April 28, 1964 P. J. WOOD 3,130,527

PACKAGING MACHINE

Filed Feb. 28, 1962 5 Sheets-Sheet 1

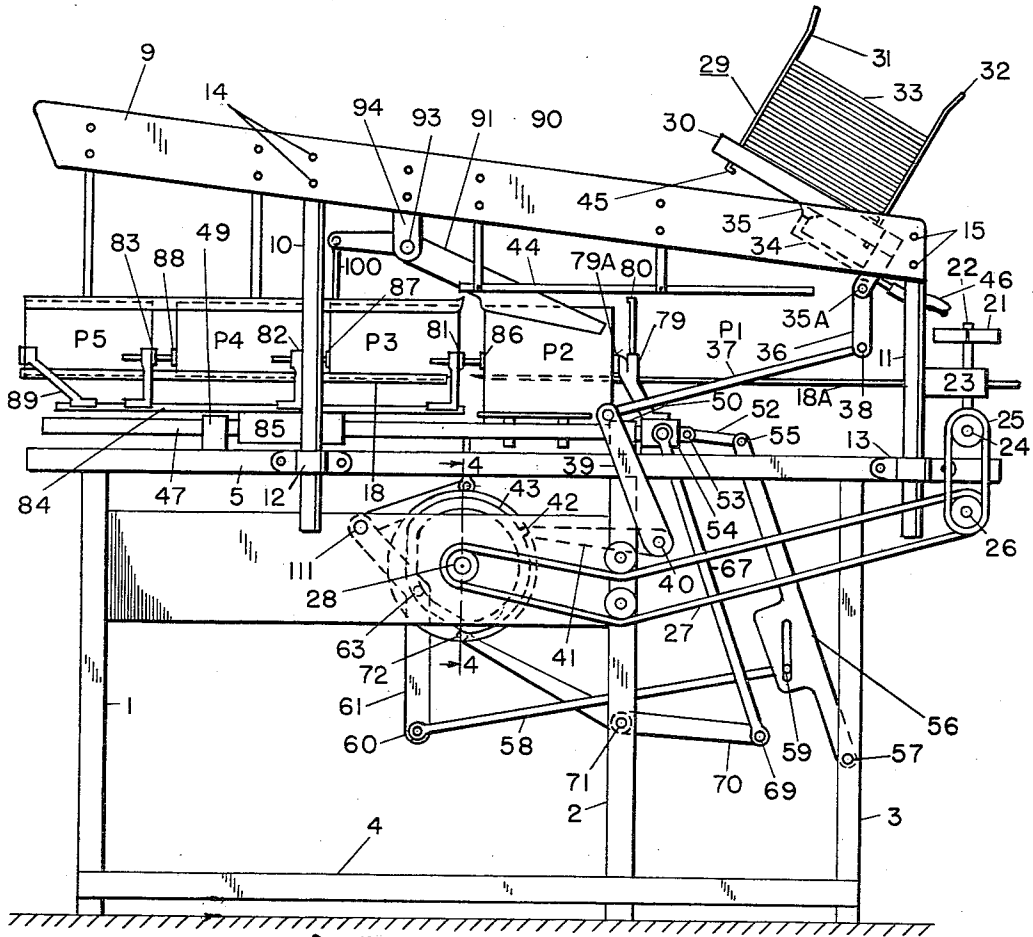

FIG. 1

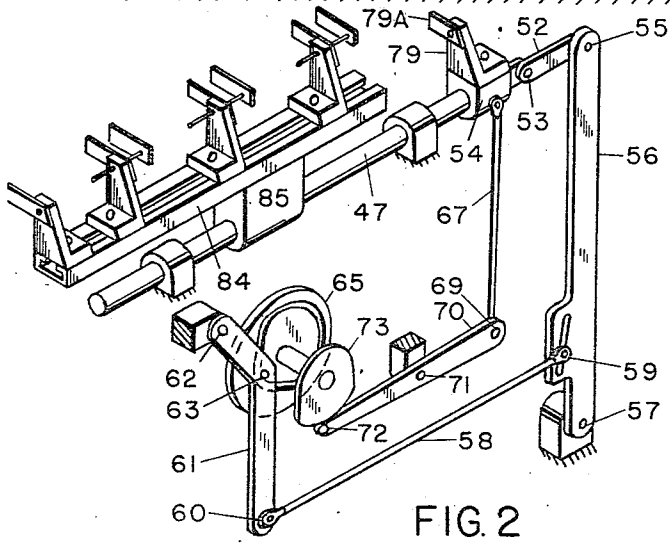

FIG. 2

INVENTOR.
PRENTICE J. WOOD
BY Walter M. Rodgers
ATTORNEY

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PACKAGING MACHINE

