Sept. 12, 1944. M. J. MILMOE ET AL 2,358,240

ARTICLE CONVEYER APPARATUS FOR PACKAGING MACHINES

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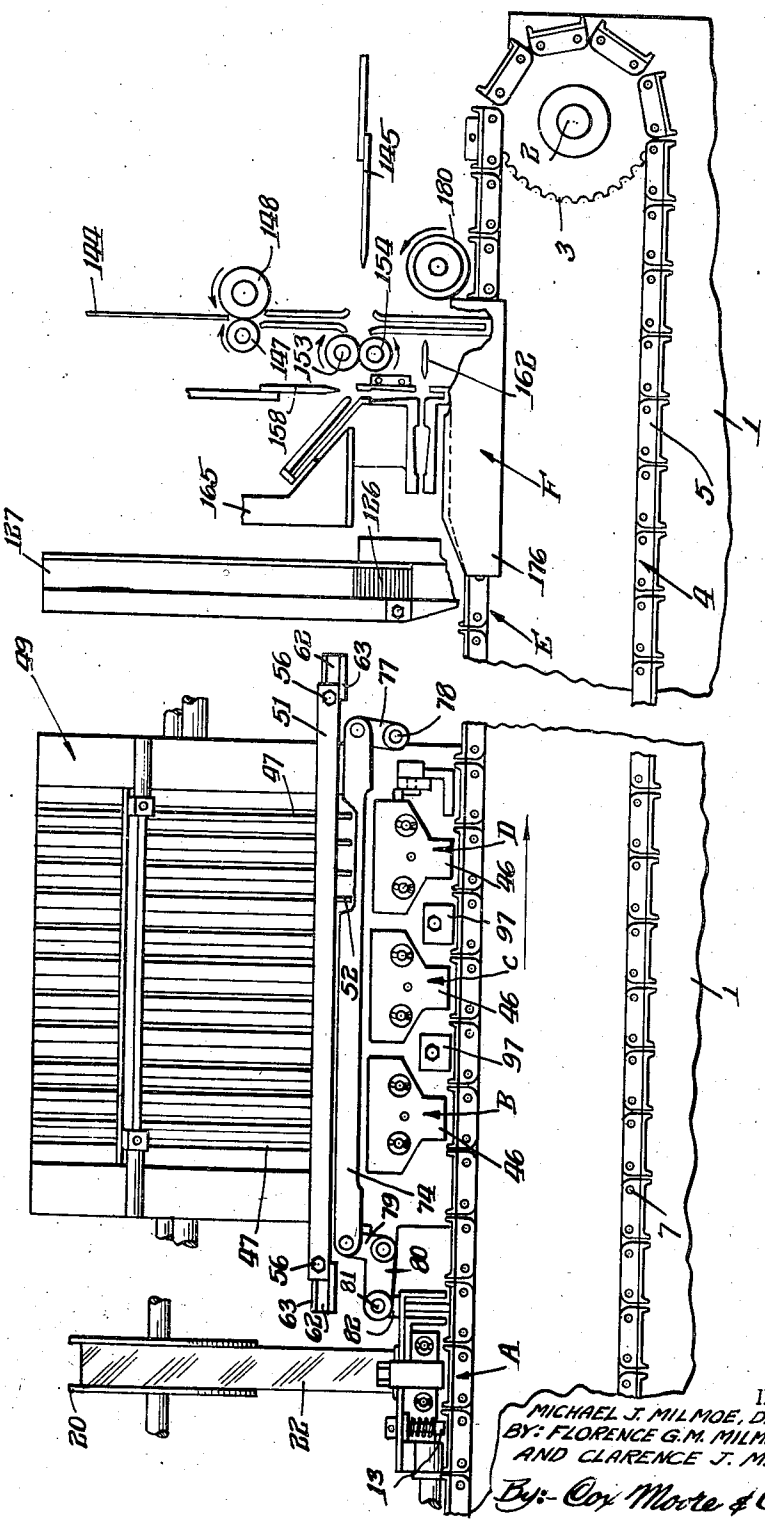


FIG. 1.

INVENTORS.
MICHAEL J. MILMOE, DECEASED
BY: FLORENCE G.M. MILMOE, EXECUTRIX
AND CLARENCE J. MALHIOT
By: Cox Moore & Olson attys.

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FIG. 2.

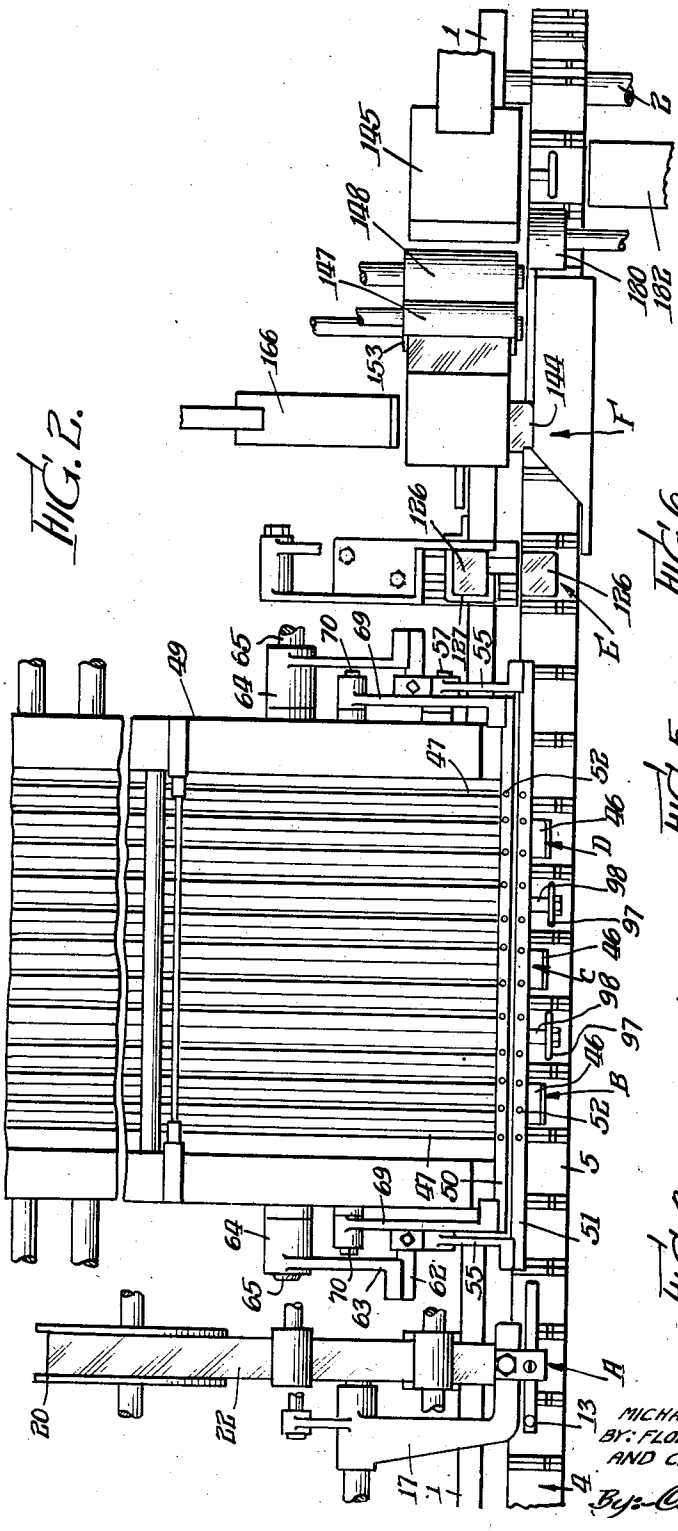



FIG. 7.

