

March 19, 1957

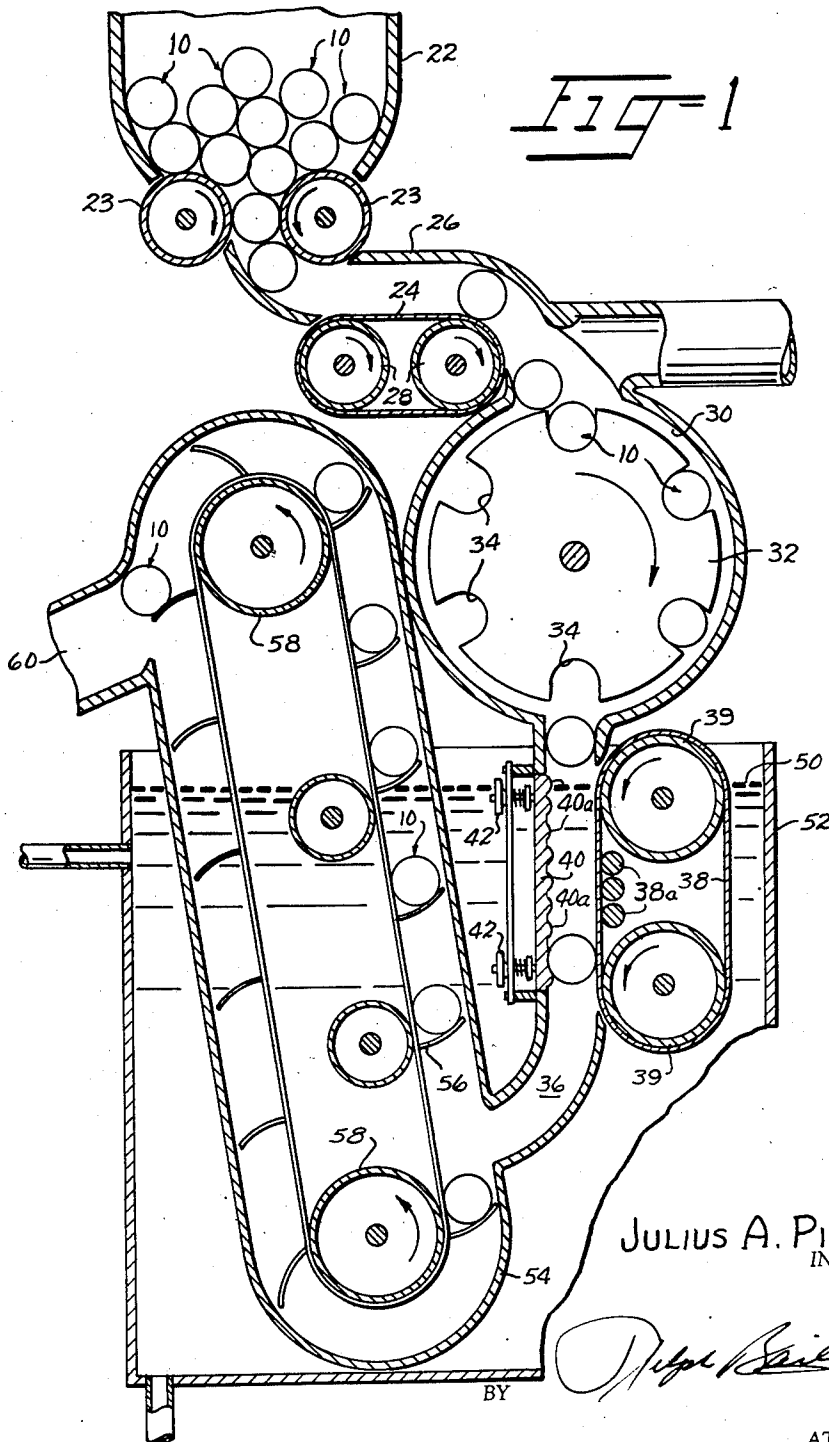
J. A. PICKENS

2,785,986

CANNING METHOD

Filed July 6, 1954

2 Sheets-Sheet 1



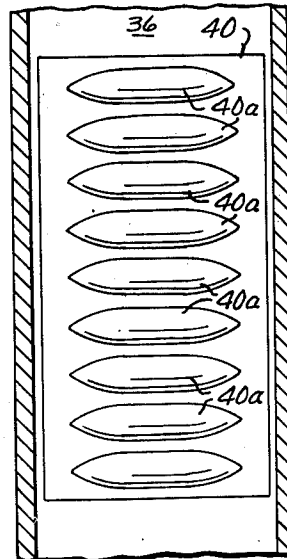
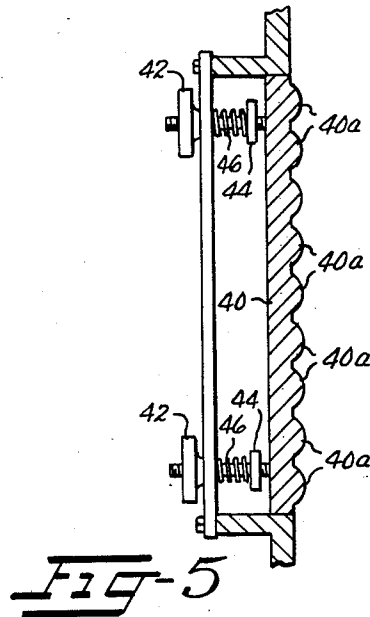
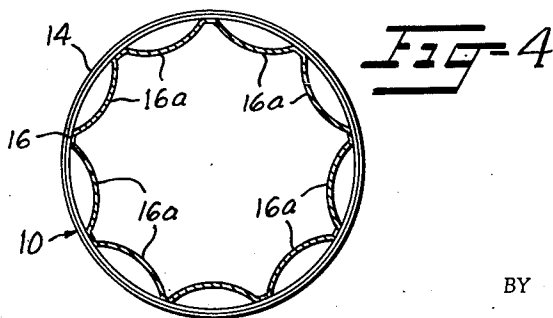
