March 5, 1968 F. A. GRANT 3,371,465

FLEXIBLE COVER APPLICATOR

Filed Aug. 17, 1965 3 Sheets-Sheet 1

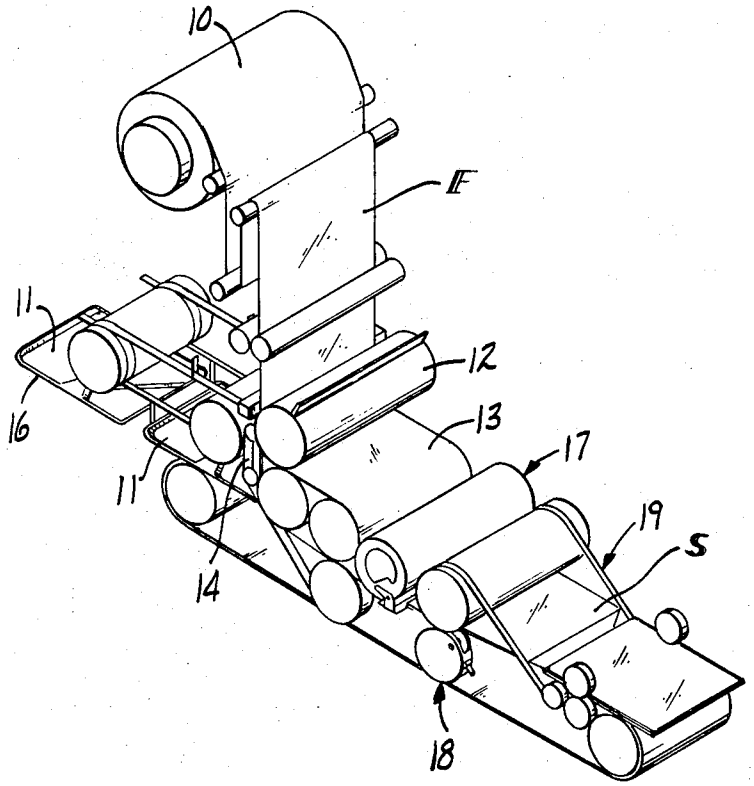


FIG - 1

INVENTOR.
FRANK A. GRANT

BY R. J. Shuttler

ATTORNEY

March 5, 1968 F. A. GRANT 3,371,465

FLEXIBLE COVER APPLICATOR

Filed Aug. 17, 1965 3 Sheets-Sheet 2

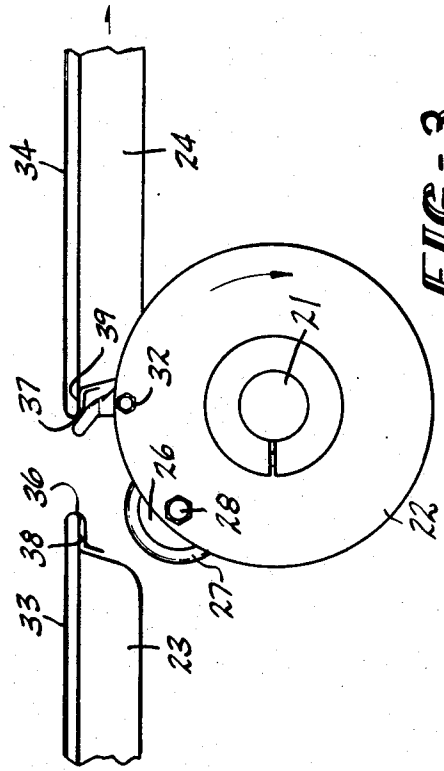


FIG-3

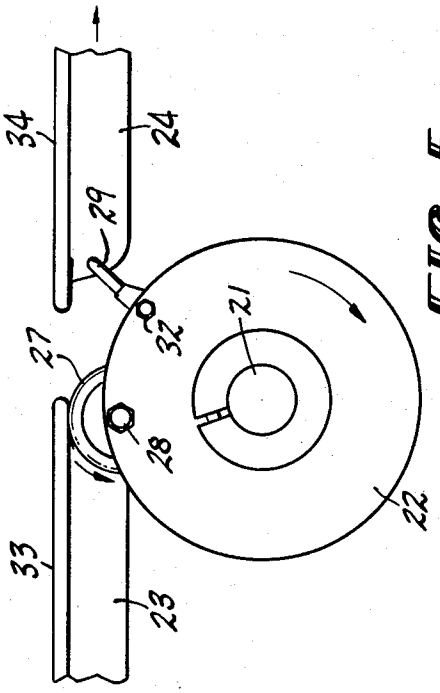


FIG-5

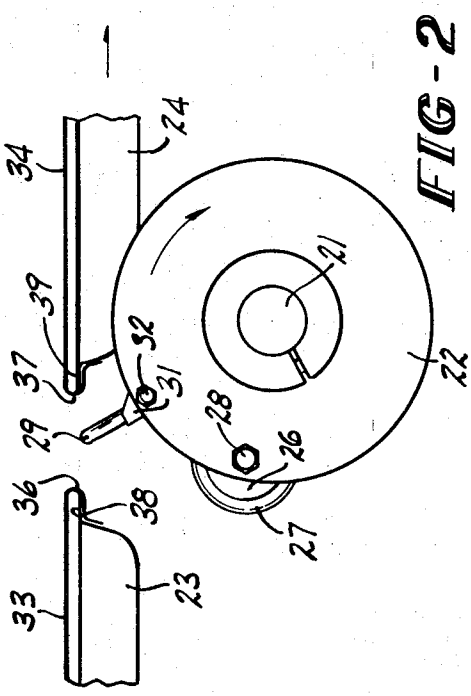


FIG-2

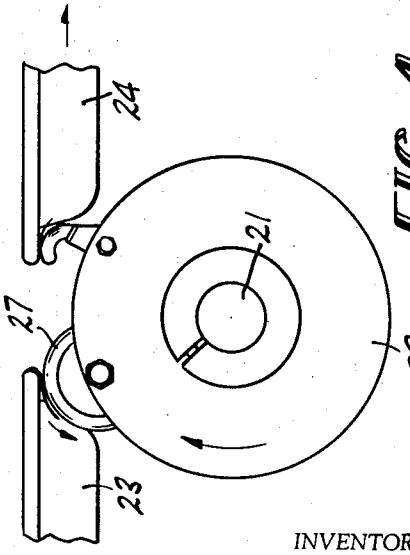


FIG-4

INVENTOR.
FRANK A. GRANT

BY R. S. Strickler

ATTORNEY

March 5, 1968 F. A. GRANT 3,371,465

FLEXIBLE COVER APPLICATOR

Filed Aug. 17, 1965 3 Sheets-Sheet 3

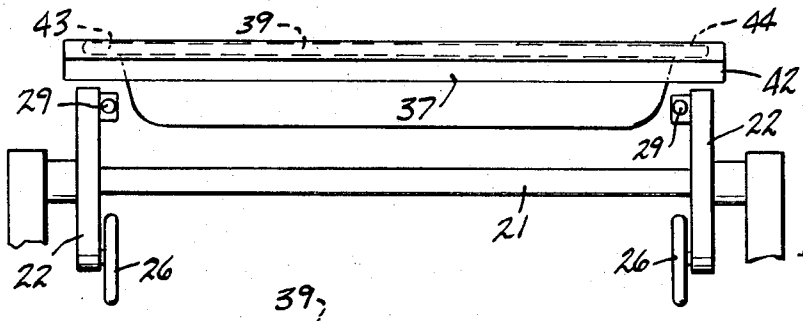


FIG-6

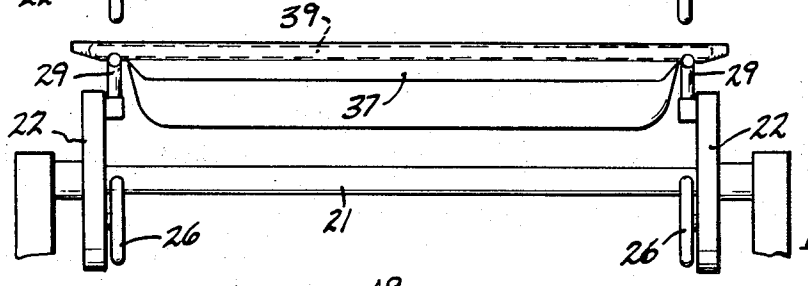


FIG-7

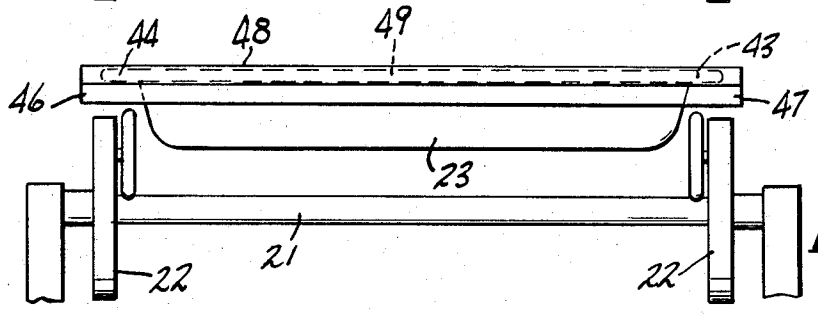


FIG-8

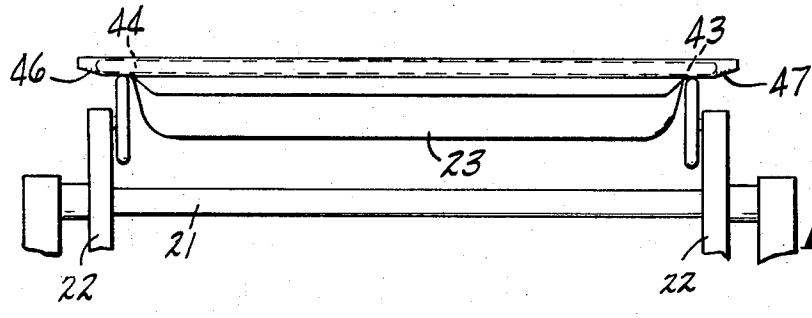


FIG-9

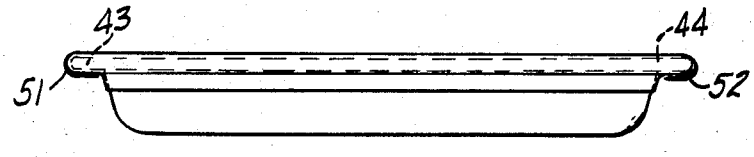


FIG-10

INVENTOR.
FRANK A. GRANT
BY R. J. Shichler
ATTORNEY

United States Patent Office 3,371,465
Patented Mar. 5, 1968

3,371,465

FLEXIBLE COVER APPLICATOR

Frank A. Grant, San Mateo, Calif., assignor, by mesne assignments, to F. A. Grant, doing business as Hoefer Machine Works, San Francisco, Calif.

Filed Aug. 17, 1965, Ser. No. 480,359