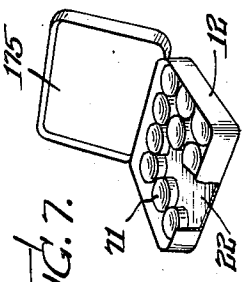



FIG. 6.

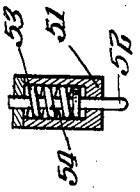



FIG. 5.

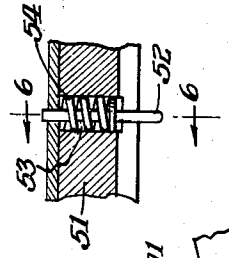



FIG. 4.

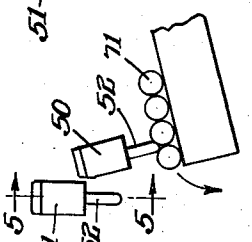
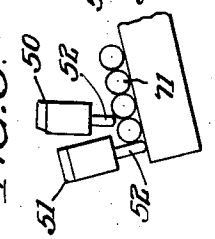



FIG. 3.




INVENTORS.
MICHAEL J. MILMOE, DECEASED
BY: FLORENCE G. M. MILMOE, EXECUTRIX
AND CLARENCE J. MALHIOT.
By: Cox Moore & Olson Attys.

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ARTICLE CONVEYER APPARATUS FOR PACKAGING MACHINES

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FIG. 8.

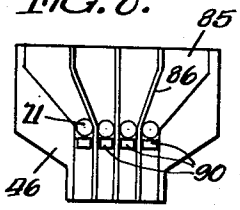



FIG. 9.


FIG. 9a.

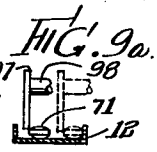



FIG. 10.

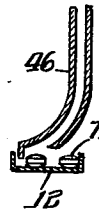



FIG. 10a.

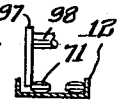



FIG. 10b.

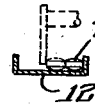



FIG. 11.

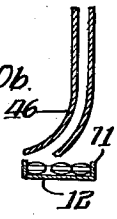



FIG. 12.

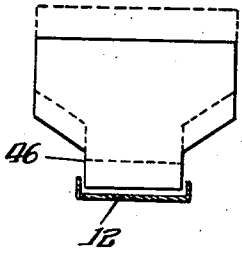



FIG. 13.

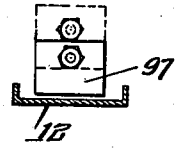



FIG. 14.

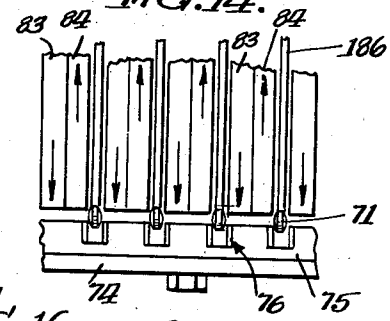



FIG. 15.

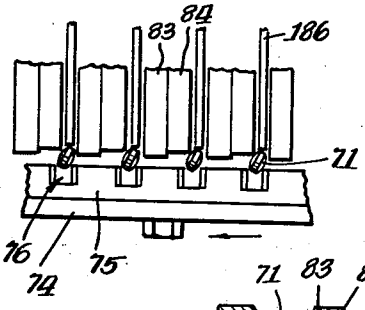
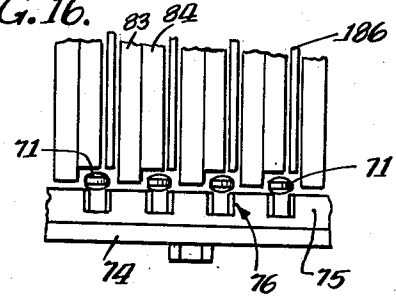



FIG. 16.



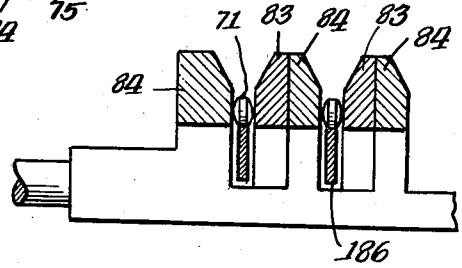
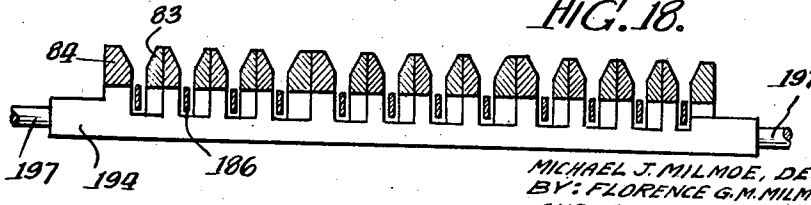




FIG. 17.

FIG. 18.

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By: Cox Moore & Olson attys.

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ARTICLE CONVEYER APPARATUS FOR PACKAGING MACHINES

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FIG. 19.

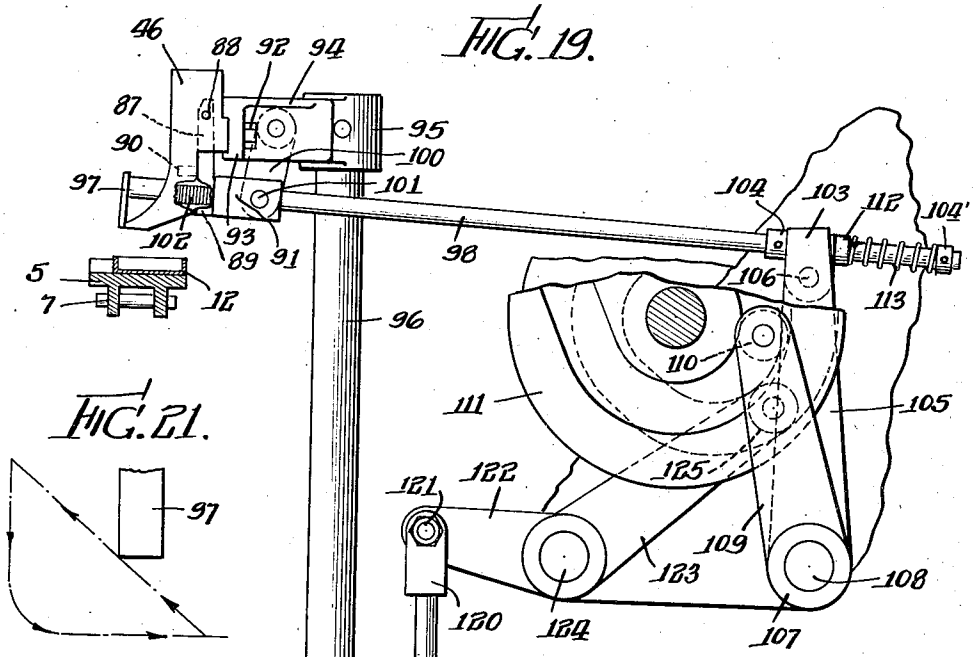


FIG. 21.




