

Jan. 31, 1967

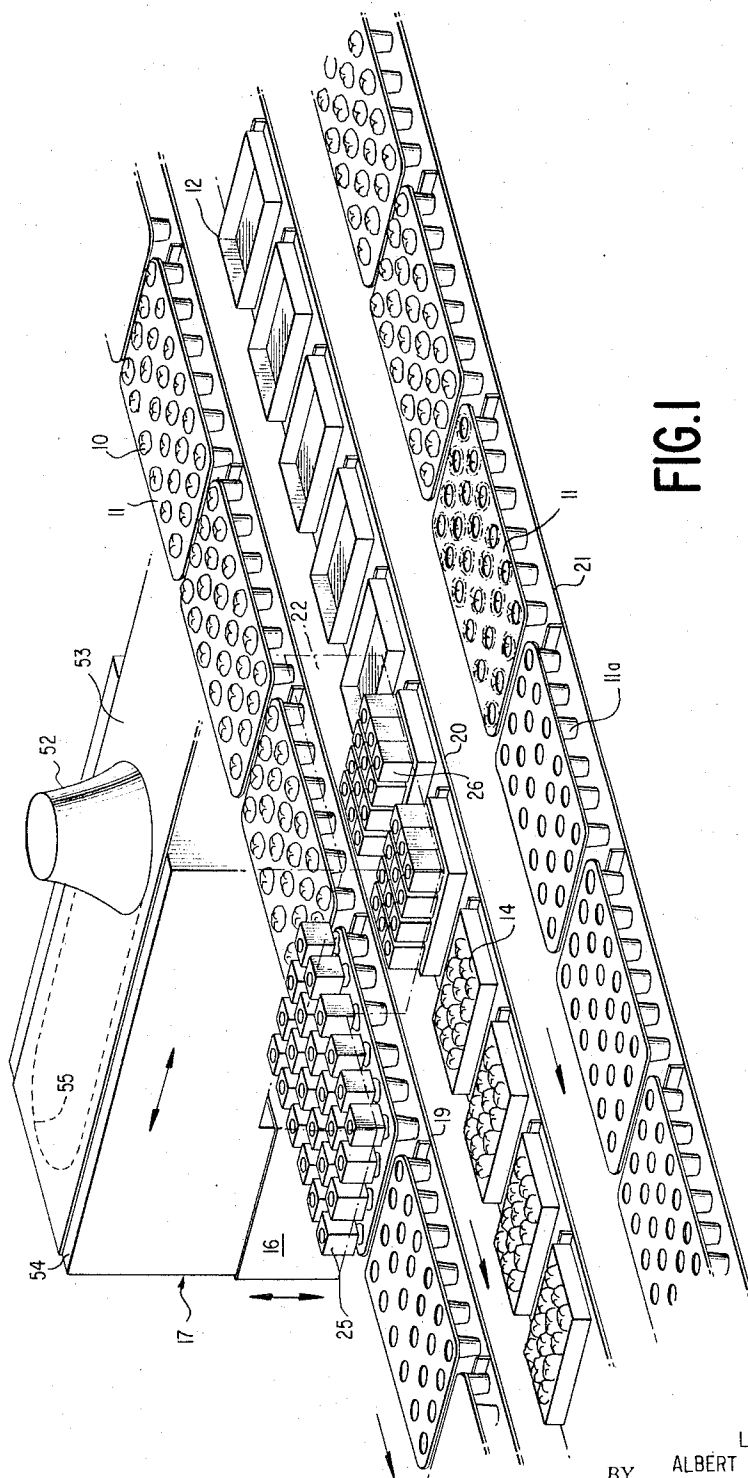
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METHOD AND APPARATUS FOR PACKAGING