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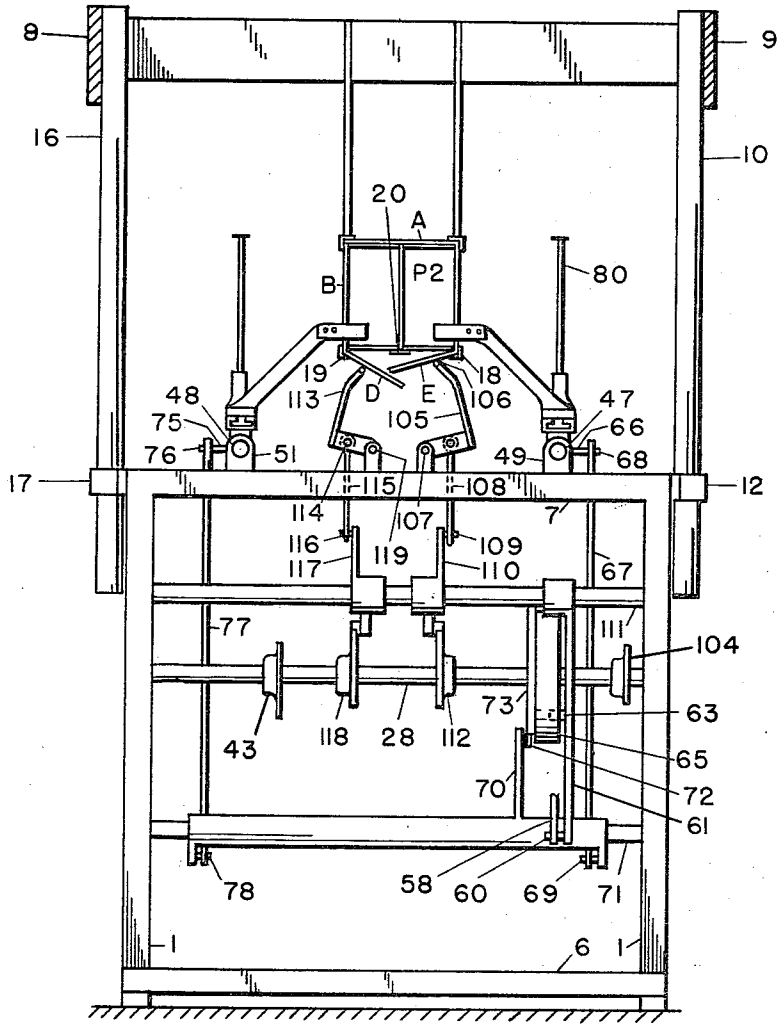

FIG. 3

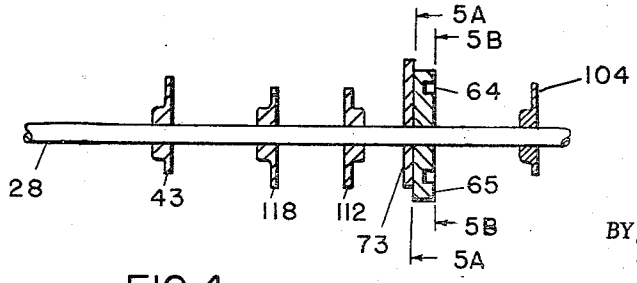

FIG. 4

INVENTOR.
PRENTICE J. WOOD
BY Walter M. Rodgers
ATTORNEY

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PACKAGING MACHINE

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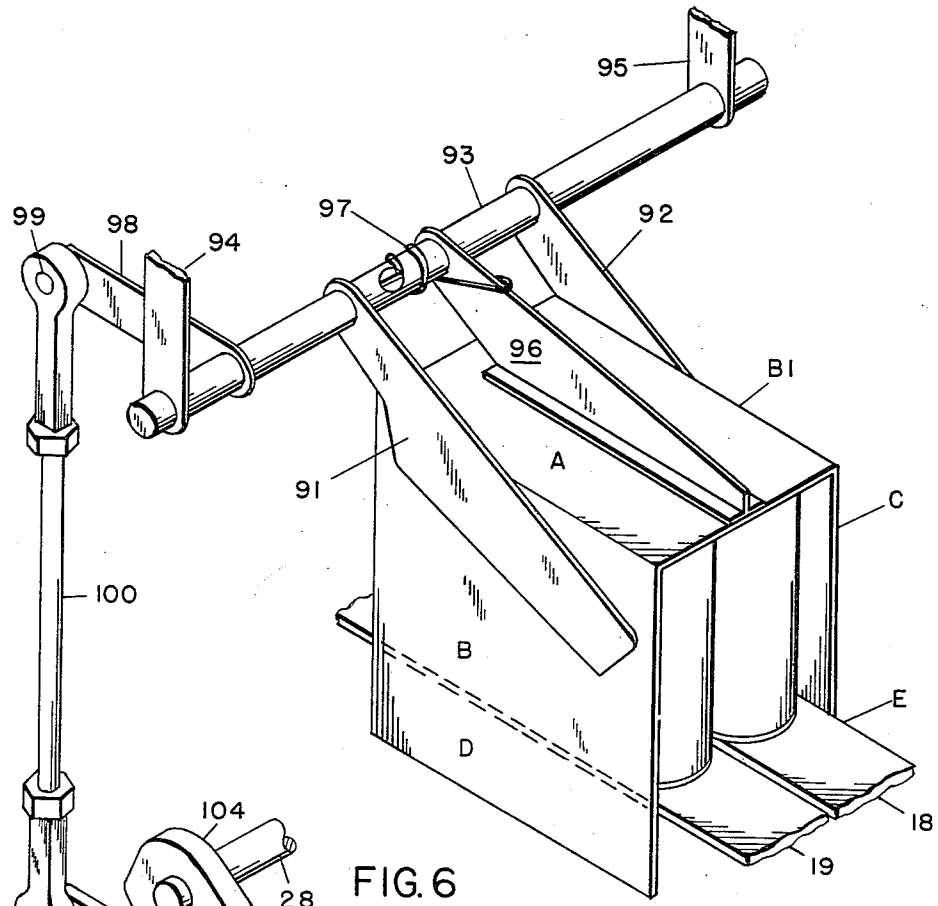

