

May 17, 1960

R. J. FAY

2,936,557

SANDWICH ASSEMBLY AND PACKAGING MACHINE

Filed July 21, 1958

16 Sheets-Sheet 1

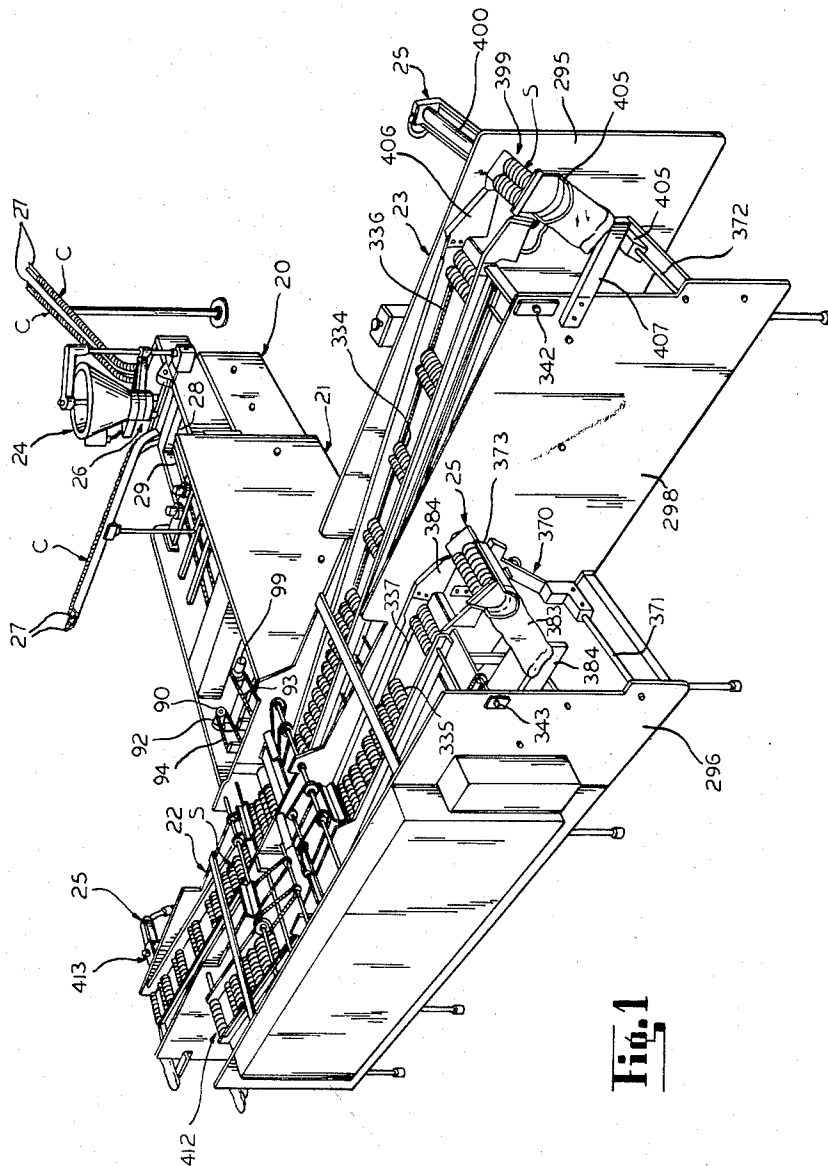


Fig. 1

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Kline, Sherman, Meloni, Gross & Simpson
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May 17, 1960

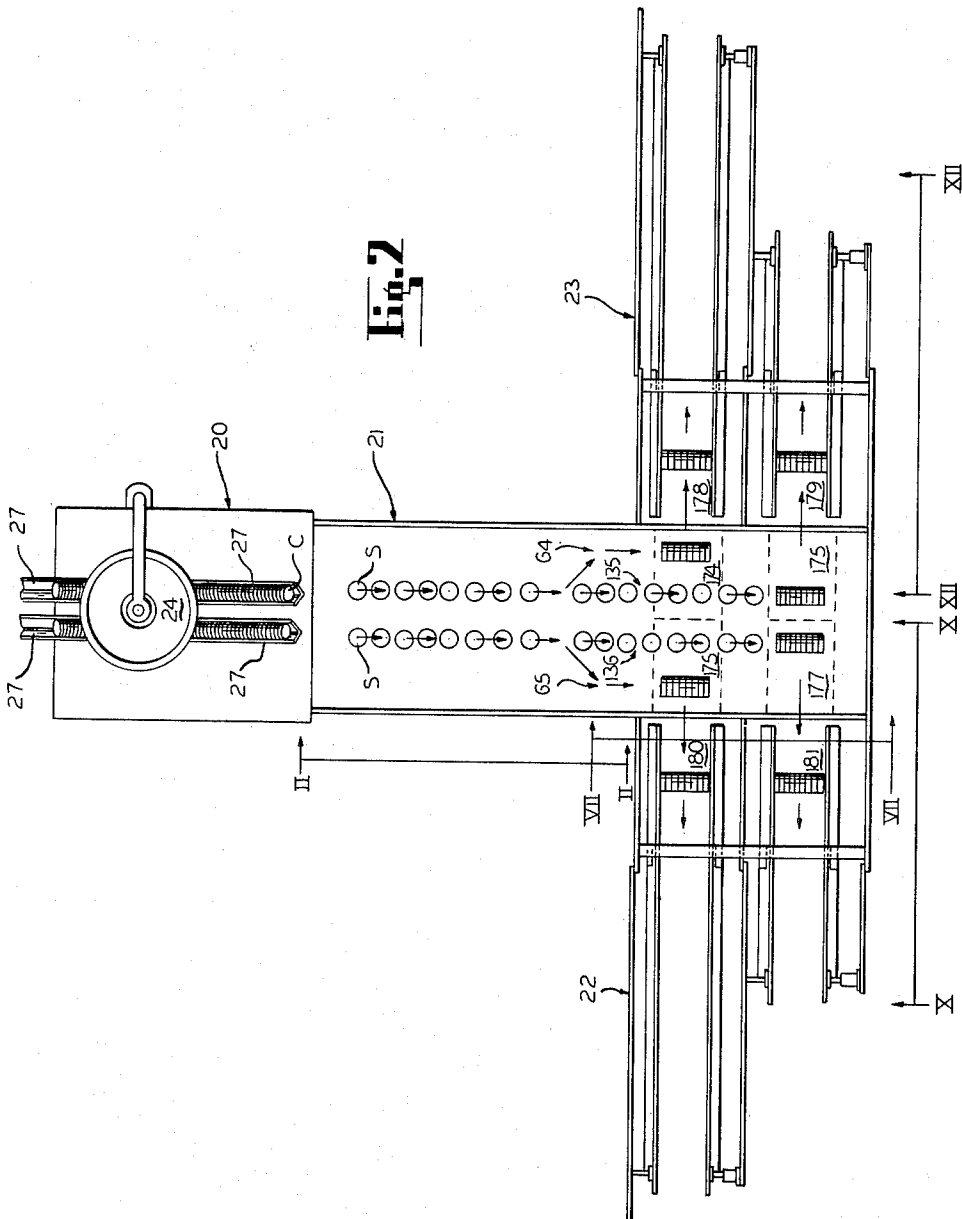
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SANDWICH ASSEMBLY AND PACKAGING MACHINE

Filed July 21, 1958

16 Sheets-Sheet 2



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SANDWICH ASSEMBLY AND PACKAGING MACHINE

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16 Sheets-Sheet 3

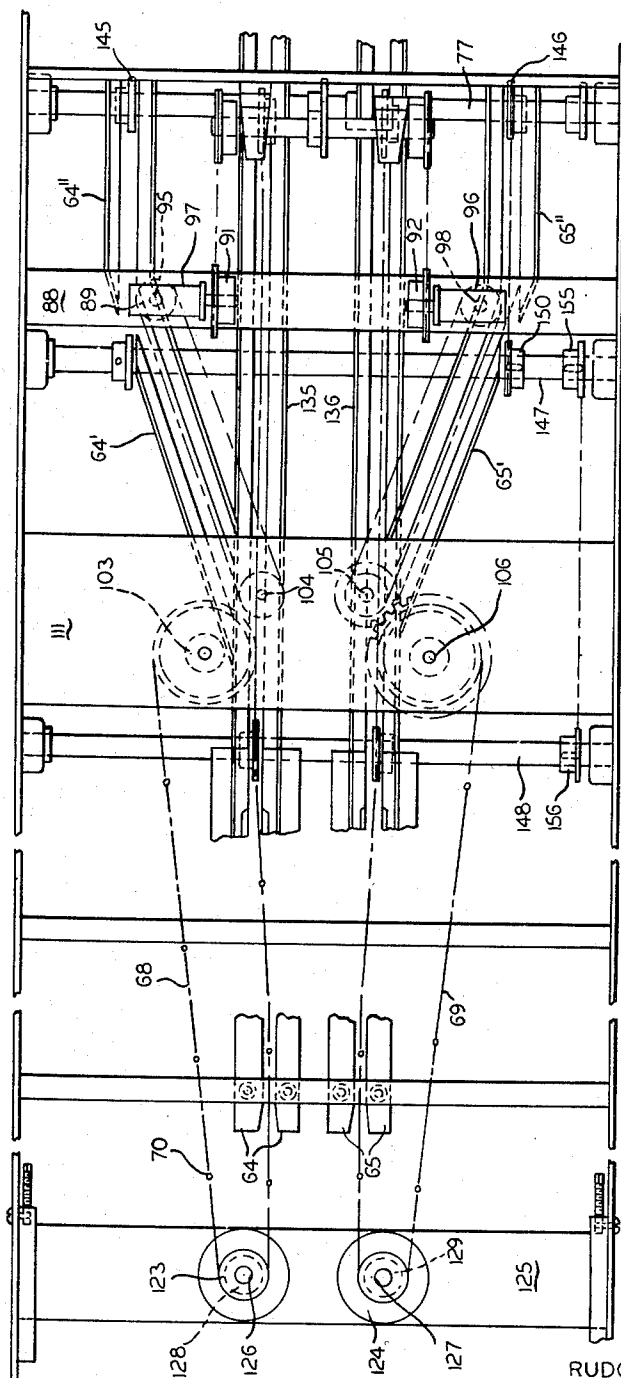


Fig. 3

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SANDWICH ASSEMBLY AND PACKAGING MACHINE

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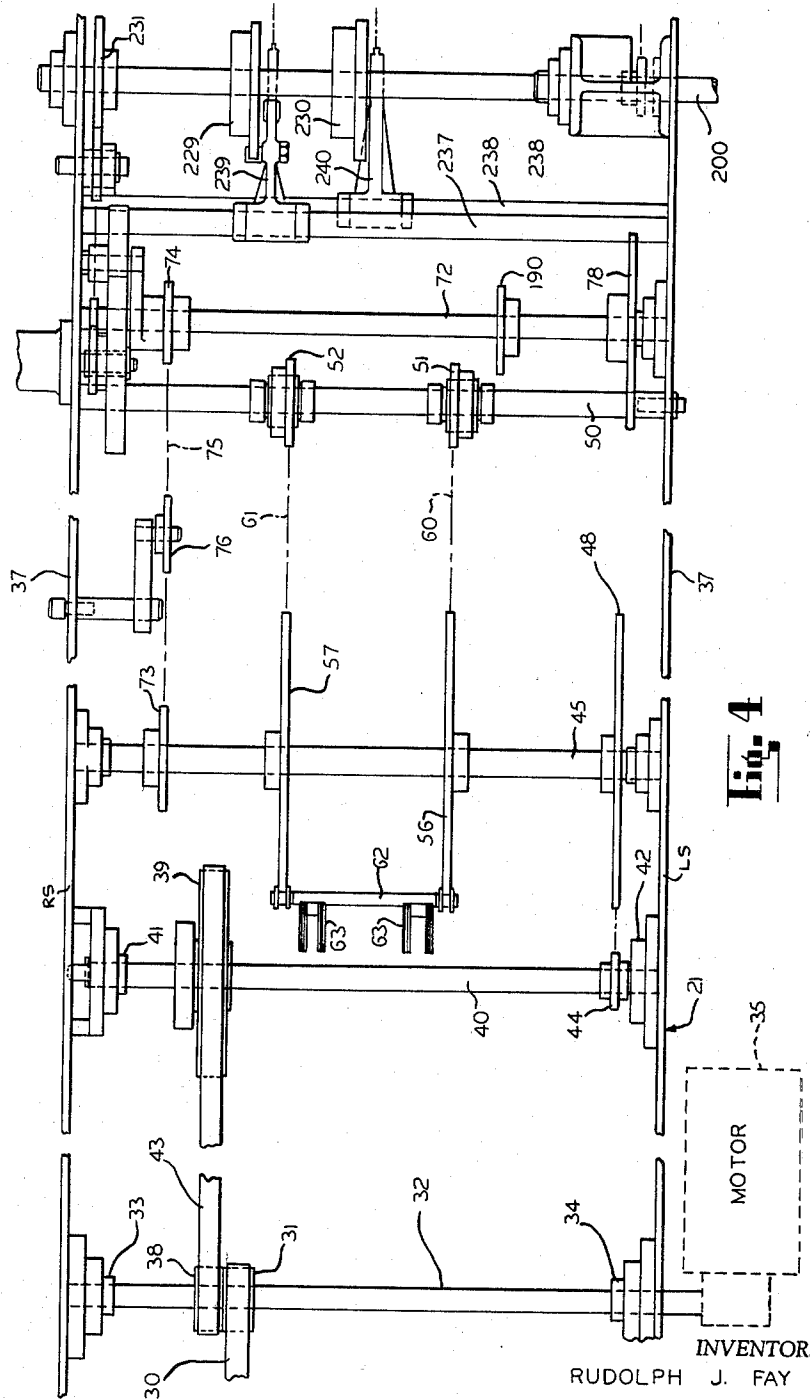


Fig. 4

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SANDWICH ASSEMBLY AND PACKAGING MACHINE

Filed July 21, 1958

16 Sheets-Sheet 5

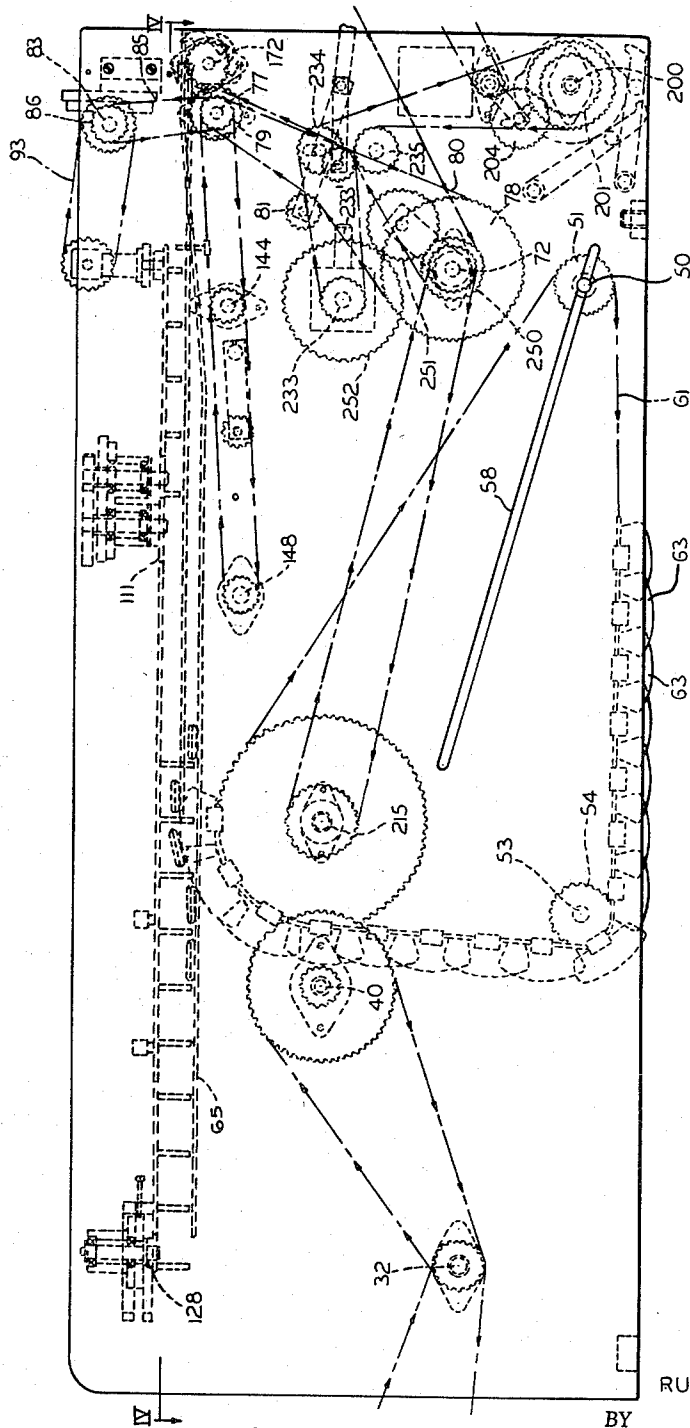


Fig. 5

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SANDWICH ASSEMBLY AND PACKAGING MACHINE

