Sept. 19, 1961 G. DOWNIE 3,000,152

METHODS OF AND MEANS FOR PACKING COMMODITIES

Filed Sept. 23, 1957 3 Sheets-Sheet 1

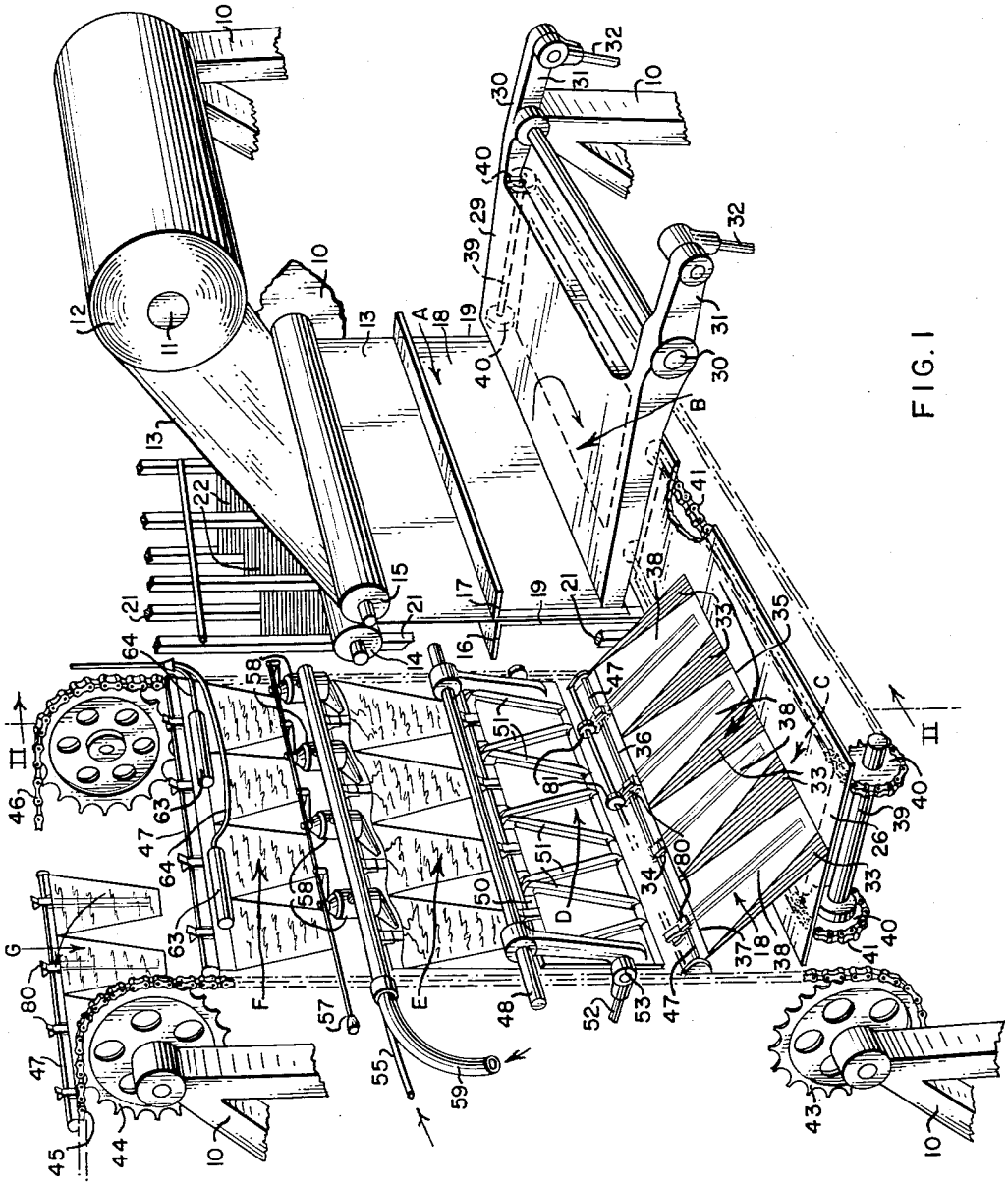


FIG. 1

INVENTOR

GERALD DOWNIE

BY Bailey, Stephens & Hartley

ATTORNEYS

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METHODS OF AND MEANS FOR PACKING COMMODITIES

