Nov. 23, 1971 C. L. SOOTHERAN ET AL 3,621,765

DEVICE FOR INSERTING PARTITIONS INTO CARTONS

Filed May 5, 1969 4 Sheets-Sheet 2

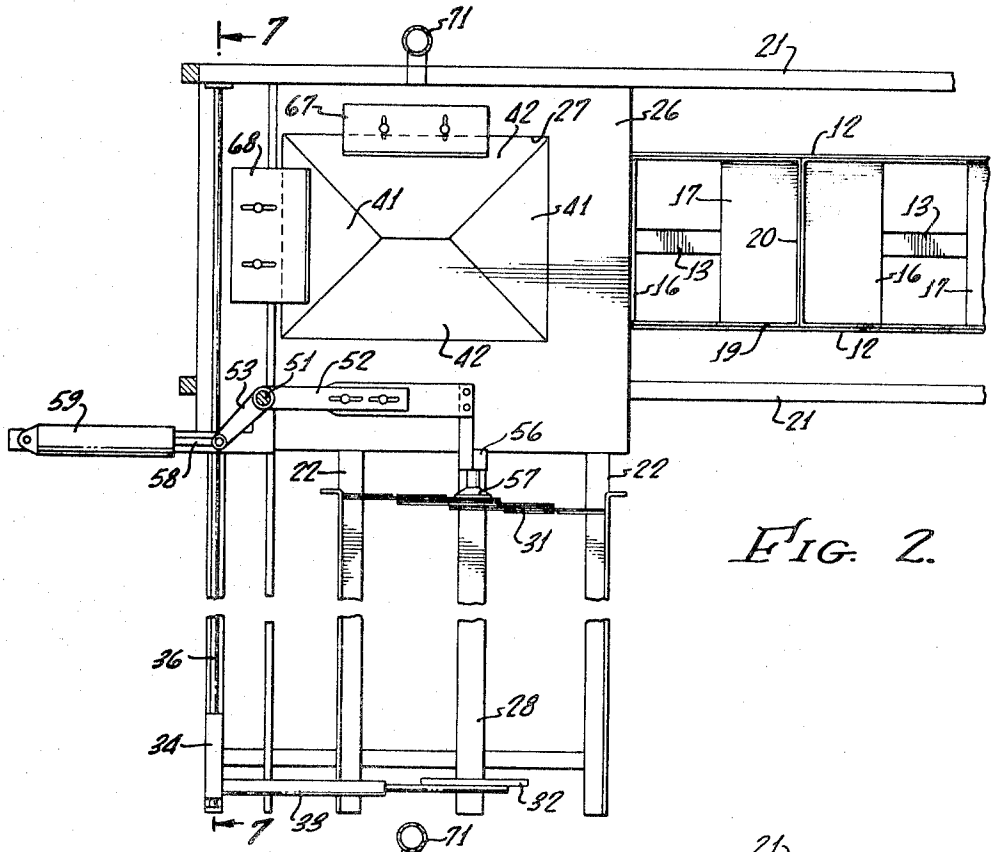


FIG. 2.

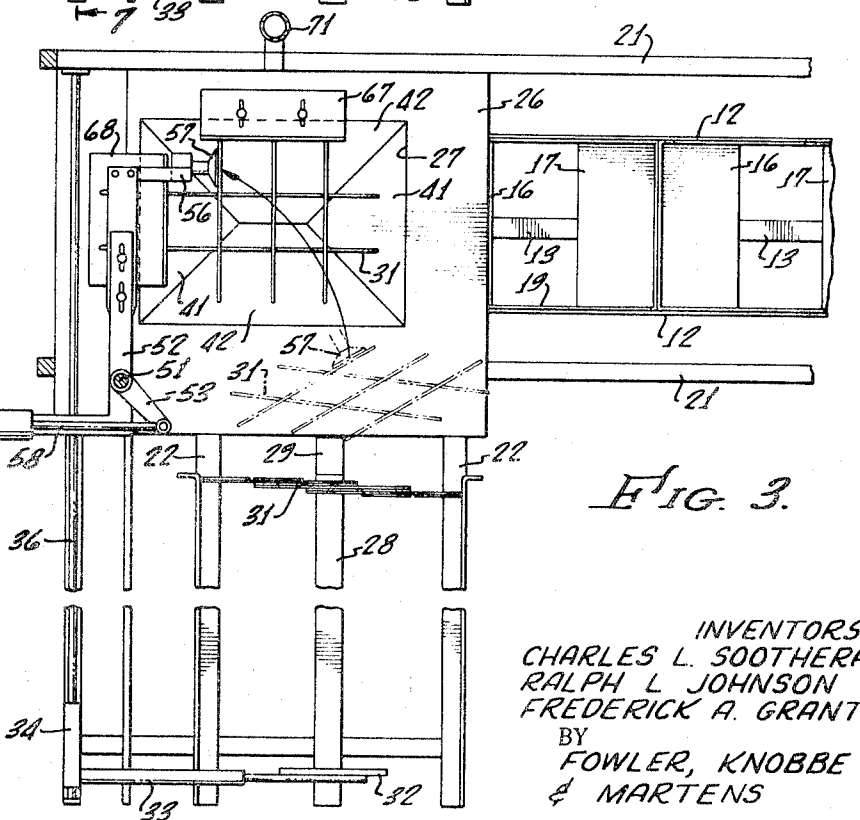


FIG. 3.

