Oct. 29, 1935. C. W. VOGT 2,018,750

APPARATUS FOR NESTING AND SUBDIVIDING COMESTIBLES

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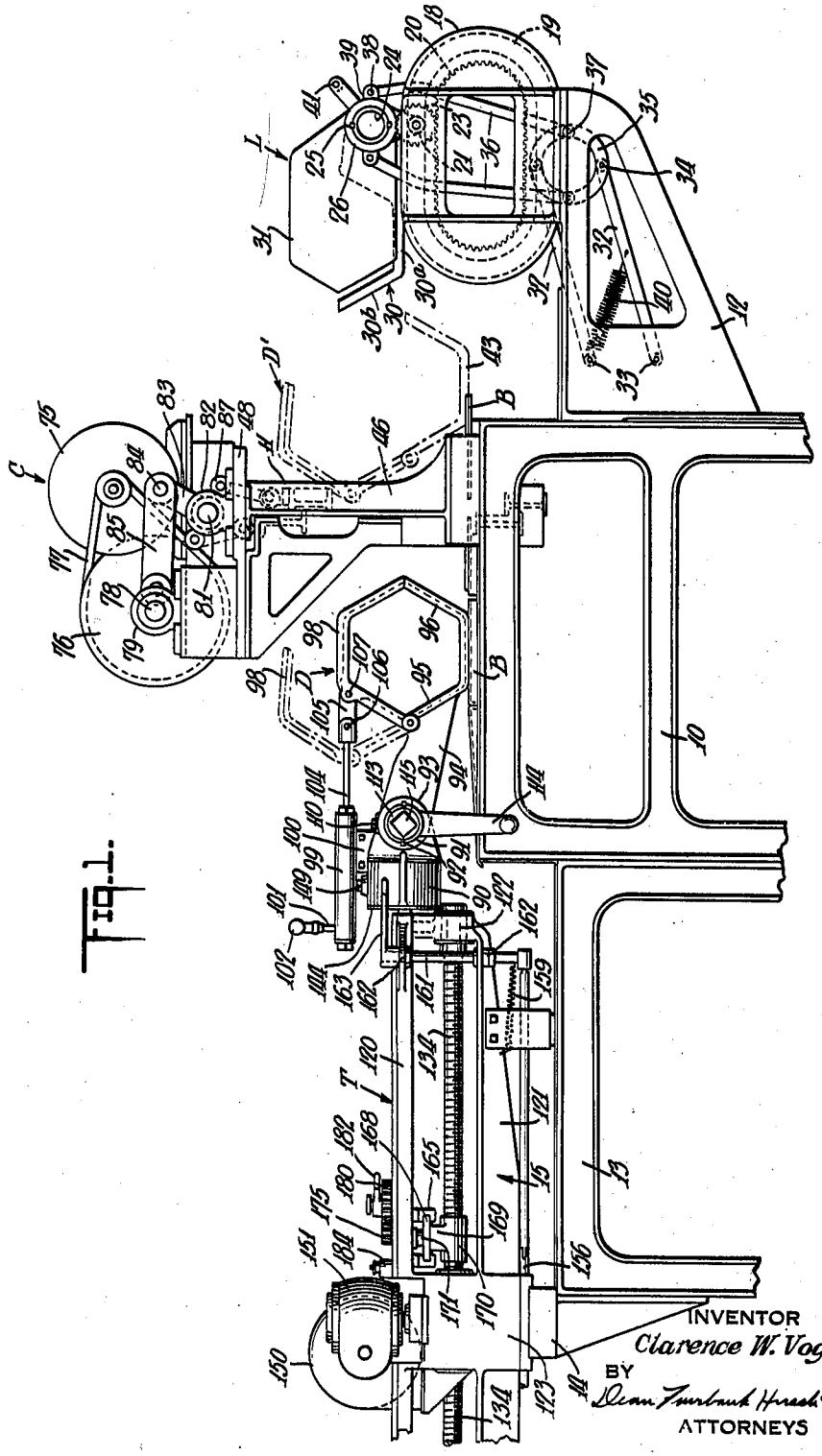


Fig. 1.

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APPARATUS FOR NESTING AND SUBDIVIDING COMESTIBLES

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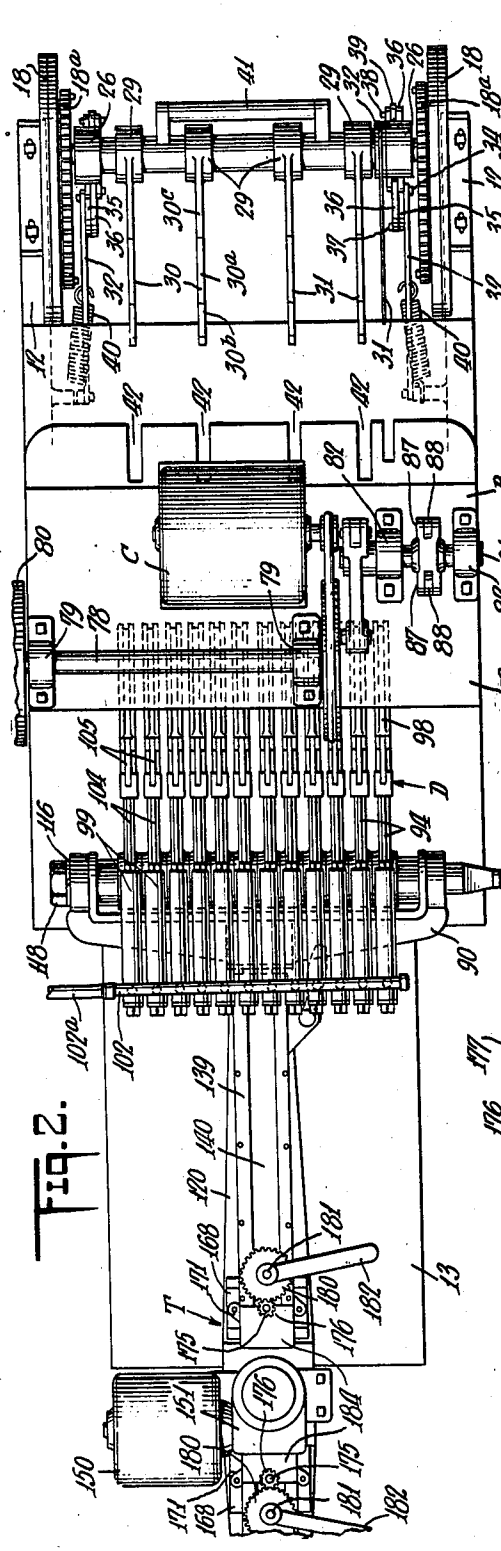


Fig. 2.

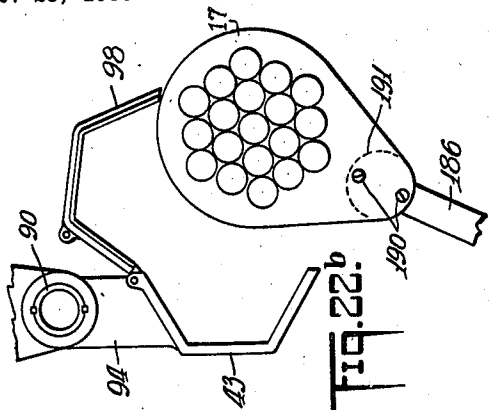


Fig. 22b.

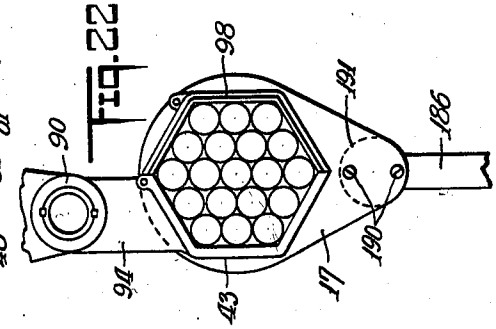


Fig. 22a.

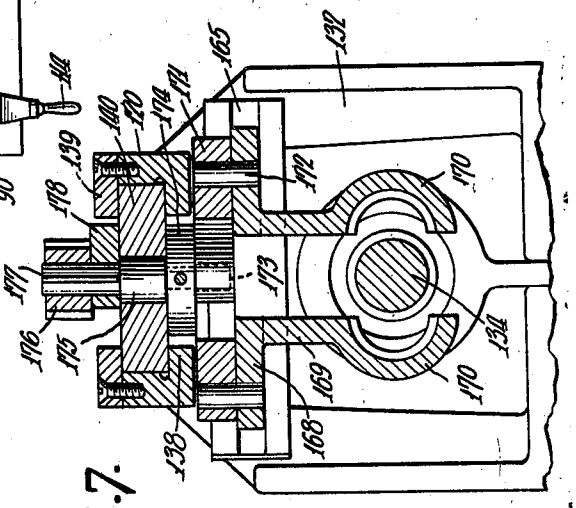


Fig. 7.

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APPARATUS FOR NESTING AND SUBDIVIDING COMESTIBLES

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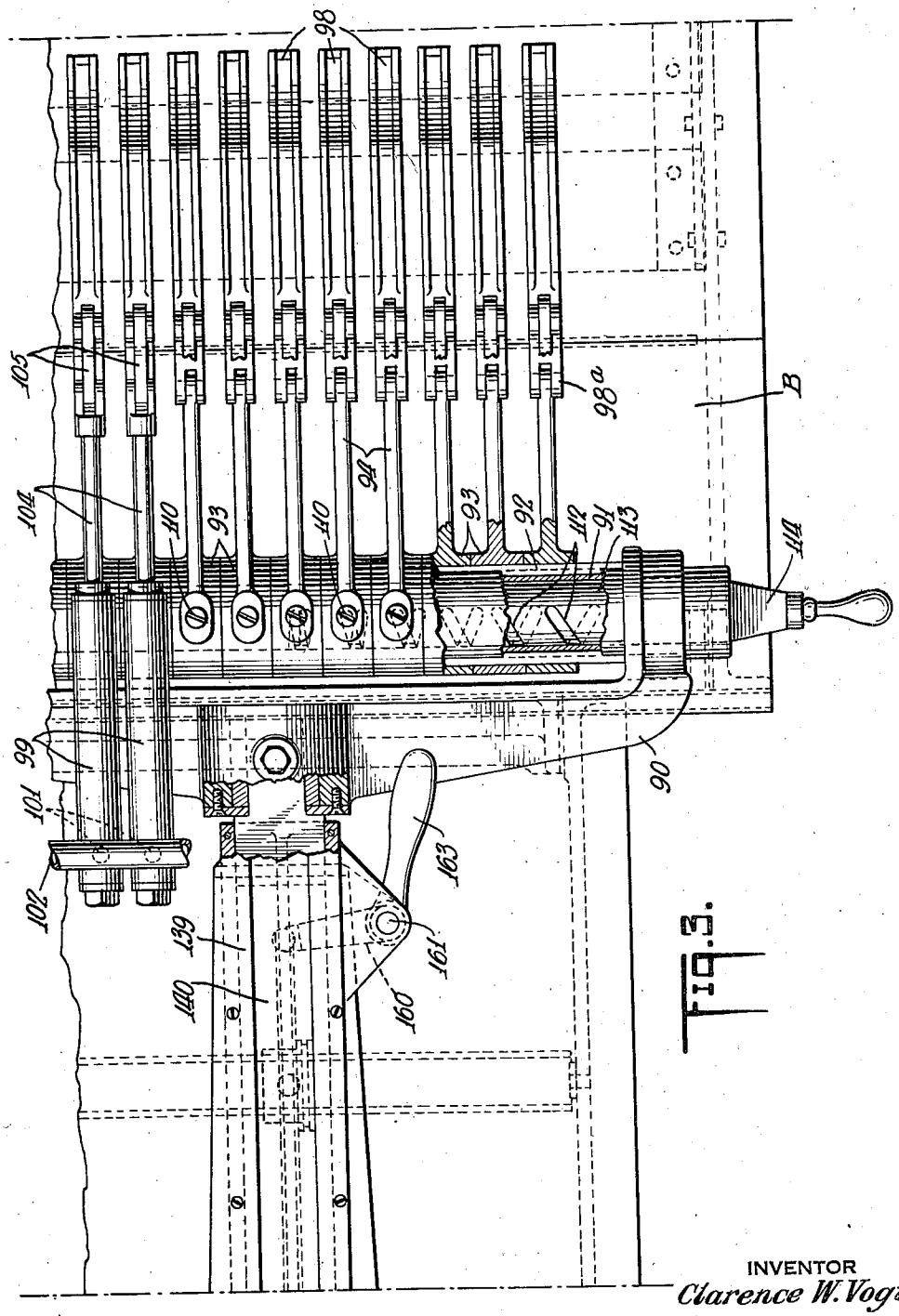


Fig. 3.

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Fig. 4.