Filed July 21, 1958

16 Sheets-Sheet 6

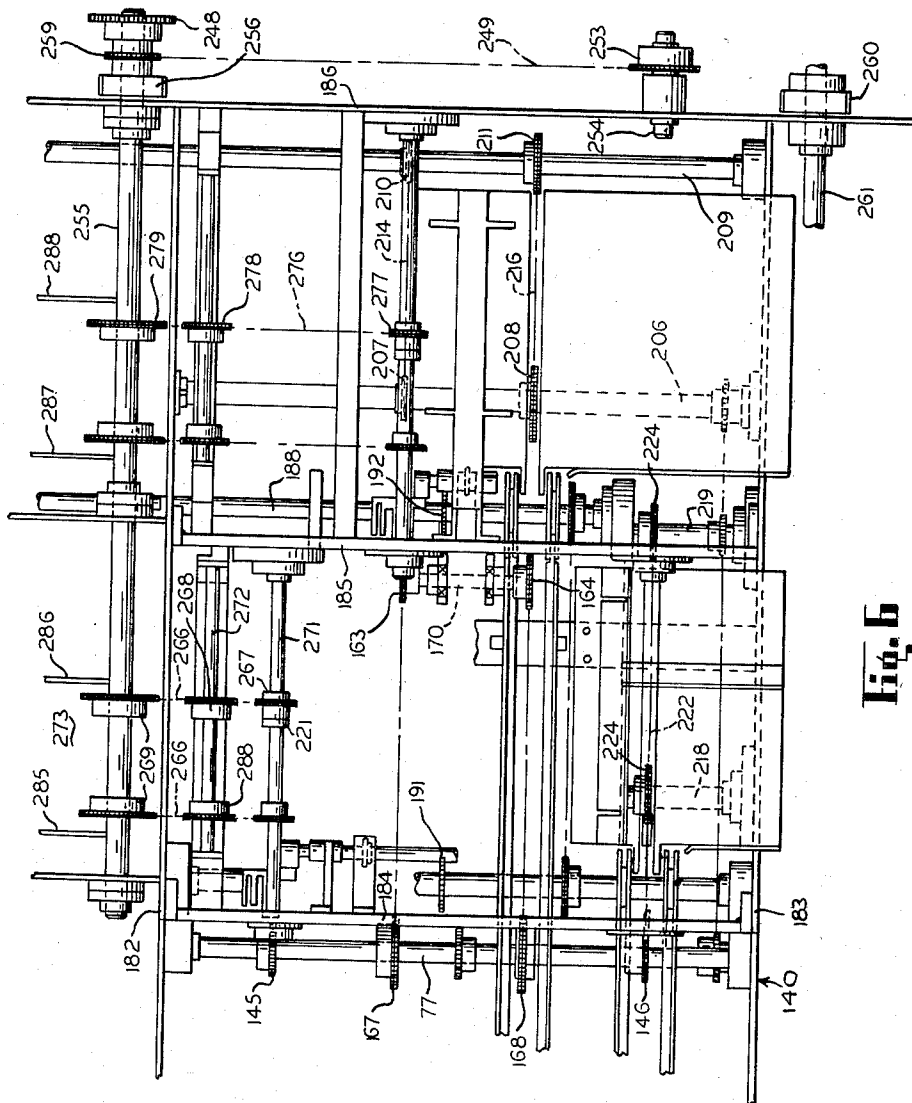


Fig. 6

INVENTOR.

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Hill, Sherman, Merani, Casper & Simpson

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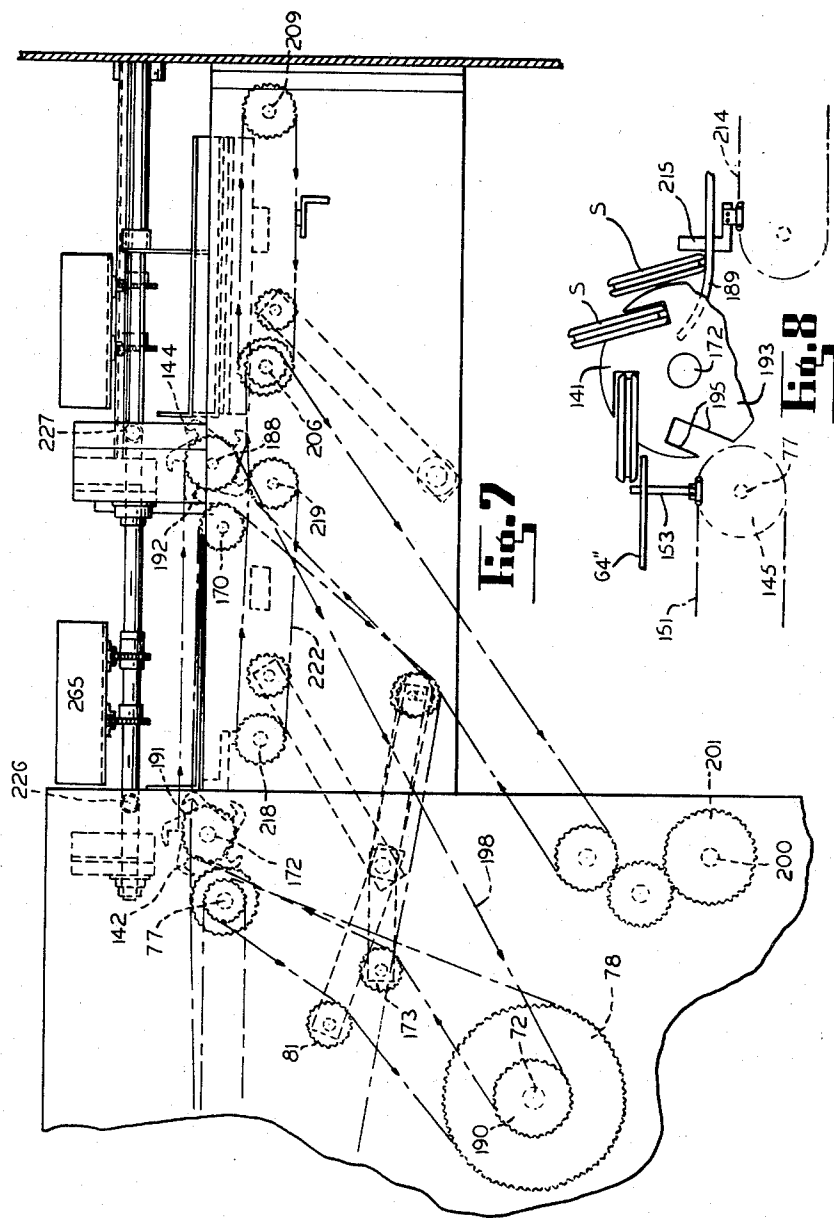
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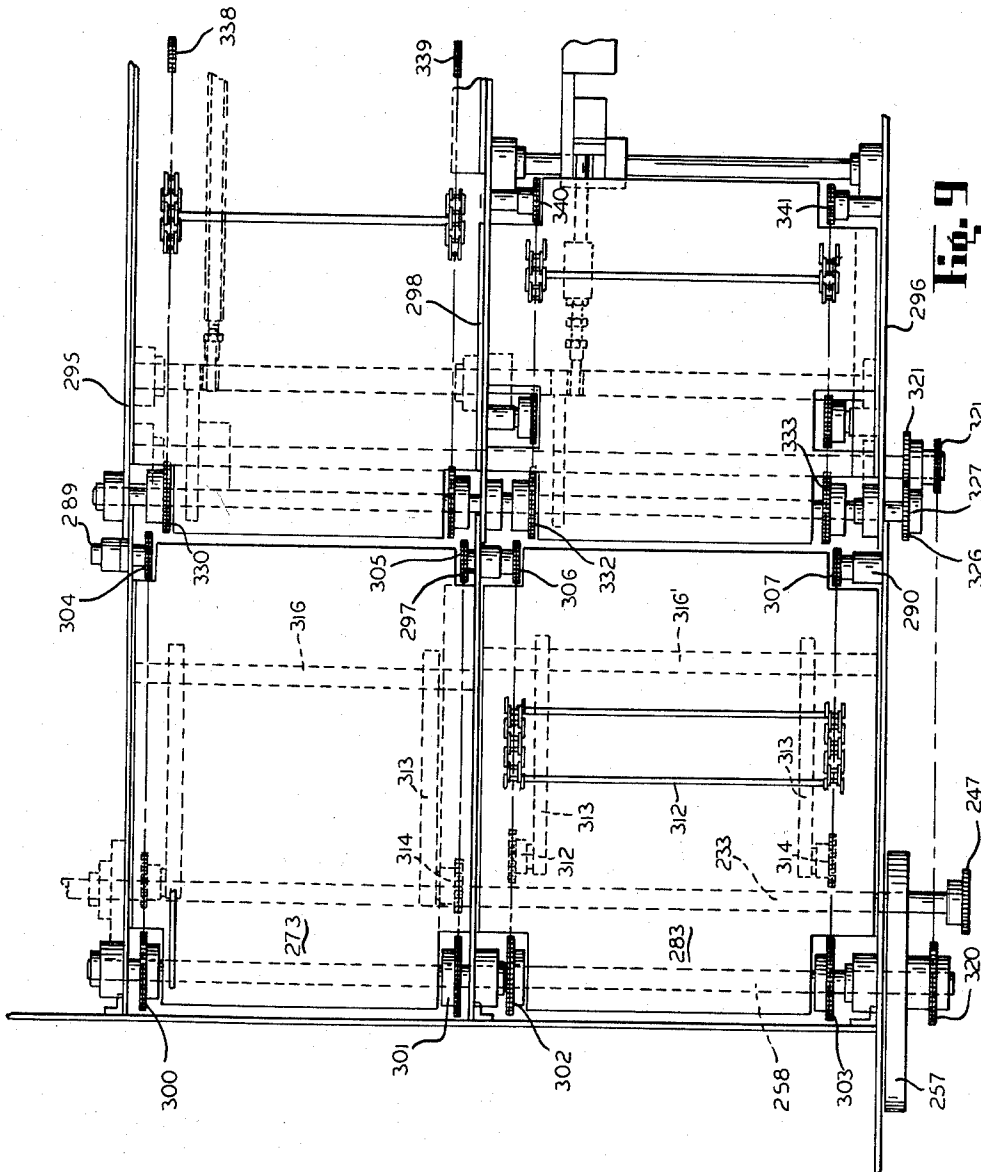


Fig. 9

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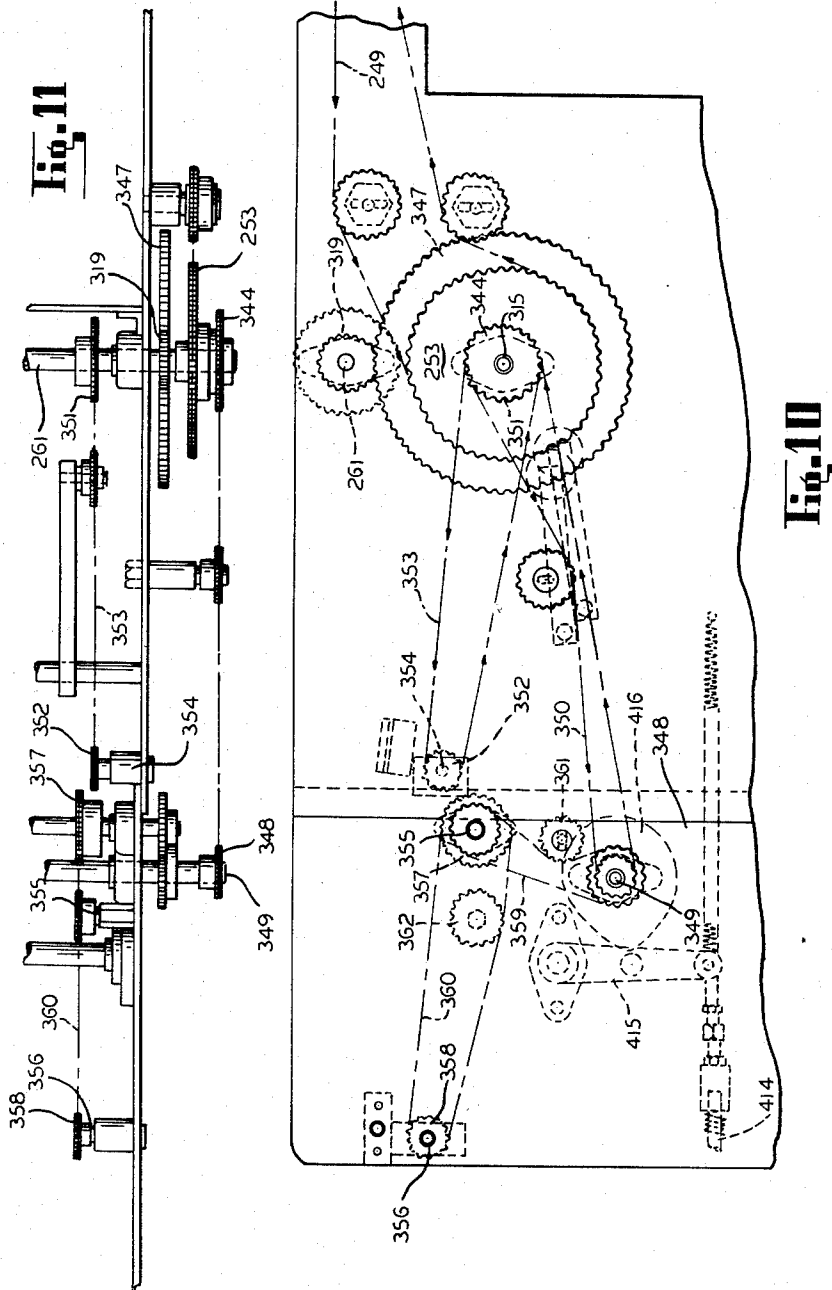
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SANDWICH ASSEMBLY AND PACKAGING MACHINE