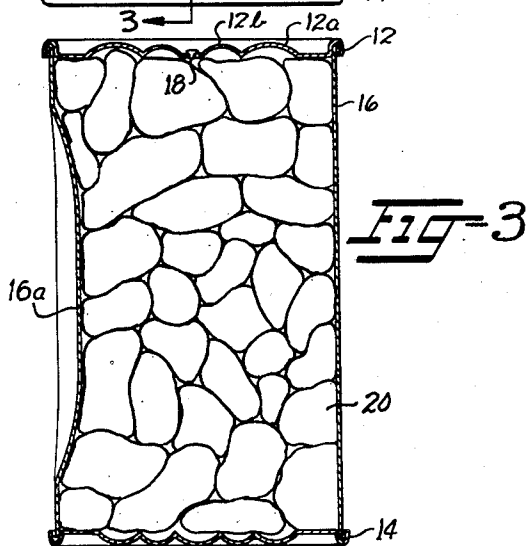
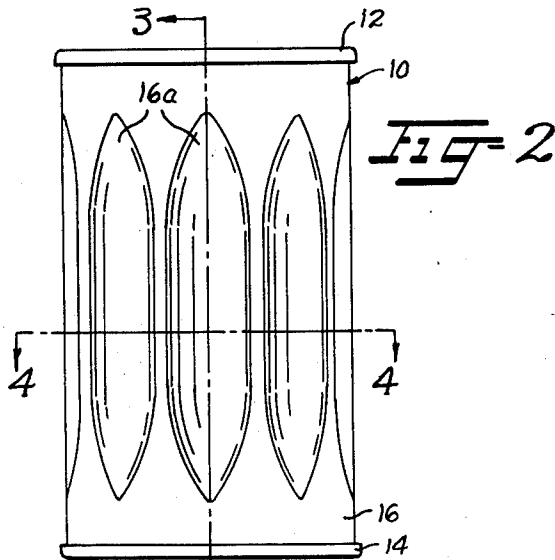
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2 Sheets-Sheet 2



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2,785,986

CANNING METHOD

Julius A. Pickens, Earley, S. C.

