circular end members and the metal rings, to the assembly point. While this procedure has been quite successful in the food industry, the shipping of metal rings is a relatively expensive operation. The rings are bulky and are subject to damage in shipment.

In accordance with this invention, a method is provided for forming the metal clamping rings at the time the containers are assembled. The metal rings are formed from a strip of flat sheet metal which can be transported on a reel. The metal strip is first passed to a bending means, which can be in the form of two crimping rolls, to form a channel member. The channel member is then fed through suitable guide means into carton-assembling apparatus which includes crimping rolls that bend and crimp the channel member on to the container members so that the clamping ring is formed and attached in one continuous operation.

In the drawing, FIG. 1 illustrates the container-assembling apparatus of this invention. FIG. 2 is a view taken along line 2—2 in FIG. 1 and illustrates the crimping rolls which are employed to form the channel member. FIG. 3 is a bottom view of a portion of the apparatus of FIG. 1. FIG. 4 illustrates the guide means and crimping means employed to secure the channel member to the container sidewall and end members.

Referring now to the drawing in detail and to FIG. 1 in particular, there is shown apparatus which is employed in the fabrication of containers from a side member and an end member. This apparatus comprises a stationary frame 10 which is mounted on a base 11. A movable frame 12 is pivoted to base 11 so as to be free to swing away from frame 10 to the illustrated position. Frame 12 comprises a lower support 13 and an upper support 14 which are spaced from one another. Support 13 is provided with a recess 15 at the edge to support the lower end of a cylindrical member which forms the side of the finished container. A hollow cylindrical member 16, see FIG. 4, open at both ends is placed over support 14 so as to rest on the edge of support 13. An end member 17 having a flanged edge 18 is inserted inside member 16 so as to rest on support 14. Members 16 and 17 are of such configuration that the upper edges thereof are at the same level, as illustrated in FIG. 4. After members 16 and 17 are positioned on frame 12, the frame is rotated to a vertical position within stationary frame 10. Members 16 and 17 can be formed of fiberboard or various other materials, depending on the intended use of the container.

The apparatus thus far described corresponds generally to that disclosed in U.S. Pat. No. 2,238,372. As an alternative, frame 12 can be pivotally mounted so as to swing into the stationary frame in the manner described in U.S. Pat. No. 2,651,977. In the apparatus described in the foregoing patents, the operator then places a metal ring over the edges of the members 16 and 17 and operates the machine so as to crimp the metal ring to form the assembled container.

In accordance with the present invention, the metal ring is actually formed at the time the container is assembled. The ring is formed from a flat strip of sheet metal 21 which is supported on a drum 20 in FIG. 1. The flat metal strip extends from drum 20 over rollers 22 and 23 to a bending means which is formed by crimping rolls 24 and 25. Rolls 24 and 25

are mounted on respective drive shafts 24' and 25' which are connected to a suitable power source, not shown. The flat metal strip 21 is bent as it is driven through crimping rolls 24 and 25 so as to form a channel member 26 having the general configuration shown in FIG. 2. The driving force of crimping rolls 24 and 25 pushes channel member 26 past a plurality of guide rollers 27 to the container assembly apparatus. A cutter bar 28 is connected to a suitable power source, not shown, and is actuated periodically to cut channel member 26 into lengths substantially equal to the circumference of end member 17 of the container.

Guide roller 22 is mounted on an arm 28 which is pivoted about the support shaft of drum 20 to form a tensioning device. To this end, a brake member 29 extends from a fixed support 30 over drum 20 and is connected to arm 28 by a spring 31.

As illustrated in FIGS. 3 and 4, channel member 26 enters the top of the assembly device and passes through two spaced guide members 33 and 34. Guide member 33 lifts the lower edge of channel member 26 above flange 18, whereas guide 34 positions channel member 26 over the edges of the container. Two crimping rolls 35 and 36 are carried by respective drive shafts 37 and 38. These drive shafts are connected to a suitable power source, not shown, so as to be rotated together. Crimping rolls 35 and 36 are spaced from one another so that the upper edges of container members 16 and 17 occupy the space between these rolls when a container is being assembled. Rotation of rolls 35 and 36 serves to bend and crimp channel member 26 about the edges of the container members so as to secure the container sides and end together. The outer edge of crimping roll 36 can be provided with protrusions 39 to assist in the crimping operation. While the invention has been described in conjunction with the formation of cylindrical containers, it should be evident that elliptical or similarly shaped containers can likewise be constructed by this procedure.

The manner in which frame member 12 and the crimping rolls operate is in accordance with the description of either of the two patents mentioned above. The sequence of operations can be carried out in a semiautomatic manner by providing a switch which is actuated by the operator when the two container elements are mounted on frame 12 and the frame is rotated into the assembly position. Such a switch can be closed to actuate crimping rolls 35 and 36, bending rolls 24 and 25 and cutter 28. The apparatus is operated so that rolls 24 and 25 drive the channel member into engagement with crimping rolls 35 and 36 before the channel member is served by cutter 28. Thereafter, crimping rolls 35 and 36 serve to pull the channel member into assembled position on the container members. Each drive element can be actuated individually by the operator or in timed sequence by automatic controls.

While this invention has been described in conjunction with presently preferred embodiments, it obviously is not limited thereto.

I claim:

1. Container forming apparatus comprising:

a frame adapted to receive a generally cylindrical hollow side member and a generally circular end member having a flanged edge and to hold such members so that said end member is inside and adjacent the end of said side member;

first and second crimping rolls positioned adjacent one another;

means to move said frame relative to said crimping rolls so that the end of a side member and the flanged edge of an end member on said frame enter the region between said rolls;

bending means adapted to receive a strip of material and bend same to transform the strip of material into a channel member;

cutting means;

guide means positioned between said cutting means and said crimping rolls, said guide means comprising a first

guide member positioned to lift one edge of the channel member over the end of a side member and the flanged edge of an end member on said frame when said frame is adjacent said crimping rolls, and a second guide member positioned to locate the channel member over said end of a side member and said flanged edge of an end member when said frame is adjacent said crimping rolls;

means to pass a strip of material through said bending means and said cutting means to said guide means, whereby a resulting channel member is positioned over the end of a side member and the flanged edge of an end member on said frame when said frame is adjacent said crimping rolls; and

means to rotate said crimping rolls to rotate the side and end members and to crimp the channel member thereon.

2. The apparatus of claim 1 wherein said bending means comprises a pair of adjacent rollers adapted to have said strip of material passed therethrough, said rollers serving to bend said strip of material and pass same to said guide means.

3. The apparatus of claim 1, further comprising a drum to hold a roll of said material, means to pass material from said drum to said bending means, and brake means connected to said drum to resist withdrawal of material from said drum.

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