Sept. 4, 1962 L. J. BUDD 3,052,397

PALLETIZED CONTAINER FOR FREEZING COMMODITIES

Filed Oct. 13, 1960 2 Sheets-Sheet 1

Fig. 1

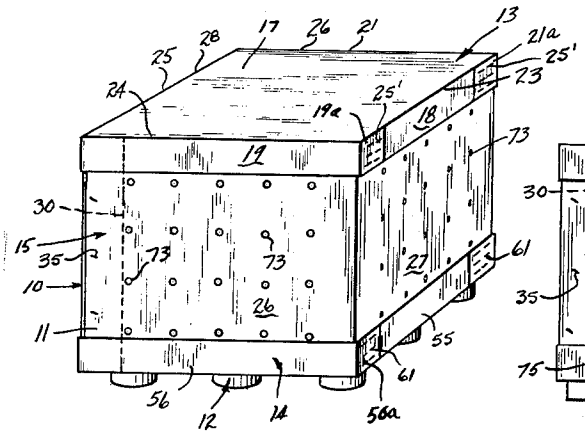


Fig. 2

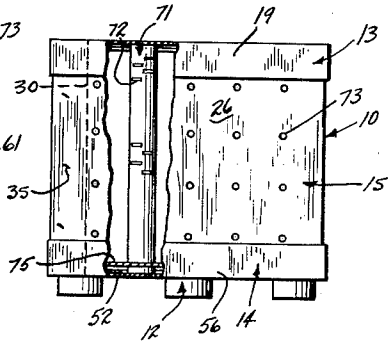
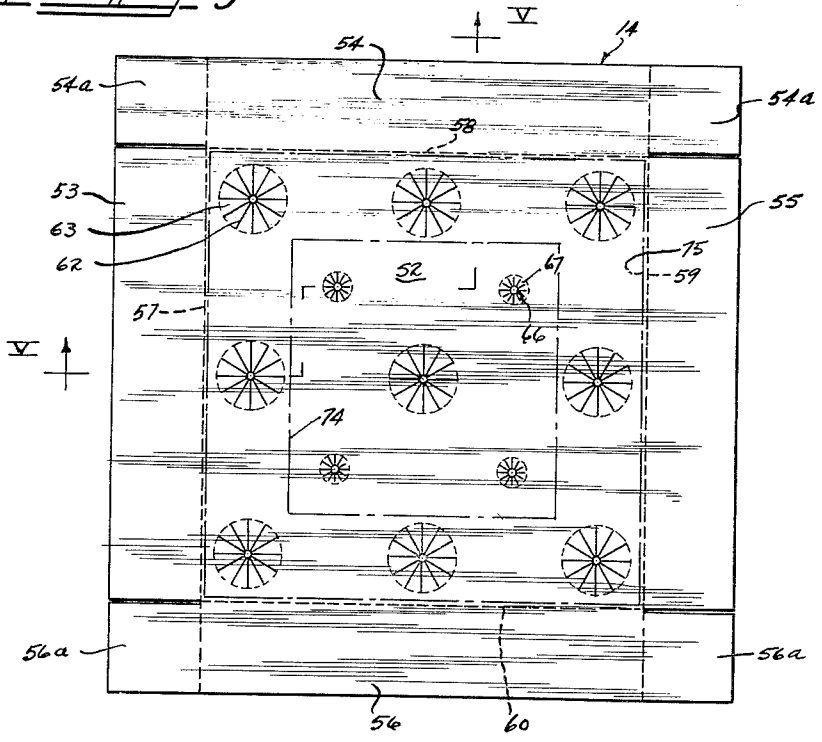