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INVENTOR.
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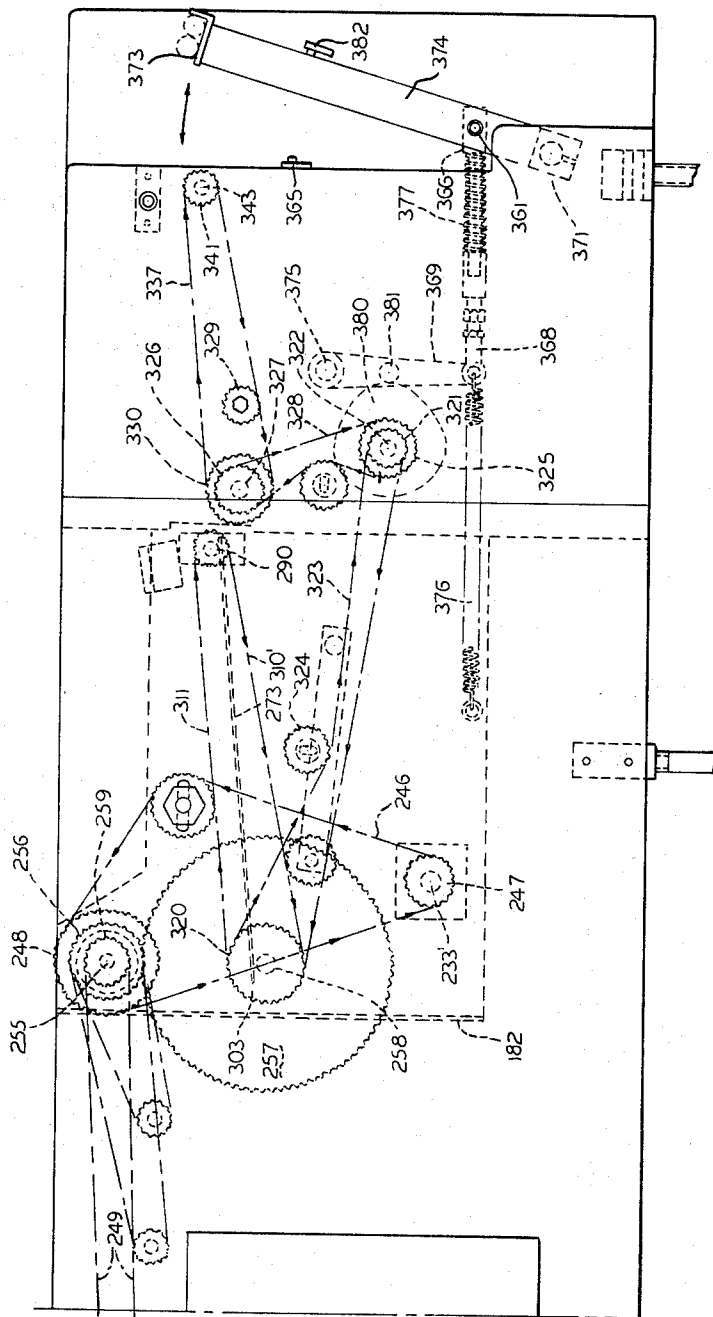


Fig. 12

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SANDWICH ASSEMBLY AND PACKAGING MACHINE

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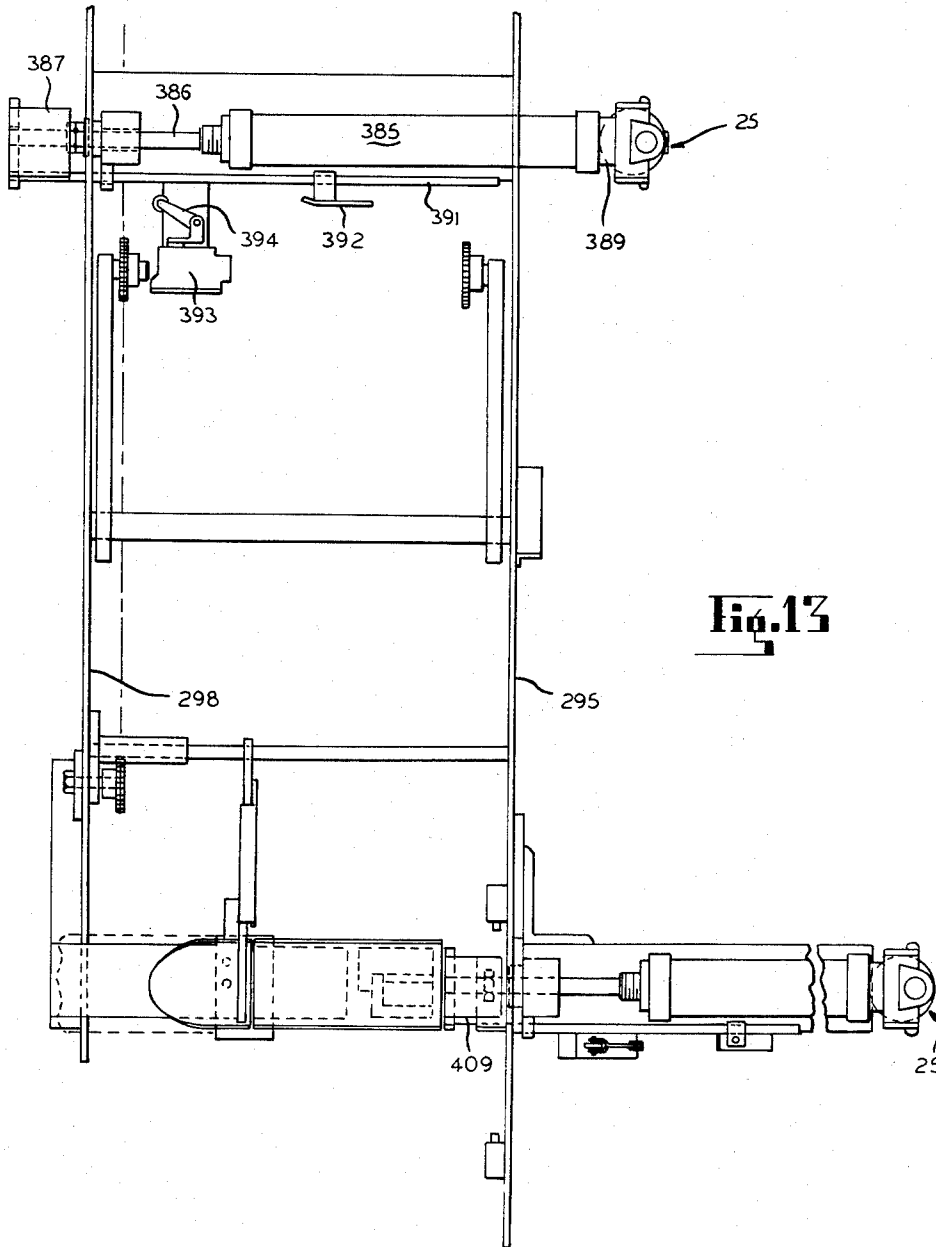


Fig. 13

INVENTOR.
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SANDWICH ASSEMBLY AND PACKAGING MACHINE

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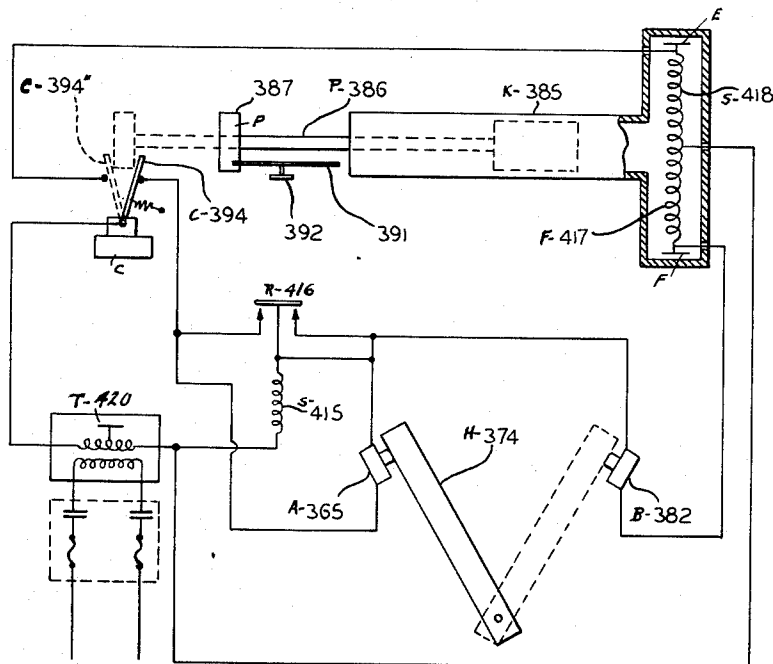


Fig. 14

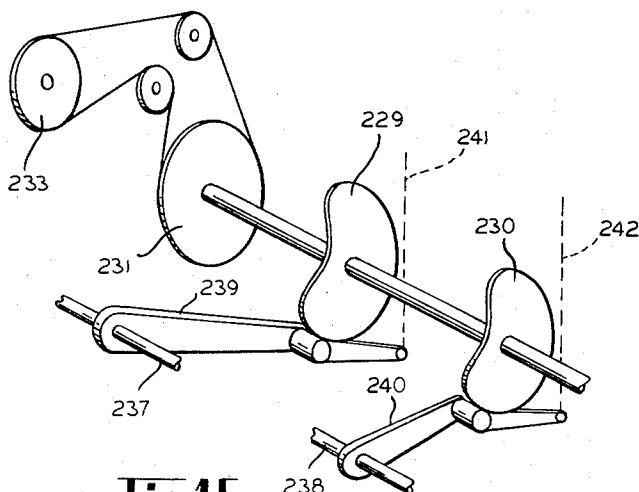


Fig. 15

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SANDWICH ASSEMBLY AND PACKAGING MACHINE

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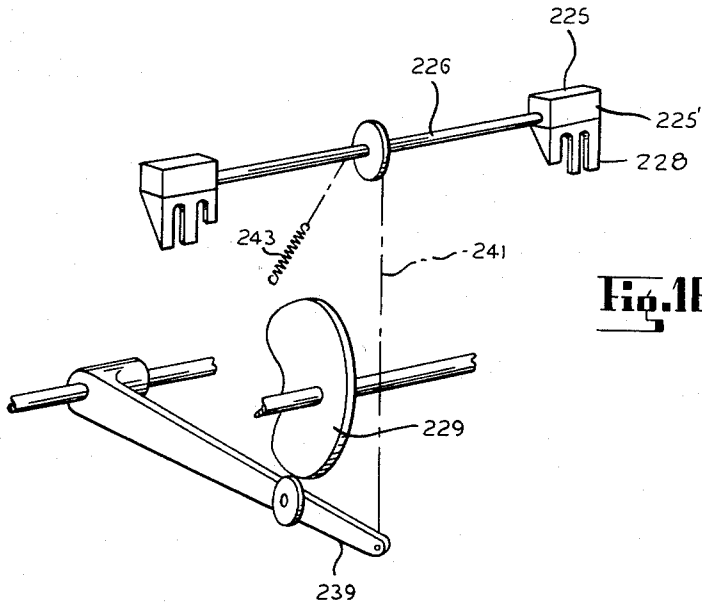


Fig. 16

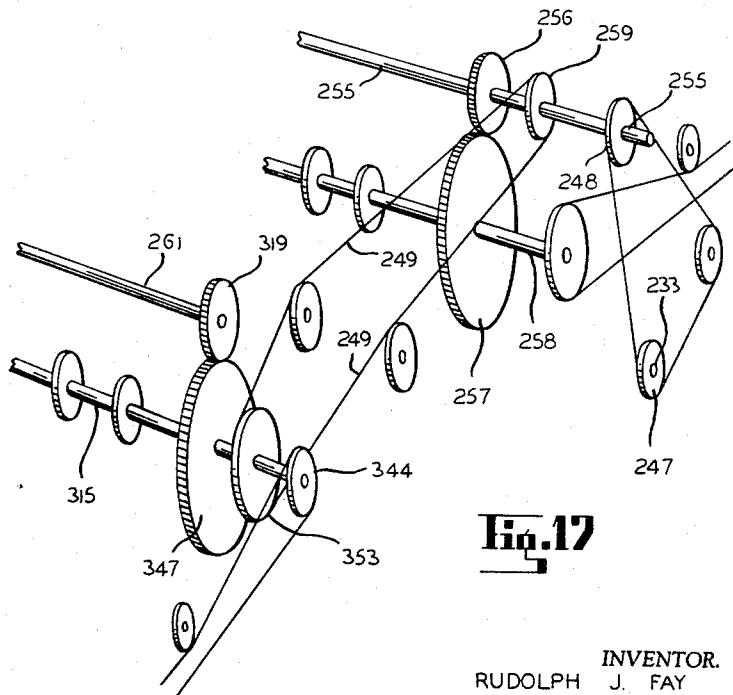


Fig. 17

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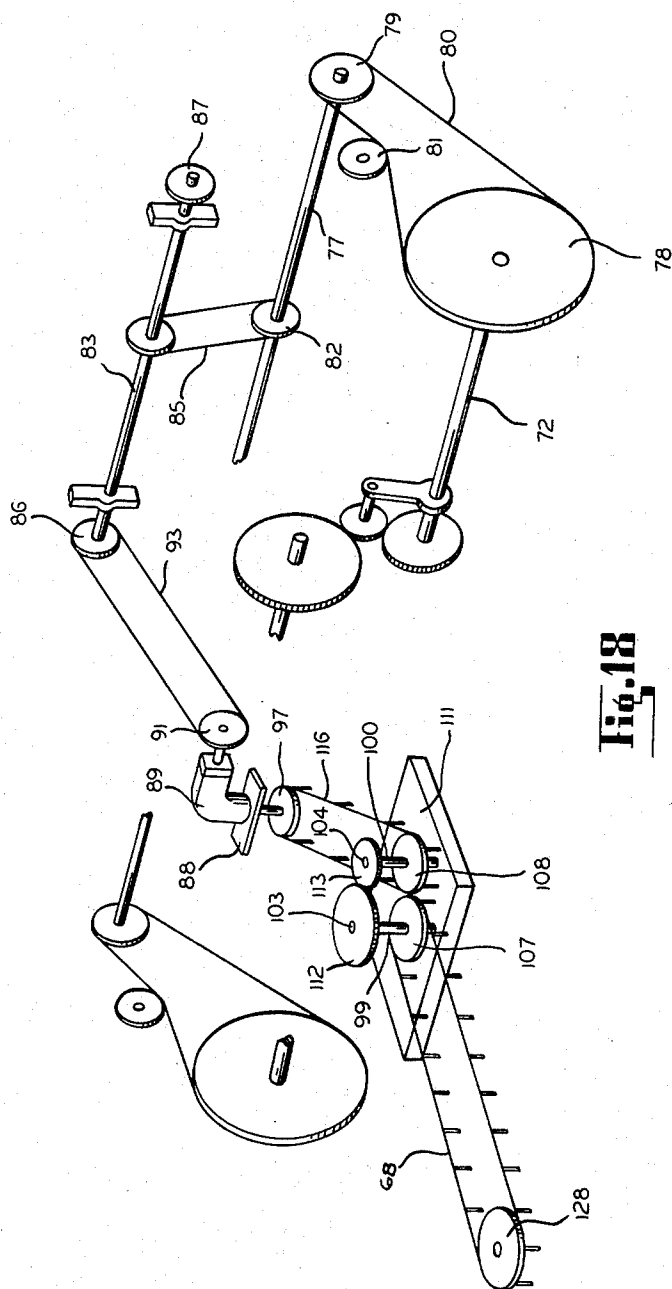
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SANDWICH ASSEMBLY AND PACKAGING MACHINE

Filed July 21, 1958

16 Sheets-Sheet 14



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SANDWICH ASSEMBLY AND PACKAGING MACHINE