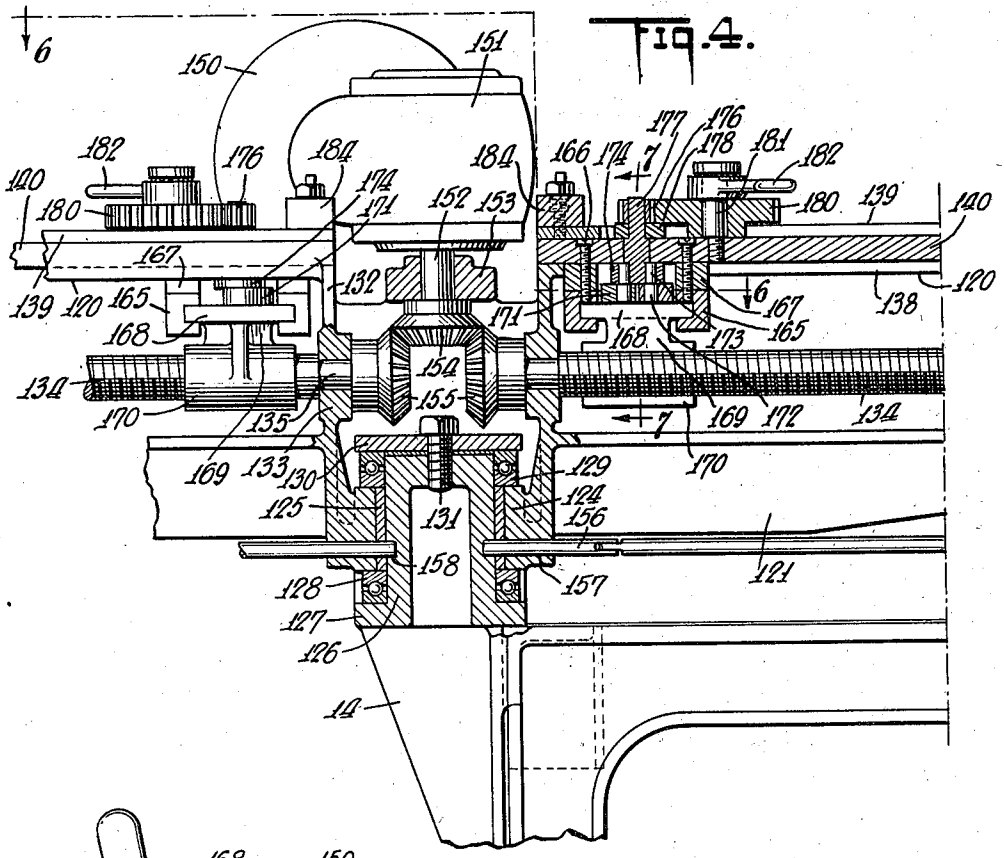
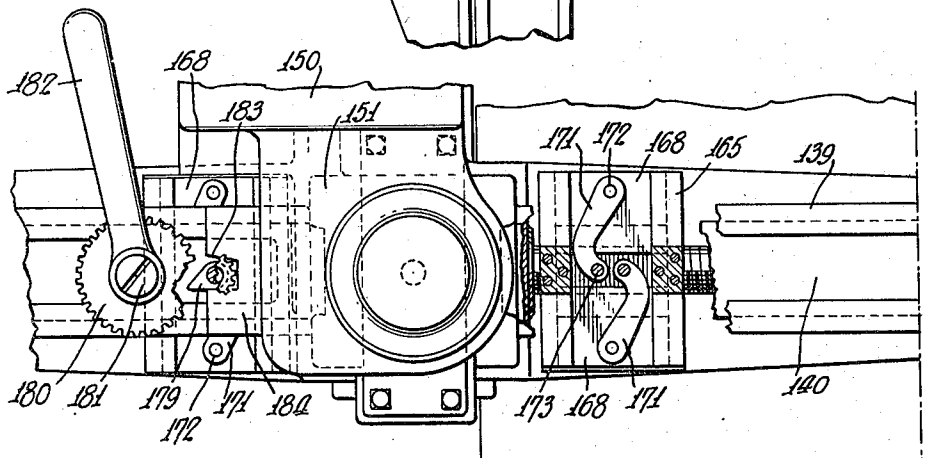


Fig. 6.



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APPARATUS FOR NESTING AND SUBDIVIDING COMESTIBLES

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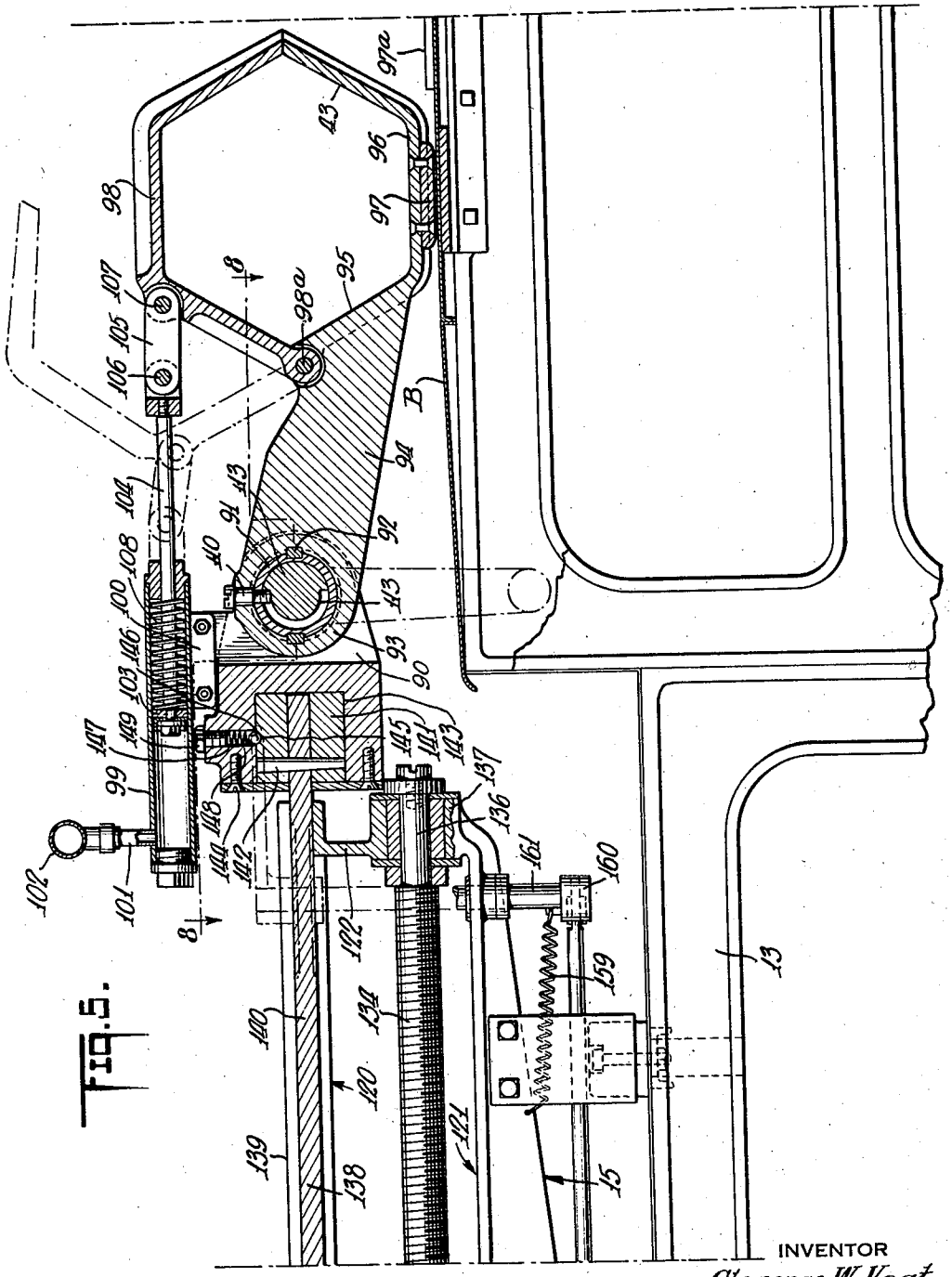


Fig. 5.

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Fig. 8.

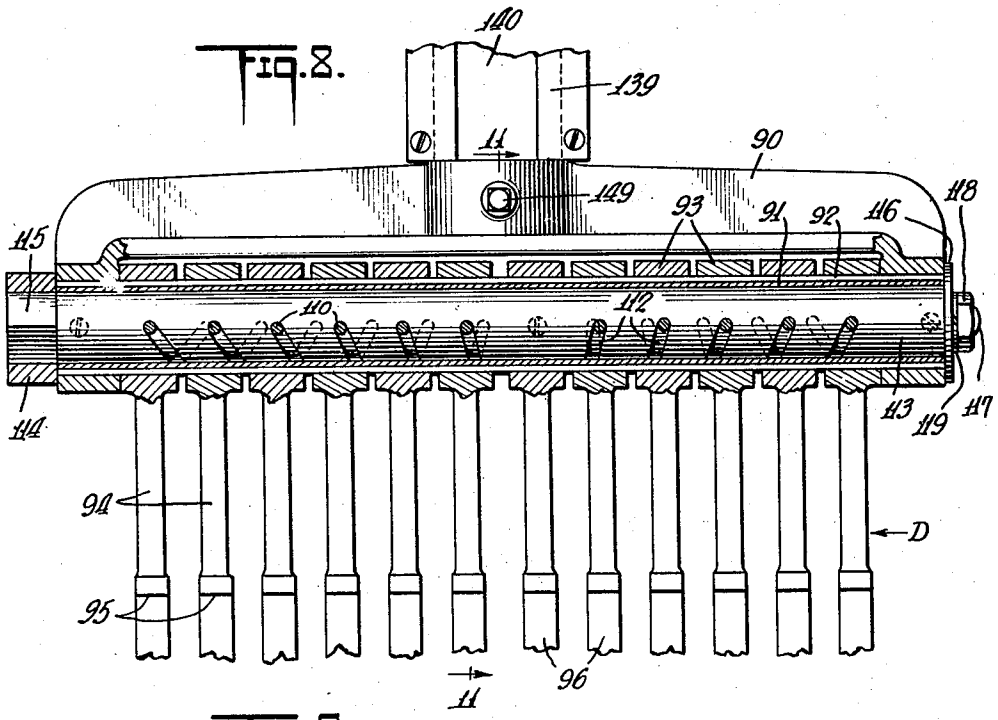


Fig. 9.

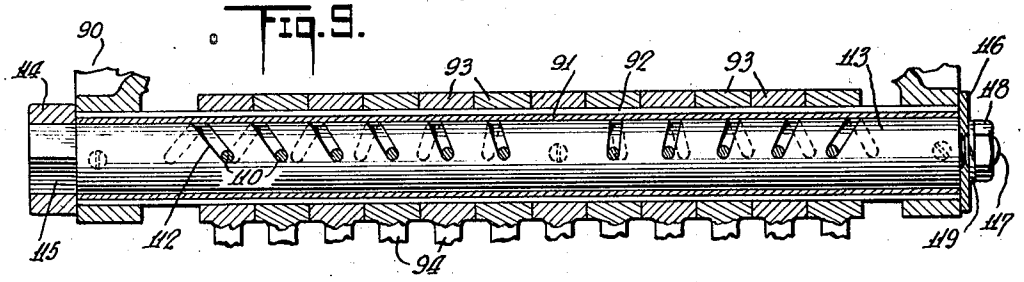


Fig. 10.

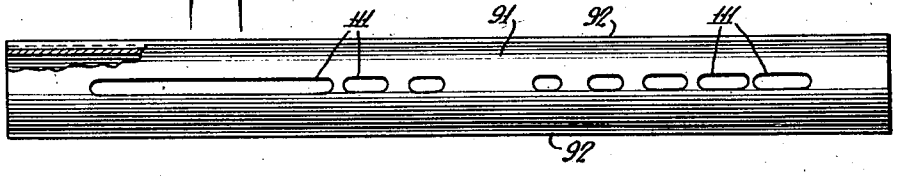
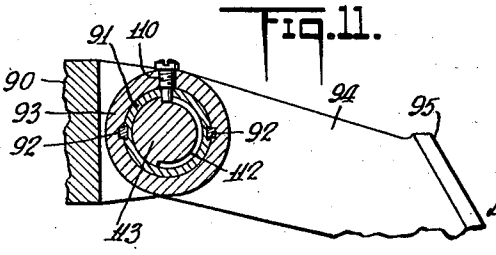


Fig. 11.



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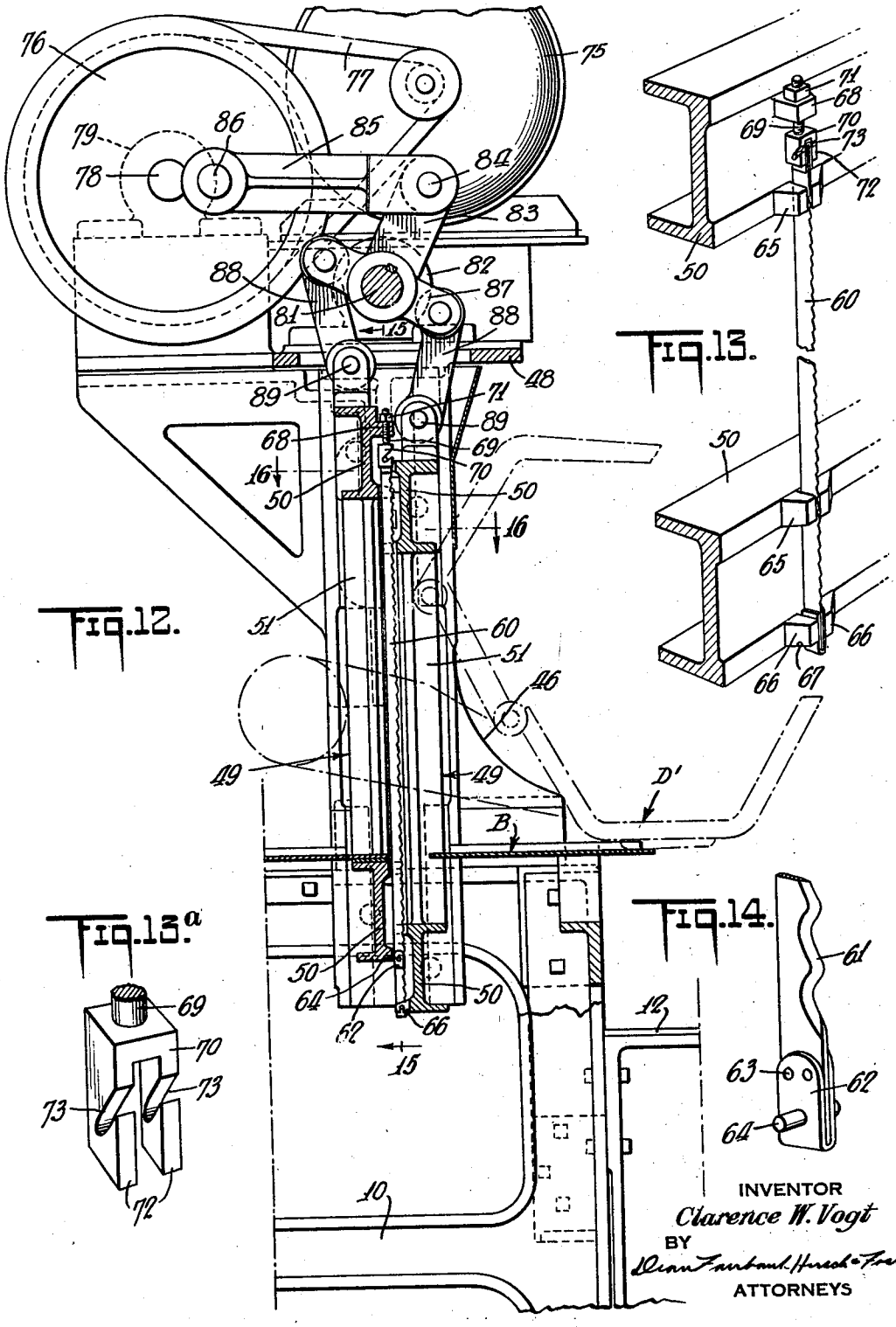


FIG. 12.

