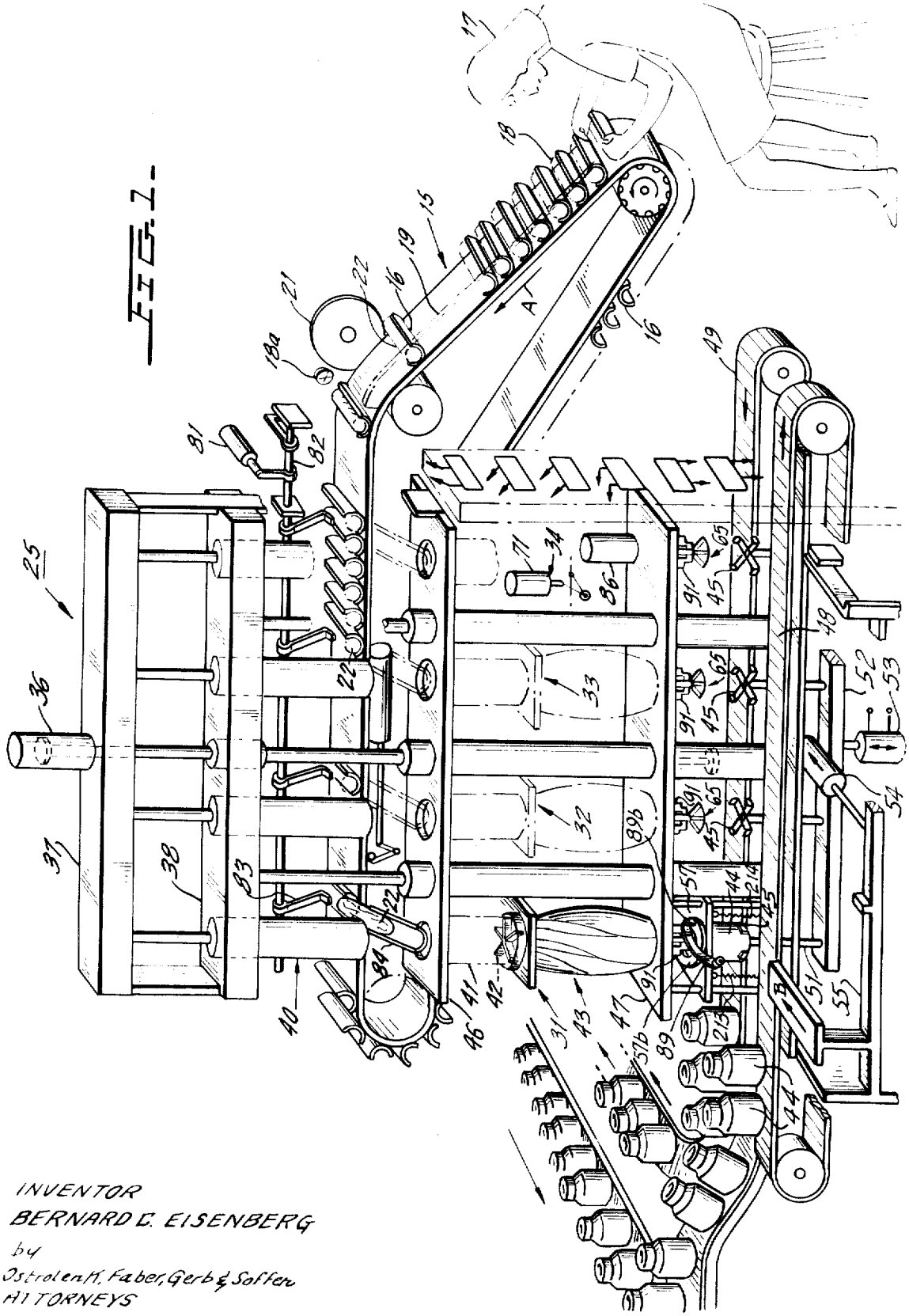
Dec. 25, 1973 B. C. EISENBERG Re. 27,852

SPEAR PACKING APPARATUS

Original Filed Oct. 26, 1970 9 Sheets-Sheet 1

FIG. 1.



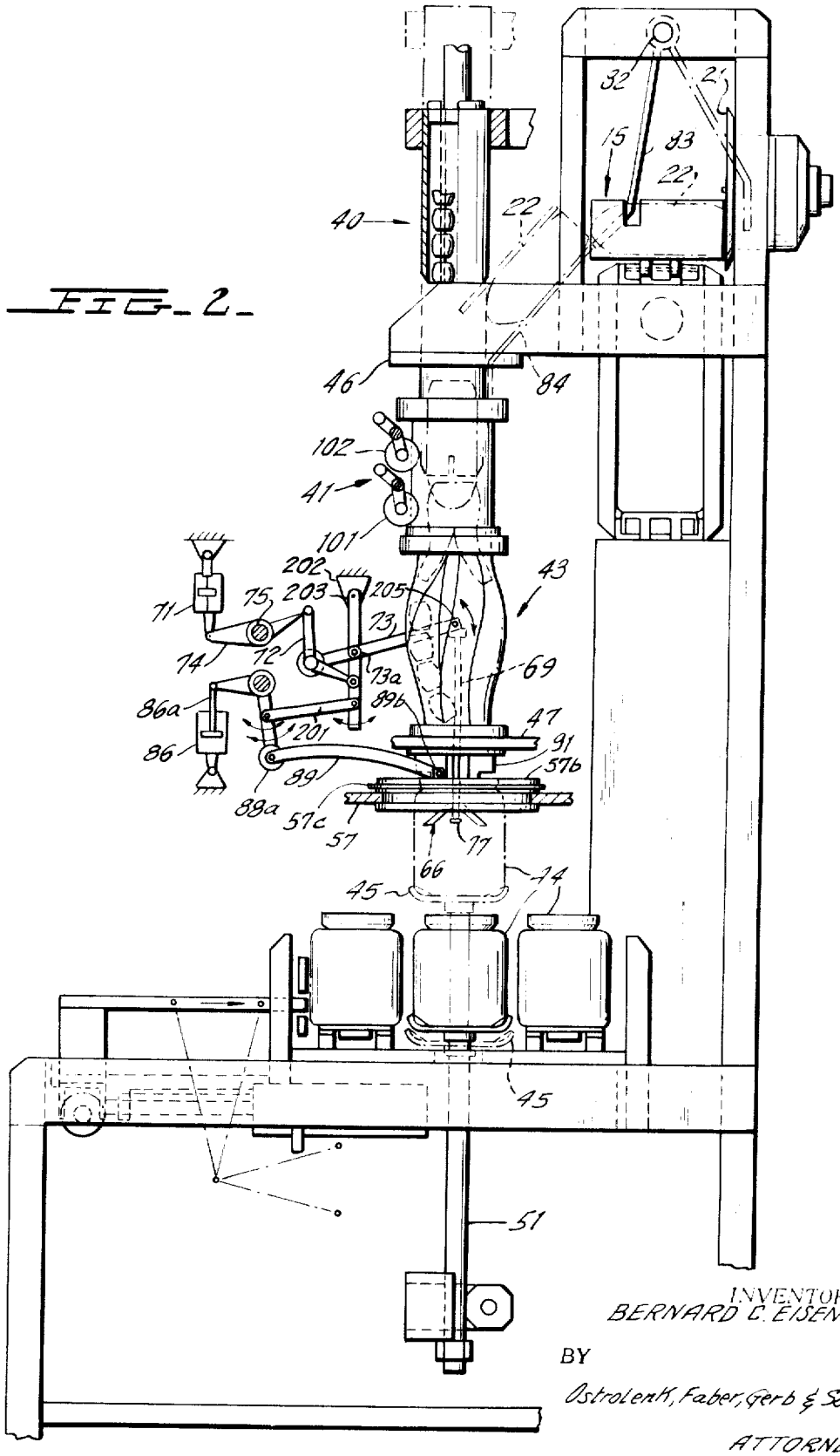
INVENTOR
BERNARD C. EISENBERG
by
Ostrolenk, Faber, Gerb & Soffen
ATTORNEYS

Dec. 25, 1973 B. C. EISENBERG Re. 27,852

SPEAR PACKING APPARATUS

Original Filed Oct. 26. 1970 9 Sheets-Sheet 2

FIG. 2



INVENTOR
BERNARD C. EISENBERG

BY

Ostrolenk, Faber, Gerb & Soffen

ATTORNEYS

SPEAR PACKING APPARATUS

Original Filed Oct. 26, 1970 9 Sheets-Sheet 3

FIG. 3.