Fig. 3



INVENTOR.
Larry J. Budd

BY

Kill, Sherman, Meroni, Gross & Simpson

ATTORNEYS

Sept. 4, 1962 L. J. BUDD 3,052,397

PALLETIZED CONTAINER FOR FREEZING COMMODITIES

Filed Oct. 13, 1960 2 Sheets-Sheet 2

Fig. 4

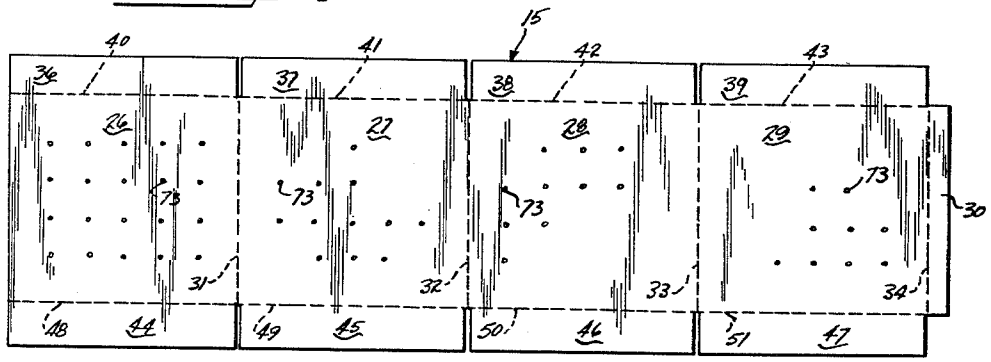


Fig. 5

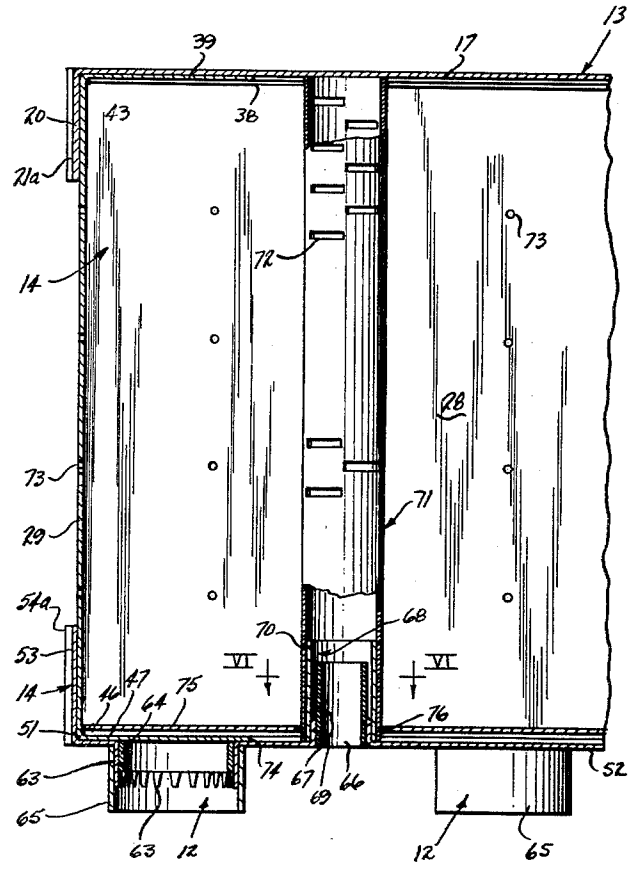
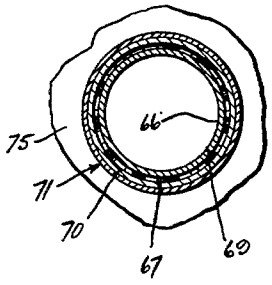


Fig. 6



INVENTOR.
Larry J. Budd

BY
Hill, Sherman, Meroni, Gross & Simpson
ATTORNEYS

United States Patent Office 3,052,397
Patented Sept. 4, 1962

3,052,397
PALLETIZED CONTAINER FOR FREEZING COMMODITIES

Larry J. Budd, Elmhurst, Ill., assignor to Pallet Devices, Inc., Des Plaines, Ill., a corporation of Illinois

Filed Oct. 13, 1960, Ser. No. 62,439
13 Claims. (Cl. 229—6)

The present invention relates to an enclosure for the storage of articles. The present invention more particularly concerns a palletized paperboard container which is adapted to contain cranberries and other vegetables, fruits, and the like which container has means through which coolant may be flowed so that the contents of the container may be quickly frozen.

In the past it has been practically impossible to freeze cranberries, vegetables, fruits and other similar articles when carried in bulk within a paperboard container. The reason for this is that paperboard or fiberboard is an excellent insulator and even though the temperature may be dropped to 30° to 40° below zero it is extremely difficult if not impossible to freeze the contents of the container.

The present invention concerns a new corrugated box in which cranberries and the like may be packed in bulk and then quickly frozen by passing streams of coolant through the corrugated box and which coolant may have a temperature such as 30° to 40° below zero.