FIG. 13.

FIG. 13a.

FIG. 14.

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APPARATUS FOR NESTING AND SUBDIVIDING COMESTIBLES

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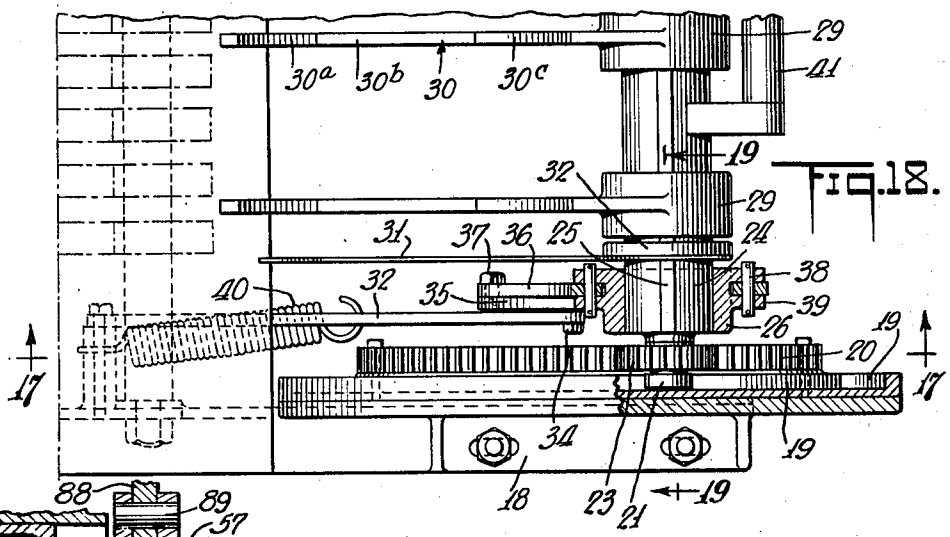


Fig. 18.

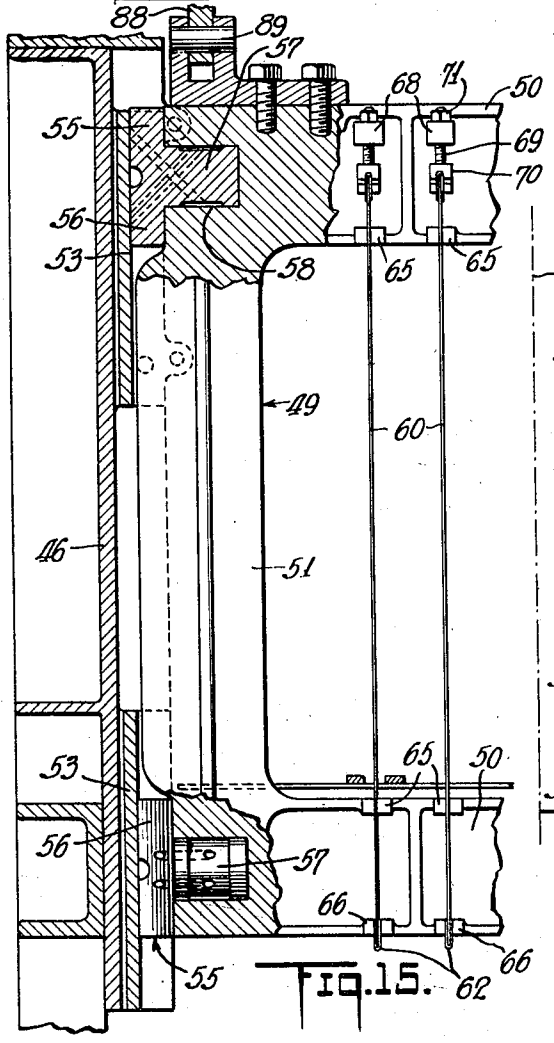


Fig. 15.

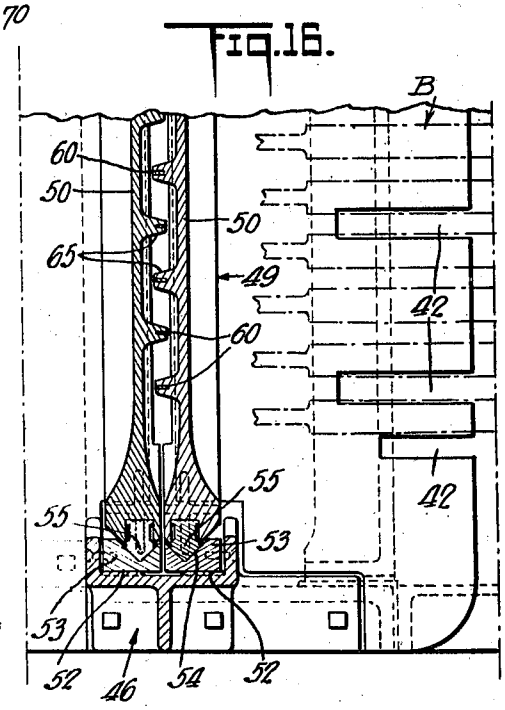


Fig. 16.

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Fig. 17.

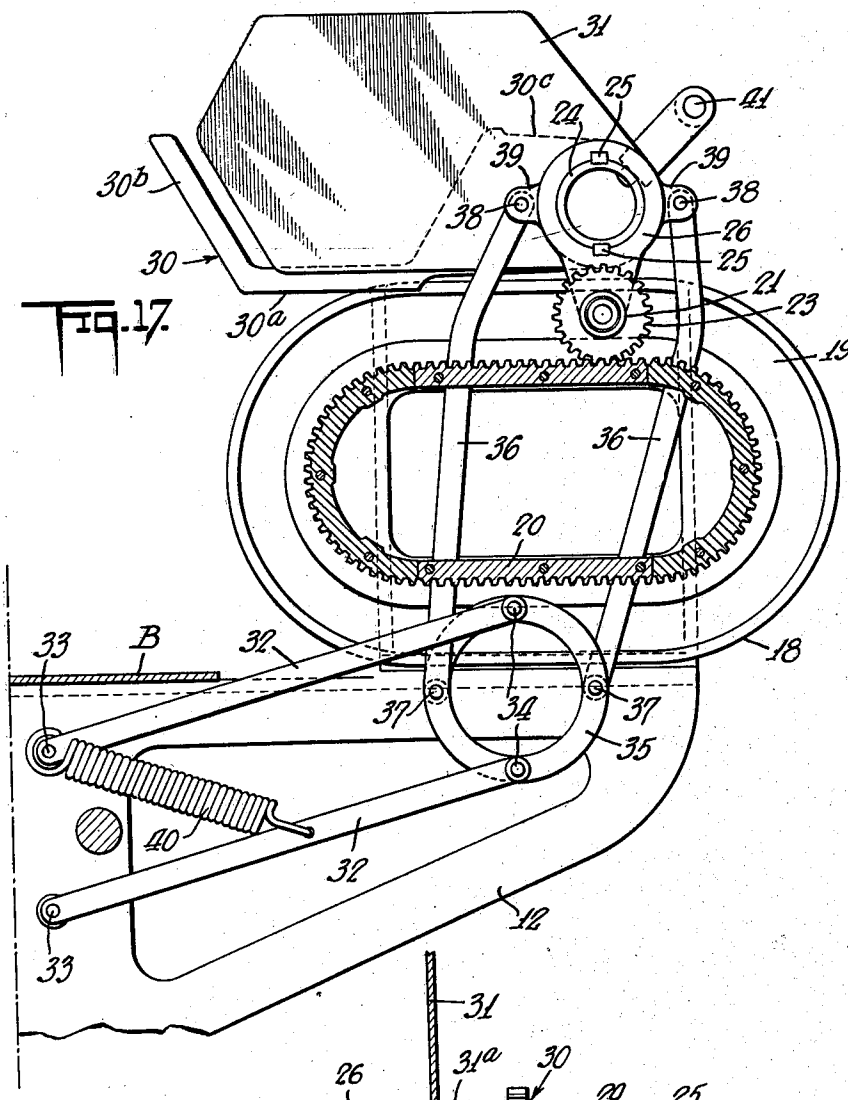
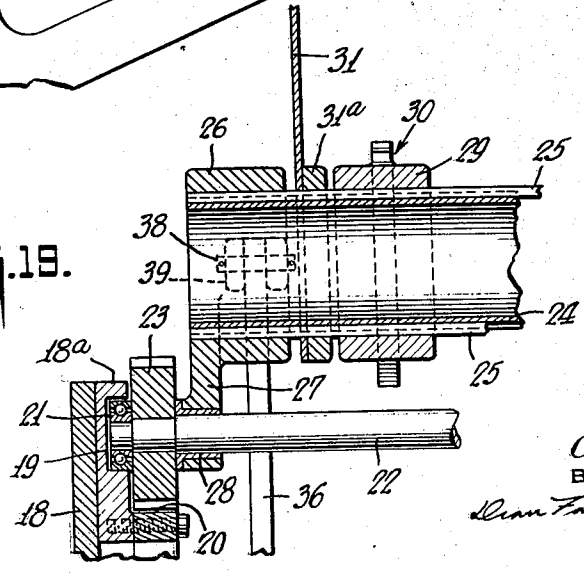


Fig. 18.



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Fig. 20.

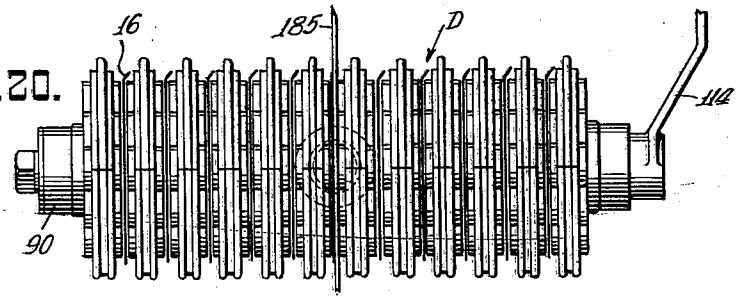


Fig. 21.

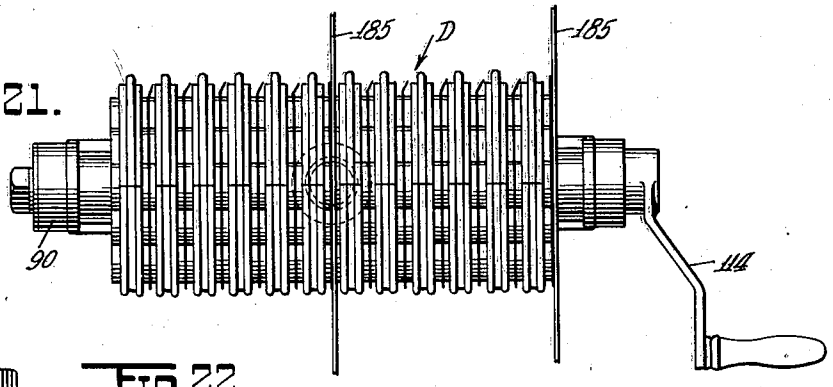
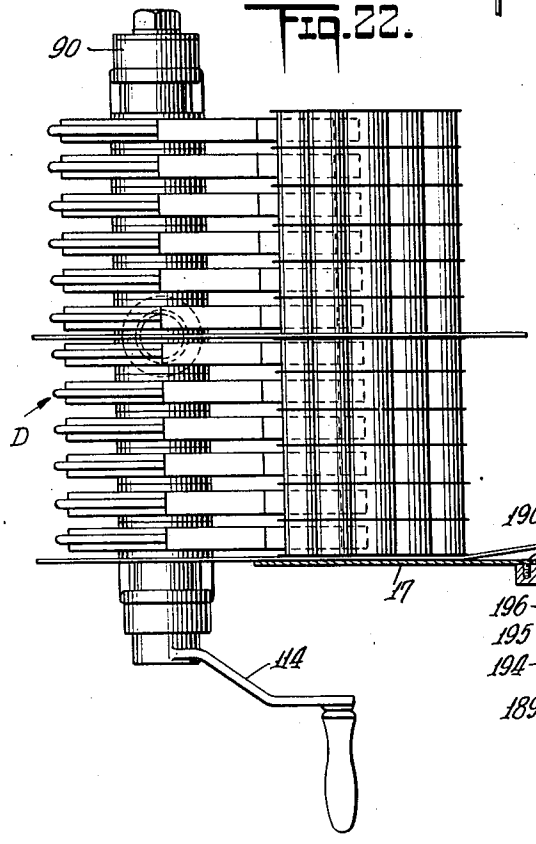


Fig. 22.



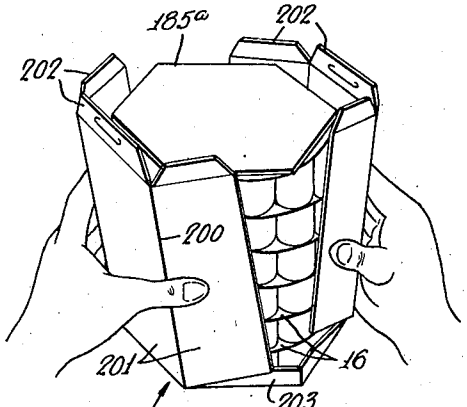
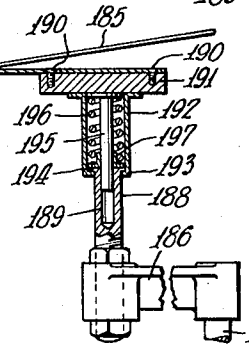


Fig. 23.



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Fig. 24.