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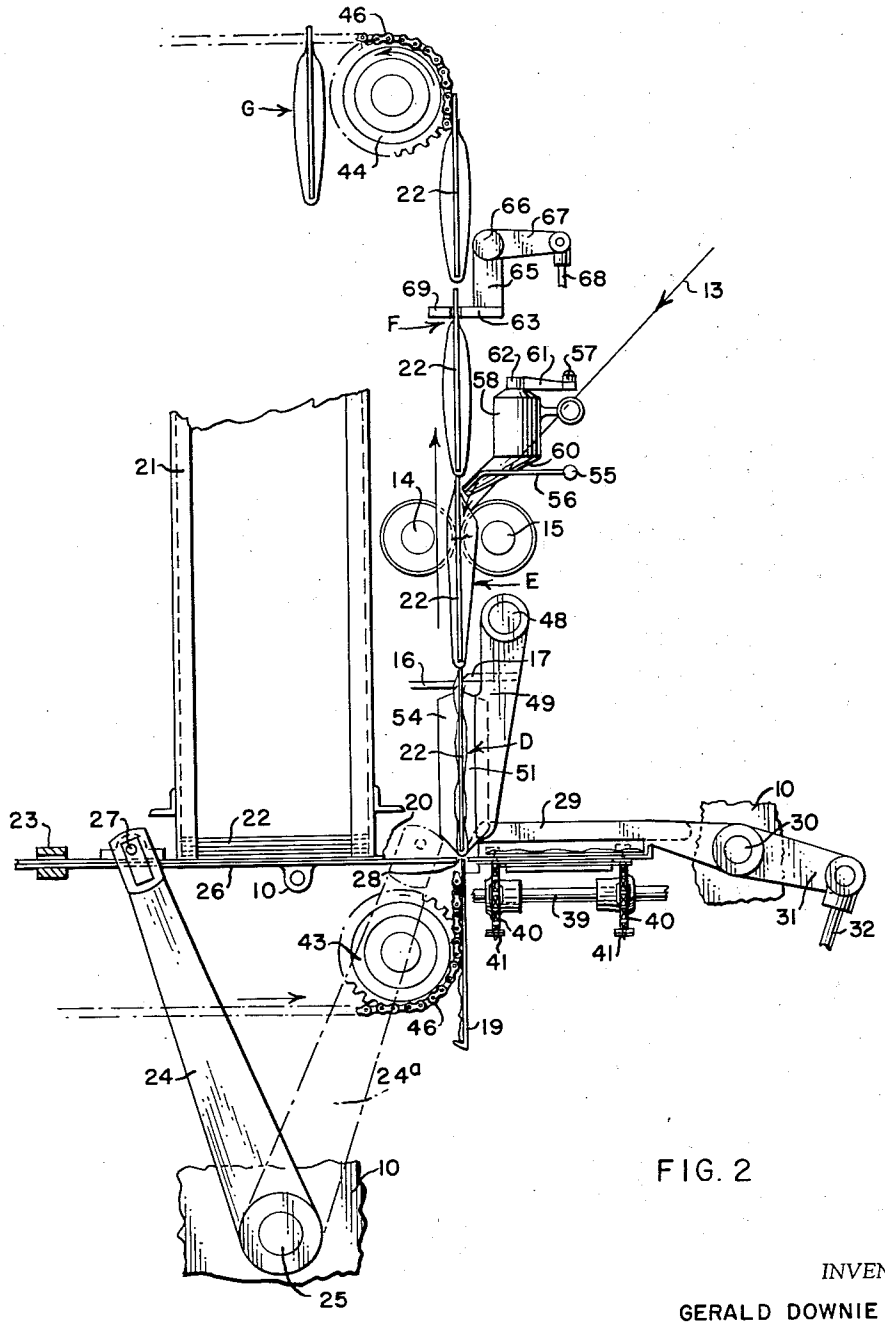


FIG. 2

INVENTOR

GERALD DOWNIE

BY Bailey, Stephens & Huettig

ATTORNEYS

Sept. 19, 1961 G. DOWNIE 3,000,152

METHODS OF AND MEANS FOR PACKING COMMODITIES

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FIG.3.