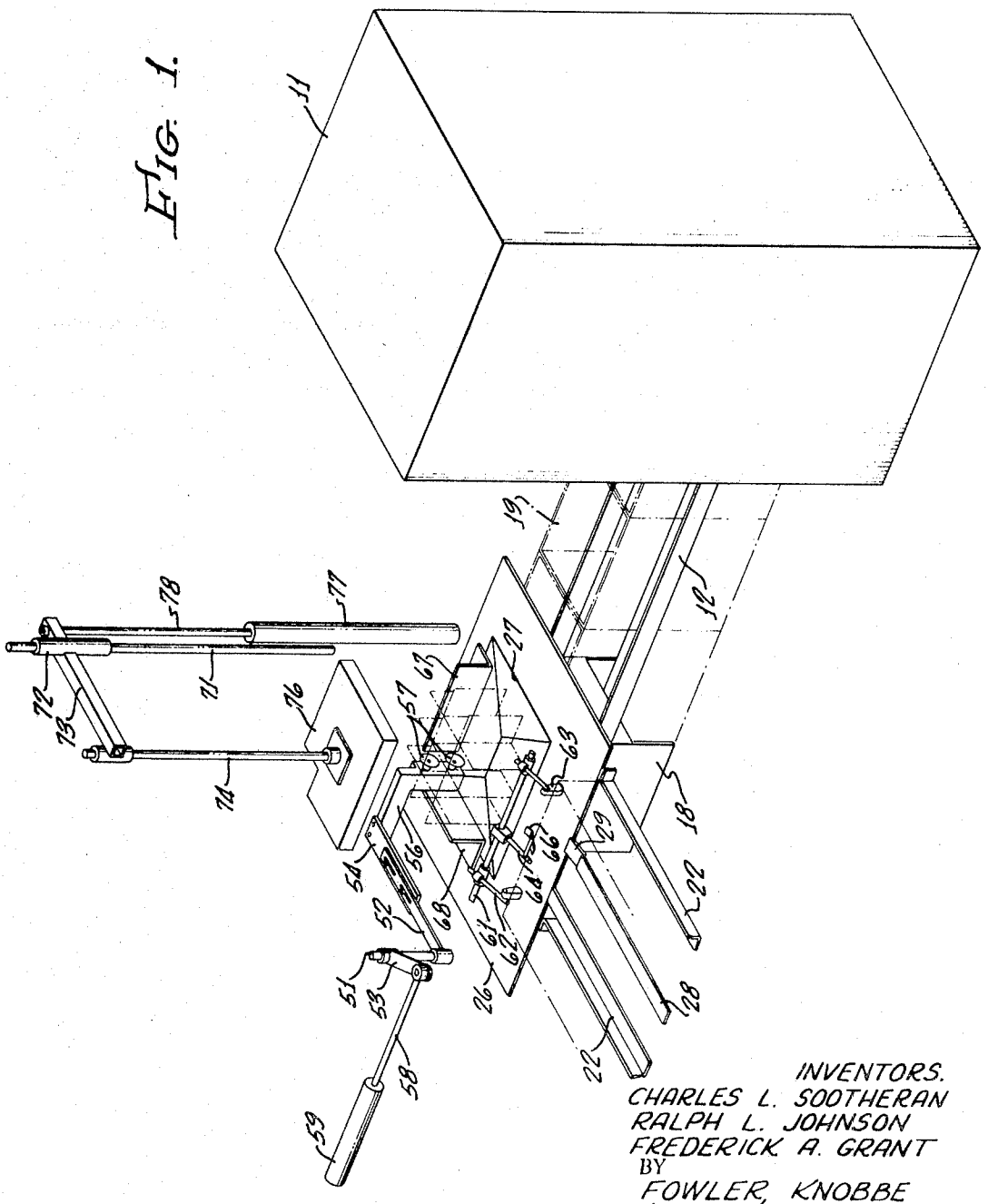
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DEVICE FOR INSERTING PARTITIONS INTO CARTONS

Filed May 5, 1969 4 Sheets-Sheet 1

FIG. 1.



