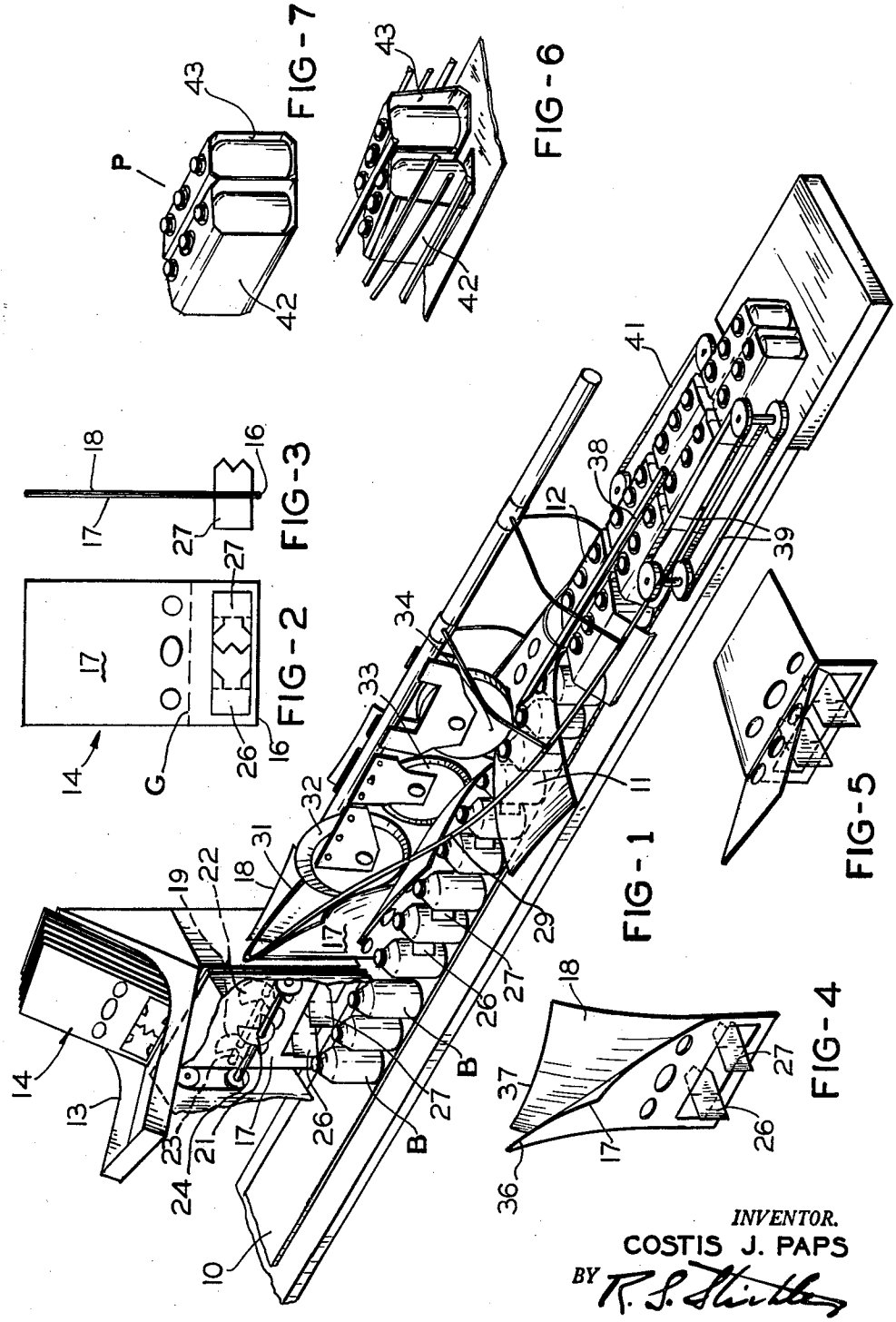
Nov. 6, 1962 C. J. PAPS 3,061,986

METHOD OF PACKAGING ARTICLES

Filed Feb. 6, 1961



United States Patent Office

3,061,986
Patented Nov. 6, 1962

3,061,986

METHOD OF PACKAGING ARTICLES

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Filed Feb. 6, 1961, Ser. No. 87,431
10 Claims. (Cl. 53—48)

The present invention relates to packaging and relates in particular to a method of packaging groups of articles in continuous fashion.

A typical package developed by the practice of the method of the present invention is disclosed and described in a co-pending application, Serial No. 57,516 filed on September 21, 1960, by Costis J. Paps.

A prime feature of the invention is the provision of a novel process for packaging articles of paper board or like material utilizing a single blank of board or other material.

A further feature of the invention is the provision of the process useful to form a package of a group of articles where the articles packaged are being advanced continuously in a plurality of rows.

A further feature of the invention is a provision of the novel method of packaging groups of articles advancing continuously in a plurality of rows where the articles packaged are separated by partition elements constituting integral part of a single one-piece blank of packaging material.