FIG. 6

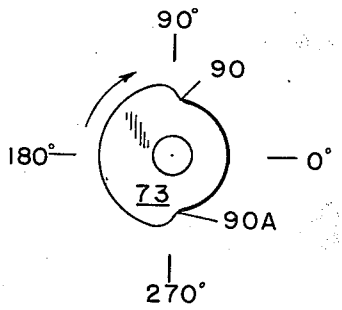

FIG. 5A

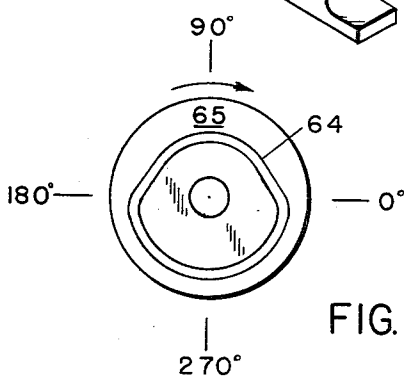

FIG. 5B

INVENTOR.
PRENTICE J. WOOD
BY Walter M. Rodgers
ATTORNEY

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PACKAGING MACHINE

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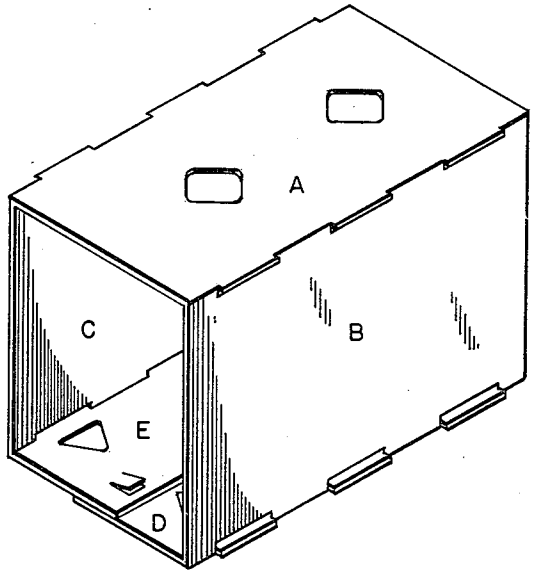

FIG. 7

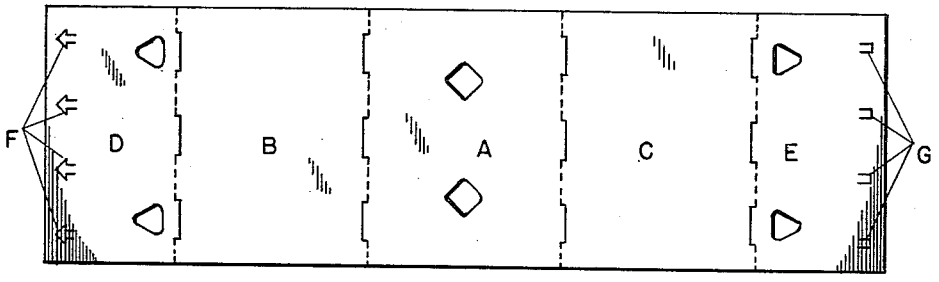

FIG. 8

INVENTOR.
PRENTICE J. WOOD
BY Walter M. Rodgers
ATTORNEY

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PACKAGING MACHINE

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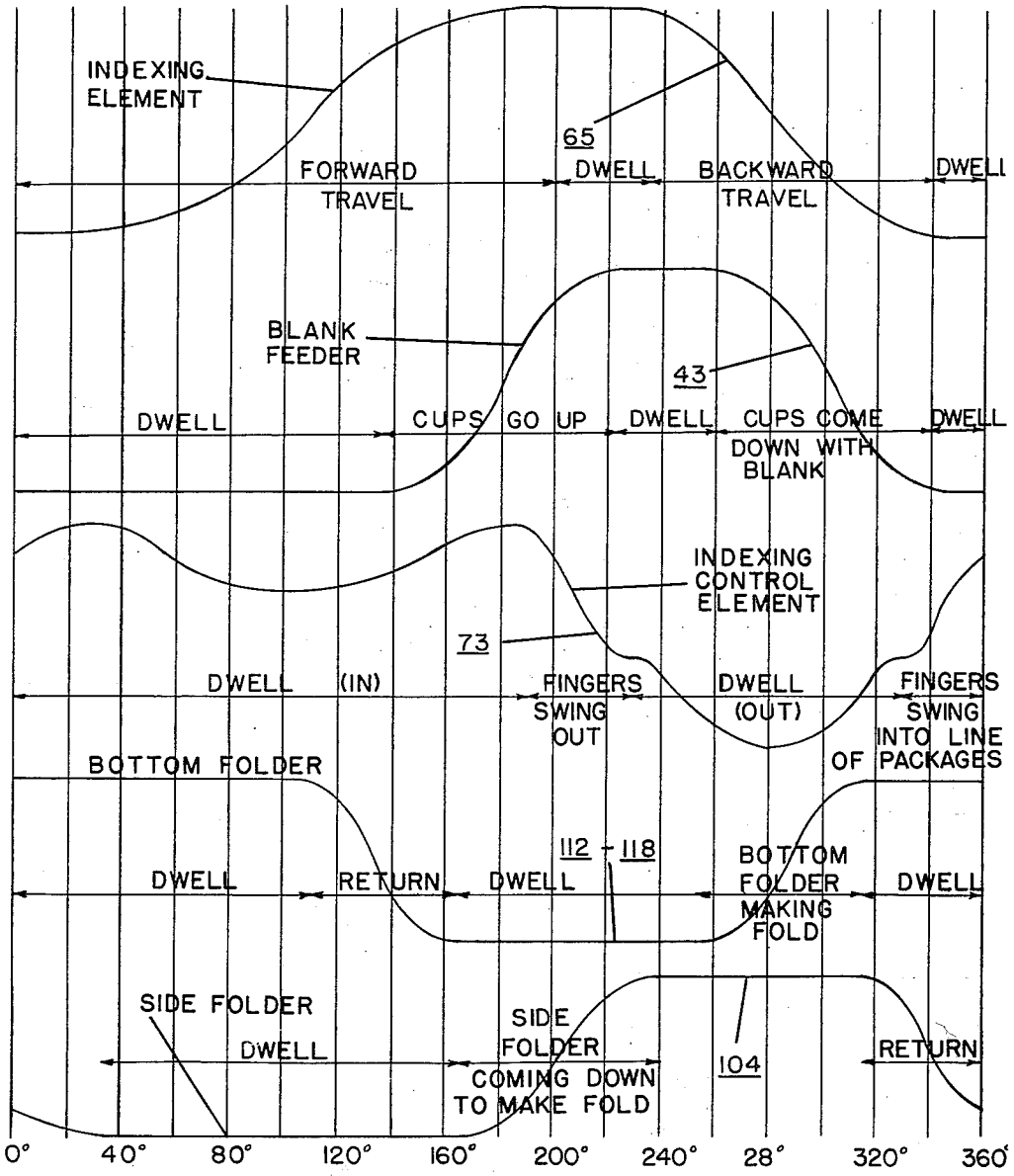

