Jan. 9, 1945. H. J. WERDEN ET AL 2,367,160

TUCKER ADJUSTING MECHANISM

Filed Aug. 3, 1943 4 Sheets-Sheet 1

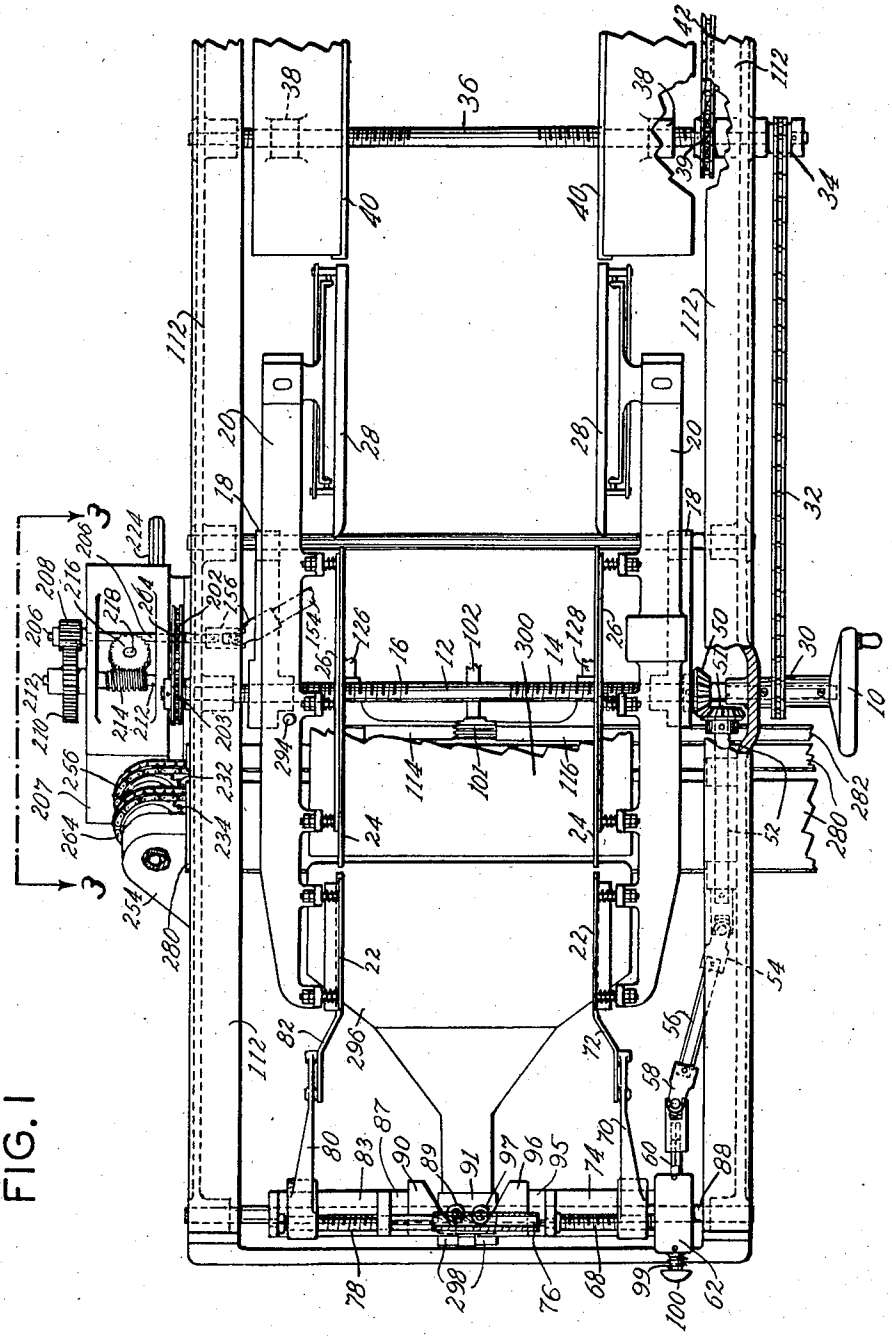


FIG. 1

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TUCKER ADJUSTING MECHANISM

Filed Aug. 3, 1943 4 Sheets-Sheet 2

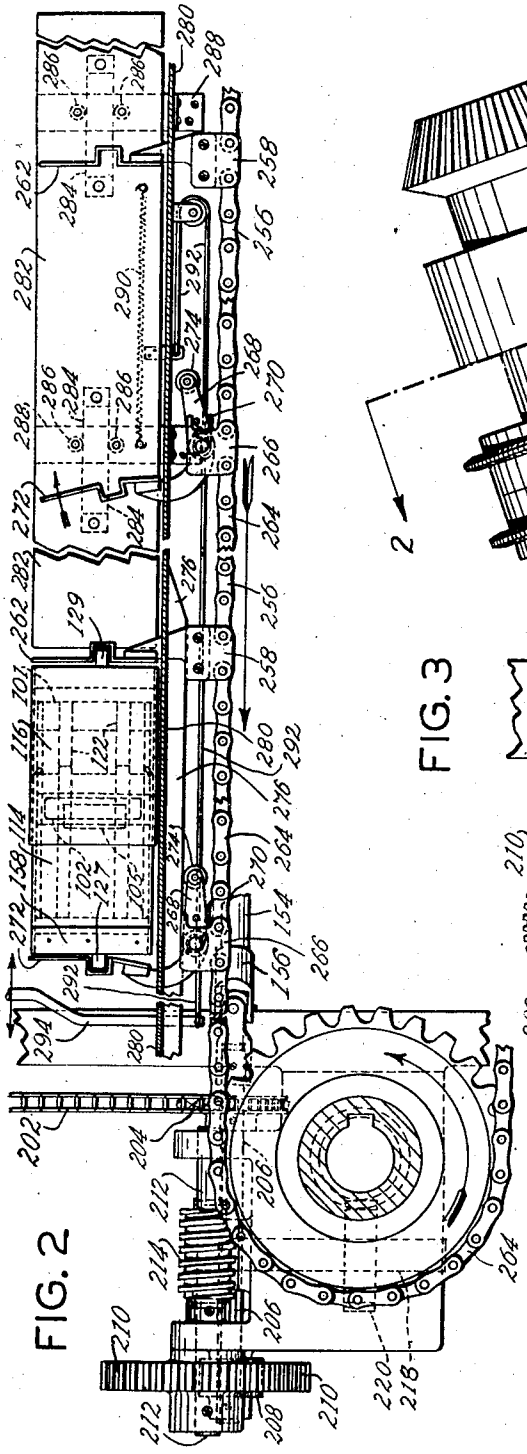


FIG. 2

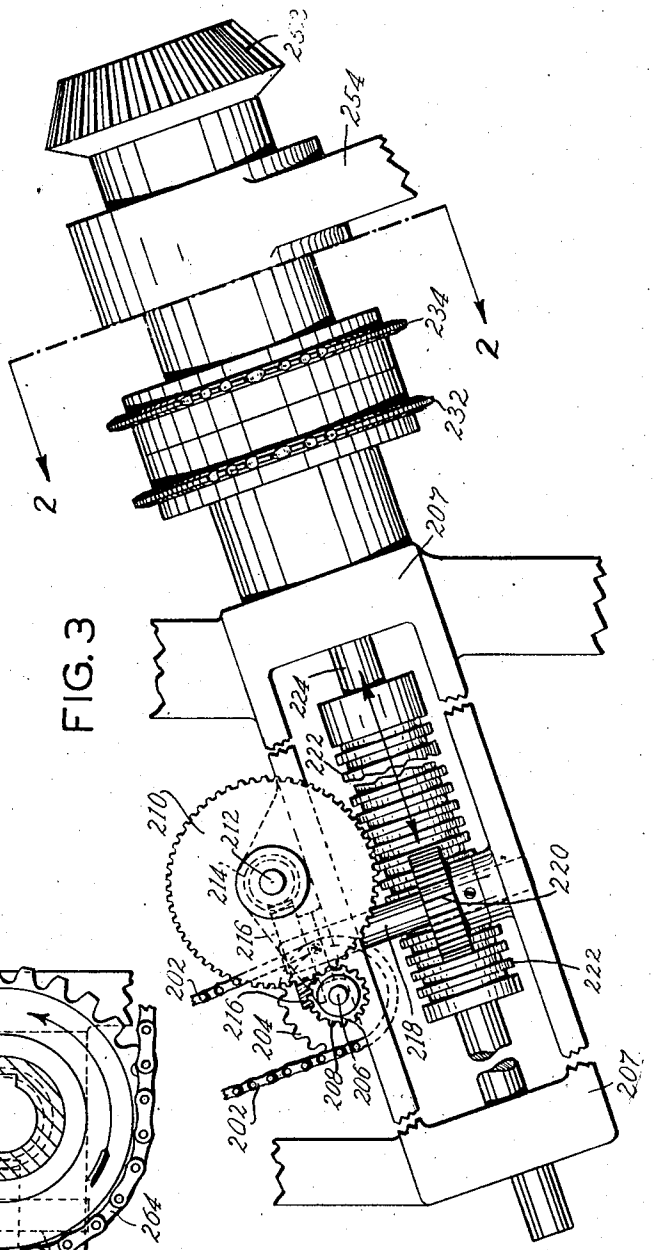


FIG. 3

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TUCKER ADJUSTING MECHANISM

Filed Aug. 3, 1943 4 Sheets-Sheet 3

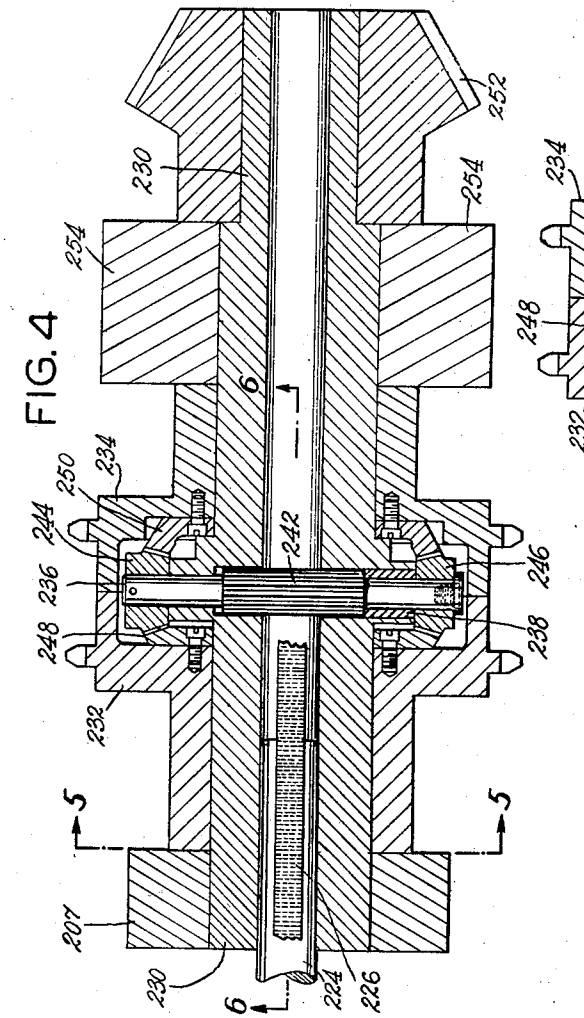



FIG. 4

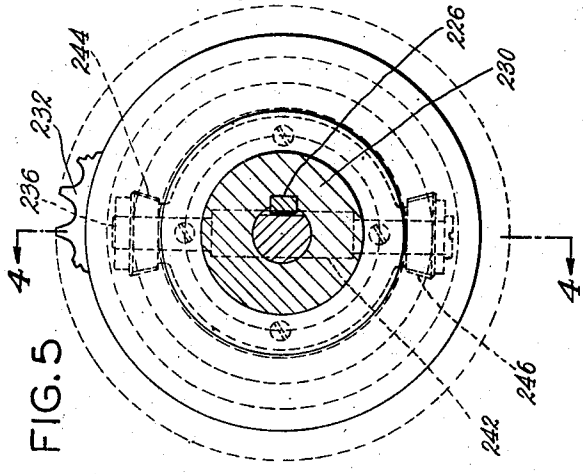



FIG. 5

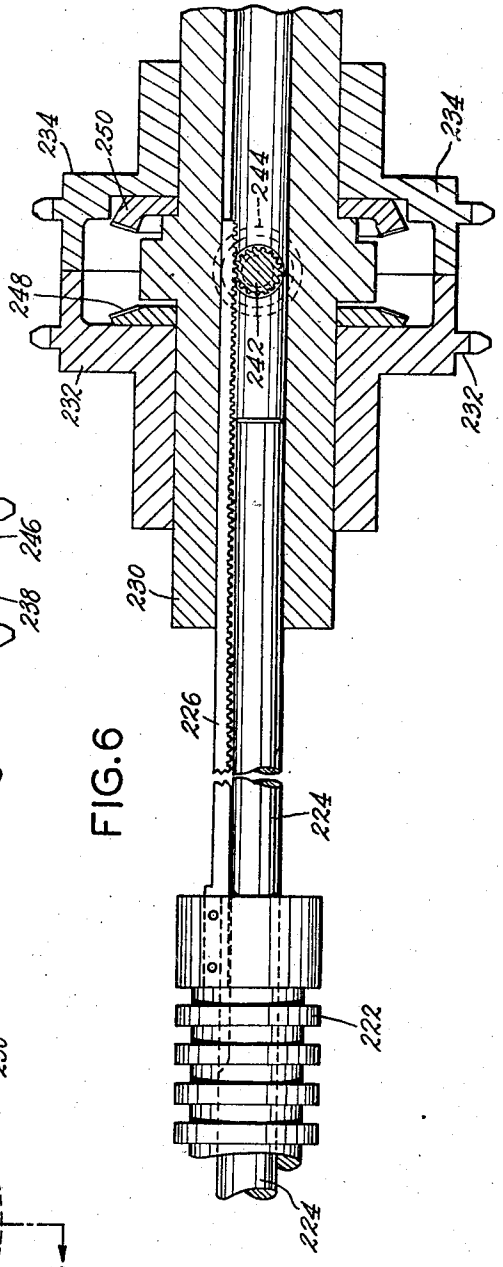



FIG. 6

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TUCKER ADJUSTING MECHANISM