FIG. 20.

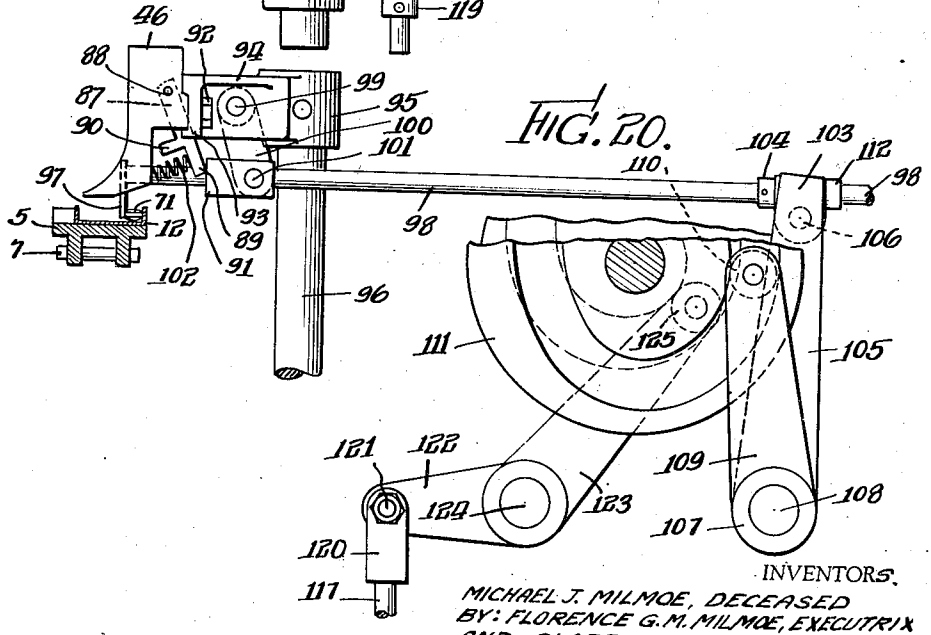


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FIG. 22.

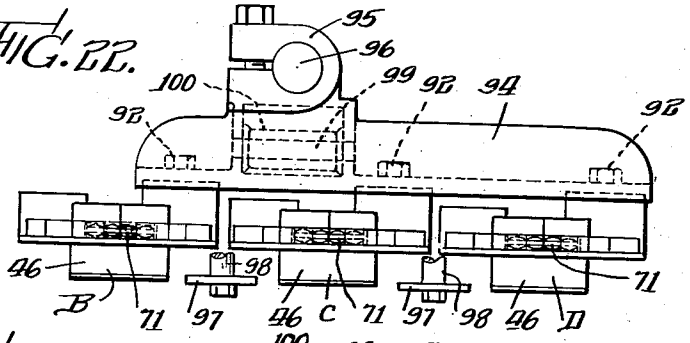



FIG. 23.

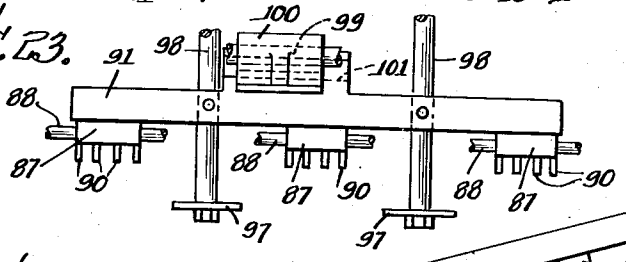



FIG. 24.

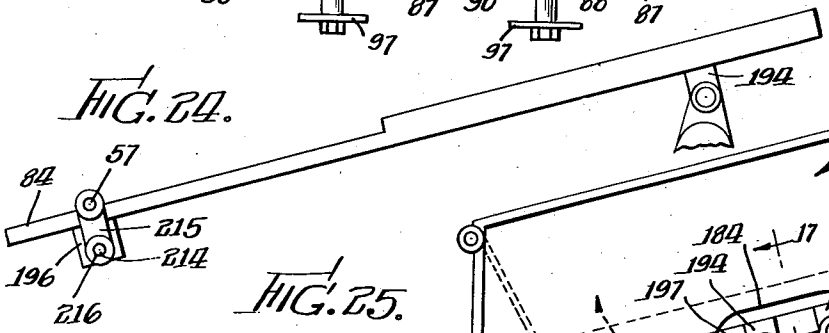
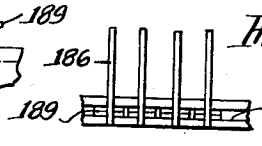



FIG. 25.




FIG. 26.


FIG. 27.




INVENTORS
MICHAEL J. MILMOE, DECEASED
BY: FLORENCE G. M. MILMOE, EXECUTRIX
AND CLARENCE J. MALNIOT
By: Cox Moore & Olson attys.

Patented Sept. 12, 1944 2,358,240

# UNITED STATES PATENT OFFICE

2,358,240

## ARTICLE CONVEYER APPARATUS FOR PACKAGING MACHINES

Michael J. Milmoe, deceased, late of Glen Ellyn, Ill., by Florence G. M. Milmoe, executrix, Glen Ellyn, Ill., and Clarence J. Malhiot, Oak Park, Ill.; said Michael J. Milmoe and said Clarence J. Malhiot assignors to F. B. Redington Co, Chicago, Ill., a corporation of Illinos

Original application September 17, 1937, Serial No. 164,364, now Patent No. 2,227,378, dated December 31, 1940. Divided and this application October 31, 1940, Serial No. 363,784

23 Claims. (Cl. 198—33)

This invention relates to article processing machines, such as packaging machines and the like, and more particularly to new and improved article conveyer structures for use therewith.

It is an object of the invention to provide a new and improved article conveyer structure for use with article processing machines, such as packaging machines or the like.

More specifically, it is an object of the present invention to provide an article conveyer structure for use with machines of the foregoing type, which conveyer will accurately and positively present or deliver articles to be processed to a packaging or other suitable station, the articles being presented in a predetermined timed sequence and in a given predetermined position. To this end the invention contemplates a conveyer structure wherein means is provided, such as agitator devices or the like, for insuring the proper passage of articles through the conveyer; wherein means is provided operable at proper predetermined intervals for releasing one or more articles in sequence for movement within the conveyer; and wherein means is provided for shifting or predetermining the position of the articles within the conveyer so that they will be presented to the packaging or other treating station in the proper and desired position.

Various other objects, advantages and features of the invention will be apparent from the following specification.