FIG. 9

INVENTOR.
PRENTICE J. WOOD
BY Walter M. Rodgers
ATTORNEY

United States Patent Office 3,130,527 Patented Apr. 28, 1964

3,130,527
PACKAGING MACHINE

Prentice J. Wood, College Park, Ga., assignor to The Mead Corporation, a corporation of Ohio

Filed Feb. 28, 1962, Ser. No. 176,357
8 Claims. (Cl. 53—48)

This invention relates to packaging machines and more particularly to a packaging machine for use in conjunction with wrapper type packaging blanks and which is characterized by stepped incremental movement from a folding station where folding of the wrapper about a group of articles takes place to a locking station where the wrapper blank is secured about the articles.

In high speed heavy duty machines which are capable of packaging large quantities of consumer items in multiple type packages, the wrappers and articles to be packaged are moved continuously from the beginning of a packaging operation to its completion and the various positioning, folding, and fastening operations are performed while the articles to be packaged into their associated wrappers are moved at high speed. Machines of this type require a substantial amount of floor space and are particularly adapted for use in conjunction with high speed high capacity packaging operations. An example of such a machine is that disclosed and claimed in U.S. Patent 2,751,730, issued June 26, 1956, on an application filed by Hermond G. Gentry and assigned to the owner of this invention.

Where the speed of packaging is not great and where the quantity of items to be packaged in a given time is not particularly large, a smaller machine using less floor space than the aforementioned type of machine is desirable. Thus, instead of moving the articles to be packaged and their associated wrapper along a continuous path of movement, it may be desirable to move the articles to be packaged and their wrapper by increments from one station to another station, the various operations such as folding and locking being performed at the different stations while the articles to be packaged and their wrapper are maintained stationary with respect to the machine. Where the articles to be packaged and their associated wrappers are moved by increments throughout the packaging operation, it is necessary to maintain precise control of the operation. For example, the articles to be packaged in a group and their associated wrapper must be accelerated and their movement arrested in a controlled fashion in order to insure that the positioning of the elements will be correct when the packaging operations are to be performed. Such operations, of course, constitute folding of the wrapper about the package group while the package group is stationary and thereafter advancing the wrapper and its articles to be packaged incrementally to another station where their movement is arrested by control means so that the desired fastening of the wrapper may take place.

A principal object of this invention is to provide an improved packaging machine of the type in which the articles to be packaged and their wrapper are moved by stepped increments throughout the packaging operation and to arrange such a machine so that precise and smooth control of the wrapper and its contents is effected throughout the packaging operation.

Another object of this invention is the provision of an improved packaging machine which occupies a minimum of floor space.

A further object of the invention is to provide an improved packaging machine which is readily adaptable for use in packaging articles of different shapes and sizes.

The invention in one form may comprise a pair of parallel elongated indexing elements which are slidably mounted in spaced relation so as to receive therebetween

the groups of articles to be packaegd, a plurality of pairs of transversely disposed indexing fingers mounted on each indexing element, each pair of fingers constituting a trailing and a leading finger and the space between the fingers of each pair corresponding generally to the dimension of the packages in the direction of travel, and driving means operably related with each of the indexing elements and effective to impart controlled movement in unison in the same direction to the indexing elements and oscillatable control means connected with each of the indexing elements for rotating the indexing elements in opposite directions about their axes. Thus, as a package group arrives between the indexing elements, the elements are rotated so that a pair of fingers on each indexing element envelopes the package group. Thereafter sliding movement of the indexing elements in the same direction moves the package group in stepped incremental fashion to the next position where rotation of the indexing element in the reverse direction swings the pairs of fingers out of engagement with a particular package group. Thereafter sliding movement of the indexing elements in the reverse direction takes place and the machine is then ready to repeat another cycle. Since there are several pairs of fingers arranged on each indexing element it is apparent that each package is "handed off" from one pair of fingers to the adjacent pair and by this means the package is moved progressively along by stepped increments.