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FIG. 7

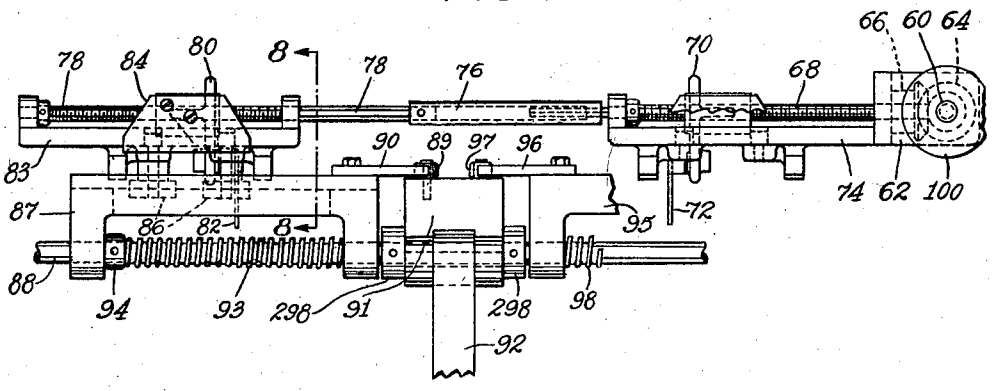



FIG. 8

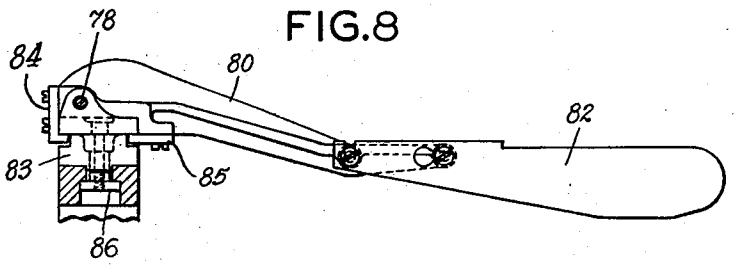
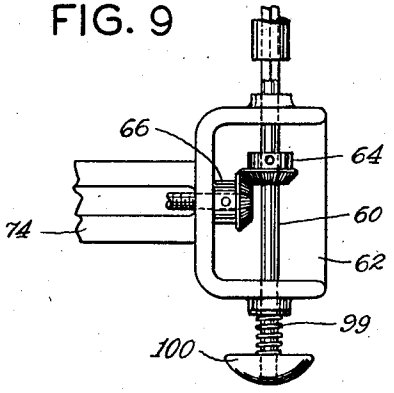



FIG. 9




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Patented Jan. 9, 1945 2,367,160

# UNITED STATES PATENT OFFICE

2,367,160

## TUCKER ADJUSTING MECHANISM

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Original application August 2, 1940, Serial No. 349,924. Divided and this application August 3, 1943, Serial No. 497,186

4 Claims. (Cl. 93—2)

This invention constitutes a division of our copending application, Serial Number 349,924, filed August 2, 1940, and relates to improvements in wrapping machines, more particularly to bread