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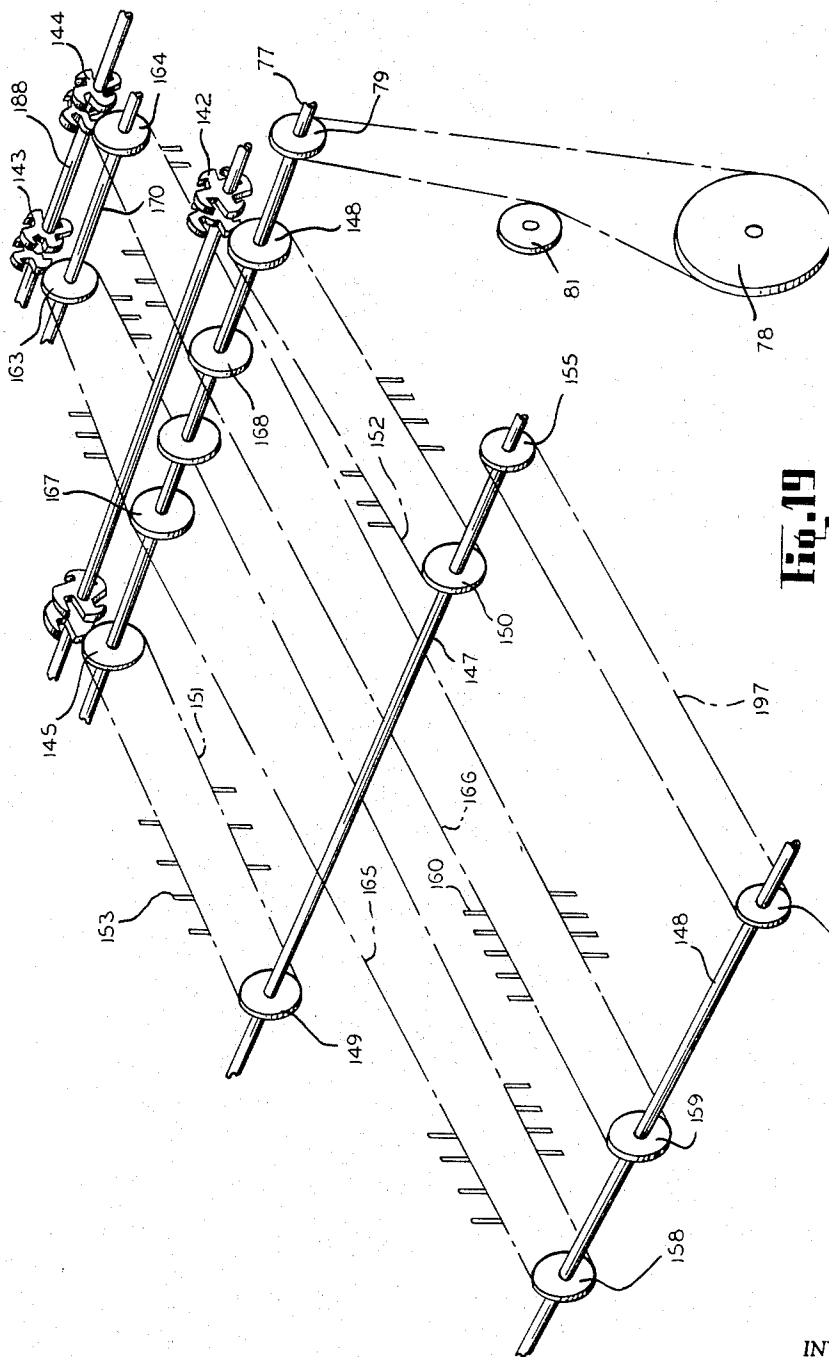


Fig. 19

INVENTOR.

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SANDWICH ASSEMBLY AND PACKAGING MACHINE

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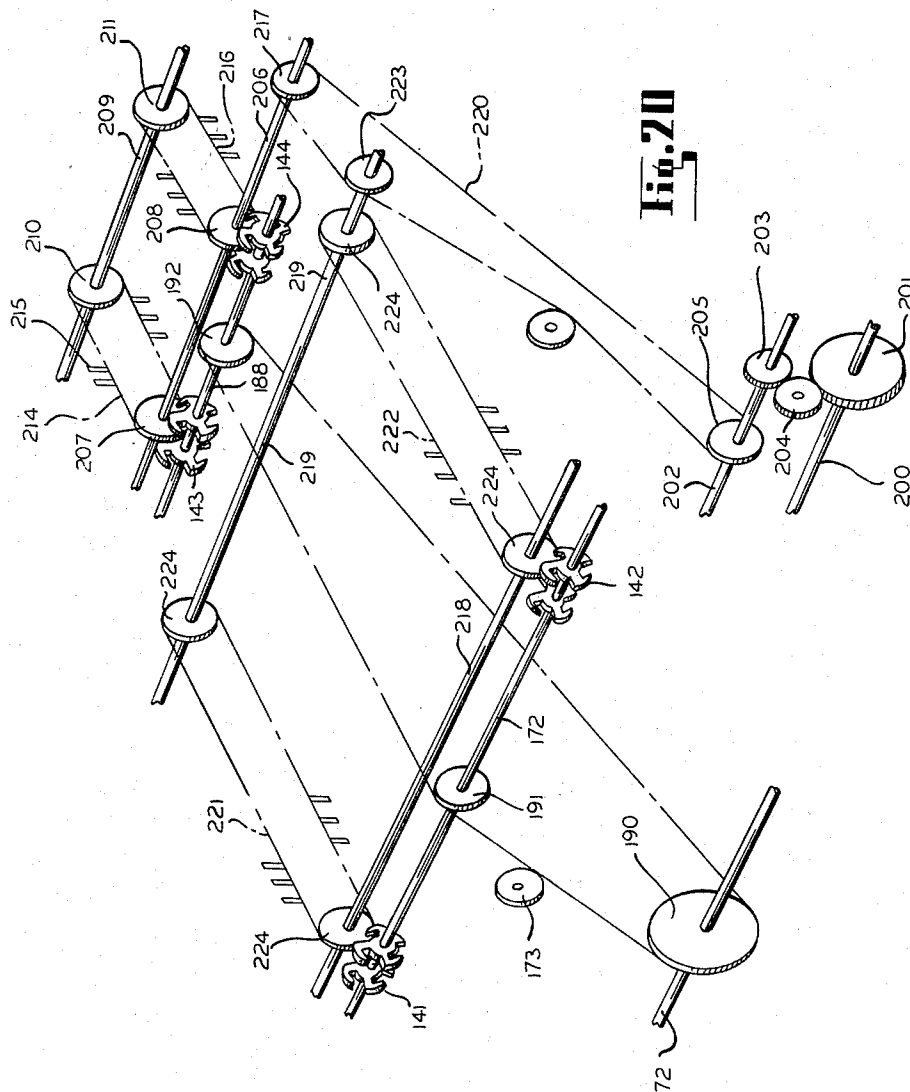


Fig. 20

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SANDWICH ASSEMBLY AND PACKAGING MACHINE

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Application July 21, 1958, Serial No. 750,012

24 Claims. (Cl. 53—159)

This invention relates to new and useful improvements in sandwich machines for assembling and packaging "sandwiches" of the type which comprises two cookies with a filler of creme between them.

Generally described, the cooky sandwich assembly and packaging machine of the present invention comprises means for supplying cookies to be assembled with filling material, such as creme, means for supplying additional cookies for combination with cookies deposited and coated with filling material to complete the sandwiches, conveying means for handling the cooky sandwiches combined with endless feeder chains or conveyors provided with projecting prongs affording cells or pockets for the reception of the sandwiches which permits them to be arranged in groups and stacks, the chains combined with control mechanism wherein the sandwiches being conveyed along a path of delivery are directed into ways of passage for automatic packaging in suitable containers available to the consumer.

Another primary object of this invention is to provide a sandwich machine for assembling cooky sandwiches and conveying them as flat objects in a row, or plurality of rows, to suitable endless feeder chains or conveyors where they are indexed in groups, repositioned in a vertical manner and arranged into horizontal stacks, conveyed to an auxiliary conveyor, or a plurality of auxiliary conveyors which are arranged to extend at right angles to the main conveyor, removed from the main conveyor to the auxiliary conveyor, or conveyors, by power driven paddles moving transversely above the main conveyor, moved continuously in a side manner along the auxiliary conveyor, divided into pairs of stacks, or any suitable number of stacks, and finally conveyed onto a movable loading tray by which they are loaded pneumatically into the suitable containers arranged therewith for disposition as desired.

One of the objects of the present invention is the provision of novel synchronizing means whereby all of the moving parts are actuated in timed relation with each other in accordance to some circumstance or condition.

A further object of the invention is to provide novel means for removing the completed cooky sandwiches from the cooky sandwich assembly conveyor means, conveying the sandwiches along as flat objects to suitable means to index the same into groups of desired numbers, then indexing the groups to travel in upper and lower flights of travel for stacking and again lowering all the stacks to a common level for packaging at a plurality of stations.

A still further object of the invention is to provide means for repositioning sandwiches while they are moving as individual flat objects in groups on one conveyor, transferring them and arranging them upon a second conveyor in a vertical manner with contacting sides, and forming horizontally positioned stacks of sandwiches for traveling longitudinally thereon.

Another and more specific object of the invention is the provision of demountable buckets upon a continuously running endless chain whereby the presence or absence

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of the buckets running in a continuous manner will determine the number of sandwiches arranged into stacks for packaging.

Other objects and advantages, more or less ancillary of the foregoing and the manner in which all the various objects are realized will appear in the following description and accompanying drawings wherein there is assembled and pointed out certain details of structure and aggroupment of parts connotative of the scope of the invention.

Figure 1 is a perspective top view of a cooky sandwich assembly and packaging machine constructed according to this invention;

Figure 2 is a diagrammatic plan view of the machine shown in Figure 1;

Figure 3 is a fragmentary plan view of the upper section of the forward end portion of the main conveyor frame which joins the discharge end of the cooky assembly machine;

Figure 4 is a fragmentary plan view of the central section of the main conveyor frame taken substantially on line 4—4 of Figure 5 and showing the power driving shafts in position of operation;

Figure 5 is a side elevational view of main conveyor unit shown in Figures 3 and 4 with operating shafts, gears and associated parts shown dotted in position of operation;

Figure 6 is a fragmentary top plan view of the mechanism interposed between the main conveyor and the auxiliary conveyors arranged at right angles therewith, for removing the stacks of cooky sandwiches from said main conveyor and depositing them on the second conveyor, parts omitted for clearness of observing parts in position of operation;

Figure 7 is a fragmentary vertical sectional view of the main conveyor showing the mechanism for repositioning flat objects into a vertical position;

Figure 8 is a somewhat enlarged detail view of the article repositioning means shown in Figure 7, and with cooky sandwiches arranged therein;

Figure 9 is a fragmentary plan view of the entrance end of one of the auxiliary conveyors showing rods and associated means for moving stacks of cooky sandwiches in sidewise manner, combined with means for dividing them into pairs of stacks for dual packaging;

Figure 10 is a fragmentary side elevational view of the auxiliary conveyor, parts removed, showing the details of mechanism for moving the stacks of cooky sandwiches toward the packing end of the machine;

Figure 11 is a fragmentary top plan view of the mechanism shown in Figure 10, some parts omitted;

Figure 12 is a fragmentary side elevational view of the auxiliary conveyor shown in Fig. 9, some parts omitted;

Figure 13 is a fragmentary plan view of the packaging end of one of the auxiliary conveyors, showing the air cylinders and parts associated therewith for ejecting pairs of stacks of sandwiches into separate containers;

Figure 14 illustrates diagrammatically a circuit diagram of the electrical control system employed with this machine;

Figure 15 is a fragmentary, diagrammatic, perspective view of the cams and chains for effecting oscillation of the shaft supporting fork means for moving stacks of cooky sandwiches;

Figure 16 is a fragmentary, diagrammatic, perspective view, similar to Figure 15, showing the stack straightening bridge members with clamping means associated therewith;

Figure 17 is a fragmentary, diagrammatic, perspective view showing the operating mechanism disclosed in Figure 12;

Figure 18 is a diagrammatic, perspective view, showing the operative mechanism disclosed in Figure 5;

Figure 19 is a diagrammatic, perspective view, showing the driving mechanism for parts shown by Figure 5; and

Figure 20 is a diagrammatic, perspective view, showing the driving mechanism as disclosed in Figure 7.

Referring to the drawings, there is disclosed therein a cooky sandwich assembling machine and conveyors coordinating together for counting, stacking, dividing and packaging cooky sandwiches.

Briefly the sandwich machine of this invention includes a cooky sandwich assembly machine 20, a main sandwich conveyor unit 21 adjacent said sandwich assembly machine 20, two auxiliary sandwich conveyor units 22 and 23 adjacent the exit end of the main conveyor unit, positioned and extending at right angles thereto, each of said auxiliary conveyor units embodying two pneumatic packaging devices, each designated by the numeral 25.

The cooky sandwich assembling machine 20 includes a creme hopper 24, a depositor 26, four cookie troughs 27, a carrier chain 28 in the right side of the machine, a second carrier chain 29 in the left half thereof as shown in Figures 1 and 2; the present machine being designed to simultaneously assemble two rows of sandwiches. The carrier chains 28 and 29 have suitable cooky carrying pockets and are supported by shafts and sprockets not shown herein. Said cooky sandwich assembling machine is power operated by the intermediation of a timing belt 30 trained around a pulley 31 keyed on the common drive shaft 32 extending between the sides of the frame work 36 and suitably journaled in bearings 33 and 34 therein for rotative movement, as shown by Figure 4. The common drive shaft 32 is shown as being driven by a motor 35, said motor made to be arranged in any suitable place and connected to said shaft 32 by any satisfactory means. Located above said pair of carrier chains 28 and 29 are assembled four cooky troughs 27 for holding a quantity of cookies "C"; two of the troughs 27 being arranged near the inlet end of the cooky sandwich assembling machine and two of the troughs 27 located near the outlet end of said machine. Between said pairs of troughs 27 is located the creme depositor 26. Cookies "C" are fed from the first pair of troughs 27 upon the traveling chains and thereupon they travel beneath the creme depositor 26 including an auger feed for depositing creme from two creme outlets to simultaneously deposit the creme on the cooky traveling at the same time in each of the two rows. The second pair of troughs 27 allows a cooky to be deposited upon the creme coated cooky, after which they are compressed together to spread out the creme located therebetween. After being compressed the two rows of cooky sandwiches "S" are moved by the two traveling chains 28 and 29 to the end of the assembly unit 20 for transfer to the main conveyor unit 21 arranged and secured adjacent thereto.

The main conveyor unit 21 includes a suitable frame work 36 with side wall 37 for enclosing the same. Said power shaft 32 is located in the lower section of the main conveyor unit 21 as is clearly shown in Figure 5. A pulley 38 is keyed upon said shaft 32 adjacent said pulley 31 for transmitting power to said main conveyor unit 21. A speed reducing pulley 39 is secured to a shaft 40 extending transversely of the unit and rotatable in bearings 41 and 42 supported by a frame work 36. For driving said shaft 40, a timing belt is provided extending around said pulley 38 on shaft 32 and around said pulley 39 on shaft 40 for this purpose.

The cooky sandwich assembling machine 20 and the main conveyor unit 21 are driven by the timing belts 30 and 43 on said common shaft 32 and maintain in synchronism.

Referring now to Figures 2, 3, 4, and 5, the preferred embodiment of the cooky sandwich conveyor, counting and stacking mechanism is disclosed wherein the parts are suitably operated and driven from the common power shaft 32. In order to count the sandwiches and separate

them for stacking, bucket type means are rotatably mounted intermediate the side walls of the conveyor unit. As a means to clarify the description of the machine, as viewed from above, in Fig. 1, the left side is marked L.S. while the right side of the machine is marked R.S.