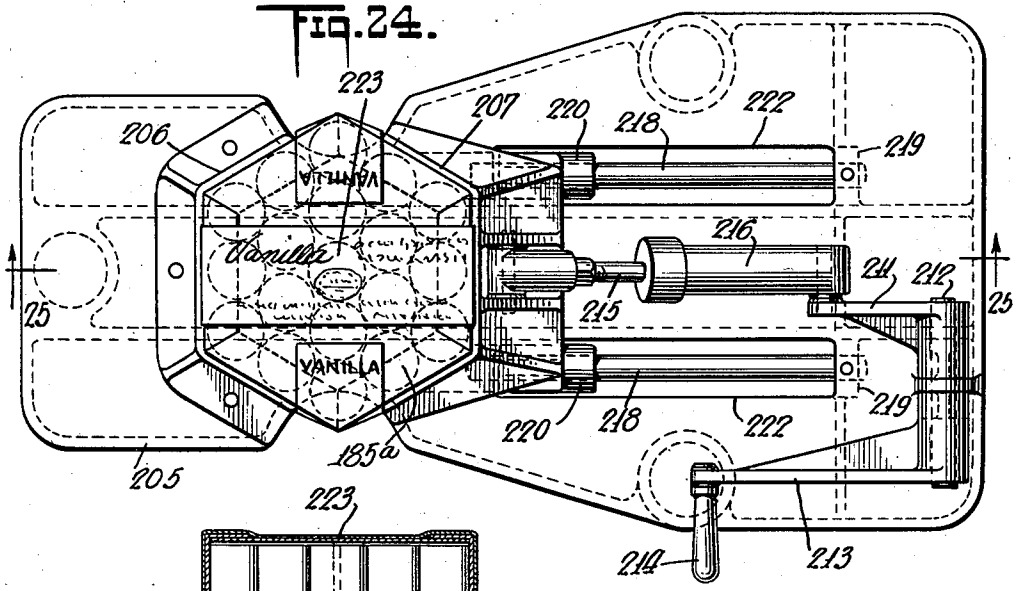


Fig. 25.

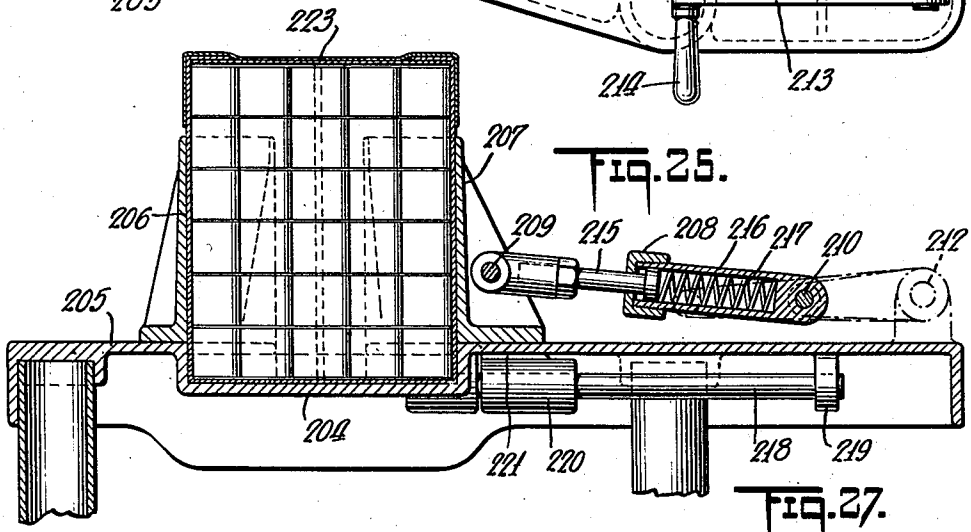


Fig. 26.

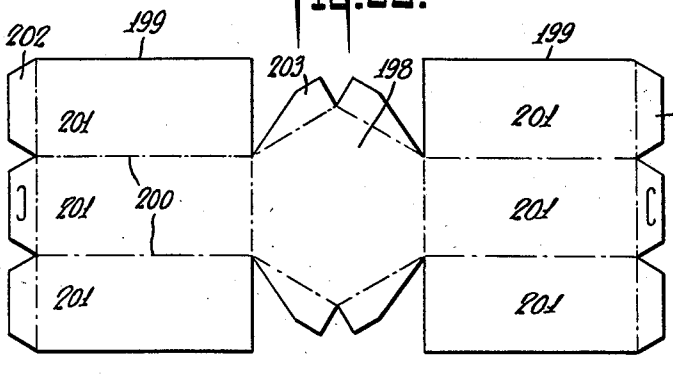
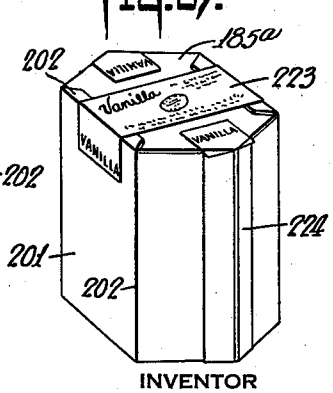


Fig. 27.



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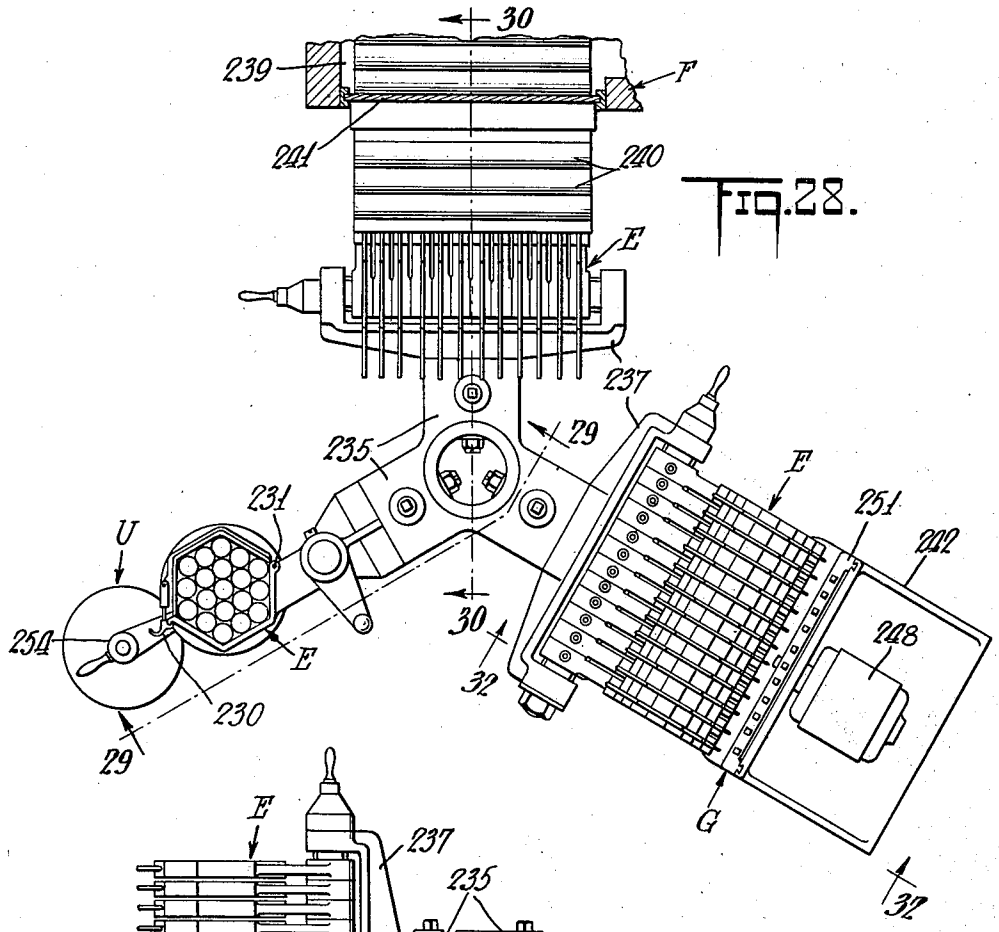


Fig. 28.

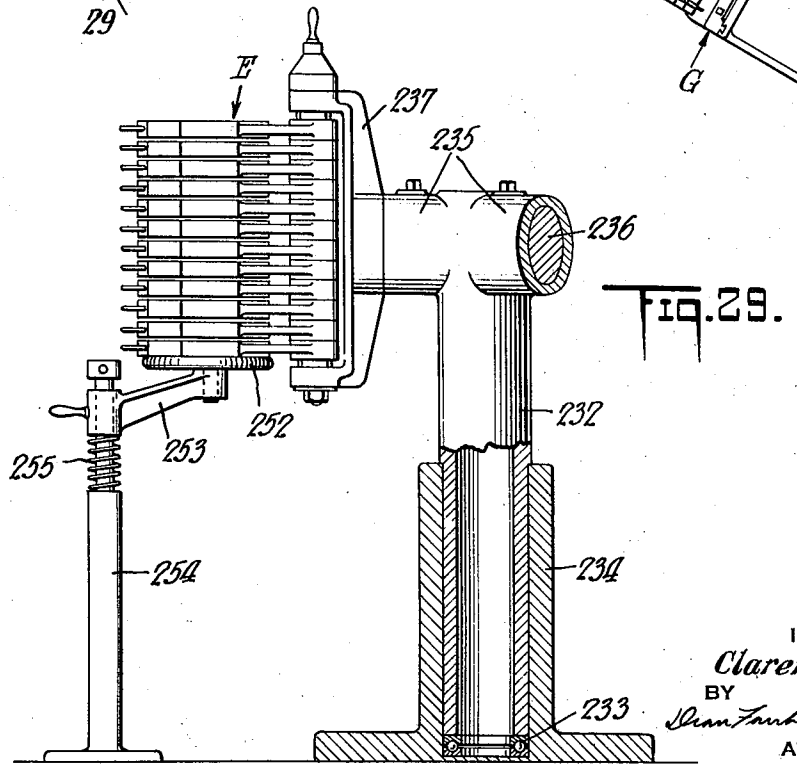


Fig. 29.

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Fig. 30.

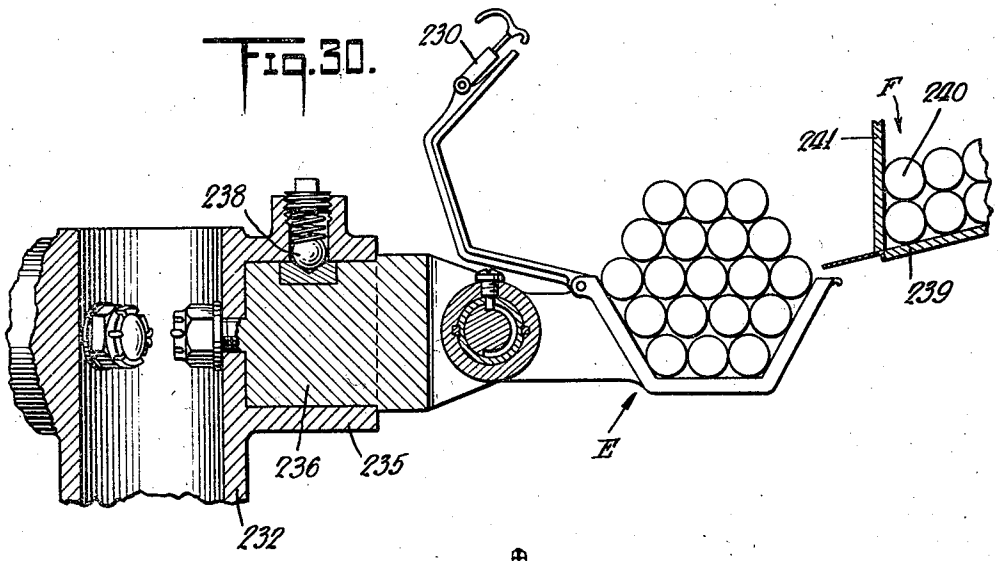


Fig. 31.

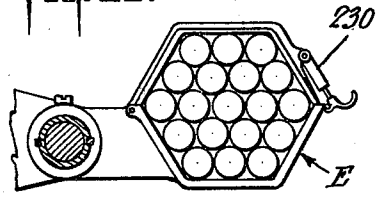


Fig. 32.

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Patented Oct. 29, 1935 2,018,750

UNITED STATES PATENT OFFICE

2,018,750

APPARATUS FOR NESTING AND SUBDIVIDING COMESTIBLES

Clarence W. Vogt, Louisville, Ky., assignor, by mesne assignments, to Vogt Processes, Incorporated, Louisville, Ky., a corporation of Delaware

Application February 23, 1933, Serial No. 658,264

34 Claims. (Cl. 107—4)

My present invention in its broader aspects relates to the art of handling, subdividing and packaging materials, and is capable of usefulness in many arts.

The invention, in the specific embodiments illustrated in the accompanying drawings, relates more particularly to the manufacture of a package of the general type disclosed in my prior copending application Serial No. 629,776, filed August 22, 1932, and more particularly application Serial No. 709,245, filed February 1, 1934. These packages each include a plurality of layers of individual service portions of ice cream of the character disclosed and claimed in my Patent No. 1,906,183, issued April 25, 1933. The invention also affords methods of and apparatus for handling, forming and packaging a wide variety of other units which are disposed in layers in the package.

In the specific embodiments illustrated, a plurality of rods or bars of the frozen ice cream, of similar length, and each with a peripheral wrapper, are assembled in parallel, juxtaposed relationship with their ends in parallel planes; the stack or pile is cut transversely in a plurality of parallel planes to form the individual service portions disposed in separate layers; relative separation of layers is effected; separators or partitions of paper or other analogous material are inserted between the adjacent layers; one or more carton blanks are inserted in the desired positions; and the layers are again moved endwise to approximately the original positions to grip the partitions and carton blank or blanks. The assembly is then removed from the machine and the packaging completed by folding the carton blanks and around the assembled layers with the interleaves or partitions and closing the cartons.

The details of construction of the machine, as well as the specific steps employed, may be modified within comparatively wide ranges, depending upon the character of the individual units which are to be packaged. Furthermore, certain parts of the machine or steps of the process may be entirely omitted or replaced by others, dependent upon the specific form of the package to be produced as well as upon the character of the material to be packaged.

As one of the important features of the machine there is provided a holder and carrier adapted to receive and retain a bundle of bars or rods, in the same relative position which the individual units are to occupy in the final package. This carrier serves not only to move the assembled rods through the subdividing mechanism, but also operates to axially shift the separated layers formed by the subdividing action, toward and from each other, and to deposit the subdivided assembly with the interleaves and carton blanks upon a suitable support for packaging.