Although the package developed by the practice of the processed steps of this invention is especially useful where longitudinal and transverse partition elements are desired, the processed steps may also be practiced to produce a package in which there are no transverse partitions and only a partial longitudinal partitional element.

A still further feature of the invention is the provision of a novel method of continuously packaging a continuously advancing line of articles utilizing a single blank of board material where the articles are utilized to feed the blank while the blank is being formed.

A process embracing certain features of the invention and useful in packaging articles in groups where the articles are arranged in a plurality of adjacent rows may comprise the steps of inserting a multi-panelled blank of board material between a given pair of rows, spreading at least two panels so that corresponding ends of the panels tend to move away from one another while opposite ends of said panels remain in face-to-face contact, thereafter continuing to move said panels away from one another along a path such that the ends of said moving panels generally define the arc of a circle with the result that corresponding ends of each panel encircle a given number of articles of a row individual thereto, and thereafter bringing said corresponding ends toward one another into a fixed relationship to create a package embracing said given number of articles from each of said pair of rows.

Other features and advantages of the present invention will become more apparent from an examination of the succeeding specification when read in conjunction with the appended drawings, in which:

FIG. 1 is a perspective view of a bottle packaging machine, the operation of which embraces the practice of the process steps of the present invention.

FIG. 2 is a side elevational view of a two-ply or two-panelled blank of board as it appears stacked in the machine hopper of FIG. 1.

The two-panelled blank of FIG. 2 is originally formed of a single sheet of material and the panels are appropriately hinged together so that one panel may be folded on top of the other in face-to-face relationship utilizing a marginal portion of the board as a hinge.

FIG. 3 is an end view of the two-ply or two-panelled

blank of FIG. 2 with the transverse partition element or transverse divider rotated to their operative positions.

FIG. 4 shows the upper, unglued margins or wings of the individual plies or panels of the given blank as they appear upon being plowed apart as they emerge from the hopper section.

FIG. 5 shows the wings of the blank being pressed down about the bottle necks.

FIG. 6 shows the action of the plow bars in combination with the side belts in drawing the wings down tightly about the sides of the bottles and also shows the initial tuck of the end margins under the bottles, and,

FIG. 7 shows the completed package with the corresponding marginal portions of each panel or ply fastened together beneath the bottles.

Referring now to the drawings, there is shown an endless conveyor belt **10** operative to advance in continuous fashion two rows of bottles B where the rows are designated by the reference numerals **11** and **12**.

The bottles B pass beneath a hopper **13** containing a supply of two-ply or two-panelled blanks **14** hinged together at **16** (see FIGS. 2 and 3) so as to define a panel **17** and a panel **18** arranged in face-to-face relationship.

The panels **17** and **18** are glued together in the margin of the blank falling below the dotted line labelled G and are freely separable above the line G.

In timed relationship relative to the passage of the bottles beneath the hopper a two-ply blank **14** is dealt from the hopper by a suitable feeding device. The blank is fed downwardly between the rows of bottles until the bottom of the blank strikes the belt **10**.

Just prior to the introduction of the blank between the rows of bottles and at an appropriately timed interval, cams **19**, **21** and **22**, rotating upon shafts **23** and **24**, respectively, operate to pivot hinged cut-outs **26** and **27** out of the plane of the blank **14** to a position generally normal to the plane of the blank as is most apparent in FIGS. 1 and 3.

Thus, when the two-ply blank **14** bottoms on the belt **10**, the bottles have been more or less set off in groups of six comprising two rows of three bottles each and the lower portion of the two-ply blank or the portion thereof falling below the dotted line G (FIG. 2) is disposed between the rows to define a longitudinal partition element while the cut-outs **26** and **27** which have been rotated normally to the plane of the blank fall between the bottles, specifically, between the first and second and between the second and third bottles of each row, to define transverse partitions.

It is important to note that from this point, the blank is driven to the right, as viewed in FIG. 1, by the bottles by virtue of the interleaving of the blank with the bottles.

As the two-ply blank emerges from the hopper section of the machine and moves to the right in company with the grouped bottles, plow bars or rails **29** and **31** operate to spread the upper portion of panel **17** away from the corresponding margin of the panel **18**.

Continued advance of the blank **14** along the rails is operative to spread the upper portions of the panels **17** and **18** farther and farther apart, as shown in FIGS. 4 and 5, while center rollers **32**, **33** and **34** bear down upon the glued (insperable) lower portions of the panels **17** and **18** urging the blank into snug contact with the necks of the bottles and keeping the bottom of the blank in contact with the belt.

As the blank traverses the plow bars **29** and **31**, the ends **36** and **37** (FIG. 4) of the respective panels **17** and **18** tend to follow a path generally defining the arc of a circle so that ultimately panel **17** virtually encircles three bottles B from row **11** so that the bottles become indi-

vidual to panel **17** while panel **18** encircles a corresponding number of bottles B from row **12** so that said corresponding bottles become individual to panel **18**.