Filed Sept. 24, 1963

8 Sheets-Sheet 1



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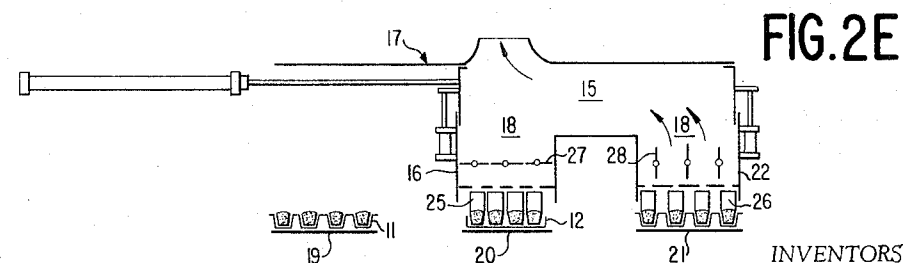
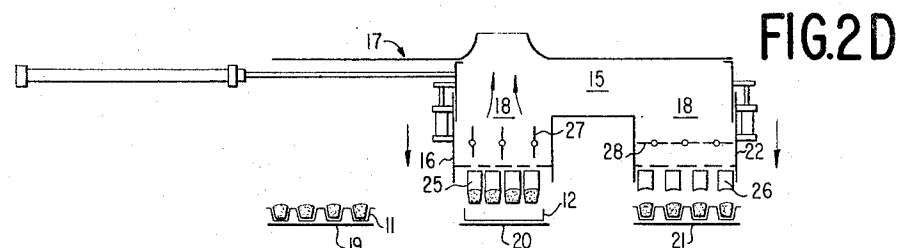
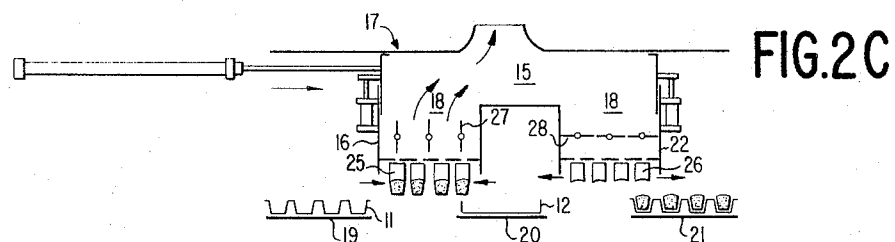
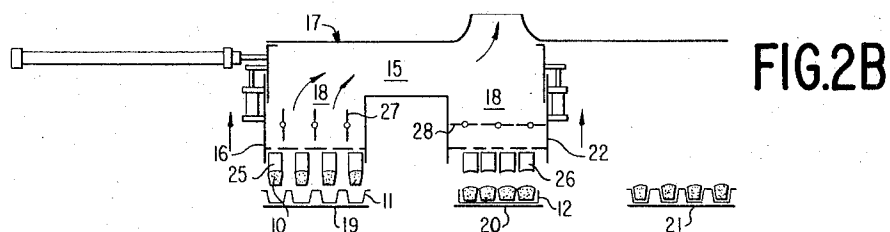
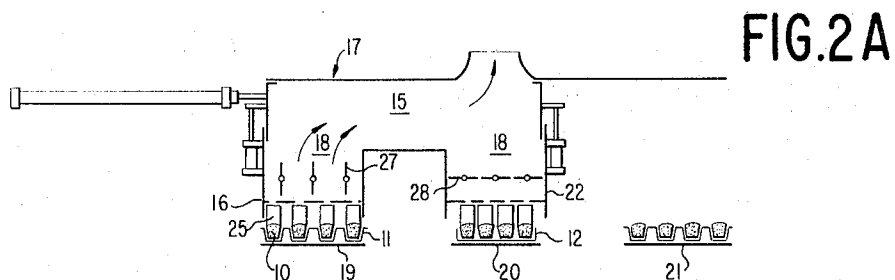
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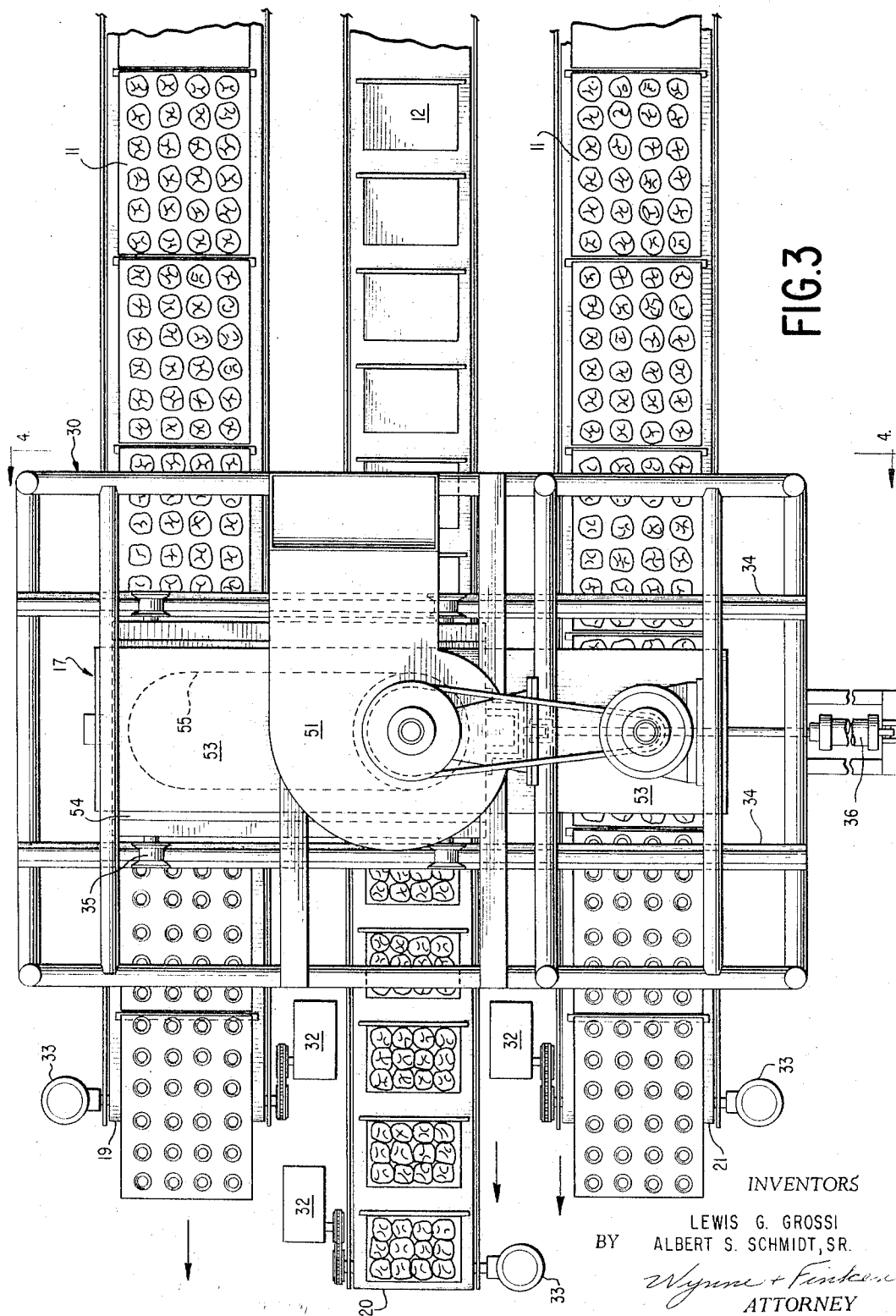
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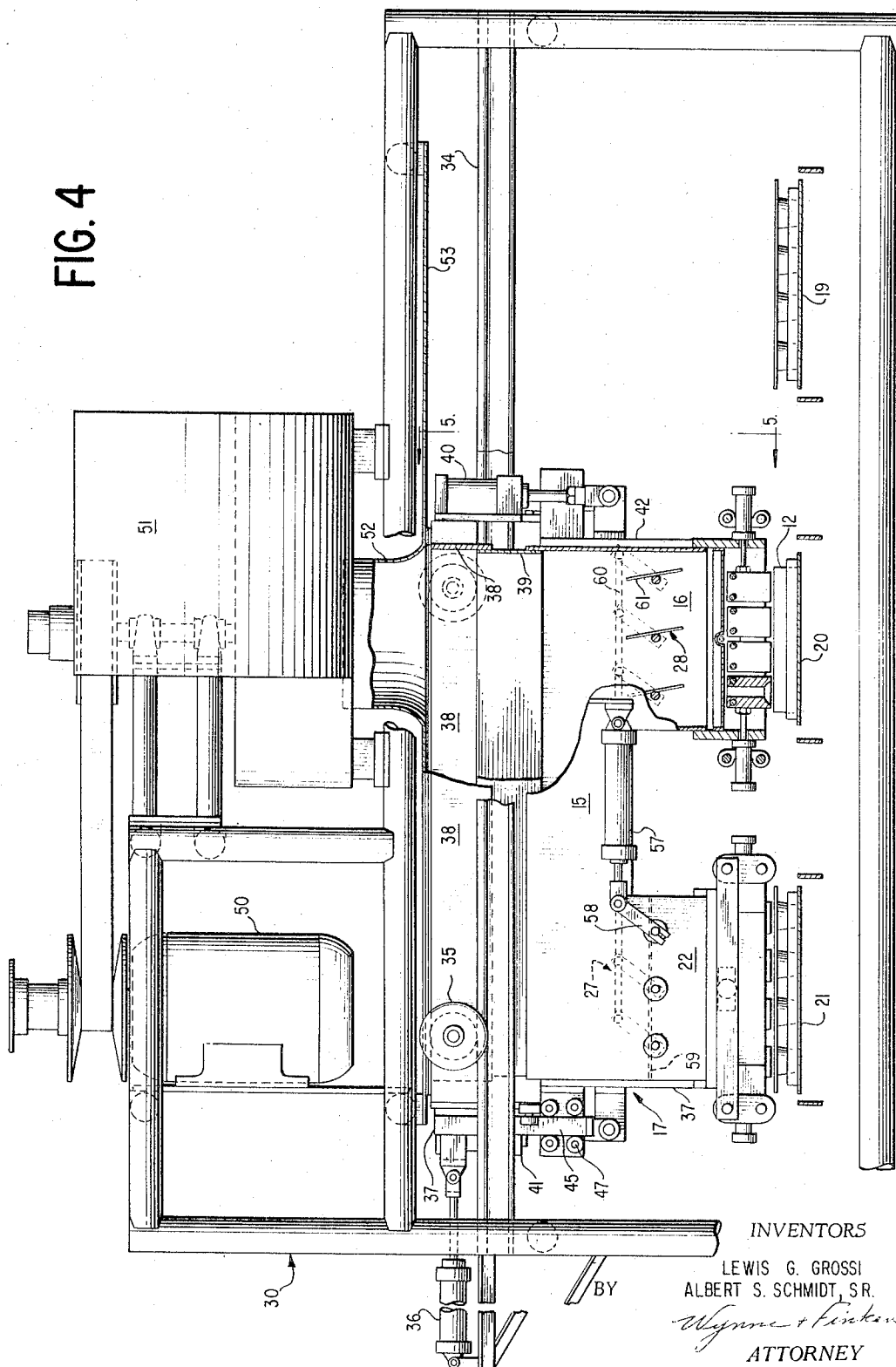
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FIG. 4