wrapping machines of the type shown in the copending applications of T. Jensen, S. N. 225,697 and 225,698, filed August 18, 1938, Patent Numbers 2,320,362, June 1, 1943, and 2,221,481, November 13, 1940, respectively, which are provided with a conveyor having sets of flights arranged to admit loaves of bread therebetween from a chute, or from an infeed conveyor delivering sliced loaves from a slicing machine, and advance the loaves endwise into position to be ejected from between the conveyor flights on a lifter table. The lifter table is provided with tuckers acting to tuck the ends of a wrapper enfolded about the loaf during the delivery of the same to the table and moving upwardly with the table, whereby the tucked ends of the package are engaged with folder structure acting to fold the wrapper ends over said tucked portions. An object of the invention is to simultaneously adjust in machines of the general type shown in the above-mentioned applications, the gap between the tuckers to accommodate loaves of various lengths.

A further object of the invention is to provide an independent manual adjustment for the tuckers and folders. Such adjustment of the tuckers is desirable when changing over from the wrapping of bread loaves to cartons.

With these and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations hereinafter fully described and then specifically set forth in the claims hereunto appended.

In the accompanying drawings which illustrate an embodiment of the invention and form a part of this specification and in which like characters designate similar parts:

Fig. 1 is a plan view of a wrapping machine exemplifying the invention;

Fig. 2 is a side elevation from line 2—2 of Fig. 3;

Fig. 3 is a side elevation of the sprocket adjusting mechanism viewed from line 3—3 of Fig. 1;

Fig. 4 is a cross-section on the line 4—4 of Fig. 5;

Fig. 5 is a detail elevational view taken on line 5—5 of Fig. 4;

Fig. 6 is a longitudinal section taken on line 6—6 of Fig. 4;

Fig. 7 is a detail view of the tucker adjusting mechanism;

Fig. 8 is a sectional view on the line 8—8 of Fig. 7; and

Fig. 9 is a detail view of the mechanism for disengaging the tucker adjusting means from the main control.