A sprocket 44 is mounted at the left end of said shaft 40 for driving the bucket counting shaft 45 mounted parallel with shaft 40 and rotatable in bearings 46 and 47 supported by the frame work 36. A sprocket 48 is secured adjacent the left end of said shaft 45. For driving said shaft 45, a chain is provided extending around sprocket 44 and around sprocket 48 for this purpose. A shaft 50 is arranged transversely of the conveyor unit, the ends thereof slidably mounted in angularly arranged slot 53 provided in the side wall 37 with suitable locking means. Intermediate the ends of said shaft 50 are mounted thereon a pair of sprockets 51 and 52 spaced a suitable distance apart. An idler shaft 53 is located below and between said shafts 40 and 45, and arranged with a pair of idler sprockets such as sprocket 54 thereon, as shown by Figure 5. A pair of sprockets 56 and 57 are mounted upon shaft 45 and spaced transversely in line with sprockets 51, 52, and 54 associated therewith, each pair of sprockets equally spaced apart. A pair of endless bucket type chains 60 and 61 are provided with cross bar 62 therebetween, the chains extending over said sprockets 51, 52, 54, 56 and 57. By adjusting the location of the end of shaft 50 within said slot 53 the endless bucket chains 60 and 61 can be maintained under desired tension. Said endless chains 60 and 61 have elevating buckets 63 spaced in pairs upon said rod 62, said rods being mountably secured with and between said endless chains as desired. The buckets are continuously arranged, and/or removed, for counting the sandwiches traveling along sandwich troughs 64 and 65 shown by Figures 3 and 5.

The troughs 64 and 65 are constructed of pairs of angle irons suitably positioned adjacent each other with desired space therebetween. For moving sandwiches longitudinally within said troughs 64 and 65, movable flight chains 68 and 69 with depending pins 70 thereon are movably arranged thereabove, later to be described.

The mechanism for driving the flight chains 68 and 69 will now be described. A shaft 72 is transversely arranged above said shaft 50 and parallel with said bucket counting shaft 45. A drive sprocket 73 is secured near the end of shaft 45 adjacent the inner wall 37 at the right side of the conveyor unit 21. A sprocket 74 is secured near the end of shaft 72 and in line with said sprocket 73. A drive chain 75 is disposed around each of said sprockets 73 and 74 for driving the shafts 72. An idler gear 76 is pivotally mounted upon a swinging arm which is secured to the side wall 37 to provide means for tightening said chain 75. A drive sprocket 78 is mounted upon shaft 72 adjacent the inner wall 37 at the left side of the unit 21. A shaft 77 is transversely arranged in bearings in the upper rear section of the conveyor unit 21, as shown in Figure 5. A sprocket 79 is secured to said shaft 77 near the left side of the unit 21. A chain 80 is trained over said sprockets 78 and 79 for driving said shaft 77 at one end thereof. A chain tightening gear 81 is pivotally mounted adjacent said chain 80 for removing the slack therein. Intermediate the ends of said shaft 77 is mounted a drive sprocket 82. Substantially vertically above said shaft 77 is rotatably mounted a short shaft 83 in bearings suitably spaced and secured to a wall panel vertically arranged transversely of the unit 21 and between the side walls 37 thereof, as shown by Fig. 5. Intermediate the ends of said short shaft 83 is secured a sprocket 84 substantially vertically above said sprocket 82. For driving said shaft 83, a chain 85 is provided extending around sprockets 82 and 84. At the opposite ends of said shaft 83 are secured sprockets 86 and 87. Between the side panel 37 is secured a supporting bar 88, said bar being arranged forwardly

of said shaft 83 and in a plane substantially horizontal herewith. Two right angles drive units 89 and 90 are mounted upon said bar 88 as shown by Figure 1. Said drive units embody a housing of inverted L shape configuration, a vertical portion of each having base portion secured to said bar 88. The upper short horizontal portions of said housing extend towards the center of the unit 21. Each housing provided with suitable bearings for supporting short shafts embodied therein, said shafts having end portions extending outwardly from the housings and projecting inwardly of the machine. One sprocket is mounted upon each of said outwardly extending shaft end portions and are designated 91 and 92 respectively, shown by Figure 3. Two short chains 93 and 94 are trained over said sprockets 86, 87, 91 and 92 for driving short vertical shafts 95 and 96 mounted in and extending downwardly from said drive units 89 and 90 and projecting through an aperture in said bar 88. A pair of horizontally arranged sprockets 97, 98 are arranged upon the lower end of said short vertical shafts 95 and 96 extending below said bar 88. Forwardly of said bar 88 is arranged and secured between the side wall 37 a wide horizontal bar 111, said bar 111 spaced above all of the forward flight chains and embodied therewith for conveying the sandwiches. Four gear drive housings 99, 100, 101, 102 of the inverted T shape configuration have their base portions mounted upon the upper side of said bar 111; each housing having a vertical shaft mounted in suitable bearings therein. The upper ends of the vertical shafts 103, 104, 105 and 106 extend above the housings 99, 100, 101 and 102 and support gears 112, 113, 114 and 115 secured thereto, the lower ends of said four vertical shafts extending downwardly through said bar 111 have attached thereto flight sprockets 107, 108, 109 and 110, as shown by Figures 3 and 5. Flight chains 116 and 117 are trained about said flight sprocket 97, 98, 108 and 109 for conveying sandwiches as flat objects in the angular upper flight troughs 121 and 122. Two sprocket drive housings 123 and 125 of inverted T shape configuration are mounted upon a wide horizontal bar 125, said bar mounted near the forward end portion of said conveyor unit 21 and in the same horizontal plane which embodies said bar 111. Vertical shafts 126, 127 are rotatably secured in said housings 123 and 124, the lower ends thereof extending through said bar 125 and supporting flight change sprockets 128 and 129 thereon. Said two flight chains 68 and 69 are trained about said sprockets 107, 110, 128 and 129 for conveying sandwiches as flat objects in the straight sandwich troughs 64 and 65 described above.

Dual troughs 135 and 136 extend rearwardly in the unit 21 as continuations of troughs 64 and 65, and are provided with an upper flight deck providing troughs 64' and 65'. The dual troughs extend from a point directly above counting shaft 45 and rearwardly therefrom. The upper troughs 64' and 65' angle outwardly towards the side walls 37 of the unit 21 to a point above said bar 88 and then parallel with said side walls to the transfer unit 140 assembled at the end of the conveyor unit 21. The lower troughs 135 and 136 continue rearwardly parallel to the side walls of the transfer unit 140. Therefore, said flight chains 68 and 69 will convey cookie sandwiches from the entrance ends of troughs 64 and 65 to the bucket counting means with bucket chains 60 and 61 where a suitable number of cookies are elevated to the upper troughs 64' and 65' after which the same number of sandwiches are allowed to travel in troughs 135 and 136. A pair of flight chains such as indicated at 116 (Figure 18) will convey the sandwiches in the angular position of the upper troughs 64' and 65' where they meet the continued straight portions 64'' and 65'' thereof.

The driving means for conveying the sandwiches from the angular portions of troughs 64' and 65' to the sandwich stackers 141 and 142 on shaft 172 at the end there-

of, and the driving means for conveying sandwiches in the inner lower troughs 135 and 136 from the counting means to the stackers 143 and 144 arranged upon shaft 188 in the transfer unit 140 near the ends of said troughs 64' and 65', will now be described. Shaft 77, rotated by sprockets 79 at the left end thereof has been described above. Two flight chain sprockets 145 and 146 are secured upon said shaft 77 in line with troughs 64'' and 65''. Forwardly of said shafts 79 are arranged two shafts 147 and 148 extending transversely of the conveyor unit 21 and mounted in suitable bearings in the side walls 37; shaft 147 arranged substantially below the exit end portion of troughs 64' and 65' while shaft 148 is arranged substantially midway between said shafts 45 and said shaft 147. Two flight chain sprockets 149 and 150 are mounted upon said shaft 147 and in alignment with said sprockets 145 and 146 on shaft 77. Flight chains 151 and 152 are trained over said sprockets 145, 146, 149 and 150 for driving said shaft 147. Said flight chains 152 and 153 are provided with outwardly extending flight pins 153 which project upwardly through the troughs 64'' and 65'' to convey the sandwiches to the outer stackers 141 and 142. To drive the shaft 148 a sprocket 155 is rigidly mounted upon shaft 147 intermediate sprockets 150 and the left end thereof, as shown by Fig. 3. A sprocket 156 is rigidly mounted upon shaft 148 and in longitudinal alignment with sprocket 155. A chain 197 is trained over said sprockets 155 and 156 driving said shaft 148. For conveying the sandwiches to stackers 143 and 144 two flight chain sprockets 158 and 159 are rigidly mounted upon said shaft 148 below the lower flight troughs 135 and 136. A short flight chain sprocket shaft 170 parallel with shaft 148 is suitably mounted in bearings mounted upon a vertical wall in the transfer unit 140, as shown by Figs. 6 and 7. Two flight chain sprockets 163 and 164 are rigidly mounted upon the ends of said shaft 170 in longitudinal alignment with said sprockets 158 and 159 mounted on shaft 148. Two flight chain sprockets 167 and 168 are freely rotatively mounted upon shafts 77 and are aligned with sprockets 158, 159, 163, and 164. Two flight chains 165 and 166 with flight pins 160 thereon are trained over said sprockets 158, 159, 163, 164, 167 and 168 whereby said pins 160 project upwardly through the troughs 135 and 136 will convey the sandwiches in said troughs to stackers 143 and 144 adjacent the end thereof.

The sandwiches have been conveyed as flat objects by four different series of troughs, and delivered to stackers 141, 142, 143 and 144 for vertical alignment, therefore means for operating the stackers and the stacking transfer paddles of the transfer unit 140 clearly shown by Figs. 6 and 7 will now be described.

The transfer unit 140 is assembled adjacent the end portion of the main conveyor unit 21 and is composed of four stack accumulating units 174, 175, 176 and 177 arranged at right angles to the upper and lower conveyor troughs thereof. Each accumulating unit has a stack dividing unit assembled adjacent thereto, referred to by numerals 178, 179, 180 and 181. The transfer unit 140 embodies vertical walls 182 and 183 forming a continuation of said side walls 37. Three vertical walls 184, 185, and 186, are transversely assembled upon suitable frame work between said walls 182 and 183 for supporting suitable shafts and mechanism for the stacking and the dividing of the stacks of sandwiches. The shaft 172 supporting stackers 141 and 142, and the shaft 188 supporting stackers 143 and 144 are rotated by suitable chains associated with the sprocket 190 rigidly mounted upon shaft 72, as shown by Figures 4 and 7. A sprocket 191 is rigidly secured upon shaft 172 intermediate said stackers 141 and 142, and a sprocket 192 is rigidly secured upon shaft 188 intermediate the stackers 143 and 144. A chain 198 is provided to travel over and around sprockets 190 on shaft 72, sprocket 191 on shaft 172 and sprocket 192 on shaft 188 and back to sprocket 190

for driving shafts 172 and 188. A suitable chain tightening sprocket 173 is pivotally mounted between said sprockets 190 and 191, as shown by Figure 7. The stackers transfer the flat sandwiches from the troughs to horizontal accumulating surfaces 189 where they are arranged vertically thereon as shown by Figure 8. Each of the stackers consist of two or more disks 193, slightly spaced apart upon a shaft 172, said shaft supported in a plane at right angles to the plane of travel of the sandwiches on the flight chains. A pair of said disks 193 revolve in a vertical plane in longitudinal alignment with each of the sandwich troughs. Each pair of disks 193 are provided with slots 194 having parallel side walls 195, a closed end 196 and an open entrance portion at the peripheral edge of the disk, said slots are suitably arranged to receive a horizontally arranged sandwich at one side from a trough and thereafter, by turning the sandwich and disk 180°, the sandwich will be positioned upon the stack accumulating surface 189 in a vertical position ready for stacking. A flight chain 214 with angle members 215 projecting therefrom is associated with each stacker and said members 215 travel ahead of the leading sandwich of each stack.

It is necessary to carry the sandwiches away at a fixed speed and is also necessary to provide means to prevent the sandwiches from again dropping rearwardly to a horizontal position once they are arranged for stacking in groups. An oscillating, or rocking, arm with stack straightening bridges is provided as will now be described. A shaft 200 is transversely arranged in the lower rear end portion of the main conveyor unit 21, the left end of said shaft extending outside the wall 37 as shown by Figure 5. Shaft 200 receives its power from shaft 78 by gears and chains later to be described. A change gear 201 is mountably secured to the end of said shaft 200. A stub shaft 202 is arranged parallel with and directly above said shaft 200 and with a spur gear 203 on the outer end thereof. An idler gear 204 is arranged between said gears 201 and 203 for rotating said shaft 202, in the same direction as shaft 200. A sprocket 205 is secured to said shaft 202. A shaft 206 for supporting accumulating chain sprockets 207 and 208 adjacent said stackers 143 and 144 is supported in suitable bearings mounted between the walls 182 and 183 of the accumulating unit as shown by Figures 6 and 7. A similar shaft 209 is mounted and secured between the walls and parallel with said shaft 206, said shaft having accumulating chain sprockets 210 and 211 mounted thereon. An endless accumulating chain 214 with outwardly projecting angle portions 215 secured thereto is trained around said sprockets 207 and 210. An endless accumulating chain 216 similar to chain 214 is trained around sprockets 208 and 211. A chain sprocket 217 is secured to the end of said shaft 206 whereby chain 220 is arranged to extend from sprocket 205 and cause said shaft 206 to rotate, thereby driving accumulating chains 214 and 216. Two shafts 218 and 219 are arranged in suitable bearings at the rear end adjacent said stackers 141 and 142. Accumulating sprockets 224 are arranged upon said shafts 218 and 219 over which accumulating chains 222 are trained. Shaft 219 has a chain sprocket 223 mounted on the end thereof and aligned with sprockets 205 and 217 whereby said chain 220 will drive it and thereby drive both of said shafts 219 and 206. A pair of sprockets 224 are also mounted on said shafts 218 and 219 at the rear of said stacker 141, said sprockets having accumulating chain 221 traveling over and around said sprockets to assist in stacking sandwiches as is done by the accumulating chain 222. Therefore the stacking of sandwiches in a vertical manner can be done in a desirable manner and at a speed arranged by suitable gears such as gears 201, 203 and 204 arranged and trained together.