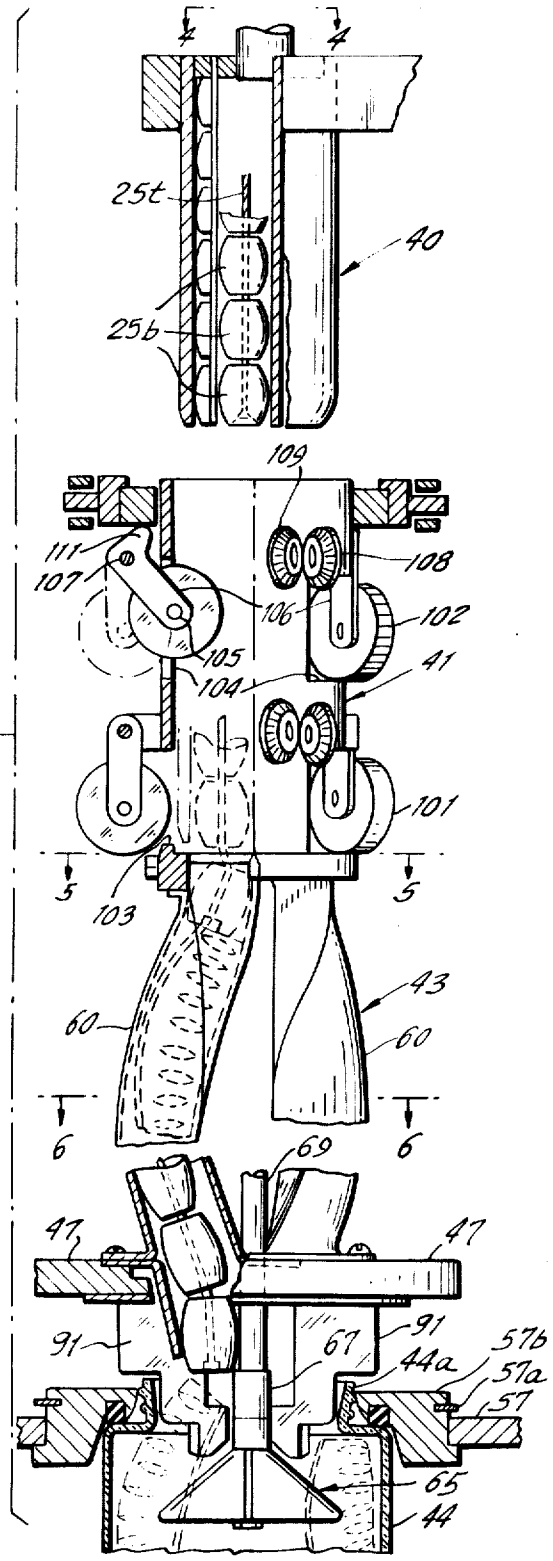


FIG. 4.

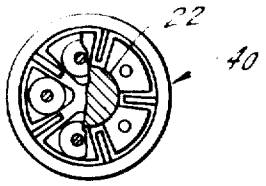


FIG. 5.

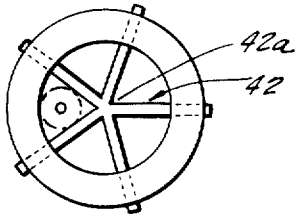


FIG. 6.

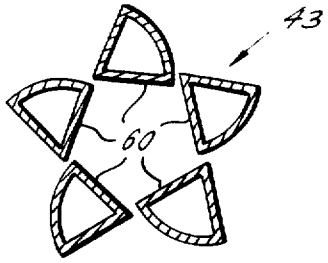
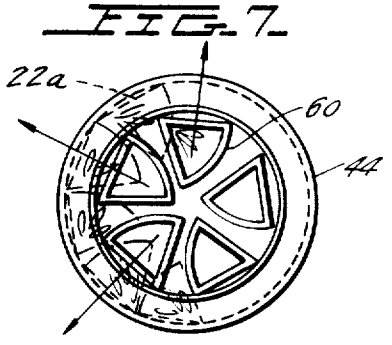


FIG. 7.



INVENTOR.
BERNARD C. EISENBERG

BY

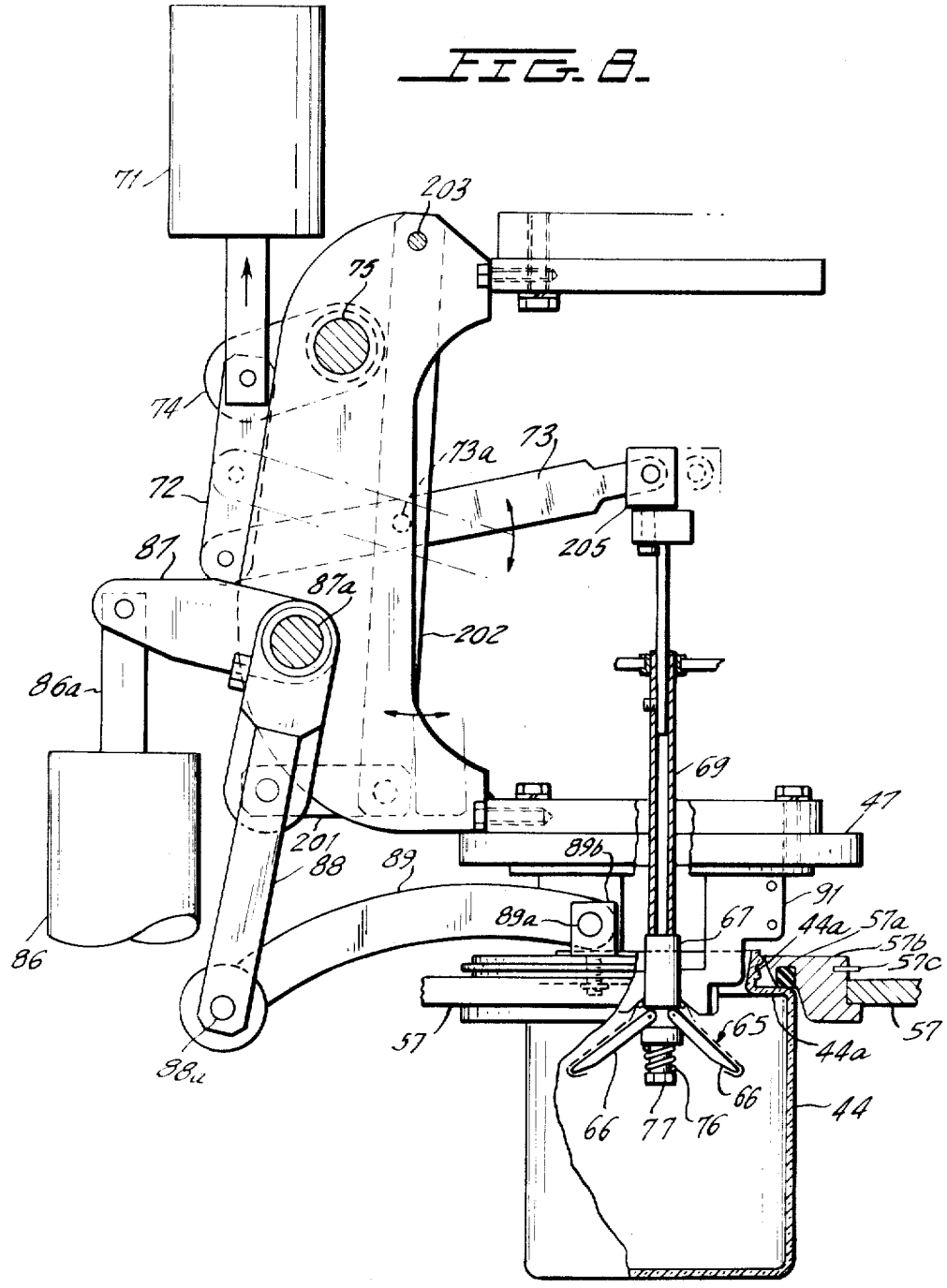
Ostrolenk, Faber, Gerb & Soffen

ATTORNEYS

SPEAR PACKING APPARATUS

Original Filed Oct. 26, 1970 9 Sheets-Sheet 4

FIG. 8.