Application July 6, 1954, Serial No. 441,373

1 Claim. (Cl. 99—182)

My invention relates to canning and more particularly to the achievement of a novel process of canning fruits, vegetables, meats and other products for the preserving of same in tin cans in an economical manner so that their desirable flavors and qualities are retained, and to the product achieved through use of the process.

The first object is the removal of the air and gases from the contents of the can so completely that the interior of the can will not oxidize and develop a mottled appearance thereby combining a trace of the metal of the can with its packed contents in a deteriorative manner and the reduction of the can's cubical volume to eliminate the resulting vacuum.

Another object is to make practical and economical the use of a thinner gauge of metal in manufacturing the can and the elimination of any pre-formed internal corrugations in the walls of the can. The use of cans having pre-formed corrugations or ribs surrounding a definite area of the can have been employed in the past but found to be impractical because of the expense involved. Such corrugated cans have the further disadvantage of limiting the degree to which the cubical volume of the cans may be reduced, thus preventing the contents from filling the can and unnecessarily distorting the can's walls, making for an awkward labeling surface.

A further object is to produce a packed or canned product that fills the cubical volume of the can sufficiently so that the danger of buckling or crushing its surface is minimized thus making the cans easier to ship and to store.

The achievement of the aforementioned objects are effected essentially by developing a rare vacuum in a packed can, then simultaneously cooling the can and its contents and mechanically reducing its cubical volume whereby, the contents substantially fill the can, preferably using cans with smooth walls and the present form of bottoms, and the tops that have an exhaust vent although, tops that are without the vent may be employed provided a method of attaining a rare vacuum, in the packed can, is used.

While some of the objects have been stated above others will become apparent to those skilled in the art relating to canning when the specification is read in connection with the accompanying drawings in which:

Fig. 1 is a sectional side view of the apparatus for carrying out the instant method,

Fig. 2 is a front view of a can after carrying out the steps of the instant method,

Fig. 3 is a sectional view taken along the line 3—3 in Fig. 2,

Fig. 4 is a sectional plan view taken along the line 4—4 in Fig. 2,

Fig. 5 is an enlarged sectional view showing the ribbed means for indenting the cans and,

Fig. 6 is a view looking toward the right hand side of Fig. 5.

Referring more particularly to the drawings, it will be

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noted that a can broadly designated at 10, having a vent such as is described in United States Patent No. 1,428,705 issued to me September 12, 1922, is employed for the purpose of illustrating the operation of this invention.

Present processes of commercial canning employ some of the features disclosed in the aforementioned patent, i. e., the internal corrugations in the wall of the can designated by 8—8—8 to prevent the atmospheric pressure from crushing and distorting the can when packed employing a rare vacuum and the corrugated flexible bottom designated by B in the patent. One of the purposes of the herein described invention is to eliminate the necessity of using such corrugations and flexible bottom by using cans with thin walls as shown in Fig. 3.

Fig. 3 is a vertical sectional view of a can of such a design as may be used to illustrate the operation necessary to produce the vacuum inside the can, said operation being the first step of the herein described process. The usual parts of the can or metal jacket 10 are designated as the top 12, the bottom 14, and the wall 16. The top 12 is equipped with an annular corrugation or steam ring 12a, a gas ring 12b, and a vent 18.

In operation the can is filled with the commodity 20, which may be heated by any suitable means, either before or after placing in the can, to a steaming temperature and steam being of less weight than air rises and fills the larger annular corrugation 12a. The air and evolved gas being pressed between the cushion of steam and the contents of the can, are urged into the gas ring 12b from which they flow through the vent 18 from the can. The above described step, being the first step of the herein described process, is to continue by means of a regulated temperature conjointly with a "vacuum box" until practically all the gas and air are eliminated.

After this first step, the vent 18 is sealed and sterilization of the contents of the can may be effected in the usual way. After the evacuation of the gas and air from the can is completed, either by the aforescribed first step, or by any other suitable method, and sterilization has been effected the novel process of this invention operates to reduce the cubical volume of the can 10.