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DEVICE FOR INSERTING PARTITIONS INTO CARTONS

Filed May 5, 1969 4 Sheets-Sheet 3

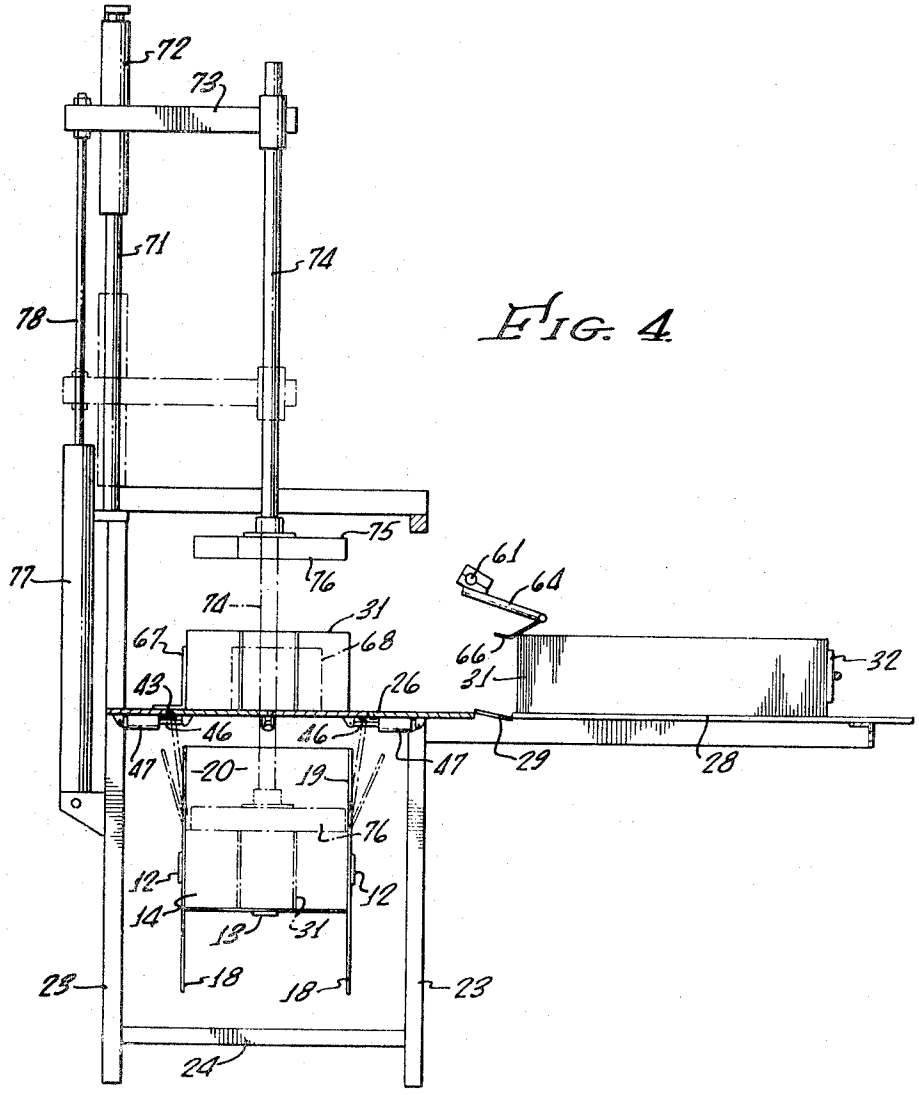


FIG. 4

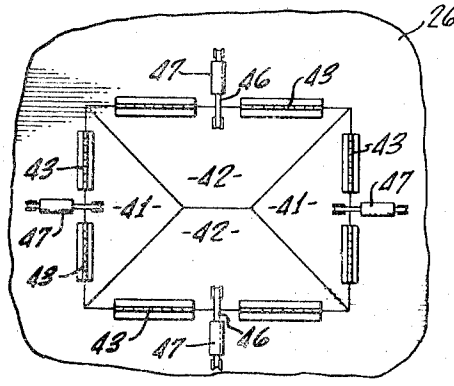


FIG. 5.

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DEVICE FOR INSERTING PARTITIONS INTO CARTONS

Filed May 5, 1969 4 Sheets-Sheet 4

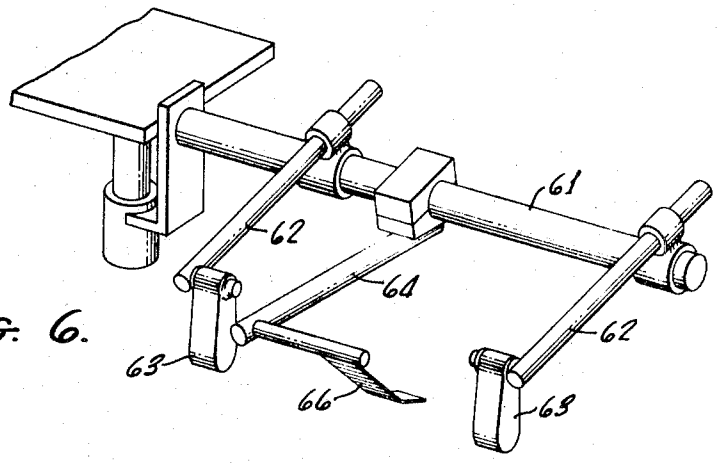


FIG. 6.

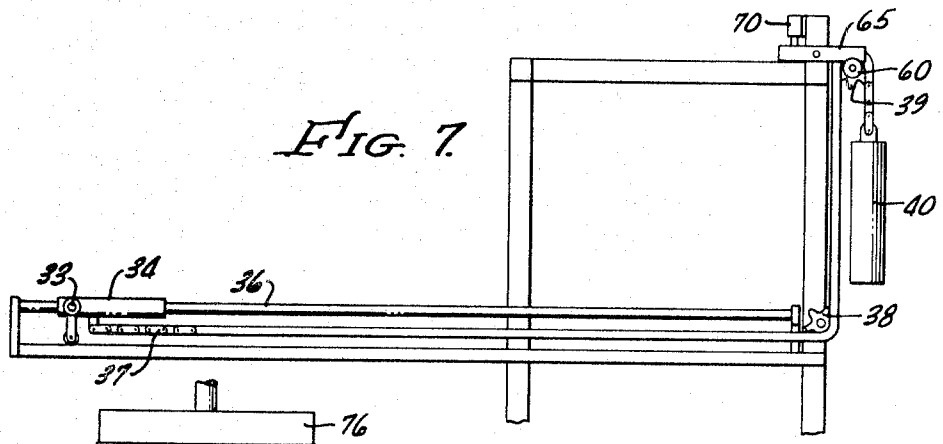


FIG. 7.

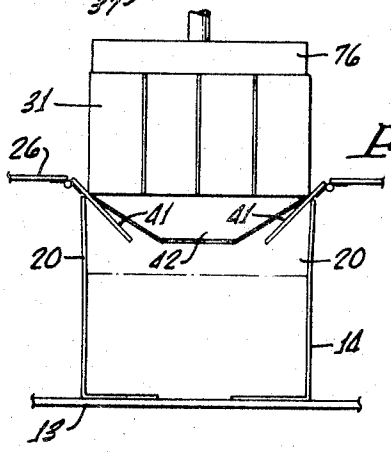


FIG. 8.

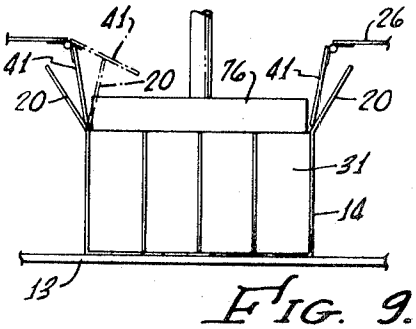


FIG. 9.

