Aug. 12, 1952 E. G. NICHOLS 2,606,704

APPARATUS FOR PACKAGING NUTS, WITH GASSING AND VACUUM MEANS COMPRISING TUBULAR BAG SUPPORTING NEEDLES

Filed April 13, 1948 2 SHEETS—SHEET 1

FIG. 1.

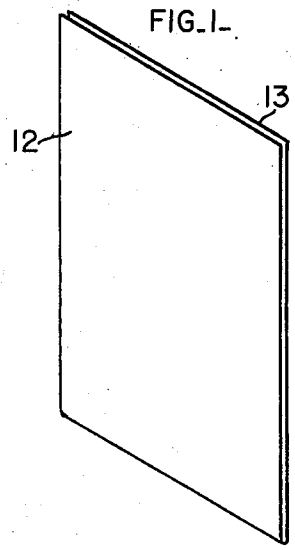


FIG. 3.

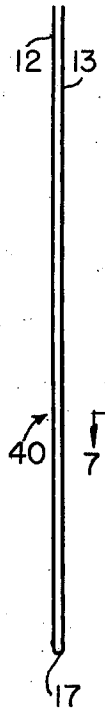


FIG. 2.

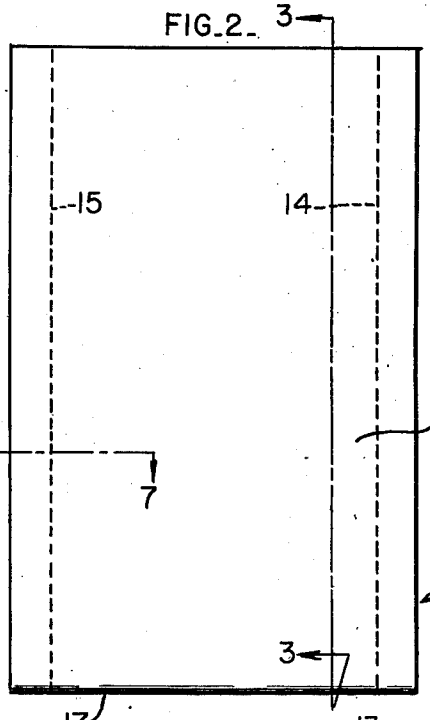
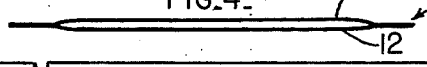


FIG. 1A.

FIG. 4.



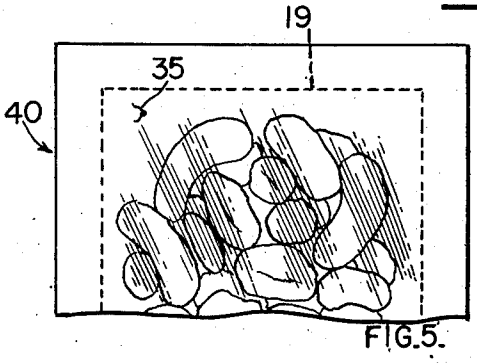


FIG. 5.

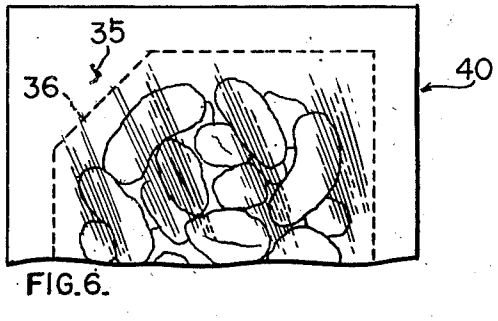
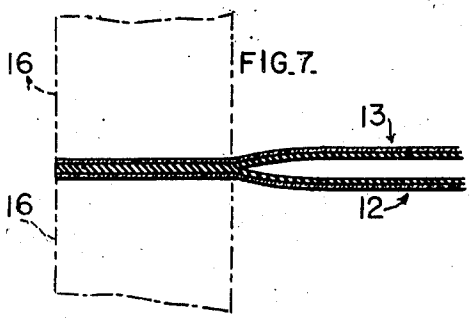


FIG. 6.

FIG. 7.