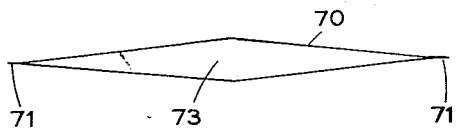
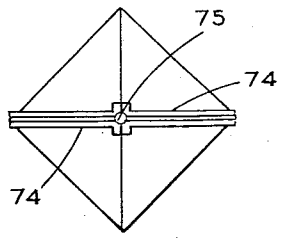


FIG.5.



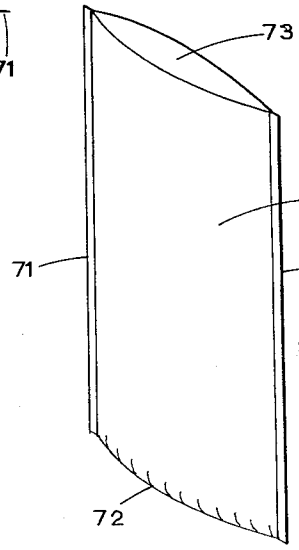
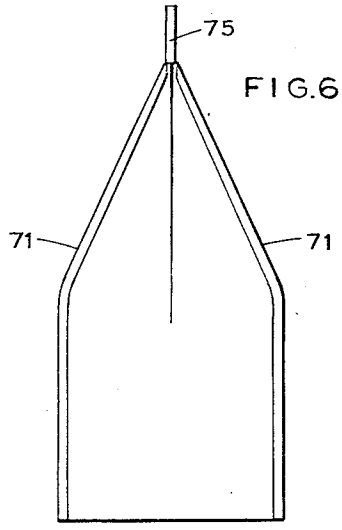
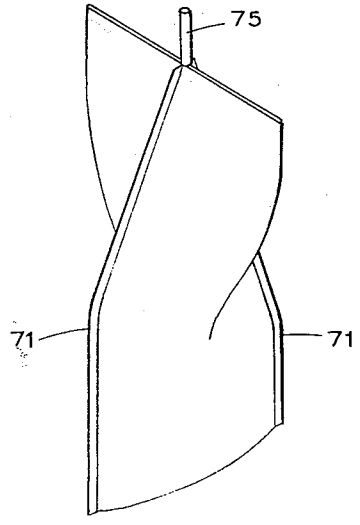


FIG.4.

FIG.7.

FIG.6.





Inventor
GERALD DOWNIE
by
Bailey, Stephens & Huettig
Attorneys

United States Patent Office 3,000,152 Patented Sept. 19, 1961

3,000,152

METHODS OF AND MEANS FOR PACKING COMMODITIES

Gerald Downie, 116 Meadowview Road, West Ewell, England

Filed Sept. 23, 1957, Ser. No. 685,622
Claims priority, application Great Britain Sept. 27, 1956
4 Claims. (Cl. 53—14)

This invention relates to methods of and means for packing commodities in containers of bag-like form which may or may not require to be sealed. It is an object of the invention to provide a method whereby a commodity may be packed more cheaply, simply, and rapidly than heretofore. In the packing of commodities in bags or containers, such as those formed by heat sealing, it is usual for only one container to be capable of being filled by the machine at any given moment and it is a further object of the present invention to provide a method whereby, if desired, the filling of a plurality of containers may be effected simultaneously without the necessity of a corresponding number of machines.

According to the invention a method of packing a commodity comprises forming a web of material with a succession of pockets each having three closed sides and a fourth open side, said fourth side lying parallel with one edge of the web, passing the web beneath a nozzle or like delivery means with said fourth side uppermost and charging the pockets with the commodity; and separating the charged pockets from the web. Conveniently, but not essentially, a plurality of pockets are formed as a batch and charged simultaneously from a corresponding number of nozzles.

The web may be of heat sealable material, and the pockets may be formed by heat sealing.

According to a further aspect of the invention, for the production of an article on a stick, for example, a frozen lolly, the stick may be inserted in the pocket before or after the pocket has been formed and before it is charged, the stick being secured to the material at a point in or adjacent to the mouth of the pocket.

According to yet a further aspect, the invention includes an open-mouthed bag, if desired having the stick located therein and united thereto at a point adjacent to the mouth thereof.