2 Claims. (Cl. 53—333)

The present invention relates to packaging and deals, in particular, with machines and processes for covering the open mouth of a container.

A representative container with which the present invention is useful is disclosed in U.S. Patent 2,878,128 issued Mar. 17, 1959, to Ralph Jorgenson.

In particular, the invention relates to a corner tucker apparatus and process which is an improvement in the apparatus and process shown in U.S. Patent 2,975,574 issued Mar. 21, 1961, to Ralph J. Jorgenson and Frank A. Grant.

As disclosed in Patent 2,975,574, the present invention deals with continuously advancing open mouthed, rimmed trays arranged in spaced array and continuously applying a flexible cover or overlay to the tray to accompiish a closure.

As described in Patent 2,975,574 the overlay is cut and deposited upon the open mouth of the tray so that a generally uniform margin of overlay material extends beyond the leading, trailing, and side rims of the tray.

The leading and trailing margins of the overlay material are first folded and tucked under the leading and trailing rims; thereafter, the side margins of the overlay material are folded and tucked under the side rims to secure the overlay and to complete the closure.

In applying and securing the overlays in accordance with the disclosure of Patent 2,975,574, the junction of the leading and side margins and the junction of the trailing and side margins (corners of the tray) frequency do not fold and tuck neatly.

Although the method and apparatus of Patent 2,975,-574 is successful commercially, it would add greatly to the over-all neatness of the covered package if the corner folds and tucks followed more precisely the corner contour of the tray rim.

Accordingly, it is a feature of the present invention to provide a corner tucking apparatus and a corner tucking process which develops a neater, tighter, and more appealing covered tray.

A further feature of the invention is to provide a corner tucking apparatus and process which is operative to fold and tuck opposed ends of the leading and trailing overlay margins after the main body of the leading and trailing overlay margins has been folded and tucked under the respective leading and trailing tray rims prior to folding and tucking side margins of the overlay material around corresponding side rims of the tray.

A further feature of the invention is the provision of a high speed machine and process for covering the open mouth of a container.