The accompanying drawings illustrate a selected embodiment of the invention and the views therein are as follows:

Fig. 1 is an elevation of an improved machine, a tablet packaging machine, including a tablet or article conveyer constructed in accordance with the principles of the invention;

Fig. 2 is a top plan view of the machine;

Fig. 3 is a diagrammatic view of the escapement bars associated with the conveyer showing them in one of their operating positions;

Fig. 4 is a view similar to Fig. 3 but showing the escapement bars in another of their operating positions;

Fig. 5 is a detail sectional view of the escapement bars on the line 5—5 of Fig. 4;

Fig. 6 is a detail sectional view of an escapement bar on the line 6—6 of Fig. 5;

Fig. 7 is a perspective view of the receptacle, a metal container in the embodiment illustrated, for receiving the articles or tablets packaged by the machine;

Fig. 8 is a detail elevational view of the article or tablet chute member associated with the conveyer;

Fig. 9 is a detail sectional view of the end of a chute member after a lateral row of tablets have been arranged in the container;

Fig. 9a is a detail sectional view showing the operation of the pusher arm associated with the chute member for moving the row of tablets placed in the container to one side of the container;

Fig. 10 is a view similar to Fig. 9 showing a second lateral row of tablets arranged in the container;

Fig. 10a is a view showing the position of the pusher arm after a second lateral row of tablets has been inserted in the container;

Fig. 10b is a view similar to Fig. 10a but showing the pusher arm having pushed the second row of tablets into their normal position;

Fig. 11 is a view similar to Figs. 9 and 10 but shows the three lateral rows of tablets positioned in the container;

Fig. 12 is an elevational view of the chute showing it in two positions;

Fig. 13 is an elevational view of the pusher bar showing the same in different positions;

Fig. 14 is a plan view of some of the mechanism at the lower end of the conveyer showing the tablet rotating bar and the tablet agitators;

Fig. 15 is a view similar to Fig. 14 showing the agitators and the tablet rotating bar at approximately mid-stroke;

Fig. 16 is a view similar to Figs. 14 and 15 but showing the position of the tablets at the fulfillment of the stroke of the tablet rotating bar and agitators;

Fig. 17 is a view taken on the line 17—17 of Fig. 25 showing part of the tablet agitators with tablets arranged in the channels of the conveyer;

Fig. 18 is a view similar to Fig. 17 showing all of the agitators and the conveyer support bars and the channels for the tablets;

Fig. 19 is a detail elevational view of some of the mechanism showing the operation of the pusher bar and chute;

Fig. 20 is a view similar to Fig. 19 but showing the pusher bar in its rearward position;

Fig. 21 is a diagrammatic representation of the movement of the tablet-alining pusher bar of Figs. 19 and 20.

Fig. 22 is a detail plan view of some of the mechanism shown in Fig. 19 showing the bracket for carrying and operating the chute members;

Fig. 23 is a view similar to Fig. 22 showing the connecting arm for the tablet pusher bars, certain parts being omitted for the sake of clearness;

Fig. 24 is an elevational view of an individual tablet agitator showing the mounting thereof;

Fig. 25 is an elevational view of the inclined conveyer or hopper and some of the actuating mechanism therefor;

Fig. 26 is an elevational view of the bracket and tablet rails showing their connection to each other; and

Fig. 27 is a plan view of the structure shown in Fig. 26.

The present invention is illustrated as applied to a machine for packaging disk shaped articles or tablets but the principle of operation of the disclosed machine is equally applicable to packaging of other articles. It is also to be understood that the conveyer structure hereinafter described and claimed may be applied to article processing machines of various types and kinds, other than packaging machines as shown. This application is a division of the joint application of Michael J. Milmoe and Clarence J. Malhiot, Serial No. 164,364, filed September 17, 1937, and entitled Packaging machine and method of packaging, said application having been issued December 31, 1940, as Patent No. 2,227,378. The present application concerns more particularly the article or tablet conveyer structure.

Referring to the drawings, the machine disclosed in general comprises a packaging machine for packaging a plurality of tablets in a container having a hinged top. The containers which receive the tablets are carried by a chain conveyer along a predetermined path, which conveyer is driven intermittently or step by step and has a series of buckets or pockets for receiving the containers in open position. As soon as the containers arrive at a predetermined position, a piece of precut material or paper is placed in the bottom of the container, the material being cut by a reciprocating knife, the movement of which is automatically synchronized with the feeding movement of the conveyer. The containers in the buckets continue along their path of movement until they arrive at a predetermined position under spaced chute members, which have received a plurality of tablets from a tablet or article conveyer, to feed an exact number of tablets into each container at a proper timed interval. Additional means are provided adjacent the tablet-feeding means for positioning the tablets in the containers in a uniform manner. After the tablets are properly positioned and arranged in the container, the filled container is continued along a path of movement to a predetermined position where it receives a slip, card or the like containing printed matter, such as directions pertaining to the use of the tablets. The container of tablets is then moved to another predetermined position to receive a folded advertising circular in superposed relation with the tablets. The circular is first folded to proper shape and then fed into proper position in the container. When the folding mechanism, which folds and feeds the advertising circular of folded dimensional size, is operated, the container is moved by the conveyer to closing position where the hinged top will be closed to complete the packaging operation.

Referring more specifically to the drawings and particularly to Figs. 1 and 2 thereof, the machine comprises a frame 1 which is attached to a base or supporting member. Transverse shafts 2 are journaled in the frame 1 and carry sprocket wheels 3, only one of these shafts and sprockets being shown in Figs. 1 and 2. The sprocket wheels 3 support and operate a conveyer belt 4 which comprises a plurality of individual conveying buckets, receptacles or plates 5 having a package or container receiving pocket. The buckets 5 are connected by links suitably secured to adjacent buckets by pins 7.

A small container 12, Fig. 7, is placed in each individual bucket 5 of the conveyer 4 and is fed along the path of the conveyer into the packaging machine. The conveyer buckets 5 carrying containers 12, are successively moved by the conveyer to a series of operating stations designated as stations A, B, C, D, E and F in the drawings, see Figs. 1 and 2. At the station A a container is first accurately positioned with respect to the conveyer bucket by which it is carried, by means of a positioning pin 13 carried by oscillating lever 17, and thereafter a short section of paper is cut from a paper web 22, Fig. 2, carried by a supply roll 20, said section being deposited in proper position at the bottom of the container as best shown in Fig. 7. The details of operation of the positioning pin 13, and the mechanism for severing and placing the cut sections of web 22 in the bottom of the containers forms no part of the herein claimed invention and accordingly is not herein specifically shown or described. A detailed showing of such mechanism appears in the aforementioned application of Michael J. Milmoe and Clarence J. Malhiot, Serial No. 164,364, now Patent No. 2,227,378.

As each container, with the web section 22 deposited in the bottom thereof, is moved by the conveyer 4 from the station A, it will be presented successively in step by step manner to the stations B, C and D immediately below a plurality of chute members 46, Figs. 1, 2, 8, 9, 12 and 19. The chute members 46 are disposed immediately above and in alignment with the conveyer buckets, Fig. 1. These chute members 46 are not limited to any particular number, but a separate chute is provided for each individual row of tablets to be fed into the container. In the present instance there are shown three chute members for feeding three individual rows of four tablets, there being four slideways for the four tablets in each chute.