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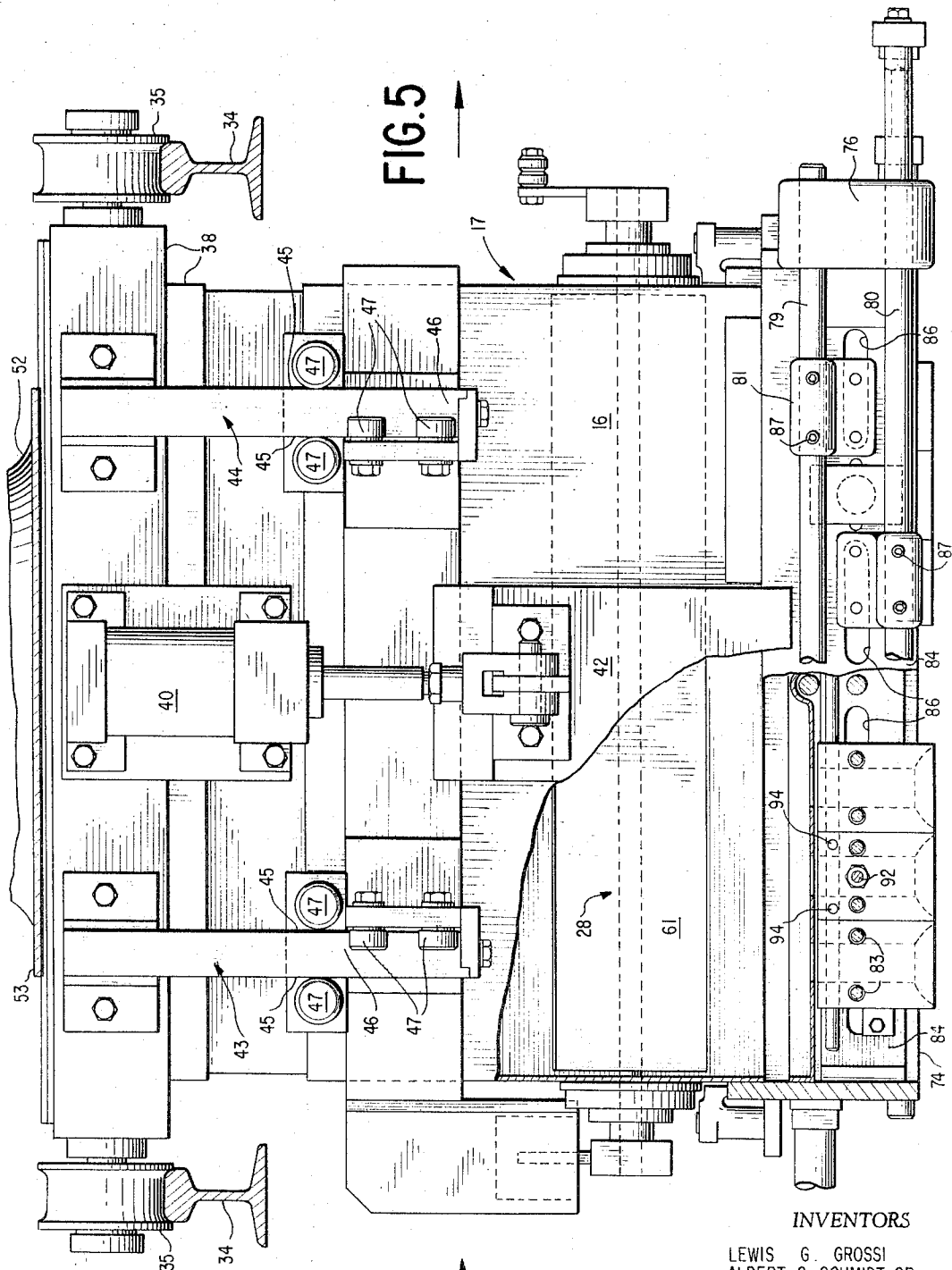
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FIG. 6B

