Oct. 8, 1963 F. D. MARASSO ETAL 3,106,048

APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

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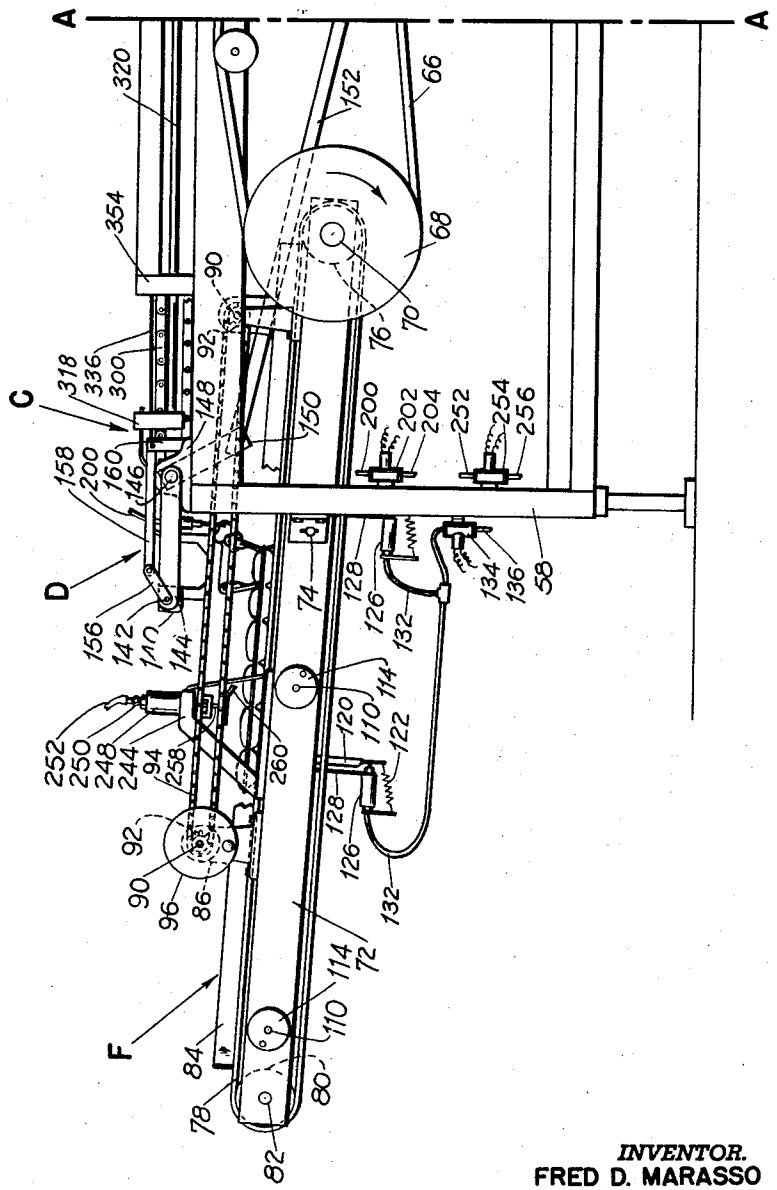


FIG. 1

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APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

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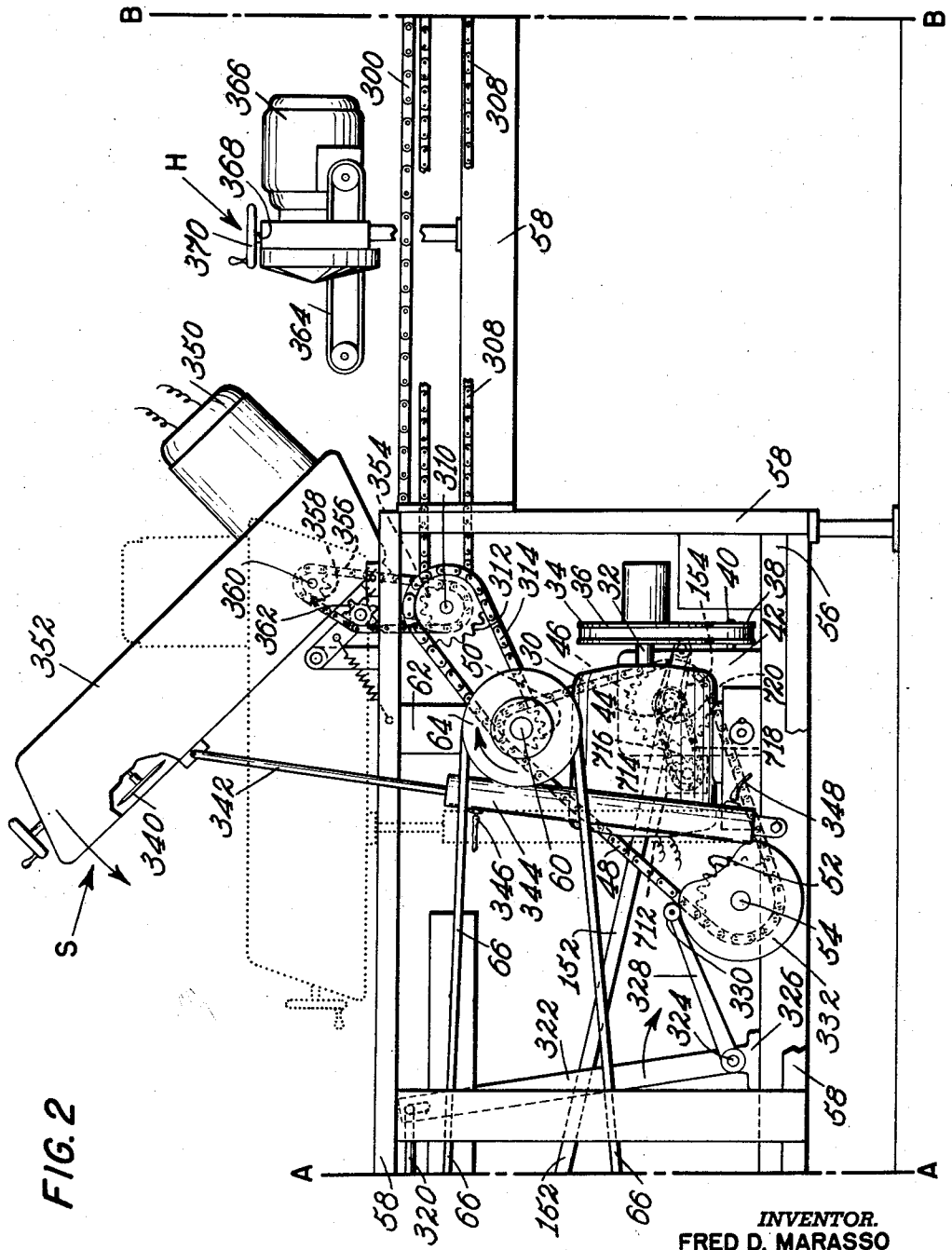


FIG. 2

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Oct. 8, 1963 F. D. MARASSO ETAL 3,106,048
APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES
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FIG. 3

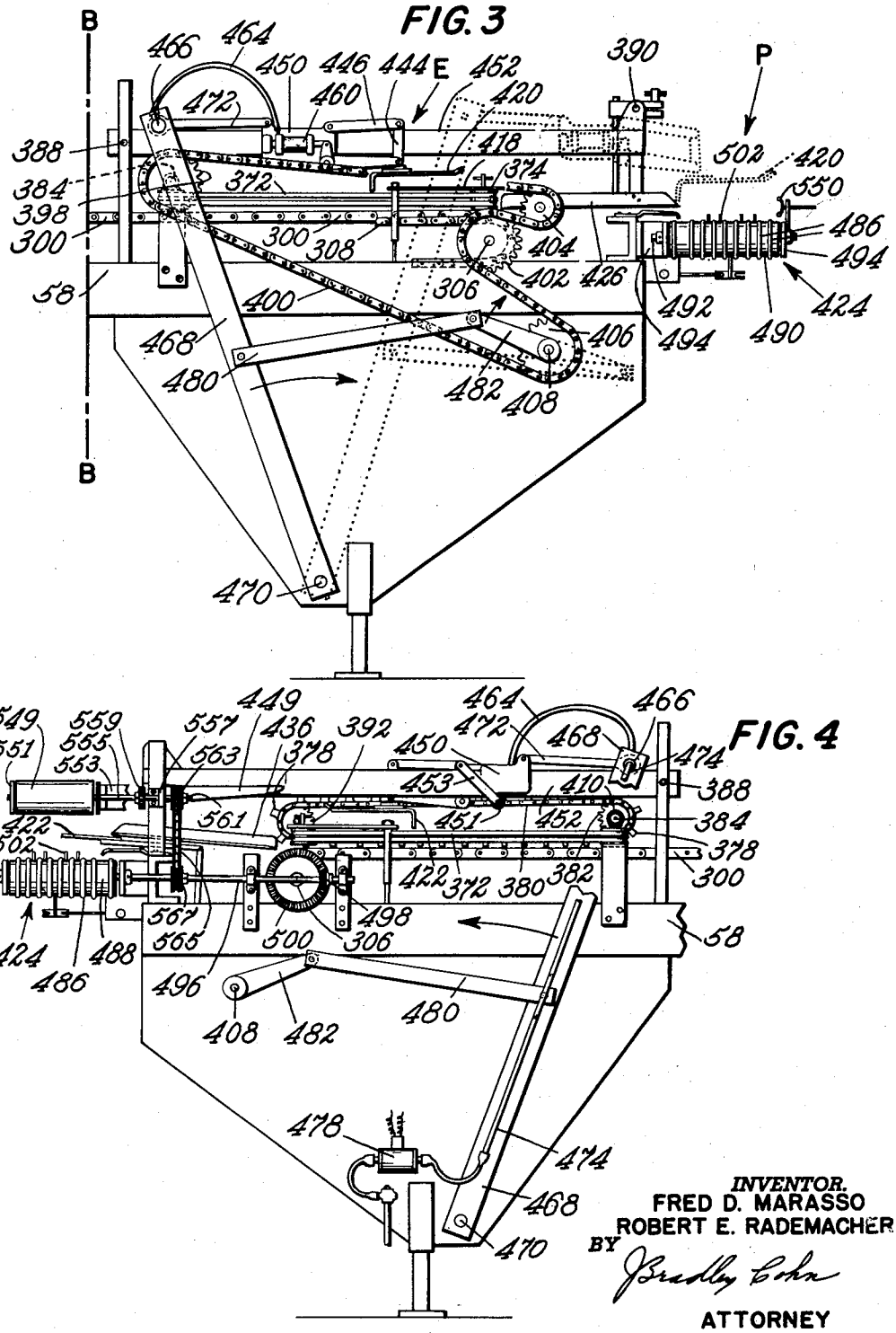


FIG. 4

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Oct. 8, 1963 F. D. MARASSO ETAL 3,106,048

APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

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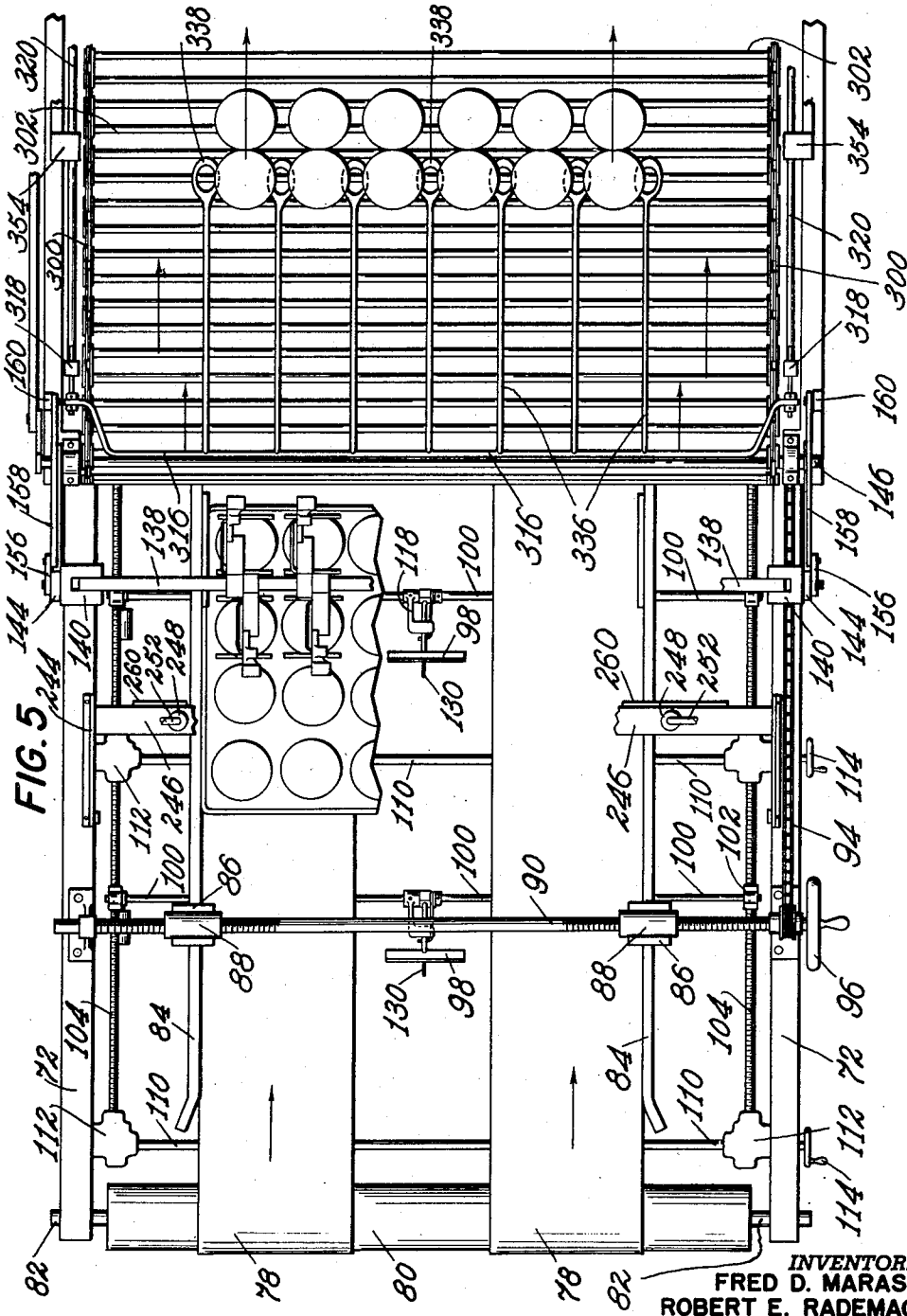


FIG. 5

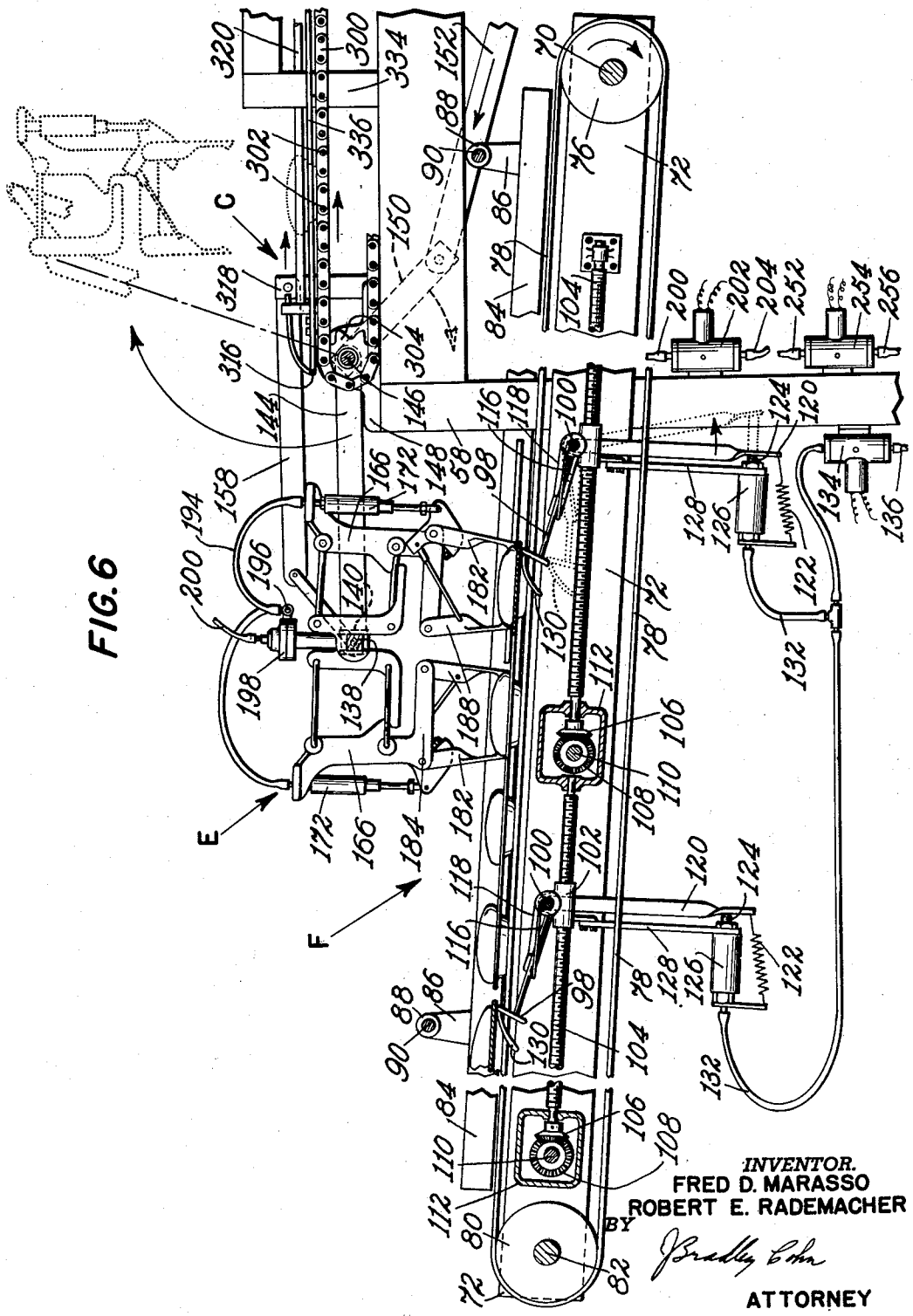
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APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