The invention will be described, as applied to the production of frozen lollies on sticks, with reference to the accompanying drawings, in which:

FIGURE 1 is a fragmentary perspective view of a machine for making and filling lolly containers in batches of four,

FIGURE 2 is an end elevation of part of the machine, on the line II—II, FIGURE 1,

FIGURES 3 and 4 show stages in the production of one form of container,

FIGURE 5 is a plan of a container,

FIGURE 6 is a side elevation thereof, and

FIGURE 7 is a perspective view thereof.

Referring to FIGURES 1 and 2, the machine is concerned with the production of bagged frozen lollies on sticks, the bags and lollies being of the usual flat type. The machine has a frame indicated at **10**, to which the various parts are attached or on which they are mounted. A roller **11** accommodates a roll **12** of material from which is led a web **13**. The web **13** is led downwardly between guide and measuring rollers **14, 15** and is chopped by knives **16, 17** associated with the frame **10** and reciprocated relatively thereto and to one another by any suitable means known to those skilled in the art. Conveniently the web is of heat sealable material, and will hereinafter be described as if it were of such material,

but it will be appreciated that other materials may be employed, for example, in conjunction with an adhesive.

The web is led downwardly by guides **19**, past a horizontal slide plate **20** (see FIGURE 2), until the lower edge of the web has reached the lower ends of the guides **19**. The knives **16, 17** then sever the web **13**, and the severed portion is indicated at **18**. In this station, indicated by the arrow A in FIGURE 1, approximately half the height of the portion **18** is above the slide plate **20**, and approximately half is below.

Behind the guide and measuring rollers **14, 15** is a framework **21** constituting a series of hoppers for stacks of lolly sticks **22**. There will be as many stacks as there are to be bags in a batch, i.e., four. In each stack the lolly sticks lie horizontally one above the other.

The slide plate **20** has four slots or recesses therein, each capable of receiving the lowest lolly stick in the stack immediately above it. The thickness of the slide plate **20** is slightly less than the thickness of the lolly sticks.

The slide plate **20** is slidable horizontally on a table **26** in a series of guides, one of which is shown at **23** in FIGURE 2. The table **26** is mounted on the frame **10** and is slotted at **28** to permit the descending severed portion **18** to pass through the slot **28** to take up the position described above. The slide plate is reciprocable on the table **26** in the guides **23** by an arm **24**, pivotally mounted on the frame **10** at **25**, and on the table **26** at **27**, and driven by any suitable means in synchronism with the main drive of the machine, which intermittently drives the roller **11** and other moving parts in a manner to be described hereinafter. Such drive is not shown, but will be apparent to those skilled in the art.

Movement of the arm **24** to the position shown in broken lines at **24a** causes the slide plate **20** to be slid horizontally forwardly on the table **26**.

At the same time, the slide plate **20** carries with it four lolly sticks, one from the bottom of each of the four stacks **22**, the sticks above remaining in the hopper **21**, but falling so that the bottom but one stick rests on the slide plate **20** There are thus four lolly sticks advancing towards the vertically suspended severed portion **18**. Their forward ends encounter the severed portion **18**, and carry it forward from the guides **19**, causing it to be folded upon itself on the table **26** so that one of its edges lies parallel with and close to the other, say ¼" from it. This station is indicated in broken lines by the arrow B in FIGURE 1.

A heater plate **29** is pivotally mounted at **30** on the frame **10**, and capable of being raised or lowered by lever arms **31** actuated by rods **32** reciprocable from the main drive. The heater plate **29** has a raised position clear of the table **26** and a lowered position in which it presses down on the table **26**.

As soon as the severed portion **18** has been folded and located on the table **26**, the heater plate **29** is lowered on to it and heat applied. The heater plate is provided with local heated areas which contact the portion **18**, and with other areas out of contact with the portion **18**, so that heat is only applied over certain areas as required. The pattern of heat sealing thus effected depends on the commodity to be packed. In the present instance, for the packing of lollies, the pattern can be readily seen from FIGURE 1, where shaded areas **33** are indicated. The areas **33** define the edges of the bags. Heavy lines **34** at the ends of the lolly sticks indicate where they are affixed to the edge of the severed portion.

After the heat sealing has been effected, the portion **18**, although it has not yet reached the station illustrated in FIGURE 1, has attained the formation there shown. The portion **18** has been retroverted about the fold line **35**, the original edges being indicated at **36** and **37**. It

has been heat-sealed over the areas **33**, so forming open-mouthed pockets **38** between said areas, and the lolly sticks have been sealed to the edge **36** as indicated by the heavy lines **34**.