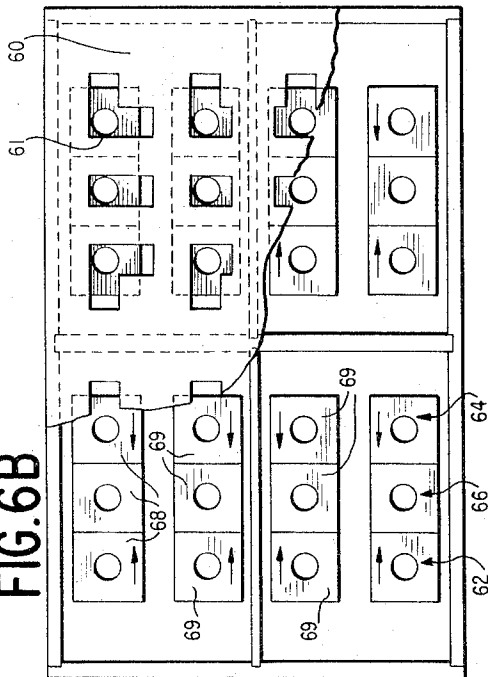


FIG. 6D

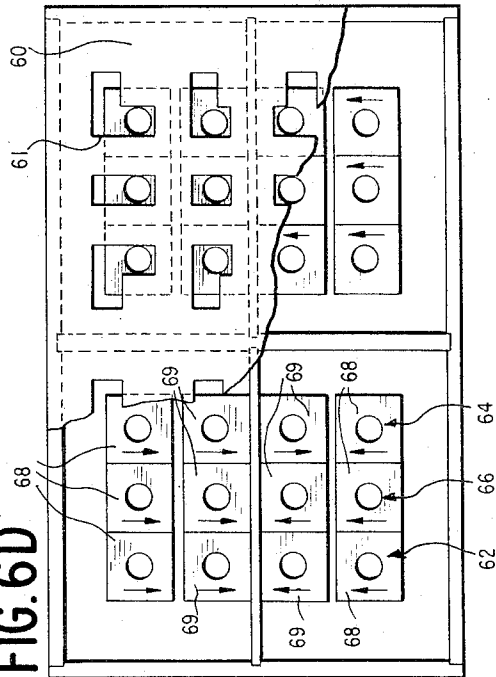


FIG. 6A

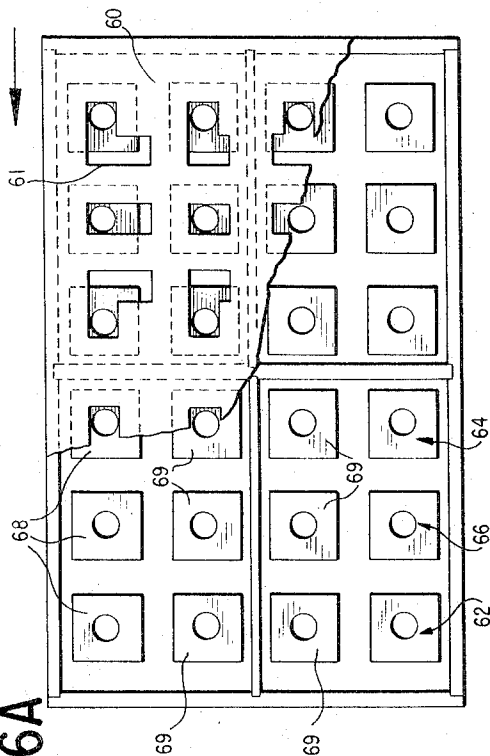
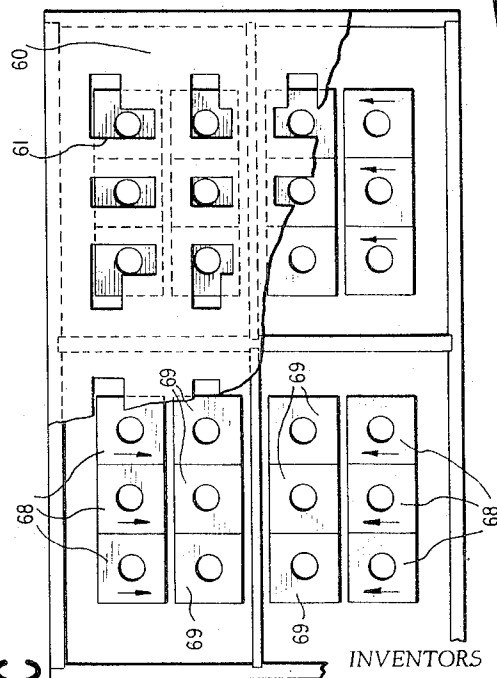


FIG. 6C



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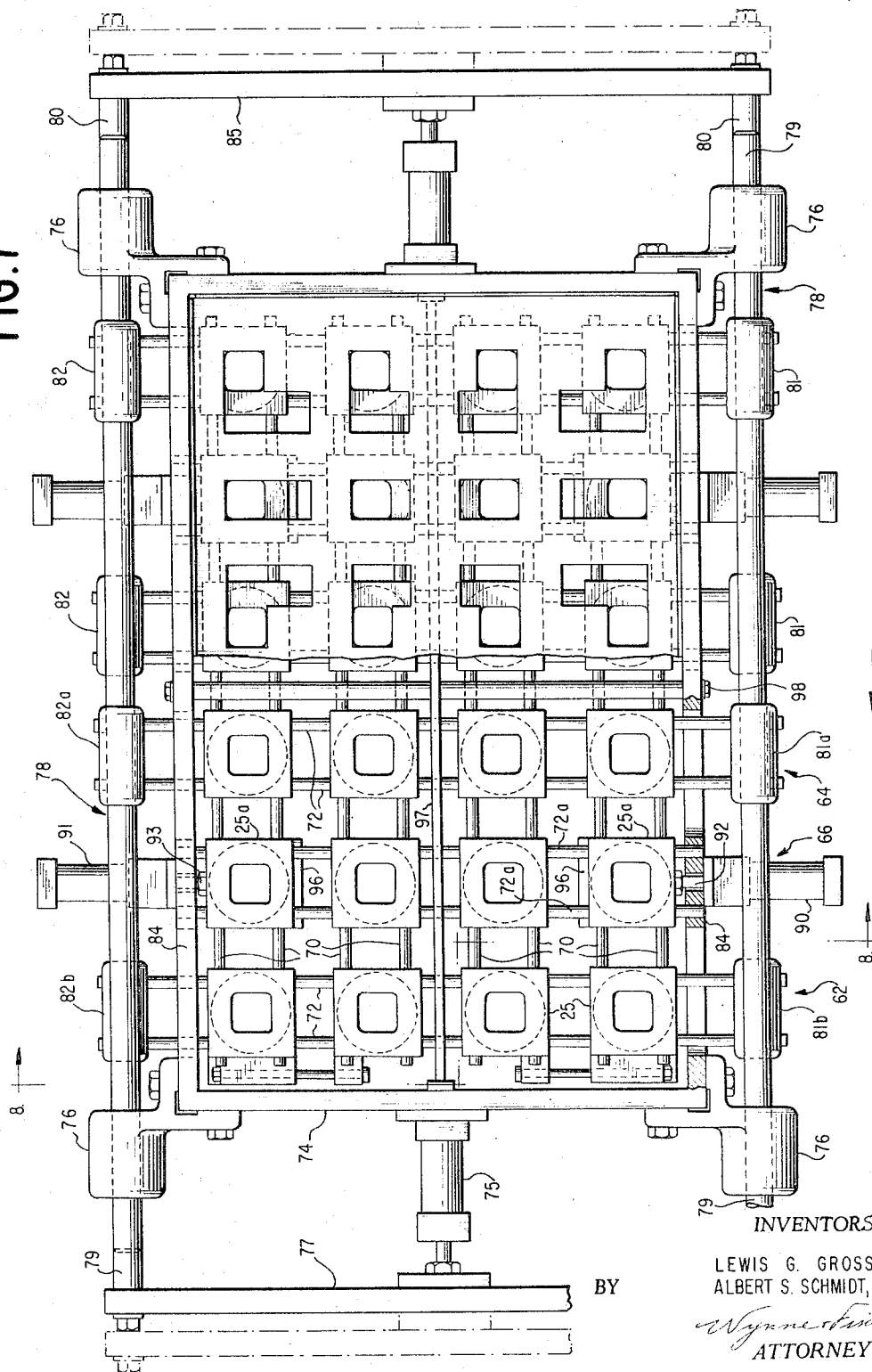
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FIG. 7