For example, after the leading and trailing overlay margins are folded and tucked, there are opposed end portions of the leading and trailing overlay margins remaining untucked and overhanging the side rims. It is desirable that these overhanging opposed end portions of margin material be tucked under their corresponding side rims before the main body of the side margin overlay material is folded and tucked.

Accordingly, the present invention deals with a process and an apparatus which is operative following the folding and tucking of leading and trailing margins and prior to the tucking of side margins.

A corner margin tucking device embracing certain principles of the present invention may comprise means for continuously advancing along a linear path a container or tray having an open top with leading, trailing, and side rims defining at least one corner, means for continuously applying a sheet of flexible cover material to the tray so that a margin of the material overlays and projects beyond said rims, means for folding and tucking a leading (and/or trailing) margin of flexible material under the leading (and/or trailing) rim with opposed ends of said margin remaining untucked, a movable element mounted for circular rotational motion about an axis positioned below and across said linear path, said axis being positioned downstream of said folding and tucking means and said movable element being in line with at least one of said side rims, the circular motion of said movable element being synchronized with respect to the advance of said tray so that as the tray encounters the axis the tray overtravels the movable element as the movable element moves upwardly into contact with said end operative to tuck said end under its mating side rim.

A process embracing certain principles of the present invention may comprise the steps of continuously advancing an open tray having a projecting lip around its periphery defining leading, trailing, and side lips, disposing a single sheet of flexible material over the tray so that margins of flexible material project beyond the tray lips, first folding and tucking the leading and trailing margins of flexible material under mating leading and trailing tray lips so that opposed ends of the leading and trailing margins remain untucked, next tucking said opposed ends under mating side lips, and finally tucking the side margins of flexible material under the side lips effective to secure the flexible material to the tray so that the folded and tucked margins thereof conform to the contour of the tray lip.

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 schematic view of a device of which the present invention is a feature;

FIGS. 2 through 5 are schematic representations of the corner tucker device and process steps as viewed from the side;

FIGS. 6 and 7 show the corner tucker device operating on the opposed ends of a trailing margin of flexible material;

FIGS. 8 and 9 show the corner tucked device and process operating on the leading margin of flexible overlay material; and,

FIG. 10 is an end view showing the finished covered tray.

Referring now in detail to the drawings, FIG. 1 shows a roll 10 of flexible foil material being advanced in the conventional fashion simultaneously with the advance of open trays 11—11.

Knife roll 12 is operative to cut flexible covering material F drawn from roll 10 to the proper size and belts 13 and 14 operate in well-known fashion to dispose the cut sheet S in register with the continuously advancing tray 11 so that a generally uniform margin of overlay material projects beyond the peripheral rim or lip 16 of the tray.

The reference numeral 17 represents the roll and associated tucking and folding bar operative to fold and tuck leading and/or trailing margins of flexible material over corresponding leading and trailing rims.

Reference numeral 18 designates the corner folding and tucking apparatus, and the reference numeral 19 designates the belt structure utilized to fold side margins

of the flexible overlay around and about corresponding side rims.

Referring now in detail to FIGS. 2 through 5, note that the corner tucker device of the present invention includes a driven shaft **21** to which is keyed a flange or disc **22** driven in the direction shown and suitably timed through appropriate gearing with the continuous advance of containers of trays **23–24**. The disc **22** carries a movable member defining a rotatable wheel **26** fitted with a tire **27** and secured to the disc **22** by bolt **28**.

Spaced from the wheel **26** is another movable member defining a flexible rubber-like finger **29** carried by socket **31** secured to the disc **22** by means of bolt **32**.

As stated previously, the disc **22** is continuously driven in the direction shown while trays **23** and **24** are continuously advanced in the direction shown. The disc **22** is appropriately phased and synchronized with respect to the advance of trays **23** and **24** so that movable members **26** and **29** engage and operate at appropriate intervals.

Although finger **29** is flexible and movable, it is fixed to disc **22**. Correspondingly, tired wheel **26** although rotatable and movable about bolt **28** is fixed to the disc **22** in the position shown.

Referring now to FIGS. 2 through 5 and FIGS. 6 and 7, the operation of the corner tucker device will be described:

Assume that sheets of overlay material **33** and **34** disposed on trays **23** and **24** have advanced sufficiently far through the apparatus of FIG. 1 so that leading overlay margins **36** and trailing overlay margins **37** are folded and tucked around and under corresponding leading tray rims **38** and trailing tray rims **39**.