For a better understanding of the invention reference may be had to the following detailed description taken in conjunction with the accompanying drawings in which FIG. 1 is a side view of a packaging machine embodying the invention; FIG. 2 is a schematic perspective view of certain essential elements of the invention with the frame and other parts of the machine not shown; FIG. 3 is an end view of the machine depicted in FIG. 1 as the machine appears from the left hand end; FIG. 4 is a fragmentary cross-sectional view of the main shaft of the machine and is taken generally along the line 4—4 designated in FIG. 1; FIG. 5A is a view taken along the line designated 5A—5A in FIG. 4 and depicts a control cam forming an essential feature of the invention; FIG. 5B is a view taken along the line designated 5B—5B in FIG. 4 and depicts the essential structure of an indexing cam which forms an essential part of the invention; FIG. 6 is a perspective view of a folding mechanism, incorporated in the machine of FIGS. 1, 2 and 3; FIG. 7 is a perspective view of a wrapper of the type to which the invention is applicable; FIG. 8 is a plan view of a blank used to form the wrapper of FIG. 7; and in which FIG. 9 is a timing chart which depicts graphically the time sequence in which the various machine operations occur.

With reference to FIG. 1 the frame of the machine comprises vertically disposed upright supporting elements designated by the numerals 1, 2 and 3. The lower portions of the vertical elements 1, 2 and 3 are interconnected by horizontally disposed support element 4. The upper ends of vertical supports 1, 2 and 3 are interconnected by horizontally disposed support element 5. As can be seen in FIG. 3 the elements 1 at one end of the machine are interconnected at the lower ends by horizontal element 6 and at their upper end by horizontal frame element 7. Secured atop the frame described above is a pair of booms designated by the numerals 8 and 9. Boom 9 is supported by vertical studs 10 and 11 which are secured by straps 12 and 13 respectively to the horizontally disposed element 5. Boom 9 is secured to the upper end of element 10 by bolts 14 while vertical stud 11 is secured at its upper end to boom 9 by bolts 15. In like fashion boom 8 is supported by vertical studs one of which is depicted in FIG. 3 and is designated by the numeral 16. This stud 16 is secured to the frame by adjust-

able means designated by the numeral 17 corresponding to the straps 12 and 13.

As is disclosed in the aforementioned Patent 2,751,730, articles to be packaged such as cans or bottles are fed into the machine on an endless conveyor and flow through the machine from end to end along a horizontal path on suitable guide plates one of which is indicated at 18A. With reference to FIG. 1 the articles to be packaged are fed in from the right and move toward the left on plate 18A and on supporting plates 18, 19 and 20.

For the purpose of controlling the rate at which articles to be packaged are admitted to the machine at the right hand end thereof, a suitable starwheel 21 is rotatable on a vertical shaft 22 which in turn is driven from a gear box 23 which in turn is driven by a sprocket 24 and a driving chain 25 through the sprocket 26 which in turn is driven by the chain 27 from the main drive shaft 28. In this manner the articles are supplied to the machine at a constant rate because the starwheel 21 is driven at a constant speed. As is well known the articles simply are engaged along the periphery of the starwheel and in this manner are fed into the machine.

For the purpose of storing and feeding wrapper blanks to the groups of articles as they are fed into the machine, a hopper structure generally designated by the numeral 29 is securely affixed atop the machine and is supported by the booms 8 and 9. The hopper structure 29 generally constitutes a lower rectangular type of frame 30 to which side posts 31 and 32 are secured in adjustable fashion. The frame 30 is provided with a central rectangular opening through which the blanks designated by the numeral 33 are drawn. The blanks are drawn downwardly by means of the arm 34 on the outer extremity of which a suction cup 35 is mounted. The arm 34 is pivotally supported on pin 35A and is rotated in swinging relation about pin 35A by the link 36 which is securely affixed to the arm 34 Operating movement of arms 34 and 35 is imparted by link 37 which is pivoted at 38 to link 36 and by crank 39 which is pivotally mounted on fixed pivot 40 and which is securely affixed to and rotatable with crank 41. As is apparent from FIG. 1 crank 41 is provided with a cam follower 42 which rides on the cam surface of feeder cam 43. Thus, cam 43 being fixed to driving shaft 28, imparts through the linkage just described a swinging movement to arm 34 about the fixed pin 35A from the position depicted in FIG. 1 in the counter-clockwise direction until a blank drawn from the bottom of the hopper is deposited on a pair of spaced blank support elements 44 disposed just above the path of movement of the articles to be packaged which are supported on support blades 18, 19 and 20.

As is well understood in the art the wrapper blanks 33 are retained within the hopper by means of suitable inwardly projecting elements disposed along the lower portion of the hopper, one such element being designated in FIG. 1 by the numeral 45. Furthermore, the suction cup 35 is supplied with vacuum pressure through the arm 34 which is hollow and through the flexible tubing designated by the numeral 46 which in turn is connected to a vacuum pump and suitable driving means therefor not shown in the drawings but which are well known in the art. Of course, it will be understood that the vacuum is controlled so that vacuum is supplied to the suction cup 35 only when it is desired to engage and withdraw the lowermost blank from the hopper 29. After the blank is in the region of blank support means 44 the vacuum is released by suitable valving so that the blank may then be deposited on the support rails 44 from which it is moved toward the left making room for the arm 34 which then is swung in a clockwise direction about the pivot 35 to engage another blank. The blank feeding operation as above described may then be repeated.

The mechanism in FIG. 1 by which stepped incremental movement of the articles to be packaged and their associated blank is achieved is shown in its extreme left hand position of travel. This structure is provided according to the invention and constitutes a pair of horizontally disposed elongated indexing elements designated in the drawings by the numerals 47 and 48. These elements are slidably supported on the frame of the machine. For example the indexing element 47 is slidably supported by support bearings 49 and 50. In like fashion indexing element 48 is slidably supported by a pair of support elements one of which is designated in FIG. 3 by the numeral 51.