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FIG. 6



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Oct. 8, 1963 F. D. MARASSO ETAL 3,106,048

APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

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FIG. 8

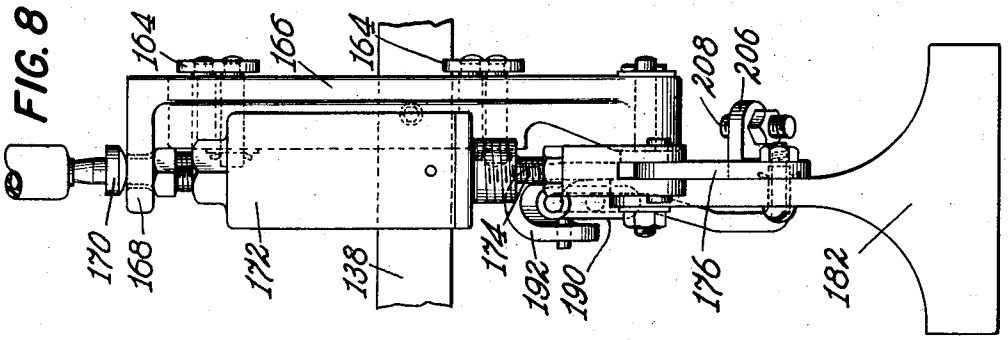


FIG. 7

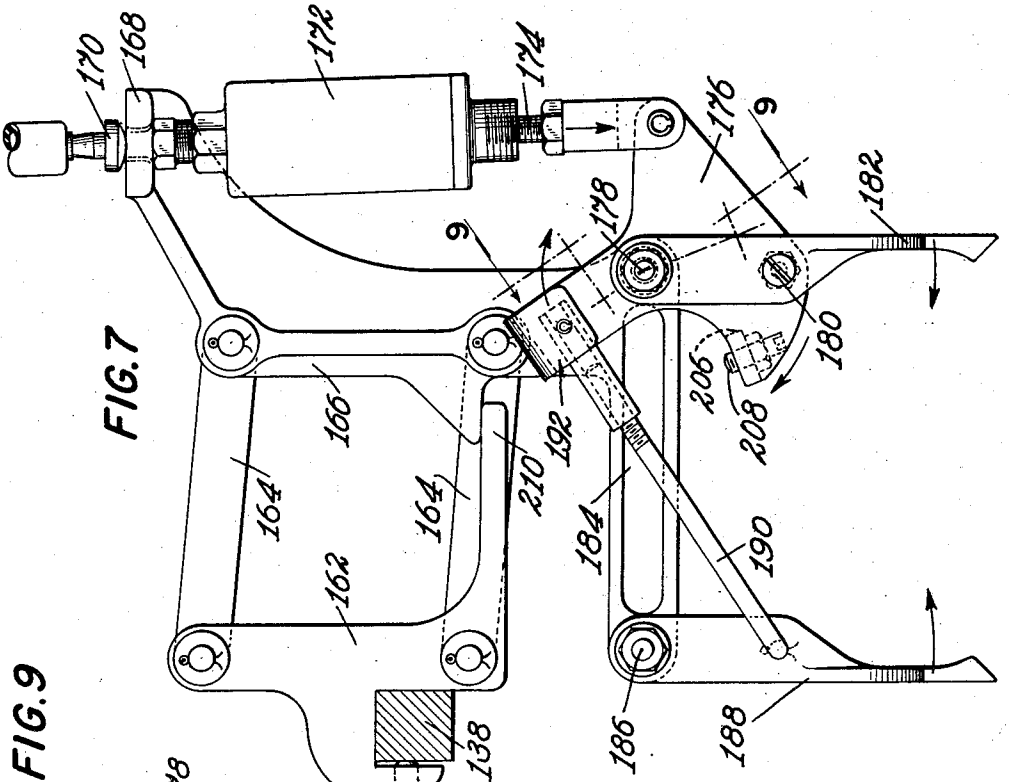
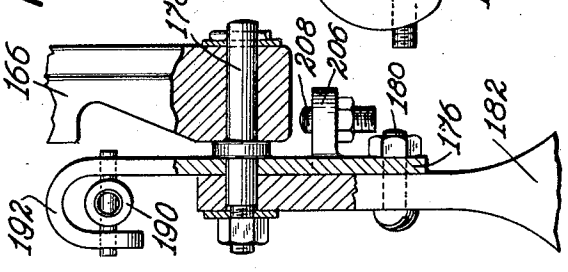


FIG. 9



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APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES
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FIG. 10

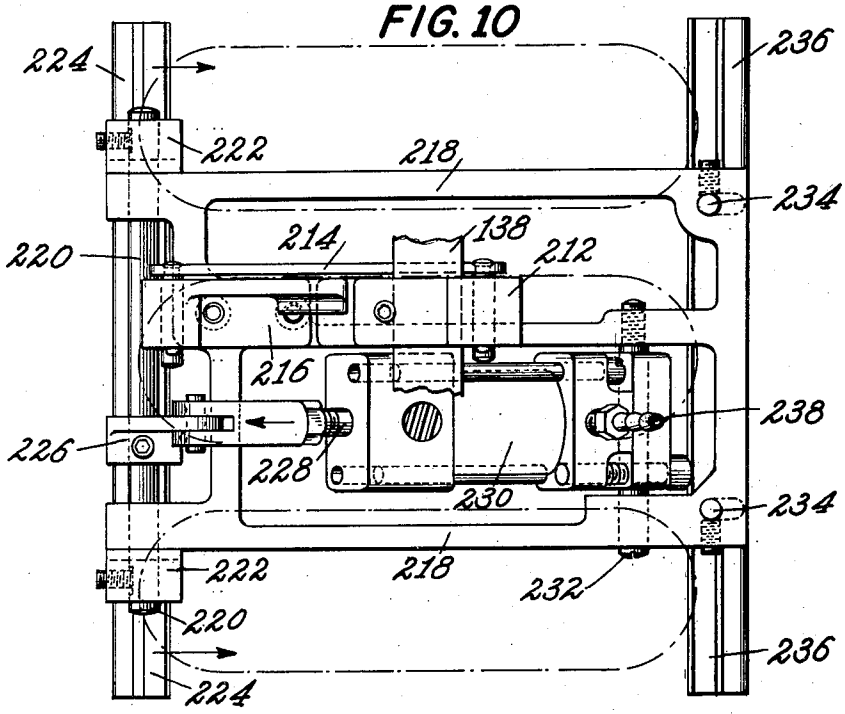


FIG. 11

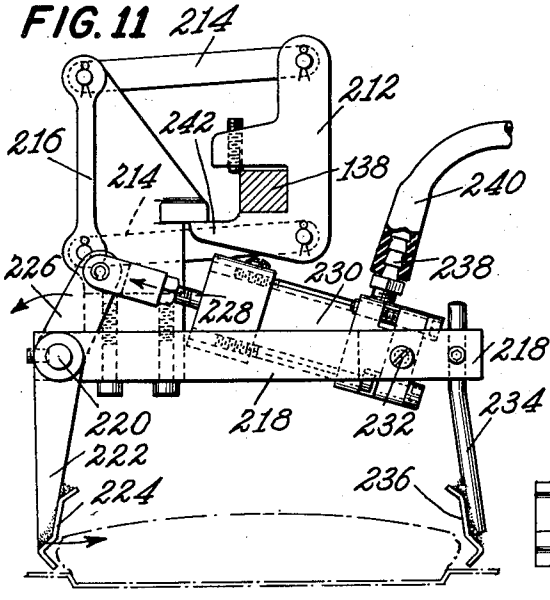
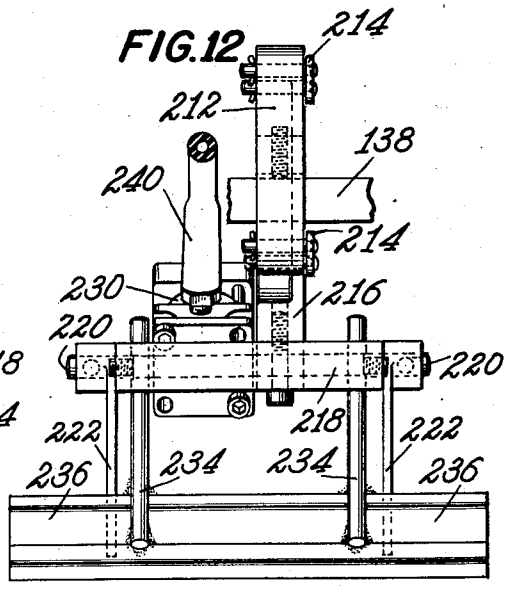


FIG. 12



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APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES
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FIG. 13

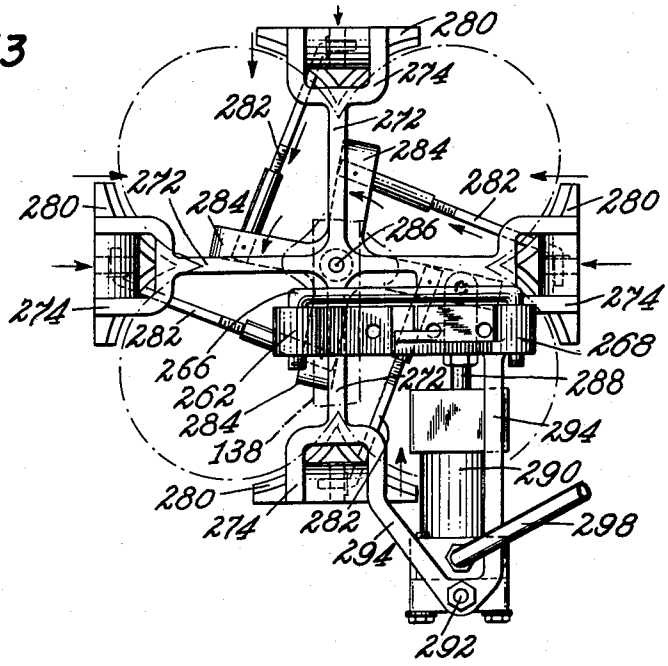
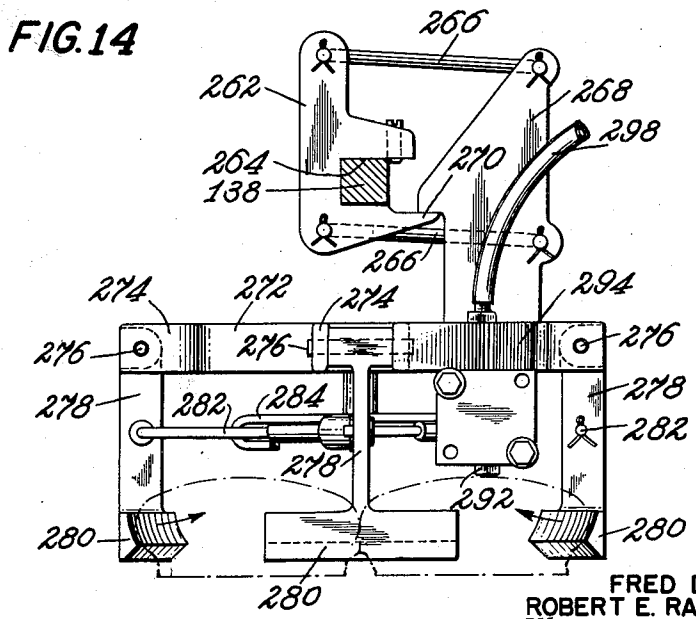


FIG. 14



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APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

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FIG. 15

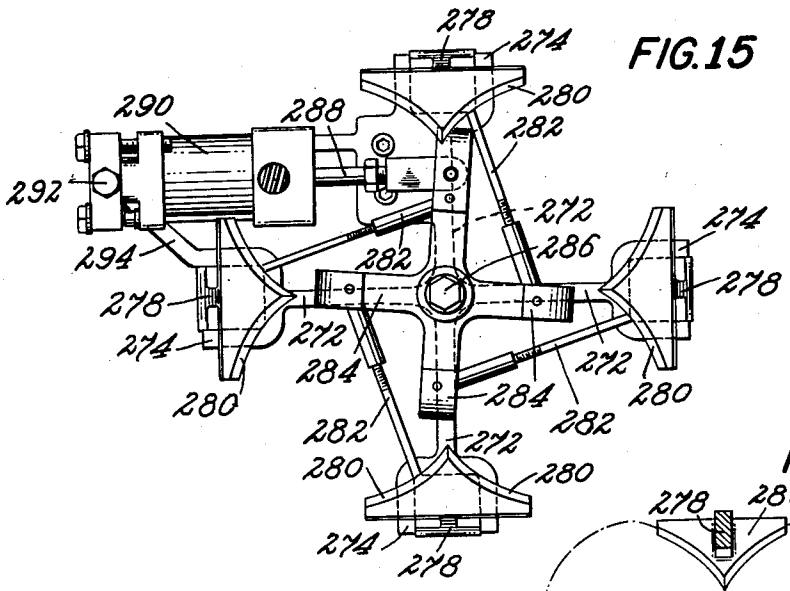


FIG. 17

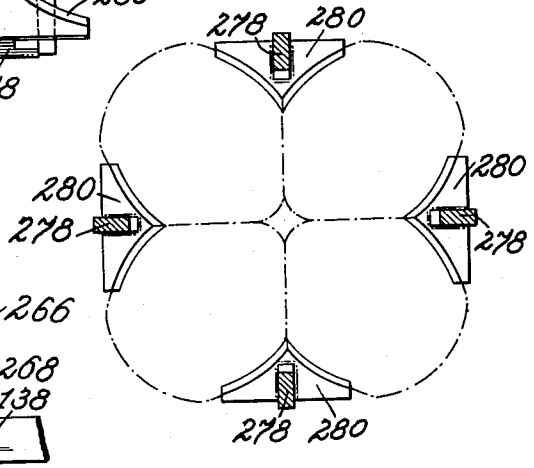
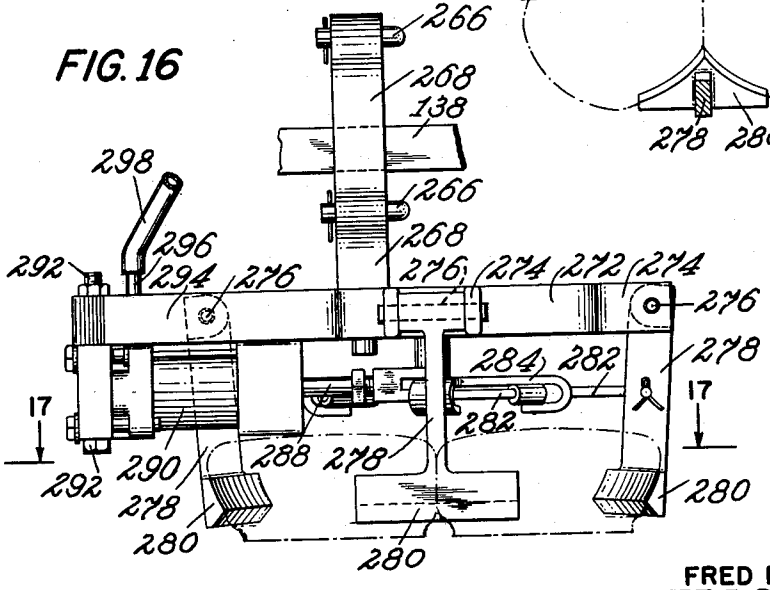


FIG. 16



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APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