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FIG. 8A

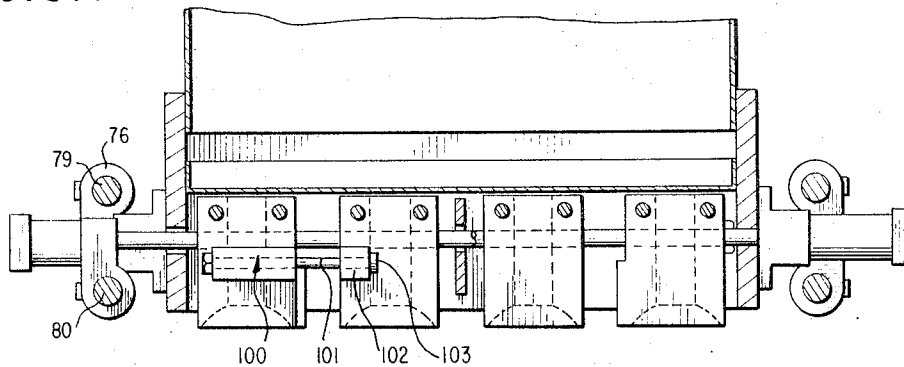


FIG. 8B

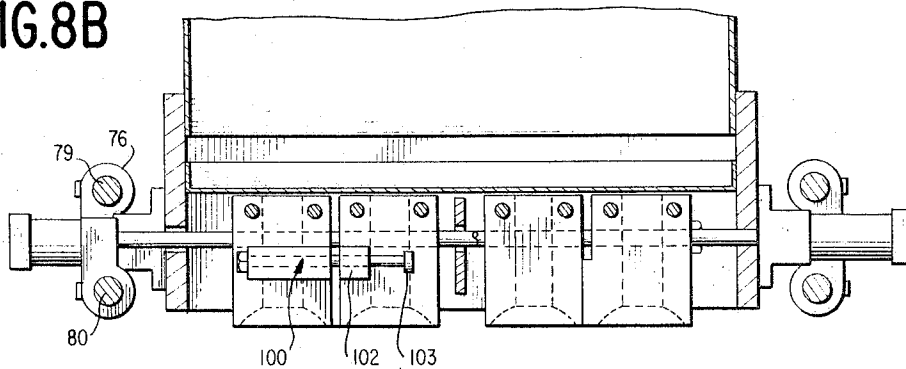
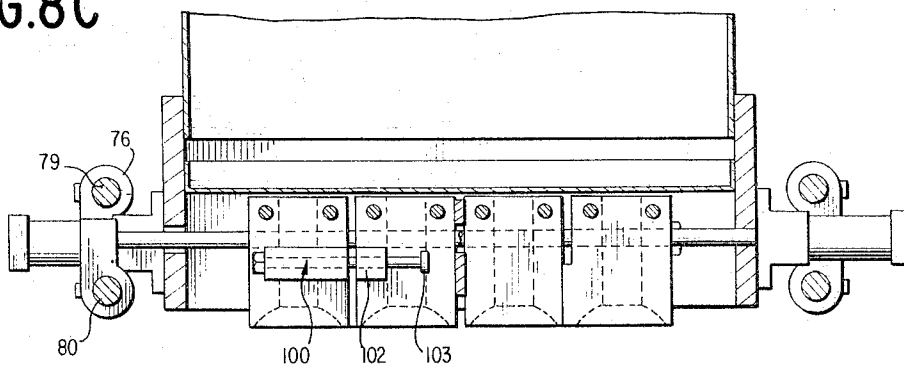


FIG. 8C



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METHOD AND APPARATUS FOR PACKAGING
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13 Claims. (Cl. 53—35)

This invention relates to a method and apparatus for packing rolls as a group in an open top box, the roll groups being alternately depanned from a left pan in a left zone and a right pan in a right zone for delivery to empty boxes in the middle zone.

More particularly, this invention relates to a method and an apparatus wherein conveyor means are used to deliver pans of rolls to a depanner station and a transfer device, having a left head and a right head, depans and packs rolls simultaneously on each transverse movement across the conveyor means.

Preferably, vacuum is used to suspend the rolls during transfer.

This invention is particularly adaptable to present day bakery equipment in that each head is equipped with suction cups which individually engage and suspend discrete rolls baked in standard cellular pans; shifting means are provided for moving the spaced rolls to form a cluster having a reduced outer periphery conforming to the open top box.

It will be recognized, therefore, that a double capacity machine is provided and that the heads of the transfer device can be adjusted to conform to any cellular spacing in baking pans for depanning followed by a consolidation of the rolls in the group to form a cluster.

The apparatus involves a design which enables multiplication of certain operating units. For example, the consolidation means for clustering the rolls may be increased or decreased in capacity in each head by the simple addition to and adjustment of the rectangular grid and rolls suspenders mounted thereon to conform to the number of groups of rolls to be formed, the number of rolls in each group also being variable. Further, the rolls may be packed as a consolidated tight cluster or as a consolidated slightly spaced cluster to meet the particular characteristics of the rolls being packed.

Other objects, advantages and meritorious features will more fully appear from the following specification, appended claims, and accompanying drawings, wherein:

FIG. 1 is a perspective diagrammatic view of the conveyor means and the transfer head;

FIGS. 2A to 2E are end diagrammatic views of the depanner station of FIG. 1 showing the process of the instant invention and the relative positions of certain elements during the process;

FIG. 3 is a top view of the apparatus;

FIG. 4 is an end view taken on line 4—4 of FIG. 3;

FIG. 5 is a left side view taken on line 5—5 of FIG. 4;

FIGS. 6A to 6D are top schematic views showing a system of movement of the suction cup suspenders to form a roll cluster of a group of rolls taken from a pan;

FIG. 7 is a top view similar to FIG. 6A but showing the structural elements which accomplish the movement of FIGS. 6A to 6D; and

FIGS. 8A to 8C are front end views taken on line 8—8 of FIG. 7 showing the movements for accomplishing consolidation of suspenders in a row.

Large open headed arrows on certain figures indicate the direction of flow of pans and boxes.

Referring now to FIGS. 1—2A to 2E, it will be seen through these somewhat schematic views that the method and apparatus of this invention involves the depanning

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of discrete rolls 10 from a cellular pan 11 as a group, the depanning operation involving an engagement of a group of rolls and the withdrawal and suspended transfer of the group from a pan to a waiting open top box 12, the rolls travelling through a substantially inverted U-shaped path.

It will be noted in FIG. 1 that the cellular pan 11 contains 24 rolls, 6 cross rows of 4 rolls per row. The pan is a standard baking pan presently in general use through the industry. The box contains one dozen rolls and in the preferred machine shown 3 cross rows of rolls make up the group 14 of a dozen rolls which will be discussed hereinafter as being transferred to a box. It will be recognized, however, that the other group of 12 rolls from the pan 11 is also similarly depanned. The instant method and apparatus may be utilized also for specially designed pans wherein the arrangement and number of rolls may vary considerably. This adaptability of the instant machine is made possible through its adjustability.

In FIG. 2A the left head 16 of the transfer device 17 is in its down position with a group of discrete suspenders 25 engaging a group of discrete rolls 10 in a pan 11 on a left pan support 19. The engaged rolls are then lifted vertically from the cellular pan 11 as shown in FIG. 2B, the vertical movement involving a movement of 2"—2½". The withdrawn and suspended group of rolls is then transferred transversely across the depanner station; this movement being shown in FIG. 2C. Upon arrival at the box support 20, the horizontal movement ceases and a downward movement of 2"—2½" takes place whereby the rolls are deposited in a suitable open top box 12, release of the rolls being accomplished in response to this downward movement.