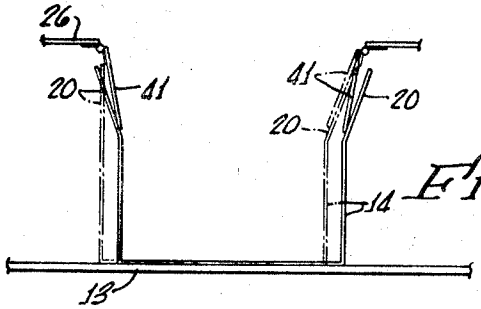


FIG. 10.

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3,621,765

DEVICE FOR INSERTING PARTITIONS INTO CARTONS

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Int. Cl. B31b 1/80, 11/02; B65b 35/54
U.S. Cl. 93—37 R 11 Claims

ABSTRACT OF THE DISCLOSURE

A conveyor system for handling shipping cartons is provided with a work station at which a partitioning assembly of criss-crossed divider walls is to be inserted. The work station has a sectional platform comprised of a plurality of trapdoor elements for receiving and supporting a partitioning assembly above the carton conveyor. When a carton has been brought into position below the platform, a reciprocable ram engages the partitioning assembly and moves it downwardly into the carton, the trapdoor elements yielding and functioning as a guiding chute, as well as correcting minor misalignment of the carton relative to the work station and holding the carton flaps out of the path of the partitioning assembly.

Shipping cartons, particularly those used for frangible containers such as glass jars or bottles, customarily contain divider or partitioning walls for isolating the containers and preventing them from bumping together during handling. These partitioning walls are usually of a cushioning type of paper material, called corrugated board or paper board, extending longitudinally and transversely of the carton, to form compartments. Usually the partitioning walls are slotted through approximately one-half the height of the wall and those extending in one direction are inverted and then telescoped upon those extending in the other direction to form an assembly of interlocking members sufficiently loosely interengaged that they may be collapsed to occupy a minimum of space for shipping and handling.

The fitting of the partitioning assemblies to the shipping cartons preparatory to insertion of the articles to be shipped requires first the expansion of the partitioning assembly, so that the longitudinal and transverse partitioning walls are criss-crossed and the assembly has substantially the configuration providing the compartments, and then the insertion of the assembly into the carton. Heretofore these operations have been performed almost exclusively by hand, which is an uneconomical procedure. In accordance with the present invention there is provided a device for performing these two operations mechanically and automatically, with complete assurance that the collapsed partitioning assemblies will be expanded to the proper configuration and guided into a carton in such a way as to avoid crushing or other damage. The guiding means serves the additional purposes of correcting any minor misalignment of the carton at the position where it receives the partitioning assembly, and preventing the closure flaps of the carton from interfering with the insertion of the partitioning assembly.

In accordance with a preferred embodiment of the invention these guiding and aligning operations are accomplished by a platform to which the partitioning assembly is delivered preparatory to its insertion into the carton and which is comprised of a plurality of pivoted platform segments together forming a trapdoor. In the preferred embodiment four such segments make up the trapdoor structure, one at each end and one on each side relative to a carton positioned to receive a partitioning assembly.

When these trapdoor segments are pivoted downwardly as a partitioning assembly is moved downwardly for insertion into the carton they provide a chute of dynamically expanding rectangular configuration for guiding the assembly. The end segments will shift the carton endwise in either direction if it is misaligned and will also deflect the end flaps out of interfering relation to the insertion of the partitioning assembly. The side segments will perform similar functions relative to the transverse alignment of the carton and the deflection of the side closure flaps.

For a complete understanding of the invention reference may be had to the following detailed description to be interpreted in the light of the accompanying drawings wherein:

FIG. 1 is a perspective view in schematic form of a device for inserting partitioning assemblies into cartons;

FIG. 2 is a plan view showing particularly the partitioning assembly storing and delivering portion of the device;

FIG. 3 is also a plan view similar to that of FIG. 2 showing a partitioning assembly as supplied, in transport and as delivered to the insertion position;

FIG. 4 is an elevational view showing a partitioning assembly in position for insertion and in phantom the assembly inserted into a carton;

FIG. 5 is a fragmental view looking upwardly from below the machine showing the platform consisting of trapdoor segments seen from above in FIGS. 2 and 3;

FIG. 6 is an enlarged perspective view of a partitioning assembly retarding device shown in FIG. 1;

FIG. 7 is a view taken substantially on the line 7—7 of FIG. 2, showing particularly a feed mechanism for a supply of carton partitioning assemblies;

FIG. 8 is a schematic view showing how the trapdoor segments form a guide chute for a partitioning assembly;

FIG. 9 is a schematic view showing how the trapdoor segments clear carton flaps out of the path of a partitioning assembly; and

FIG. 10 is a schematic view showing how misalignment of a carton is corrected.

Referring now to the drawings, and particularly to FIG. 1, the reference numeral 11 designates a housing for mechanism (not shown) for preparing cartons to receive partitioning assemblies. A widely used type of carton is made of paper board and consists of four sides in a rectangular configuration each having bottom and top closure flaps. Usually the flaps are integral with their respective sides and are scored to facilitate bending into usable position. It is a common practice to supply cartons collapsed or flattened at two of the diagonally opposite corners and with the upper and lower flaps lying flat in the planes of their respective sides.

In the exemplary embodiment cartons in this form are available to the enclosure 11 and that enclosure contains mechanism (not shown) for opening the cartons to their expanded or rectangular condition.

Extending leftwardly, as viewed in FIG. 1, from housing 11 are rails 12, also shown in FIGS. 2, 3 and 4, for guiding cartons formed by the mechanism in housing 11. The rails 12 are spaced apart a distance to confine and guide the formed cartons. Below and intermediate the rails 12 is a rail 13 for supporting formed cartons.