INVENTOR.

ELLSWORTH G. NICHOLS.

BY

Arthur F. Randall, Atty.

Aug. 12, 1952 E. G. NICHOLS 2,606,704

APPARATUS FOR PACKAGING NUTS, WITH GASSING AND VACUUM MEANS COMPRISING TUBULAR BAG SUPPORTING NEEDLES

Filed April 13, 1948 2 SHEETS—SHEET 2

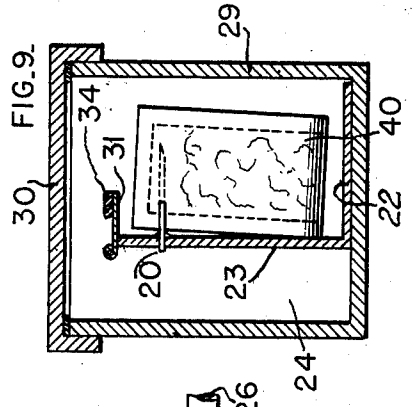


FIG. 9.

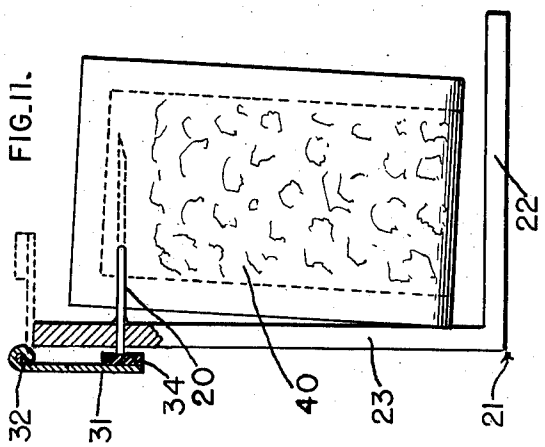


FIG. 11.

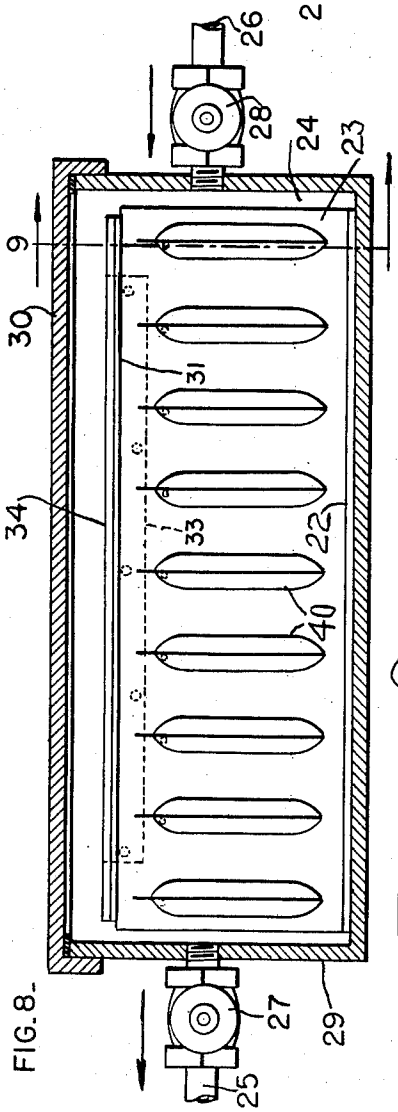


FIG. 8.

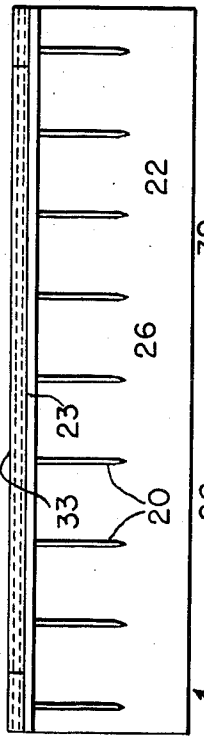


FIG. 10.

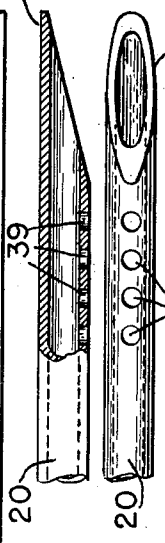


FIG. 12.