As mentioned, the preferred transfer device 17 has two heads 16 and 22 and during the above discussed operation of the left head 16, the right head 22 is going through a reverse or vice versa operation. FIG. 1 shows the left head 16 at the left pan support 19 with the right head 22 at the box support 20 where it is releasing previously depanned rolls, these rolls having been depanned from pan 11a. The showing of the outer housing of the transfer device 17 has been indicated through the use of solid and dotted lines where appropriate, the main showing of FIG. 1 being of the left suspenders 25 and the right suspenders 26.

FIG. 2A shows the right head 22 at the stage of release of a cluster of rolls into a box 12; FIG. 2B shows the right head at the end of its upward movement with its suspenders 26 empty and ready for a second group of rolls; FIG. 2C shows the right head moving to the right; FIG. 2D shows the right head in position for engaging a group of rolls at the right pan support 21; and FIG. 2E shows the right head engaging the rolls for suspended movement to a box at the box support.

Preferably when rolls are depanned from standard pans, the spaced apart group of discrete rolls is consolidated into a cluster. Standard cellular baking pans presently are designed on about 3 and 5/16" centers between cells and the consolidation accomplishes a relative movement to produce a 2 and 1/4" center dimension of a clustered group of rolls for deposition in a box having a cross or row dimension of 7" and an in-line or longitudinal dimension of 10", this being for the group of 12 rolls previously mentioned having 3 rows with 4 rolls in each row.

As will be explained in detail, the consolidation of the suspended roll group is accomplished by a consolidating means during horizontal movement of a head by the moving means which moves the transfer device across the depanner station; the consolidating means forming a clustered group. While the consolidation of the group may

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be accomplished by movement of all suspenders toward a corner of a head, the preferred consolidation is accomplished by movement of the rolls toward the cross and in-line center lines of the group. In this manner the total distance travelled by the rolls of a group is significantly reduced thereby producing consolidation in the shortest possible time.

FIG. 1 shows 2 spaced apart groups of rolls and suspenders at the left box support 19 and 2 clustered groups of rolls and suspenders at a right pan support 20.

FIGS. 2A-2E show the step of consolidation of the left head 16 as well as the step of spacing apart the consolidated right head 22 during rightward movement of the transfer device 17. As will be explained, the preferred consolidating means includes a rectilinear grid on which the suspenders 25 and 26 are slidably mounted for in-line and cross movement between a spaced apart orientation and a clustered orientation.

It has been found that the preferred suspension means for delicate items such as freshly baked rolls is a vacuum suspension means, the suspenders 25 and 26 being formed of any suitable material such as plastic or metal. Under certain circumstances, compressible material may be utilized to soften the engagement with the roll, though in the preferred embodiment this has not been utilized.

A vacuum suspension means is schematically disclosed in FIGS. 2A-2E, wherein the suspenders 25 and 26 are mounted in an inverted U-shaped transfer device 17, the left and right legs 18, 18 of which form suction conduits to a common conduit 15 at the bight of the U. Valve means 27 and 28 control the vacuum at the heads 16 and 22, respectively, the suspenders taking the form of vacuum cups in the embodiment shown. The valve means 27 in the left head 16 is open in FIG. 2A with the vacuum means 28 in the right head 22 closed. It will be recognized that the valve means will be closed upon movement of a head from the box support 20 outwardly to its pan support and vice versa.

The apparatus is particularly designed for ready insertion into a bakery conveyor line, wherein pans of rolls are delivered to a packing area by conveyors. The instant apparatus is preferably equipped with supports 19, 20, and 21 in the form of longitudinally extending conveyor means including a middle box conveyor 20, a left pan conveyor 19 and a right pan conveyor 21, the predetermined intermittent movement of these conveyors being controlled to respond to movements of the transfer device 17, these controls being of the normal control system type used in machinery of this kind involving limit switches and the like. Control systems of this type are well known to those skilled in the art.

General arrangement of apparatus

FIGS. 3-5 show the general arrangement of the apparatus. A tubular structure 30 is provided which may be mounted on wheels or skids (not shown) to facilitate movement of the apparatus into a production line. The ends of the conveyors 19, 20, and 21 are shown at the downstream end of FIG. 3, the upstream ends not being shown to indicate they may be of any desired length and also to indicate that the apparatus may be an integral part of the line, if desired. The conveyor means is mounted on the tubular structure 30, each conveyor being equipped with a cam box 32 which controls movement of its conveyor through its operatively connected brake motor 33. It will be recognized that the cam boxes 32 will properly position pans 11 and boxes 12 at the depanner station in accordance with predetermined scheduling of the cam boxes 32.

Parallel spaced across tracks 34 are mounted on the tubular structure 30 above the conveyor means and extend across the depanner station. The transfer device 17 is equipped with wheels 35 which ride on tracks 34, the track and wheel arrangement being selected to meet the sanitary requirements in the baking industry. The trans-

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fer device 17 is moved across the depanner station by means of a horizontal fluid cylinder 36 connected to the right side of the transfer device 17 through force transmitting framework 37 (FIG. 4) which transmits the forces to the top peripheral band 38 as well as to the right head 22. The heads 16 and 22 are telescopically connected to the band 38, intermediate flange 39 being telescopically received within the band 38 for vertical movement therein a distance of about 2"-2 and 1/2" upwardly from the down position shown in FIG. 4. This vertical movement is accomplished by two vertical fluid cylinders 40 and 41 mounted centrally at the outer sides of the heads, the vertical forces being transmitted to the heads 16 and 22 through plates 42 and 37, respectively. Guided movement of the heads 16 and 22 is provided by two vertical rectangular bars 43 and 44 spaced equally on either side of their respective vertical cylinders 40 and 41, these bars 43 and 44 being rigidly mounted on the band 38, each of the bars providing two in-line bearing surfaces 45 and two cross bearing surfaces 46 on which ride cam followers 47.

Power for the machine is provided by motor 50 mounted at the top of the tubular structure 30, a suction fan 51 being similarly mounted and driven thereby. The vertical duct 52 connects the suction fan 51 with the top opening of the transfer device, the vertical duct 52 flaring into a horizontal cover 53 having an area sufficient to extend throughout the depanner station (FIG. 4). The transfer device 17 has a top plate 54 in face-to-face engagement with the cover 53, the top plate 54 having an elongated cross opening 55 of a width equal to the flared duct 52 and of a length equal to the cross movement of the transfer device 17 so that the duct 52 is in continuous fluid communication with the air passage 15 at the bight of the U of the transfer device 17.

FIG. 4 shows valve means 27 and 28 for controlling the suction at the heads, this valve means involving a drive cylinder 57 mounted on the transfer device 17 and operatively engaging a lever system 58 in the right head 22 for opening and closing movement of the multiple damper plates 59 therein, a drive lever 60 from this damper system operating the damper plates 61 at the left head 16 such that when one valve is open the other valve is closed.

It is to be noted that FIG. 4 looks downstream which causes the left head 16 to be positioned on the right of this figure; also that the transfer device 17 has been moved to the right position.