The flaps of the cartons have not been flexed from their positions substantially in the planes of their respective sides at the time the cartons are formed into rectangular configuration. Each carton, after it has been formed, is propelled into the space between the rails 12 with the point of flexure of the leading bottom flap slightly above the rail 13. As the carton is propelled, the end of the rail 13, upon being engaged by the leading bottom flap, will flex the flap upwardly into position beneath the formed carton. Means (not shown) will tuck the trailing bottom flap up so that it will rest on the rail 13.

As a result of the operations thus far described there will appear in succession, between the rails **12** and resting on rail **13**, the cartons **14** having leading and trailing bottom flaps **16** and **17** respectively, lower side flaps **18** and upper side and end flaps **19** and **20**, respectively. As additional cartons emerge from assembly housing **11** they push those already formed leftwardly.

Associated with the carton conveying structure is a framework of a mechanism for handling carton partitioning assemblies, comprising frame members **21** extending parallel to the rails **12**, frame members **22** extending laterally from the frame members **21** and legs **23** interconnected by a cross brace **24** (FIG. 4). At the corner of the L-shaped configuration formed by the frame members **21** and the frame members **22** is a platform **26** at a sufficient distance above the cartons to permit the upstanding upper flaps **19** and **20** to pass beneath it. The platform **26** has an aperture **27** for passage of a partitioning assembly from above the tabletop to an empty carton below.

As shown in FIGS. 1, 2 and 3 the frame members **22** are angle bars positioned with one flange horizontal to support, and the other flange upstanding to confine, carton partitioning assemblies. As previously described these assemblies usually consist of criss-crossed and interlocked partitioning walls of paper board and are generally supplied in collapsed or flattened form. The reference numeral **31** in FIGS. 2 and 3 designates such a partitioning assembly, confined between the upstanding flanges of the frame members **22**, standing on edge and facing toward the platform **26**. Between the rails **22** is a rail **28** for supporting the collapsed partitioning assemblies intermediate their ends. An incline **29** at the end of the rail **28** nearest to the table **26**, and resting upon the table, assures that when a partitioning assembly is being transferred to platform **26** it will be lifted clear of the edge of the platform.

A pusher plate **32** for feeding partitioning assemblies is mounted on an arm **33** carried by a sleeve **34** that is slideable on a rod **36** carried by the framework. A chain **37** has one end connected to the sleeve **34** and extends along underneath the rod **36**, around and upwardly from a sprocket **38**, around another sprocket **39**, and suspends at its other end a weight **40**. The sprockets **38** and **39** are rotatably mounted on brackets supported by the framework of the structure. The weight **40**, acting through the chain **37** and the arm **33**, provides a thrust applied by the pusher plate to move a supply of partitioning assemblies toward the platform **26**. The arrangement for controlling the advancement and presentation of the partitioning assemblies to the tabletop will be described hereinafter.

The aperture **27** in the platform **26** is provided with closure plates **41** at the ends and **42** at the sides, pivotally attached to the platform **26** by hinges **43** secured to the underside of the tabletop, as shown in FIG. 5. The four closure plates form a segmented trapdoor. Each of the closure plates **41** and **42** is pivotally engaged by a piston rod **46** of a piston (not shown) contained in a cylinder **47** pivotally connected to the undersurface of the platform **26**. The cylinders **47** are pneumatic devices for controlling the operation of the pivoted closure plates **42** and **43**, as will be described hereinafter.

Although the closure plates may have various configurations, in the preferred embodiment of the invention they have their edges substantially bisecting the corner angles of aperture **27**, as shown in the drawings. Because the aperture is rectangular but not square it follows that the end closure plates **41** will be triangular and the side plates **42** will be trapezoidal. If the aperture were square, the plates would all be triangular. In either case the geometrical altitude of the triangular end closure plates, measured from their pivotally mounted edges, will be equal to the altitude of the side closure plates, whether the side plates are triangular or are trapezoidal.

Near a corner of the platform **26** is a vertically supported rocker shaft **51** which has secured thereto a lever arm **52** and a second lever arm **53**. The arm **52** adjustably mounts an extension **54** which in turn supports an L-shaped extension **56** the downwardly extending arm of which supports one or more suction cups **57**. The arm **53** of rocker shaft **51** is connected by a piston rod **58** to a piston (not shown) contained in a cylinder **59**. The normal position of the suction cup arm **52** is that shown in FIG. 3 in which the arm is generally parallel to the ends of the table aperture **27**.

As shown in FIGS. 1 and 6, a rod **61**, which may be secured to one of the structural members of the framework, extends across, above and parallel to the platform **26**, at a point between aperture **27** and the near ends of angle bars **22**. The rod **61** has secured thereto arms **62** extending obliquely downwardly toward the supply of partitioning assemblies, and each of the arms **62** pivotally supports at its free end a weight member **63** suspended above and substantially in alignment with the angle bars **22**. At or near the middle of the space between the arms **62**, the rod **61** has secured thereto another arm **64**. This arm also extends obliquely downwardly toward the supply of partitioning assemblies and supports a flexible leaf spring **66** extending obliquely downwardly toward the aperture **27** in the platform **26**. The principal function of the weights **63** is to serve as stops for the foremost partitioning assembly of the supply as the supply is moved toward platform **26** by the pusher plate **32** although they also assist in the expansion of the partitioning assembly. The principal function of the leaf spring **66** is to assist in the expansion of the partitioning assembly to rectangular configuration, as will be described hereinafter.