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FIG. 18

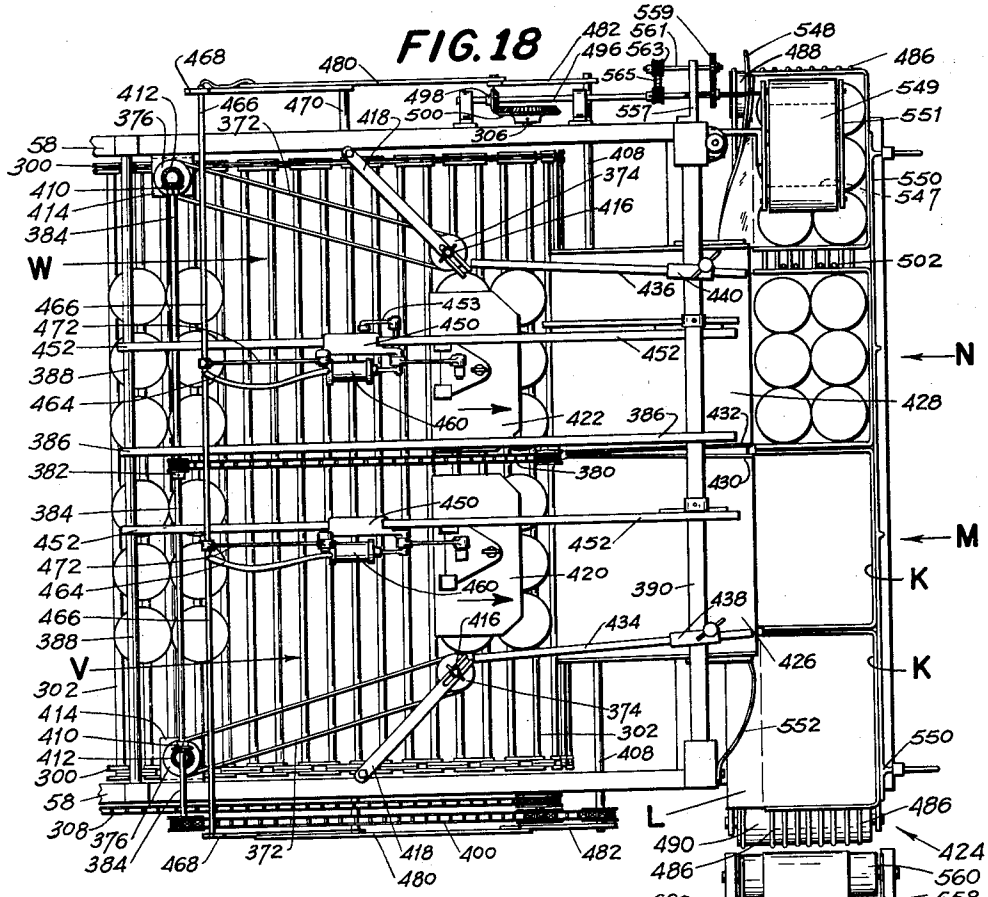


FIG. 22

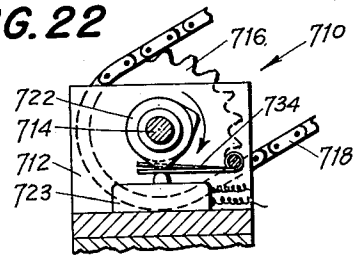
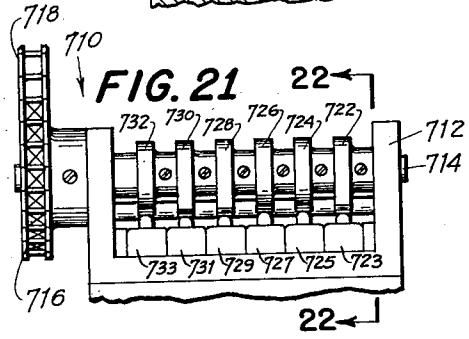


FIG. 21



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APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

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FIG. 19

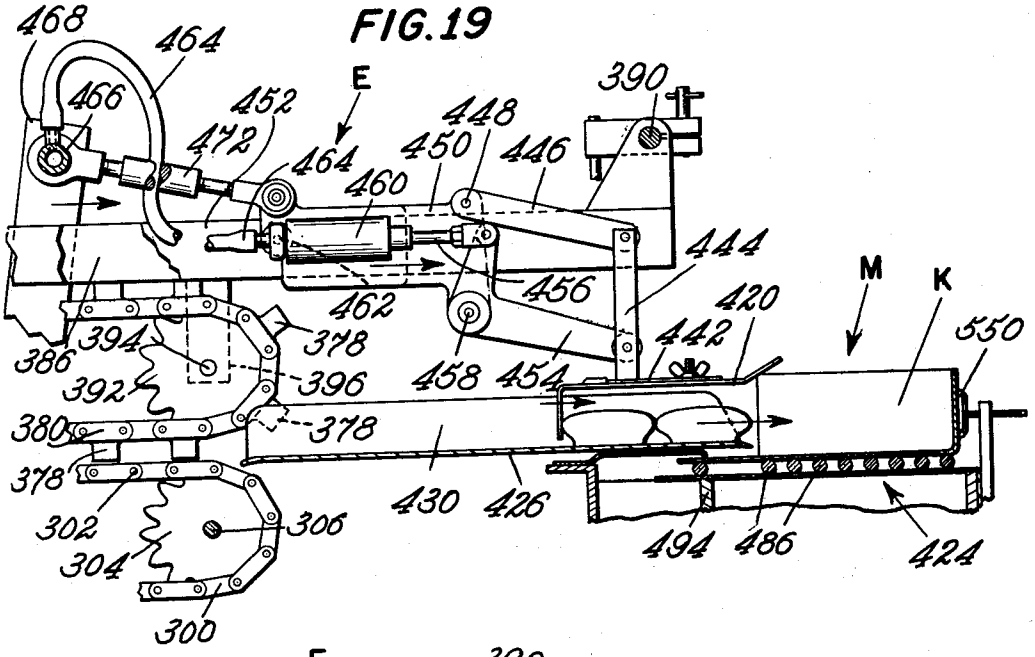
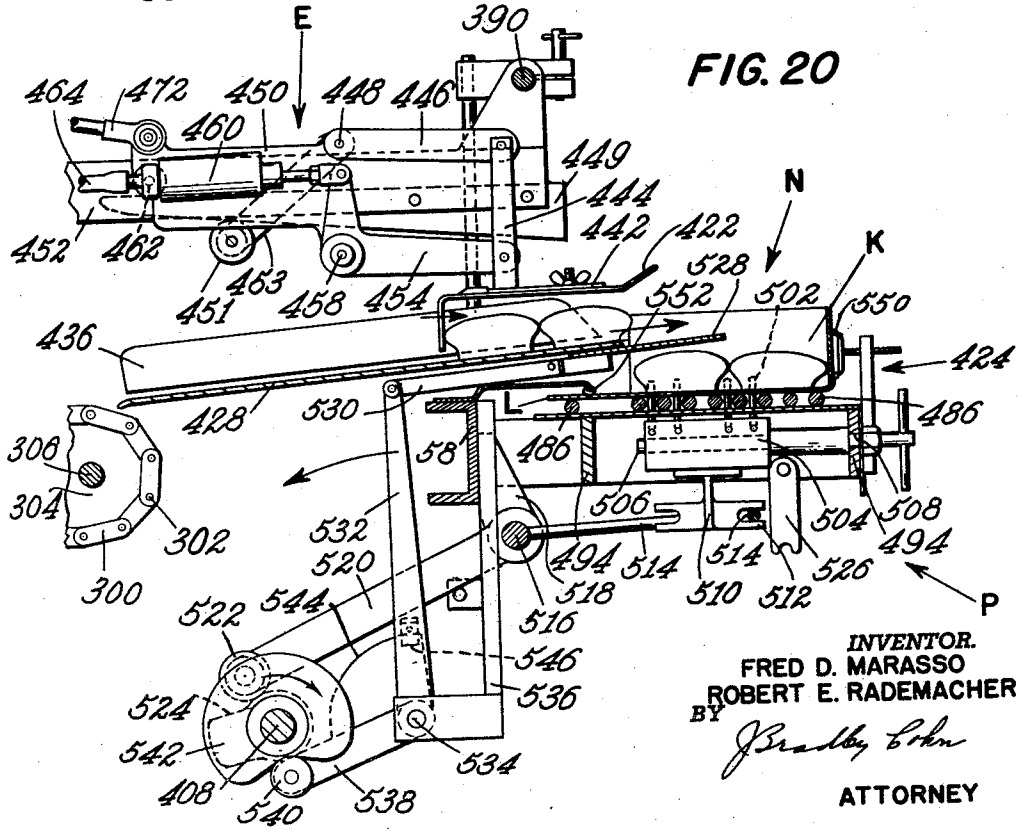


FIG. 20



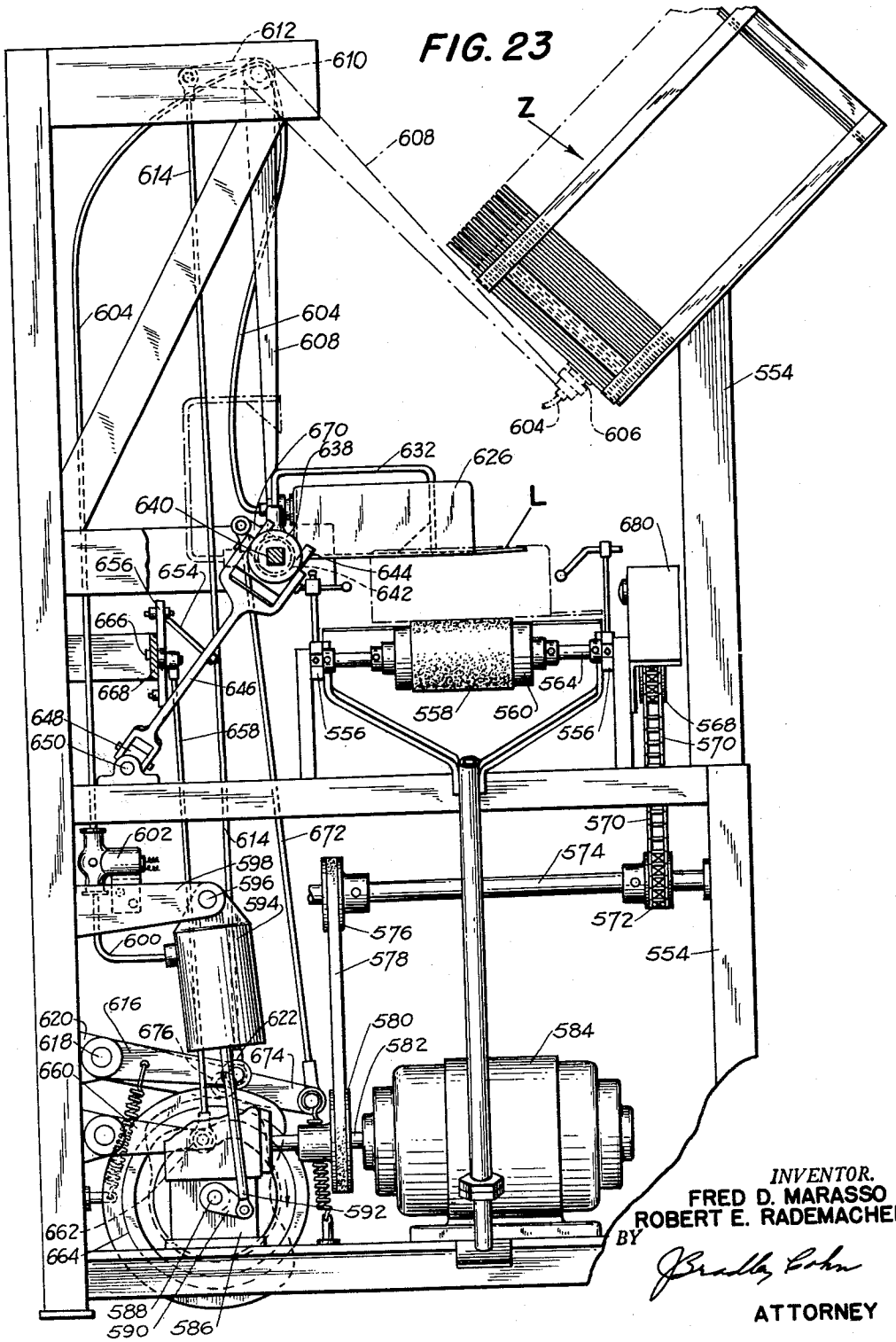
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Oct. 8, 1963 F. D. MARASSO ETAL 3,106,048

APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

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FIG. 23



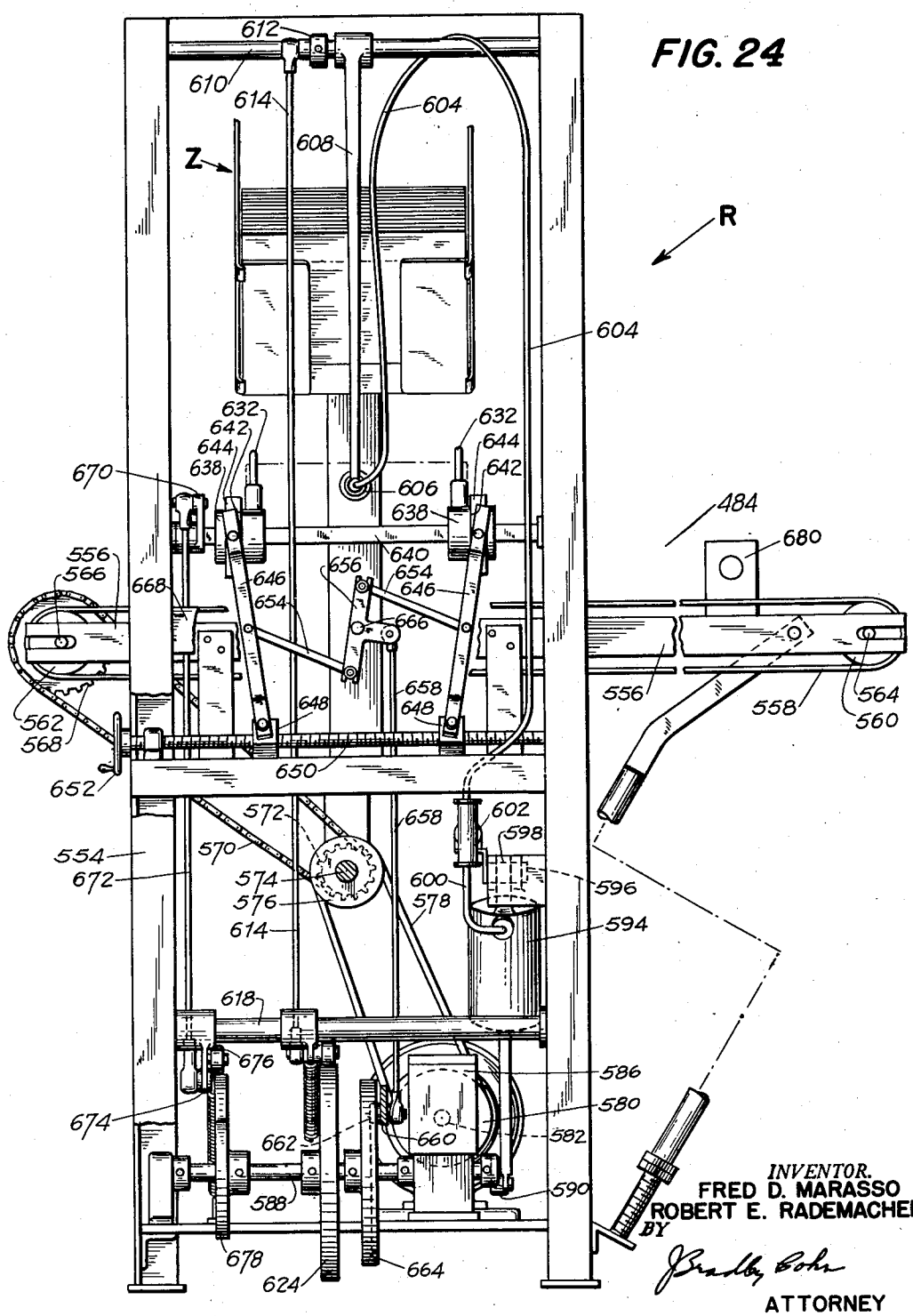
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Oct. 8, 1963 F. D. MARASSO ETAL 3,106,048

APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

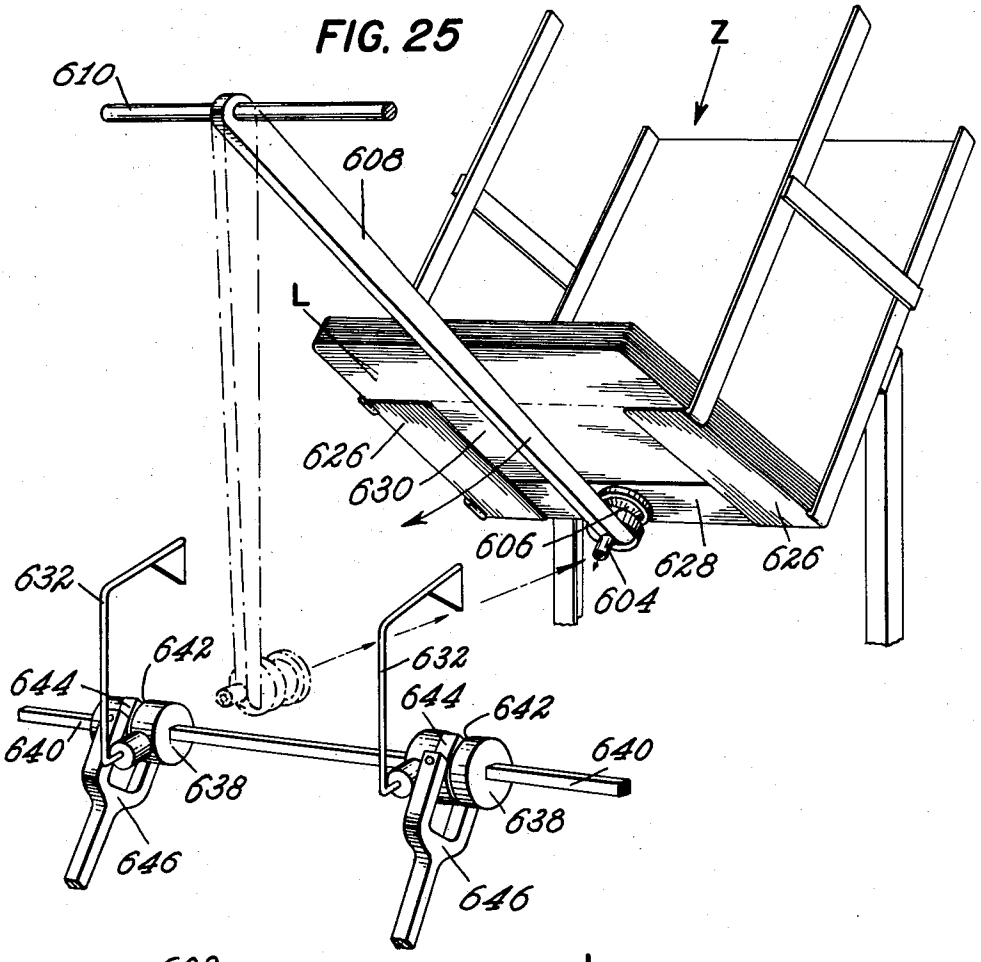
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FIG. 24