Referring to Fig. 1, it will be seen that the conveyor, pusher, tuckers, top folders, plough folders, bottom folders, heat sealers and refrigerated coolers are simultaneously adjustable to accommodate loaves of various lengths. For this purpose a hand wheel 10 mounted on a shaft 12 supported by the side frames 112 and having right and left-hand threaded portions 14 and 16 threaded into brackets 18 carrying frames 20 on which are mounted the top folders 22, plough folders 24, bottom folders 26 and heat sealers 28. The construction of these folders and sealers may be similar to that shown in the copending application of T. Jensen, S. N. 225,697, filed August 19, 1938, to which reference may be had for the details thereof. A sprocket 30 on shaft 12 is connected by sprocket chain 32 to a sprocket 34 on a shaft 36 supported in frames 112 and having right and left-hand threaded portions threaded into lugs 38 at one end of the refrigerated coolers 40, and shaft 36 is provided with a sprocket 39 connected by a chain 42 to a shaft (not shown) similarly threaded into lugs at the other end of the coolers. Thus upon turning the hand wheel 10 the coolers will be adjusted simultaneously with the folders and sealers. The construction of the coolers may be similar to that shown in the above mentioned Jensen application, S. N. 225,697. It will be seen that the pusher is formed with a pusher head 101 fastened on a slide 102. Extensions 114 and 116 of the pusher head 101 are slidably mounted on the latter, extension 114 being supported by an arm 126, and extension 116 being supported by an arm 128. Reference may be had to our above mentioned application for further details of the construction of the pusher.

A bevel gear 50 on shaft 12 meshes with a bevel gear 51 on a shaft 52 supported by one of the side frames 112 and connected by a universal joint 54 to a link 56 carrying a second universal joint 58 which is fastened to a stub shaft 60 journaled in a housing 62. A bevel gear 64 fastened on shaft 60 meshes with a bevel gear 66 fastened on the end of a spindle 68 projecting into the bracket 62 (Fig. 7). Spindle 68 has a right hand threaded portion threaded into a tucker-supporting arm 70 on which is fastened a tucker 72. The arm 70 is free to slide to and fro on a bracket 74 whereby turning of the shaft

68 will adjust the tucker 72 inwardly or outwardly. The end of the shaft 68 projecting from the bracket 74 has a squared cross-section slidably fitting a tube 76 fastened to the end of a spindle 78 having a left-hand threaded portion threaded into a tucker-supporting arm 80, carrying the other tucker 82. The arm 80 is free to slide on bracket 83 and is guided thereon by guides 84 and 85 fastened to the arm and extending under the bottom of the bracket. The bracket 83 is clamped by bolts 86 to the support 87 which is slidably mounted on a shaft 88 and moved outwardly during the delivery of the loaf to the lifter by the action of a roller 89 engaging a plate 90 on the support 87. The roller is mounted on a swinging block 91 loosely mounted on shaft 88 and rocked back and forth by a link 92 from a cam (not shown) to move the support outwardly with the tucker 82 during the delivery of the loaf to the lifter table, the plate 90 being held against roller 89 by a compression spring 93 bearing against support 87 and seated against a collar 94 fastened on shaft 88, whereby the tucker 82 will be returned to its inward position to tuck one end of the wrapper enfolding the article delivered to the lifter table. The bracket 74 is similarly clamped to a support 95 similarly mounted on shaft 88 and provided with a plate 96 engaging a roller 97 on block 91 against which it is held by compression spring 98. The bevel gear 64 on shaft 60 is held in mesh with bevel gear 66 by a compression spring 99, seated against bracket 62 and bearing against a knob 100 on the projecting end of shaft 60. Thus upon pushing the knob inwardly the gears 62 and 66 will be disengaged and the tuckers may be manually adjusted, as is desirable when changing from wrapping bread to wrapping cartons, by turning the tube 76 by hand. With the illustrated construction, moreover, it is possible to have a greater range of adjustment without recourse to reversal of the tuckers from one side of the tucker supporting arms to the other, as heretofore, for maximum and minimum lengths of articles.