For the purpose of imparting simultaneous reciprocatory motion to the indexing element 47, a control mechanism is provided comprising a link 52 pivoted by pin 53 to the end structure 54 of indexing element 47. Similar linkage mechanism is interconnected with indexing element 48 at its right hand end. Link 52 is connected by pin 55 to oscillatable driving arm 56 which is pivoted at 57 to vertical support 3 and to the corresponding support on the other side of the machine. A rod 58 is connected with arm 56 by an adjustable pivot 59 and by a pivot 60 with cam link 61 which in turn is rotatable about a fixed shaft 111 mounted on the frame of the machine and which at its midpoint is provided with a cam follower 63. Cam follower 63 rides in a groove 64 formed in the indexing cam 65 secured to the driving shaft 28.

Rotation of the main drive shaft 28 imparts rotary motion to the cam follower 63 and to the linkage 61, 58, 56 and 52 which in turn results in reciprocatory to and fro motion of the indexing elements 47 and 48.

For the purpose of imparting oscillatory angular motion to the indexing elements 47 and 48 about their major axes as a center, oscillatable control means is provided according to this invention. Such control means may take the form of a control linkage comprising crank 66 securely affixed to the end portion 54 of indexing element 47, link 67 secured by pin 68 to crank 66 and by pivot 69 to the crank 70 which is rotatable about a fixed pivot 71 and to the other end of which a cam follower 72 is affixed. Cam follower 72 rides along the cam surface of control cam 73.

Since control cam 73 is securely affixed to and rotatable with the main shaft 28, rotation of the shaft and control cam results in controlled movement of the cam follower 72 and of the control linkage. Such movement, is of course, oscillatory and is for the purpose of swinging the indexing fingers mounted on the indexing elements 47 and 48 into and out of engagement with the groups of packages as they pass from right to left through the machine.

It will be understood, of course, that the indexing element 48 is provided with a linkage which is identical with that described above in connection with indexing element 47. Thus, rotation of indexing element 48 is controlled by control arm 75 which is connected by extension 76 to the link 77 which in turn is connected by the pin 78 with the oscillatable control arm 70. Thus, angular oscillation of indexing elements 47 and 48 occurs simultaneously in synchronism but these elements rotate in opposite directions as viewed in FIG. 3 for example.

For the purpose of controlling the movement of each group of articles, an indexing finger 79 is securely affixed to the extension 54 of indexing element 47. This indexing finger includes a laterally disposed extension 79A which is securely affixed to the finger 79. Indexing element 79 is a trailing finger in that it moves behind the package with which it is associated and serves to push the package from right to left as the indexing element reciprocates. Of course, oscillation of the finger about the major axis of indexing element 47 moves the finger behind and away from the associated package. For example as viewed in FIG. 3 when the indexing element

47 is rotated in a clockwise direction, the indexing finger 79 swings clockwise from the position depicted in FIG. 3 to disengage the package P2. Subsequent reciprocation of indexing element 47 toward the right as viewed in FIG. 1 will condition the structure for the next indexing operation. When moved to the right and thereafter rotated in the counter-clockwise direction as viewed in FIG. 3, indexing element 47 causes the trailing finger 79 to move behind a package disposed in the area designated as P1. Thereafter reciprocation of the indexing elements 47 and 48 moves the package from the position designated as P1 to that designated as P in FIG. 1.

For the purpose of insuring correct movement of the blank deposited on the blank support means 44 a blank control finger 80 is secured to the trailing finger 79. This finger moves behind the trailing edge of the blank deposited on blank support means 44 and causes the blank to move along in unison with the group of articles to be packaged which are moved by the trailing index finger 79 and its horizontally disposed projection 79A.

For the purpose of moving each package by increments farther toward the left, additional trailing index fingers are provided. For example with reference to FIG. 1 and in connection with indexing element 47, trailing index fingers 81, 82 and 83 are provided for pushing the packages P3, P4 and P5, respectively. These trailing index fingers 81, 82 and 83 are securely affixed to a bar 84 which is supported at its midpoint by a support element 85 rigidly secured to the indexing element 47. Thus, as will be apparent from FIG. 1 the support element 85 may reciprocate between the supports 49 and 50 for the indexing element 47.

Since the trailing index fingers as above described all perform a pushing operation for the packages as they move in stepped progression through the machine and because it is necessary to arrest the movement of the packages by a controlled operation, an essential feature of the invention constitutes leading index fingers which are disposed ahead of each package and which respectively constitute the other finger of each pair of fingers comprising a trailing and a leading index finger. For example, with reference to FIG. 1 and in connection with indexing element 47, a leading index finger 86 is threadedly mounted on the trailing index finger 81. The leading index finger 86 is the other finger of a pair of fingers constituting the trailing finger 79 and the leading finger 86. It will be observed that the leading finger 86 is threadedly mounted and is adjustable to accommodate different sizes of articles to be packaged and different sizes of packaging blanks. In like fashion leading index finger 87 is threadedly mounted on index finger 82 and cooperates with trailing finger 81 to form a pair of fingers for engaging one of the groups of packages such as P3 as shown in FIG. 1. Likewise leading index finger 88 is threadedly mounted on finger 83 and cooperates with trailing finger 82 and leading finger 89 is affixed to the extreme left hand end of the rod 84 and acts to arrest package P5 after movement is imparted thereto by trailing finger 83.

From the description thus far in connection with indexing element 47 it is apparent that the package is handed off from each pair of index fingers as the operation progresses from one station to another station.

Since the indexing fingers which are mounted on the indexing element 48 are identical to the indexing fingers as described above these particular fingers are not shown in detail in the drawings and a detailed description thereof is not deemed necessary.