According to the present invention, the container has legs and the bottom carries a series of tubular shafts which extend between the bottom and the top of the container. Each of the shafts overlies a bottom vent disposed in the bottom of the container. The shafts also have a series of shaft vents which are disposed along the length of the shafts. The side walls of the containers also have side wall vents. The coolant is adapted to be circulated between the legs into the bottom vents and then into the tubular shafts whereupon the fluid passes through myriads of shaft vents and engages the contents of the container to freeze the contents and the coolant then passes out through the side wall vents to the atmosphere.

An important object of the invention is to provide a corrugated box in which goods such as cranberries, peas, carrots, corn and the like all may be carried in bulk within the container and quickly frozen in order to preserve the contents of the container.

Still another object of the present invention is to provide a ventilated type of container which may be quickly filled with goods to be ventilated without interfering with the ventilating means.

Yet another object of the present invention is to provide a low cost type of ventilated enclosure in which goods may be stored.

According to the general features of the present invention there is provided a correct quick freeze palletized paperboard container which comprises an enclosure having its walls provided with wall vents and its bottom provided with spaced legs. The bottom also has a series of spaced bottom vents and tubular shafts are mounted on the bottom in the enclosure over the bottom vents. The shafts have shaft vents through which freezing air may pass through the bottom vents up into the tubular shafts out through the shaft vents to freeze the contents of the enclosure and then pass through the wall vents. The bottom has bottom material cut-out to form the bottom vents turned into the enclosure in annular relation about each of the vents. Inner and outer tubular shaft supports are secured in assembly with the bottom material about each of the bottom vents on the opposite sides of the material turned away from the bottom. The tubular shafts are telescoped over the tubular shaft supports so

that the shafts are carried by the bottom on the shafts in an upright position within the enclosure.

According to still other features of the present invention there is provided a new method of freezing the contents of a paperboard or corrugated container comprising the steps of passing streams of freezing coolant through at least one of the container walls of the container, confining the streams of freezing coolant as the streams pass into the interior of the container, then breaking up the flow of each of the streams into myriads of lesser streams causing the freezing coolant to flow about the contents of the enclosure, and then discharging the lesser streams of coolant through at least one of the container walls exteriorly of the container.

Other objects and features of the present invention will more fully become apparent in view of the following detailed description taken in conjunction with accompanying drawings illustrating a single embodiment and in which:

FIGURE 1 is a perspective view of a palletized corrugated or paperboard container according to features of the present invention;

FIGURE 2 is a front elevation of the container with parts broken away to show the relationship of its components;

FIGURE 3 is a plan view of the blank which is used in the formation of a base for the container;

FIGURE 4 is a plan view of a blank used to form a side wall structure for the container;

FIGURE 5 is an enlarged fragmentary cross-sectional view taken substantially on the line V—V in FIGURE 3 showing the manner in which the columns are supported within the container or enclosure; and

FIGURE 6 is an enlarged fragmentary cross-sectional view taken substantially on the line VI—VI in FIGURE 5.

As shown on the drawings:

The reference numeral **10** indicates generally a quick freeze palletized corrugated paperboard container. The palletized container **10** includes a container or enclosure **11** mounted on a plurality of spaced legs **12**. The container or enclosure **11** further includes a top cap member or dished cap **13**, a bottom cap member or dished member or pallet **14**, and a rectangular wall structure **15**. The wall structure **15** is telescoped within the cap members **13** and **14** when the components are in assembly together.

The cap member **13** includes a top **17** and top flaps **18–21**, inclusive. The top flaps **19** and **21** have top end flaps **19***a*—**19***a* and **21***a*—**21***a*. The flaps **18–21**, inclusive are bent relative to the top **17** at fold or score lines **22–25**, inclusive. The end flaps **19***a*—**19***a* and **21***a*—**21***a* are secured to the top flaps **18** and **20** by suitable fasteners such as rivets indicated at **25'** to thereby form the top cap member **13**. The blank used to form the cap member **13** is identical to the blank used to form the bottom cap member **14**, as illustrated in FIGURE 3.