Immediately above the chute members are a plurality of members spaced to provide conveyer channels 47, Figs. 1, 2 and 25, in an inclined article or tablet conveyer 48. These channels permit the tablets to slide or roll downwardly and be fed from a hopper 49 into the chute members 46. The channels of the inclined conveyer 48 are so disposed that four of the channels 47 lie in perfect alignment with the slideways in each of the chute members. This arrangement is to allow one tablet at a time to be fed from each channel to a respective chute member, and since there are four channels for each chute member four tablets are fed to each chute member to provide a row of four tablets, Fig. 8. The conveyer 48 comprises a transmission conveyer for the tablets, for transmitting them from the hopper 49 to

the chute members 46. These chute members constitute a receiving conveyer, for receiving the tablets from the transmission conveyer, and for further transmitting them to the containers 12.

At the lower end of the inclined conveyer 48 and disposed immediately above the channels 47 are a pair of escapement bars 50 and 51, Figs. 1, 2, 3 and 25, which extend transversely across the channels 47 of the conveyer 48. These escapement bars are for the purpose of limiting the number of tablets being fed from the conveyer channels into the chute members. The bars 50 and 51, carry a plurality of pairs of spring-urged pins 52, Figs. 2 to 6, each pair of pins extending through the bars 50 and 51 and in alignment with each channel 47, Fig. 2. The number of pairs of pins in the bars is equal to the number of channels 47, the pins being for the purpose of limiting or stopping the tablets being fed.

The bars 50 and 51 have a plurality of recesses 53 each of which receives a spring 54 surrounding the pin 52, Figs. 5 and 6. The front escapement bar 51, Figs. 1 and 25, is connected to a crank arm 55 by bolts 56. The crank arm 55 is pivoted around the shaft 57 and has extending beyond the pivot an extension 58 which has a threaded aperture 59 adapted to receive a bolt 60, Fig. 25. The bolt 60 has threaded thereon a pair of nuts 61 which contact the extension 58 for securing the adjustment of the bolt. The bolt 60 on the arm 55 contacts the underside of a bar 62, which is integrally connected to a second crank arm 63, integral with a bearing 64 pivoted about the shaft 65. The shaft 65 may be carried by the frame in any convenient manner. A crank arm 66 extends from the bearing 64 and has a cam roller mounted at 67 which cooperates with a cam 68. The back escapement bar 50 is integrally connected to a crank arm 69 which is pivoted at 70. The crank arm 69, Fig. 25, has a threaded recess 72 adapted to receive a threaded bolt 73 which contacts the bar 62 to limit the downward movement of the escapement bar 50. This bolt 73 is adjustable to predetermine the movement of bar 50.

The tablets 71, Fig. 25, roll down the inclined article conveyer 48 in the channels 47 on their peripheral edges and come in contact with the spring-urged pins 52 which are disposed in the back bar 50, and are stopped thereby. Each pin is spring-urged to prevent injury to the tablets when the pin moves into clamping contact with a tablet 71. Upon the rotation of the cam 68 to reciprocate the arm 63 vertically upward, the crank arm 69 and the escapement bar 50 are lifted by the bar 62 from the position shown in Fig. 25 to move the pins 52 carried by this bar out of contact with the tablets. Simultaneously with the lifting of the crank arm 69 by the extension 62, the crank arm 55 is released for downward movement around its pivot 57 to bring the pins on the escapement bar 51 into position in front of the tablets, as shown in Fig. 3. The escapement bar 50, therefore, allows only one tablet at a time to be fed from each channel to the escapement bar 51. The further rotation of the cam 68 moves the arm 66 about its pivot to oscillate the arm 63 and bar 62 downwardly, so that this bar contacts the bolt 60 of the arm 55 and causes the arm 55 to pivot about the shaft 57. This downward movement of the extension 62 raises the arm 55 and its cooperating escapement bar 51 from the position shown in Fig. 3 to the position shown in Fig. 4 to release the tablets. Simultaneously with the raising of the bar 51, the escapement bar 50 moves downwardly to the position shown in Figs. 4 and 25, whereby each pin 52 of this bar contacts a second tablet in each line of tablets and prevents further feeding movement of these and the succeeding tablets. The escapement bar 51 therefore in turn allows only a single tablet 71 of each channel to be fed into a tablet-rotating bar 74, Figs. 1, 14 and 25.

The tablet-rotating bar 74, Figs. 1, 14–16 and 25, is disposed immediately below the escapement bar 51 and adjacent the lower end of the inclined conveyer. This bar 74 carries a bar 75 which is provided with a plurality of recesses 76, these recesses being equal in number to the number of channels 47. The bar 74, Figs. 1 and 25, is connected at one end by a link 77 to a pivot stud 78. At the other end it is connected to a bell crank lever, Fig. 1, having arms 79 and 80. The arm 80 is pivoted at 81 to a link 82 for connection to its actuating mechanism (not shown).

The vertical reciprocation of the link 82 oscillates the bell crank which reciprocates the bar 74 and brings the recesses 76 into and out of alignment with the channels 47, as shown in Figs. 14 to 16. Fig. 14 shows the bar 74 at the extreme right-hand position of its stroke and just starting to move to the left. In this position a tablet 71, fed past the escapement bar 51, falls partially into a recess 76. The continued movement of the bar 74 turns the tablet over to the position shown in Fig. 15 and then to the position shown in Fig. 16, in which latter position it is exactly perpendicular to its former position in channels 47. In the reciprocation of the bar 74 reciprocating tablet agitators or members 83 and 84, Figs. 14–18, assist in the repositioning of the tablets 71. The reciprocating tablet agitators 83 and 84 will be hereinafter described.

At the extreme left-hand position of the bar 74, the tablets 71, having been repositioned, will be allowed to drop into the respective channels 85 of the chute members 46, Fig. 8, the channels 85 being in alignment with the recesses 76 and the channels 47. Each chute member 46 has four of these channels 85, as previously stated, which are separated by the guides 86, Fig. 8. In position B, Figs. 1 and 2, the first four channels 47 of the inclined conveyer feed the first chute member 46, in position C the second four channels feed the second chute member 46, while in position D the last four channels feed the third chute member.

Each of the chute members 46 has associated therewith a finger member 87, Figs. 19, 20 and 23, pivoted on a stud or shaft 88. Each finger member is provided above its lower end 89 with four finger extensions 90, Figs. 8, 19, 20 and 23. The purpose of these extensions 90 is to control the feed of the tablets 71 from the channels 85 so that all four tablets for each chute member will be fed simultaneously into the container 12. Each finger 87 has a pendulum movement about the stud 88, and all the fingers are controlled by a bar 91, Figs. 19 and 23, mounted on pusher rods which will be hereinafter described.

The chute members 46 are bolted by bolts 92 to the vertical face 93 of an angular bracket 94, Figs. 19, 20 and 22, the horizontally extending arm of which is integrally connected with a boss 95 adjustably secured to an actuating rod 96.