Referring now, in particular, to FIGS. 6 and 7, note that although trailing overlay margin **37** is folded and tucked about trailing tray rim **39**, opposed ends **41** and **42** of the trailing overlay margin **37** remain untucked.

The rotational speed and phasing of disc **22** is selected so that flexible finger **29** wipes opposed ends **41** and **42** as tray **24** moves in the direction shown (FIG. 2) with the result that opposed ends **41** and **42** are folded upwardly and tucked under side rims **43** and **44** as is most apparent in FIG. 7.

Obviously, the shaft **21** is driven at a speed which will produce a horizontal component of linear velocity in the flexible finger **29** to effect a wiping action between the finger **29** and corresponding end **41** or **42**, as the case may be. When fingers **29—29** work opposed ends **41** and **42**, their horizontal component of velocity is faster than that of the tray **24**.

Referring now to FIGS. 8 and 9, it is apparent that opposed ends **46** and **47** of leading overlay margin **36** are similarly unfolded and untucked even though the main body of the leading margin of flexible material is folded and tucked about the leading rim **38** of tray **23**.

Opposed ends **46** and **47** are folded and tucked by rotatable wheel **26** whose tire **27** engages and makes rolling contact with ends **46** and **47** as shown schematically in FIGS. 2 through 5.

Immediately after flexible finger **29** encounters tray **24**, rotation of disc **22** brings wheel **26** upwardly into contact with opposed ends **46** and **47** so that tires **27—27** encounter ends **46** and **47** operative to fold these ends upwardly and tuck them under mating side rims **44** and **43** to convert ends **46** and **47** from the position shown in FIG. 8 to the position shown in FIG. 9.

Friction between tires **27** and mating ends **46** and **47** imparts rotational motion in wheel **26** in the direction shown by the arrows (counterclockwise) in FIGS. 4 and 5 with the result that wheel **26** lays ends **46** and **47** back and under corresponding side rims.

It is particularly desirable to construct finger **29** of a flexible, pliable material to avoid tearing yet with sufficient firmness to perform necessary work to accomplish the folding and tucking operation.

Correspondingly, it is important that tire **27** be formed of resilient material developing an appropriate coefficient of friction with the flexible covering to effect the folding and tucking operation.

As is apparent in FIG. 5, the flexible finger **29** finally flicks out of contact with the tray **24**. Correspondingly, wheel **26** rotating in a counterclockwise direction about bolt **28** moves out of contact with tray **23** as it is carried in a circular path by disc **22**.

The process of the present invention embraces the following continuous steps:

Folding and tucking the leading and trailing overlay margins about their respective leading and trailing rims.

Next, opposed ends **41–42** of the trailing overlay margin are folded and tucked.

Thereafter, opposed ends **46–47** of the leading overlay margin are folded and tucked.

Finally, side margins **51** and **52** are folded about their mating side rims **43** and **44** by side margin folding belts reference **19** in FIG. 1 to develop a completely covered tray as represented in FIG. 10.

It is anticipated that a wide variety of modifications and design changes may be devised without departing from the spirit and scope of this invention.

What is claimed is:

1. In a machine for applying a sheet of flexible covering material to the open top of a continuously advancing container having a projecting lip around its periphery defining leading, trailing, and side lips including means for folding and tucking leading and trailing margins of covering material under the leading and trailing lips with opposed ends of said margins untucked, the improvement comprising: a movable member mounted for circular motion about an axis traversing said tray located in line with one side lip and downstream of said folding and tucking means, the circular motion of said member being synchronized with respect to the advance of the tray so that the member moves upwardly into contact with one of said ends operative to fold and tuck said end under said one side lip.

2. An apparatus for continuously advancing along a linear path a plurality of spaced open trays having outwardly projecting leading, trailing, and side rims intersecting to define corners, means for continuously applying a sheet of flexible material to each tray so that the material overlays the tray with margins of material projecting beyond said rims, means for folding and tucking leading and trailing margins under mating leading and trailing rims, opposed ends of said leading and trailing margins remaining untucked, wheel means and flexible finger means mounted for circular movement about an axis traversing said path downstream of said folding and tucking means and in line with said opposed ends operative to fold said ends under said side rims.

References Cited

UNITED STATES PATENTS

2,926,473	3/1960	Byland	53—379 X
2,975,574	3/1961	Jorgenson et al.	53—378 X
3,116,580	1/1964	Anderson	53—378 X

WILLIAM W. DYER, JR., *Primary Examiner.*

R. L. FARRIS, *Assistant Examiner.*