It will now be assumed that an empty carton is positioned below the aperture **27** in the platform **26** and that a supply of partitioning assemblies is available between the pusher plate **32**, whatever its position along the rod **31**, and the stops comprising weight members **63**. Upon the admission of air under pressure into the cylinder **59** to move the piston therein from right to left, the rocker shaft **51** will be rocked clockwise to bring the suction cups **57** into engagement with the surface of the outermost wall member of the partitioning assembly **31** that is presented facing the aperture **27**. The engagement preferably occurs in the vicinity of the right hand end of the wall, as viewed in FIG. 2. Following the bringing of the suction cups into this position, suction is applied to them to cause them to grip the outermost wall member of the partitioning assembly. Thereupon the piston in cylinder **59** is moved rightwardly to restore the lever arm **52** to its normal position.

As the gripped wall member of the partitioning assembly begins to move with the suction cups it tends to be drawn away from the other wall members, because of the relatively loose articulation of the several wall members with one another. Also, it was found that engagement of the gripper suction cups **57** with the exposed face of the outermost wall member of the partitioning assembly, at a point near the end of that wall member that is most remote from the rocker shaft **51** on which the arm **52** that carries the suction cups is mounted, in combination with movement of that wall member in an arcuate path, produces a marked tendency for the partitioning assembly to be expanded or opened rather than merely to be dragged along in its closed condition. As is seen in FIG. 4 the spring **66** extends downwardly from mounting and has an upward bend, to provide an inverted hump to bear upon the edges of the wall members of the partitioning assembly. It drags upon those remaining engaged after those ahead escape one by one, and thus cooperates in the expansion of the assembly. The weights **63** are suspended in the path of partitioning assembly and are swung upwardly as it moves. As each weight escapes from the edge of a wall member and drops back it offers resistance to movement of the next wall member, thus contributing to the

With the withdrawal of a partitioning assembly from the supply the pusher plate is advanced to present the

next partitioning assembly in the position to be gripped and withdrawn by the suction cups. As previously set forth, movement of the pusher plate is effected by the weight **40**. For the purpose of controlling the advancement of the supply of partitioning assemblies, a pivotally mounted brake lever **65** (FIG. 7) engages a protruding hub **60** of the sprocket **39** and normally presses against the hub to prevent the weight **40** from applying a thrust to the pusher plate **32**. A solenoid **70** is provided for controlling the brake lever **65**. When the pusher plate **32** is to be permitted to advance the supply of partitioning assemblies the pressure of the brake lever **65** upon the hub **60** is relieved by the solenoid **70**, and the weight **40** is permitted to move the supply of partitioning assemblies to bring the foremost of those assemblies into arrested engagement with the weights **63** carried by the rod **61**. Following arrestment of movement of the supply of partitioning assemblies, solenoid **70** reapplies pressure of the brake lever **65** upon the hub **60** to relieve the thrust of the pusher plate **32** upon the supply.

The platform **26** has adjustably secured thereto an angle iron **67** which provides a barrier wall or stop parallel to the side flaps of the cartons. It also adjustably supports an angle iron **68** which provides a barrier wall parallel to the end flaps of the cartons.

As the suction cups are moved into their rest position they bring one end of each of the longitudinal partitioning walls of the assembly into engagement with the barrier wall afforded by angle iron **68** and one end of each of the transverse partitioning walls into engagement with the barrier wall afforded by angle iron **67**. By means of the two barrier walls a final opening and squaring up of the partitioning assembly is achieved and the expanded partitioning assembly is positioned in registry with the position that the carton that is to receive it occupies. The suction gripping of the assembly may be relieved at this time.

As shown in FIGS. 1 and 4, a rod **71** supported vertically by a structural member of the device slideably supports a sleeve **72** to which is secured an arm **73** parallel to table top **26** and extending toward the position to which the suction cups **57** move a partitioning assembly. At substantially the geometrical center of the aperture **27** in the platform **26**, the arm **73** has secured thereto a depending ramming rod **74** that supports at is lower end a platen **76**. A means for reciprocating the ramming rod **74** is provided by the cylinder **77** secured to the framework and containing a piston (not shown) that is connected by a piston rod **78** to the arm **73**.

After a partitioning assembly has been brought by the suction cups **67** into position for insertion into a carton the pneumatic cylinder **77** is energized to reciprocate rod **74** downwardly, bringing platen **76** into engagement with the top of the partitioning assembly. As indicated particularly in FIG. 1, platen **76** has a corner cut out to clear the suction cups **57** and the arm by which they are supported.

As platen **76** continues its downward movement, having come into contact with the partitioning assembly it imparts downward movement to that assembly, the hinged closure plates **41** and **42** yielding to permit passage of partitioning assembly into the carton. As the plates swing downwardly they form a chute to guide the partitioning assembly and maintain it in its generally rectangular configuration. FIG. 8 shows how the closure plates become a guide chute as their downward slope increases.

As soon as the partitioning assembly has been fully inserted into the carton the cylinder **77** is energized in the reverse direction and platen **76** is withdrawn. This completes a cycle of operation of the partitioning assembly insertion machine. Another cycle is initiated by the ejection of another carton from the carton assembly housing **11**, which will cause an empty carton to be delivered into position to receive a partitioning assembly.

As previously set forth, and as shown in FIGS. 4 and 5, the closure plates **41** and **42** are connected to the piston rods **46** of the cylinders **47**. In accordance with the preferred mode of operation air at a steady pressure is applied to the pistons contained in the cylinders to keep the closure plates closed. About the time that the platen **76** comes into engagement with a partitioning assembly preparatory to inserting it into a carton air pressure to the cylinders **47** is reduced to a value which will prevent the closure plates from falling away of their own weight but will offer little resistance to downward movement of the plates by the moving partitioning asembly. After the platen **76** has been withdrawn, air under pressure is reapplied to the cylinders **47** to restore the closure plates to their closed condition. In order to avoid any possibility that a closure plate might, from any cause, move into interfering relation to the platen **76** when the platen is at the bottom of its stroke, it may be provided with a flange **75**, as shown in FIG. 4, giving it an effective depth that holds the closure plates against restoration until the platen has been lifted.