Tablet pusher bars 97, Figs. 1, 2, 13, 19, 20, 22 and 23, which are positioned between the chute members 46, as best shown in Figs. 1 and 2, are

mounted on pusher shafts 98. The bracket 94 carries a shaft or stud 99 to which a downwardly extending link 100 is pivoted. The opposite end of the link 100 is pivoted to a shaft 101, Figs. 19, 20 and 23, carried by the bar 91. The shafts 98, which carry the pushers 97, extend through the bar 91 and are rigidly secured thereto as shown in Fig. 23. This bar 91, which is positioned immediately behind the chute member 46 and below the bracket 94 extends transversely of all three chute members 46 and cooperates with springs 102, Figs. 19 and 20, mounted in said chute members for controlling the movement of the fingers 87. The movements of these fingers control the feed of tablets 71 into the container 12 as previously stated.

The pusher bar shafts 98, Figs. 19 and 20, for the pusher bars 97, have at their rear ends bearings 103 positioned on the shafts 98 by collars 104 and 112, the collars 104 being fastened to the shafts and the collars 112 being loose thereon. The bearings 103 have downwardly extending levers 105 attached thereto, as indicated at 106. At its lower end each lever 105 is integrally connected with a boss portion 107 fastened to a shaft 108. Also fastened to the shaft is a lever 109, carrying a roller 110 which contacts a cam 111. This cam 111, upon rotation, moves the roller 110, which, through levers 109 and 105, causes reciprocation of the pusher bar shafts 98. A helical spring 113, mounted between a rear collar 104', Fig. 19, fastened to each shaft 98 and the collar 112, acts as a safety spring to permit the bearing 103 to move idly relative to its shaft 98 if the pusher 97 in the rearward movement encounters any undue resistance.

The chute-actuating rod 96, Figs. 19 and 20, extends vertically downward from the boss 95 and is fastened at its lower end to a boss 114, Fig. 19, which carries a horizontal arm 115. At the end of the arm 115 is a boss 116 which is adapted to receive a rod or link 117. The rod 117 is positioned against displacement in the boss 116 by the collars 118 and 119. The rod or link 117 extends vertically upward and in parallel alignment with the rod 96 and has at its upper end a yoke 120, pivoted at 121 to an arm 122 of a bell crank pivoted at 124. The other arm 123 of the bell crank carries a cam roller 125 which cooperates with a driving cam (not shown). The rotation of the cam moves the roller 125 and causes the bell crank lever to pivot about its pivot 124, to vertically reciprocate the link 117 and the rod 96.

The path along which the pusher bars 97 are moved by the shafts 98 and the rod 96 is diagrammatically shown in Fig. 21. The upward reciprocation of the rod 96 takes place during the forward movement of the shafts 98 and consequently the pusher bars move diagonally upwardly and forwardly, as shown in Fig. 19, during the vertical upward movement of the chute members 46. Each chute member in its upper position receives in its channels 85 a set of four tablets fed from the recesses 76 of the tablet-rotating bar 74. The tablets which have been fed into the channels 85 are held therein by the extensions 90 on the pivoted fingers 87. In this position of the extensions 90, the pusher arm 97 is at the front of a chute member 46 and the bar 91 pressing against the fingers 87 retains them in their forward position against the action of the springs 102.

During the major portion of the downward movement of the rod 96 the shaft 98 is inoperative and consequently the chute members 46 and pusher bars 97 move vertically downward as a unit until the rod 96 approaches the end of its travel when the shaft 98 begins to move rearwardly. Rearward movement of the shaft 98 causes the bar 91 to move away from the chute members to thereby release the springs 102. The springs 102 move the fingers 87 backwardly and allow four tablets to fall from each chute member into the front of a container 12 positioned at the points B, C and D in Figs. 1 and 2. The feeding positions of the tablet in the front of the container are shown in Figs. 9, 10 and 11, Fig. 9 showing the first row of tablets in initial position in the container; Fig. 10 showing the second row of tablets in initial position and the first row of tablets in adjusted position; and Fig. 11 showing the third row of tablets in fed position and the first and second rows of tablets in adjusted position.

As shown more particularly in Figs. 1 and 2, the pusher bars 97 overlie the buckets positioned between the chute members. Consequently these bars, when the rod 96 has completed its downward movement, engage the first and second rows of tablets which initially are fed to the same relative position in the container as shown in Figs. 9, 9*a*, 10 and 10*a*. The rod 96 having completed its downward movement, the shaft 98 continues to move rearwardly and causes the pusher bars 97, engaged with the first and second rows of tablets, to move the same toward the rear of the container, as shown in dotted lines in Figs. 9*a* and 10*b*, thereby properly positioning the tablets in these rows in the containers.

This movement having been completed, the shafts 98 and pusher bars 97 are then moved forwardly to clear the tablets and having cleared the same the rod 96 again moves upwardly while the shaft 98 moves forwardly, thereby returning the chute member and pusher bars to their positions shown in Fig. 19 and setting the fingers 87 for reception and retention of tablets in said chute member.

As shown in Fig. 11, the third row of tablets is initially fed into its proper position adjacent the front edge of the container. Therefore a pusher bar 97 is not provided for this row of tablets.

As the containers with the three rows of tablets arranged therein leave the last chute member 46 at station D, they are transmitted to a station E, Figs. 1 and 2, where a slip 126, containing printed matter or instructions, is placed in superposed position upon the tablets 71 in each container. The slips 126 are carried by a hopper 127, and are adapted to be transmitted by suitable mechanism onto the tablets in the container. From the station E the containers are then moved by conveyer 4 to the station F, Figs. 1 and 2, where the lid 175, Fig. 7, of each container is engaged by a fixed guide member 176 which operates to move the lid to closed position. However, as an incident to the lid-closing operation, and just prior to the completion thereof, mechanism including a series of folders 145, 158, 162, 165, 166 and a series of feed rolls such as rolls 147, 148 and rolls 153, 154 also disposed at station F, operate to fold and introduce a circular 144 onto the slip 126 and under the lid. The lid is then locked in closed position by means of a presser roll 180, the completely loaded containers then being delivered by the conveyer 4 to a suitable discharge point, such as the table 182. The mechanism for in-

serting the slips 126, for closing the container lids and for folding and inserting the circulars 144 forms no part of the herein claimed invention and need not be specifically described. A detailed description of this mechanism appears in the aforesaid application of Michael J. Milmoe and Clarence J. Malhiot, Serial No. 164,364, now issued as Patent No. 2,227,378.

Referring further to the conveyer for transmitting the tablets to the chute members 46, it will be seen that the hopper 49, Fig. 25, is mounted on an angular frame bracket 185, which is attached to a main frame bracket 8. The top portion of the bracket 185 supports the hopper 49, the tablet-agitator bars 83 and 84, and tablet rails 186 to form the inclined conveyer 48. This inclined conveyer consists of a plurality of feed channels 47, as hereinbefore described.

The tablet rails 186 are connected at the rear and front of the hopper to transverse bars 187 and 192 which are bolted to the frame bracket 185 in any suitable manner as by bolts 188, shown at the right of Fig. 25. Each rail 186 has pins 189 at opposite ends thereof, and these pins are adapted to fit into recesses 190 in the bars 187 and 192. The rails 186 fit into recesses 191 which are disposed perpendicular to the recesses 190, Figs. 26 and 27.