The blank used to form the wall structure **15** is illustrated in FIGURE **4** and includes side walls and an end flap identified at **26–30**, inclusive. The side walls and the end flap **30** are bent relative to one another along the vertical side wall fold lines **31–34**, inclusive. When the side walls are folded along the fold lines **31–34**, the end flap **30** is adapted to be secured to the wall **26** by any suitable means such as rivets **35** to thereby form a rectangular wall structure. Carried at the upper ends of the side walls **26–29** are a series of upper end wall flaps **36–39**, inclusive. These flaps are foldable relative to the side walls along fold lines **40–43**, inclusive. Disposed along the bottom edges of the side walls **26–29** are a series of lower side wall flaps **44–47**, inclusive which are also foldable relative to the side walls along the fold lines **48–51**, inclusive.

In FIGURE 3 is shown the blank for forming the bottom cap member or base 14. The base 14 includes a bottom 52 and a series of bottom flaps 53–56, inclusive which are foldable along the fold lines 57–60, inclusive, so as to be capable of being turned generally at right angles to the bottom 52. The bottom flaps 54 and 56 are provided with bottom flap end portions 54*a*—54*a* and 56*a*—56*a*. These flaps are adapted to be turned about the corners of the bottom 52 and secured by any suitable means such as rivets 61 to the bottom flaps 53 and 55 to thereby form the base member 14.

The pallet 14 includes the legs 12 and these legs are formed by providing the bottom with cut leg areas 62 which each include a series of triangular flaps 63, where a circular type of make is to be used. The triangular leg segments 63 are turned vertically below the bottom 52 and inner and outer annular leg members 64 and 65 are disposed on opposite sides of the segments 63 and are secured in assembly together by any suitable means such as glue, rivets, and the like. The legs are arranged in rows and the legs are spaced from one another a suitable distance so that the prongs of a lift truck may be moved between the legs to facilitate handling of the palletized container 10.

According to the features of the present invention, the bottom 52 is also provided with a series of vents 66. Each of the vents, as illustrated, comprises a cut-out area which is defined by a series of triangular segments 67. These segments are turned upwardly from the bottom 52 in the opposite direction with respect to the leg segments 62. Shaft or columns support means indicated generally at 68 is secured to the vent segments 67 by any suitable means such as glue or rivets and the like. The shaft support means 68 comprises inner and outer annular shaft support members 69 and 70 which are disposed radially opposite sides of the segments 67.

Secured upon the shaft support means 68 are a series of tubular shafts or columns indicated generally at 71. These columns or shafts 71 have a series of circumferentially and vertically spaced column or shaft vents 72 disposed along the length of the shafts.

When it is desired to fill the palletized container 10, the top cap 13 is removed and the shafts 71 are engaged with the support means 68 so that the shafts 71 are disposed in upright relation with respect to the bottom 52. The goods to be stored within the container are then poured into the container about the vertical upright shafts or columns 71 and the cap is then replaced on the wall structure 15. The palletized container 10 may then be placed into a freezer so that freezing coolant having a temperature such as 30 to 40 degrees below zero may be caused to flow through the bottom vents 66 into the shafts 71 whereupon the main streams of coolant are broken up into myriads of small streams and passed through the shaft passageways 72 to quickly freeze the contents of the container or enclosure. The coolant passes through the contents of the container and then out through side walls at 73 to the atmosphere. Any suitable number of side wall vents 73 may be provided such as 240 vents on each side wall. It will be noted there are no vents to atmosphere at the bottom or the top of the container or enclosure. It will further be noted that when the cover 13 is mounted on the container that its wall 17 engages the top of the shafts or columns or posts 71 so as to further stabilize the posts 71.

When the wall structure 15 is folded to shape, the flaps 36–39, inclusive, are turned at right angles relative to the side walls 26–29, inclusive, and are disposed in lapped relation with respect to one another for abutment against the cap wall 17. Similarly, the bottom flaps 44–47, inclusive, are turned at right angles with respect to the side walls 26–29, inclusive, and are engaged with the bottom 52 of the pallet member 14. The edges of the flaps 44–47, inclusive, have been designated by phantom line 74, as shown in FIGURES 3 and 5. It will be appreciated these flaps are adapted to lap the leg slit areas and act as closure elements to prevent the contents of the box from discharging through the openings to atmosphere defined by the legs 12. Since these flaps 44–47, inclusive, only cover the peripheral leg holes and not the central leg holes, a pad of paperboard or corrugated material 75 is provided and adapted to be superimposed on top of the flaps 44–47, inclusive, as shown in FIGURE 5. The pad or closure elements 75 has column holes 76 in it enabling the pad to be moved over the columns 71 with the columns being adapted to pass through the holes 76. Any suitable number of columns may be provided and it will be noted the illustrated container has four such columns, as shown in FIGURE 3. In order to illustrate the peripheral outline of the pad 75, a phantom line designated by the numerals 75 is illustrated in FIGURE 3 for this purpose.

The enclosure or container 11 may be made from any suitable materials such as double wall corrugated board capable of withstanding a 350 pound test. The tubular shafts or columns 71 may be comprised of spiral wound fibers and be of a ⅛ inch thickness. As illustrated, the support means 68 and more particularly the outer annular support member 70 has a vertical height which is approximately ⅓ of the height of the shaft 71. It will be appreciated that the shaft means 68 must be of a sufficient height so as to prevent the shaft 71 from being knocked over when the enclosure is being filled with the goods to be stored.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. A quick freeze palletized paperboard container comprising an enclosure having its walls provided with wall vents and its bottom provided with spaced legs underlying the bottom, the bottom also having a series of spaced bottom vents with the legs providing means spacing the vents from a supporting surface to allow coolant to flow between the legs into the vents, and tubular shafts mounted on said bottom in said enclosure over said bottom vents, the shafts having shaft vents whereby freezing air may pass through the bottom vents up into the tubular shafts out through the shaft vents to freeze the contents of the enclosure and then pass through the wall vents.

2. A quick freeze palletized paperboard container comprising an enclosure having its walls provided with wall vents and its bottom provided with spaced legs, the bottom also having a series of spaced bottom vents, and tubular shafts mounted on said bottom in said enclosure over said bottom vents, the shafts having shaft vents whereby freezing air may pass through the bottom vents up into the tubular shafts out through the shaft vents to freeze the contents of the enclosure and then pass through the wall vents, the bottom having bottom material cut out to form the bottom vents turned into the enclosure in annular relation about each of the vents, inner and outer tubular shaft supports secured in assembly with the bottom material on its opposite sides and with the tubular shafts telescoped over the tubular shaft supports to support the tubular shafts in an upright position within the enclosure.

3. A quick freeze palletized paperboard container comprising an enclosure having its walls provided with wall vents and its bottom provided with spaced legs, the bottom also having a series of spaced bottom vents, and tubular shafts mounted on said bottom in said enclosure over said bottom vents, the shafts having shaft vents whereby freezing air may pass through the bottom vents up into the tubular shafts out through the shaft vents to freeze the contents of the enclosure and then pass through the wall vents, the bottom having bottom material cut out to form the bottom vents turned into the enclosure in annular relation about each of the vents, shaft support means secured in assembly with the bottom material adjacent

the bottom vents and with the tubular shafts being secured to the shaft support means and disposed in alignment with the bottom vents.

4. A quick freeze palletized paperboard container comprising an enclosure having its walls provided with wall vents and its bottom provided with spaced legs, the bottom also having a series of spaced bottom vents, and tubular shafts mounted on said bottom in said enclosure over said bottom vents, the shafts having shaft vents whereby freezing air may pass through the bottom vents up into the tubular shafts out through the shaft vents to freeze the contents of the enclosure and then pass through the wall vents, the bottom having bottom material cut out to form the bottom vents turned into the enclosure in annular relation about each of the vents, shaft support means secured in assembly with the bottom material adjacent the bottom vents and with the tubular shafts being secured to the shaft support means and disposed in alignment with the bottom vents, the tubular shafts being supported at the opposite ends by being engaged against a top wall of the container.

5. A quick freeze palletized paperboard container comprising an enclosure having its walls provided with wall vents and its bottom provided with spaced legs, the bottom also having a series of spaced bottom vents, and tubular shafts mounted on said bottom in said enclosure over said bottom vents, the shafts having shaft vents whereby freezing air may pass through the bottom vents up into the tubular shafts out through the shaft vents to freeze the contents of the enclosure and then pass through the wall vents, the bottom having shaft supports secured about said bottom vents and extending above the bottom approximately ⅕th the height of the tubular shafts and with the tubular shafts being in telescoped assembly with said shaft supports.