As viewed in FIG. 1, it is apparent that the control arm 67 must swing through a substantial angle as the movement progresses from one station to another. Preferably, the extreme positions will be approximately equidistant from the vertical position of the control arm 67. Thus, the effective radius of control arm 67 is greatest at its center vertical position and is a minimum at its extreme limits of travel. For the purpose of removing any error in the control movement of the elements constituting the control linkage and in accordance with a feature of the invention, cam 73 is provided with a recess in the general region of the numeral 90 and in the general region of the numeral 90A as shown in FIG. 5A. Thus, any error due to a variable effective length of the radius of the control arm 67 is eliminated by the recesses 90 and 90A in cam 73.

As viewed in FIG. 1 the station P2 is the folding station. Thus, in order to accommodate folding of the blank underneath the articles to be packaged and in accordance with a feature of the invention the trailing finger 79 is mounted directly to the structure 54 on the indexing element 47 and the remaining trailing and leading fingers are all supported by the support elements 84 and 85. In this manner space is provided by which the extremities of the blank may be folded underneath each package group as shown best in FIG. 3.

With reference to FIGS. 7 and 8 the blank comprises a top panel A, side panels B and C, and a pair of bottom lap panels D and E. Panel D is provided with several locks F which respectively engage retaining apertures G. The carton disclosed in Patent 2,786,572 is of the general type to which the machine of this invention is particularly applicable.

As depicted in FIG. 3 the bottom lap panels D and E are being folded underneath the package P2.

For the purpose of folding the sides B and C of the blank downwardly over the group of articles located at station P2, a folding apparatus depicted in FIG. 6 is provided. As is shown in FIG. 6 such folding apparatus comprises a pair of arms 91 and 92 securely affixed to a shaft 93 which is journally supported by structure 94 and 95 secured to the frame of the machine. Midway between the arms 91 and 92 is a loosely mounted arm 96 which is biased by spring 97 toward the package. Operating movement is imparted to shaft 93 by a link 98 pivoted by pin 99 to adjustable rod 100. Rod 100 in turn is pivoted by pin 101 to cam follower arm 102 mounted at one end to a fixed pivot 103 and engageable with a driving cam 104. As will be understood cam 104 is secured to and rotatable with driving shaft 28.

From the description thus far it will be understood that as the blank is moved to station P2 immediately above the associated bottle group the arms 91 and 92 thereafter move from an extreme upper position downwardly in a clockwise direction as viewed in FIG. 6 to sweep the sides B and C of the carrier downwardly about the group of articles to be packaged. In the meantime, arm 96 engages the top A of the carton and holds the carton securely against the top of the packages by virtue of the action of spring 97.

After the sides B and C of the carrier are folded downwardly as depicted in FIG. 6 it is then necessary to fold the bottom lap panels D and E inwardly as depicted in FIG. 3. For example panel E is engaged by folding arm 105 to the end of which a folding rod 106 is mounted. Folding arm 105 is pivoted to a fixed pivot 107 and is rotated by link 108 which in turn is connected by pin 109 to crank 110 which is pivotally mounted on shaft 111 supported by the frame. A suitable cam follower which rides on the bottom folding cam 112 causes controlled folding movement of the linkage as described above. In like fashion the bottom panel D is folded inwardly by arm 113 pivoted at 119, which is controlled by pin 114, link 115, pin 116, crank 117 and in turn by the cam 118. Of course, cam 118 is securely affixed to and rotatably with shaft 28. Once the lap panels D and E are folded to the position depicted in FIG. 3, these panels are maintained in appropriate position by suitable guides which serve to maintain the package as depicted in FIG. 3 until the locking operation is performed at station P5. The particular locking operation which is especially adapt-

ed for fastening the panels D and E is performed by structure disclosed and claimed in U.S. application Serial No. 176,572, filed March 1, 1962, which is owned by the assignee of this invention.

For a precise representation of the sequence of operations performed by the machine of this invention reference may be had to the timing chart depicted in FIG. 9. As will be apparent from the timing chart and assuming that the positions of the parts as depicted in FIG. 1 correspond to the zero degree position, it is apparent that the indexing elements move to their extreme right hand positions by a smooth and even operation and when they reach that position they then are caused to engage the packaged groups by means of the control element which moves into engagement and subsequently out of engagement with the package groups. In the meantime, the paper feed operation draws down a blank for use on the successive package group as the operation of the structure approaches its midpoint and continues to its extreme left hand position of travel. Simultaneously the side folder sweeps the carton sides downwardly and the bottom folders then operate is sequence to overlap the bottom panels D and E, it being apparent that the panel E must be folded over slightly ahead of the folding of the panel D. Thus, the curve 112—118 is shown as a single curve but it will be understood that these two cams are spaced apart slightly.

While I have shown and described a particular embodiment of the invention, I do not wish to be limited thereto and intend in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A machine for imparting controlled movement to a group of articles to be packaged, said machine comprising an elongated indexing element reciprocable in a direction generally parallel to the path of movement of the group of articles and in the direction of its major axis, said element being angularly oscillatable about its major axis as a center, a pair of indexing fingers affixed to said indexing element and extending transversely therefrom, said indexing fingers being spaced apart by a distance corresponding generally to the dimension of the group of articles in the direction of movement thereof, oscillatable driving means connected to said indexing element for imparting reciprocable movement thereto along its major axis, and oscillatable control means connected with said indexing element and effective to impart oscillatory angular movement to said indexing element about its major axis.

2. A machine for imparting controlled movement to a group of articles to be packaged, said machine comprising an elongated indexing element reciprocable in a direction generally parallel to the path of movement of the group of articles and in the direction of its major axis, said element being angularly oscillatable about its major axis as a center, a pair of indexing fingers affixed to said indexing element and extending transversely therefrom, said indexing fingers being spaced apart by a distance corresponding generally to the dimension of the group of articles in the direction of movement thereof, an oscillatable pivotally mounted control arm pivotally connected to said indexing element and disposed in substantially perpendicular relation thereto when approximately midway between its limits of travel, and driving means engageable with a part of said control arm, said driving means being adapted to impart uniform movement to said indexing element irrespective of the positional relation of said control arm to said indexing element.