Referring to Figs. 2–6, wherein are shown the details of the conveyor adjusting mechanism which form no part of the present invention, and constitute subject matter of our above-mentioned application, S. N. 349,924, it may be noted that a sprocket chain 202 driven from a sprocket 203 on the shaft 12 drives a sprocket 204 on a shaft 206 to which the universal joint 156 is fastened, said universal joint carrying the tube 154 which is connected to the universal joint (not shown) fastened to the pinion shaft of the pusher adjusting mechanism (not shown). Shaft 206 is mounted in bearing lugs formed on a housing 207 fastened to one of the side frames 112, and is also provided with a pinion 208 driving a gear 210 on a countershaft 212 also mounted in said bearing lugs of housing 207. Shaft 212 carries a worm 214 which meshes with a worm wheel 216 mounted on a shaft 218 journaled in housing 207. On shaft 218 is mounted a pinion 220 meshing with a rack worm 222 carried by a shaft 224 rotatably mounted in housing 207 and also slidable therein. A rack 226 is fastened at one end in the worm 222 and projects into a sleeve 230 on which are mounted sprockets 232 and 234 having abutting flanges which enclose the ends of a cross-shaft 236, projecting through sleeve 230 and bearing 238 in sleeve 230. A pinion 242 on shaft 236 meshes with the rack 226 whereby bevel gears 244 and 246 on the ends of shaft 236, which mesh with ring gears 248 and 250 fastened to the sprockets 232 and 234, respectively, may be rotated to turn the sprockets 232 and 234 in opposite directions simultaneously. The sprockets 232 and 234 are driven from a bevel gear 252 which is fastened to the sleeve 230 and intermittently driven from a suitable indexing mechanism (not shown), the sleeve being supported by a bearing 254 secured to the side frame 112.

Sprocket 232 drives a sprocket chain 256 to which are fastened at equal intervals a series of brackets 258 each having fastened thereon a flight 262 (Fig. 2). Sprocket 234 drives a chain 264 to which are fastened at equal intervals a series of brackets 266 on each of which is pivoted an arm 268 which is urged upwardly by a torsion spring 270. Flights 272 are fastened to the upper end of each arm 268 in position opposing an adjacent flight 262 to clamp a loaf of bread therebetween. It may be noted that each torsion spring urges its respective flight 272 away from the opposing flight 262 of the other chain so that the loaf of bread may readily enter between them, which is particularly desirable with sliced loaves. The inner upper end of each arm 268 is suitably beveled and the lower end of each flight is disposed at an acute angle to the remainder of the flight, so that the extent which the flight 272 needs to be swung back to admit the loaf may be substantially reduced. Each inserted loaf is then advanced between a set of flights 262, 272, whereby the cam roller 274 on the lower end of the arm 268 rides along the inclined face of the cam rail 276 on to the bottom face thereof and swings the flight 272 against the adjacent end of the loaf to firmly clasp it against the flight 262 and maintains flight 272 in clamping position at the loaf-ejecting station. By the above described relative adjustment of the sprockets 232 and 234, various lengths of loaves may be accommodated, as the coacting flights of each set may be brought closer together or farther apart within the desired range. Each flight has a bend in its mid-portion forming a slot adapted to receive the lugs or projections 127 and 129 of the pusher arms. Those lugs project sufficiently into the slots to assure removal of the heels of sliced bread loaves.

The loaves are delivered from a chute (not shown), or from the delivery conveyor of a slicing machine, on to a runway 280 having a longitudinal slot through which the arms supporting the flights travel into loaf-receiving and ejecting positions successively. The loaves inserted between the flights are guided by a guide rail 282 engaging one side of the loaves. This guide is provided with strips 284 sliding between rollers 286, supported on uprights 288 and a tension spring 290 urges the guide forwardly toward the path of the pusher. A cable 292 is connected at one end to guide 282 and at the other end to a bar 294 fastened to one of the frames supporting the folders. The length of the cable is such that the rail 282 is maintained in a position slightly to one side of the path of the pusher and advanced toward or retracted from the same as the pusher is contracted or expanded to conform to different lengths of loaves.