The heating plate **29** is now raised. The table **26** has located thereunder two spindles **39** each carrying two sprockets **40** around which extend two sprocket chains **41** which protrude upwardly through slots **42** in the upper surface of the table **26** and constitute a transfer conveyor, whereby the folded and heat sealed portion **18** is conveyed from Station B under the heater plate **29** to the next station, indicated in broken lines in FIGURE 1 by the arrow C.

At this station there is a vertical conveyor, having a pair of lower sprocket wheels **43** and a pair of upper sprocket wheels **44** mounted on horizontal spindles on the frame **10**, and intermittently driven from the main drive. There are two sprocket chains **45**, **46** around these sprockets, arranged to be movable upwardly from wheels **43** to wheels **44**, and between the chains there extend gripper bars **47**. Each gripper bar **47** consists of a strip pivotally mounted at its ends on links of the chains **45**, **46**, with spring clips **80** operated by cams **81** to grip the ends of the lolly sticks, as the gripper bar reaches the level of the table **26** during the ascending movement of the gripper bar. It will be seen, therefore, that after the portion **18** has reached Station C, it will be gripped by the next ascending gripper bar **47** and raised from a horizontal to a vertical position. FIGURE 1 shows a portion **18** inclined at 45° in the course of being so raised.

Pivotally mounted on the frame **10** is a spindle **48**, from which depend arms **49** carrying a frame **50** on which are knives **51**. The frame **50** and knives **51** are reciprocable by a rod **52** pivoted to the arm **49** at **53** and operated intermittently from the main drive. Fixed knives **54**, located to co-act with the pivotable knives **51**, are secured to the main frame **10**.

The knives **51**, **54** are so located as to cut along the lines demarcating the shaded areas **33**, so that the shaded areas are cut away when the portion **18**, held by a gripper bar, has ascended to the position indicated by the arrow D, i.e., to Station D. It will be noted that the cuts do not extend as far as the marginal part of the portion **18** that is held by the gripper bar **47**, i.e., the four bags of the batch are not completely severed from one another.

Above the knives is a pipe **55** feeding compressed air to four nozzles **56**, each nozzle being located so as to direct a blast of air into the mouth of one of the pockets formed in the portion **18**. Parallel with the pipe **55** is a tube **59**, mounted on the main frame **10**, and supporting four liquid reservoirs **58**, located to serve the four pockets of a batch. The tube **59** keeps the reservoirs **58** supplied with the liquid which is to be packed in the pockets. Each reservoir **58** has a spout **60** directed into the mouth of a pocket. A transverse bar **57** is pivotally connected with a lever arm **61** extending from each reservoir **58**, and each lever arm is arranged to rotate a vertical spindle **62** in the reservoir to operate two valves whereby the liquid in the reservoir may be passed to or withheld from the nozzle **60**. The capacity of the reservoir **58** is the same as that of the pocket it is to fill. The transverse bar **57** is connected with intermittent operating means phased with the main drive, whereby a predetermined volume of liquid may be metered into a pocket after the portion **18** has arrived at Station E, as indicated by the arrow E in FIGURES 1 and 2.

Arranged transversely above the liquid reservoirs **58** is an electric heater **63**, served by cables **64**. The heater **63** is pivotally mounted on arms **65** about an axis **66** and operable by a lever arm **67** and rod **68** so that it can be swung to or from a platen **69** mounted on the main frame **10**. The heater **63** is employed, when the portion has reached Station F, indicated by the arrow F, to seal the mouths of the filled pockets by pressing them against the platen **69**. The heater **63** is then pivotally retracted by the rod **68**.

The filled pockets now hang from the lolly sticks in such a way that the sticks are symmetrically arranged within the pockets, i.e., there is an equal thickness of the liquid wall on each side of the stick within the pocket. This may readily be achieved merely by gravity, unless the nature of the liquid (e.g. if it were to have an unusually high viscosity) necessitates the provision of simple guide means for the pockets.

Further travel of the conveyor chains **45**, **46** carries the filled and sealed pockets away to Station G, indicated by the arrow G, whence they are removed for subsequent freezing and/or other treatment. The pockets, it will be noted, are still unsevered along their top edges.