As a further important feature of the invention there is provided a mechanism in which the rods are assembled in the desired relationship, and which is so designed as to facilitate the transfer of the entire group of assembled rods to the holders or carriers previously referred to.

As an important feature of the method, the interleaves and carton blank are inserted between and gripped by the separate layers of the units to be packaged before said units are unloaded from the carriers.

As a further important feature of the method the package is made or formed around the assembled units, as distinguished from the heretofore method of depositing the units or groups of units in a more or less completely preformed carton.

It is among the objects of the invention to provide an apparatus of the general character described above in which the bundle of frozen ice cream sticks is securely held during subdivision of the bundle into layers of individual portions, and in which subdivision and packaging are accomplished in such a manner that the subdivided portions remain in aligned relationship as contrasted to staggered relationship vertically so that the columnar effect of this alignment is insured, and whereby the weight of superposed portions or layers is carried in part at least by substantially the entire peripheries of the wrapment, all to the end that the product in the lower layers is not compressed, mashed or otherwise distorted.

Further objects are to accomplish the foregoing desiderata by a simple, rugged, durable mechanism capable of convenient manipulation insofar as hand operations are concerned and substantially foolproof in operation insofar as the motor controlled operations are concerned.

In the accompanying drawings there are illustrated two embodiments of certain features of the invention, but it will, of course, be understood that these are to be considered in an illustrative rather than in a limiting sense, and a wide variety of other embodiments might be designed within the scope of the invention as defined in the appended claims.

In these drawings one embodiment is illustrated in Figs. 1 to 27 inclusive.

Fig. 1 is a side elevation of the apparatus with one end broken away.

Fig. 2 is a top plan view of the parts shown in Fig. 1.

Figs. 3 and 6 taken together are an enlarged fragmentary top plan view similar to a portion of Fig. 2, but with some parts broken away and in section, Fig. 6 being taken on line 6—6 of Fig. 4.

Figs. 4 and 5 taken together are a central, vertical, longitudinal section through certain of the parts shown in Fig. 2, the figures being central, longitudinal, vertical sections of the parts shown in Figs. 6 and 3 respectively.

Fig. 7 is a sectional detail on the line 7—7 of Fig. 4.

Fig. 8 is a top plan view partly in section, on the staggered line 8—8 of Fig. 5 showing the holders in axially spaced relationship.

Fig. 9 is a section similar to a portion of Fig. 8, but showing the holders in closely juxtaposed positions.

Fig. 10 is a top plan view of the sleeve shown in section in Figs. 8 and 9.

Fig. 11 is a section on the line 11—11 of Fig. 8.

Fig. 12 is a vertical longitudinal section through the slicing mechanism.

Fig. 13 is a perspective view of one of the blades of the slicing mechanism and its supports.

Fig. 13*a* is a perspective view of one of the upper blade holding and tensioning blocks.

Fig. 14 is a perspective view of the lower end of one of the blades.

Fig. 15 is a fragmentary vertical sectional view on the line 15—15 of Fig. 12.

Fig. 16 is a horizontal section through a portion of the slicing mechanism, and taken on the staggered line 16—16 of Fig. 12.

Fig. 17 is a side elevation, partly in section, of the assembling device for the rods, the section being taken on the line 17—17 of Fig. 18.

Fig. 18 is a fragmentary top plan view partly in section of the mechanism shown in Fig. 17.

Fig. 19 is a sectional detail on the line 19—19 of Fig. 18.

Fig. 20 is an elevated detail showing the layers in spaced relationship in the holders, with the partitions inserted.

Fig. 21 is a view similar to Fig. 20, but showing the holders in closed up position.

Fig. 22 is a view similar to Fig. 21, but showing the carriers swung to discharging position, the holders opened and the assembly withdrawn therefrom.

Fig. 22*a* is a diagrammatical plan view showing a clamp carrier in discharging position over an unloading table, the carton blank not being shown.

Fig. 22*b* is a similar view but showing the clamps opened and the table shifted to a position when the load clears the clamps.

Fig. 23 is a perspective view showing the package in partly formed condition.

Fig. 24 is a top plan view of the mechanism for aiding in forming the carton around the contents.

Fig. 25 is a central longitudinal section on the line 25—25 of Fig. 24.

Fig. 26 is a plan view of the carton blank, and

Fig. 27 is a perspective view of the final package.

A second embodiment of the invention is illustrated in Figs. 28 to 32 inclusive.

Fig. 28 is a top plan view of another machine embodying certain features of the invention.

Fig. 29 is a side elevation partly in section, on the line 29—29 of Fig. 28.

Fig. 30 is a section on a larger scale, on the line 30—30 of Fig. 28.

Fig. 31 is a view similar to a portion of Fig. 30, but showing the holder in closed position, and

Fig. 32 is a side elevation partly in section, on the line 32—32 of Fig. 28.

As previously noted the specific mechanisms illustrated are particularly designed for making packages of individual service portions of ice cream from bars of peripherally wrapped hardened ice cream. These bars may be formed by means of the mechanism illustrated and described in my prior copending application Serial No. 628,322, filed August 11, 1932. The bars as formed by the mechanism there illustrated or in any other suitable manner may be cut into long sections, superchilled and hardened to the required degree, and then cut into shorter sections, for instance of a length substantially equal to the height of two or more superposed packages of the individual service units. The present mechanism receives these short bars, which may be about 20½ inches long and about 1⅞ inches in diameter. The bars are assembled in parallel superposed and/or nested relationship with their ends in lateral alignment to form approximately a hexagonal body composed of nineteen of these bars. Such a pile or bundle of bars will represent the equivalent of approximately five gallons of ice cream, or of two packages of approximately two and one-half gallons each. Obviously if the bars are of larger or smaller diameter there will be a corresponding difference in the number of bars assembled and the final package may be made of different length, different cross-sectional form or of different ice cream content.

My improved mechanism in the form illustrated includes a sectional holder in the form of a carrier clamp for receiving and gripping the assembly of bars forming this hexagonal body and carrying them and the resulting units caused by subdivision, through various successive operations. It is not essential that the bars be assembled as a hexagonal body, as obviously they may be assembled in a body of any other desired cross-section, depending upon the size and form of the final package to be produced. The particular shape illustrated has the practical advantage of readily fitting into practically any of the refrigerated spaces of the numerous types of soda fountains and ice cream cabinets which are now in use in this country, the Dominion of Canada and elsewhere and designed to receive five gallon cans of bulk ice cream.

With particular reference to Figs. 1 to 27 inclusive, the machine shown in side elevation in Fig. 1 consists of a main frame casting 10 supporting a second frame 11 also in the form of a casting which in turn mounts or carries all of the cutters and their driving means, said cutter mechanism being indicated generally at C.

A bracket 12 secured to one end of the main frame 10 mounts a loading unit indicated generally at L. Abutting the opposite side of the frame member 10 is another frame 13 having at the end thereof remote from the frame 10 a bracket extension 14 which provides a rotatable mount for a turntable unit indicated generally at T. Assemblage T is designated a turntable primarily for descriptive convenience and comprises an elongated frame structure, each end of which carries a sectional carrier clamp unit designated generally at D. The clamp unit is mov-

able from its full line position of Fig. 1 into the dotted line position shown at D' at which point a load of sticks is transferred into the clamp from the loader L.

Thereupon the clamp is drawn along the bed B supported upon frame 10 to carry all of the sticks through the reciprocating saw elements of the cutter mechanism C with the sticks firmly clamped in the carrier. Subsequently the turntable is rotated through 180° to bring a new clamp unit into position to be pushed through the saws for the reception of another load of sticks while the filled clamp unit, as illustrated in Fig. 20, is opened up to permit the insertion of sheets of paper or other separator material 16 and carton blanks between layers of material cut by the saws. With the paper sheets inserted, the clamps which cooperatively constitute the carrier member D are moved together to clamp the paper and carton blanks between the layers of ice cream as illustrated in Fig. 21.

The entire clamp structure is rotated on a horizontal axis to the position illustrated in Fig. 22, and the stack unloaded onto a receiving table 17 from which the series of layers with their associated carton blanks are carried to the package forming mechanism illustrated in Figs. 24 and 25 where the folding and closing of the cartons is completed.

Loading mechanism (Figs. 1, 2, 17, 18 and 19)

Rising from the bracket 12 are a pair of vertically disposed spaced casting members 18 of generally oval or elliptical external contour, and the inner face of each casting member carries a track plate 18a grooved to define an elliptical track 19. Fixed upon the inner faces of the track plates 18a are a series of racks 20 cooperatively providing a continuously toothed trackway following the contour of the track 19, but disposed within the confines thereof. A pair of ballbearing rollers 21 connected by an axle 22 travel in the tracks 19, and gears 23 arranged inwardly of each roller 21 are continuously in mesh with the tracks afforded by the racks 20.

A hollow shaft or sleeve 24 is provided with diametrically opposite, longitudinally extending keys 25 and the ends of this shaft are encircled by and keyed to hub castings 26 having apertured extensions 27 receiving the axle 22 and having such apertures bushed at 28 to afford bearings for the axle. Disposed between the two end castings 26 any suitable number of finger-carrying hubs 29 encircle and are keyed to shaft 24. Each of these hubs is rigidly fixed to a finger member 30, and each finger 30 includes a horizontally disposed intermediate portion 30a, an upwardly and outwardly inclined free end 30b, and an upwardly inclined end portion 30c which may take the form of a web as indicated in Fig. 17. These fingers cooperatively define a skeleton basket or cradle of roughly semi-hexagonal shape, save that the finger portions 30b and 30c are somewhat longer than the horizontal portion 30a for a purpose which will more fully hereinafter appear.

In filling the skeleton basket with a series of sticks of hard frozen ice cream of similar length, proper lateral alignment of the stick ends may be assured by placing one end of each stick against an abutment plate 31 constituting one end of the basket and held in position by a collar member 31a to which it is affixed. Collar 32, like the hubs 26 and the member 29, encircles and is keyed to the shaft 24.

Suitable pantograph mechanism is provided for maintaining the skeleton basket loader in a horizontal plane at all times even though the rollers 21 which afford traction means for the basket are moved completely around their orbital tracks 19.

Various types of parallel motion linkage might be utilized for this purpose, but I have found the mechanism herein illustrated to be highly satisfactory. This mechanism (see Fig 17) includes pairs of parallel links 32, 32. Each pair of links has fixed pivots 33, 33 in the bracket 12, and the free ends of the links are pivotally connected as at 34 to diametrically opposite points of a ring member 35. Second pairs of links 36 which are either parallel or so arranged as to have the effect of parallel links have their lower ends pivoted at 37 to the ring 35, pivots 37 being at the ends of a diametric axis of the ring at right angles to the diametric axis intersecting the pivots 34. The upper ends of the links 36 are pivotally connected as at 38 to lugs 39 projecting from diametrically opposite sides of the hubs 26.

Coiled contractile springs 40 having their ends secured to the intermediate portions of the lower link 32 of each pair and to some fixed point as for instance the pivot of the upper link 32 of each pair, tend to maintain the entire pantograph link system in an elevated position and tend to counterbalance the descending movement of the loaded basket and assist the ascending movement of the unloaded basket as said basket moves downwardly at one end of its orbit and upwardly at the opposite end thereof. To insure proper balance a complete pantograph mechanism is provided at each end of the loading basket (Fig. 2), the two sets of mechanism being spaced apart a sufficient distance to completely straddle the loader and the sticks which it carries.

A handle member 41 fixed on the shaft 24 is used for moving the loader forwardly and downwardly from the position of Fig. 17 into a position where the fingers 30 and the bottom plate 31 pass through slots 42 in the rear edge of the bed B and the load of sticks is transferred into a waiting receiver in the form of a carrier clamp shown at D' in Fig. 1. During this movement the fingers 30 pass between the spaced and correspondingly shaped relatively fixed fingers 43 of the carrier clamp so that the assembly or bundle of sticks remains on the fingers 43 while the loader mechanism may be drawn on downwardly and moved completely around its orbit by manual actuation of the handle 41 until it is again in loading position. The manner in which the springs 40 tend to counterbalance the weight of the descending loader and assist in lifting the empty loader back into position, will be entirely obvious. The two sets of parallel linkage 32, 32 and 36, 36 operate in conjunction with the ring 35 to maintain the loading basket in a horizontal plane at all times.

Cutter mechanism (Figs. 1, 2 and 12 to 16 inclusive)

The bundles of sticks gripped by the carrier clamps are drawn along the bed B through a series of spaced vertically reciprocating cutting members 60, the individual clamping elements of the carrier clamps being thin enough to pass between the cutters. While various types of cutting mechanism and driving mechanism might be employed, I have found that the mechanism illustrated in some detail herein serves to cut the stick bundles rapidly and cleanly without

distorting the sticks while they are being severed into layers of individual service portions of ice cream.

The frame structure 11 of the cutter mechanism includes a pair of spaced vertical frames or standards 46 supporting at their upper ends a table 48 upon which the drive mechanism for the cutters is mounted. Two knife or saw carrying frames, each indicated generally at 49, are vertically reciprocable in guides afforded by the frames 46. Each frame 49 is of generally rectangular shape including upper and lower crossbars 50 connected by vertical end bars 51.

The inner faces of the frames 46 (Figs. 15 and 16) include machined faces 52 near their upper and lower ends to which are bolted tracks or wear plates 53 having inwardly facing V-shaped grooves 54 therein. Riding in these grooves are shoes 55 mounted at the ends of the upper and lower crossbars 50 of the saw carrying frames 49. Each shoe 55 includes a V-shaped head member 56 fitting within the tracks 54, and a circular shank member 57 accommodated in a socket 58 in the crossbar 50. Cylindrical shanks 57, in their sockets 58, permit such correct alignment of the shoes 55 in the grooves. Shims behind the plates are employed to accommodate for wear of the parts. The shoes 55 being free to oscillate are prevented from possible jamming during vertical reciprocation of the saw carrying frames.

Any suitable means may be employed for mounting and tensioning the saw blades on the crossbars 50 in their carrier frames 49. Merely as an example, I have shown in Figs. 13*a* and 14 a type of blade which works satisfactorily. Each blade 60 is shown as provided with a serrated knife edge 61 similar to that of an ordinary bread cutter. Each end of the flexible blade 60 has a head portion or reinforcement 62 riveted thereto as indicated at 63 and having a pin 64 extending transversely therethrough.