Operation of double head

As previously mentioned, suitable controls are employed for coordinating the movements of the various structural components in accordance with a predetermined schedule. The conveyors 19, 20, and 21 are controlled by the cam boxes 32 to deliver filled pans and empty boxes to the depanner station, the boxes having previously been set up. Certain bellows-end type boxes may require erecting fingers to maintain their set up condition at the depanner station, as is well known. Assuming the machine is in the condition shown in FIG. 4, the valve means 27 and 28 would be reversed to accomplish suspension of rolls by the head 22 and simultaneous release of rolls by head 16 into the box 12. The transfer device 17 would then be telescopically moved upwardly by cylinders 40 and 41 and then cylinder 36 would move the transfer device 17 across tracks 34 to the left position, the right head 22 being moved from the right zone to the middle zone with the left head 16 at the left zone of the depanner station. Upon reaching the left position, horizontal movement is stopped and downward movement is accomplished through cylinders 40 and 41, the flange 39 telescopically moving downwardly from its position within the band 38. The damper systems 27 and 28 are then reversed by cylinder 57 to release a group of rolls into waiting empty box and simultaneously to suspendedly engage another group of rolls. During horizontal movement of the trans-

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fer device, the box conveyor always moves to discharge filled and deliver empty boxes. The pan conveyor supporting the empty pan is also moved to replace the empty pan with a filled pan.

Consolidation into clusters

Preferably the spaced apart discrete rolls from the standard baking pans are consolidated into clusters. The preferred structure for accomplishing consolidation is shown in FIGS. 7-8A to 8C with a somewhat schematic showing in FIGS. 6A to 6D.

A patterned ceiling 60 is mounted in each head immediately above the suspenders or vacuum cups, the ceiling 60 having a pattern of cut-outs 61 conforming to the preselected movement of the vacuum cups. Portions of this patterned ceiling are shown in FIGS. 6A-6D, the particular pattern shown being capable of providing controlled suction for vacuum cups moving first toward the cross center line of a group and then toward the in-line center line of a group. FIG. 6A shows the spaced apart cup pattern conforming to a standard baking pan; FIG. 6B shows the outer rows 62 and 64 of a group of a dozen cups moved toward the middle row 66 at the cross center line of a group; FIG. 6C shows the first stage of movement of consolidation of the cups in their respective rows, the outermost cups 68 at the ends of each row being transversely moved inwardly into engagement with their adjacent cups 69; and FIG. 6D shows the final stage of in-the-row orientation wherein all cups are moved toward the in-line center line of the group.

It is to be noted that there are two heads 16 and 22 in the preferred machine and two groups suspended and consolidated by each head. The following explanation of the consolidating means will be directed toward the mechanism for a single group in a head, it being recognized that the duplex head shown duplicates the system.

The preferred consolidating means is shown in the left head in FIG. 7 as including longitudinal in-line rods 70 and transverse cross rods 72 which form a rectilinear grid. The suspenders 25 are slidably mounted thereon. A consolidating frame 74 rectangular in shape supports in-line double bearings 76 at its four corners. Row sliding means 78 is slidably supported in the bearings 76 and includes a downstream power cylinder 75 for driving a top cross arm 77 at each end of which is mounted a top shaft 79 slidably positioned in its respective bearings 76. A similar structure is provided at the upstream end of the frame with its bottom shafts 80 extending beneath the top shafts 79 as shown more clearly in FIG. 8A. Tubular adapters 81, 82 are adjustably mounted on the shafts 79 and 80, pairs of adapters 81 and 82 being cross aligned to support two cross rods 72, 72 which pass through bearings 83 (FIG. 5) in the outer rows 62, 64 of a group of suspenders 25, the cross rods 72a of the center row 66 being fixedly mounted in the in-line legs 84, 84 of the rectangular frame 74 and similarly passed through bearings in their suspenders 25.

The downstream arm 77 controls movement of the upstream outer row 64 of suspenders and conversely the upstream arm 85 controls movement of the downstream outer row 62. In the duplex head shown in FIG. 7, the downstream arm 77 controls the upstream row 64 through adapters 81a and 82a and conversely, the upstream arm 85 controls downstream row 62 through adapters 81b and 82b. In the duplex head shown, the rows of two groups are consolidated to the position shown in FIG. 6B by the arms 77 and 85.

FIG. 5 shows the in-line legs 84, 84 of the frame 74 with horizontally elongated apertures 86 which allow passage of the cross rods 72, 72a therethrough; adjusting screws 87 on the adapters 81, 82 enable pre-setting of the adapters to accommodate the different center spacing characteristics of the pans.

It is to be noted that the rectangular frame 74 is a dependent part of each head and is affixed to the transfer

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device and further that the consolidation mechanism is supported by the frame.

"In-the-row" consolidation is accomplished by two cylinders 90, 91 for each group mounted on the in-line legs 84 at the center line of their group. The drive rod 92, 93 of each cylinder is rigidly attached to the outermost suspender of the center row 66 and these two outermost suspenders are adjustably affixed by set screws 94 (FIG. 5) to their respective in-line rods 70. These two suspenders therefore cannot move along their in-line rods 70 and therefore these in-line rods 70 cause inward movement of their adjacent suspenders in the outer rows 62 and 64 to the position shown in FIG. 6C. An "in-the-row" spacer 96 of about 1/4" is provided on these control suspenders 25a which engage the inner suspenders and push them inwardly to the longitudinal center line area of the frame. The frame is equipped with an inner skeleton for rigidification thereof, this skeleton including an in-line 1/4" wide strip 97 and two vertically spaced cross pins 98. The suspenders on being moved by the suspender sliding means to the longitudinal center line therefore are spaced apart about 1/4" in that they engage the in-line wide strip 97 at this point as shown in FIG. 6D.

As previously mentioned, consolidation takes place during horizontal movement from the pan support to the box support. On return movement, the suspenders are returned to their spaced apart positions. This is accomplished through the reversal of the procedure discussed above subject to the difference that the outermost suspenders in the rows move transversely away from the inner suspenders first, after which the inner suspenders are pulled outwardly to their spaced positions. This is accomplished by the pulling means 100 (FIGS. 8A to 8C) extending along the row 62 between an outer suspender and its transversely adjacent inner suspender, bolt 101 mounted on the outer suspender and slidably received in an apertured ear 102 on the inner suspender accomplishing this movement since on inward movement the bolt 101 slides freely through the ear 102 allowing the spacer 96 to push the inner suspender and on return the bolt 101 freely slides in the ear 102 until its head 103 engages the ear at which time the inner suspender is pulled outwardly.

What is claimed is:

1. The method of packaging a roll group in an open top box positioned in an upright position in a middle zone, the roll group being alternately depanned from a left pan in a left zone and a right pan in a right zone, which method comprises the steps of

engaging a left roll group in the left pan at their tops while releasing a previously transferred right group from the right pan into a box in the middle zone, withdrawing and suspendedly transferring the left group to the middle zone while positioning an empty box at the middle zone, positioning a filled pan at said right zone, releasing the transferred left group into said empty box while engaging a right group at said filled pan at their tops, and vice versa.

2. The method of packaging a roll group in an open top box positioned in an upright position in a middle zone, the roll group being alternately depanned from a left pan in a left zone and a right pan in a right zone, which method comprises the steps of

engaging a left roll group in the left pan at their tops while releasing a previously transferred right group from the right pan into a box in the middle zone, withdrawing and suspendedly transferring the left group to the middle zone while positioning an empty box at the middle zone, positioning a filled pan at said right zone, consolidating the suspended rolls of the left group during transfer to form a clustered group,

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releasing the transferred left group into said empty box while engaging a right group at said filled pan at their tops, and vice versa.