The inclined conveyer 48 has a plurality of tablet-agitator bars 83 and 84, disposed between and above the tablet rails 186, Figs. 17 and 18, there being a pair of agitator bars for each channel 47. These tablet agitators 83 and 84 are supported at the back of the conveyer by supporting bars 194 and 195, and at the front by a support bar 196, Fig. 24, and by a bar (not shown). The support bar 194 for the bars 84, at the rear of the inclined conveyer, has integral therewith at both ends a shaft 197. The agitating bars 83, which cooperate with the agitating bars 84, are carried in a similar manner by a support bar 195, having shaft extensions 198 a both ends. These support bars and shafts are parallel and adjacent to each other and extend through an aperture 184 in the hopper 49, Fig. 25.

At the upper end of the conveyer, the support 194, carried by the shaft 197, is interconnected with arms 199. These arms 199, one at each end of the support 194, are rigidly mounted on a shaft 201 journaled at both ends in the hopper support bracket 185. Mounted on the front end of the shaft 201, Fig. 25, is a lever 203 connected at 204 to a link 205. The link 205 is rotatably fastened to a crank 206 driven by means (not shown). Rotation of the crank 206 therefore imparts a reciprocating movement to the agitator bars 84. The shaft extensions 198 are rotatably mounted in levers 207 rigidly mounted on the shaft 209. Fastened to the back end of shaft 209, Fig. 25, is a lever 210 connected at 211 to a link 212. The link 212 is rotatably fastened to a crank 213 driven by means (not shown). Rotation of the crank 213 imparts a reciprocating movement to the bars 83. The connecting mechanisms for actuating the agitator bars 83 and 84 are similar in every detail. The link 205 and its actuating mechanism for the bars 83 is disposed on one side of the hopper, while the link 212 and its actuating mechanism for the bars 84 is disposed on the opposite side of the hopper. The supporting bar 196 at the lower end of the conveyer 48 has a shaft portion 214 at each end, which is adapted to be received in connecting levers 215 for supporting the agitator bars. The levers 215 have openings 216 adapted to receive the shaft portions 214 providing a movable support, swinging in an arc, and allowing the reciprocation of the agitating bars 84. The support levers 215 at their opposite ends are supported by the shaft 57 carried by the frame 185 for supporting the bar 196 which carries the tablet agitator bars 84. A similar mechanism mounted on the shaft 70 supports the tablet agitators 83.

The bars 83 and 84 are reciprocated so that on the forward stroke of one bar the other is moving backwards. This is obvious, since the bars 83 and 84 feed the tablets down the tablet rails 186 into a position to be received by the tablet-rotating bar 74, Fig. 14. The bars 83 in their forward position, in conjunction with the bars 84 at their backward position, cooperate with the bar 74 in turning the tablets around in position to be fed into the chute members. The reciprocation of the bars 83 and 84 have the further purpose of agitating and feeding the tablets along the channels 47 of the inclined conveyer 48.

It is to be understood that the packaging machine hereinbefore described has its various actuating mechanisms connected to a main drive shaft (not shown) for synchronizing the series of operations in timed relationship.

*Operation*

The open containers 12 are placed in conveyer buckets 5 and properly positioned therein by the pin 13 just prior to reaching the position A, Fig. 1, where a slip of paper 22 is fed and cut off and finally inserted in the bottom of the container. The containers are then moved in succession by the intermittently operating conveyer to the position B, under the first chute member 46, where each container receives the first row of tablets 71, coming from the inclined conveyer 48 past the escapement bars 50 and 51, to be turned around by the rotating bar 74 and allowed to fall into the chute member 46.

The pusher bar 97 positions the row of tablets to the back of the container at the next position, after which it is fed along to position C. At this position it receives a second row of tablets by repeating the same cycle of operation, and in its next position the second pusher bar 97 properly positions the second row of tablets along the median line of the container. The conveying of the container with the two rows of tablets to the position D allows it to receive a third row of tablets from the chute member at this point.

When a container is moved to position D to receive the last row of tablets, the conveyer has positioned additional containers at positions C and B and A to receive the second and first row of tablets and the bottom paper or slip 22, respectively. After each container is filled it is then conveyed to position E to receive the top slip 126 fed from the hopper 127. The slip is fed by suitable mechanism into each container 12 into superposing relationship with the tablets 71.

Each container 12 is next conveyed to the position F, where a printed circular 144 which has been folded by the folding devices is inserted into the container. The lid 175 of each container 12, while approaching the position F, contacts the angular guide member 176 which functions to move the lid 175 toward a closed position, but the lid is prevented from closing completely until the folded circular has been inserted.

After the folded circular is inserted, the container is conveyed under a presser roll 180 which

applies pressure upon the partially closed container lid to snap the lid 175 into complete closed position to form a completed package.

It will be seen that after the containers 12 have been placed in the buckets 5 the packaging machine automatically performs its series of operations to provide a container with its full contents, and then completely closes the container to form a completed package, this automatic operation being accomplished without any manual means whatsoever.

Changes may be made in the form, construction and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is hereby claimed as follows:

1. In combination with a packaging machine for packaging tablets, an inclined conveyer comprising a plurality of tablet-supporting bars and a plurality of pairs of tablet-agitating bars, said supporting bars and pairs of agitating bars forming a plurality of tablet-receiving channels in the conveyer, means for reciprocating the agitating bars to feed the tablets, means for limiting the number of tablets being fed from the conveyer, and means adjacent the conveyer comprising a transversely shiftable member movable in predetermined timed relation with the agitating bars for rotating the tablets from one predetermined direction to another predetermined direction.

2. In combination with a packaging machine for packaging tablets, a conveyer comprising a plurality of inclined tablet supporting bars along which the tablets roll edgewise and a plurality of pairs of tablet-agitating bars, said supporting bars and pairs of agitating bars forming a plurality of tablet receiving channels in the conveyer, means for reciprocating the agitating bars to feed the tablets along the supporting bars, and means adjacent the conveyer shiftable transversely of the conveyer and cooperatively associated with the agitating bars for rotating the tablets to feed the tablets flatwise from the conveyer.

3. In an article packaging machine or the like, a conveyer for feeding the articles comprising a plurality of fixed inclined article supporting bars transversely aligned, and a pair of article agitating bars between adjacent article supporting bars, said supporting bars and agitating bars forming a plurality of article receiving and feeding channels in the conveyer, and means for simultaneously reciprocating adjacent agitating bars in opposite directions to feed the articles along said inclined article supporting bars.

4. In an article processing machine, an inclined conveyer channel down which articles are adapted to be propelled by gravity, a pair of agitator members symmetrically disposed with respect to the channel and simultaneously engageable with the articles on the conveyer to facilitate the movement of the articles, means for propelling each of said agitators in a direction longitudinally of the axis of the conveyer, and blocking and release means associated with the conveyer channel and operative to effect the successive release of the articles therethrough, said agitators and said blocking and release means being driven in predetermined timed relation.

5. In an article processing machine, a conveyer structure along which articles of predetermined shape are adapted to be propelled, a withdrawable agitator member engageable with the articles on the conveyer to facilitate the movement thereof, means operable upon the articles at a predetermined point in their path of travel to effect the repositioning thereof, and means for withdrawing said agitator member during the operation of said repositioning means and in predetermined timed relation therewith, said agitator member being shaped to accommodate the path of travel followed by the articles during their repositioning.