The stacking of sandwiches on the accumulating chains 214, 216, 221 and 222 and retaining same at the far end of the stack by the lug or projection 215 thereof

also requires the embodiment and use of a stack straightening bridge 225 located above and at the rear of each stacker. Directly above each stacker is suitably mounted a bridge member 225, said bridge members above the stackers 141, 142 being mounted upon the end of rotatable shafts 226 extending transversely of the machine and above the lower inner troughs, said shaft 226 being supported by bearings in suitable bearing support upon the vertical wall 184. The bridge members above the stackers 143 and 144 associate and in alignment with the lower troughs 135 and 136 are mounted upon the ends of a short shaft 227 supported by bearings and bearing brackets mounted upon the vertical wall 185. The bridge members 225 consist of shaft clamping means 225' with a fork-like member 228 depending downwardly therefrom. As a sandwich "S" is deposited by a stacker upon the support 189, the forward sandwich engages the lug 215 upon the accumulating chain. After a suitable number of sandwiches are deposited by the stacker, the fork-like member 228 is moved into contact with the back side of the last sandwich in the stack to keep it in a vertical position and move the entire stack of sandwiches forwardly. The fork 228 cooperates with the accumulating chains to move the stack therealong. To give the fork the necessary oscillating movement, the shafts 226 and 227 must be rotated in a clockwise direction and then reversed and moved in a counterclockwise direction by suitable means now to be described. The shaft 200 described above, as shown by Figure 5, has assembled therewith a pair of cams 229 and 230. Two shafts 237 and 238, shown by Figure 4, are mounted in suitable bearings in the side wall 37, each shaft having an arm extending outwardly and under said cams 229 and 230. A sprocket 231' is rigidly mounted and secured near the end of said shaft 200 and a sprocket 232 is rigidly mounted upon a power driven shaft 233 elevated and secured in bearings upon the side wall 37. Two idler gears 234 and 235 are suitably arranged whereby a chain 236 can travel over and around sprockets 231, 232, 234 and 235 for driving sprocket 231' on driving shaft 200. The intermediate section of each arm 239 and 240 is provided with a roller suitable to ride upon the peripheral face of the cam associated therewith. The outer end of said arm 239 has a chain 241 attached thereto. The outer end of said arm 240 has a chain 242 attached therewith. Said chain 241 extends upwardly and over a sprocket mounted intermediate the forks 228 upon said shaft 226 adjacent stackers 141 and 142, said chain having its opposite end attached to a coil spring 243 which has its opposite ends secured to a rigid support. Said shaft 200, with cams 229 and 230 thereon, makes one revolution during each cycle of the machine. The fork like members 228 will be moved forward and back once for each cycle. A cycle in time is equal to double the time it takes to place a group of sandwiches, such as 16, upon or in a trough, since a group of sandwiches must be arranged in the upper trough as well as in the lower trough during one cycle. Chain 242 extends upwardly and over a sprocket mounted intermediate the forks 228 mounted upon the ends of the short shaft 227 above the adjacent stackers 143 and 144 associated with the lower central troughs, said chain having its opposite end attached to a coil spring 244 which has its opposite end secured to a rigid support.

The removal of stacks of sandwiches must be in timed relation with respect to all moving parts of the machine. Above it was described how power was delivered to shaft 200. The drive shaft for the stack transfer paddles must be in timed relation with other devices driven by said shaft 200, therefore the paddles are driven by means connected with shaft 233, which is driven indirectly by shaft 78. A drive gear 250 is mounted upon shaft 78 which drives an idler gear 251 secured in a bearing mounted in one end of a pivoted arm which has its opposite end mounted with means pivoted on said shaft 78.

As shown by Figure 5, a timing gear 252 is mounted upon shaft 233 and is driven by said idler gear 251. Said timing gear drives said shaft 233 which in turn drives sprockets 232, 231 and shaft 200 described above. A right anle drive is mounted upon the end of shaft 233, outside the main unit, a drive shaft 233' extends through the right branch 23, a sprocket 247 is mounted on the free end thereof. A chain 246 is arranged to train over sprocket 247 and about a sprocket 248 mounted upon the end of shaft 255, the main drive shaft in the right branch of the transfer unit for operating the stack of transfer paddles. The pinion gear 256, keyed to the shaft 255, is mounted adjacent the exterior surface of the wall 37 for driving spur gear 257 mounted upon the drive shaft 258 directly below shaft 255 of the stack conveying and dividing unit, said dividing unit assembled adjacent said vertical wall 182 and extending outwardly therefrom forming the right branch of the T shape machine. Between sprockets 248 and gear 256 there is mounted on shaft 255 a sprocket 259 which is connected to a sprocket 253 mounted upon a shaft 315 parallel with and below shaft 261 by chain 249, shown by Figures 10 and 11. Shaft 315 drives shaft 316 which drives gears 317 and 318 thereon. Gear 318 in turn drives gear 319 rigidly mounted upon shaft 261, the main drive shaft for operating the stack transfer paddles in the left branch of the transfer unit.

The right branch of the transfer unit is constructed with mechanism to remove the stacks of sandwiches from the right upper trough 64" and the right lower trough 135. Paddles 265 are assembled upon pairs of flight chains 266 which are trained to travel over pairs of sprockets 267, 268 and 269. Said sprockets 267 and 268 are mounted upon shafts 271, 272 mounted in bearings and between walls 184 and 185. Sprockets 269 are mounted upon the far end of shaft 255 for driving the flight chains 266 and paddles 265. Said paddles 265 will remove stacks of sandwiches from the upper trough 64" onto the accumulation table 273, shown by Figure 9. Paddles 275 are assembled upon flight chain 276 which are trained over sprockets 277, 278 and 279. The sprockets 277, 278 are mounted upon shafts 281 and 282 mounted in bearing and between walls 185 and 186. Sprocket 279 is mounted over the near end of shaft 255 for driving the flight chains 276 and paddles 275. Said paddles 275 will remove stacks of sandwiches from the lower troughs 135 onto the accumulation table 283 also shown in Figure 9.

The sandwiches arranged in stacks upon the table 273 are held in longitudinal alignment and pass between metal panels 285 and 286. The sandwiches arranged in stacks upon table 283 are held in longitudinal alignment and pass between metal panels 287 and 288. Shaft 258 extend transversely of the table 273 and 283 at the entrance end thereto. Two stub shafts 289 and 290 are arranged parallel with said shaft 258 and mounted at the exit end of the table 273 and 283 in the sidewalls 295 and 296 of the accumulating and dividing unit. A short shaft 297 extends through the central wall 298, parallel with shaft 258 in alignment with stub shafts 289 and 290. Four sprockets are mounted upon shaft 258, two of the sprockets 300 and 301 at the entrance end of the table 273; two of the sprockets 302 and 303 at the entrance end of the table 282. Sprocket 304 is mounted upon the free end of said stub shaft 289. Sprocket 305 and 306 are mounted upon the free end of said short shaft 297. Sprocket 307 is mounted upon the free end of said stub shaft 290. A flight chain 309 is arranged over sprockets 300 and 304. A flight chain 309' is arranged over sprockets 301 and 305. Rods 311 are secured to and extend between the chains 309 and 309' and are spaced at suitable distances whereby they may be on opposite sides of each stack of sandwiches being moved over said table 273. An endless flight chain 310 is arranged over and around sprocket 302 and 306. An endless flight chain

310' is arranged over and around sprockets 303 and 307. Rods 312 are secured to and extend between the chains 310 and 310' and are spaced to be on opposite sides of each stack of sandwiches being moved over said table 283. Flight chain tighteners 314 are mounted upon arms 313 and 313' which are pivotally mounted upon shafts 316 and 316' extending transversely over the tables 273 and 283. The flight chains are moved at a selected speed over said table 273 and 283 controlled by shaft 258. As stated above the shaft 255 drives the paddles through the intermediation of sprockets and chains. Said shaft 255 also drives said shaft 258 through timing gears and associated parts for driving the rods 311 and 312 assembled on the flight chains 309, 309', 310 and 310'.

The left branch of the machine embodying the accumulating tables 345 and 346 for receiving sandwiches from upper trough 65" and lower trough 136 are constructed of similar parts and operate in similar manner as just described with regard to tables 273 and 283, except the sandwiches are moved to the left instead of to the right with regard to the main unit 21. The parts are rotated and moved according to the rotation of shaft 261 identical to shaft 255 and mounted parallel with it and mounted on the opposite side of the central transfer unit 21.

The rods 311 and 312 with the flight chains are driven at the exact speed whereby a rod is arranged over each side of each stack being transferred. Shaft 258 drives the flight sprockets thereon according to the ratios of gears 256 and 257. The chain sprocket 320 is rigidly mounted upon the end of shaft 258 for driving sprocket 321 mounted upon shaft 322 associated with the stack dividing mechanism. A chain 323 is trained over and around said sprockets 322 and 321. A chain tightener 324 is movably mounted by suitable supporting means for keeping chain 323 under sufficient tension.

To drive shaft 327, a sprocket 325 is secured to shaft 322 and a sprocket 326 is secured to shaft 327. A chain 328 is trained over said sprockets to drive said shaft 327 and the flight chains with rods associated therewith for dividing the stacks in pairs for packaging. A chain tightener 329 is movably mounted by suitable supporting means for keeping chain 328 under sufficient tension. Said shaft 327 drives the flight sprockets 330, 331, 332 and 333 mounted thereon. Due to the different gear ratios of the various gears described the flight chains in the dividing mechanism are moved at a greater speed than those of the accumulating mechanism and fewer rods are assembled therewith, whereby, a pair of stacks of sandwiches may be selectively moved with a space between each pair of stacks equal to the span of a pair of stacks. Rods 334 are assembled upon the long flight chain 336 trained over sprockets 330 and 331, while rods 335 are assembled upon the short flight chains 337 trained over sprockets 332 and 333; said sprockets 330, 331 are in alignment with sprockets 338 and 339 mounted upon shaft 342 in the extended branch 23, and said sprockets 332 and 333 are in alignment with sprockets 340 and 341 mounted upon shaft 343 in the short branch 23' of the dividing unit.

The left branch 22 of the cooky sandwich machine is driven substantially in the same manner as described above with regard to branch 23 thereof. Chain 249, driven by sprocket 259 on shaft 255, drives sprocket 253 upon shaft 315 as shown by Figure 10. Sprocket 253 drives shaft 315, said shaft 315 drives sprockets 344 and gear 347. Gear 347 drives gear 319 which drives main shaft 261 described above. Sprocket 344 drives sprocket 348 in shaft 349 by chain 350 trained therewith. Shaft 315 drives sprocket 351 on shaft 261 which drives sprocket 352 on shaft 354 by flight chain 353; said chain 353 and sprockets 351 and 354 similar to chains 313 and 313' and sprockets associated therewith in branch 23 described above. Shaft 348 drives shaft 355 and 356 by sprockets 357 and 358 through the intermediation of chains 359 and

360 shown by Figures 10 and 11. Chain tightening gears 361 and 362 are associated with chains 359 and 360 to maintain the proper tension therein. Stacks of sandwiches are accumulated and divided in branch 22 by rods and other means identical with parts in branch 23. Shaft 261 functions with associated parts in branch 22 as does shaft 255 in branch 23.

The mechanism for loading pairs of stacks of sandwiches will now be described in connection with branch 23, as shown by Figures 1, 12 and 13. The pneumatic packaging units 25 are pivotally supported and embody loading trays mounted upon the upper end of movable arms which rocks clockwise and counterclockwise, the arms being driven by rods and cams associated therewith. As shown by Figures 1 and 12, the loading mechanism 370 associated with pneumatic unit 25 is arranged to load pairs of stacks of sandwiches received from the upper and lower branches of the main conveyor unit and divided by rods 335 on chains 337 in the short leg of branch 23 and divided by rods 334 and chains 336 in the long leg section. A shaft 371 is assembled in the lower section of discharge end of short leg section thereof, said shaft extending between walls 296 and 298. A shaft 372 is assembled in the lower section of the discharge end of the long leg section thereof, said shaft extending between walls 295 and 298. By Figure 12, the loading tray 373 for the short leg section is shown mounted upon the upper end of a loading tray arm 374 pivoted at its lower end to shaft 371, said tray being of a modified channel shape and configuration, the midsection thereof being the substantially horizontal load carrying portion with a low sidewall extending upwardly at the entrance side thereof, and a high sidewall extending upwardly at the far side thereof. When the tray is adjacent to the flight chain 337 it is in position for loading by the rod on the chains, and when the tray is in this position the intermediate portion of said loading tray arm 374 contacts a microswitch 365 later to be described. The lower portion of said arm 374 has a two piece spring loaded connecting rod 366 connected thereto by pivot pin 367. The opposite end 368 of said rod 366 is pivotally connected to a crank arm 369 mounted and depending from a shaft 375. A coil type tension spring 376 is secured at one end thereof to a panel wall of the machine. The free end of said spring is secured to said crank arm and said connecting rod assembled together by said pivot pin 367. A compression type coil spring 377 is assembled intermediate the outer ends of said two-piece connecting rod to resiliently bias the tray arm 374 when the crank arm 369 is cam operated towards said tray arm 374. The cam 380 is mounted upon shaft 322, cam service thereof contacting a roller 381 mounted intermediate the ends of said crank arm 369. Therefore, as shaft 322 is rotated, the cam 380 will bias the crank arm 369 in a counterclockwise direction, said crank arm will force the connecting rod in the same direction, said rod forcing the free end of the loading tray arm in a clockwise direction carrying a pair of stacks of sandwiches to a bag loading position as shown by Figure 1. As said tray arm 374 approaches its outer position, it will also strike a microswitch 382 later to be described. A loading chute is rigidly supported by a pair of brackets 384 secured to the guide wall adjacent to flight chain 337. A pneumatic cylinder 385 is mounted upon the frame work between said walls 295 and 298. The plunger rod 386 extends outwardly from the operating end of said cylinder. Upon the end of said rod 386 is mounted a displacement member 387, for contacting sandwiches to be packaged. When a blast of air is discharged into the sealed end 389 of said cylinder 385, the plunger rod 386 and displacement member 387 will move outwardly biasing the sandwiches in the trough 373 into the loading chute 383 and into a bag 390 position thereabout by an operator. A bag support 396 is rigidly supported beneath the chute 383 by bracket 397 secured to the sidewall 296, said support

to support the loaded bag with sandwiches therein until it is removed by the operator. A rubber shield 395 is vertically assembled above and adjacent the exit end of said loading chute 383, the supported upper rigid portion of the shield being in contact with the bag when placed over the chute. The lower depending edge portion of the shield is free to be moved outwardly as sandwiches are discharged from the chute 383 and into the bag 390, the free end of the shield keeping the sandwiches from contacting the edge portion of the bag at the entrance thereof.

A rod 391 is attached to said displacement member 387 and extends rearwardly therefrom, and parallel with cylinder 385. A switch operating arm 392 is secured to said rod 391 and moves with said arm as a displacement member is moved outwardly and rearwardly. A control switch 393 is mounted adjacent the center wall 298, said switch embodying a resiliently mounted arm 394 which is operated by said arm 392 when it is moved forwardly with said rod 391, as shown by Figure 13. Switch 393 controls the length of stroke of the rod connected with the dispensing member 387.

A loading mechanism 399 similar to the loading mechanism 370, embodies a pneumatic cylinder 400 mounted adjacent the end of panel 295 of branch 23, to package the stacks of sandwiches being conveyed and divided by chain 336 in rods 334; said sandwiches to be received from the right hand upper conveying trough 64" of the main conveyor unit. Adjacent the end of said cylinder 400, is movably mounted a loading trough 403 similar to trough 373 described above. The trough 403 is supported by an arm 404 pivoted at its lower end to the shaft 372. Said arm is moved by a connecting rod and associated parts cam operated and substantially the same as described with loading mechanism 370. A loading chute 405 is rigidly assembled with a pair of brackets 406 mounted with the guide panels adjacent flight chains 336. A bag support is rigidly assembled beneath the chute 405 by brackets 407 secured to the vertical wall 298. A rod 408 similar to rod 391 is mounted adjacent to cylinder 400 and attached to a dispensing member 409. An adjustable switch operating arm 410 is attached to said rod 408 for contacting switch 411 assembled adjacent the wall 295 for controlling the length of the stroke of rod connected with a dispensing member 409.

Two packaging and loading mechanisms 412 and 413 are mounted with the branch 22 of the sandwich machine as shown by Figure 1. The loading mechanism 412 is driven by connecting rod 414, pivoted arm 415, a cam 416 upon shaft 349, and gears shown by Figure 10, all of said mechanism operated in the same manner as described above with the opposite branch of the machine.