Both the upper and lower crossbars 50 (Fig. 13) carry guide brackets 65 in the form of pairs of lugs integral with the crossbars and affording slots between them to accommodate the saw. Below the guide brackets 65 on the lower crossbar 50 is a second pair of lugs 66 spaced sufficiently far apart to accommodate between them the combined thickness of the saw blade and the member 62 and having grooves 67 in their under faces adapted to accommodate the ends of the pins 64.

On the upper crossbar 50 above the bracket 65 there is mounted a lug 68 apertured for the reception of a bolt 69, the latter carrying on its lower end a block 70 adapted to engage the upper end of the saw 60. The upper threaded end of the bolt is encircled by a nut 71 which serves to raise and lower the bolt and thereby regulate tension on the saw blade which is held in the block 70. This block, illustrated in perspective in Fig. 13*a*, has a vertical recess 72 accommodating the member 62 at the upper end of the saw blade, and also has inwardly and downwardly inclined recesses 73 intersecting the recess 72 adapted to receive the ends of the pin 64. Thus as the nut 71 begins to draw the block 70 upwardly pin 62 will work more deeply into the bottom of the recess 73 and there is no danger of the saws inadvertently springing out of position or becoming disengaged from their carriers during operation.

The crossbars of the two saw carriers are of generally U-shape in cross-section, and as best seen in Figs. 12 and 16 the brackets 65 of one crossbar are staggered with respect to and lie between the brackets of the crossbar of the other saw frame so that the cutting edges of all of the saws of both sets are disposed in the same plane and face in the same direction.

The means for vertically reciprocating the saw carrying frames 49 (Figs. 2 and 12) includes a motor 75 mounted upon the table 48 and driving a crank disc 76 through an endless driving band 77. The crank disc 76 is fixed upon the end of a shaft 78 mounted in suitable bearings 79 and on the opposite end of this shaft there is preferably provided a flywheel 80. A rocker arm 81 journaled in bearings 82 on the table 48 has a crank arm 83 rigidly fixed thereto and pivotally connected, as at 84 to the crank rod 85 which in turn is pivotally secured at 86 to the outer face of the crank disc 78. Also keyed to the rocker arm 81 is a walking beam 87, the ends of which are pivotally connected to links 88 which are in turn pivotally connected at 89 to the upper crossbars of the two knife carrying frames 49. This drive means for effecting reciprocation of the two blade carrying frames is merely one of many types which could be used and the details are no part of the invention.

It is desirable that the knife carrying frames always move in relatively opposite directions, that is, one ascending while the other is descending and vice versa. The advantage of this arrangement is that the sticks of ice cream which are being drawn through the knives are never subjected to strains which might tend to cause relative displacement of the sticks constituting the bundles, that is, the action of the upwardly moving set of knives is counterbalanced by the action of the downwardly moving set of knives at all times. The purpose of the flywheel is, of course, to prevent any irregular or jerky motion of the reciprocating knife carriages. The construction is such that the knives may be readily removed for sharpening as often as required, and tension on the knives may be conveniently taken up at any time without removing them from the machine.

Carrier clamps (Figs. 1, 2, 3, 5, 8, 9, 10 and 11)

Each carrier clamp includes a plurality of individual clamping elements normally spaced apart a sufficient distance to clear the knives as the sticks are drawn through the set of knives and capable of being shifted a greater distance apart to separate the individual layers formed by the cutting operation when the occasion requires. Each carrier clamp may properly be said to include a yoke member 90 in the ends of which a sleeve member 91 is keyed as at 92 to prevent rotation. Keyed for sliding movement along this sleeve are hub members 93 each integral with a web portion 94 carrying the fingers 43.

The end face 95 of each web carries a finger portion 96 to form the lower half of a hexagonal clamp. The fingers 96 are preferably provided with shoes 97 on their under sides traveling between tracks 97*a* on the bed B, to guide the movement of the carrier clamps along the bed. Cooperating with the fingers 96 are semi-hexagonal fingers 98 each pivotally connected as at 98*a* to one of the webs 94. The fingers 98, which in effect constitute a movable upper half of each individual clamp unit, are simultaneously movable to the open position indicated in dotted lines in Fig. 5 when the clamps are to receive their charge from the loading mechanism previously

described, and simultaneously movable to the full line closed position of Fig. 5 to firmly engage and hold a bundle of sticks. Any suitable means might be utilized for effecting the simultaneous opening and closing of the fingers 98 and I have illustrated a pneumatic means for the purpose.

A series of horizontally disposed cylinders 99 are secured upon brackets 100 fixed to the yoke 90. Each cylinder at one end communicates through a flexible conduit 101 with a header 102 which may be connected by a flexible conduit to any suitable source of compressed air (not shown). The flexibility of the conduits 101 permits the axial spreading of the clamps as hereinafter described. Pistons 103 working in the cylinders 99 are fixed to piston rods 104 extending through the ends of the cylinders and connected by links 105 to the fingers 98. The links 105 have pivotal connections as at 106 and 107 with both the piston rods and the fingers in order that straight linear motion of the piston rods may be converted into arcuate movement of the fingers 98 about their fixed pivots 98a.

Coiled expansion springs 108 disposed within the cylinders between the cylinder heads and the pistons 103 normally tend to swing the fingers 98 to open position, but the introduction of compressed air into the cylinders overcomes the action of these springs and closes the clamps. The springs might operate in the opposite direction and a vacuum be used instead of air pressure.

The manner in which the various individual sectional clamps which cooperate to define the complete skeleton carrier clamp unit, may be separated for the purpose of separating the layers of ice cream carried by the individual clamps, is more clearly illustrated in Figs. 8 to 11 inclusive and Fig. 3.

Each of the hub members 93 has an inwardly extending stud 110 passing through a longitudinal slot 111 in the fixed sleeve 91, and into a cam groove 112 formed in the peripheral surface of a shaft 113 journaled within the sleeve 91. Shaft 113 is held against endwise displacement with respect to the sleeve by a crank handle 114 fixed on a squared projection 115 at one end of the shaft and by a washer 116 encircling a reduced threaded extension 117 at the other end of the shaft and forced into abutment with the outer face of one end of the yoke 90 by a nut 118, a suitable lock washer being interposed between the nut 118 and washer 116 if desired.

Each cam groove 112 extends around approximately one-half of the periphery of the shaft 113 so that by rotating the shaft 113 through 180°, studs 110, and the hubs 93 to which they are affixed, are shifted from one extreme position to the other endwise along the sleeve 91. As the sleeve 91 cannot rotate and the slots 111 are longitudinal the hubs cannot rotate during this endwise movement.

The purpose of this arrangement is to separate the individual hubs 93 and the clamps carried thereby a sufficient distance to permit the insertion of paper separators, carton blanks or other thin material between the layers of ice cream carried by the clamps. The particular spacing between the clamps when they have been separated will be dictated by the particular requirements of the packages to be formed. In the present instance, one of the hub members 93 remains stationary as seen in Figs. 8 and 9. Five hub members to the right of it are shifted outwardly into spaced positions with respect to each other and the stationary hub and six hubs to the left of it are shifted outwardly into similarly spaced relationship.

The full width of the yoke 90 may be utilized in the spacing operation so that the two end hubs of the composite carrier clamp actually abut the inner ends of the yoke when the individual clamps are in the separated position shown in Fig. 8. Of course, successive clamp elements must be shifted relatively greater distances during this separating operation and this is taken care of by the successively varying pitch of the cam slots 112. Suffice it to say that when the crank handle 114 is shifted from the position of Fig. 9 through 180° to the position of Fig. 8, all of the clamps 96, 98 will be separated from each other, and when the handle is swung back again all of the hubs will be shifted back into lateral abutment. I have shown separate slots 111 in the sleeve 91, for certain of the pins 110 whose ranges of movement do not overlap. This is not important as a single slot 111 for all of the pins will serve the same purpose.

Turntable (Figs. 1, 2, 4, 5 and 6)

The elongated turntable frame 15 includes an upper horizontally disposed portion 120 and a lower horizontally disposed portion 121. These spaced portions of the turntable are connected at their ends by integral connecting webs 122 and at the center of the turntable they are connected by upstanding webs 123. The turntable portion 121 at its center provides a collar or hub portion 124 lined with a suitable bearing bushing 125 and adapted to rotate on the upwardly presented hollow stud 126 on the bracket 14. Interposed between the hub 124 and a flange 127 of the stud 126 is a ball thrust bearing 128. A second ball thrust bearing 129 is interposed between the upper side of the hub 124 and a disc 130, the latter being held against the top of the stud 126 by a screw 131.

Rising from the hub 124 are spaced web members 132 each affording bearings at 133 for the reduced ends 135 of screw shafts 134, such screw shafts extending longitudinally of the turntable. The other outer ends of the shafts (Fig. 5) are also reduced as indicated at 136 and journaled in bearings 137 provided in the end web members 122 which connect the upper and lower turntable portions 120 and 121.

The turntable portion 120 includes spaced parallel rails each including an inwardly turned flange 138 which cooperates with a track plate 139 upon the top of the rail to afford a trackway guiding the movement of a draw bar 140 connected to the carrier clamp units D.

The connection of the draw bar and carrier clamp appears in Fig. 5 wherein it will be noted that the reduced end of the flat draw bar 140 enters a circular stud member 141 and is pinned thereto as at 142. Stud members 141 are rotatable within sockets 143 formed in the intermediate portions of the yoke 90 (Fig. 3). Plates 144 prevent retraction of the studs 141 from the sockets, and each stud 141 is provided with a recess 145 for coaction with a ball member 146 forced into engagement with the stud at all times by a coiled compression spring 147 arranged in a radial bore 148 in the yoke socket and tensioned by a screw 149 which closes the end of the bore. The ball 146 and the recesses or sockets 145 cooperate to afford a snap lock which will sustain the carrier clamp unit either in the horizontal position of Fig. 5 or in a vertical position

when the yoke has been rotated on the stud 141 through an angle of 90°.

The screw shafts 134 are continuously driven from a motor 150 mounted on the turntable and driving, through a reduction gear 151, a downwardly extending stub shaft 152 having bearings at 153 in the turntable casting. The lower end of this stub shaft carries a bevel gear 154 meshing with a pair of bevel gears 155 on the respective screw shafts 134. Thus it will be observed that the screw shafts are continuously rotated and that the turntable, in the absence of some means for preventing it, can be rotated at will.

In order to prevent inadvertent rotation of the turntable, however, I have provided a special latch mechanism illustrated in Figs. 1, 5 and 6 which includes a pair of bolts 156 projecting inwardly through openings 157 in the hub 124 and its bushing 125 and into sockets 158 in the stud 156. These bolts when projected prevent rotation of the socket on the stud. They are normally held in projected position by coiled contractile springs 159 anchored to crank arms 160 mounted on vertical shafts 161 having bearings at 162 in the members 120 and 121 and being provided at their upper ends with operating handles 163 for manually retracting the latch bolts against the action of the springs when it is desired to turn the table.

The screw shafts 134 may be operatively engaged with the draw bars 140 in such a manner that the screw feed drags a filled carrier clamp through the saws. Means is provided for automatically disconnecting the draw bars from the driving screws after the loaded carrier clamps have been drawn between saws, and means is also provided for manually shifting the carrier clamps in the opposite direction while their draw bars are disengaged from the screws and for manually effecting reengagement of the draw bars with the screw for the next operation. Such mechanism will now be described.

Draw bar actuating and releasing mechanism (Figs. 1, 2, 3, 4, 6 and 7)

As best seen in Figs. 4, 6 and 7 each draw bar 140 supports a pair of spaced pendant transversely extending U-shaped tracks 165 (Fig. 4), these tracks being secured by screws 166 and spaced the proper distance below the draw bar by spacer blocks 167 through which the screws pass. Transversely slidable along these tracks are the flanged upper ends 168 (Fig. 7) of hanger members 169 which at their lower ends terminate in semi-cylindrical, internally threaded nut sections 170 adapted to be shifted into engagement with the screw shafts 134. Means for shifting the half or split nut sections 170 into and out of engagement with the shaft 134 includes a pair of arcuate links 171 (Fig. 6) each having its outer end pivotally connected by a stud 172 to the flange 168 and each having its inner end pivotally connected by a stud 173 with a superjacent disc or crank plate 174. This plate is carried by the lower end of a shaft 175 mounted on the draw bar and having a pinion 176 keyed at 177 to the upper end thereof. Arranged between the pinion and the draw bar 140 is a loosely pivoted cam member 178 of generally circular shape except for an elongated pointed extension 179 (Fig. 6) at one side thereof.

The pinion 176 is continuously in mesh with a gear 180 journaled on a shaft 181 fixed in the draw bar and manually rotatable by a handle member 182. It will be evident that rotation of the pinion 176 in one direction declutches the nut section 170 from the screw shaft 134 and rotation of the pinion in the opposite direction reengages said nut sections with the screw shaft.

The cam member 178 which is fixed upon the shaft 175 insures automatic declutching as the clamps reach the limit of their positive feed along the screw shafts, such positive feed occurring during the dragging of the carrier clamps and their load through the saws. This declutching is accomplished by the provision of a squared notch 183 in the edge of a block 184 secured upon the top of the upper turntable frame section 120. As the clamp carriage is drawn through the saws by the manually effected interconnection of the draw bar 140 with the nut sections 170 and just before the nut sections can abut the web 132, the nose of the cam 178 engages a corner of the notch 183 swinging the cam and the pinion 176 and the gear 180 causing the cam to enter the recess butt end first and automatically withdrawing or declutching the nut sections 170. The rotation of the pinion caused by turning of the cam operates to rotate the disc 174 and cause the arms or links 171 to shift the nut sections outwardly

The purpose of using the particular type of curved link best illustrated in Fig. 6 is to provide a past center arrangement which is effective to positively hold the nut sections in operative position or positively hold them out of operative position when the disc 174 has been rotated 90° in one direction or the other. The arrangement is such that an inwardly applied pressure on the flanges 168 when in the position of Fig. 7 would be ineffective to move them due to the positive blocking action of the links 171. In other words, the clamps can only be moved by a positive rotation of the pinion 176 which rotation is accomplished only by turning the handle 182 or by the engagement of the cam 178 with the notched block 183.

The means above described for moving the carrier back and forth along the turntable and in a direction which is substantially radial in respect to the pivotal center of the latter, is mechanical and positively acting, but it will be obvious that such means need not be mechanically actuated and need not be positively acting. For instance, the draw bar 140 or equivalent part may be pushed, pulled and controlled by other means such as a pneumatic or hydraulic cylinder and piston of any suitable well known type such as that hereinbefore described, for opening and closing the clamps.

Interleaving the layers and unloading the clamps (Figs. 20 and 22b)

Immediately after the ice cream sticks or rods have been moved past the saws, the handle 114 is swung from the position shown in Fig. 21 to the position of Fig. 20 thereby serving to open up all of the individually clamped layers of individual service portions of ice cream. Thus there is no sufficient time interval during which the abutting ends of the freshly cut sticks may refreeze together.

After the carrier clamp has been disengaged from the screw drive by the action of the automatic clutch release above described, the handle 163 is swung to retract the turntable locking bolts 156, and using the handle 163 for the purpose the turntable is rotated through 180° presenting a new empty carrier clamp at the bed B and moving the filled carrier to a point where the inter-

leaving of paper and the introduction of carton blanks takes place.

Inasmuch as the cartons which I have illustrated are adapted to contain only six layers of ice cream, the clamp carrier will, of course, hold a sufficient charge for two cartons. With the clamps opened up as shown in Fig. 20 layers of waxed or oiled paper or other suitable separators 16 are introduced between the spaced layers of ice cream portions and a projecting edge of each separator is bent over as indicated so that they will not slip out of position by the force of gravity. A flat carton blank 185 shown in plan in Fig. 26 is introduced between the two sets of six layers of ice cream and held in place by hand until by swinging the handle 114 the individual clamping elements are moved together again clamping the separators (including the carton blank) between them.

A second carton blank is now held by hand against the outer face of one of the end layers and the yoke 90 with its contents is swung through an angle of 90° so that the axis of the yoke 90 is vertical. As the carrier reaches vertical position the unloading table 17 (resiliently supported upon an arm 186 rotatable about a standard 187) is swung into position to support the carton blank which has been held by hand against the stack and to receive the contents of the carrier clamps when they are released. By relieving the air pressure in cylinders 99 the clamps open and the weight of the stack is transferred to the unloading table.

The means for yieldingly mounting the table 17 includes a standard 188 rising from the free end of the arm 186 and having a relatively deep socket 189 in the upper end thereof. The table 17 is secured as by screws 190 on a plate 191, the latter plate carrying a downwardly presented cylinder 192 having an inwardly turned flange 193 at its lower end interlocking with an outwardly turned flange 194 at the top of the standard 188. The plate 191 also carries a plunger 195 guided in the bore 189. A coiled expansion spring 196 is confined within the cylinder 192 and encircles the plunger 195. One end of this spring works against a reactance member 197 encircling plunger 195 and resting upon the top of the standard 188 and the other end of the spring works against the plate 191 and tends to elevate it.

The purpose of the spring lift for the table 17 is to permit slight manual depression of this table so that it can be slipped under the hand of the operator holding the lower carton blank in place. The spring also always causes the table to rise against the lower end of a stack of severed layers of ice cream before they are released by the carrier clamps. With the carriers in the vertical position shown in Fig. 22 and directly over the table 17 as indicated diagrammatically in Fig. 22*a*, the air pressure in the header 102 is released, thereby permitting the springs 108 to open the clamp fingers 98 and release the assembled stack of layers of individual ice cream portions.

Thereupon the loading tables are swung to the position of diagrammatic Fig. 22*b* so that the load clears the clamps and the clamps may be reclosed and restored to horizontal position ready for return to the bed B upon the next reversal of the turntable T.

In order to best understand the manner in which the packages shown in Fig. 27 may be completed, reference may be had to the blank of Fig. 26. This blank includes a central portion 198 of hexagonal conformation to opposite sides of which are attached rectangular blank sections 199, each of the sections being divided by a fold or score line 200 into three individual panels 201. The free end of each panel 201 is provided with an inwardly bendable tab 202 and those edges of the hexagonal section 198 which are not directly connected to the blank sections 199 are also provided with inwardly foldable tabs 203. The package and blank shown in Figs. 23, 26 and 27 are illustrated and claimed in my copending application Serial No. 709,245 hereinbefore referred to.

In positioning the blanks with respect to the layers of ice cream in Fig. 20, the central portion 198 of each blank is disposed in registration with the clamped layers.

Packaging mechanism (Figs. 24, 25, 26 and 27)

In the present application, no claim is made to the mechanism which is illustrated for forming the carton blank around the stack and completing the package, and therefore, so far as the present invention is concerned, this operation may be carried out in any suitable manner and entirely by hand or by the use of any suitable mechanism. As an example, this operation may be accomplished in the manner which will now be described.

The mechanism illustrated in Figs. 24 and 25 is illustrated and claimed in my copending application Serial No. 1,872, filed Jan. 15, 1935.

The side forming blank sections 199 of the uppermost carton of the stack which has been deposited upon the table 17 are manually folded upwardly as shown in Fig. 23 and the carton lifted from the table 17 and deposited in a hexagonal depression 204 in a table 205. A hexagonal carton top 185*a* is laid upon the contents of the carton. As the partially folded and filled carton is deposited in the socket 204, folding of one of the blank sections 199 is completed by a stationary clamp member 206 fixed upon the table and encircling nearly one-half of the recess 204 and serving as a folding guide. A complementary folding or clamping element 207 corresponding in size and shape to the member 206 is slidable over the table 205 to complete the folding of the sides of the carton about the contents thereof.

The means for advancing and retracting the movable folding element 207 includes a link 208 having a pivotal connection at 209 with the member 207 and a pivotal connection at 210 with a crank arm 211 fixed upon a rock shaft 212, the opposite end of the rock shaft carrying a second crank arm 213 to which a handle 214 is affixed. Link 208 is formed of two sections and includes a spring portion to render it longitudinally resilient so that the clamping member 207 will not be positively thrust against the carton with sufficient force to smash the contents thereof in the event that the carton is slightly misaligned or certain of the individual ice cream portions have slipped slightly out of place. Illustratively the link 208 includes a rod portion 215 telescoping within a cylinder portion 216, the cylinder having a coiled expansion spring 217 which normally tends to extend the link to its full length, but which is yieldable when the clamp 207 has pressed the carton blank together with sufficient firmness to insure contacting of the sides 201 firmly with the individual portions of the product. With the construction shown, a slight variation

in the size of these portions is compensated for in the cartons.

The sliding movement of the clamp may be guided by guide rods 218 arranged under the table 205 and working in guide brackets 219. The guide rods are fixed to sleeve members 220 attached to the clamp by webs 221. Longitudinal slots 222 in the table provide clearance for the movement of these webs as the clamp member is shifted back and forth.

With the sides of the carton folded upwardly by the clamping mechanism, four of the tabs 202 are folded inwardly, a top piece or cover 185a is placed over them, and the other two tabs 202 on the center panels 201 of the sections 199 are folded on top of the cover 185a and are pasted down by a transversely extending paster 223 which extends across the top of the carton and down over the two opposed flat sides thereof. The juxtaposed edges of the two blank sections 199 are secured by pasters 224 which conceal such juxtaposed edges, extend vertically of the carton and overlap the top and bottom of the completed package.

The clamps 206 and 207 are so designed that they will leave a space between them adjacent to the lines of abutment of the blank sections 199, 199 sufficiently wide to permit the application of the pasters 224 while the carton is held by the clamps. This space between these edges of sections 199 may vary slightly to compensate for slight variations in the space taken up by the nested portions within the package. The so-called pasters 223 and 224 may be in the form of gummed paper or adhesive tape or any other suitable material preferably capable of carrying the name and trade-mark of the manufacturer, and if desired, the address of the consignee of the package, and any other suitable legends, such as the weight and contents of the package, the flavor of the cream, etc.

Operation

While the operation of the apparatus will be substantially self-evident from the foregoing description, it may be briefly recapitulated as follows:

By engaging the handle member 182 and while the nut sections 170 are declutched from the screw shaft 134, and after closing the carrier clamps D by the application of air pressure, the carriers are thrust from the full line position of Fig. 1 to the dotted line position indicated at D' and air pressure is released opening up the clamps so that they may receive a charge of sticks from the loader L. By grasping the handle of the loader, the loader is moved forwardly through its complete orbit leaving a stack of sticks in the open clamp D.

By the reapplication of air pressure the clamp is again closed, and by swinging the handle 182 the nut sections 170 are coupled to the screw shaft 134. Thereupon the screw draws the clamp carrier D through the continuously operating cutter mechanism C, the saws severing the sticks to form individual service portions of ice cream, each individual clamp element of the clamp carrier retaining one of such layers. Continued rotation of the screw shaft eventually moves the parts to a position where the automatic release cam 178 causes declutching of the nut sections.

Thereupon the handle 183 is swung through 180° unlatching the turntable T and shifting the loaded clamp carrier D into a position adjacent the load receiving table 17. During this swinging motion or before or thereafter, but preferably before, the handle 114 is swung through 180° so as to open up the individual elements of the individual clamps of the clamp carrier. The paper layers 16 are inserted, and one of the carton blanks 185 is introduced between the two central clamping elements and held in such position by hand until the clamps are closed by reverse movement of the handle 114. Thereupon the sheet of paper 16 and the second carton blank 185 which will form the bottom of the stack to be deposited upon the table 17 are hand pressed against the endmost layer of cream and the clamp carrier unit is rotated by hand into vertical position adjacent the table 17. Thereupon the table 17 is slightly depressed and swung under the stack. Next the air pressure is relieved to permit opening of the clamps. The table 17 is again swung to shift its load out of the path of the clamps, and the clamps may be restored to horizontal position and closed if desired so that they will be ready for their next trip through the saws to receive their next load of sticks.

The top six layers of the stack deposited upon the table are then picked up by manually grasping the carton under them as shown in Fig. 23. The carton is transferred to the packaging table 205, top 185a is applied, and the carton folded and sealed. A similar procedure is followed with the lower six layers of cream and their associated carton, and the table is thus cleared and ready to receive its next load from the other clamp carrier which has received its load and dragged it through the saws during the time that one clamp carrier was being unloaded and the package completed.

Another form of part of the apparatus

In Figs. 28 to 32 inclusive I have illustrated an alternative structural arrangement designed to accomplish a similar purpose, and in this case I employ three carrier clamps E which correspond in construction to the clamps D save for the fact that the movable fingers of the clamps are mechanically latched as at 230 and mounted on spring hinges 231 instead of being pneumatically closed.

Here a rotatable standard 232 is supported upon a thrust bearing 233 within a floor socket 234 and the upper end of the standard carries three equidistantly spaced radial arms 235 adapted to receive rotatable stud members 236 which are carried by and serve as the radial mounts for the yokes 237 of the clamps E. As illustrated in Fig. 30 a snap latch mechanism including a ball 238 coacts with the shafts 236 to latch the clamps in either horizontal or vertical position as required.

With this triple arm arrangement one clamp is always disposed adjacent a loading station F, another loaded clamp is operatively associated with a cutting mechanism G, and the third clamp is disposed adjacent an unloading station U.

As indicated in Fig. 30 the loading station may simply consist of a chute 239 adapted to be kept full of the frozen sticks 240. These sticks may roll into the open clamps by lifting the sliding end wall 241 of the chute.

Due to the design of the clamps the sticks will automatically arrange themselves in progressively increasing rows of three, four and five, superjacent rows of four and three being emplaced by hand to provide the general hexagonal conformation required.

With the clamp charged as illustrated in Fig. 30 it is closed and latched and shifted to the

position of Fig. 31 adjacent the cutter mechanism G. With this form of the invention instead of drawing the sticks through the cutter, the cutter mechanism is mounted upon a frame 242 adapted to be reciprocated over a bed plate 243, the reciprocating means in the present instance including a crank 244 driven from a crank disc 245 which in turn is driven by a motor 246 through a speed reduction gearing 247. A motor 248 arranged on the traveling cutter frame 242 acts through a crank disc 249 and crank 250 to vertically reciprocate a saw frame 251 or a pair of such frames carrying saws of the character previously described.

The clamp is held in the position shown in Fig. 31 as the cutter mechanism moves forward and the saws passing between the individual clamps sever the sticks into individual service portions of ice cream. The filled carrier clamp may then be shifted into position adjacent an unloading table 252 which like the table 17 is carried by an arm 253 rotatable about a standard 254, the arm 253 in this instance being resiliently sustained by a spring 255 to permit depression of the table 252. When the filled frame has been positioned adjacent the table 252 the individual clamps of the clamp carriers are separated and the process herein described of interleaving the paper, associating cartons, etc. is carried out. The clamps are shifted to vertical position to deposit their stack upon the table, opened and after the stack of material has been carried out of the path of the clamps by swinging the table 252 about the crank 244 the clamps are ready to go back to the filling station 259.

It will be understood, of course, that the three arm arrangement contemplates a substantially continuous operation since one clamp carrier is always being filled while the sticks in another clamp carrier are being sawed and while the contents of a third clamp carrier are being interleaved and unloaded.

The cross-sectional shape of the carrier clamps in both forms of the invention, is determined by the proposed cross-sectional shape of the completed package. Clamps of rectangular, triangular or other suitable conformations might be substituted for those herein illustrated, if desired. One advantage of using the hexagonal arrangement, entirely aside from the convenience of storing and shipping the completed packages, is the fact that by using a loader of semi-hexagonal shape, twelve of the nineteen sticks which form the completed bundle, may simply be run by gravity into the skeleton loader basket, or into the clamp itself and will automatically assume the approximately semi-hexagonal shape desired. Furthermore, such a flaring basket effectively braces the lower sticks of the hexagonal bundle, so that the upper sticks may be conveniently laid upon them, without danger of spreading the lower layer of sticks apart.

Regardless of whether the bundle be of hexagonal or other shape, or includes seven, nineteen, thirty-seven, or any other number of sticks, the same principle will apply.

It may also be noted that the cross-sectional shapes of the frozen sticks themselves may be varied to suit the particular requirements of the trade, and that sticks of other cross-sections may lend themselves more readily to packaging in bundles and cartons of other cross-sections.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An apparatus of the class described including holder means to engage and hold a bundle of sticks of a comestible, subdividing mechanism for transversely severing the bundle of sticks while so held into a plurality of layers each consisting of short lengths cut from the sticks, and means for effecting relative separation of the individual layers while they are still retained by said holder means whereby to permit the introduction of separators between the layers before they are discharged from said holder mechanism.

2. An apparatus of the class described including holder means for a bundle of sticks of comestible, subdividing mechanism for transversely severing the bundle of sticks into a plurality of layers each consisting of short lengths cut from the sticks, and means for effecting relative movement of the individual layers toward and from each other to permit the introduction of separators between the layers and the clamping of the separators between them.

3. An apparatus of the class described including in combination a plurality of spaced cutters, a carrier clamp including a plurality of spaced independent clamping members adapted to engage a bundle of sticks of material at spaced points along their lengths, and means to effect relative movement of the cutters and the carrier clamp whereby to effect the transverse severance of the sticks between said carrier clamps into a plurality of layers each consisting of short lengths cut from the sticks.

4. An apparatus of the class described including in combination a loading station, cutter mechanism, an unloading station, a carrier clamp including a plurality of spaced independent clamping members adapted to receive and engage a bundle of sticks of material at the loading station, means to effect relative movement of the cutter mechanism and the carrier clamp whereby to effect the simultaneous transverse severance of the sticks into a plurality of layers each consisting of short lengths cut from the sticks and each layer being held in an individual clamping element of the carrier clamp, means for moving the carrier into operative position with respect to the unloading station, and means for effecting relative separation of the individual layer holding elements of the carrier to permit the application of separators between the layers.

5. An apparatus of the class described including in combination cutter mechanism, a carrier clamp including a plurality of spaced independent clamping members adapted to receive and engage a bundle of sticks of material at the loading station, means to effect relative movement of the cutter mechanism and the carrier clamp whereby to effect the simultaneous transverse severance of the sticks into a plurality of layers each consisting of short lengths cut from the sticks and each layer being held in an individual clamping element of the carrier clamp, and means for effecting relative movement of the individual layer holding elements of the carrier toward and from each other to permit the application of separators between the layers and the clamping of the separators between the layers.

6. An apparatus of the class described including in combination cutter mechanism, a clamp including a plurality of spaced independent clamping members adapted to receive and engage a bundle of sticks of material, means to effect relative movement of the cutter mech-

anism and said clamp whereby to effect the transverse severance of the sticks into a plurality of layers each consisting of short lengths cut from the sticks and each layer being held in an individual clamping element of the clamp, and a carrier for bodily moving the clamp into operative position with respect to an unloading station, said clamp being rotatable about a horizontal axis and in respect to said carrier.

7. An apparatus of the class described including a carrier adapted to receive a charge of sticks, a plurality of vertically reciprocating cutters, means for drawing said carrier through between the cutters to sever the sticks transversely into shorter lengths, and a rotatable support for the carrier movable to carry the carrier with its severed layers of material to an unloading position.

8. In combination a main frame, cutter mechanism supported thereby and including a plurality of spaced cutters, a turntable movable about a vertical axis, and clamps bodily slidable along said turntable and toward and from the center of the latter and between said cutters and rotatable about a horizontal axis on said turntable.

9. In combination, cutter mechanism including a plurality of spaced blades, a turntable, a carrier clamp mounted on the turntable and bodily movable toward and away from the center of the turntable, said carrier clamp including a plurality of pairs of individual clamping members sufficiently thin to pass between adjacent blades of the cutting mechanism, means to draw the clamp through the cutting mechanism to effect transverse severance of the material carried thereby into a plurality of layers of short sections, and an unloading table remote from the cutter mechanism, said carrier clamp being movable into registration with said unloading table by rotation of the turntable.

10. In combination, cutter mechanism, a turntable, a carrier clamp adapted to receive a bundle of sticks and mounted on the turntable, said carrier clamp including a plurality of pairs of separate clamping elements sufficiently spaced apart to permit transverse severance of the sticks along cutting lines between said elements, means for relatively moving the clamp and cutters to effect such severance, and means for effecting relative movement of the individual clamping elements away from each other to axially separate the severed sections.

11. In combination, cutter mechanism, a turntable, a carrier clamp adapted to receive a bundle of sticks and mounted on the turntable, said carrier clamp including a plurality of pairs of separate clamping elements sufficiently spaced apart to permit transverse severance of the sticks along cutting lines between said elements, and means for relatively moving the clamp and cutters to effect such severance, said carrier and clamp being rotatable on horizontal axes in respect to said turntable into unloading position.

12. In combination, cutter mechanism, a turntable, a carrier clamp adapted to receive a bundle of sticks and mounted on the turntable, said carrier clamp including a plurality of pairs of separate clamping elements sufficiently spaced apart to permit transverse severance of the sticks along cutting lines between said elements, means for relatively moving the clamp and cutters to effect such severance, said carrier clamp being rotatable on a horizontal axis in respect to said turntable into unloading position, and means for simultaneously opening all of said pairs of clamping elements to deposit the stack of layers in superposed positions.

13. An apparatus of the class described including a plurality of spaced vertical reciprocating cutters, a clamp unit including a plurality of individual axially spaced clamping members each having a displaceable section to admit of the filling of the clamp, said individual sections being movable between the cutters to a position for filling with sticks of ice cream, and means for drawing the filled clamps through the cutter mechanism to effect transverse severance of a clamped bundle of sticks into a plurality of individual layers.

14. An apparatus of the class described including a plurality of spaced vertically reciprocating cutters, a clamp unit including a plurality of individual clamping members each having a displaceable section to admit of the filling of the clamp, said individual clamping members being movable between the cutters to a position for filling with sticks of ice cream, motor actuated means for drawing the filled clamps through the cutter mechanism to effect transverse severance of a clamped bundle of sticks into individual layers, and means for automatically disconnecting the clamps from said power means after the bundle of sticks has been severed.

15. Clamping and carrier mechanism for handling a plurality of sticks of a comestible, including a plurality of laterally spaced clamping members, each including relatively displaceable sections to admit of filling of the carrier and closing of the clamps about the stick material therein, and means for effecting relative movement of the clamping members toward and from each other lengthwise of the sticks.

16. Clamping and carrier mechanism for handling sticks of a comestible, including a plurality of laterally spaced clamps including relatively displaceable sections, means for bodily moving said clamps toward and from each other, said means including a hub fixedly connected to each of the individual clamping elements, a hollow shaft upon which the hubs are keyed, a shaft arranged within said hollow shaft and having cam grooves therein, and studs on the hubs projecting through the hollow shaft and into said grooves.

17. Clamping and carrier mechanism for handling sticks of a comestible, including a plurality of laterally spaced clamps including relatively displaceable sections, means for bodily moving said clamps toward and from each other, said means including a support along which said sections are slidable, and a rotatable cam member within said support for effecting said sliding movement.

18. Clamping and carrier mechanism for handling sticks of a comestible, including a plurality of laterally spaced clamps each having a hub, a non-rotatable hollow shaft upon which the hubs are keyed and having longitudinally extending slots, a member within said hollow shaft and having cam surfaces, studs on the hubs projecting through said slots into engagement with said surfaces, and means for moving said member within said hollow shaft to move said clamps toward and from each other.

19. In an apparatus of the class described a loading mechanism including a skeleton basket, a pair of spaced similar orbital track members, traction means for the basket movable in said track members, and a pantograph mechanism for maintaining the basket in a horizontal plane during movement throughout its entire orbit.

20. In an apparatus of the class described a pair of spaced similar curved track members, a loading mechanism including a skeleton basket movable along said track members, a pantograph mechanism for maintaining the basket in a horizontal plane during movement along said track members, and a movable receiver mechanism arranged for disposition adjacent the basket and into which the contents of the basket are transferred during the movement of the latter.

21. In an apparatus of the class described a pair of spaced similar track members having sections at different elevations, a loading mechanism including a basket movable along said track members, and a receiver arranged for disposition adjacent the track members and into which the contents of the basket are transferred during the downward movement of the latter, said basket and said receiver each including spaced fingers, the fingers of the basket being staggered with respect to the fingers of the receiver whereby the load may be transferred from one set of fingers to the other as the basket is moved through its orbital path.

22. In an apparatus of the class described a pair of spaced similar track members having portions at different elevations, a loading mechanism including a basket movable along said track members, a receiver arranged for disposition adjacent the track members, said basket and said receiver each including spaced fingers, the fingers of the basket being staggered with respect to the fingers of the receiver whereby the load may be transferred from one set of fingers to the other as the basket is moved downwardly along said track members, and counterbalancing springs for opposing the descending movement of the basket when loaded and assisting the ascending movement of the basket when empty.

23. In an apparatus of the class described a rotary support member, a pair of similar carriers arranged on said support member, a loading station, and an unloading station, said carriers being so arranged that one of them is in position for loading while the other is in position for unloading, each of said carriers adapted to receive a plurality of horizontally disposed sticks of material, and each carrier being mounted for rotation on an axis at right angles to the axis of rotation of the support whereby the sticks may be transferred in said carriers from the loading to the unloading station in horizontal position and unloaded in vertical position.

24. In an apparatus for handling and subdividing lengths of frozen material, means for encircling and gripping at spaced points a bundle consisting of a plurality of lengths of frozen material, means for transversely severing the bundle at points between said gripper means, whereby to provide a plurality of layers of shorter lengths held by the individual grippers, and means for simultaneously releasing the stack of layers from the grippers with the layers in superimposed relationship.

25. In combination means for carrying a stack of layers of individual portions of ice cream, and an unloading table adapted to be manually shifted into and out of operative relationship with the carrier, said unloading table being spring pressed upwardly and horizontally revoluble about an axis disposed beyond the confines of the table.

26. Apparatus of the class described including a cutter mechanism, a skeleton carrier mechanism for a bundle of ice cream sticks, said carrier mechanism being movable through the cutter mechanism to effect severance of the sticks, a screw shaft, a draw bar on the carrier mechanism, clutching means carried by the draw bar for operative engagement with the screw shaft, means for manually effecting engagement of the clutching means with the screw shaft, and means for automatically effecting disconnection of the draw bar and the screw shaft after a predetermined relative movement of the draw bar.

27. A method of forming individual portions of ice cream or the like prior to packaging, which consists in assembling a stack of hard, frozen, peripherally wrapped ice cream sticks in laterally juxtaposed position, circumferentially gripping the assembly at a plurality of spaced points, and severing the ungripped portions of the assembly transversely to provide a plurality of layers of individual ice cream portions.

28. A method of forming individual portions of ice cream or the like prior to packaging, which consists in assembling a stack of hard, frozen, peripherally wrapped ice cream sticks in laterally juxtaposed position, circumferentially gripping the assembled sticks at a plurality of points, severing the assembly transversely along planes paralleling and between the planes of the grippers to provide a plurality of layers of individual ice cream portions, separating the layers, interposing separator material between them, moving the layers again into abutment to clamp the separator material, and depositing the stack of layers thus formed upon a support.

29. In an apparatus for handling and subdividing lengths of frozen material, means for encircling and gripping at spaced points a bundle consisting of a plurality of lengths of frozen material, means for transversely severing the bundle at points between said gripper means, whereby to provide a plurality of layers of shorter lengths held by the individual grippers, means for rotating said gripper means to bring said layers into superposed positions, and means for simultaneously releasing the layers from the gripper means with the layers in said superposed positions.

30. In an apparatus for handling and subdividing lengths of frozen material, means for encircling and gripping at spaced points a bundle consisting of a plurality of lengths of frozen material, a plurality of parallel reciprocating cutters for transversely severing the bundle at points between said gripping means, whereby to provide a plurality of layers of shorter lengths held by the gripping means, means for simultaneously moving each alternate cutter upwardly during downward movement of the remaining cutters, and means for effecting relative axial separation of the layers thus cut.

31. In an apparatus for handling and subdividing lengths of frozen material, means for encircling and gripping at spaced points a bundle consisting of a plurality of lengths of frozen material, a plurality of parallel reciprocating cutters for transversely severing the bundle at points between said gripping means, whereby to provide a plurality of layers of shorter lengths held by the gripping means, means for simultaneously moving each alternate cutter upwardly during downward movement of the remaining cutters, and means for rotating the bundle to bring the layers into superposed positions.

32. A machine for simultaneously cutting a plurality of rods of frozen comestible into unit sections for packaging, including a series of par-

allel cutters spaced apart to equal distances dependent upon the length of the unit sections to be formed, and a carrier including a plurality of pairs of clamp members, each pair cooperatively encircling a plurality of said rods to hold them together in a bundle, said pairs each being of a width less than the distance between adjacent cutters, and said pairs being spaced apart lengthwise of said rods, whereby said carrier and said cutters may be moved relatively to effect cutting of all of said rods in planes between adjacent clamping pairs, and each pair of clamping members serving to hold said rods together before cutting and hold a separate layer of unit sections together after cutting.

33. A machine for simultaneously cutting a plurality of rods of frozen comestible into unit sections for packaging, including a series of parallel cutters spaced apart to equal distances dependent upon the length of the unit sections to be formed, and a carrier including a plurality of pairs of clamp members, each pair cooperatively encircling a plurality of said rods to hold them together in a bundle, said pairs each being of a width less than the distance between adjacent cutters, and said pairs being spaced apart lengthwise of said rods, whereby said carrier and said cutters may be moved relatively to effect cutting of all of said rods in planes between adjacent clamping pairs, and each pair of clamping members serving to hold said rods together before cutting, and hold a separate layer of unit sections together after cutting, said pairs of clamp members being relatively movable lengthwise of said rods to separate the cut layers.

34. A machine for simultaneously cutting a plurality of rods of frozen comestible into unit sections for packaging, including a series of parallel cutters spaced apart to equal distances dependent upon the length of the unit sections to be formed, and a carrier including a plurality of pairs of clamp members, each pair cooperatively encircling a plurality of said rods to hold them together in a bundle, said pairs each being of a width less than the distance between adjacent cutters, and said pairs being spaced apart lengthwise of said rods, whereby said carrier and said cutters may be moved relatively to effect cutting of all of said rods in planes between adjacent clamping pairs, and each pair of clamping members serving to hold said rods together before cutting and holding a separate layer of unit sections together after cutting, said carrier being movable about a horizontal axis to bring said layers into superposed position.

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