3. The method of depanning a group of spaced discrete rolls from cellular pans and consolidating and packing the depanned rolls as a cluster in an open top box which method comprises the steps of
 positioning said box in an upright position at a middle zone to receive a cluster,
 positioning pans of rolls at a left zone and a right zone on each side of said box,
 engaging a group of rolls individually at their tops on one side of said box for withdrawal and suspended transfer from the pan to a box while simultaneously releasing a previously transferred and consolidated cluster of rolls from the other side into a box at the middle zone,
 transferring the suspended group of rolls leftwardly to the middle zone while simultaneously positioning a second box at said middle zone and positioning a second pan of rolls at said left zone,
 consolidating the suspended rolls during transfer in two horizontal directions to form a cluster of the rolls with the peripheral configuration of the cluster corresponding to said second box, and
 releasing the resultant cluster into said second box while simultaneously engaging rolls in the right zone at their tops.

4. An apparatus for packaging roll groups in upright open top boxes, the roll groups being alternately depanned from left pans and right pans, comprising
 longitudinally extending conveyor means including a middle box conveyor, a left pan conveyor, and a right pan conveyor, each pan conveyor being spaced the same predetermined transverse distance on opposite sides of the box conveyor,
 a transfer device mounted above said conveyor means at a depanner station and having a left head and a right head transversely spaced apart said predetermined transverse distance, each head being adapted to engage and suspend a roll group,
 moving means operatively connected to said transfer device for vertically and horizontally moving said device through a substantially inverted U-shaped path between a left position with its left head at the left pan conveyor and its right head at the middle box conveyor and a right position with its left head at the middle box conveyor and the right head at the right pan conveyor,
 said conveyor means being responsive to said moving means intermittently to move the middle box conveyor and a predetermined one of the pan conveyors to replace a filled box and an empty pan with an empty box and a filled pan respectively at said depanner station.

5. An apparatus for depanning spaced discrete rolls as a group from a cellular pan and consolidating and packing the depanned rolls as a cluster in an open top box, the roll group being alternately depanned from left pans and right pans comprising
 longitudinally extending conveyor means including a middle box conveyor, a left pan conveyor, and a right pan conveyor, each pan conveyor being spaced the same predetermined transverse distance on opposite sides of the box conveyor,
 a transfer device mounted above said conveyor means at a depanner station and having a left head and a right head transversely spaced apart said predetermined transverse distance, each head having a group of discrete vacuum cups for engaging and suspending the rolls of a roll group,
 moving means operatively connected to said transfer device for vertically and horizontally moving said device through a substantially inverted U-shaped

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path between a left position with its left head at the left pan conveyor and its right head at the middle box conveyor and a right position with its left head at the middle box conveyor and the right head at the right pan conveyor,

consolidating means mounted in each head and responsive to movement of the head by said moving means to said middle box conveyor to move the group of discrete vacuum cups and their suspended rolls into contiguousness to form a clustered group,
 vacuum means operatively connected to the right and left heads and responsive to movement of said transfer device by said moving means to provide a suction at the head which is at a pan conveyor,
 said vacuum means continuing said suction until the subject head is moved through said inverted U-shaped path to said middle box support to suspendedly transport a group of rolls from a pan to a box,
 said conveyor means being responsive to said moving means intermittently to move the middle box conveyor and a predetermined one of the pan conveyors to replace a filled box and an empty pan with an empty box and a filled pan respectively at said depanner station.

6. An apparatus for depanning spaced discrete rolls as a group from a cellular pan and consolidating and packing the depanned rolls as a cluster in an open top box, comprising

support means including a box support and a pan support,
 a transfer device mounted above said support means at a depanner station including a head having a group of discrete suspenders for engaging and suspending the rolls of a group,
 moving means operatively connected to said transfer device for vertically and horizontally moving said transfer device through a substantially inverted U-shaped path between one position with its head at said pan support and another position with its head at said box support,
 suspension means operatively connected to said suspenders and responsive to movement of said transfer device to provide a suspending engagement of a roll when the head is at the pan support, said suspension means continuing said suspending engagement until the head is moved through said inverted U-shaped path to said box support to suspendedly transport a group of rolls from a pan to a box, and
 consolidating means mounted in said head and responsive to movement of the head by said moving means to said box support to consolidate the spaced apart group of discrete suspenders into a cluster, said consolidating means including longitudinal in-line rods and transverse cross rods forming a rectangular grid, said suspenders being slidably mounted on said in-line rods and cross rods, and means for moving said in-line rods, cross rods and suspenders between a spaced-apart group orientation and a clustered group orientation in response to movement of the head between the pan support and box support.

7. An apparatus as defined in claim 6 wherein said discrete suspenders are vacuum cups and said suspension means includes a vacuum means and said transfer device includes conduit means connecting said cups with said vacuum means, valve means in said conduit means for providing a suspension force at said cups to lift rolls out of said pans.

8. An apparatus as defined in claim 6 and wherein said support means includes a longitudinally extending box conveyor and pan conveyor.

9. An apparatus as defined in claim 8 including a pair of spaced cross tracks extending transversely across said conveyor means at said depanner station, wheels rotatably affixed to said transfer device and mounted on said tracks.

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10. An apparatus as defined in claim 6 and wherein said transfer device includes two transversely spaced heads and said support means includes another pan support, said support means defining a depanner station with a middle box support and a pan support on either side, said moving means moving said transfer device through two inverted U-shaped paths to depan a pan at one of the pan supports while releasing a group of rolls at the box support.

11. An apparatus as defined in claim 10 and wherein each head includes suspenders for two groups of rolls and consolidating means are provided for consolidating both groups into separate clusters for release into separate boxes.

12. In an apparatus for depanning spaced discrete rolls as a group from a cellular pan and consolidating and packing the depanned rolls as a cluster in an open top box, a consolidating head comprising

a frame having a longitudinal center line,
cross rods extending transversely of said frame,
discrete roll suspenders for said group slidably mounted on said cross rods, said suspenders defining a transverse center row and an outer row on either side of said center row,

row sliding means movably mounting said cross rods on said frame for movement of rows of suspenders between a spaced row orientation conforming to the rows of a cellular pan and a packed row orientation conforming to the box,

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in-line rods extending longitudinally of said frame, at least one in-line rod being rigidly affixed to each suspender of a center row and slidably mounted on the suspenders of the outer rows,

suspender sliding means connected to the outermost suspender of said center row at each end thereof for moving these suspenders transversely toward said longitudinal center line, the suspenders of the outer rows being simultaneously carried toward each other by said in-line rods and vice versa to accomplish movement between the spaced in-the-row orientation of the cellular pan and a packed in-the-row orientation conforming to the box.

13. In an apparatus as defined in claim 12 and including a pulling means positioned in a row between an outer suspender and its transversely adjacent inner suspender, said pulling means being operatively arranged only to pull said inner suspender outwardly from a consolidated box orientation to spaced pan orientation upon transverse outward movement of said suspender sliding means.

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