FIG. 13.

FIG. 14.

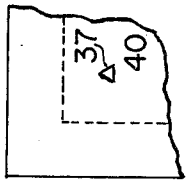


FIG. 17.

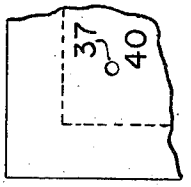


FIG. 16.

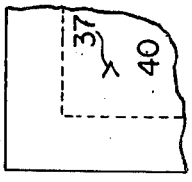


FIG. 15.

INVENTOR.
ELLSWORTH G. NICHOLS.
BY
Arthur V. Randall
attys.

Patented Aug. 12, 1952

2,606,704

UNITED STATES PATENT OFFICE

2,606,704

APPARATUS FOR PACKAGING NUTS, WITH GASSING AND VACUUM MEANS COMPRISING TUBULAR BAG SUPPORTING NEEDLES

Ellsworth G. Nichols, Winchester, Mass.

Application April 13, 1948, Serial No. 20,765

3 Claims. (Cl. 226—20.6)

1

This invention relates to the art of packaging nuts and has for its primary object to provide an improved apparatus for packaging nuts and the like.

It has been customary heretofore to package nuts within an air-tight container which had the disadvantage that the oxygen occupying the container with the nuts caused the latter to become rancid in a comparatively short length of time, particularly nuts cooked in oil or the like.

It has also been proposed heretofore to package nuts within an air-tight sheet metal container from which the oxygen had been evacuated and an inert gas such as nitrogen or carbon dioxide substituted, the latter serving to prevent, or substantially retard, rancidity, but so far as I know this has not been possible heretofore when the airtight container was made from thin flexible and pliant impervious sheet material.

The present invention contemplates the production or a package of nuts comprising a bag made from thin flexible and pliant sheet material that is impervious to oxygen, moisture and grease, said bag having an initially open end or mouth through which it is loaded with the nuts and the opposite sides of said mouth being thereafter sealed against each other to close said mouth after which an aperture is formed in a wall of the bag through which oxygen is evacuated from the bag and an atmosphere of sterile gas substituted whereupon the bag is again rendered air-tight.

It is a feature of the invention that after filling and closing the bag the latter is impaled upon a tubular needle or spike that provides a conduit whose inner end communicates with the interior of the bag and whose opposite end is outside of the bag, said needle being utilized to exhaust the oxygen content of the bag and to substitute the inert gas therefor after which the aperture formed or provided in a wall of the bag for the accommodation of the needle or spike is permanently closed.

In producing the bag I preferably employ two-ply sheet material comprising a transparent sheet or ply of solidified viscose, such as the product known commercially as "cellophane" to constitute the exterior of the bag to which is bonded or welded a transparent film or layer of the same size and shape of a rubber composition to serve as a lining for the bag, said lining being capable of being welded to a similar film or layer through the employment of heat and pressure. A sheet material product answering this description is known commercially as "pliofilm." The main requirements for the lining composition are that it be impervious to oxygen, moisture and grease, and that it shall be a heat-sealing material, or coated with a heat-sealing material, which is impervious to oxygen, moisture and grease.

2

The novel apparatus hereinafter described for use in effecting the above described operations constitutes another feature of the invention.

Other features of my invention are hereinafter pointed out.

In the accompanying drawings:

Figure 1 shows, in perspective, an oblong blank of sheet material folded transversely at its middle as the first step in fabricating the bag to be described.

Figure 1A is a sectional view of the two-ply sheet material hereinafter described.

Figure 2 shows in side elevation the folded blank of Figure 1 having its opposite side marginal portions welded together as indicated by dotted lines 14 and 15.

Figure 3 is a section on line 3—3 of Figure 2.

Figure 4 is a top plan view of the structure shown in Figure 2.

Figure 5 shows the upper end portion of a partially completed loaded bag before the same is completely closed.

Figure 6 is an elevation of the upper end of the completed and loaded bag.

Figure 7 is a magnified sectional view taken on line 7—7 of Figure 2.

Figure 8 is a longitudinal vertical sectional view of an apparatus for use in evacuating oxygen from filled bags and substituting an inert gas therefor.

Figure 9 is a section on line 9—9 of Figure 8.

Figure 10 is a top plan view of the bag-holding rack hereinafter described.

Figure 11 is an end view, partly in section, of the rack shown in Figures 8, 9 and 10.

Figures 12, 13 and 14 are details on enlarged scale illustrating the construction of each of the needles or spikes hereinafter referred to, Figure 12 being partly in elevation and partly in section, Figure 13 being a bottom plan view and Figure 14 being an end view.

Figures 15, 16 and 17 are hereinafter described.

The bag illustrated in the accompanying drawings is produced from an oblong or elongated rectangular blank of sheet material preferably consisting of two plies including a thin non-tacky transparent lining ply 10, Fig. 1A, of a rubber or latex composition and an outer ply 11 preferably consisting of a transparent non-elas-

tic sheet of solidified viscose commonly known as "cellophane," said two plies being bonded together throughout their extent by cement or otherwise and the thickness of the composite blank may measure in the neighborhood of five one-thousandths of an inch.

The elongated rectangular blank is folded transversely upon itself at its middle, Figs. 1 and 2, to close the bottom of the bag when the latter is finished as shown in Fig. 2, as well as to provide opposite side wall panels 12 and 13 either or both of which may bear suitable printed inscriptions (not shown).

The opposite side marginal portions of the two panels 12 and 13 are then permanently united throughout limited areas at each side thereof, each area extending a substantial distance inwardly from the proximate side edges of the panels as shown in Fig. 4 and as indicated by dotted lines 14 and 15 in Fig. 2, and said union extending from the bottom to the top of the bag. This union of the two opposed side marginal portions of the lining ply 10 may be effected in any suitable manner, but preferably by the application thereto of heat and pressure through the medium of heated metal bars or dies that are indicated by dotted lines at 16 in Fig. 7, which dies serve to weld together the opposed and contacting portions of the lining ply 10 thus avoiding the use of cement, although the latter is an alternative method of effecting such union.

The two dotted lines 14 and 15, Fig. 2, together with the bottom closure bend or fold 17 define a chamber into which the nuts are introduced through the mouth of the bag which at this stage is open to admit the same.

After loading the bag 40 with nuts as above described the top marginal portions of the two panels bordering the mouth are permanently united throughout limited areas extending a substantial distance inwardly from the top of the bag as indicated by the dotted line 19 in Fig. 5, said union extending from side to side of the bag. This union of the two opposed top marginal portions bordering the mouth of the bag may be effected in any suitable manner, but preferably by the application thereto of heat and pressure through the medium of a pair of heated metal bars or dies such as are indicated by dotted lines at 16 in Fig. 7, which serve to weld together or integrate the opposed and contacting top marginal portions of the lining ply 10 thus avoiding the use of cement although the latter is an alternative method of effecting such union.

After making, loading and sealing a number of bags as above described, each bag is impaled upon a tubular metal needle 20, Figs. 9 to 14, inclusive, each of said tubular needles being pointed at one end thereof as shown in Figs. 12 and 13 so that it may be caused to penetrate through one of the side walls of its bag with said pointed end within the bag and communicating with the interior of the latter.

As shown in the drawings, the tubular needles 20 form parts of a metal bag-supporting rack 21 provided with a horizontal base 22 that is made with a vertical wall 23, said wall being formed with a horizontal row of apertures within each of which a needle 20 is fixedly secured by solder, or otherwise, in a horizontal position with its pointed end in position to penetrate a side wall of its bag and support the latter as shown in Figs. 8 and 9.

The rack 21, thus loaded with bags, is placed within an air-tight chamber 24, Figs. 8 and 9, with which the ends of two conduits 25 and 26 are connected, said conduits being provided, respectively, with normally closed shutoff valves 27 and 28. When its valve 27 is opened conduit 25 connects chamber 24 with air-exhausting mechanism (not shown) which maintains as high a degree of vacuum within said conduit as possible. When valve 28 of conduit 26 is opened, the latter connects the chamber 24 with a supply of nitrogen or other suitable inert rancidity-retarding gas under pressure.

While valve 28 is closed the valve 27 is opened with the result that a high degree of vacuum is established within the air-tight chamber 24 and by reason of the vents provided by the tubular needles 20, this results in the withdrawal of approximately all of the oxygen-laden air from within the bags that are supported by the needles. Valve 27 is now closed and valve 28 opened with the result that inert nitrogen gas under pressure is supplied to chamber 24 and forced from the latter through the tubular needles into the interiors of the bags.

The chamber 24 is the interior of a vessel 29 provided with a removable cover or closure 30. After the introduction of the nitrogen gas into chamber 24 and the bags as described, valve 28 is closed. Closure 30 is now removed thereby permitting the removal of rack 21 from vessel 29, the outer ends of the tubular needles 20 being at this time closed by a valve member 31 that is pivotally connected at 32 to the upper end of the wall 23 of rack 21 by a hinge-leaf 33, Fig. 8, and pintle 32. The valve 31 may, as shown, be in the form of an elongated hinge-leaf provided upon one side thereof with a sponge rubber strip 34 for engagement with the outer ends of the needles 20.

In Fig. 5 of the drawings the aperture produced when impaling a bag upon one of the needles is shown at 35 and after removal of the bag from the needle the material of the lining film surrounding this aperture upon the inner side of its side wall is welded to the lining film of the oppositely disposed side wall through the application of heat and pressure, as indicated by the dotted line at 36 in Fig. 6, thereby effectually closing the aperture 35.

As shown in Figs. 15, 16 and 17, instead of forcing each needle through the side wall of its bag said side wall may be pre-formed with an aperture or slit as shown at 37 in Figs. 15, 16 and 17.

As shown in Figs. 12 and 13, I preferably provide each needle, adjacent to its free pointed end and upon its underside, with a series of small ports 39.

What I claim is:

1. An apparatus for use in packaging nuts, said apparatus comprising an air-tight vessel having removable closure means, a bag supporting rack asssembly having a vertical wall mounted within said air-tight vessel, a plurality of tubular bag supporting needles mounted upon said rack, said needles passing through and extending outwardly from the vertical wall of said bag supporting rack, each needle adapted to have impaled thereon a wall of a loaded bag made from thin, flexible and pliable impervious sheet material so that one end of each needle communicates with the interior of its bag while the opposite end thereof is in communication with the interior of said vessel; an air-exhaust conduit connected with the interior of said vessel;

a second conduit through which an inert gas under pressure is at times supplied to the interior of said vessel, and valve means for selectively controlling said two conduits.

2. An apparatus for use in packaging nuts comprising an air-tight vessel having removable closure means, an L-shaped support having the horizontal leg thereof supported on the floor of the airtight vessel, and a plurality of tubular bag-supporting needles supported on the vertical leg, each bag-supporting needle adapted to occupy an aperture provided through the wall of a loaded bag that is made from thin, flexible and pliant impervious sheet material so that one end of each needle communicates with the interior of its bag while the opposite end thereof is in communication with the interior of said vessel; a normally closed air exhaust conduit connected with the interior of said vessel, and valve means for controlling said conduit thereby to remove oxygen-laden air from said chamber and bag.

3. An apparatus for use in packaging nuts comprising an air-tight vessel having removable closure means, an L-shaped support having the horizontal leg thereof supported on the floor of

the airtight vessel, and a plurality of tubular bag-supporting needles supported on the vertical leg one end of each needle communicating with the interior of its bag while the opposite end thereof is in communication with the interior of said vessel; a normally closed air exhaust conduit connected with the interior of said vessel; a second normally closed conduit for supplying an inert gas under pressure to the interior of said vessel, and valve means for selectively controlling said two conduits thereby to remove oxygen-laden air from said chamber and bags and substitute inert gas therefor.

ELLSWORTH G. NICHOLS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,406,380	Heath et al.	Feb. 14, 1922
2,343,276	Carlson	Mar. 7, 1944
2,349,303	Pelosi	May 23, 1944
2,442,161	Bergstein	May 25, 1948
2,506,769	Bergstein	May 9, 1950