6. In an article processing machine, an elongated conveyer structure along which articles are adapted to be propelled, a reciprocable agitator member extending longitudinally of said conveyer and engageable with the articles on the conveyer to facilitate the movement thereof, means operatively associated with the conveyer to reposition the articles so that portions thereof are projected laterally, and means for controlling the reciprocable movements of the agitator member to permit such lateral movement.

7. In an article processing machine, a conveyer structure along which articles are adapted to be propelled, a pair of reciprocable agitator members forming walls on either side of the conveyer and engageable with the articles on the conveyer to facilitate their movement, laterally shiftable means operatively associated with the conveyer for repositioning the articles thereon to effect the lateral shifting thereof in one direction, and means for simultaneously withdrawing the agitator member on one side of the conveyer and to project the other agitator member into article blocking position to facilitate such lateral movement.

8. In an article processing machine, a conveyer structure comprising a plurality of parallel channels along which articles are adapted to be propelled, and means including a member shiftable transversely of the channel axes and simultaneously engageable with the articles transmitted through said plurality of channels to effect the twisting of the articles and the repositioning thereof.

9. In an article processing machine a conveyer structure along which articles are adapted to be propelled, and means operatively associated with the conveyer including a member shiftable transversely of the conveyer axis and engageable with the articles to effect the twisting of the articles and the repositioning thereof, said member having a pocket into which at least a portion of each article is adapted to project to effect the twisting thereof.

10. In an article processing machine, a plurality of parallel conveyers along which articles are adapted to be propelled, means operatively associated with the conveyers including a member shiftable transversely of the conveyer axes and engageable with the articles to effect the twisting of the articles and the repositioning thereof, said member having a series of pockets, one cooperable with each of said conveyers and into which at least a portion of each of the articles is adapted to engage whereby as said member is shifted the articles engaged in said pockets are twisted and repositioned.

11. In an article processing machine, a first conveyer structure along which articles are adapted to be propelled, a second article conveyer structure adapted to receive the articles from the first conveyer, and article repositioning means arranged between the conveyers, said article repositioning means including a member

engageable with the articles at the repositioning station for twisting them substantially on their own individual axes, said member having a pocket into which a portion of the articles is received to effect the twisting thereof.

12. In an article processing machine, a transmission conveyer structure along which articles are adapted to be propelled in successive alignment, an agitator member engageable with the articles on the transmission conveyer to facilitate their movement, a receiving conveyer provided with means arranged to receive and bodily retain the articles, said receiving conveyer being reciprocably movable from a position adjacent the transmission conveyer to a position removed therefrom, blocking and release means arranged at a predetermined point on the transmission conveyer for effecting the successive blocking and release of the articles in predetermined timed relation for delivery to the receiving conveyer, and means for operating the agitator member and for bodily shifting the receiving conveyer in timed relation with the operation of the blocking and release means.

13. In an article processing machine, a conveyer structure along which articles are adapted to be propelled in successive aligned relation, blocking and release means arranged at a predetermined point on the conveyer for effecting the successive blocking and release of the articles in predetermined timed relation, means comprising a shiftable member having an article receiving pocket operable upon the articles as they are released for effecting the rotatable repositioning thereof with respect to the conveyer, and means for operating the shiftable member in predetermined timed relation with the blocking and release means.

14. In an article processing machine, a conveyer structure comprising a plurality of parallel channels along which articles are adapted to be propelled in successive aligned relation, blocking and release means arranged at a predetermined point on each of said channels for effecting the successive blocking and release of the articles in predetermined timed relation, said blocking and release means comprising a pair of alternately operable release members alternately engageable with the articles, means for operating said members comprising a common operating member operatively connected to all of said members whereby to control the accurate timed functioning thereof, means comprising a shiftable member having article receiving pockets operable upon the articles as they are released for effecting the repositioning thereof with respect to the conveyer, and means for operating the shiftable member in predetermined timed relation with the blocking and release means.

15. In an article processing machine, a conveyer structure along which articles are adapted to be propelled in successive aligned relation, a pair of agitator members on either side of the conveyer engageable with the articles on the conveyer to facilitate their movement, blocking and release means arranged at a predetermined point on the conveyer for effecting the successive blocking and release of the articles in predetermined timed relation, repositioning means engageable upon the articles as they are delivered from the blocking and release means, said repositioning means including a member engageable with the articles for twisting them substantially on their own individual axes, and discharge means adapted to receive the articles from the repositioning means.

16. In an article processing machine, a transmission conveyer structure along which articles are adapted to be propelled in successive alinement, a receiving conveyer arranged to receive and retain the articles, blocking and release means arranged at a predetermined point on the transmission conveyer for effecting the successive blocking and release of the articles in predetermined timed relation for delivery to the receiving conveyer, means for bodily shifting the receiving conveyer along a reciprocatory path of travel in timed relation with the operation of said blocking and release means, and a second blocking and release means for the receiving conveyer operable in predetermined timed relation with the shifting movement of said receiving conveyer.

17. An article processing machine as defined in claim 6, wherein said repositioning means comprises a member shiftable laterally of the conveyer.

18. An article processing machine as defined in claim 6, wherein said repositioning means comprises a member having a pocket into which a portion of the articles is received.

19. In an article processing machine, an elongated conveyer structure along which articles are adapted to be propelled, and means operatively associated with the conveyer to reposition the articles so that a portion thereof is projected laterally, said repositioning means comprising a first member shiftable longitudinally of the conveyer axis, and a second member shiftable transversely of the conveyer axis, and common drive means for both said members whereby they are operated in predetermined timed relation.

20. An article processing machine as defined in claim 5, wherein said agitator member comprises an elongated member of generally uniform cross sectional contour, and wherein said agitator member cooperates with the repositioning means in the repositioning of the articles.

21. In an article packaging machine or the like, a conveyer for feeding the articles, said conveyer comprising a plurality of parallel elongated support surfaces along which the articles are adapted to be moved, and a pair of article agitating bars between adjacent article support surfaces, said support surfaces and agitating bars forming a plurality of article receiving and feeding channels in the conveyer, and means for simultaneously reciprocating adjacent agitating bars in opposite directions longitudinally of the conveyer to feed the articles along said support surfaces.

22. In an article processing machine, a conveyer structure along which articles are adapted to be propelled in successive aligned relation, said conveyer structure comprising a support surface along which the articles are adapted to be propelled, and a pair of agitator members engageable with opposite sides of the articles while on said support surface, blocking and release means arranged at a predetermined point on the conveyer for effecting the successive blocking and release of the articles in predetermined timed relation, means comprising a shiftable member operable upon the articles as they are released for effecting the repositioning thereof with respect to the conveyer, and means for operating the shiftable member in predetermined timed relation with the blocking and release means.

23. In an article processing machine, a conveyer structure along which articles are adapted to be propelled in successive aligned relation,

blocking and release means arranged at a predetermined point on the conveyer for effecting the successive blocking and release of the articles in predetermined timed relation, means comprising a shiftable member engageable with the articles as they are released for twisting them substantially on their own individual axes, and means for operating the shiftable member in predetermined timed relation with the blocking and release means.

FLORENCE G. M. MILMOE.
*Executrix of the Estate of Michael J. Milmoe, Deceased.*

CLARENCE J. MALHIOT.