3. A machine for imparting stepped incremental movement to a group of articles to be packaged, said machine comprising an elongated indexing element, fixed mounting means slidably and rotatably supporting said indexing element in generally parallel relation to the path of movement of the group of articles, a plurality of pairs of indexing fingers mounted on said indexing element and extending transversely therefrom in one general direction, the fingers of each pair of indexing fingers being spaced apart along the major axis of said indexing element by a distance corresponding generally to the dimension of the group of articles in the direction of movement thereof, oscillatable driving means connected to said indexing element for imparting reciprocable movement thereto, the length of stroke through which said indexing element is moved in each direction being generally equivalent to the spacing between the fingers of one pair of indexing fingers in addition to the spacing between adjacent pairs of fingers, and oscillatable control means connected with said indexing element for imparting oscillatory angular movement to said indexing element so as to cause each pair of indexing fingers to envelop and subsequently to disengage a group of articles, movement of said indexing element along its major axis during the period of envelopment of a group of articles by each pair of fingers being effective to advance such groups of articles through one increment of movement.

4. A packaging machine comprising means for supplying a plurality of articles to be packaged along a predetermined path at a predetermined rate, a hopper for storing wrapper blanks above the path of movement of the articles, blank support means disposed below said hopper and above the path of movement of the articles, feeder means for drawing down a blank from said hopper and for depositing said blank on said blank support means, an indexing element reciprocably mounted alongside the path of movement of the articles and arranged for angular oscillation about its path of reciprocation, a trailing indexing finger mounted on said indexing element and arranged to swing into the path of movement of the articles to be packaged while said indexing element occupies an extreme position adjacent the incoming articles, a blank controlling finger movable with said indexing finger for engaging a blank on said blank support means when said indexing finger is moved into its article engaging position so that subsequent movement of said indexing element causes movement of a group of articles along its path of movement and causes simultaneous movement of an associated blank.

5. A packaging machine comprising means for supplying a plurality of articles to be packaged along a predetermined path at a predetermined rate, a hopper for storing wrapper blanks above the path of movement of the articles, blank support means disposed below said hopper and above the path of movement of the articles, feeder means for drawing down a blank from said hopper and for depositing said blank on said blank support means, an indexing element reciprocably mounted alongside the path of movement of the articles and arranged for angular oscillation about its path of reciprocation, a trailing indexing finger mounted on said indexing element and arranged to swing into the path of movement of the articles to be packaged while said indexing element occupies an extreme position adjacent the incoming articles, a blank controlling finger movable with said indexing finger for engaging a blank on said blank support means when said indexing finger is moved into its article engaging position so that subsequent movement of said indexing element causes movement of a group of articles along its path of movement and causes simultaneous movement of an associated blank and a leading indexing finger mounted on said indexing element and disposed in leading relation to said trailing indexing finger for arresting movement of the articles at the end of a stroke of said indexing element.

6. A machine for imparting controlled movement to a group of articles to be packaged, said machine comprising an elongated indexing element reciprocable in a direction generally parallel to the path of movement of the group of articles and in the direction of its major axis, said element being angularly oscillatable about its

major axis as a center, a pair of indexing fingers affixed to said indexing element and extending transversely therefrom, said indexing fingers being spaced apart by a distance corresponding generally to the dimension of the group of articles in the direction of movement thereof, a drive shaft, driving means for rotating said drive shaft, a pair of cams secured to and rotatable with said shaft, means including a cam follower interconnecting one of said cams and said indexing element for imparting reciprocatory motion thereto along its major axis and means including a second cam follower interconnecting the other of said cams and said indexing element for imparting angular oscillatory motion to said indexing element about its major axis as a center.

7. A machine for imparting incremental movement to a group of articles to be packaged, said machine comprsiing a pair of parallel elongated indexing elements slidably mounted in spaced relation, means for causing said indexing element to reciprocate in unison in the same direction along their major axes, a trailing index finger mounted on each of said indexing elements, means for imparting angular oscillatory motion to said indexing elements causing them to rotate in unison and in opposite directions so as to cause said trailing index fingers to move generally toward each other and in position to engage the trailing portion of a group of articles disposed generally between said indexing elements, said trailing fingers being effective to move the group of articles during each reciprocation of said indexing elements in one direction and said trailing index fingers being movable out of engagement with the articles due to angular oscillation of said indexing elements causing said trailing index fingers to move generally away from each other.

8. A machine for imparting incremental movement to a group of articles to be packaged, said machine comprising a pair of parallel elongated indexing elements slidably mounted in spaced relation, means for causing said indexing elements to reciprocate in unison in the same direction along their major axes, a trailing index finger mounted on each of said indexing elements, means for imparting angular oscillatory motion to said indexing elements causing them to rotate in unison and in opposite directions so as to cause said trailing index fingers to move generally toward each other and in position to engage the trailing portion of a group of articles disposed generally between said indexing elements, said trailing fingers being effective to move the group of articles during each reciprocation of said indexing elements in one direction and said trailing index fingers being movable out of engagement with the articles due to angular oscillation of said indexing elements causing said trailing index fingers to move generally away from each other, and a leading index finger mounted on each of said indexing elements and spaced therefrom in the direction of incremental movement of the group of articles, said leading index fingers being effective to arrest movement of the group of articles at the end of each reciprocation of said indexing elements in the direction of movement of the group of articles.

No references cited.