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FIG. 25



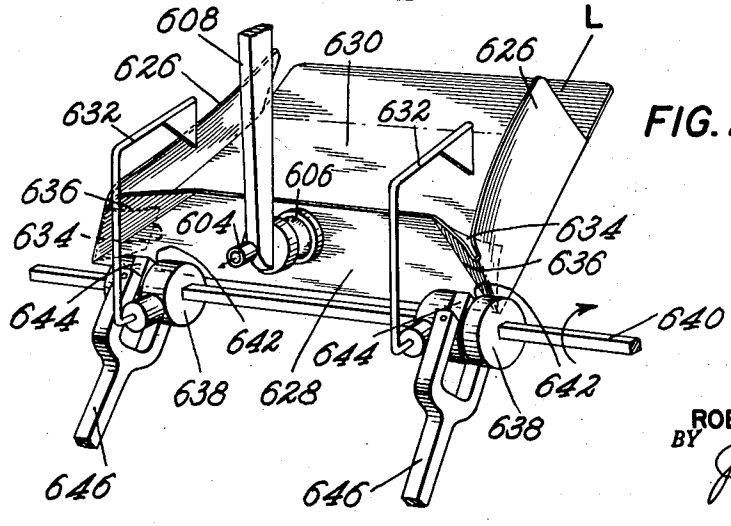


FIG. 26

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FIG. 27

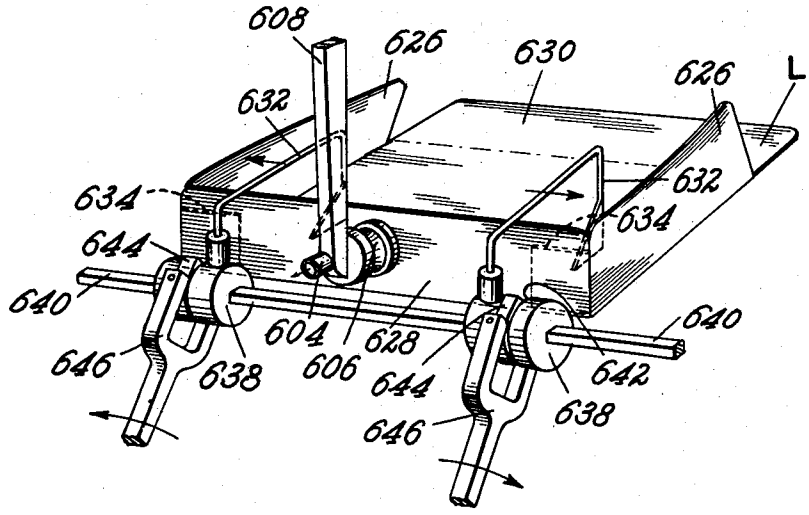
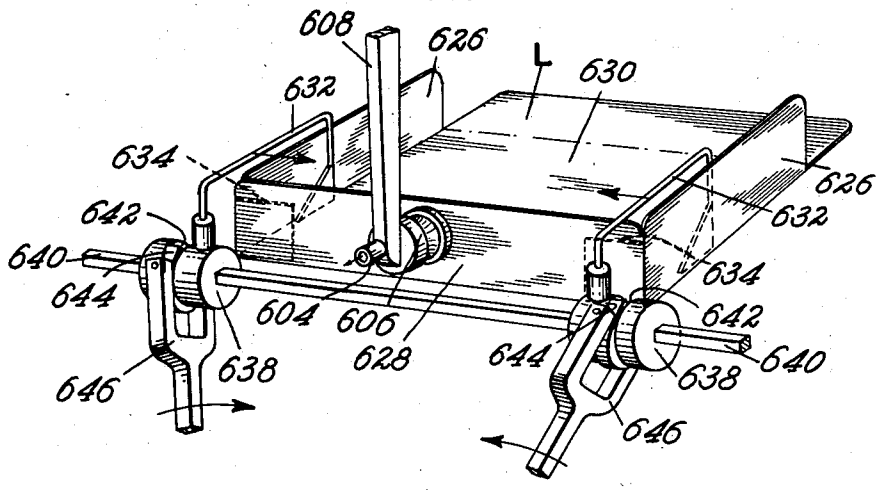


FIG. 28



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FIG. 29

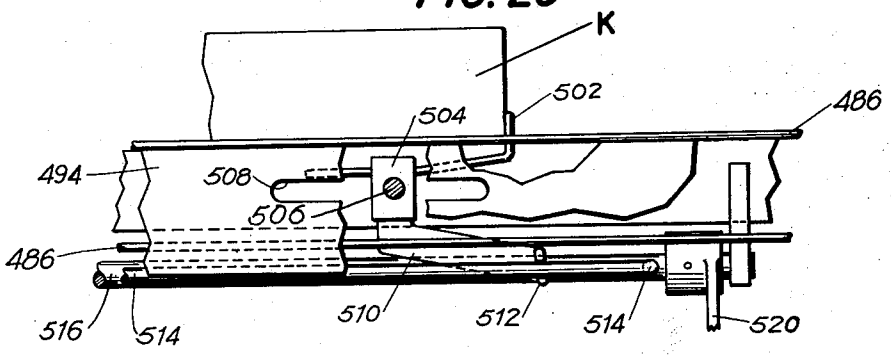
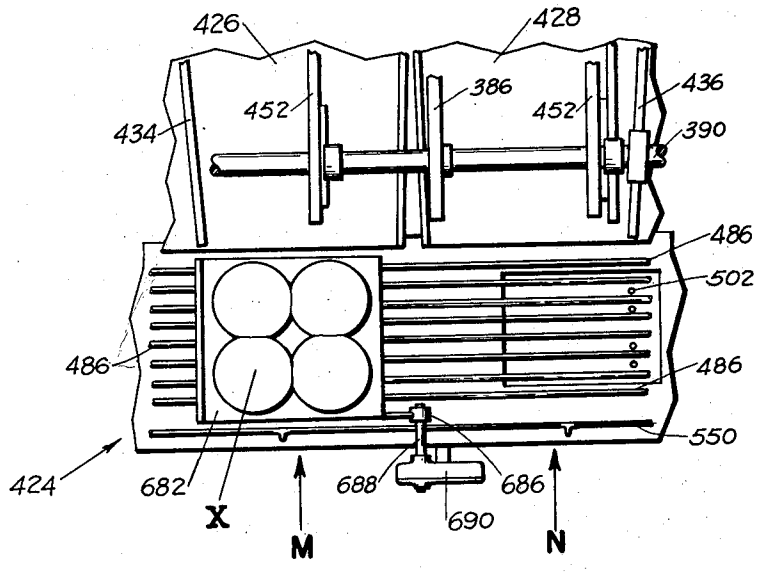


FIG. 30



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Oct. 8, 1963 F. D. MARASSO ETAL 3,106,048
APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES
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FIG. 31

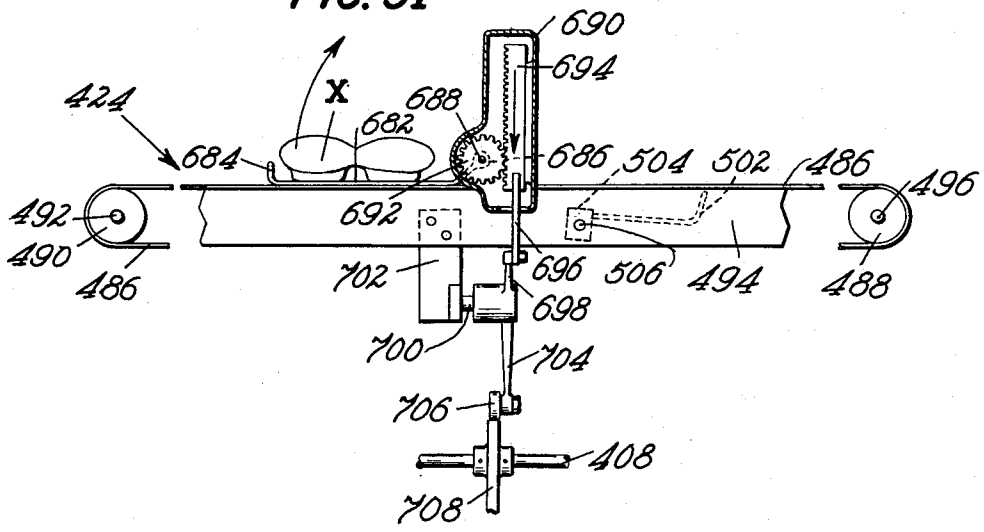


FIG. 32

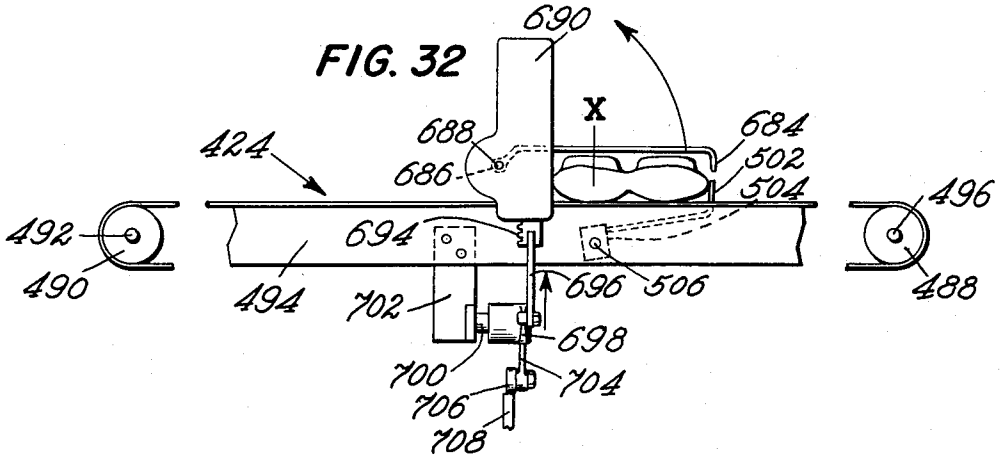
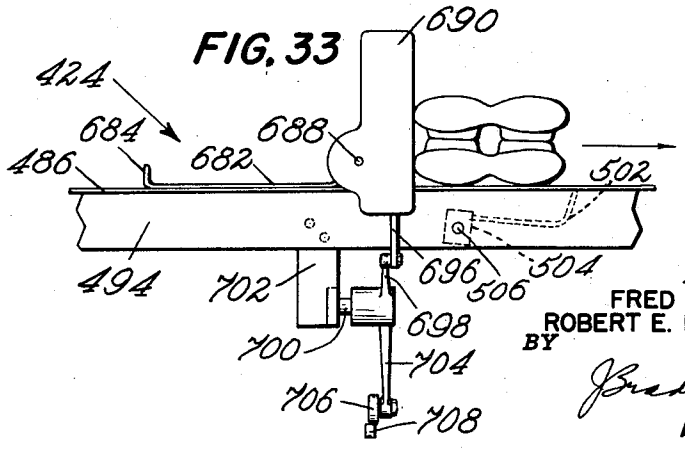


FIG. 33



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United States Patent Office 3,106,048 Patented Oct. 8, 1963

3,106,048

APPARATUS FOR DEPANNING, SLICING, DISPENSING AND PACKAGING BAKED ARTICLES

Fred D. Marasso and Robert E. Rademacher, Richmond, Va., assignors to American Machine & Foundry Company, a corporation of New Jersey

Filed Feb. 2, 1959, Ser. No. 790,420
36 Claims. (Cl. 53—123)

This invention relates to handling and packaging of fragile articles and more particularly baked articles such as buns, rolls and the like.

Normally, bake pans have a plurality of pockets each generally containing one article. Generally the pockets are laterally spaced in rows in the baking container. Consequently, such pans may be conveyed along a conveyor thereby providing laterally spaced rows of endless length. Such baked articles must be removed from the pan and packaged for marketing. With certain specialty types of bun, such as hamburger buns and hot dog rolls, it is additionally necessary to slice them.

Heretofore, it has been necessary to perform the operation of depanning and cartoning manually. A further problem has been that where suitable slicing machines have been devised for halving the buns, nonetheless it was necessary to hand deposit the buns on a suitable conveyor for proper alignment into the slicing machines.

It is therefore an object of the invention to depan, align, slice and package buns on a single machine. It is an object of this invention to perform these multiple operations continuously and automatically on a unitary device.

Certain semi-automatic depanning devices are known which in general comprise inverting the pan and jarring it so that the baked articles fall therefrom. This type of operation disarranges the orientation of buns and in the case of fragile buns subjects them to damage. Accordingly, it is an object of this invention to depan fragile buns in a gentle manner and without disturbing their spacial orientation.

It is a further object of this invention to provide means for readily and rapidly changing the pneumatically-operated fingers used for depanning. These fingers are modeled parts for different types of buns and quick change-over is desired.

It is a further object of the invention to operate these pneumatic fingers in conjunction with a continuous conveyor and realignment means to realign and/or to vary as desired the spacial orientation of the articles transferred by the fingers.

Accordingly, it is an object of the invention to devise a novel transfer means for transferring oriented articles from one position to another with or without changing their orientation in a predetermined manner.

Still another object of the invention is to provide a conveyor which will properly receive spaced articles and vary their spacing to accommodate to an article treating device such, for example, as a slicing device.

An added object of the present invention is to provide a novel mechanism for moving spaced oriented baked articles from a delivery and/or article treatment conveyor in predetermined alignment.

A further object of this invention is to provide positively-operated pusher means for transferring baked articles delivered on a conveyor into cartons in predetermined arrangement.

It is likewise an object of the invention to provide means for sub-dividing rows of baked articles delivered to a discharge station on a conveyor and to provide means for changing the lateral spacing of the articles to bring the articles into abutting side-by-side relationship.

It is a further object of this invention to provide a packaging device for use with a depanning member and a

conveyor for delivering articles to a discharge station having a plurality of article feed positions, and including a first pusher member for moving a portion of the baked articles delivered to the discharge station into a carton at a first article feed position and second pusher member for moving the remainder of the baked articles on the conveyor into a carton at a second feed position, the pusher member at the second feed position being operative to dispense the articles in overlying relationship with articles moved into a carton at the first discharge station and positive support means over which articles at the second discharge station are moved by the second pusher member.

Another object of the present invention is to provide means for indexing a carton delivered to the discharge station from the first article feed position to a second article feed position.

An added object of this invention is to provide means for transferring and inverting baked articles delivered from a first article feed position to a second article feed position whereby articles delivered to the second article feed position are disposed in overlying relationship with the inverted articles.

Another object of this invention is to provide an article dispensing device provided with means for removing a folded carton blank from a source of supply and cam-actuated finger members for assembling the removed blank into a carton having one side open for receiving articles.

Another object of the invention is to provide a carton dispensing device provided with a suction member for extracting a folded blank from a source of supply and cam-actuated finger members for assembling the removed blank into a carton having a major side in open position for receiving articles.

It is an object of the invention to devise a novel carton and mechanism for readily delivering it from a magazine.

It is a further object of the invention to devise a novel carton in which articles may be fed sidewardly into the carton.

It is a further object to devise a novel carton suitable for slidingly receiving oriented baked articles.

The novel features which are believed to be characteristic of the invention are set forth with particularity in the appended claims. The invention, itself, however, both as to its organization and method of operation may be understood by reference to the following description taken in connection with the accompanying drawings, in which:

FIGS. 1, 2 and 3 when joined on line A—A and B—B illustrates a side elevation of the depanning, slicing dispensing and packaging machine for baked goods;

FIG. 4 is a partial rear view of the dispensing and packaging portion of the machine;

FIG. 5 is a plan view of the depanning and aligning mechanism of the machine;

FIG. 6 is a partial sectional side elevation of the machine illustrating the depanning and aligning mechanism;

FIG. 7 is a side elevation illustrating a gripper unit adapted for depanning and transferring single hamburger buns;

FIG. 8 is an end elevation of the same;

FIG. 9 is a partial sectional end elevation of the gripper actuating mechanism on line 9—9 of FIG. 7;

FIG. 10 is a plan view of a gripper and transfer mechanism adapted for use with single frankfurter rolls and frankfurter roll clusters;

FIG. 11 is a side elevation of the same;

FIG. 12 is an end elevation of the frankfurter roll mechanism;

FIG. 13 is a plan view of a gripper and transfer mechanism adapted for use with hamburger bun clusters;

FIG. 14 is an end elevation of the same;

FIG. 15 is a bottom view of the hamburger bun cluster

mechanism illustrating the gripper fingers during gripping action;

FIG. 16 is a side elevation of the same;

FIG. 17 is a sectional plan view of the gripping fingers during gripping action taken on line 17—17 of FIG. 16;

FIG. 18 is a plan view of the dispensing and packaging portion of the machine;

FIGS. 19 and 20 are sectional side elevations illustrating the dispensing mechanism during insertion of the baked goods into a carton;

FIG. 21 is a side elevation of a control unit for air valve operation;

FIG. 22 is a sectional end elevation of the same taken on line 22—22 of FIG. 21;

FIG. 23 is an end elevation of the carton dispensing and opening mechanism in conjunction with a forwarding conveyor;

FIG. 24 is a side elevation of the same;

FIGS. 25, 26, 27 and 28 are perspective views illustrating the successive steps employed in the dispensing and opening of the carton to be forwarded to the packaging machine;

FIG. 29 is a partial end elevation, partly in section, illustrating the carton indexing device;

FIG. 30 is a plan view illustrating a bun or roll cluster turnover device; and

FIGS. 31, 32 and 33 are partial end elevations of the packaging conveyor in conjunction with the cluster turnover device illustrating the successive steps of the turnover operation.