6. A quick freeze palletized paperboard container comprising an enclosure having its walls provided with wall vents and its bottom provided with a series of cut-out areas, the cut-out areas having a series of segments turned away from the bottom and tubular legs secured in assembly therewith, the bottom also having the series of spaced bottom vents, tubular shafts mounted on said bottom in said enclosure over said bottom vents, the shafts having shaft vents whereby freezing air may pass through the bottom vents up into the tubular shafts out through the shaft vents to freeze the contents of the enclosure and then pass through the wall vents, and a pad carried on the bottom with the tubular shafts extending through the bottom and with the pad functioning as a closure element to prevent the contents of the enclosure from discharging through the tubular legs.

7. A quick freeze pallet including a bottom provided with spaced legs, the bottom also having a series of spaced bottom vents, tubular shafts mounted on said bottom over said bottom vents, the shafts having shaft vents whereby freezing air may pass through the bottom vents up into the tubular shafts out through the shaft vents, the bottom having shaft supports secured about said bottom vents and extending above the bottom and with the tubular shafts being in telescoped assembly with said shaft supports.

8. A quick freeze palletized container including a pallet having spaced legs, the pallet also having a series of spaced pallet vents, tubular shafts mounted on said pallet in the container over said pallet vents, the shafts having shaft vents whereby freezing coolant may pass through the pallet vents up into the tubular shafts out through the shaft vents to freeze the contents of the container, the pallet having shaft supports secured about said pallet vents and with the tubular shafts being in telescoped assembly with said shaft supports, and a wall structure secured to the pallet and a top closure element carried on the

wall structure to define the container, the wall structure having wall vents through which the freezing coolant may pass to atmosphere from the container.

9. The container of claim 8 further characterized by the wall structure comprising a rectangular piece of material having its opposite ends fastened together, said pallet and said top closure each being cup-shaped and with said wall structure having its opposite ends secured in the cups defined by the pallet and the top closure element.

10. The container of claim 9 further characterized by said pallet exclusive of the legs and said top closure element each comprising a single piece of paperboard material.

11. A fiberboard container having a series of walls, one of the walls having a series of spaced coolant inlet vents, tubular shafts mounted on said last mentioned wall in said container over said coolant inlet vents, the shafts having shaft vents whereby freezing coolant may pass through the inlet vents into the tubular shafts out through the shaft vents to ventilate the contents of the container, the walls having wall vents through which the freezing coolant may pass to the exterior of the container from the inside of the container, said one of said walls having shaft supporting means secured thereto and with said shaft supporting means and said shafts being in telescoped assembly together, the shaft supporting means including a series of cut-out areas each having a series of segments formed from the material of the cut-out areas extended away from said one of the walls and with ring means secured at one end to said segments, the ring means and said shafts being in telescoped assembly together.

12. In a ventilated shipping container having an apertured bottom, perforated side walls and a top, a plurality of vertical columns carried on the bottom and communicating through apertures in the bottom to the container exterior, said columns having transverse wall openings communicating with the interior of said container, and spaced means under said bottom for supporting said container in elevated position for defining passages for air to enter the lower ends of the columns and to pass through said transverse wall openings and through the container interior and out of the side wall perforations.

13. A quick freeze palletized paperboard container comprising an enclosure having its walls provided with wall vents and its bottom provided with spaced tubular legs underlying the bottom, the bottom having leg holes aligned with the tubular legs, the bottom also having a series of spaced bottom vents with the tubular legs providing means spacing the vents from a supporting surface to permit coolant to circulate between the legs and up through the bottom vents, means providing a closure for the leg holes in the bottom and the tubular legs to prevent the contents of the container from being discharged through the tubular legs, and tubular shafts mounted on said bottom in said enclosure over said bottom vents, the shafts having shaft vents whereby freezing air may pass through the bottom vents up into the tubular shafts out through the shaft vents to freeze the contents of the enclosure and then pass through the wall vents.

References Cited in the file of this patent

UNITED STATES PATENTS

2,276,800	Sprague	Mar. 17, 1942
2,375,700	Singley	May 8, 1945
2,621,847	Stefanich	Dec. 16, 1952
2,673,022	Prossen	Mar. 23, 1954
2,762,551	Fallert	Sept. 11, 1956
2,774,230	Kasser	Dec. 18, 1956
2,801,742	Farrell	Aug. 6, 1957
2,889,689	Morrison	June 9, 1959
2,894,373	Morrison	July 14, 1959