INVENTOR
BERNARD C. EISENBERG

BY

Ostrolenk, Faber, Gerb & Soffen

ATTORNEYS

SPEAR PACKING APPARATUS

Original Filed Oct. 26, 1970 9 Sheets-Sheet 6

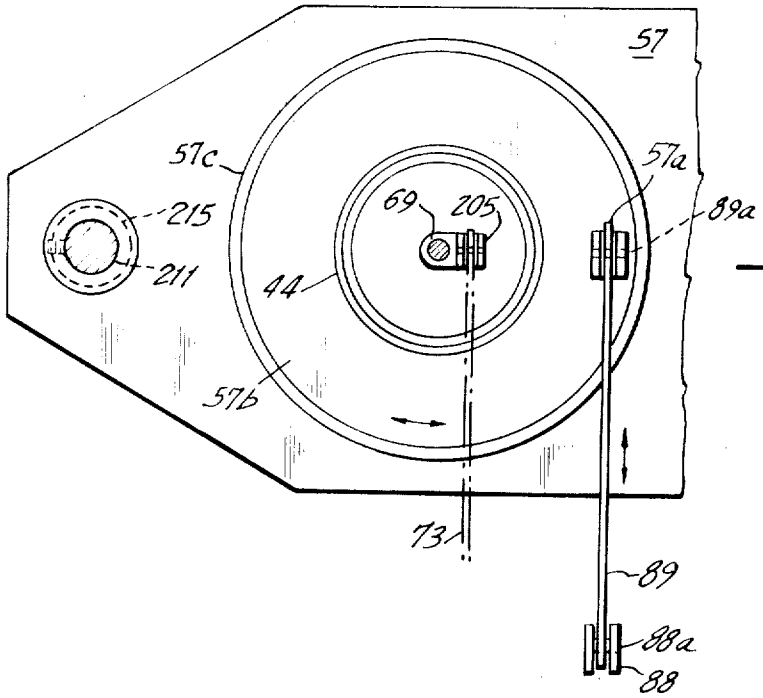


FIG. 8A.

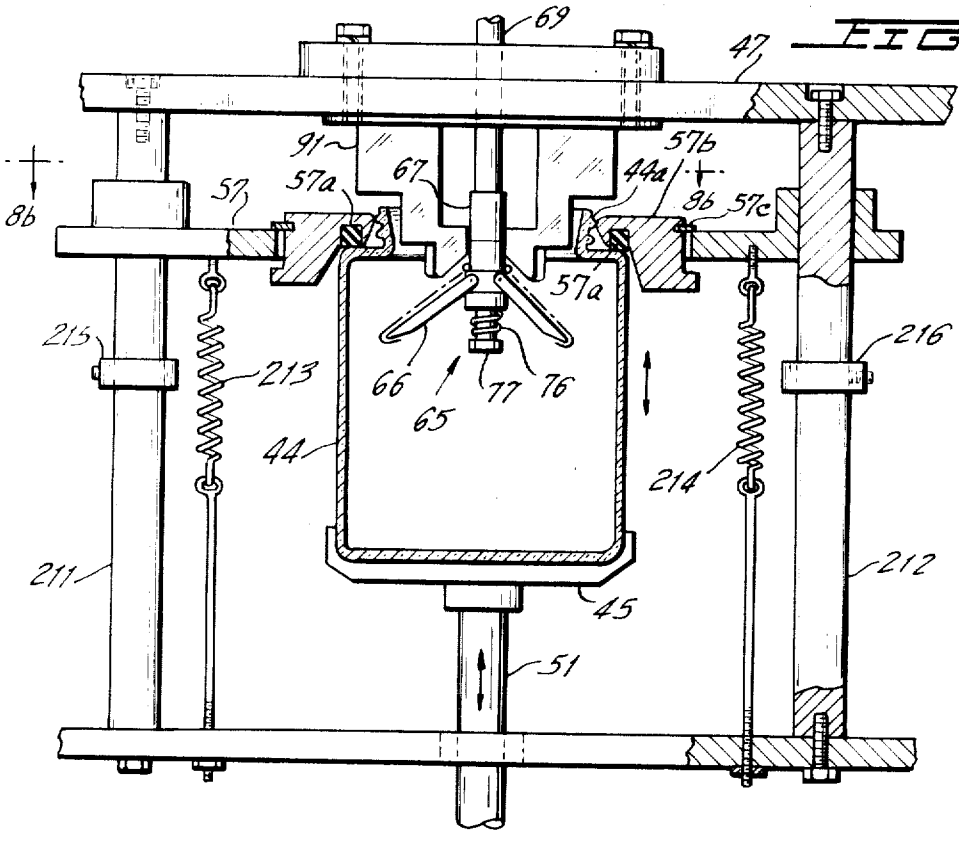


FIG. 8B.

SPEAR PACKING APPARATUS

Original Filed Oct. 26, 1970 9 Sheets-Sheet 6

FIG. 9A.

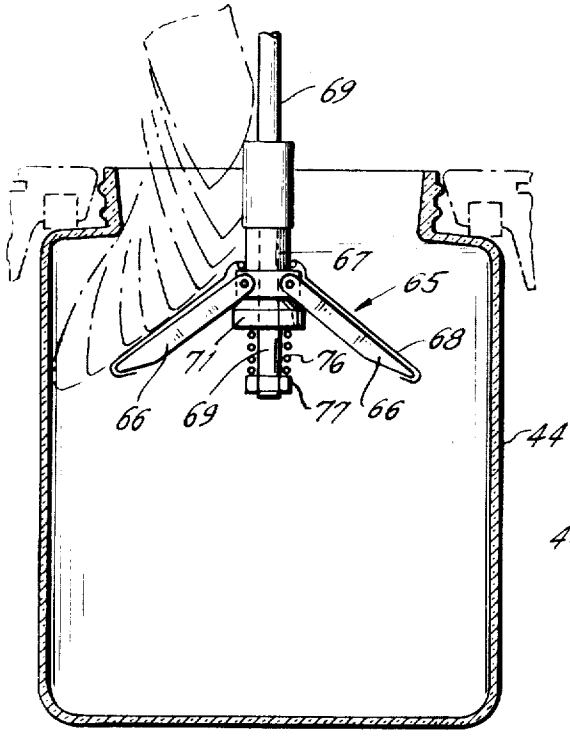


FIG. 9B.

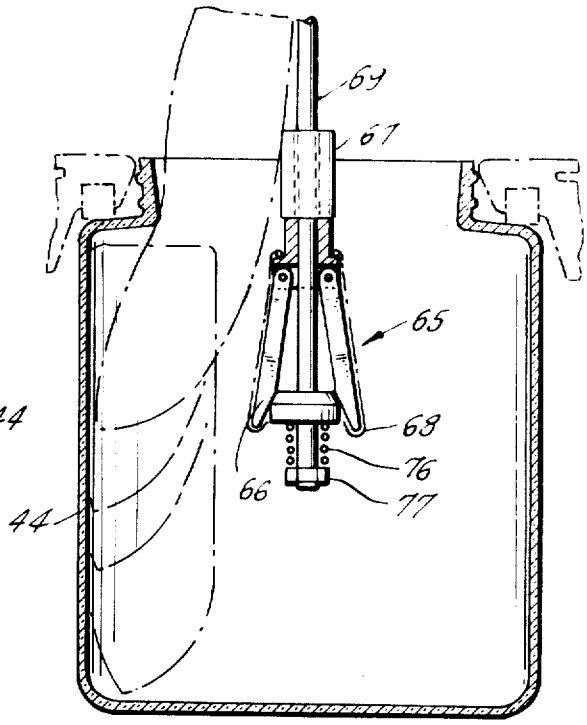


FIG. 11.

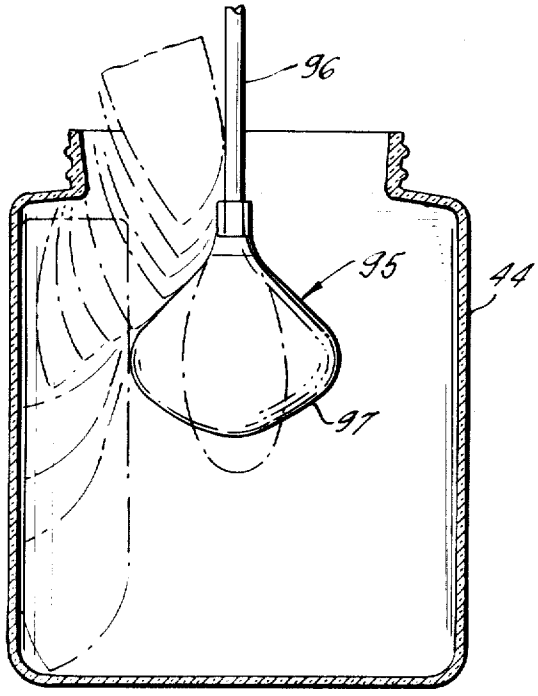
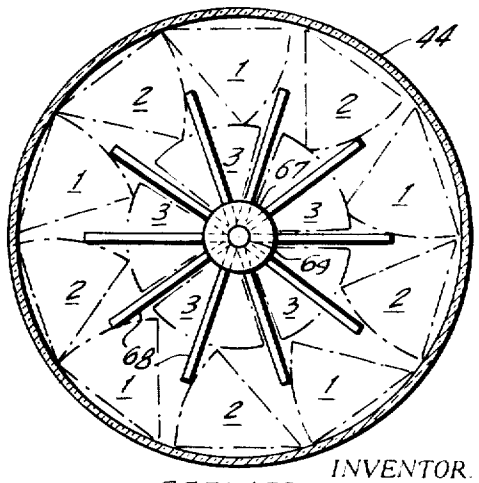


FIG. 10.

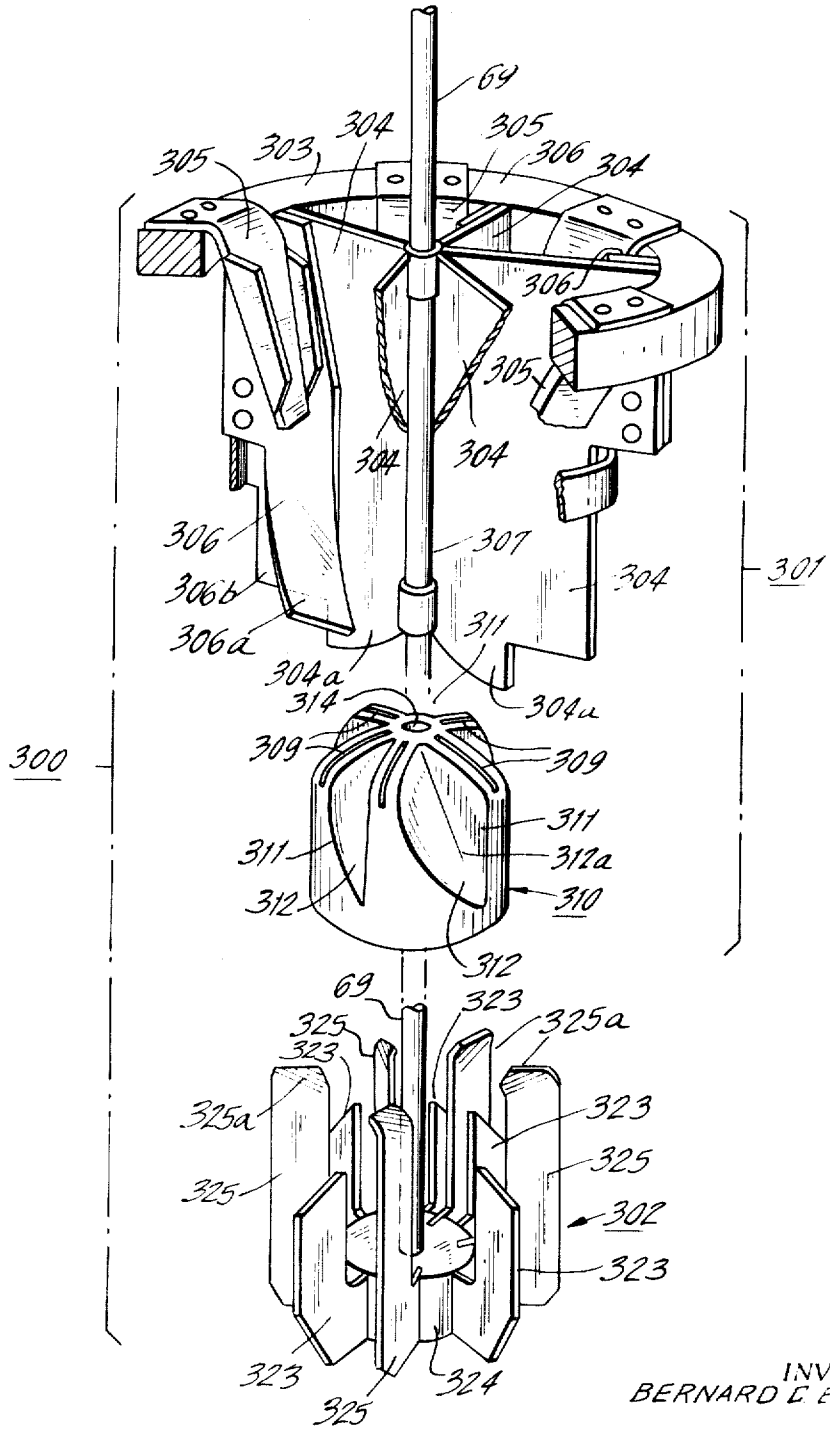


INVENTOR.
BERNARD C. EISENBERG
BY
Ostrolenk, Faber, Gerb & Soffen
ATTORNEYS

SPEAR PACKING APPARATUS

Original Filed Oct. 26, 1970 9 Sheets-Sheet 7

FIG. 12.



INVENTOR.
BERNARD C. EISENBERG

BY

Ostrolenk, Faber, Gerb & Soffen

ATTORNEYS

SPEAR PACKING APPARATUS

Original Filed Oct. 26, 1970 9 Sheets-Sheet 8

FIG. 13.

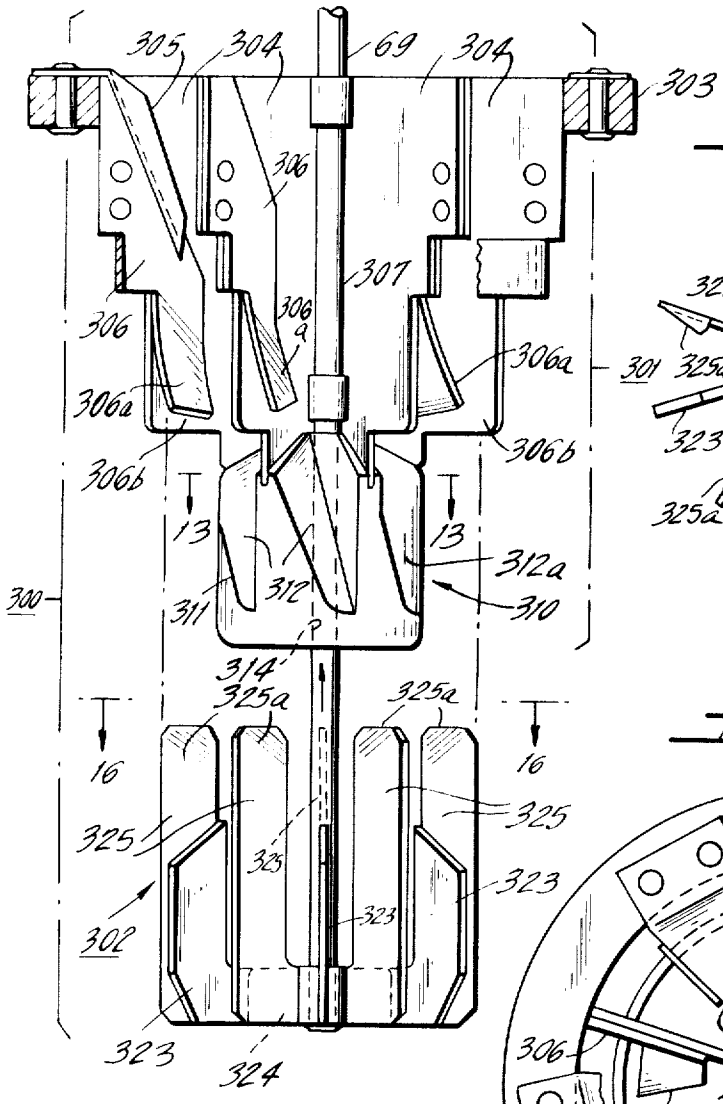


FIG. 16.

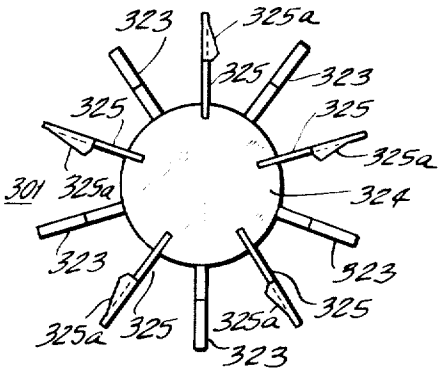
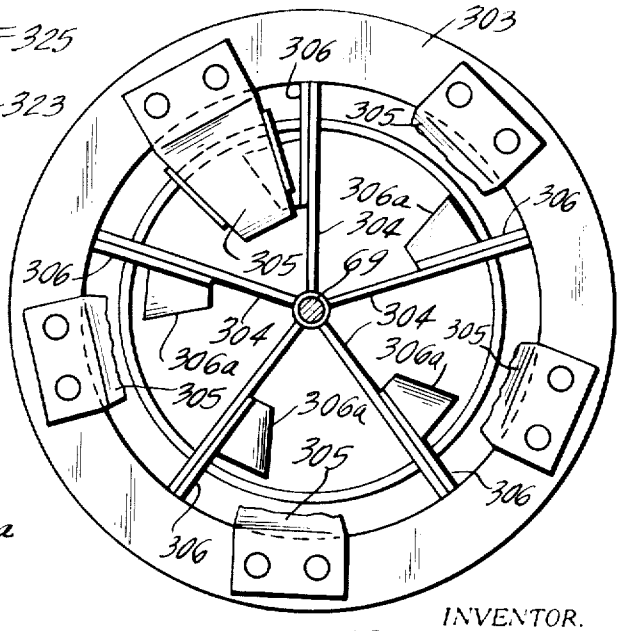


FIG. 14.



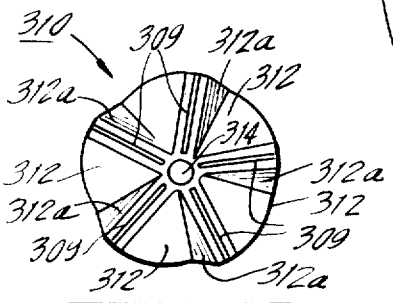


FIG. 15.

INVENTOR.
BERNARD C. EISENBERG

BY

Ostrolenk, Faber, Gerb & Soffen

ATTORNEYS

SPEAR PACKING APPARATUS

Original Filed Oct. 26, 1970 9 Sheets-Sheet 9

FIG. 17.

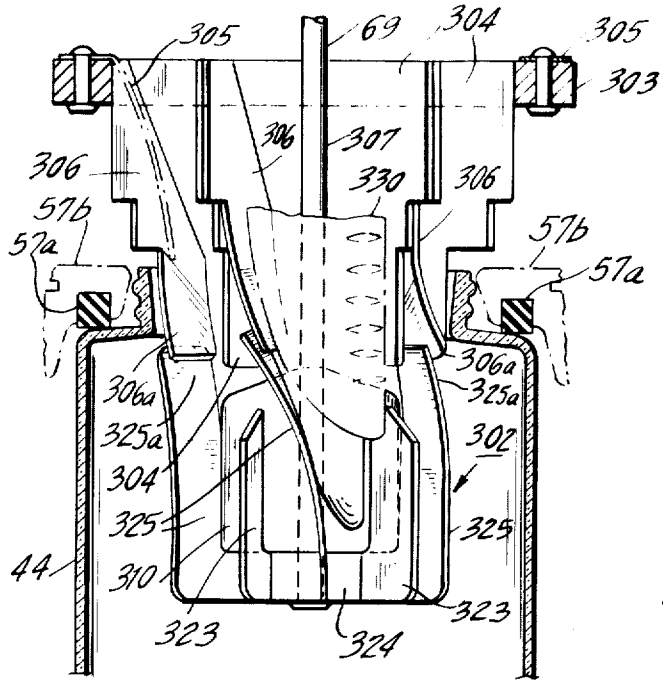


FIG. 17A.

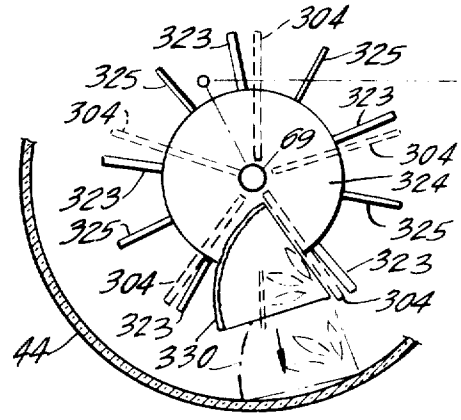


FIG. 18.

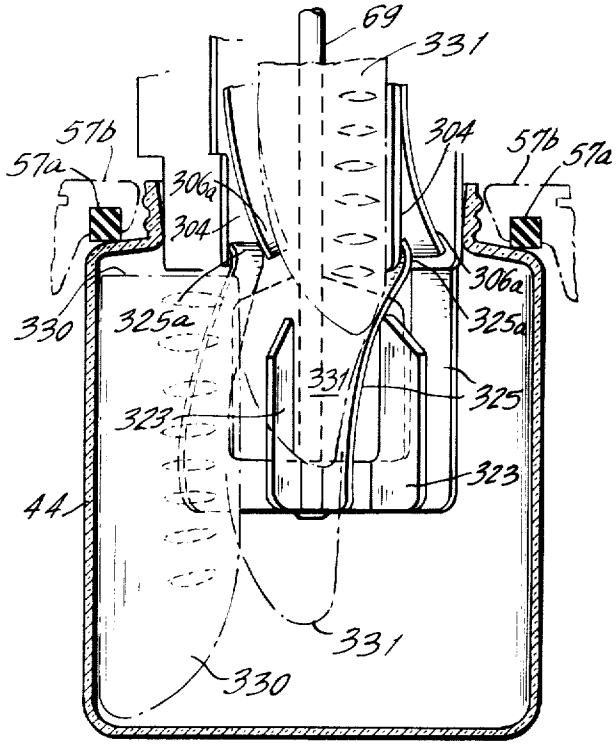
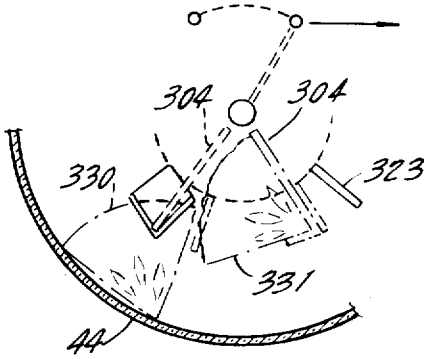


FIG. 18A.



INVENTOR.
BERNARD C. EISENBERG

BY

Ostrolenk, Faber, Gerb & Soffen

ATTORNEYS

United States Patent Office

Re. 27,852
Reissued Dec. 25, 1973

27,852

SPEAR PACKING APPARATUS

Bernard C. Eisenberg, Rockaway, N.J., assignor to Solbern Corp., Fairfield, N.J.

Original No. 3,662,518, dated May 6, 1972, Ser. No. 83,868, Oct. 26, 1970. Application for reissue Nov. 29, 1972, Ser. No. 310,390

Int. Cl. B65b *63/00*

U.S. Cl. 53—123 14 Claims

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

ABSTRACT OF THE DISCLOSURE

Apparatus for longitudinally segmentizing cucumbers and packing the segments in a jar with the seeded surfaces of the segments facing outward is constructed with means for receiving a whole cucumber and cutting same to predetermined length. The predetermined length of cucumber is slit longitudinally into spears of segmental cross section that are fed through individual twisted chutes and exit therefrom into a jar with the seeded surfaces of the segments facing outward. Guide means at the exit ends of the twisted chutes directs the segments outward toward the jar wall. Thereafter the guide means and the jar are angularly stepped so that additional spear segments entering the jar are directed between those segments previously placed in the jar.

In one embodiment of this invention, after the jar wall is lined with spear segments the guide means is withdrawn from the jar and additional spears are placed in the central region of the jar by hand.

In another embodiment of this invention, the guide means is selectively operated to a collapsed and an expanded condition. The jar wall is lined with spears while the guide means is expanded, and after the jar wall is lined with spear segments the guide means is collapsed and additional spear segments entering the jar remain at the central region to fill the jar without interfering with the spear segments lining the jar wall.

This invention relates to automatic packaging apparatus for inserting longitudinally segmentized spears into a glass container, with cut or seeded surfaces of the spears facing the side wall of the container.

Process pickles are prepared by packing clean cucumbers and appropriate chemicals in sealed containers and subjecting the packed sealed containers to heat for a sufficient period of time to kill bacteria and bring about the desired chemical reaction. Such pickles are usually packaged in jars either as whole cucumbers, as disc-like slices, or as spears formed by longitudinally slitting cucumbers into so-called segmentized spears. Marketwise, it is preferable to package segmentized spears so that the cut or seeded surfaces, rather than the skinned or uncut surfaces, face the side wall of the jar. In the prior art, for the most part, this type of packaging was performed entirely by a tedious hand operation which added significantly to the cost of the finished product.

Prior art apparatus to automatically pack segmentized spears with their seeded surfaces facing outward is disclosed in my U.S. Pat. No. 3,468,098 issued Sept. 23, 1969 for "Spear Packing Apparatus." Briefly, such patent discloses apparatus for pushing cucumbers, cut to predetermined length, through segmentizing knives and twisting chutes into a jar disposed at the exit end of the chutes. The mouth of the jar is smaller than the body thereof, and in order to direct the segmentized spears against the jar wall, the jar together with the pusher means, the knife means, and the twisted chutes are rotated to establish centrifugal forces acting on the segmented spears to drive them against the wall of the jar.

Operation of this type of apparatus has proven generally to be satisfactory. However, under some conditions there is a tendency for the segmental spears to skew, so that segmental spears previously placed in the jar interfere with segmental spears entering the jar thereafter. In addition, the provision of bearings and other mountings for the rotating parts and the provision of means for keying a downwardly moving pusher with rotating knives involves considerable expense. Thus, the apparatus of the instant invention is constructed so that there is no need to rely upon centrifugal forces for placement of the segmental spears.

Briefly, the apparatus of the instant invention includes the same knife means, twisted chutes, and pusher means as in my aforesaid U.S. Pat. No. 3,468,098. The knife means and twisted chutes are stationary, while the pusher means merely moves vertically and is not required to rotate. In one embodiment of this invention a guide means at the exit end of the twisted chutes is operable to an expanded or extended position for directing segmental spears outward the jar wall. The segmental spears produced from the first cucumber are not sufficient to cover the entire jar wall, so that the jar is stepped angularly to place unoccupied portions of the jar wall in position to receive segmental spears from the next cucumber. After a layer of spears covers the jar wall, the guide means is permitted to collapse so that additional segmental spears entering thereafter rest at the center of the jar.

In another embodiment of this invention, a non-collapsible guide means is utilized to direct segmental spears outward against the jar wall. This guide means is provided with pockets equal in number to twice the number of segments formed by each operation of the pusher means, and upon angular stepping of the guide means and jar appropriate guide means pockets guide the spears from the chutes to desired positions along the jar wall.

Accordingly, a primary object of the instant invention is to provide novel means for automatically packing segmental spears with the cut surfaces thereof facing outward.

Another object is to provide apparatus of this type having a plurality of pockets and means to angularly step the pockets so that selected ones thereof are used for guide purposes each time a cucumber is segmentized and the segments thereof placed in the jar.

Still another object is to provide apparatus of this type utilizing an expandable and collapsible guide for directing the segmental spears to predetermined positions in the jar.

Yet another object is to provide apparatus of this type in which the jar is stepped during the filling operation so that portions of the jar wall unoccupied by segmental spears are positioned to receive other segmental spears entering the jar.

A further object is to provide apparatus of this type in which the extendable and collapsible guide means is an umbrellalike structure.

A still further object is to provide apparatus of this type in which the expandable and collapsible guide means includes a fluid inflatable bladder.

These objects as well as other objects of this invention will become readily apparent after reading the following description of the accompanying drawings in which:

FIG. 1 is a perspective of a four-gang apparatus constructed in accordance with teachings of the instant invention.

FIG. 2 is a side elevation of one section of the apparatus of FIG. 1.

FIG. 3 is an enlarged view, partially sectioned, showing selected portions of the elements of FIG. 2.

FIG. 4 is a plan view of the pusher means taken through line 4—4 of FIG. 3, looking in the direction of arrows 4—4.

FIG. 5 is a plan view of the segmentizing knives looking in the direction of arrows 5—5 of FIG. 3.

FIG. 6 is a hoizontal cross section taken through lines 6—6 of FIG. 3, looking in the direction of arrows 6—6, showing the cross section of the guide chutes at a point intermediate the end thereof.

FIG. 7 is a plan view showing the exit end of the guide chute of FIG. 1 relative to a jar being filled.

FIG. 8 is an enlarged view of the operating mechanism for the extendable or expandable guide that direct segmental spears in the jar.

FIG. 8A as a vertical cross section taken through the center of a jar, looking in the direction of arrows 8A, 8A of FIG. 8, and showing the jar support and stripper elements.

FIG. 8B is a plan view of the elements of FIG. 8A.

FIGS. 9A and 9B are side elevations showing operation of the extendable guide means in greater details than in FIG. 8. In FIG. 9A the guide means is extended, and in FIG. 9B the guide means is collapsed.

FIG. 10 is a plan view showing the relation between the guide means and the segmental spears, packed in a jar.

FIG. 11 is a side elevation illustrating another embodiment of the guide means, comprising an inflatable bladder.

FIG. 12 is an exploded perspective, illustrating a further embodiment of the guide means.

FIG. 13 is a side elevation of the elements of FIG. *12* [11].

FIGS. 14, 15 and 16 are plan views of the elements of FIG. *13* [12] looking in the direction of the respective arrows **14**, **14**, **15**, **15** and **16**, **16**.

FIG. 17 is a fragmentary side elevation illustrating the manner in which a spear is guided into place in the jar during the first down stroke of the pusher means.

FIG. 17A is a fragmentary plan view of the elements of FIG. 17.

FIG. 18 is a fragmentary side elevation, showing the elements of FIG. 17, repositioned to guide a spear into place in the jar during the second down stroke of the pusher means.

FIG. 18A is a fragmentary plan view of the elements of FIG. 18.

Now referring to the figures, and more particularly to the embodiment of FIGS. 1–10. Automatic filling apparatus of the instant invention includes product feed conveyor **15** having a plurality of transversely extending pockets **16** into which operator **17** inserts whole cucumbers **18**, forcing the left end thereof against barrier **19** which extends along the upwardly inclined loading flight for conveyor **15**. The right ends of cucumbers **18** extend beyond the right end of each pocket **16**, and as conveyor **15** moves in the direction of arrow A past rotating slitter blade **21**, the excess length tip **18a** is removed to produce spears **22** of predetermined length that are delivered to four-gang packet **25**.

Packer **25** consists of four essentially identical units **31–34**, mechanically tied together for simultaneous operation. Apparatus **25** is constructed with four packing units, since a single operator **17** may conveniently fill pockets **16** fast enough to satisfy a four-gang unit. Since each of the packing units **31–34** is substantially identical, hereinafter for the most part only the construction of packing unit **31** will be referred to. Apparatus **25** includes double acting cylinder **36** mounted to member **37** for operating horizontal tie bar **38** up and down.

Pusher means **40**, including five assemblies of metal thread **25t** and a plurality of plastic bead-like elements **25b**, is mounted to tie bar **38** for movement thereby. Downward movement of tie bar **38** drives the lower end of pusher means **40** into hopper **41** through the upper end thereof, and in so doing drives spear **22** in hopper **41** through segmentizing knives **42** (FIG. 5) at the bottom of hopper **41**, and drives the segmental spears **22a** formed by knives **42** through the array of five twisted chutes **43** into jar **44** supported on platform **45**. Hopper **41** and twisted chute array **43** are fixedly connected end to end, and the combination of hopper **41** and array **43** extend between stationary frame members **46**, **47** and are fixedly secured thereto.

Each spear **22** is centered in hopper **41** by two sets of rollers **101**, **102**, which project through openings **103**, **104** respectively, in the sides of hopper **41** to engage the sides of spear **22**. The five hollers **102** of the upper set are freely mounted on pin **105** to the lower end of bifurcated crank **106** between the arms thereof. A midportion of crank **106** is pivoted at pins **107** to outboard extensions of hopper **41**. The ends of pins **107** are keyed to bevel gears **108**, **109**, which engage bevel gears keyed to pivot pins adjacent cranks **106**. Torison springs (not shown) mounted on pins **107** bias rollers **102** inward.

Each crank **106** is provided with upwardly extending nose **111** engageable by means (not shown) when plunger or pusher **40** is raised, to move rollers **102** radially away from the center of hopper **41**. The interconnection of all rollers **102** by gears **108**, **109** assures that wheels **102** are always equally spaced from the axis extending through the center **42a** of knives **42**. Mountings and interconnections for lower wheels **101** are identical to these elements for wheels **102**. However, the cranks for lower wheels **101** are not provided with extensions similar to **111**, so that lower wheels **101** are always forced radially inward.

Empty jars **44** arrive at apparatus **25** on input conveyor **48**, and after filling thereof jars **44** are taken away on take-off converyor **49**. In particular, support **45**, pivotally mounted to the upper end of rod **51** extending upward from tie bar **52**, is operated vertically by double acting cylinder **53**. With support **45** operated to its lowered position by cylinder **53**, operation of double acting cylinder **54** to drive extension **56** of tie bar **55** in the direction of arrow B moves an empty jar **44** from input conveyor **48** on to support **45**, and in so doing the empty jar **44** pushes a full jar from support **45** and delivers the full jar to take-off conveyor **49**. Thereafter cylinder **53** is operated to raise support **45**, so that the upper part of jar **44** fits firmly against resilient collar **57a** secured to ring **57b** located at the exit end of twisted chute array **43**.

For a reason to be explained hereinafter, ring **57b** is locked to plate **57** by snap ring **57c** (FIGS. 8–8B), so that ring **57b** is pivotable in the plane thereof. Plate **57** is slidably mounted on vertical rods **211**, **212**, which extend between frame members **47** and **147**. Tension springs **213**, **214** engage plate **57** from below, biasing the latter downward to maintain a good seal between jar **44** and resilient collar **57a**. Adjustable stops **215**, **216** on the respective posts **211**, **212** limit downward movement of plate **57**, so that with support **45** in its lowermost position the upper edge of jar **44** is below ring **57b**.

The individual chutes **60** of array **43** are twisted from one end to the other, so that each segmental spear **22a** is rotated to a position where a cut or seeded surface thereof faces outward as spears **22a** leave chute array **43**. It is desired that the segmental spears **22a** forming the outer layer of material within jar **44** will remain in this position. Thus, extendable guide means **65** is provided at the lower end of twisted chute array **43**.

Guide means **65** (FIGS. 9A and 9B) is an umbrella-like structure, which extends into jar **44** when jar support platform **45** is in its raised position. Guide means **65** includes a plurality of ribs **66** hinged to collar **67** and extending outwardly therefrom. Flexible sheet member **68** is connected to the plurality of ribs **66** to provide a generally conical guide surface when ribs **66** are operated to their extended positions of FIG. 9A. Operating rod **69** is axially movable through a central bore in collar **67**. Cam **71**, slidably mounted to rod **69** near the lower end thereof, is engageable with ribs **69** to extend the latter

when rod **69** is in its raised position of FIG. 9A. Rod **69** is raised and lowered by double acting cylinder **71** (FIG. 8), driving through link **72**, and crank **73**, with movement of link **72** being guided by link **74** pivoted on stationary shaft **75**. With guide means **65** in its extended or expanded position of FIG. 9A, as segmented spears **22a** enter jar **44** the lower ends thereof are deflected radially outward or toward the inner surface of jar **44**. The edge of the guide surface formed by sheet member **68** remains firmly in engagement with segmental spears **22a** through the yielding action of coiled compression spring **76** wound about the lower end or rod **69** and interposed between cam **71** and nut **77**.

As best seen in FIG. 10, the side wall of jar **44** is extensive enough to accommodate ten segmental spears **22a**, yet only five such spears **22a** are formed each time pusher assembly **40** moves through a down stroke. Thus, starting with empty jar **44**, on the first down stroke of plunger assembly **40** there will be spaces between those segmental spears **22a** that are placed in jar **44**. To position these spaces to receive the next group of segmental spears **22a** inserted in jar **44**, prior to the next down stroke of plunger **40**, double acting cylinder **86** (FIG. 8) is actuated to step resilient collar **57a** and guide means **65** angularly through 180° divided by the number of chutes in array **43**. Thus, in the construction illustrated, collar **57a** and guide means **63** are pivoted through a 36° step. Jar **44**, being on raised platform **45** in firm frictional engagement with collar **57a**, also pivots in a 36° step.

More particularly, when operating rod **86a** of cylinder **86** is retracted from the position of FIG. 8, rod **86a** acts through crank **87**, **88** centrally pivoted at **87a**, and link **89** to pivot plate **57b** and resilient collar **57a** secured thereto. Link **89** is connected at pin **88a** to the end of crank **87**, **88** remote from cylinder **86**, and is connected at pin **89a** and clevis **89b** to collar bearing plate **57b**. Movement of link **89**, being in a vertical plane that does not pass through the center of plate **57b**, causes pivoting of collar **57a** and jar **44**, in frictional engagement with collar **57a**.

Connecting rod **201** joints the lower end of link **202** to crank **87**, **88** and pin **203** pivotally mounts link **202** at its upper end. Links **73**, **202** are pivotally connected at their centers by pin **73a** and extend generally at right angles to one another. Thus, when the bottom end of rod **202** moves through the operation of cylinder **86**, link **73** moves generally parallel to the length thereof and acts through crank connection **205** at the upper end of rod **69** to pivot the latter, thereby pivoting guide means **65**.

After a substantially complete layer of segmental spears **22a** is formed against the wall of jar **44**, guide means operating rod **69** is moved downward to the position shown in FIG. 9B. This permits guide means **65** to collapse as the next group of segmental spears **22a** is forced into jar **44**, so that this last group of spears **22a** remains at the center of jar **44** and does not interfere with the segmental spears **22a** lining the wall of jar **44**.

While jar support **45** is being lowered through the operation of cylinder **53**, springs **213**, **214** pull plate **57** downward against stops **215**, **216** and after plate **57** ceases to move, filled jar **44** continues to move downward to a point below ring **57b**, with the weight of loaded jar **44** being sufficient to separate jar **44** from collar **57a**.

Operation of apparatus **25** consists of the following operations:

(1) Jar support **45** is lowered by cylinder **53**, and cylinder **54** is actuated so that pusher **56** delivers an empty jar **44** to support **45** and in so doing such empty jar **44** pushes or delivers a full jar from support **45** to take-off conveyor **59**. Thereafter, support **45** is raised to raise plate **57** and plae an empty jar **44** in position adjacent the bottom of twisted chute assembly **43**, with diverter plate array and guide means support **91** extending into the upper end of jar **44**.

(2) Adjacent packing units **31–34** being spaced apart by five times the center-to-center distance of adjacent pockets **16**, conveyor **15** is then stepped by a distance equal to four times the space between adjacent pockets **16**, and plunger assembly **40** is raised.

(3) Segmental spears **22a** are ejected from selective pockets **16** by operating power cylinder **81** to pivot shaft **82** and operate arm **83** to sweep through selected pocket **16** and remove spears **22a** therefrom. These removed spears **22a** are guided by slides **84** into hopper **41** at the upper end thereof.

(4) Guide means **65** is expanded by operating cylinder **71**.

(5) Plunger assembly **40** is lowered to drive a group of five segmental spears **22a** into jar **44**, and then assembly **40** is moved upward and withdrawn from hopper **41**.

(6) Cylinder **86** is operated to angularly step jar **44** and expanded guide **65** through an angle of 36°.

(7) Steps 2, 3 and 5 above are repeated in sequence.

(8) Cylinder **71** is operated to collapse guide means **65**, as in FIG. 9B, and steps **2**, **3** and **5** above are repeated in sequence.

(9) Cylinder **86** is operated to restore jar support **45** to its angular position of steps 1–5 above, and steps 1–5 above are repeated in sequence.

(10) Steps 6, 7 and 8 above are repeated in sequence.

(11) Steps 9 and 10 above are repeated in sequence over and over again.

In the embodiment of FIG. 11, guide means **95** consists of inflatable bladder **97** of plastic or rubber material reinforced with fabric so that bladder **97** assumes a predetermined shape when inflated. Hollow tube **96** connected to the top of bladder **97** provides a conduit through which pressurized fluid enters and leaves bladder **97** for actuation and decatuation thereof.

The embodiment of the guide means illustrated in FIGS. 12–18A is intended for operation in which the spears are automatically placed in a single layer against the jar wall, and additional spears are placed inside of this layer, manually, in random fashion. In particular, guide means **300** of FIGS. 10–18A comprises stationary section **301** and movable section **302**. The latter is pivotally mounted for angular to-and-fro stepping by the same means that operates link **89** to pivot jar **44**.

Stationary section **301** includes mounting ring **305** fixedly secured to stationary frame member **47** in position with the spaces between fins **304** extending radially inward from ring **303** to tubular hub **307** through which rod **69** extends. Each fin **304** is positioned in alignment with the chute sides at the exit openings of twisted chutes **60**. Five spring deflectors **305** secured to ring **303** and equally spaced thereabout extend into the spaces between fins **304** for a reason to be hereinafter explained. An individual sheet metal element **306**, secured to each of the fins **304**, is flared at its lower end **306a** away from its associated fin **304** to form space **306b**, for a reason to be hereinafter explained.

The lower ends **304a** of fins **304** are entered into tightly fitting radial slots **309** in the upper surface of nylon block **310** to frictionally retain block **310** in operative engagement with fins **304**. Block **310** is provided with five vertical notches **311**, each having slanting surface **312**, which, as will hereinafter be explained, deflects a spear outwardly toward the inner wall of the jar. Operating rod **69** also extends through central bore **314** of block **310** aligned with tube **307**.

Movable section **302** is secured to the lower end of rod **69**, so as to be pivoted thereby. Section **302** includes five circularly arranged vertically extending rigid fingers **323**, secured to the outer surface of short cylindrical block **324** and extending upwardly along the side of block **310**. Also secured to block **324** are five resilient fingers **325**, which extend upwardly along the side of block **310** and above the upper ends of fingers **323**. Each resilient finger **325** is located in the space between two adjacent rigid fingers **323**, and is spaced midway between them.

Upper end **325a** of finger **325** is deflected in the direction in which section **302** will pivot prior to the second

stroke of the pusher means when providing spears for the same jar. Upper end **325a** of finger **325** extends into space **306b** so as to engage fins **304** and members **306** and be deflected thereby to the positions illustrated in FIGS. 15 and 16. More particularly, during the first downward stroke of pusher means **40**, guide means section **302** occupies the position shown in FIG 15, with the upper end **325a** of resilient finger **325** being deflected to the left with respect to the bottom end thereof, which is fixedly secured to block **324**. In this position of movable section **302**, the pocket formed between spring finger **325** and rigid finger **323** immediately to the right thereof is positioned to receive and guide segmental spear **330** as it moves through a pocket **311** in block **310**, being deflected outwardly by block surface **312** and being deflected circularly toward block surface **312a** by spring **305**.

When the lower end of spear **330** reaches the bottom of jar **44**, movable section **302** and jar **44** are angularly stepped in a clockwise direction with respect to FIG. 17A to the position of FIG. 18A. In this latter position, upper end **325a** of spring finger **325** engages fin **304**, to be deflected to the right with respect to the lower end of finger **325**. On the next downstroke of pusher means **40**, spear **331** moves through and is guided by the pocket formed by resilient finger **325** and rigid finger **323** immediately to the left thereof. In this manner, the five spears **331** are placed against the inner wall of jar **44** in the spaces between the other five spears **330**.

After the second down-stroke of pusher means **40** in a sequence, jar **44** is lowered and moved out from under guide means **300**. At this point the ten spears **330** and **331** form a single layer against the interior wall or jar **44**. The core portion of jar **44** is then filled with spears inserted in random fashion, either manually or by automatic or semi-automatic means (not shown).

In view of the disclosure of my aforesaid U.S. Pat. No. 3,468,098 and the present state-of-the-art, the sequential controller and its associated switches for automatic control of the apparatus previously described herein is not shown or described.

Although there have been described preferred embodiments of this novel invention, many variations and modifications will now be apparent to those skilled in the art. Therefore, this invention is to be limited not by the specific disclosure herein but only by the appending claims.

The embodiments of the invention in which an exclusive privilege or property is claimed are defined as follows.

1. Apparatus for slicing elongated articles longitudinally into spears having segmental cross sections and inserting these spears lengthwise into a transparent container with cut edges of these spears lying against the container side wall; said apparatus including a hopper having an open upper end to receive an elongated article having its axis generally vertical, knife means including upwardly facing cutting means at the bottom of said hopper, first means, operating means for moving said first means from an inactive position withdrawn from said hopper downwardly into said hopper to drive an article therein through said knife means, second means positioned below said knife means to receive spears formed thereby and guide each of such spears through independent limited controlled angular movement, third means for positioning an elongated transparent container with its open end below said second means to receive spears issuing therefrom, guide means extending into a container supported by said third means in a spear receiving position below said second means, said guide means being operatively constructed to direct spears entering a container supported by said third means toward the side wall of such container, driving means for moving at least a section of said guide means and a container supported by said third means through a controlled angular step occurring between first and second successive operations of said operating means to said active position, whereby spears formed by the second operation of said operating means to said active position are directed to occupy spaces formed between adjacent spears formed during the first operation of said operating means to said active position.

2. Apparatus as set forth in claim **1**, in which the guide means includes a guide portion operable between expanded and collapsed positions, said guide portion when expanded directing spears toward the side wall of a container supported by said third means and when in collapsed position directing spears to the central region of such containers.

3. Apparatus as set forth in claim **2**, in which the guide portion is constructed of sheet material having an outwardly and downwardly flaring section.

4. Apparatus as set forth in claim **3**, in which there is a collapsible mechanical support for operating the sheet material from the collapsed position to the expanded position of the guide portion.

5. Apparatus as set forth in claim **4**, in which the flaring section is generally conical.

6. Apparatus as set forth in claim **5**, in which the second means comprises a plurality of vertically extending elongated chutes each having a twist therein, said knife means including a plurality of radially extending blade sections and each of said chutes being of generally segmental cross section with the twist therein being substantially less than 180°, said angular step being equal to approximately 180° divided by the number of said chutes.

7. Apparatus as set forth in claim **3**, in which the sheet material defines a bladder, fluid means for expanding said bladder to operate said guide portion to said expanded position.

8. Apparatus as set forth in claim **5**, in which the sheet material defines a bladder, fluid means for expanding said bladder to operate said guide portion to said expanded position.

9. Apparatus as set forth in claim **7**, in which the second means comprises a plurality of vertically extending elongated chutes each having a twist therein, said knife means including a plurality of radially extending blade sections and each of said chutes being of generally segmental cross section with the twist therein being substantially less than 180°, said angular step being equal to approximately 180° divided by the number of said chutes.

10. Apparatus as set forth in claim **2**, in which there is a biasing means which operates to urge the guide portion toward its extended position; said biasing means positioned to permit partial collapse of said guide portion by segmental spears being forced by the first means into a jar supported by the third means.

11. Apparatus as set forth in claim 1 in which the guide means includes a stationary section and a movable section, said movable section being that section previously recited as being angularly stepped by said driving means, said movable section including a plurality of vertically extending circularly arranged fingers spaced to form pockets therebetween, said pockets being equal in number to twice the number of spears formed by a single operation of said operating means to said active position.

12. Apparatus as set forth in claim 11 in which alternate ones of said fingers are rigid and the remainder of said fingers are flexible, said stationary section having formations to control deflection of said flexible fingers when said movable section is stepped by said driving means so that spears are directed to alternate ones of said pockets upon said first operation of said operating means and to the remaining ones of said pockets upon said second operation of said operating means.

13. Apparatus as set forth in claim 12, in which the second means comprises a plurality of vertically extending elongated chutes each having a twist therein, said knife means including a plurality of radially extending blade sections and each of said chutes being of generally segmental cross-section with the twist therein being substantially less than 180 degrees, said angular step being equal to approximately 180 degrees divided by the number of said chutes.

14. Apparatus as set forth in claim 12 in which said flexible fingers are substantially longer than said rigid fingers and the upper ends of the former extend substantially above the upper ends of the latter.

References Cited

The following references, cited by the Examiner, are of record in the patented file of this patent or the original patent.

UNITED STATES PATENTS

3,461,646	8/1969	Lane et al.	53—123
3,468,098	9/1969	Eisenberg	53—123

TRAVIS S. McGEHEE, Primary Examiner

U.S. Cl. X.R.

53—263