Fixed press bar **38** maintains a downward pressure upon the central portion of the blank **14** as its advances while pairs of V-belts **39—39** and **41—41** engage the panels **17** and **18** in the region thereof which ultimately defines the sidewalls **42** and **43** of the finished package (FIGS. 6 and 7) effective to draw the sidewalls downwardly and snugly about the bottle necks.

The ends **36** and **37** of the panels **17** and **18** are finally brought together beneath the bottles and are connected into a fixed relationship either by gluing or by a suitable mechanical lock to develop package P consisting of two rows of bottles B where each row includes three bottles.

The machine disclosed and described herein is presented primarily for the purpose of illustrating an exemplary embodiment of machinery operative to practice the process steps of the present invention. It is to be specifically understood that it is entirely within the spirit and scope of the invention that the principles thereof may be utilized to package a wide variety of articles of glass, metallic or plastic structure including packages formed with or without transversed partitions or with full or partial longitudinal partition.

It is to be noted that the multi-panelled blank may be inserted between the rows of articles to any desired depth, initially. It is not necessary that the blank bottom upon the conveyor belt.

What is claimed is:

1. A method of continuously packaging articles advancing in a plurality of adjacent rows comprising the steps of sequentially inserting a multi-panelled blank of board material between a given pair of rows to provide a longitudinal partition, partially spreading at least two panels so that corresponding ends of the panels tend to move away from one another while opposite ends of said panels remain in face-to-face contact, thereafter continuing to move said panels away from one another along a path generally defining the arc of a circle so that corresponding ends of each panel encircle a given number of articles of the row individual thereto, and thereafter bringing said corresponding ends toward one another into a fixed relationship to create a packaging embracing said given number of articles from each of said pair of rows.

2. The method of continuously packaging articles as defined in claim 1 wherein a portion of the blank is rotated generally normal to the plane of the blank to provide a transverse partition.

3. A method of forming a package embracing a group of like articles comprising the steps of disposing an even number of the articles in two rows, providing a single blank of packaging material in sheet form where the blank has been folded or doubled while remaining connected to define a plurality of face-to-face panels, disposing the folded blank between the rows of articles so that the bottom of the blank develops a longitudinal partition, thereafter separating end margins of the blank and moving said end margins away from one another along a path generally defining an arc of a circle so that each panel encircles a row of articles individual thereto and thereafter connecting said end margins together beneath the articles to define a package embracing a given number of articles from each of said rows.

4. A method of forming a package embracing a group of like articles comprising the steps of disposing an even number of the articles in two rows, providing a single blank of packaging material in sheet form where the blank has been folded or doubled while remaining partially hinged to define two face-to-face panels, disposing the folded blank between the rows of articles so that the bottom of the blank develops a longitudinal partition,

thereafter separating marginal portions of the panels and moving said marginal portions away from one another along a path generally defining an arc of a circle so that each panel encircles a row of articles individual thereto and thereafter connecting said marginal portions together beneath the articles to define a package embracing a given number of articles from each of said rows.

5. A method of continuously packaging articles advancing in a plurality of adjacent rows comprising the steps of sequentially inserting a two-panelled blank of board material between a given pair of rows, partially spreading said two panels so that corresponding ends of the panels tend to move away from one another while opposite ends of said panels remain in face-to-face contact, thereafter continuing to move said panels away from one another along a path generally defining the arc of a circle so that corresponding ends of each panel encircle a given number of articles of the row individual thereto, and thereafter bringing said corresponding ends toward one another into a fixed relationship to create a packaging embracing said given number of articles from each of said pair of rows.

6. A method of packaging articles using a single blank of packaging material comprising advancing the articles in rows along a predetermined path of travel, interleaving a group of said articles with a divider portion of the blank of packaging material so that the articles drivingly engage said blank, then utilizing said advancing articles for driving said blank along said path of travel, and forming a wrapper portion of the driven blank around said articles while the articles and the blank are moving along said path of travel.

7. A method, as defined in claim 6, wherein the article and the blank are relatively moved into association with each other so that the article drivingly engages a midportion of the blank, said blank having opposite end portions extending from said midportion, and wherein the forming of the blank around the article comprises moving said opposite end portions of the blank in generally opposite directions around the article and into overlapping relationship.

8. A method of packaging articles comprising the steps of advancing a plurality of articles disposed in substantially side-by-side relationship along a predetermined path of travel, relatively moving said articles and a single blank of packaging material in sheet form having panels disposed in generally face-to-face relationship and connected along first margins and separated along opposite margins into predetermined association with each other with said first margins disposed between said articles, then advancing the associated articles and blank along said path of travel, and thereafter moving said opposite margins of said panels away from each other and forming said panels around the articles.

9. A method, as defined in claim 8, which comprises drivingly engaging said articles against said blank and utilizing said articles for driving the blank along said path of travel during the forming of the blank around the articles.

10. A method, as defined in claim 8, wherein said plurality of articles comprises two rows extending in the direction of said path of travel and each including a plurality of articles, said method including the step of folding a section laterally outwardly from at least one of said panels and disposing said section between adjacent articles in each row when said blank and said articles are moved into association with each other.

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