The main drive is conveniently obtained from a constantly rotating source of power, such as an electric motor. The operation of the machine is, however, intermittent, and any known means may be employed to accomplish this. Movement of severed portions from one station to the next is effected simultaneously, that is, all the portions are moved together each from its station to the next successive station.

It will be convenient now to summarize the action of the machine by setting forth the operations performed at the various stations.

Station A.—The portion **18** is severed from the web **13**. During transfer to Station B, it is folded and located on the table **26**, with lolly sticks in the fold.

Station B.—The heater **29** is lowered and heat seals the portion **18** to define open-mouthed pockets with the lolly sticks secured in the mouths thereof.

Station C.—The portion **18** is gripped by a gripper bar **47** and raised to a vertical position at

Station D.—where the knives **51**, **54** cut away the waste, leaving the pockets sealed at their edges.

Station E.—The pockets are opened by an air blast, and a measured charge of liquid from the reservoirs **58** is introduced.

Station F.—The mouths of the filled products are sealed by heater **63** pressing against platen **69**.

Station G.—The filled and sealed pockets are ready for further treatment.

It will be appreciated that instead of a folded web there may be employed two webs of suitable unequal widths, one overlying the other, with their coincidental edges joined.

It is important that virtually all that part of the stick which is within the pocket be free from the material of the web.

Suckers or plungers may be used in place of air nozzles.

In the embodiment just described the batch of four pockets for the lollies are joined to one another, but they may at any convenient intermediate stage be separated entirely from the web.

It will be seen that the method permits any number of pockets to be charged simultaneously while the additional apparatus required consists merely of the desired size of heaters and number of knives, nozzles, and feeding means therefor.

The invention may be applied to commodities which do not have sticks, such as table jellies, which would be fed in free flowing form into the pockets and allowed to set therein, liquid shampoos, or even material in fluent powdered form. Where sticks are not employed, the uncut edge of the web may be used, e.g. by being passed between supports and guides, for the handling of the web in the latter stages of the method.

In the embodiment described, the charged pocket has been sealed on its fourth edge along a line in the same plane as the opposite or bottom edge. It may, however, be sealed in a plane at right angles to the plane of the bottom edge, the flexible sides accommodating themselves. One example is shown in FIGURES 3 to 7. A

container comprises a tube 70, heat sealed along its edges 71. The edge 72 which is closed, may be so rendered either by retroversion of a web as already described, or by heat sealing. Sealing of the open mouth 73, instead of being by a single flat heater and platen as before, is by two or preferably four heaters 74, as shown in FIGURE 5, whereby a substantially tetrahedral shape is obtained. If the container is to hold, e.g., a beverage, a drinking straw or nozzle 75 may be located in the mouth so as to be sealed into the centre of the cross.

I claim:

1. A method of packing a commodity in a pocket on a stick comprising folding a web of material upon itself with the aid of the stick, so that only said stick is interposed between the folded layers of said web and projects beyond said web fastening portions of the facing surfaces of said web to form a pocket having three closed sides and a fourth open side, said fourth side lying parallel with one edge of the web while simultaneously securing said stick to the inside of the pocket at said fourth side, lifting said pocket carried by said stick with said fourth side uppermost to beneath a commodity delivery means, filling each pocket with the commodity in liquid state, and then solidifying the commodity in each pocket.

2. A method as in claim 1, further comprising simultaneously forming and filling a plurality of said pockets on said web.

3. A method as in claim 2, said web being composed of heat sealable material, and forming said pockets by heat sealing said facing surfaces of said web.

4. A method as in claim 3, further comprising partially severing said pockets from each other and said web beneath said one edge of said web and prior to filling the pockets.

References Cited in the file of this patent

UNITED STATES PATENTS

2,136,876	Chaveas et al.	Nov. 15, 1938
2,139,039	Salfisberg	Dec. 6, 1938
2,403,482	Cloud	July 9, 1946
2,486,758	Pfeiffer	Nov. 1, 1949
2,616,232	Meyer	Nov. 4, 1952
2,728,677	Colman	Dec. 27, 1955
2,759,831	Young et al.	Aug. 21, 1956
2,877,121	Anderson et al.	Mar. 10, 1959