Cans packed, as aforescribed, or by any of the vacuum processes carried to a high degree; if permitted to cool in the usual way would develop a rare vacuum as the steam within them condenses. Thus an atmospheric pressure is exerted on the circular walls on the order of approximately 1224 pounds on the No. 2½ cans, on the one quart and 14 ounce cans used to preserve juices 1696 pounds and on the No. 10 cans 1949 pounds. To prevent the cans from being crushed by this pressure a mechanical reduction of their cubical volume simultaneously with the condensation of the imprisoned steam is effected by the herein described apparatus employed to carry out the novel process of this invention.

In Fig. 1 of the drawing the cans 10, after being packed as aforescribed, are placed in the bin or hopper 22. At the bottom of the hopper 22 the rolls 23 are positioned (may or may not be driven) to prevent the cans from wedging and to accelerate their movement into the channel formed by the belt 24 and the shield 26. The belt 24 being movable on the pulleys 28 which are preferably driven cause the cans 10 to pass into the distribution chamber 30. From the distribution chamber 30 the driven distribution cylinder 32, by means of pockets 34, conveys the cans and drops them at regular intervals into the channel 36 formed by the extension of the chamber 30, the belt 38 and the adjustable ribbed plate 40. The ribbed plate 40, having ribs 40a, is shown in cross section in Fig. 5 as attached to the extension of the chamber 30 and is equipped with nuts 42 to adjust its position in the channel 36, and with nuts 44, to adjust the coiled springs

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46 for the purpose of regulating the pressure exerted by the ribs 40a on the cans 10. Fig. 6 shows the front of the plate 40 and the ribs 40a thereon in the form of button dies which form indentations 16a in the cans 10. The channel 36 being submerged in the cooling liquid 50 in the tank 52, condensation of the steam in cans 10 is effected simultaneously in the can as its circular walls are indented and its volume reduced by the ribs or dies 40a as they pass down the face of the plate 40 and pressed thereby against the belt 38. The belt 38 is tautly held against the can by the idle rolls 38a, as it is driven by the pulleys 39.

After the cans 10 have revolved and moved downward between the plate 40 and the belt 38 they are dropped into a second chamber 54 and while passing to the chamber 54 the steam in the cans has been condensed by the cooling liquid in the tank 52, while simultaneously the circular walls 16 of the cans 10 have been indented by the pressure of the dies 40a thereby, reducing the cubical volume of the cans 10. The cans 10 fall onto a bucket conveyor 56 which is driven by the pulleys 58 and are carried to the exit 60. To prevent gorging of the machine with cans the driven elements referred to above are preferably synchronously driven.

This simultaneous indenting and cooling operation removes substantially all the cavities in the can and regulates and reduces the crushing strain, so that no irregular distortion of the can nor rupture of the seams can occur and the can is finished in a symmetrical and attractive shape with a certain portion of the arched faces of the can flattened or indented, so that when complete cooling and condensation occurs these indented or flattened faces may still spring in a little without distortion of the can or rupture of its seams.

It is thus seen that I have provided an apparatus and method of canning permitting thinner sheet metal to be used in the construction of the can. The contents of the can would practically fill its entire cubical volume and when shipped, the contents would not churn or agitate. The can being completely filled, its resistance to bruising or crushing would be increased and its packed contents being free from gas, would not corrode and absorb a

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metal trace from the can and thus its contents would be protected from spoilage or deterioration indefinitely.

While a preferred embodiment of my invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the invention as defined by the appended claim.

I claim as my invention:

The method of packaging food products comprising substantially filling a relatively rigid, thin metal walled container with a commodity, elevating the temperature of the container and its contents to a steaming heat, evacuating the major portion of the gases from the container and contents, sealing the container when the contents are still at such elevated temperature and relatively free from gases, subjecting the container to a cooling medium which will cool the container and contents relatively rapidly and mechanically indenting by external mechanical means the container substantially simultaneously with the cooling thereof, whereby the pressure due to the vacuum is relieved so that the entire volume of the container is filled with the commodity making it possible to use a container constructed of relatively thin metal.

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