It will be apparent, from an examination of FIG. 4, that the distance between the platform **26** and the carton presented to receive a partitioning assembly should be such that the tips or free ends of the closure members **41** and **42** do not enter the carton and extend below the top of the partitioning assembly when that assembly has been seated in the carton. Were the closure plates to enter the carton they might interfere with the insertion of the partitioning assembly, or restoration of the closure plates to normal position might be impeded if not prevented by the partitioning assembly.

If there has been any tendency for the side flaps or the end flaps of the carton to lean inwardly over the interior of the carton they will be deflected out of the path of the partitioning assembly by the closure plates **42** and **41** respectively. It will be noted that as the end closure plates pivot downwardly they present their convergent lateral edges toward the side closure flaps of the carton and their lower surfaces toward the end flaps. Similarly the side closure plates, pivoting downwardly, present their convergent lateral edges toward the end closure flaps and their lower surfaces toward the side closure flaps. Depending upon the extent to which a flap may be leaning inwardly into the path of a partitioning assembly, it may be moved out of the interfering position by a cam-like action of one of the lateral edges of a closure plate which has its pivotal axis at right angles to the line of flexural association of the flap with the carton, or by a face-to-face confrontation with a closure plate that has its pivotal axis parallel to the line of flexural association of the flap with the carton, or by a combination or succession of both actions. FIG. 9 shows, in dotted line format the action of a closure plate in deflecting a flap that has been leaning inwardly of a carton.

If the carton that has been presented beneath the closure plates has a minor misalignment either laterally or longitudinally with respect to them the closure plates will tend to move the carton by engagement with its flaps and correct the misalignment. In view of the fact that the cartons are confined between the rails **12** the likelihood of lateral misalignment is remote. The carton may, however, be moved longitudinally by the closure plates **41** so that minor misalignment of the carton longitudinally may be corrected. From this it follows that a certain amount of inaccuracy in positioning the carton by the carton delivering mechanism may be tolerated. FIG. 10 illustrates longitudinal movement of a carton by a closure plate from a misaligned position (dotted lines) to a correct position (solid lines).

It should be noted that the closure plate ends just short of the line of flexural association of the carton flap with the carton. Were the end of the closure plate to be appreciably above this line of flexural association, the motion of the closure plate might result merely in flexure

or the flap, rather than causing movement of the carton into the desired position. The preferable relationship is that the closure plates shall just fail to extend into the carton below the top of the partitioning assembly.

No mention has been made hereinbefore of the dimensions of the aperture **27** in the platform **26** relative to other elements. Preferably, it is proportioned to permit the partitioning assembly to pass through smoothly, deflecting the closure plates into a little less than full vertical position as it does so. If the aperture is so large, and the closure plates are pivoted so far laterally from the sides of an aligned carton that the closure plates are considerably short of parallel relation to the sides of the carton as the partitioning assembly passes through, the closure plates can accommodate passage of the partitioning assembly only by flexing the carton flaps outwardly to substantially the same angle as the final angular position of the closure plates. It may be undesirable to subject the partitioning assembly to the added load of flexing the flaps outwardly beyond the clearance needed for entry of the partitioning assembly. From their normal position as a supporting platform, the closure plates pivot through progressively steeper conditions of slope, and present to the partitioning assembly a rectangular funnel with walls of continuously increasing slope and with continuously enlarging orifice. Preferably the rectangle formed by the intersection of the pivotal axes of the closure plates shall be sufficiently larger than the area of the carton that the closure plates, when fully depressed, shall still have some funneling configuration relative to the descending partitioning assembly.

In the foregoing description the several actions or operations have been described in the sequence in which they will logically occur, without details as to actual control. The elements that are concerned in controlling or performing operations are the pneumatic cylinder devices **59**, **77** and **47**, and solenoid **70**. Since it is a condition precedent to the insertion of a partitioning assembly into a carton that an empty carton be available, it will be logical to have primary control of the succession of operations allocated to the carton forming and delivering apparatus contained in housing **11**.

With this as a starting point, it will be assumed that when a carton has been delivered to the partitioning assembly receiving position a control will be affected by the apparatus in housing **11** to cause the admission of air under pressure to cylinder **59** to move the suction cups into position to grip a partitioning assembly. Incidental to this operation, suction would be applied to the suction cups to cause them to grip the partitioning assembly. At the completion of the seizure of a partitioning assembly air under pressure would be admitted to the cylinder **59** to cause the suction cup arm **52** to be returned to its normal position.

The return of the arm to its normal position would then cause the admission of air under pressure to cylinder **77** to cause the delivery of the partitioning assembly into the carton, and the reduction in pressure to the closure plate cylinders **47**. The return of the suction cups to normal position could also effect the necessary control over solenoid **70** to permit weight **40** to advance the supply of partitioning assemblies and then reapply the brake. The movement of platen **76** to the bottom of its stroke could be made effective to reverse the energization of the cylinder **77** to cause withdrawal of the platen.

Finally, the return of the platen **76** to its normal position can cause the restoration of air pressure to cylinder **47** to close aperture **27**, and could, if desired, signal for the delivery of another empty carton. However, if the time required for the assembly of a carton in housing **11** is greater by a comfortable margin than that required for the transfer of a partitioning assembly, the exercise of control over the equipment in housing **11** by the platen operating system would not be required. The provision of a pneumatic system for operating the air responsive devices and the solenoid, including interlocks, is considered to be within the capabilities of one skilled in the art and has not been included in this disclosure.