While a set of flights is at loaf-ejecting position, the pusher advances and ejects the loaf on to a lifter table 296 which has hubs 298 fastened to shaft 88 at either side of block 91, shaft 88 carrying a cam lever (not shown) whereby shaft 88 is intermittently rocked to periodically raise the table from loaf-receiving position to a horizontal

position aligned with a table **300**. A web of wrapping material (not shown) is fed into position to be partially enfolded about the loaf during its delivery to the lifter table, as described in the above-mentioned Jensen application, S. N. 225,697, and the tuckers are moved apart to admit the partially enfolded loaf therebetween and then moved inwardly to tuck the ends of the wrappers. During the ascent of the lifter table the top folders **22** fold the upper wrapper flaps over the tuckers. Then the loaf is advanced by flights (not shown) carried by a continuously traveling chain to advance the loaf upon table **300** whereby the final bottom flap is folded under the bottom of the loaf and the plough folders **24** and the bottom folders **26** complete the folding of the ends of the wrapper. As the wrapped loaves are pushed through the sealers **28** and coolers **40** by the following loaves advanced over table **300**, the finished loaves will be advanced beyond the coolers.

What is claimed is:

1. The combination with a lifter table movable from one position at which it receives an article partially enfolded in a wrapper to a position at a different level, of a set of members movable with said table and adapted to be moved with a parallel rectilinear movement toward each other to engage and tuck said wrapper, a device for automatically moving said members toward each other with a parallel rectilinear movement after the partially enfolded article is delivered to said table, to press and hold the edges of the wrapper against the ends of said article, and mechanism for simultaneously adjusting said members toward or away from each other to accommodate articles of various sizes therebetween.

2. The combination with a horizontal shaft, of a lifter table mounted on said shaft and movable from a lower position at which it receives an article partially enfolded in a wrapper to an upper position, a set of members movable with said table adapted to be moved with a parallel rectilinear movement toward each other to engage and tuck said wrapper, a device for automatically moving said members toward and away from each other with a parallel rectilinear movement, and mechanism for adjusting said members to accommodate articles of various sizes therebetween, said device including supports slidably mounted on said shaft and movable toward and away from each other, said members being slidably supported on the supports, and said mechanism including a right-hand screw threaded into one of said members, a left-hand screw threaded into the other of said members, and means for simultaneously turning said screws to vary the positions of said members on their supports.

3. The combination with a horizontal shaft, of a lifter table mounted on said shaft and movable from a lower position at which it receives an article partially enfolded in a wrapper to an upper position, a set of members movable with said table adapted to be moved with a parallel rectilinear movement toward each other to engage and tuck said wrapper, a device for automatically moving said members toward and away from each other with a parallel rectilinear movement, and mechanism for adjusting said members to accommodate articles of various sizes therebetween, said device including supports slidably mounted on said shaft and movable toward and away from each other, said members being slidably supported on the supports, and said mechanism including a right-hand screw threaded into one of said members, a left-hand screw threaded into the other of said members, and means for simultaneously turning said screws to vary the positions of said members on their supports, said means including a tube fastened to one of said screws and slidably mounted on the other of said screws, a universal joint connected to one of said screws and adapted to rotate said screws and thereby adjust said members toward and away from each other, and instrumentalities for turning said universal joint.

4. The combination with a lifter table pivotally mounted on a stationary horizontal pivot and movable from a lower position at which it receives an article partially enfolded in a wrapper to an upper position, of a set of members slidably supported on said pivot and movable with said table from the lower to the upper position thereof and having a parallel rectilinear movement toward each other to engage and tuck said wrapper, a device for automatically moving said members toward each other with a parallel rectilinear movement after the partially enfolded article is delivered to said table, to press and hold the edges of the wrapper against the ends of said article, and mechanism for simultaneously adjusting said members along said pivot to accommodate articles of various sizes therebetween.

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