With reference to the drawings, the bun depanner and packer consists of a pan feeding conveyor F, a bun depanning and lifting device D, a bun aligning and conveying mechanism C, a bun slicing device S, a bun dispensing mechanism E and a bun packaging device P.

The entire machine, with the exception of the bun slicing device S and the carton dispensing mechanism of the packaging device P, are driven by a motor **30** (FIG. 2), the shaft **32** of which carries a variable speed pulley **34** of the well-known spring-loaded Reeves type. Pulley **34**, through a V-belt **36**, drives a pulley **38** mounted on the input shaft **40** of a suitable gear reduction unit **42**. Mounted on the output shaft **44** of unit **42** is a sprocket **46** which, in turn, drives sprockets **50** and **52** through a suitable chain **48** (FIG. 2). Sprocket **52** is mounted on a cam shaft **54** rotatably supported by suitable bearings held by a member **56** of the main frame **58**. Sprocket **50** is mounted on and drives the main drive shaft **60** which is also supported in suitable bearings held by a frame member **62**. Pulley **64** is mounted on shaft **60** and, by means of a belt **66**, drives a pulley **68** mounted on a shaft **70** which is the drive shaft for the pan feeding conveyor F. Pan feeding conveyor F consists of a suitable frame **72** which is secured by means of adjustable brackets **74** (FIG. 1) to the main frame **58** of the machine. The drive shaft **70** is supported by suitable bearings located in the forward end of frame **72**. A pulley **76** is secured to shaft **70** and drives a pair of spaced conveyor belts **78** which run over an idler pulley **80** mounted on a horizontal shaft **82** supported by suitable bearings in frame **72**. The pan feed conveyor F is also provided with suitable adjustable pan guide bars **84** which are suspended above the conveyor belts **78** by lugs **86**. Each lug **86** is integral with and projects from a threaded sleeve or hub **88**. Each guide bar **84** is provided with a pair of spaced lugs **86** and sleeves **88**. The sleeves **88** of one guide bar **84** engage with the left hand threaded end portions of a pair of spaced horizontal transverse shafts **90** while the sleeves **88** of the other guide bar **84** engage with the right hand threaded portions on the opposite ends of said transverse shafts **90**. Both shafts **90** are supported by suitable bearing brackets secured to the top edges of conveyor frame **72**. To one end of each of the shafts **90** is secured a sprocket **92** (FIG. 1) which is connected by a chain **94**. Handwheel **96** is fastened to the forward end of one of the shafts **90** to turn shafts **90** in a clockwise or counterclockwise direction, as desired. It will be understood that, due to the threaded end portions of shafts **90**, a turning of handwheel **96** effects a transverse lateral movement of the guide bars **84** either towards or away from each other, providing adjustable guide means for pans of various widths.

Since it is essential to stop the pans intermittently during the depanning operation, the pan infeed conveyor F is provided with a pair of spaced indexing fingers **98**, each of which is loosely mounted on a transverse shaft **100**. Each shaft **100** is rotatably supported at each end by a suitable bearing lug projecting from a threaded sleeve **102**. Each of the two threaded sleeves **102** supporting each transverse shaft **100** engages a threaded longitudinally arranged shaft **104** (FIGS. 5 and 6). Each threaded shaft or spindle **104** is rotatably supported at each end by suitable bearings formed by either gear housings or individual bearing brackets secured to the inner sides of the conveyor frame **72**. To one end of each spindle **104** is secured a bevel gear **106** which meshes with a corresponding bevel gear **108**. Each pair of bevel gears **108** is mounted on a transverse shaft **110** as shown in FIGS. 5 and 6. Each transverse shaft **110** is rotatably supported at both ends by suitable bearings formed by gear housings **112** secured to the inner face of frame **72**. To one end of each transverse shaft **110** is also secured a handwheel **114** (FIGS. 1 and 5). The turning of handwheels **114**, through the associated bevel gears **106** and **108** and spindles **104**, effect longitudinal back or forward travel of sleeves **102**. Since each shaft **100**, carried by a pair of sleeves **102**, supports a pan indexing finger **98** it will be understood that the indexing fingers **98** may be moved to any desired position in accordance with the size and dimensions of the pans used.

As mentioned heretofore, each indexing finger **98** is loosely mounted on one of the transverse shafts **100**. A torsion spring **116** holds finger **98** in engagement with a suitable lug projecting from an actuating arm **118** mounted on the transverse shaft **100**. To each transverse shaft **100** is secured a trip lever **120**, the free end of which, by means of a tension spring **122**, engages with the free end of a stud **124** (FIG. 6). Stud **124** protrudes from a piston within an air cylinder **126** held by a bracket **128** mounted on a suitable lug projecting from the lower side of one of the threaded sleeves **102**. The injection of air into the cylinder **126** actuates the piston therewithin moving the protruding stud **124** forward to press the trip lever **120** on shaft **100** to swing or move in a counter-clockwise direction as indicated in dotted lines in FIG. 6. A counter-clockwise rotation of shaft **100**, of course, causes the finger actuating arm **118** mounted on shaft **100** to move downward, thus lowering the index finger **98** and disengaging it from the pan resting on the continuously driven conveyor belt above. Each index finger **116**, at its forward edge, is provided with a projecting curved rod **130** which serves as a guiding rod to permit the use of pans of various designs. Each air cylinder **126** is of conventional design and is provided with a flexible hose **132**, all of which are connected to a properly timed Bellows Electro air control valve **134** which, in turn, is connected by a suitable tube **136** to a conventional air supply, such as a compressor (not shown).

The depanning operation which removes the buns from the pans which have been indexed into proper location by the mechanism described herein-above is accomplished by a plurality of bun gripping units carried by an oscillating lifter mechanism which lifts the buns from the pans and delivers them to a continuously driven bun conveyor.

The buns are lifted from the pans either one or two rows at a time depending on the type of pans used. The type of lifter units employed to lift the buns or rolls depends on the type of buns or rolls delivered by the pans. Generally, there are four main types of buns and

rolls used in this type of operation. They are: the round single hamburger roll, the oblong-shaped frankfurter rolls, the hamburger roll cluster and the frankfurter roll cluster. A hamburger roll cluster comprises four round hamburger rolls arranged in a substantially square pattern held together by a web of dough, while a frankfurter roll cluster includes, as a rule, four oblong frankfurter rolls arranged side-by-side and held together by a web of dough.

Regardless of the type of lifter units used, each particular type is adjustably spaced and arranged on a transverse, preferably square, bar **138** which at each end is detachably held by a U-shaped lug **140** provided with conventional spring-loaded snap-locks (not shown). Such an arrangement permits easy insertion and extraction of the bar **138**, allowing rapid conversion from lifter units for one type of roll or bun to lifter units for a different type. From each supporting lug **140** extends a stud **142** which is rotatably supported by the free end of a lifter arm **144**. Each arm **144** is mounted to each end of a transverse shaft **146** supported by a pair of suitable bearing brackets **148** mounted on top of the frame **58**. To one end of shaft **146** is also secured an actuating arm **150** the free end of which is pivotally connected to one end of a link **152**. The other end of link **152** is pivotally connected to a crank arm **154** secured to the gear reduction output shaft **44** (FIG. 2). The rotating crank arm **154**, through link **152**, arm **150** and shaft **146** transmits oscillatory motion to the lifter arms **144** which carry the lifter units. In order to keep the lifter units in vertical position at all times a lever **156** is secured at one end to the stud **142** of each lifter unit supporting lug **140**. The free end of each lever **156** is pivotally connected to one end of a stabilizing bar **158** while the other end of the bar **158** is pivotally attached to a stationary lugs **160** mounted on frame **58**. The stabilizing bars **158**, coacting with the lifter arm **144**, form parallelograms which assure a vertical position of the lifter units while being moved through an arc by the oscillating lifter arms **144**.

The lifter unit illustrated in FIGS. 7, 8 and 9 is a single unit used primarily for gripping and lifting single round hamburger rolls. It consists of a supporting bracket **162** which is detachably and adjustably secured to transverse square bar **138** mentioned heretofore. A lifter bracket **166** is pivotally connected to the supporting bracket **162** by means of a pair of parallel links **164**. The upper portion of bracket **166** is provided with a lug **168** which, by means of a collar **170**, supports the upper end of air cylinder **172**. From the lower end of cylinder **172** protrudes a piston rod **174** the free end of which is pivotally connected to a gripper finger actuating member **176**. Member **176** is loosely supported by a stud **178** projecting from and held by the lower portion of the lifter bracket **166**. A gripper finger **182** is pivotally mounted on stud **178** also and is secured to member **176** by means of screw **180**. Integral with and horizontally extending from the lower portion of lifter bracket **166** is a lug **184** (FIG. 7). The free end of lug **184** pivotally supports another gripper finger **188**, by means of a stud **186**, positioning finger **188** in line with and exactly opposite finger **182**. Link or connecting rod **190** pivotally connects gripper finger **188** to a suitably shaped extension **192** integral with the member **176** and extending upward therefrom. The top end of the cylinder **172** is suitably connected to a flexible hose **194** which, in turn, is connected to a tube **196** leading to a conventional quick exhaust valve **198**, such as manufactured by Schroeder. The quick exhaust valve **198** is connected by a flexible hose **200** to a suitable air control valve **202**, such as a Bellows Electro air valve. The electrical control of valve **202** will be described hereinbelow. The air control valve **202** is connected by a tube **204** to a suitable source of air (not shown).

It will be understood that when air is supplied to the cylinder **172** of the lifter unit, the piston rod **174** moves downward and causes member **176** to swing clockwise about its pivot **178**. This effects a clockwise movement of gripper finger **182** and through connecting rod **190**, a corresponding counterclockwise movement to gripper finger **188**, causing a closing or gripping movement of the gripper fingers **182** and **188**. To control this gripping motion, as desired, and to protect the rolls from harmful indentations, member **176** is provided with a lug **206** which carries an adjustable stop screw **208**. Stop screw **208** engages the bottom side of lug **184** of the lifter bracket, thereby limiting the gripping motion of the gripper fingers. Integral with and extending from the bottom portion of the supporting bracket **162** is a horizontal lug **210** which supports the lifter bracket **166** and permits the gripper fingers carried by the lifter bracket **166** to contact the top face of the pan regardless of possible uneven heights of pans delivered thereto.

The bottom of the cylinder **172** is provided with a suitable compression spring (not shown) which is compressed as the air forces the piston within the cylinder **172** downward. When the air pressure in cylinder **172** is released, the spring (not shown) urges the piston rod **174** upwardly again. Thus the spring (not shown) and the quick exhaust valve **198** effect a rapid opening of the gripper fingers **182** and **188**. The number of lifter units employed is preferably equal to the number of buns or rolls in a single row of buns in a pan. In the event that the distance betwen the rows of buns in the pan is such that two rows of buns can be gripped and lifted at one time the single units described above are so designed that they may be placed side by side and alternately turned 180° such that the gripper fingers are suspended alternately in the front and rear of bar **138** in longitudinal alignment as illustrated in FIGS. 5 and 6.

While the description hereinabove describes the depanning of round hamburger rolls, the present invention may be used to depan oblong frankfurter rolls by simply replacing the hamburger lifter or gripper units described above with gripper units such as illustrated in FIGS. 10, 11 and 12 which are specially designed for gripping and lifting oblong frankfurter rolls. Each of these frankfurter roll gripper units consists of a supporting bracket **212** which is adjustably and detachably secured to the same type of preferably square transverse gripper unit supporting bar **138** mentioned heretofore. A lifter bracket **216** is pivotally connected to supporting bracket **212** by means of a pair of parallel links **214**. To the bottom portion of bracket **216** is secured a horizontal gripper arm supporting frame **218**. One end of frame **218** rotatably supports a transverse shaft **220** to each end of which is secured a gripper arm **222**. Gripper arms **222** at their bottom end are connected by and support a suitably shaped transverse gripper member **224**. An actuating lever **226** is secured at one end to shaft **220**. The free end of lever **226** is pivotally connected to the forked end of a piston rod **228** projecting from one end of an air cylinder **230**. The opposite end of cylinder **230** is pivotally supported by the frame **218** by stud shaft **232**. The other end of frame **218** remote from shaft **220** adjustably supports a pair of spaced vertical rods **234**. The lower ends of rods **234** are integral with and carry a transverse gripper member **236** which is of substantially the same shape as gripper member **224**. Air cylinder **230** is provided with an air inlet nozzle **238** and connected by flexible tube **240** through quick exhaust valve **198** to a suitable air supply as described hereinabove for the hamburger roll lifter units.

The bottom portion of the supporting bracket **212** is also provided with a horizontally extending lug **242** which serves as a support for the gripper arm carrying lifter bracket **216** and enables the gripper members **224** and **236** to contact the top face of each pan delivered thereto although the height of the individual pan may vary.

It will be apparent that when air is supplied to the cylinder **230** the piston therewithin is forced to the top causing actuating lever **226** to swing in a counter-clockwise direction as indicated by the arrow in FIG. 11. The counter-clockwise movement of lever **226** is transmitted to the shaft **220** which, in turn, causes a swinging movement of the gripper member **224** towards the stationary gripper member **236** on rods **234**, effecting an endwise gripping of a plurality or portion of a row of frankfurter rolls as indicated in dot and dash lines in FIG. 10. The reason for employing in this unit one stationary and one movable gripper member is to dislocate the frankfurter rolls from the pans during the gripping operation since some frankfurter rolls have a tendency to adhere to the bottom of the pan. When the open gripper units are moved into gripping position adjacent the rolls in a pan, the lower edge of the movable gripper member **224** comes momentarily to rest on the top face of the pan adjacent the rear end of the rolls as indicated in dot and dash lines in FIG. 11. As member **224** moves inwardly through the action of air cylinder **230**, the rolls are pushed lengthwise out of the indentation of the pan before being fully gripped between members **224** and **236**.

As soon as the air supply to cylinder **230** is released, a suitable compression spring (not shown) located on top of the piston within cylinder **230** pushes piston rod **228** quickly downwardly in concert with the action of the quick exhaust valve **198**, thus causing a rapid opening action of the gripper member **224** and a fast release of the rolls.

Depending on the length of the rows of frankfurter rolls to be depanned, any desired member of these gripper units can be mounted on the square transverse supporting bar **138**. To change from depanning of hamburger rolls to depanning of frankfurter rolls the operator simply disconnects the air supply hose **200** from the quick exchange valve **198** with which each bar assembly is provided, snaps the hamburger gripper assembly bar **138** out of the U shaped supporting lugs **140** on lifter arms **144**, inserts the frankfurter gripper assembly bars in lugs **140** and reconnects the air supply hose **200** to the quick exhaust valve **198**. After moving the pan indexing fingers **98** by means of handwheels **114** to bring fingers **98** in proper relation with the frankfurter roll pans, the machine is ready for depanning frankfurther rolls.

The frankfurter roll gripper and lifter unit described above may be used either for rows of single frankfurter rolls or cluster of frankfurter rolls. The latter is usually formed by four rolls side by side connected by a web of baked dough.

Since it happens that during the baking of frankfurter rolls the ends of the rolls in one row creep towards the ends in the next row, causing a slight adhesion therebetween, a removable pneumatic bun clamping device, such as indicated in FIGS. 1 and 5 is provided. The bun clamp consists of a pair of spaced hinge mounted brackets **244** attached to the infeed conveyor frame **72**. Brackets **244** are connected by a horizontal cross bar **246** to the top face of which are secured a pair of spaced air cylinders **248**. Cylinders **248** are connected at their tops by a tube **250** which, in turn, is connected to a Bellows electro air control valve **254** by a hose **252**. Valve **254** is connected by a tube **256** to a suitable source of air supply (not shown). From the bottom of each air cylinder **248** and protruding through a hole in the cross bar **246** projects a piston rod **258** from the bottom of which is suspended a suitably shaped clamp plate **260**. On the bottom of and within the cylinder **248** below the piston is located a suitable compression spring (not shown) which normally holds the piston in its uppermost position in the cylinder **248**. Thus piston rod **258** normally holds the clamping plate **260** above and out of contact with the rolls in the pans passing beneath. As soon as the indexing fingers **98** have contacted a pan and the gripper members on the gripper and lifter unit have descended to engage the rolls in the pan, air is supplied to the cylinders **248** causing the piston within cylinders **248** to move downwardly together. Clamping plate **260** thus engages the top face of the row of rolls therebeneath. The row engaged by plate **260** is the row directly in back of the row of rolls to be engaged and lifted from the pan by the gripper members of the lifter unit. Should one or more rolls in these rows be adhered together, they are gently torn apart during the depanning action without danger of pulling rolls out of the row of rolls in back of the one presently being depanned.

As soon as the air supply to the cylinders **248** is interrupted, the compression spring (not shown) within the cylinder urges the piston and the clamping plate **260** upwardly, thereby disengaging the rolls in the pan beneath plate **260**. The action of the clamping plate **260**, is properly timed and synchronized with the operation of the pan indexing fingers **98** and the action of the gripper and lifter units of the depanning device.

As mentioned heretofore, the present device can also be used for depanning clusters of hamburger rolls by simply substituting the single hamburger roll or frankfurter roll gripper and lifter units with units especially designed for clusters of hamburger rolls. One of the gripper and lifter units for clusters of hamburger rolls is illustrated in FIGS. 13, 14, 15, 16 and 17 and consists of a supporting bracket **262** having a horizontal square slot **264** for attaching bracket **262** to one of the square transverse gripper unit supporting bars **138**. A lifter bracket **268** (FIG. 14) is pivotally connected to supporting bracket **262** by means of a pair of parallel links **266**. Bracket **268** rests freely on a lug **270** extending from the lower portion of bracket **262**. To the lower portion of lifter bracket **268** is secured a cross-shaped member **272**. The free ends of each of the four lugs of member **272** forms a fork **274**. From each fork **274** a gripper arm **278** is pivotally suspended by means of a stud **276**. The bottom end of each gripper arm **278** is provided with a curved V-shaped jaw **280**. The center portion of each of the four arms **278** is pivotally connected to the free end of one leg of a cross-shaped gripper arm actuating member **284** by means of a suitable connecting rod **282**. Member **284** is pivotally supported at its center by a vertical stud **286** projecting from the center of the stationary cross-shaped member **272**. One leg of the cross-shaped gripper arm actuating member **284** is pivotally connected at one end to the free end of a piston rod **288** (FIG. 15) attached to a piston (not shown) within an air cylinder **290**. Air cylinder **290**, at one end, is pivotally supported by a vertical stud **292** projecting from a suitably shaped lug **294** which is integral with the stationary cross-shaped member **272**. On top of the piston (not shown) within cylinder **290** is located a suitable compression spring (not shown) which normally keeps the piston in the back portion of cylnider **290**. When the piston (not shown) is in this position, the gripper arms **278** are radially spread out or open as illustrated in FIG. 13. The back portion of cylinder **290** is provided with an air nozzle **296** to which is attached a flexible tube **298** which leads to quick exhaust valve **198** with which each bar **138** is provided.

When air is introduced into cylinder **290** the piston moves forward and compresses the spring (not shown) on top of cylinder **290**, moving piston rod **288** forward. This forward movement of the piston rod **288** causes a counter-clockwise rotation of cross-shaped gripper arm actuating member **284** which, in turn, through connecting rods **282**, affects a radial inward movement of the four gripper arms **278**, causing jaws **280** to contact and grip the hamburger roll cluster as illustrated in FIG. 16 where the hamburger roll cluster is indicated with dot and dash lines.

The lifting movement imparted to the gripper units is effected through oscillating arms **144** in the same manner as the single hamburger roll and frankfurter roll grippers described hereinabove. As soon as the air is interrupted

to cylinder **290**, the compression spring (not shown) within the cylinder forces the piston and rod **288** backward, causing a clockwise rotation of the cross-shaped gripper arm actuating member **284**. Actuating member **284** through connecting rods **282** results in a radial outward movement of the gripper arm **278** and jaws **280** and, consequently, in a release of the hamburger roll cluster. Of course, several of these hamburger roll cluster gripping units may be mounted side by side on one transverse bar **138** in a manner similar to the gripper units described heretofore.

All gripper units are swung through an arc by means of the oscillatory lifter arms **144** as illustrated in FIG. 6, and the depanned buns are released above and permitted to drop onto the bun conveying and aligning mechanism E shown in FIGS. 5 and 6. The bun conveyor consists of a plurality of longitudinally spaced endless chains **300** which carry a plurality of evenly spaced transverse rods **302**. Endless chains **300** are supported and driven by suitable sprockets **304**, the idler sprockets of which are loosely mounted on the transverse shaft **146**, while the driving sprockets are secured to a transverse shaft **306** (FIGS. 3, 18 and 19) supported by suitable bearings mounted on the frame **58** of the machine. The transverse conveyor drive shaft is driven continuously through a suitable sprocket (not shown) which, in turn, is driven through a chain **308** (FIGS. 2 and 3), by another sprocket mounted on shaft **310**, which is supported by suitable bearings in framework **58**. To shaft **310** is secured another sprocket **312** which through a chain **314** is driven by a suitable sprocket (not shown) on the drive shaft **60**.

Slightly above the bun receiving end of the bun conveyor is located the bun aligning device which is employed for the purpose of properly aligning and spacing the buns dropped onto the conveyor to assure that said buns, when reaching the slicing device S, are in the desired position to affect precise slicing of the buns.

The aligning device consists of a transverse cross bar rod **316** (FIGS. 5 and 6) which at each end is detachably secured to a lug **318**, which is fastened to and projects upwardly from, one end of a horizontal guide bar **320** (FIGS. 1, 2, 5 and 6). Each of the two guide bars **320** at the opposite end is pivotally connected to a suitable slot provided at the top end of an arm **322** (FIG. 2), and both arms **322** at their bottom end are secured to a transverse shaft **324** rotatably supported by bearing brackets **326** mounted on frame **58**. To shaft **324** is also secured a cam lever **328**, the free end of which carries a cam roller **330**, which engages with a suitable cam **332** mounted on the cam shaft **54**. The two guide bars **320** are slidingly supported in suitable bearing lugs **334** forming part of the framework **58**. The transverse aligning bar **316** is provided with a plurality of evenly spaced rods or prongs **336** (FIGS. 1, 5 and 6) which project at right angles from the transverse aligning bar **316** and longitudinally with, but slightly above, the conveyor. The free ends of the longitudinal prongs **336** are provided with suitable ears or lobes **338** which are provided for the purpose of precisely positioning the buns on the conveyor with respect to the distance between each bun in each row so the slicer will slice each bun in a precise manner.

The bun aligning device operates as follows: The cam **332** through cam lever **328**, arms **322** and guide bars **320** imparts longitudinally reciprocating motion to the transverse and longitudinal aligning rods **316** and **336**, respectively. The transverse bar **316** dwells in its backmost position when one or two rows of buns are dropped on the moving bun conveyor, but immediately thereafter moves forward at a faster rate than the speed of the conveyor, thus catching up with the row of buns and moving them slightly forward on the conveyor. This accomplishes a transverse alignment of the buns while the longitudinal prongs provide longitudinal alignment. The aligning bars **316** and **336** then move backward again while the buns are carried forward and thus pass the ears or lobes **338** of the prongs **336** which parts the buns in the precise position for the slicer.

After the aligning operation the buns are carried in aligned formation by the conveyor through the slicer or slitter S where the buns are sliced by a plurality of horizontally rotating knives **340** (FIG. 2) usually in such a manner as to leave a hinge between the upper and lower portion of the sliced bun. The slicing device S is a conventional unit available commercially from the Alto Machine Co., York, Pa., and forms no part of this invention. The slicer unit S is hingedly mounted to the top of frame **58** and suspended above the conveyor by means of a pair of piston rods **342** projecting from a pair of pivotally mounted vertical hydraulic cylinders **344**. Cylinders **344** are connected by means of tubes **346** and **348** (FIG. 2) to a suitable source of air supply (not shown). Thus the unit S may be raised to a non-operative position above the conveyor, as shown in FIG. 2 when no slicing of the buns is desired. The rotating knives **340** within the unit S are driven by an independent motor **350** mounted on top of the unit housing **352**. Within the unit S are mounted a number of longitudinally arranged and properly spaced top guide belts (not shown) which hold the buns firmly on the conveyor during slicing operation. Since these top guide belts must be driven and move at the same speed as the conveyor a sprocket **354** mounted on the shaft **310** drives a second sprocket **358** (FIG. 2) through a chain **356**. Sprocket **358** is mounted on a transverse shaft **360** supported by suitable bearings within the slicer unit S. Shaft **360** constitutes the drive shaft for the top guide belts located within unit S. The chain **356** runs over a spring-mounted chain tightener sprocket **362** to facilitate raising and lowering of the slicer unit S.

As mentioned heretofore, the slicing unit S illustrated in FIG. 2 prferably slices the buns only partially so that the upper and lower half of each bun is still connected by a "hinge" of dough. In case it is desired to slice the buns all the way through, a band slicer H (FIG. 2) is mounted across the machine and secured to the top of the framework **58**. An endless saw band (not shown) travels transversely across and above the conveyor and parallel therewith while the buns are held down on the moving conveyor by a plurality of longitudinally spaced belts **364** traveling at the same speed as the conveyor. The entire unit is driven by a suitable gear reduction motor **366** and may be raised or lowered by means of a pair of vertical spindles **368** actuated by suitable handwheels **370**.

After passing either through the slicing unit S or the band slicing unit H the buns are carried by the conveyor to the bun dispensing mechanism E illustrated in FIGS. 3, 4, 18, 19 and 20. The dispensing unit E consists chiefly of a bun guiding and funnelling device and a bun inserting device. Since the buns are usually packaged in two layers there are two devices of each type. One funnelling device reorients and arranges the buns for the bottom layer while the other funnelling device re-orients and arranges the buns for the top layer. This, of course, is also true for the inserting devices, one inserts the bottom layer while another inserts the top layer.

The funneling device consists of two sets of vertically suspended endless guide belts **372** arranged above the conveyor in diagonal fashion as illustrated in FIG. 18. The forward pulleys **374** are closer together than the rearward pulleys **376** thus forming a funnel-shaped continuously moving channel with its side walls (belts **372**) moving at the same speed as the bottom of the channel formed by the bun conveyor. The channel thus formed is divided along exact longitudinal center line by a plurality of vertical lugs **378** secured to an endless chain **380** (FIGS. 4, 18 and 19). Belts **372** are suspended above the bun conveyor and driven from one end thereof at the same speed as the conveyor by means of a sprocket **382** mounted on a

transverse shaft 384. Shaft 384 is supported by suitable bearings in the framework 58 and a central supporting bar 386 which in turn is held by two transverse rods 388 and 390 secured to the framework 58. The forward end of chain 380 is supported by an idler sprocket 392 (FIG. 19) pivotally held by a stud shaft 394 mounted on a lug 396 suspended from and secured to the bar 386. Shaft 384 is continuously driven by means of a sprocket 398 mounted thereon. Sprocket 348, in turn, is driven by a sprocket 402 through a chain 400. Sprocket 402 is mounted on the conveyor drive shaft 306 (FIG. 3). Chain 400 is also led over an idler sprocket 404 and imparts driving motion to another sprocket 406 mounted on a transverse shaft 408. To transverse shaft 348 are secured two bevel gears 410 each of which meshes with a bevel gear 412 (FIG. 18). Each bevel gear 412 is secured to the top end of one of the side guide belts driving pulleys 376 which are pivotally supported by vertical stud shafts secured to suitable supporting plates 414 extending horizontally from the framework 58. The front pulley 374 of side guide belts 372 are pivotally held by suitable vertical studs 416 each of which is adjustably mounted to the free end of an arm 418 which extends horizontally from and is adjustably secured to the framework 58. Thus the front end of the two conveyor channels V and W may be widened or narrowed as desired. The continuously driven channel walls are employed for the purpose of closing the lateral spaces between the individual buns in the row. Since the walls are driven synchronously with the conveyor no disturbance of the lateral alignment of the row is experienced. Thus when the rows reach the mouth or the dispensing end of the channels, the rows of buns are close together and in lateral alignment ready to be engaged by the inserting devices.

The inserting devices comprise reciprocating pusher plates 420 and 422 which push and insert the rows into an open box waiting at the bun dispensing stations M and N (FIGS. 18, 19 and 20). The boxes K which are open on top and on one side are forwarded to the dispensing station by a suitable transverse conveyor 424 which will be described hereinbelow. Between the end of the bun conveyor channel V, mentioned above, and the transverse box conveyor 424 is a horizontal stationary bridge plate 426. Bridge plate 426 leads to the bun dispensing station M (FIG. 19) while between the end of the bun conveyor channel W and transverse conveyor 424 is an inclined bridge plate 428 which leads to the bun dispensing station N (FIG. 20). Both bridge plates 426 and 428 are suitably secured to the framework. Each plate 426 and 428 is provided with one stationary side guide rail 430 and 432, respectively, and one adjustable side guide rail 434 and 436, respectively (FIG. 18). The adjustable guide rails 434 and 436 are mounted on brackets 438 and 440, respectively, both of which are adjustably secured to and suspended from the transverse rod 390 (FIG. 18). The horizontal bridge plate 426 forms the guide channel for the buns to be dispensed to the bottom of the box while the inclined bridge plate 428 forms the channel for guiding the buns for delivery on top of the first layer already in the box. Since the pusher plates 420 and 422 which dispense the buns from the conveyor channels V and W, respectively, into the boxes K are of identical construction, only one of the pusher units and their operating mechanism will be described and the parts of both pusher units will have identical reference characters. Each rectangularly-shaped pusher plate is adjustably mounted to a supporting plate 442 (FIGS. 19 and 20) which is integral with an upright lug 444 the free top end of which by means of a link 446 is pivotally connected to a stud shaft 448 carried by a guide shoe 450. Shoe 450 is supported by and slidingly engages with a horizontal guide rail 452. The guide rails 452 for both pusher units at their front end are secured by means of suitable lugs to the transverse rod 390 while the other end of each rail 452 engages with and is supported by the transverse rod 388 (FIG. 18). To the bottom portion of each upright lug 444 is pivotally connected the free end of an arm of a bell crank lever 454 which forms a parallelogram with link 446. The free end of the other arm of the bell crank lever is pivotally connected to the free end of a piston rod 456. The bell crank lever proper is pivotally mounted on a stud 458 held by and projecting horizontally from the lower front portion of the guide shoe 450. The piston rod 456 projecting from an air cylinder 460 is integral with a piston (not shown) within cylinder 460. Each air cylinder 460 at the opposite end from which the piston rod protrudes, is pivotally mounted on a stud 462 carried by and projecting horizontally from the guide shoe 450, and at this same end, a flexible air hose 464 is connected to the bottom of said cylinder. The flexible air hoses 464 of both cylinders are connected to a transverse hollow shaft 466 pivotally supported at each end by the upper free end of an arm 468, one of each of which is located at each side of the machine. Each arm 468 is mounted to one end of a transverse shaft 470 rotatably supported by suitable bearings in frame work 58. The transverse hollow shaft 466 pivotally connects with one end of a pair of spaced connecting rods 472, the other end of each of which is pivotally connected to the rear end portion of one of the guide shoes 450. One end of the transverse hollow shaft 466 is provided with a suitable plug, and the other end by means of a suitable tube or hose 474, is connected to an air control valve 478, such as a Bellows Electro (FIG. 4). Valve 478 in turn is connected to a source of air supply (not shown) by a suitable tube. Each of the two arms 468 is pivotally connected by means of a link 480 to a crank arm 482, both of which are mounted on the continuously rotating shaft 408 described heretofore. It is self evident that the continuously rotating crank arms 482 through links 480 impart oscillating motions to the arms 468 and the transverse hollow shaft 466 carried by the same. Since shaft 466 through links 472 is connected to the guide shoes 450 on rails 452, oscillating motion of said shaft 466 effects reciprocating motion of guide shoes 450, and, since guide shoes 450 carry the pusher plate assembly, reciprocating motion is also imparted to the latter. It is also apparent that when air is introduced to cylinders 460, the pistons within move forward and through their respective piston rods 456 in conjunction with bell crank levers 454 effect a downward movement of the respective pusher plates 420 and 422. When the air supply is shut off, a compression spring (not shown) located on top of the piston within each cylinder 460, forces the piston backward again and thus effects a raising of the pusher plate.

The bun dispensing action of each pusher plate assembly is as follows: The mechanism of the machine are preferably operated in timed relationship such that the pusher plates 420 and 422 are momentarily dwelling in a backmost and raised position at the forward end of the bun conveyor channels V and W waiting for a row of buns to pass beneath. As a row of buns pass beneath, the pusher plates are lowered and immediately moved in a forward direction so that the downwardly projecting portion of each pusher plate engages the trailing end of the row of buns. Plates 420 and 422 then push the buns rapidly forward over the bridge plates 426 and 428 respectively and into the open box K which is momentarily stopped to permit insertion of the buns therein. After inserting the buns into the box, the pusher plates are immediately raised and moved backward to their starting position to engage a succeeding row of buns forwarded by the conveyor for insertion into boxes.

As mentioned heretofore, the empty boxes or cartons K are forwarded to the bun dispensing stations M and N by a transverse conveyor 424 which in turn receives the boxes from a conveyor 484 which is part of a box or carton dispenser R illustrated in FIGS. 23 and 24 and will be described hereinafter.

The transverse conveyor 424 consists of a plurality

of narrow endless belts **486** which are continuously driven by means of a pulley **488** at one end and supported by an idler pulley **490** at the other. Idler pulley **490** is rotatably supported by a horizontal shaft **492** secured to a suitable conveyor frame **494** mounted on the main framework **58** of the machine. The driving pulley **488** (FIG. 4) is secured to a shaft **496** (FIGS. 4 and 18) which is rotatably supported by suitable bearing brackets also mounted on the framework **58**. To shaft **496** is secured a bevel gear **498** which meshes with a bevel gear **500** fastened to the continuously driven transverse shaft **306**.

In order to stop the cartons during the bun inserting operation, the conveyor **424** is provided with suitable carton arresting and indexing fingers **502** (FIGS. 3, 18, 20 and 29) which at the proper time protrude upwardly through the spaces between belts **486** and engage the leading end of the carton as illustrated in FIG. 18. Indexing fingers **502** are mounted on a supporting member **504** which is pivotally supported by a horizontal stud shaft **506** (FIG. 20). Shaft **506** at one end is adjustably secured in a horizontal slot **508** provided in the front portion of conveyor **494**. To the bottom portion of the finger supporting member **504** is secured a suitably shaped control member **510**. Member **510** is provided with a forked extension **512** which loosely engages with a horizontal rod **514**, both ends of which are bent at right angles to form a U. The free ends of this U-shaped rod **514** are secured to a horizontal shaft **516** which is rotatably supported by a pair of suitable bearing brackets **518** mounted on the framework **58** of the machine. A cam lever **520** is also secured to shaft **516**; the free end of cam lever **520** carrying a cam roller **522** which engages with a cam **524** mounted on the continuously rotating transverse shaft **408**. It will be apparent that the cam **524**, through cam lever **520** and shaft **516**, imparts timed oscillating motion to the U-shaped rod **514**. Rod **514** in turn through members **510** and **504**, transmits up and down motion to the indexing fingers **502**. In case it is desired to incapacitate the indexing fingers **502**, a latch lug **526** (FIG. 20) pivotally suspended from the frame of the conveyor, is moved into engagement with the U-shaped rod **514**, thus keeping fingers **502** in their down position.

As illustrated in FIG. 18, the indexing fingers **502** are so located as to engage the leading end of the carton aligned with the conveyor channel W at the bun dispensing station N during the bun inserting operation. The stopping of the carton of course, arrests the succeeding carton which is then aligned with the bun conveyor channel V at the bun inserting station M. FIGURE 19 illustrates the manner in which a double row of buns is pushed by plate **420** from the bun conveyor over the horizontal bridge plate **426** and into the open carton. After the insertion of the buns in a carton at station M, the partially filled carton is then permitted to move with the conveyor **424**, but is again arrested at the bun inserting station N (FIG. 20) where a double row of buns is pushed by the plate **422** over the inclined bridge plate **428** onto the first layer of buns previously inserted at station M.

To assure that the pusher plate **422**, when pushing buns over the inclined bridge plate **428** into the boxes, follows an inclined path corresponding to the incline of plate **428** (FIG. 20), there is provided an inclined cam rail **449** (FIG. 20) secured to the rail **452**. Cam rail **449** engages with a cam roller **451** carried by an arm **453** which is secured to shaft **448**. One end of link **446** is mounted on shaft **448** also, thus forming a double lever consisting of arm **453** and link **446**. By this arrangement, when roller **451** engages the cam rail **449**, it raises the opposite end of the double lever and thus effects a gradual raising of the pusher plate **422** serving the bun inserting station N.

In order to prevent any tumbling of the second layer of buns and damage thereto while being pushed on top of the first layer, the dispensing station N is provided with an oscillating shuffle plate **528**. Shuffle plate **528**, during bun inserting operation, emerges from beneath the inclined bridge plate **428** to form an extension of the latter, thus providing a smooth bridge from the leading edge of plate **428** to a point half way over the double row of the first layer of buns already in the carton as illustrated in FIG. 20.

The oscillating shuffle plate **528** is secured to one end of a bar **530** while the other end of the latter is mounted to the free upper end of an arm **532** (FIGURE 20) loosely mounted on a shaft **534** rotatably held by a suitable bearing bracket **536** attached to the frame **58**. To shaft 534 is secured a cam lever **538** the free end of which carries a roller **540** which engages with a cam **542** secured to the continuously rotating transverse shaft **408**. Cam lever **538** is also provided with a suitably shaped flange **544** (FIGURE 20) to which, by means of a clamp plate **546** is adjustably secured the shuffle plate actuating arm **532**. Thus there is provided means for adjusting the bridging distance of the shuffle plate **528** from the leading edge of the plate **428** to the desired point in the carton. The pusher plate **422** which pushed the second layer of buns over the shuffle plate **528** into the carton, of course, dwells momentarily in its forward most position to permit withdrawal of the shuffle plate **528**, before returning to its own starting position.

As mentioned heretofore and illustrated in the drawings the empty boxes or carton K are topless and arrive at the dispensing station with one side flap down and in line with the bottom of each box. After the boxes are filled and released by the indexing fingers **502** the filled boxes are carried by the conveyor **424** past a curved rod **548** (FIGURE 18) which acts as a plow and causes an upward bending of the extending side flap, thus effecting a closing of the box.

In order to keep the filled box firmly on the conveyor belt **486** and prevent a raising or tilting of said box while passing the curved side flap folding rod **548**, a continuously driven top compression or hold-down belt **549** engages with the top of the filled carton as illustrated in FIGURE 18. Belt 549 is located parallel to and above the delivery end of conveyor **424** and is held by a pair of pulleys **547** rotatably supported by a frame **551**. Frame **551** is adjustably secured by means of a bracket **553** to the main frame **58** of the machine. One of pulleys **547** is driven by a horizontal shaft **555** (FIGURE 4) rotatably supported by a suitable bearing bracket **557** mounted on the frame **58**. Shaft **555** is driven through a pair of gears **559** from a shaft **561** (FIGURE 18) which is also rotatably supported by bracket **557**. Shaft **561** carries a sprocket **563** which is driven through a chain **565** by a sprocket **567** (FIGURE 4) mounted on the conveyor drive shaft **496**.

If desired these topless boxes are then forwarded to a suitable wrapping machine (not shown) which envelopes the boxes with a wrapper. Conveyor **424** is also provided with a suitable adjustable side guide rail **550** and a rail **552** (FIGURE 18) which holds the open side flap L of the boxes down on the conveyor until the boxes are filled with buns at the dispensing stations M and N as described heretofore.

As mentioned above, the boxes K to be filled are forwarded to the conveyor 424 by the conveyor **484** which is part of the box dispensing device R illustrated in FIGS. 18, 23 and 24. This box dispensing device R consists of a frame **554** (FIGURES 23 and 24) which supports a suitable frame **556** of the conveyor **484** and a suitably-formed magazine Z. Magazine Z is equipped to hold a stack of folded boxes or carton blanks K as illustrated in FIG. 23. The conveyor **484** consists of an endless belt **558** which is led over and supported by an idler pulley **560** and driven by a pulley **562** (FIGURE 24). Idler pulley **560** is rotatably supported by a shaft **564** which is mount-

ed at both ends in a suitable slot in the forward end of the conveyor frame **556**. The driving pulley **562** is mounted on a shaft **566** rotatably supported by suitable bearings in conveyor frame **556**. To shaft **566** is secured a sprocket **568** which through a chain **570** is connected to a sprocket **572** mounted on a continuously driven shaft **574** supported by suitable bearings mounted in the frame **554**. To shaft **574** is mounted a pulley **576** which through a belt **578** is driven by a pulley **580** mounted on the motor shaft **582** of a motor **584** secured to the frame **554**. The motor shaft **582** is also connected to and drives a gear reduction unit **586** the output shaft **588** of which on one side serves as a cam shaft while to another portion of said shaft protruding from the opposite of said unit is mounted a crank arm **590**. Crank arm **590** is pivotally connected to the lower free end of a piston rod **592** which is integral with a piston (not shown) within a cylinder **594** pivotally supported by and suspended from a stud shaft **596** held by a suitable bracket **598** secured to the frame **554**. The top portion of said cylinder by means of a flexible tube **600** is connected to a suitable electrically controlled cut-out valve **602** which also by means of another flexible tube **604** is connected to a suction head **606** carried by and secured to the free end of a dispensing arm **608** mounted on an oscillating horizontal shaft **610** rotatably supported by suitable bearings in the frame **554**. To shaft **610** is also secured an activating lever **612** the free end of which by means of a connecting rod **614** to a cam lever **616** loosely supported by a shaft **618** supported by suitable brackets **620** mounted on frame **554**, cam lever **616** carries a cam roller **622** which engages with a cam **624** mounted on the shaft **588**. Cam **624** is employed for the purpose of transmitting oscillating motion to the dispensing arm **608** while each down stroke of the piston in cylinder **594** activated by the crank arm **590** creates suction which through tube **600**, valve **602** and tube **604** is transmitted to the suction head **606** carried by the arm **608**. The suction supply is so timed that when the arm **608** swings in an anticlockwise direction suction is supplied to the head **606** shortly before the latter reaches the folded cartons in the magazine M, so that when said head **608** contacts the bottom carton of the folded stack of cartons in the magazine, said bottom carton adheres to the head **606** on arm **608** as indicated in dotted lines in FIGURE 23. The cartons in the magazine M are folded flat with the end flaps **626** folded over the back side flap **628** of the carton, while the front side flap L is unfolded and extends straight from the bottom **630** as illustrated in FIGURE 25. When the suction head **606** reaches the cartons in the magazine it contacts the outside face of the back side flap **628** as illustrated in FIGURE 25. The arm **608** then moves in clockwise direction and causes the carton adhering to the suction head to be pulled out and freed from the magazine M. When the carton now held only by the back flap **628** is free of the magazine, the rest of the body of the carton due to its own weight will drop down and away from arm **608** and thus affect a partial opening of said carton as illustrated in FIGURE 26. When the arm **608** reaches its vertical starting position said arm dwells with the outside of the back side flap **628** of the carton still adhering to the suction head **606**. During this dwelling period a pair of L-shaped fingers **632** enter the carton from the open top, contact the bottom **630** of said carton and press the latter downward until said bottom is at right angles to the back side flap **628** still held by the suction head **606** as illustrated in FIGURE 27. The fingers **632** then move toward the end flaps **626** as indicated by arrows in FIGURE 27 and press against the inside of said end flaps until they assume a straight upright position as illustrated in FIGURE 28, and thus effect a complete opening of the formerly folded carton. A pair of stiffening tabs **634** which are folded extensions of the end flaps **626** and which are glued to the inside of the originally folded end portions **636** (FIGURE 26) snap in place against the inside of the back side flap **628**, and assist in preventing the carton from collapsing after opening. Fingers **632** then retreat again towards the center and then out of the open box after which the suction is released from the suction head **606** and the carton is permitted to drop onto the conveyor belt **558** which carries them to the conveyor **424** as described heretofore.

The L-shaped box opening fingers **632** are mounted on sleeve **638** both of which are supported and slidingly engage with a square horizontal shaft **640** which at both ends is rotatably supported by suitable bearings in frame **554**. Each sleeve **638** is provided with an annular groove **642** which engages with a forked member **644**. Each forked member **644** in turn is pivotally mounted at the forked end portion of an arm **646** which at the bottom end is pivotally secured to a block **648** provided with a threaded horizontal bore by means of which said block engages with a horizontal threaded spindle **650** (FIGURES 23 and 24), which is rotatably supported by suitable bearings mounted on the frame **554**. To one end of spindle **650** is secured a hand wheel **652**. Half of the spindle is provided with right hand thread while the other half is provided with left hand thread and by the same token one of the blocks **648** has a right hand threaded bore while the other has a left hand threaded bore, thus providing adjusting means for the finger actuating arms **646**. Both arms **646** by means of a pair of links **654** are pivotally connected to the cross bar of a T-shaped member **656** while the vertical bar of said member is pivotally connected to the upper end of a connecting rod **658**. The lower end of connecting rod **658** is pivotally connected to a cam lever **660** which carries a cam roller **662** engaging with a cam **664** on shaft **588**. The T-shaped member **656** at its central portion is pivotally held by a stud **666** which is held by a cross frame member **668** secured to frame **554**. While cam **664** through rod **658** member **656** and links **654** transmits oscillating motion to arms **646** the latter in turn impart horizontal reciprocating motion to sleeves **638** and consequently to fingers **632**. Due to the T-shaped member **656** the horizontal reciprocating motion of fingers **632** are towards and away from each other. To the horizontal square shaft **640** is secured an arm **670** (FIGURES 23 and 24) which through a connecting rod **672** is pivotally connected to a cam lever **674** carrying a cam roller **676** engaging with a cam **678** mounted on shaft **588**. Cam **678** through cam lever **674**, connecting rod **672** and arm **670** provides oscillating motion to said square shaft **670** and consequently to fingers **632**.

Since the cartons are dispensed and forwarded by conveyor **484** to conveyor **424** at a faster rate than the boxes can be filled an electric eye **680** is mounted adjacent the conveyor **484** and is employed to receive a light beam across said conveyor. When said light beam is broken by empty cartons remaining on said conveyor, the electric eye and its electrical control (not shown) will cause current to be transmitted to the vacuum cut-out valve **602** which in turn will be actuated in such a manner as to prevent vacuum from reaching the suction head **606** on arm **608**. The latter, of course, continues to oscillate but will not pull cartons from the magazine Z.

Since it is sometimes desirable not to box clusters of hamburger or frankfurter buns not simply place them bottom to bottom and then envelop them in a transparent wrapper, the machine may be provided with a bun turnover device such as illustrated in FIGURES 30, 31, 32 and 33. This device is located at the bun dispensing end of the machine and may be suitably attached to the conveyor frame **494** of the conveyor **424**. The bun turnover device consists of an oscillating platform **682** provided on one side with an upright flange **684** while the other side is suitably secured to a hub **686** (FIGURE 30) mounted on a horizontal shaft **688** projecting from and supported by suitable bearings of a housing **690**, the bottom portion of which is suitably secured to the conveyor

frame 494. Fastened to shaft 688 within housing is a gear 692 (FIGURE 31) which meshes with a vertical gear rack 694 which at its lower end by means of a link 696 is pivotally connected to the free end of an arm 698 pivotally supported by a horizontal stud shaft 700 held by a suitable bracket 702 mounted on the conveyor frame 494. Integral with the hub of arm 698 and extending therefrom is a cam lever 704 which at its free end carries a roller 706 engaging with a cam 708 which is secured to the continuously driven shaft 408 described heretofore. Cam 708 is designed to transmit vertical reciprocating motion to the gear rack 694 which in turn through gear 692 and shaft 688 imparts oscillating motion to the platform 682.

As illustrated in FIGURES 30 and 31 a cluster of buns X has just been pushed by the pusher plate 420 of the bun dispensing device described heretofore over the bridge plate and onto the platform 682 which at this moment dwells in a horizontal position on top of the conveyor 424 at the bun dispensing station N. As soon as the cluster of buns is on said platform 682 the latter by means of shaft 688 is swung 180° in a clockwise direction which effects a delivery of said cluster of buns bottom up onto the continuously moving belts 486 of the conveyor 424 illustrated in FIGURE 32. Simultaneously with the swinging of the conveyor the indexing fingers 502, also described heretofore, move upward and engage with the leading end of the cluster and prevent the same from being carried away by belts 486. The platform 682 then swings back 180° to its bun receiving position and another cluster of buns is pushed by the pusher plate 422 over the inclined bridge plate 428 on top of the bottom up cluster held by the indexing fingers 502 at the bun dispensing station M so that now two clusters are stacked bottom to bottom on top of each other as illustrated in FIGURE 33. The indexing fingers 502 then retreat downward again permitting said stack of clusters to be carried to a wrapping machine (not shown).

In order to properly synchronize the action of all Bellow Elector air control valves in this machine so that air pressure to the various mechanisms may be supplied and released at the proper time a control unit 710 such as illustrated in FIGS. 21 and 22 is provided. The control unit 710 consists of a housing or frame 712 which in suitable bearings supports a cam shaft 714 to one end of which is secured a sprocket 716. Sprocket 716 through a chain 718 is driven by a sprocket 720 which is secured to the output shaft 44 of the gear reduction unit 42 illustrated in FIG. 2 of the drawings. To cam shaft 714 are secured cams 722, 724, 726, 728, 730 and 732 which are employed for the purpose of actuating micro switches 723, 725, 727, 729, 731 and 733 respectively. All micro switches are located beneath their respective cams and are provided with conventional actuator arms 734 (FIGURE 22) all of which are supported by a suitable rod 736 held in housing 712.

As mentioned heretofore the action of the pan indexing fingers 98 are controlled by the Bellow elcetro air valve 134 (FIGURES 1 and 6) which through suitable wires are connected with the micro switch 727 which in turn is actuated by the cam 726. By the same taken the action of the bun clamp plates 260 shown in FIGURE 1 are controlled by the Bellow electro air valve 254 which through suitable wires is connected to the micro switch 729 which in turn is actuated by the cam 728. Therefore when cams 726 and 728 depress their respective micro switches the valves 134 and 254 respectively are energized during that period of time permitting air pressure to pass through the same and effect the actuation of the pan indexing fingers 98 and the bun clamp plates 260 as described heretofore.

Since it is essential to keep the bun gripper fingers of the gripper units open during half of their operating cycle and closed during the other half, the Bellow electro air valve 202 (FIGURES 1 and 6) which controls the opening and closing of said gripper fingers is provided with a two way controlled solenoid. Therefore cam 732 through micro switch 733 causes valve 202 to open and cam 730 through 731 effects the closing of the same.

As described heretofore the up and down motion of the pusher plates 420 and 422 of the bun dispensing device are actuated through air flow controlled by the Bellow electro air valve 478 illustrated in FIGURE 4. Since it is essential that said pusher plates during their forward travel remain in a downward position while during their backward movement they must remain in a raised position, the valve 478 is also provided with a two way controlled solenoid which is actuated by cam 722 through micro switch 723 to effect an opening of valve 478 while cam 724 through micro switch 725 controls the closing of the same. The opening of valve 478, of course, permits air pressure to reach the air cylinders 460 (FIGURE 18) which tends to keep said pusher plates in a downward position while moving forward during their bun dispensing operation as described heretofore.

We claim:

1. Apparatus for packaging baked articles comprising means for removing at least one row of articles from laterally spaced baking containers, a conveyor for receiving and delivering said laterally spaced rows of articles to a cartoning station having a plurality of article feed positions, means coacting with said conveyor for aligning and spacing of said rows of articles, means for feeding empty cartons to said cartoning station in position to receive articles delivered thereto, means for moving a portion of at least one row of said articles into a carton at a first article feed position of said cartoning station, means for moving the remainder of said row of articles into a partially filled carton at another article feed position of said cartoning station in overlying position with articles moved thereinto at said first article feed position from the previous row delivered to said cartoning station, and means for conveying said filled carton away from said second position of said cartoning station.

2. An apparatus for handling baked articles comprising in combination a depanning device for removing at least one row of articles from laterally spaced baking containers, a conveyor for receiving and delivering laterally spaced rows of articles to a discharge station having a plurality of article feed position, said depanning device being operative to deposit rows of articles in upright position from said container onto said conveyor, means for aligning the article in said rows laterally and longitudinally on said conveyor, means for fractionating a row of said articles adjacent said discharge station, pusher means for removing a portion of said fractionated row from said conveyor at a first article feed position, a second pusher means for removing the remainder of said fractionated row at a second article feed position into overlying position with articles discharged at said first article feed position from the previous row delivered to said discharge station, and means for conveying said layered articles away from said discharge station.

3. An apparatus for packaging comprising in combination a depanning device for removing at least one row of articles from laterally spaced baking containers, a conveyor for receiving and delivering laterally spaced rows of articles through a cartoning station having a plurality of article feed positions, said depanning device being operative to deposit rows of articles in upright position from said container onto said conveyor, means for aligning the article in said rows laterally and longitudinally on said conveyor, a source of supply of cartons, means for feeding empty cartons from said source to said cartoning station, means for fractionating a row of said articles adjacent said cartoning station, a first pusher means for moving a portion of said fractionated row into a carton positioned at a first article feed position, means for indexing said partially filled carton to a second article feed position, a second pusher means at said second article

feed position for moving the remainder of said fractionated row of articles in a partially filled carton in overlying position with articles discharged into said partially filled carton at said first article feed position from the previous row delivered to said cartoning station, and means for conveying said filled carton away from said cartoning station.

4. The invention as defined in claim 2 wherein said first and second pusher means are operated substantially in unison to move baked articles into cartons at said first and second article feed positions substantially simultaneously.

5. The invention as defined in claim 2 including slicing means, means for bringing sliced articles into abutting position and positive support means over which said articles are moved by said second pusher means.

6. In a baked article handling machine including a depanner member for removing said articles from their associated baking containers and conveyor means for delivering a plurality of depanned articles in pre-determined arrangement to a discharge station, having first and second article feed positions, packaging apparatus comprising a source of supply of empty cartons, means for delivering said carton seriatim to said first article feed position, means for sub-dividing said plurality of baked articles on said conveyor into fractions, a first pusher member for moving one of said fractions into said carton at said first article feed position to form a bottom layer therein, means for indexing said partially-filled carton to said second article feed position, a second pusher member for moving the remainder of said sub-divided plurality of baked articles into a carton indexed to said second article feed position, disposing said remainder in overlying position with articles moved into a carton at said first article feed position from the previous plurality of articles delivered to said discharge station and means for conveying said filled carton away from said second article feed position.

7. The invention as defined in claim 6 including operating means for said first and second pusher members comprising a support for each of said pusher members, means movably mounting said pusher member for movement along its associated support, an operating bar connected to each of said pusher members for moving said members along said supports, operating arms for said bar, including crank arms, means connecting one of said crank arms to each of said operating arms for imparting oscillatory motion thereto, and a common drive shaft for rotating both crank arms whereby said pusher members are moved substantially in unison along their associated supports.

8. In a baked article handling machine including a depanner member for removing at least one row of baked articles from laterally disposed baking containers and conveyor means for delivering aligned rows of baked articles in pre-determined arrangement to a discharge station having first and second article feed positions, packaging apparatus comprising a source of supply of empty cartons, means for delivering said cartons to said first article feed position, means for sub-dividing said rows of baked articles on said conveyor into fractions, a first pusher member for moving one of said fractions into a carton at said first article feed station, means for indexing a carton from said first to said second article feed position, a second pusher member for moving the remainder of said subdivided row of baked articles into a carton indexed to said second article feed position and disposing said remainder in overlying position with articles moved into said carton at said first article feed position from the previous row delivered to said discharge station and means for conveying said carton and layered articles away from said discharge station.

9. The invention as defined in claim 8 including operating means for said pusher members comprising a support for each of said pusher members, means mounting each of said supports above and longitudinal of said conveyor, said supports being mounted in laterally spaced relationship, means movably mounting said pusher members for movement along its associated support, means for moving said pusher members vertically relative to said support whereby said pusher members are operative to engage baked articles on said conveyor and move them into cartons at said first and second article feed positions, an operating arm connected to each of said pusher members for moving said members along said supports, crank arms, means connecting one of said crank arms to each of said operating arms for imparting reciprocating motion thereto and a common drive shaft for rotating both of said crank arms whereby said pusher members are moved substantially in unison forward and backward along their associated supports.

10. The invention as defined in claim 9 wherein said means for effecting vertical movement of said pusher members includes an air cylinder for each of said pusher members slidably mounted in said cylinder, means mounting one of said air cylinders on each of said pusher mounting means, operating means for said air cylinders and means connecting said piston rod to said pusher member whereby upon actuation of said air cylinder operating means, said pusher member is moved downwardly to engage baked articles on said conveyor and upwardly, upon de-actuation of said air cylinder operating means, after said pusher member has moved said engaged baked articles into said carton, to permit return of said pusher member to article engaging position.

11. The invention as defined in claim 8 including a movable plate, means mounting said plate at said second article feed position, and means for moving said plate in timed relationship with said second pusher member to support said baked articles moved thereby for a portion of their travel into said carton, maintaining said baked articles out of engagement with articles in said carton from said first article feed position whereby said baked articles are arranged in multiple layers in said carton without damage.

12. A transfer device for use with a baked article handling machine comprising a first loading element aligned with a first level in a first container and a second loading element aligned with a second level, higher than said first level, in a second container, and means for actuating said loading elements simultaneously, said second loading element having a vertically actuable support member, and means responsive to the actuation of said second loading element for thereby elevating said second loading element.

13. A support device for use with a dispensing mechanism for dispensing baked articles in multiple layers at a dispensing station comprising a support member at the end of a conveyor, means movably mounting said support member, adjacent said dispensing station, means for moving said support member independent of said conveyor into a position directly overlying a substantial portion of a layer of articles previously dispensed by said mechanism, and means for moving another layer of baked articles over said support through said substantial distance, without engaging said previously dispensed layer of articles, to minimize damage in dispensing multiple layers of said articles.

14. In a device for depanning spaced baked articles comprising a conveyor adapted to intermittently convey pans of the type having baked articles transversely arranged in regular spaced order, means to positively position a pan during the intermittency of said feed, positive means to position a pan at a depanning station during the intermittency of said feed, an article receiving station, a transfer device movable from said depanning station to said receiving station, said transfer device supporting a plurality of grippers, said grippers being movably attached to said transfer device for free movement upwardly, said transfer device having a downward override at said depanning station, said grippers being positioned to

contact a pan at said depanning station and riding relatively upwardly by said sliding motion during the override motion of said transfer, said grippers having a self-contained fluid actuated motor to open and close said grippers, flexible fluid conduits communicating said motor with a source of fluid power, and means to control the application of said fluid power in conjunction with the motion of said transfer.

15. In a device for depanning spaced baked articles comprising a conveyor adapted to intermittently convey pans of the type having baked articles transversely arranged in regular spaced order, means to positively position a pan during the intermittency of said feed, positive means to position a pan at a depanning station during the intermittency of said feed, an article receiving station, a transfer device movable from said depanning station to said receiving station, said transfer device supporting a plurality of grippers, said grippers being movably attached to said transfer device for free movement upwardly, said transfer device having a downward override at said depanning station, said grippers being positioned to contact a pan at said panning station and riding relatively upwardly by said sliding motion during the override motion of said transfer, said grippers having a self-contained motor transportable therewith to operate to actuate said grippers, and flexible means to connect said motor with a regulated source of power distant from said gripping means.

16. A device substantially as set forth in claim 14 further characterized in that said gripper means comprise a plurality of opposed swingably mounted fingers, interconnecting links and cranks to move all of said fingers inwardly toward each other upon the movement of one of said fingers, said self-contained motor being connected to one of said fingers to move said finger.

17. A device substantially as set forth in claim 15, further characterized in that said gripper means comprise a plurality of opposed swingably mounted fingers, interconnecting links and cranks to move all of said fingers inwardly toward each other upon the movement of one of said fingers, said self-contained motors being connected to one of said fingers to move said finger.

18. A device for transversely aligning and laterally spacing articles on a moving conveyor comprising in combination a member extending transversely across said conveyor, a plurality of members positioned longitudinally of said conveyor, said transverse and said longitudinal members being spaced from said conveyor a distance less than the height of an article positioned thereby, drive means to oscillate said transverse member along said conveyor at a velocity greater in one direction at least than said conveyor whereby articles placed on said conveyor may be transversely aligned by said transverse member and laterally spaced by said longitudinal members, a depanning device having a depanning station and a delivery station, a transfer movable from said depanning station to said delivery station, a plurality of article grippers, said gripper elements being hung on said transfer device to permit a yielding motion on the descent of said transfer device to said depanning station, said transfer device moving on downward transit to said depanning station sufficient for a portion of said gripper elements to contact an article supporting pan at said depanning station, and means to activate said gripper elements to grip an article at said depanning station.

19. In a depanning device having a pick-up station for supporting a pan and a delivery station, a transfer device movable from said pick-up station to said delivery station, said transfer device comprising a crank arm swingable about a center, a non-circular shaft pivoted on the free end of said crank arm, a parallel linkage associated with said crank arm and engaging said non-circular shaft to maintain its spacial attitude during its movement with said crank arm, a plurality of gripping elements hung on said non-circular shaft in sliding engagement therewith, said gripping elements being adapted to grip articles at said pick-up station for delivery to said delivery station.

20. A device as set forth in claim 19 and further characterized by a hold down at said pick-up station and operative to engage and hold down a pan at said pick-up station as said transfer lifts articles therefrom.

21. In a depanning device having a pick-up station and a delivery station, a transfer device movable from said pick-up station to said delivery station, said transfer device comprising a crank arm swingable about a center, a shaft pivoted on the free end of said crank arm, a parallel linkage associated with said crank arm and engaging said non-circular shaft to maintain its spacial attitude during its movement with said crank arm, a plurality of gripping elements secured to said shaft in sliding engagement therewith, said gripping elements being adapted to grip articles at said pick-up station for delivery to said delivery station.

22. In the baking industry, a machine comprising a first conveyor, a second conveyor, a depanner and a packer of edible baked items which normally cohere to a baking pan, means in said first conveyor for transporting a baking pan containing one of said items to a depanning station, means at said station, responsive to said transporting, for securing said pan against motion incident to the separation of said item from said pan, means incident to said securing for discretely grasping said item, means incident to said grasping for separating said item from said pan, means incident to said separating for placing said depanned item on said second conveyor and means incident to said placing of said depanned item on said second conveyor for transporting said item to said packer.

23. In the baking industry, a machine comprising a first conveyor, a second conveyor, a depanner and a packer for conveying, depanning and packing edible baked items, means of ingress in said machine for a baking pan carrying one of said items, said depanner disposed intermediate said means of ingress and said packer, means responsive to the motion of said pan on said first conveyor for activating said depanner, first means in said depanner, responsive to said actuation, for securing said pan against displacement on said conveyor, second means in said depanner operative incident to said securing, and coactive therewith for then lifting said item from said pan, third means in said depanner responsive to said lifting, for placing said now depanned item on said second conveyor, to direct it to said packer.

24. In a baking machine, a depanning mechanism for simultaneously depanning a plurality of edible baked articles, said mechanism comprising a depanning unit having a first fixed gripper member and a second gripper member, opposed to and displaceable with respect to said first gripper member, means for disposing said gripper members at opposed ends of each of a plurality of panned baked articles on a first conveyor, so that said plurality may be gripped simultaneously between said members, an air cylinder in said unit, means interconnecting said air cylinder and said displaceable gripper member so as to actuate said displaceable gripper member toward said fixed gripper member so as to clutch said plurality of said baked articles between said members, a second conveyor, a depanning transfer mechanism for transferring said articles after depanning from said first to said second conveyor, said transfer mechanism comprising a mounting to said depanning unit, said mounting having means for adjusting the position of said depanning unit with respect to the position of baked articles to be depanned, means for actuating said transfer mechanism so as to transfer said depanning unit from a position over said first conveyor to a position over said second conveyor, means for actuating said depanning unit so as to release said baked articles over said second conveyor, said transfer mechanism comprising a rotatable arm for carrying said unit and a crank for actuating said arm to effect said transfer.

25. A depanning mechanism in accordance with claim

24, said mechanism having means for readily mounting and demounting said depanning unit on and from said transfer mechanism.

26. A device for handling baked articles comprising first means for removing a plurality of said articles from their baking containers in spaced orientation, a conveyor member for receiving and delivering said articles to a discharge station, second means at said discharge station for removing a plurality of articles from said conveyor in a predetermined assembled relationship, means for conveying said articles removed at said discharge station away from said discharge station and means for disposing said plurality of articles in said second means in multiple layers.

27. A device for handling baked articles comprising means for removing a plurality of said articles from their baking containers in spaced orientation, a conveyor member for receiving and delivering said articles to a discharge station, means at said discharge station for removing a plurality of articles from said conveyor in a predetermined assembled relationship, means for conveying said discharged articles away from said discharge station, means at said discharge station for inverting a first plurality of articles removed from said conveyor, and means for actuating said removing means to dispose a second plurality of articles in overlying relationship with said inverted plurality in predetermined oriented arrangement.

28. An apparatus for handling baked articles comprising means for removing at least one row of articles from laterally spaced baking containers simultaneously while maintaining the articles in their original panned lateral sequence, a conveyor for receiving and delivering said laterally spaced row of articles to a discharge station, means coacting with said conveyor for maintaining alignment and spacing of rows of articles thereon, means for removing a portion of at least a row of said articles from said conveyor at said discharge station, means for removing the remainder of said row of articles from said conveyor and disposing said remainder in overlying position with articles previously removed from said conveyor, means for conveying said layered articles away from said discharge station and means for slicing said aligned and spaced rows of articles as they are advanced by said conveyor toward said discharge station.

29. An apparatus for handling baked articles comprising means for removing at least one row of articles from laterally spaced baking containers simultaneously while maintaining the articles in their original panned lateral sequence, a conveyor for receiving and delivering said laterally spaced row of articles to a discharge station, means coacting with said conveyor for maintaining alignment and spacing of rows of articles thereon, means for removing a portion of at least a row of said articles from said conveyor at said discharge station, means for removing the remainder of said row of articles from said conveyor and disposing said remainder in overlying position with articles previously removed from said conveyor, means for conveying said layered articles away from said discharge station, means for decreasing the lateral spacing between said articles on said conveyor to facilitate removal of said articles from said conveyor, slicing means, means operatively associated with said slicing means to maintain the lateral spacing of said articles on said conveyor, means for bringing sliced articles into abutting position and positive support means, over which support means said articles are moved into overlying position.

30. A machine for handling edible baked articles in the baking industry, said machine having a device comprising a first conveyor, movable pan indexing members associated with said conveyor, a second article conveying means, a transfer device movable from a position adjacent said first conveyor to said second conveyor, means secured to said transfer device extending transversely across said conveyor, a plurality of groups of fingers mounted on said transverse means, each of said groups of fingers having at least one finger operative to move toward and away from one other finger, a device to move said movable finger toward said other finger when said transfer device is adjacent said first-named conveyor in order to grip an article thereon and to move said finger oppositely when said transfer means is adjacent said second-named conveyor to release an article held between said fingers, said transfer device comprising a lifter arm rotatable about an axis in an arc, said arm connected at its free end to said transverse means, means for rotating said arm to transfer said transverse means between said positions adjacent said conveyors, a moving aligning member extending across said second conveyor and having a transverse spar and longitudinally extending spars, said longitudinal spars being positioned to extend along said conveyor between transverse rows of articles conveyed thereon, said member oscillating for a short distance along said conveyor at a velocity greater than the velocity of said conveyor to re-align transversely and longitudinally a row of articles placed on said second conveyor and said transfer device.

31. A device substantially as set forth in claim 30, further characterized by spars formed on said longitudinal spars to transversely reposition and space said articles as said articles and said longitudinal spars are separated as a result of the relative motion between said articles and said aligning member along said conveyor.

32. In combination, a receiving station, a depanning station, a packing station, a first conveyor connecting said receiving station and said depanning station, a second conveyor connecting said depanning station and said packing station, means at said receiving station for receiving a baking pan containing an edible baked article, means incident to the arrival of said baking pan at said depanning station for discretely grasping and compressing said article in such position as to decohere all its cohering surface from said pan, means at said depanning station for lifting said decohered article from said pan, means at said depanning station for placing said article on said second conveyor, means at said packing station, incident to the arrival of said article thereat, for inserting said article in a container.

33. In the baking industry, the combination with means for supporting a baking pan having a baked article thereon at a depanning station, of a depanning mechanism movable to and from said station, gripper means on said mechanism constructed and arranged for discretely grasping, compressing and temporarily deforming said article so as to decohere and separate said article from said pan, said gripper means then grippingly supporting said article during movement of said mechanism from said station whereby said article may be depanned from a pan at said station.

34. In the baking industry, the combination with means for supporting a baking pan having a plurality of baked articles regularly arranged thereon in a pattern at a depanning station, of a depanning mechanism movable to and from said station, plural gripper means on said mechanism regularly arranged to correspond to said pattern and constructed and arranged for discretely grasping and compressing said articles so as to decohere and separate said articles from said pan, means for actuating each of said plural gripper means at said station substantially simultaneously with each of the others, said gripper means then grippingly supporting said articles during movement of said mechanism form said station, whereby said plural articles may be depanned from a pan at said station in said regular pattern.

35. In the baking industry, the combination with means for supporting a baking pan having a baked article thereon at a depanning station, of a depanning mechanism movable to and from said station, gripper means on said mechanism constructed and arranged for discretely grasping, compressing and temporarily deforming said article so as to decohere and separate said article from said pan, said gripper means then grippingly supporting said article

during movement of said mechanism from said station, and other means at said station for engaging said pan to hold it against displacement during said movement of said mechanism away from said station, whereby said article may be depanned from the pan at said station.

36. In combination, a receiving station, a depanning station, a subsequent station, a first conveyor connecting said receiving station and said depanning station, a second conveyor connecting said depanning station and said subsequent station, means on said receiving station for receiving a baking pan containing a baked article, means incident to the arrival of a baking pan at said depanning station for discretely grasping and compressing said article in such position as to decohere all its cohering surface from said pan, means at said depanning station for lifting said decohered article from said pan, and means at said depanning station for placing said article on said second conveyor whereby said article may be conveyed to said subsequent station.

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