The four sandwich loading units 370, 399, 412 and 413 are mechanically operated as described above; however, the four pneumatic plungers embodied therewith for dispensing the sandwiches into the bags from the loading tray are each controlled by a separate electrical circuit operated by the movement of the loading tray arm. Figure 14 illustrates diagrammatically a circuit diagram of the electrical control system employed by said units of this machine, and will be described in connection with loading unit 370. The electrical controls shown by Figure 14 in addition to being identified by a reference numeral are also designated by letters of the alphabet combined therewith for clarity. The loading tray arm 374 is rocked back and forth by connecting rod 368 which is operated by arm 369 which is rocked back and forth by cam 380 upon shaft 322. Said arm H-374 strikes and closes switch A-365 which energizes solenoid S-415 which closes relay R-416. As the arm H-374 rocks in a clockwise direction it strikes and closes switch B-382 which energizes solenoid F-417 opening a valve "F" causing the piston with the piston rod P-386 extending from cylinder K-385 to be moved forward. The operation of said

rod P-386 and dispenser means 387 in combination with rod 391 and bar 392 associated therewith, the switch arm C-394 is biased opening one circuit connected with switch A-365 and closing the circuit connected with switch B-382. Closing of said switch C-394 in energizes solenoid S-418 operating a valve "E" causing the piston and the piston rod P-386 to return to normal position within the cylinder K-385 and again opening said switch C-394 and closing switch C-394 by spring loaded means associated therewith. As the arm H-374 again swings to its normal position it strikes switch A-365 starting the cycle over again. Transformer T-420 is used with said circuit in the usual manner as shown. The pneumatic plungers in all four of the loading units are operated and controlled in the same manner as described with reference to Figure 14.

In operation of the cooky sandwich machine, the hopper 24 is filled with a suitable creme and the troughs 27 are filled with cookies and kept filled by the operator, or automatically by any suitable means. As the cookies are fed beneath the hopper, the creme is deposited upon two cookies arranged upon the conveyor chains there beneath, and after which two cookies are arranged upon the two creme coated cookies and in this manner the cooky sandwiches are formed.

As the two conveyor chains move horizontally within the machine the two lines of sandwiches pass over two automatic counting devices consisting of vertically rotating discs with rods arranged therebetween, the rods having buckets or bucket type means thereon to elevate the sandwiches to a plurality of elevated conveyor means. As for example, when sixteen sandwiches are desired in a stack of sandwiches, sixteen buckets are mounted upon 16 of the rods in alignment with each of the original two conveyors. In this manner sixteen sandwiches are elevated to each of the elevated troughs 64 and 65. The following sixteen rods are arranged without buckets assembled thereon and the cooky sandwiches conveyed from the assembly machine continue to travel upon the lower troughs 135 and 36. Therefore, the sandwiches originally assembled upon two conveying means have been transferred to four troughs in groups of 16 each and in this manner they are transferred to the transfer unit 140 assembled adjacent the end of the main conveyor unit 21.

The transfer unit embodies four stack accumulating units 174, 175, 176 and 177. The sandwiches from the two upper level troughs 64 and 65 are deposited upon the near units 174 and 176. The sandwiches from the lower level troughs 135 and 136 are deposited upon the far units 175 and 177. These stacks of sandwiches upon the near unit 174 are moved to a unit 178 of the stack accumulating unit in branch 23 of the machine by paddles 265. The stack of sandwiches upon the unit 176 is moved to the unit 180 of the stack accumulating unit in branch 22 of the machine. The stack of sandwiches upon unit 175 is moved to the unit 179 in branch 23. The stack of sandwiches upon unit 177 is moved to unit 181 in the branch 22.

By the stack accumulating units, the stacks of sandwiches are moved outwardly in a sidewise manner to the stack dividing chains, each stack having a rod positioned on each side thereof. After the stacks of sandwiches arrive at the four stack dividing units the stack dividing chains with rods thereon continue to convey the stacks. Due to the speed of the flight chains and location of the rods thereon, the stacks are now arranged in pairs with a suitable distance between each pair of stacks of sandwiches. Each pair of stacks of cooky sandwiches deposited upon the unit 178 are therefore divided by rods 334 and the chains 336 moving between the inner wall 295 and the central wall 298. One pair of stacks of sandwiches are arranged between a pair of rods assembled with the flight chains, therefore each pair of stacks of sandwiches conveyed by the rods 334 will be delivered

to the packaging or loading mechanism 399. The operator places a bag 391 upon a bag support 396 arranged adjacent the outer end of the pneumatic cylinder associated with the loading mechanism. As the loading tray and arm supporting it is in its outer position a blast of air within the pneumatic cylinder will force the dispensing member outwardly biasing the pair of stacks of cooky sandwiches into the bag supported adjacent thereto. The filled bag is then removed by the operator and the tray arm is again automatically rocked into a counterclockwise direction to its loading location.

By this cooky sandwich machine, four operators when stationed at their loading stations can remove loaded bags and assemble them in suitable containers without undue stress because of the extreme simplicity in construction of the entire machine. The two conveyor units in the sandwich assembly unit supply the sandwiches to four packaging stations by supplemental conveyors in conjunction therewith by employment of elevating devices and elevated conveying mechanism, the conveyors terminating in substantially the same horizontal plane for loading and packaging of the sandwiches.

I have heretofore referred to the use of conveyor troughs, conveyor chains and flight chains with projecting pins thereon, but it will be understood that the terms "conveyor" and "flight chains" are intended to cover and include any flexible feeding mechanism which travels around a circuit after the manner of a chain, inside troughs or above troughs, and intended to advance the sandwiches in processional relation and in a manner conformable to the requirements of the present invention.

It is apparent from the foregoing that various modifications and variations in the present invention may be made without departing from the spirit and scope of the novel concepts thereof.

I claim as my invention:

1. In a sandwich assembly and packaging machine, a sandwich assembly unit, a plurality of conveyors on said sandwich assembly unit, conveyors on said assembly unit to receive and discharge cooky sandwiches upon a counting and stacking unit adjacent thereto, a counting device assembled adjacent and in alignment with said conveyors on said assembly unit, a plurality of conveyors assembled upon said counting and stacking unit, said conveyors embodying means for counting and discharging a plurality of lines of sandwiches as flat objects, a stacking device adjacent the discharge end of each of said conveyors on said counting and stacking unit for stacking the sandwiches vertically, a plurality of stack conveying means adjacent said stackers for receiving said stacks of sandwiches in vertical arrangement, a transfer unit adjacent the discharge end of said counting and stacking unit, said plurality of conveying means discharging said stacks of sandwiches from said counting and stacking unit upon said transfer unit, a stack accumulation and dividing unit assembled adjacent each side of said transfer unit, a plurality of chain driven transfer paddles for laterally moving said stacks of sandwiches to said stack accumulating and dividing units, flight chains and rods upon said dividing units for conveying stacks of sandwiches in sidewise manner to loading stations assembled therewith, a loading tray mounted upon a movable loading arm pivotally mounted adjacent each loading station to receive the pairs of stacks of sandwiches to be placed into a container, a discharge chute assembled with each loading tray, container securing means arranged with each chute, loading means for discharging a pair of sandwiches from each loading tray and chute into a container arranged upon each chute, and means operated by said movable loading arm for controlling said loading means for discharging of said stacks of sandwiches into said container.

2. In a sandwich assembly and packaging machine, a sandwich assembly unit, a plurality of conveyors on said sandwich assembly unit, troughs to receive and direct cookies onto said conveyors at one station of the machine,

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a depositor at a second station of the machine for depositing fill material on the cookies deposited upon said conveyors, trough to receive and direct cookies onto said fill coated cookies at a third station of the machine, said conveyors to discharge the completed sandwiches upon a counting and stacking unit adjacent thereto, a counting device assembled adjacent and in alignment with said conveyors on said assembly unit, a plurality of conveyors assembled upon said counting and stacking unit, of said conveyors embodying means for counting and discharging a plurality of lines of sandwiches as flat objects, a stacking device adjacent the discharge end of each of said conveyors on said counting and stacking unit for stacking the sandwiches vertically, a plurality of stack conveying means adjacent said stackers for receiving said stacks of sandwiches in vertical arrangement, a transfer unit adjacent the discharge end of said counting and stacking unit, said plurality of conveying means discharging said stacks of sandwiches from said counting and stacking unit upon said transfer unit, a stack accumulation and dividing unit assembled adjacent each side of said transfer unit, a plurality of chain driven transfer paddles for laterally moving said stacks of sandwiches to a plurality of accumulating stations on said stack accumulating and dividing units, flight chains and rods upon said dividing units for conveying stacks of sandwiches in sidewise manner to loading stations assembled therewith, a loading tray mounted upon a movable loading arm pivotally mounted adjacent each loading station to receive the pairs of stacks of sandwiches to be placed into a container, a discharge chute assembled with each loading tray, container securing means arranged with each chute, loading means for discharging a pair of sandwiches from each loading tray and chute into a container arranged upon each chute, and means operated by said movable loading arm for controlling said loading means for discharging of said stacks of sandwiches into said container.

3. In a sandwich assembly and packaging machine, a sandwich assembly unit, a plurality of conveyors on said sandwich assembly unit, troughs to receive and direct cookies onto said conveyors at one station of the machine, a depositor at a second station of the machine for depositing fill material on the cookies deposited upon said conveyors, trough to receive and direct cookies onto said fill coated cookies at a third station of the machine, said conveyors to discharge the completed sandwiches upon a counting and stacking unit adjacent thereto, a counting device assembled adjacent and in alignment with said conveyors on said assembly unit, a plurality of conveyors assembled upon said counting and stacking unit, said conveyors embodying means for counting and discharging a plurality of lines of sandwiches as flat objects, a stacking device adjacent the discharge end of each of said conveyors on said counting and stacking unit for stacking the sandwiches vertically, a plurality of stack conveying means adjacent said stackers for receiving said stacks of sandwiches in vertical arrangement, a transfer unit adjacent the discharge end of said counting and stacking unit, said plurality of conveying means discharging said stacks of sandwiches from said counting and stacking unit upon said transfer unit, a stack accumulation and dividing unit assembled adjacent each side of said transfer unit, a plurality of chain driven transfer paddles for laterally moving said stacks of sandwiches to a plurality of accumulating stations on said stack accumulating and dividing units, flight chains and rods upon said accumulating stations for conveying stacks of sandwiches in sidewise manner to the stack dividing stations, flight chains and rods for conveying said stacks of sandwiches in pairs from the accumulation stations to the loading stations, a loading tray mounted upon a movable loading arm pivotally mounted adjacent each loading station to receive the pairs of stacks of sandwiches to be placed into a container, a discharge chute assembled with each loading tray, container securing means arranged with each chute, pneu-

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matic means for discharging a pair of sandwiches from each loading tray and chute into a container arranged upon each chute, and electrical means operated by said movable loading arm for controlling said pneumatic means for discharging of said stacks of sandwiches into said container.

4. In a sandwich assembly and packaging machine, a sandwich assembly unit, a plurality of conveyors on said sandwich assembly unit, troughs to receive and direct cookies onto said conveyors at one station of the machine, a depositor at a second station of the machine for depositing fill material on the cookies deposited upon said conveyors, trough to receive and direct cookies onto said fill coated cookies at a third station of the machine, said conveyors to discharge the completed sandwiches upon a counting and stacking unit adjacent thereto, a counting device assembled adjacent and in alignment with said conveyors on said assembly unit, a plurality of conveyors assembled upon said counting and stacking unit, a second pair of conveyors mounted over said first conveyors on said counting and stacking unit, said counting device discharging an equal number of sandwiches upon said first pair of conveyors and thereafter an equal number of sandwiches upon said second pair of conveyors of said counting and stacking unit, both of said pairs of conveyors for counting and discharging of four lines of sandwiches as flat objects, a stacking device adjacent the discharge end of each of said conveyors on said counting and stacking unit for stacking the sandwiches vertically, a plurality of stack conveying means adjacent said stackers for receiving said stacks of sandwiches in vertical arrangement, a transfer unit adjacent the discharge end of said counting and stacking unit, said plurality of conveying means discharging said stacks of sandwiches from said counting and stacking unit upon said transfer unit, a stack accumulation and dividing unit assembled adjacent each side of said transfer unit, a plurality of chain driven transfer paddles for laterally moving said stacks of sandwiches to a plurality of accumulating stations on said stack accumulating and dividing unit, flight chains and rods, upon said accumulating stations for conveying stacks of sandwiches in sidewise manner to the stack dividing stations, flight chains and rods for conveying said stacks of sandwiches in pairs from the accumulation station to the loading stations, a loading tray mounted upon a movable loading arm pivotally mounted adjacent each loading station to receive the pairs of stacks of sandwiches to be placed into a container, a discharge chute assembled with each loading tray, container securing means arranged with each chute, pneumatic means for discharging a pair of sandwiches from each loading tray and chute into a container placed upon said chute and electrical means operated by said movable loading arm for controlling said pneumatic means for discharging of said stacks of sandwiches into said container.

5. In a sandwich assembly and packaging machine, a sandwich assembly unit, a plurality of conveyors on said sandwich assembly unit, troughs to receive and direct cookies onto said conveyors at one station of the machine, a depositor at a second station of the machine for depositing fill material on the cookies deposited upon said conveyors, troughs to receive and direct cookies onto said fill coated cookies at a third station of the machine, said conveyors to discharge the completed sandwiches upon a counting and stacking unit adjacent thereto, a counting device assembled adjacent and in alignment with said conveyors on said assembly unit, a plurality of conveyors assembled upon said counting and stacking unit adjacent said counting device, a second pair of conveyors mounted over said first conveyors on said counting and stacking unit, said counting device discharging a number of sandwiches upon said first pair of conveyors and thereafter an equal number of sandwiches upon said second pair of conveyors of said counting and stacking unit, both of said first and second pairs of conveyors for con-

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veying and for discharging of four lines of sandwiches as flat objects therefrom, a stacking device adjacent the discharge end of each of said conveyors on said counting and stacking unit for stacking the sandwiches vertically, a plurality of stack conveying means adjacent said stackers for receiving and retaining said stacks of sandwiches in vertical arrangement, a transfer unit adjacent the discharge end of said counting and stacking unit, said plurality of conveying means discharging said stacks of sandwiches from said counting and stacking unit onto said transfer unit, a stack accumulation and dividing unit assembled adjacent each side of said transfer unit, a plurality of chain driven transfer paddles for laterally moving said stacks of sandwiches to a plurality of accumulating stations on said stacks accumulating and dividing unit, flight chains with rods assembled thereto for conveying stacks of sandwiches in sidewise manner from said accumulating stations to stack dividing stations on said accumulating and dividing unit, flight chains with rods assembled thereto for conveying said stacks of sandwiches in pairs from the dividing stations to a plurality of loading stations, a loading tray mounted upon a movable loading arm pivotally mounted adjacent each loading station, said tray to receive the pair of stacks of sandwiches to be placed into a container, a discharge chute assembled with each loading tray, a container securing means arranged with each chute, a controlled pneumatic means for discharging a pair of stacks of sandwiches from each loading tray and chute into said container secured to said chute, a single motor mounted upon said counting and stacking unit for operating a common power shaft on said sandwich assembly unit and the common power shaft for said counting and stacking unit whereby said transfer unit, said stack accumulating and dividing and said movable loading arm may be operated indirectly by said common power shaft on said counting and stacking unit, and electrical means controlled by the operation of said movable loading arm for controlling said pneumatic means for discharging of said stacks of sandwiches into said container.

6. In a machine of the class described, the combination with a sandwich assembly unit with a main conveyor for conveying a plurality of sandwiches as flat objects, a common power shaft on said sandwich assembly unit, a sandwich counting and stacking unit with a plurality of stack conveyors arranged adjacent one end of said main conveyor, a common power shaft on said sandwich counting and stacking unit, a sandwich stack transfer unit adjacent the ends of said stacking unit and conveyors associated therewith, stack transfer means for removing stacks of sandwiches to an accumulating station arranged laterally therefrom, stack dividing and conveying flight chains adjacent said accumulating station for delivering stacks of sandwiches to a loading device adjacent thereto, automatic means for depositing a stack of sandwiches into a suitable container arranged with said loading device and a single motor mounted upon said sandwich counting and stacking unit for operating said common power shaft on said sandwich assembly unit and said common power shaft on said sandwich counting and stacking unit whereby the transfer means, the stack dividing and conveying flight chains may be operated in timed relation.

7. In a machine of the class described, the combination with a sandwich assembly unit with a plurality of main conveyors for conveying a plurality of sandwiches as flat objects, a sandwich counting and stacking unit with a plurality of stack conveyors arranged adjacent one end of said main conveyors, a sandwich stack transfer unit adjacent the end of said stacking unit and conveyors associated therewith, a plurality of transfer means for removing stacks of sandwiches to an accumulating station arranged laterally therefrom, stack dividing and conveying flight chains adjacent said accumulating stations for delivering stacks of sandwiches to a plurality of loading

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devices positioned adjacent thereto and a plurality of electrical controlled means for depositing said stacks of sandwiches into a plurality of containers arranged with said loading devices.

8. In a machine of the class described, the combination with a sandwich assembly unit with a plurality of main conveyors for conveying a plurality of sandwiches as flat objects, a sandwich counting and stacking unit with a plurality of stack conveyors arranged adjacent the ends of said main conveyors, a sandwich stack transfer unit adjacent the end of said stacking unit and conveyors associated therewith, a plurality of transfer means for removing stacks of sandwiches to an accumulating station arranged laterally therefrom, stack dividing and conveying means adjacent said accumulating stations for delivering stacks of sandwiches to a plurality of loading trays mounted upon a plurality of pivotally mounted arms positioned adjacent thereto and a plurality of pneumatic means for depositing said stacks of sandwiches into a plurality of containers removably arranged with said load trays.

9. In a machine of the class described, the combination with a sandwich assembly unit with a plurality of main conveyors for conveying a plurality of sandwiches as flat objects, a common power shaft on said sandwich assembly unit, a sandwich counting and stacking unit with a plurality of stack conveyors arranged adjacent one end of said main conveyors, a common power shaft on said sandwich counting and stacking unit, a sandwich stack transfer unit adjacent the end of said stacking unit and conveyors associated therewith, a plurality of transfer means for removing stacks of sandwiches to an accumulating station arranged laterally therefrom, stack dividing and conveying means adjacent said accumulating stations for delivering stacks of sandwiches to a plurality of loading devices mounted upon a plurality of pivotally mounted arms positioned adjacent thereto and a plurality of electrically controlled pneumatic means for depositing said stacks of sandwiches into a plurality of containers detachably arranged with said loading devices and a single motor mounted upon said sandwich counting and stacking unit directly connected to said common power shafts for operating the common power shafts whereby said assembly unit, the counting and stacking unit, the transfer means, the stack dividing and conveying means may be operated in timed relation.

10. In a machine of the class described, the combination with a sandwich assembly unit with a plurality of main conveyors for conveying a plurality of sandwiches as flat objects, a sandwich counting and stacking unit with a plurality of stack conveyors arranged adjacent one end of said main conveyors, a sandwich stack transfer unit adjacent the end of said stacking unit and conveyors associated therewith, a plurality of transfer means for removing stacks of sandwiches to an accumulating station arranged laterally therefrom, stack dividing and conveying means adjacent said accumulating stations for delivering stacks of sandwiches to a plurality of loading devices mounted upon a plurality of pivotally mounted arms positioned adjacent thereto and a plurality of electrically controlled pneumatic means for depositing said stacks of sandwiches into a plurality of containers detachably arranged with said loading devices.

11. In a machine of the class described, the combination with a sandwich assembly unit with a plurality of main conveyors for conveying a plurality of sandwiches as flat objects, a sandwich counting and stacking unit with a plurality of stack conveyors arranged adjacent one end of said main conveyors, a sandwich stack transfer unit adjacent the end of said stacking unit and conveyors associated therewith, a plurality of paddle means for removing stacks of sandwiches to an accumulating station arranged laterally therefrom, stack dividing and conveying means adjacent said accumulating stations for delivering stacks of sandwiches to a plurality of loading trays

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mounted upon a plurality of pivotally mounted arms positioned adjacent thereto and a plurality of electrically controlled pneumatic devices for depositing said stacks of sandwiches into a plurality of containers detachably arranged with said loading trays.

12. In a machine of the class described, the combination of a cooky sandwich assembly unit and a plurality of conveyors associated therewith, a sandwich stacking unit with a plurality of conveyors associated therewith and arranged adjacent the exit end of said assembly unit, a rotatable sandwich counting device assembled between said assembly unit and said stacking unit, a sandwich stack transfer unit arranged adjacent the exit end of said stacking unit, a plurality of paddle means for transferring stacks of sandwiches to a plurality of stack accumulating stations, flight means for dividing stacks of sandwiches into pairs and conveying said pairs of stacks of sandwiches to a plurality of loading trays mounted upon the upper ends of pivotally mounted arms, and electrically controlled means for loading said pairs of stacks of sandwiches upon said trays into suitable containers removably arranged with said loading trays.

13. In a machine of the class described, the combination of a cooky sandwich assembly unit and a plurality of conveyors associated therewith, a sandwich stacking unit with a plurality of conveyors associated therewith and arranged adjacent the exit end of said assembly unit, a sandwich counting device comprising a pair of rotatable discs with counting means thereon assembled between said assembly unit and said stacking unit, a sandwich stack transfer unit arranged adjacent the exit end of said stacking unit, a plurality of paddle means mounted upon flight chains for transferring stacks of sandwiches to a plurality of stack accumulating stations, flight means for conveying said stacks of sandwiches to stack dividing and conveying flight chains for dividing said stacks of sandwiches into pairs and further for conveying said pairs of stacks of sandwiches to a plurality of loading trays mounted upon the upper ends of pivotally mounted arms, and electrically controlled pneumatic means for loading said pairs of stacks of sandwiches upon said trays into suitable containers removably arranged with said loading trays.

14. In a machine of the class described, the combination of a cooky sandwich assembly unit and a plurality of conveyors associated therewith, a sandwich stacking unit with a plurality of conveyors associated therewith and arranged adjacent the exit end of said assembly unit, a sandwich counting device comprising a pair of vertically mounted rotatable discs with elevating buckets arranged thereon assembled between said sandwich assembly unit and said sandwich stacking unit, a sandwich stack transfer unit arranged adjacent the exit end of said stacking unit, a plurality of paddle means for transferring stacks of sandwiches laterally to a plurality of stack accumulating stations, flight means for dividing stacks of sandwiches into pairs and conveying said pairs of stacks of sandwiches to a plurality of loading trays associated therewith, and pneumatic means for loading said pairs of stacks of sandwiches upon said trays into flexible containers removably arranged with said loading trays.

15. In a machine of the class described, the combination of a cooky sandwich assembly unit and a plurality of conveyors associated therewith, a sandwich stacking unit with a plurality of conveyors associated therewith and arranged adjacent the exit end of said assembly unit, a sandwich counting device assembled between said sandwich assembly unit and said stacking unit, a plurality of sandwich stacking disks for vertically arranging said sandwiches, a sandwich stack transfer unit arranged adjacent the exit end of said stacking unit, a plurality of means for transferring said stacks of sandwiches laterally to a plurality of stack accumulating stations, flight means with rods arranged therewith for dividing said stacks of sandwiches into pairs and for conveying said pairs of

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stacks of sandwiches to a plurality of loading trays mounted upon pivoted arms associated therewith, pneumatic means for loading said pairs of stacks of sandwiches upon said trays into suitable containers removably arranged with said loading trays, said pneumatic means electrically controlled due to movement of the arm associated therewith, and flexible means permanently secured to said trays and arranged for moving laterally and into said containers for guiding said pair of stacks of sandwiches into said container.

16. In a machine of the class described, the combination of a cooky sandwich assembly unit and a plurality of conveyors associated therewith, a sandwich stacking unit with a plurality of conveyors associated therewith and arranged adjacent the exit end of said assembly unit, a sandwich counting means assembled between said sandwich assembly unit and said stacking unit, a sandwich stack transfer unit arranged adjacent the exit end of said stacking unit, a plurality of paddle means mounted on flight chains for transferring said stacks of sandwiches laterally to a plurality of stack accumulating stations, flight chains with rods assembled therebetween for dividing said stacks of sandwiches into pairs and for conveying said pairs of stacks of sandwiches to a plurality of loading trays mounted upon the upper ends of pivoted arms associated therewith, pneumatic means for loading said pairs of stacks of sandwiches upon said trays into suitable flexible bags removably arranged with said loading trays electrical switches operated by the movement of said arms for controlling the operation of said pneumatic means associated with the respective arm, and flexible means permanently secured to said trays and arranged for moving laterally and into said flexible bags for guiding said pair of stacks of sandwiches into said flexible bags.

17. In a machine of the class described, the combination with a pair of main conveyors for conveying a plurality of substantially flat objects, a second pair of conveyors adjacent the outlet ends of the first conveyors, a third pair of conveyors arranged above said second pair of conveyors, an object counting means arranged between said first and second pairs of conveyors, a plurality of removable elevating means assembled with said counting means, said elevating means conveying said flat objects in contact therewith to said third pair of conveyors arranged above said second pair of conveyors, stacker means arranged at the exit ends of said second and third pair of conveyors to arrange said flat objects into stacks of vertically positioned objects, conveying means for conveying said stacks of objects onto a transfer unit, means for transferring a plurality of stacks of objects onto an accumulating unit arranged adjacent each side of said transfer unit, means for dividing and conveying said stacks of objects by pairs to said loading trays mounted adjacent thereto, and means for discharging said pairs of objects into containers removably mounted with said trays.

18. In a machine of the class described, the combination with a pair of main conveyors for conveying a plurality of flat cooky sandwiches, a second pair of conveyors adjacent the outlet ends of the first conveyors, a third pair of conveyors arranged above said second pair of conveyors, a sandwich counting means arranged between said first and second pairs of conveyors, a plurality of removable elevating means assembled with said counting means, said elevating means conveying said flat sandwiches in contact therewith to said third pair of conveyors arranged above said second pair of conveyors, stacker means arranged at the exit ends of said second and third pair of conveyors for conveying said flat sandwiches in contact therewith to said third pair of conveyors arranged above said second pair of conveyors, stacker means arranged at the exit ends of said second and third pair of conveyors to arrange said flat sandwiches into stacks of vertically positioned sandwiches,

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conveying means for moving said stacks of sandwiches onto a transfer unit, means for transferring a plurality of stacks of sandwiches onto an accumulating unit arranged adjacent each side of said transfer unit, means for dividing and conveying said stacks of sandwiches by pairs to said loading trays mounted adjacent thereto, and means for discharging said pairs of sandwiches into containers removably mounted with said trays.

19. In a machine of the class described, the combination of a pair of main conveyors for conveying a plurality of substantially flat sandwiches, a second pair of conveyors adjacent the outlet ends of the first conveyor, a third pair of conveyors arranged above said second pair of conveyors, a sandwich counting means vertically and rotatably mounted between said first and second pairs of conveyors, said counting means for conveying said flat sandwiches to said second pair of conveyors, a plurality of removable elevating buckets assembled with said counting means, said elevating buckets conveying the flat sandwiches contacted thereby to said third pair of conveyors arranged above said second pair of conveyors, rotatable vertically mounted stacker means arranged at the exit ends of said second and third pairs of conveyors to arrange said flat sandwiches into stacks of vertically positioned objects, conveying means for moving said stacks of sandwiches onto a transfer unit, means for transferring a plurality of stacks of sandwiches onto an accumulating unit arranged adjacent each side of said transfer unit, means for dividing and conveying said stacks of sandwiches by pairs to said loading trays mounted adjacent thereto, and means for discharging said pairs of sandwiches into containers removably mounted with said trays.

20. In a machine of the class described, the combination with a pair of main conveyors for conveying a plurality of substantially flat objects, a second pair of conveyors adjacent the outlet ends of the first conveyors, a third pair of conveyors arranged above said second pair of conveyors, a pair of rotating object counting means arranged between said first and second pairs of conveyors, a plurality of removable elevating means assembled with said counting means, said elevating means conveying said flat objects in contact therewith to said third pair of conveyors arranged above said second pair of conveyors, rotatable stacker means arranged at the exit ends of said second and third pair of conveyors to arrange said flat objects into stacks of vertically positioned objects, conveying means for conveying said stacks of objects onto a transfer unit, means for transferring a plurality of stacks of objects onto an accumulating unit arranged adjacent each side of said transfer unit, means for dividing and conveying said stacks of objects by pair to said loading trays mounted adjacent thereto, and means for discharging said pairs of objects into containers removably mounted with said trays.

21. In a machine of the class described, the combination with a pair of main conveyors for conveying a plurality of flat cooky sandwiches, a second pair of conveyors adjacent the outlet ends of the first conveyors, a third pair of conveyors arranged above said second pair of conveyors, a pair of rotatable disc type sandwich counting means arranged between said first and second pairs of conveyors, a plurality of removable elevating means assembled with said counting means, said elevating means conveying said flat sandwiches in contact therewith to said third pair of conveyors arranged above said second pair of conveyors, a plurality of rotatable disc type stacker means arranged at the exit ends of said second and third pair of conveyors for conveying said flat sandwiches in contact therewith to said third pair of conveyors arranged above said second pair of conveyors, stacker means ar-

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ranged at the exit ends of said second and third pair of conveyors to arrange said flat sandwiches into stacks of vertically positioned sandwiches, conveying means for moving said stacks of sandwiches onto a transfer unit, means for transferring a plurality of stacks of sandwiches onto an accumulating unit arranged adjacent each side of said transfer unit, means for dividing and conveying said stacks of sandwiches by pairs to said loading trays mounted adjacent thereto, and means for discharging said pairs of sandwiches into containers removably mounted with said trays.

22. In a machine of the class described, the combination of a pair of main conveyors for conveying a plurality of substantially flat sandwiches, a second pair of conveyors adjacent the outlet ends of the first conveyor, a third pair of conveyors arranged above said second pair of conveyors, a plurality of sandwich counting means vertically and rotatably mounted between said first and second pairs of conveyors, means for conveying said flat sandwiches to said second pair of conveyors, a plurality of removable elevating buckets assembled with said counting means, said elevating buckets conveying the flat sandwiches contacted thereby to said third pair of conveyors arranged above said second pair of conveyors, rotatable vertically mounted stacker means arranged at the exit ends of said second and third pairs of conveyors to arrange said flat sandwiches into stacks of vertically positioned objects, conveying means for moving said stacks of sandwiches onto a transfer unit, means for transferring a plurality of stacks of sandwiches onto an accumulating unit arranged adjacent each side of said transfer unit, means for dividing and conveying said stacks of sandwiches by pairs to said loading trays mounted adjacent thereto, and means for discharging said pairs of sandwiches into containers removably mounted with said trays.

23. In a sandwich assembly and packaging machine having a sandwich assembly unit and a main traveling flexible feeding mechanism therefor, adjustable means separating sandwiches from the main traveling flexible feeding mechanism into spaced sets of sandwiches of predetermined and selectively variable number, traveling flexible feeding mechanism for the respective sets of sandwiches, means for further separating the spaced sets of sandwiches into sets of spaced sets of sandwiches, means for vertically stacking the sandwiches of each set, and means for moving the stacks of sandwiches thus formed in a plurality of differing directions to different packaging sites.

24. In a sandwich assembly and packaging machine having a sandwich assembly unit and a main traveling flexible feeding mechanism therefor, adjustable means for separating sandwiches from the main traveling flexible feeding mechanism into spaced sets of sandwiches of predetermined and variable number, traveling flexible feeding means for the respective sets of sandwiches, means for further separating said spaced sets of sandwiches into spaced sets of sandwiches of the same number in each set, means for vertically stacking the sandwiches of each set, means for moving the stacks of sandwiches thus formed in a plurality of directions and means for packaging the respective sets of sandwiches as they are moved in the several directions afforded by said last named means.

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