What is claimed is:

1. In a device for inserting an assembly of partitioning elements into cartons having top closure means comprising flaps:

a pair of opposedly presented pivotally mounted platform members;

an additional pair of opposedly presented platform members pivotally mounted in quadrature to and in the plane of the first mentioned pair and having their lateral edges convergent in close proximity and parallel to the lateral edges of the members of the first mentioned pair for supporting with the first mentioned pair a partitioning assembly;

means for supporting an opened carton at the opposite side of the platform members; and

means for causing pivotal movement of the platform members to accommodate entry of the partitioning assembly into a carton and to deflect the carton flaps out of blocking relation to the partitioning assembly by engagement of the platform members with the flaps, the two pairs of platform members forming a guide chute of decreasing rectangular dimension for the assembly of partitioning elements as the platform members move pivotally to accommodate entry of the assembly into the carton.

2. In a device for inserting into a carton a partitioning assembly comprised of criss-crossed divider walls:

two pairs of trap door members complementing each other to form in combination a platform for supporting a partitioning assembly, each of the trap door members being pivotally supported on an axis parallel to a different one of the sides of a carton positioned to receive the partitioning assembly; and

pushing means engageable with the partitioning assembly for pushing it through the platform and into the carton.

3. A device in accordance with claim **2** in which the rectangle defined by the intersections of the axes of the four trapdoor members exceeds in length and width the corresponding dimensions of a carton to cause the trapdoor members to become a rectangular funneling chute for the partitioning assembly during the pushing of the partitioning assembly into the carton.

4. A device in accordance with claim **2** in which the lateral edges of the four trapdoor members substantially bisect the angles of intersection of the axes of those members and are of equal depth measured in a direction normal to their axes.

5. A device in accordance with claim **2** in which the distance from the axis of pivotal support of any of the trapdoor members to the top of the nearest wall of a carton positioned to receive a partitioning assembly is substantially equal to but not less than the depth of the member measured in a direction normal to its axis.

6. In a device for inserting into a receptacle a partitioning assembly comprised of loosely interlocked divider walls presented in collapsed form:

means engageable with only an outer divider wall, in the vicinity of one end thereof, of a collapsed assembly for gripping the assembly at a supply position and moveable in an arcuate path to drag the assembly to a position in registry with the receptacle; and

barrier means engageable by the assembly for causing it to change from collapsed to criss-crossed condition of the walls during movement.

7. In a device for inserting into a receptacle a partitioning assembly comprised of loosely interlocked divider walls presented in collapsed form:

means for gripping the assembly at a supply position and moving it to a position in registry with the receptacle; and

barrier means engageable by the assembly for causing

it to change from collapsed to criss-crossed condition of the walls during movement, wherein said barrier means serves to align the divider walls with the positions they are to occupy in the receptacle.

8. In a device for inserting into a receptacle a partitioning assembly comprised of loosely interlocked divider walls presented in collapsed form:

means for gripping the assembly at a supply position and moving it to a position in registry with the receptacle;

barrier means engageable by the assembly for causing it to change from collapsed to criss-crossed condition of the walls during movement; and

drag means engaging the divider walls successively as the assembly is moved from the supply position for impeding movement of the walls and thereby assuring expansion of the partitioning assembly.

9. A device in accordance with claim **8** in which the drag means includes weight members pivotally supported to form a yieldable obstruction in the path of the partitioning assembly and adapted to swing up and over and to fall back against the divider walls.

10. A device in accordance with claim **8** in which the drag means includes a leaf spring bent to present an inverted hump in engagement with the edges of the divider walls as they pass under it, thereby to drag upon and retard the walls.

11. In a device for inserting into a carton a partitioning assembly comprised of loosely interlocked divider walls:

means for supporting a supply of partitioning assemblies in collapsed state and resting on their edges;

a platform disposed substantially in the plane of said supporting means and having an aperture having the configuration of and relatively slightly larger than the area enclosed by the walls of a carton;

guide rails below the platform for supporting and guiding cartons;

means for moving empty cartons with their closure flaps upstanding along said guide rails and for presenting them successively below and in symmetrical relation to the aperture in the platform;

closure means for the aperture comprising two pairs of non-overlapping plates pivotally supported underneath the platform and having their lateral edges substantially coinciding with a line bisecting the corners of the aperture whereby the lateral edges of the plates are convergent and the plates of at least one pair are triangular;

an arm secured above the platform to a rocker shaft extending vertically of the platform;

suction gripping means carried by the arm;

means for operating the rocker shaft to bring the suction gripping means through an arcuate path into gripping means through an arcuate path into gripping engagement with a face of an exposed partitioning assembly and to drag the assembly onto the aperture closure means;

drag means comprising weight members pivotally supported above and in the path of the partitioning assembly and adapted to swing up and over and fall back against the divider walls of the partitioning assembly and effect expansion thereof from its collapsed state:

other drag means comprising a leaf spring supported in the path of upper edges of the divider walls for applying a holding force to divider walls and thereby participating in the expansion of the partitioning assembly;

pusher means comprising a ram supporting a platen above the aperture closure means a sufficient distance to accommodate the transfer of an expanded partitioning assembly to the closure means; and

means for reciprocating the ram to bring the platen into engagement with the expanded partitioning assembly and drive it downwardly through the aperture and into the carton.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,621,765 Dated November 23, 1971

Inventor(s) Charles L. Sootheran, Ralph L. Johnson, Frederick A. Gran

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 4 line 73 - after "to the", insert --expansion of the partitioning assembly--

Col. 10 line 3 - after "gripping", delete --means through an arcuate path into gripping--

Signed and sealed this 18th day of July 1972.

SEAL)
ttest:

DWARD M.FLETCHER,JR.
ttesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents