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Gordon et al.

[11] **3,709,325**

[45] **Jan. 9, 1973**

[54] CASE FOR SHIPPING ARTICLES IN AN UPRIGHT POSITION AND IN SPACED LATERAL SEPARATION

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[52] **U.S. Cl.** .....**206/65 Y**, 229/14 C

[51] **Int. Cl.** **B65d 71/00**

[58] **Field of Search** .....206/47 FR, 65 R, 65 E, 65 Y; 217/26.5; 229/14 C

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Assistant Examiner—Steven E. Lipman
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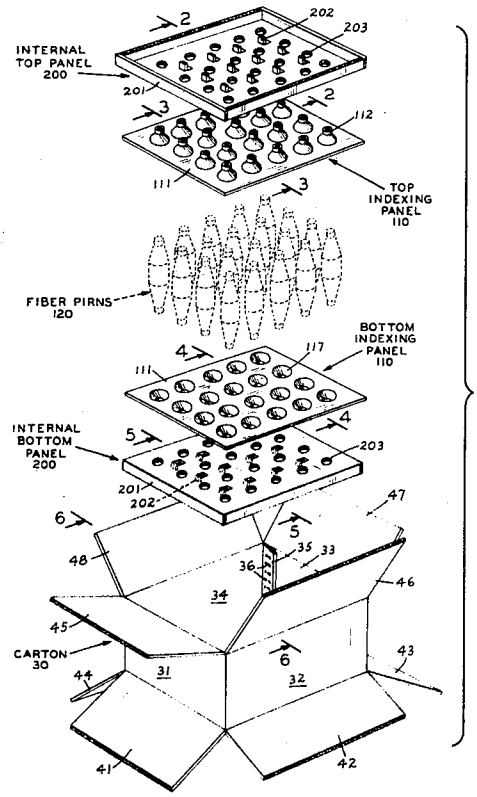
[57] **ABSTRACT**

The case comprises wall panels, one or more bottom flaps, a bottom indexing panel containing one or more downwardly projecting female recesses into which the bottom of the packaged article is inserted, an internal bottom panel disposed beneath said bottom indexing panel containing apertures which fit over the periphery of said downwardly projecting female recesses, and means for spacing apart the internal bottom panel and bottom of the case so as to allow the downwardly projecting female recesses to pass through, and be locked in place by, the aperture of the internal bottom panel.

The case further comprises a top indexing panel containing one or more upwardly projecting female recesses into which the top of the packaged article is inserted, an internal top panel disposed above the top indexing panel containing apertures which fit over the periphery of the upwardly projecting female recesses, one or more top flaps, and means for spacing apart the internal top panel and top of the case so as to allow the upwardly projecting female recesses to pass through, and be locked in place by, the apertures of the internal top panel.

The shipping case can be provided with an article separator layer assembly when the case is used to package a plurality of layers of articles.

20 Claims, 8 Drawing Figures



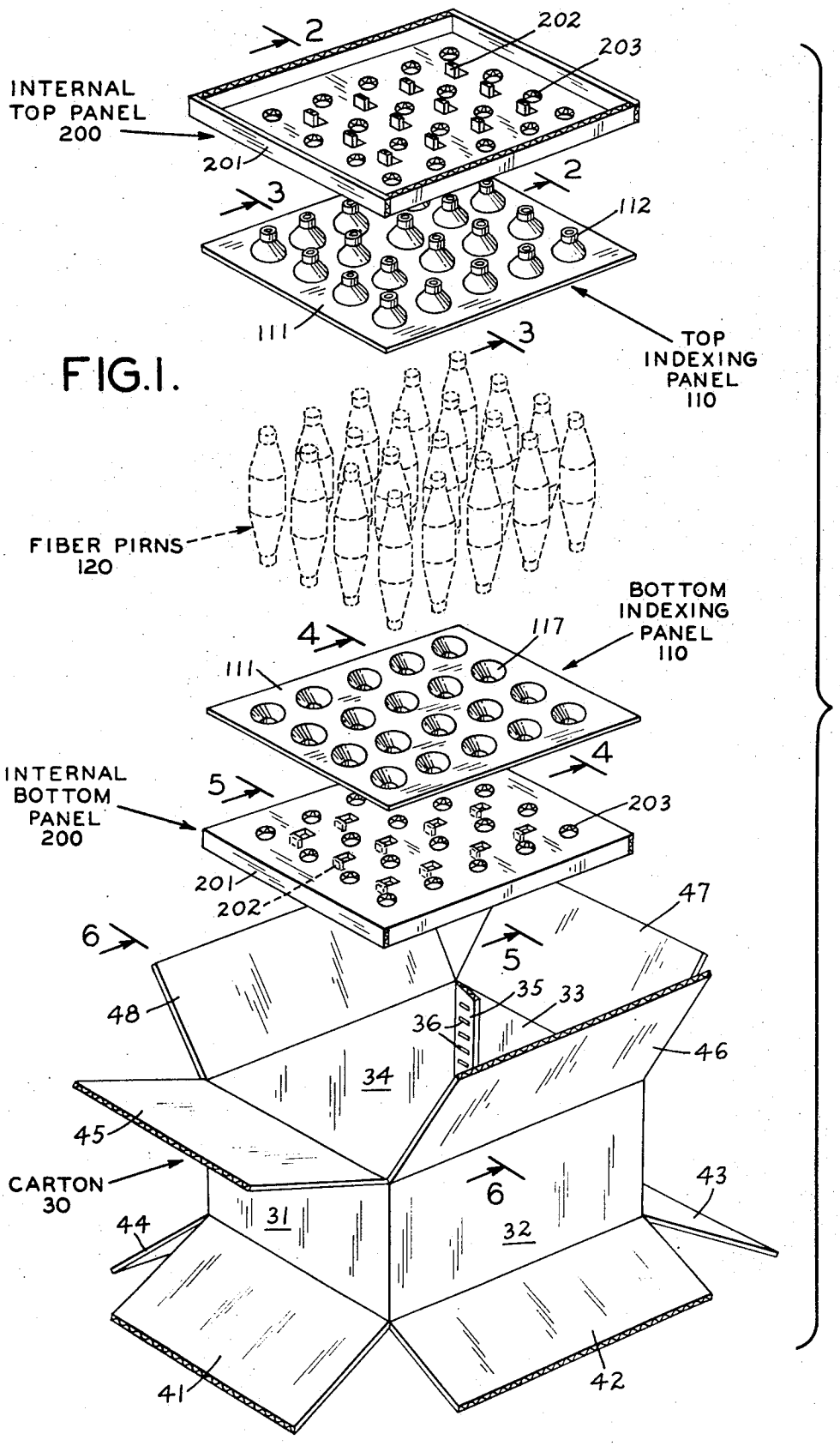

INTERNAL TOP PANEL 200
202
203
201
2
2
3
112
111
3
TOP INDEXING PANEL 110
FIBER PIRNS 120
BOTTOM INDEXING PANEL 110
4
117
111
4
INTERNAL BOTTOM PANEL 200
5
203
201
202
47
6
5
48
35
33
36
46
34
45
CARTON 30
6
43
44
31
32
41
42

FIG.1.

FIG.2.

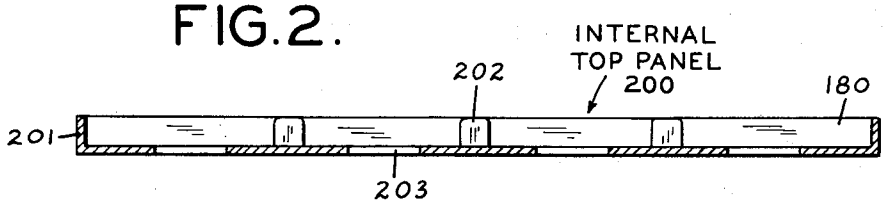


FIG.3.

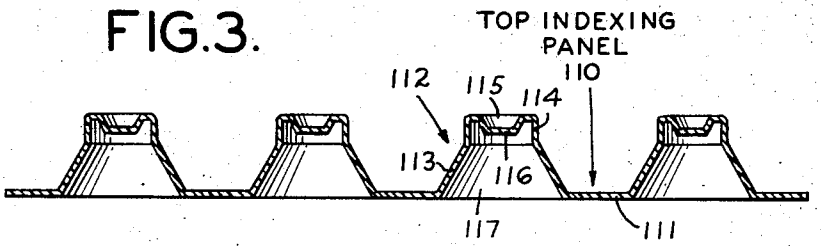


FIG.4.

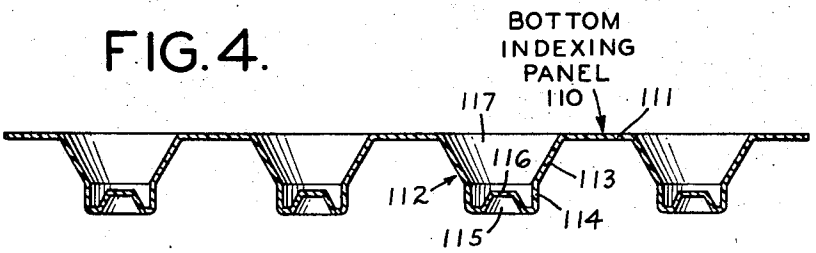


FIG.5.

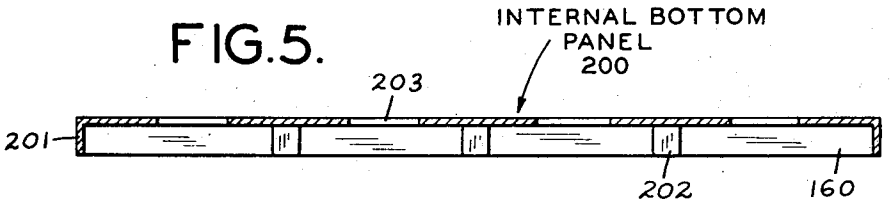


FIG.6.

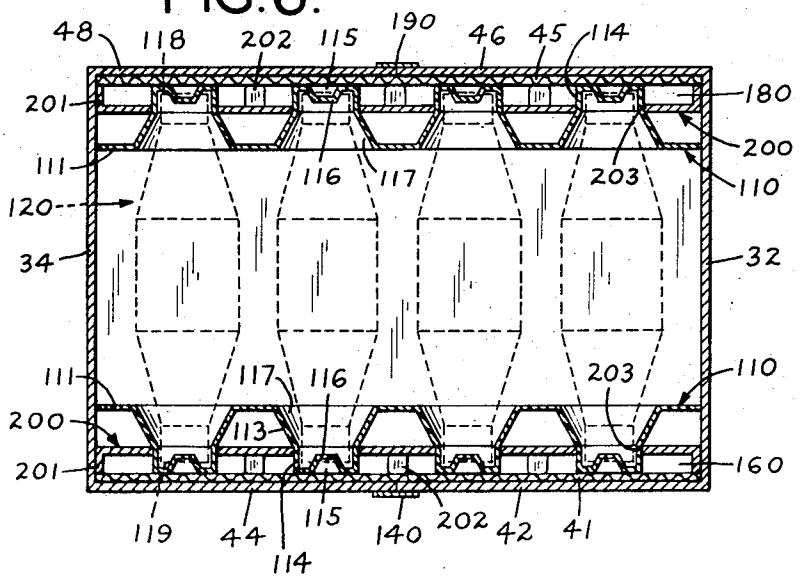


FIG.7.

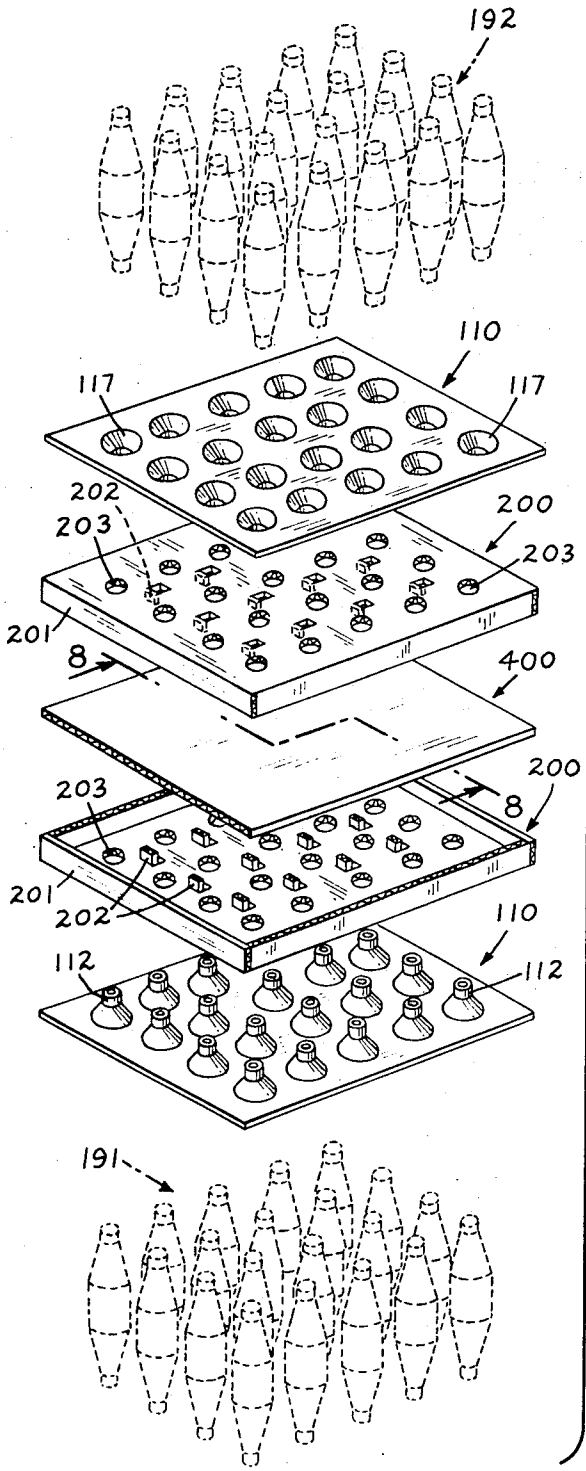
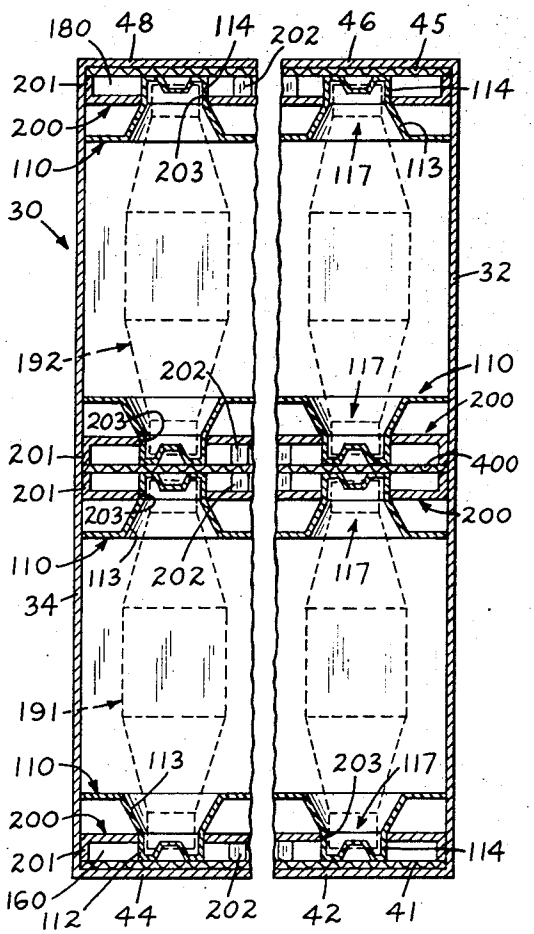

192
110
117
117
202
203
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8
400
200
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110
112
112
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FIG.8.


180
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CASE FOR SHIPPING ARTICLES IN AN UPRIGHT POSITION AND IN SPACED LATERAL SEPARATION

BACKGROUND OF THE INVENTION

This invention relates to shipping cases and, more particularly, to cases for shipping articles wherein, for various reasons, it is necessary to maintain the articles in a substantially upright position and in spaced lateral separation from each other and adjoining portions of the case during transit.

Such cases are used for shipping a variety of items such as, for example, pirns or bobbins of natural and synthetic filaments; fragile bottled items such as liquor, medicinals, and drugs; and other articles which can be damaged upon exposure to the impacts normally encountered in transit of the case.

The shipping of certain polyester filaments is an illustrative example of a situation where it is necessary to protect the pirns of fiber from contact during shipment with abrasive articles; certain polyester filaments are extremely sensitive to very slight abrasive forces and readily fray or break at the surface layers on the pirn if so exposed, often resulting in the total loss of the large quantity of filament on the pirn.

Numerous shipping cases have heretofore been proposed for safely shipping fragile articles. In one such case, the individual articles are packaged between lateral separator partitions and are often further enclosed in a plastic bag to protect them during shipment. Such packages are expensive and are not entirely satisfactory because of the abrasive forces which can be exerted by the lateral partitions against the surfaces of the article upon subjection of the case to impact.

In another package, unrestrained article indexing panels are provided at the top and bottom of the package to grasp the top and bottom portions of the articles in an attempt to prevent lateral movement of the articles upon impact. These indexing panels typically comprise a corrugated cardboard panel containing a plurality of die cut holes which engage the top and bottom of the articles. Among the disadvantages of such cases are the abrasion to the articles which occurs when the rough die cut apertures rub against the article. Moreover, since the indexing panels are unrestrained, they have a tendency, upon subjection to impact, to crumple and roll up along their edges with the result that they no longer effectively perform their function of maintaining the articles in an upright position and in spaced lateral relationship from each other.

In yet another prior art case, top and bottom indexing panels are provided which are integrally attached to the walls of the case. These panels contain apertures into which the bottom and top portions of the articles are insertable. While such an arrangement reduces damage to the indexing panels upon lateral impact, the problem still remains of the corrugated die cut holes abrading the article which they are restraining; moreover, there is a tendency for the holes in the indexing panels to wear away about their periphery during transit and upon impact and no longer firmly restrain the tops and bottoms of the article due to the enlargement of the periphery.

A further disadvantage of cartons employing top and bottom indexing panels occurs in situations where it is desirable to remove only one article from a case containing a plurality of articles; the top indexing panel must usually be removed and thereupon reinserted over the remaining articles when the case is reclosed. Additionally, inspection of the contents of the case is difficult without removing an indexing panel.

It is apparent that if the articles are not maintained in a substantially upright position, any stacking strength which the assembled case may possess is minimized, at least in the case where the article itself possesses some support strength. If the shipping case will not insure that the articles will remain in the upright position during transit, it become necessary to provide for reinforced and stronger wall panels in the package to provide the vertical stacking strength ordinarily required. Such a measure, of course, results in a more expensive package. It is also apparent that great damage can be done to the contents of the case upon subjection to impact if the contents are thrown against each other or against the walls of the case.

It is, therefore, a general object of this invention to provide an inexpensive and readily assembled case for shipping one or more articles in a substantially upright position and in spaced lateral relationship from each other and from the adjoining walls of the case.

It is another object of this invention to provide a shipping case wherein the strength of the articles contained therein is employed to provide enhanced stacking strength of the case.

It is another object of this invention to provide a shipping case which effectively prevents lateral movement of the articles contained therein when the case is subjected to an impact.

It is another object of this invention to restrain the tops and bottoms of packaged articles against lateral movement upon impact by means of indexing panels which are not damaged upon subjection of the case to impact thereby losing their effectiveness.

It is another object of this invention to restrain the tops and bottoms of the articles of the case against lateral movement by means of smooth non-abrasive surfaces which cannot be worn away and enlarged during transit.

It is another object of this invention to provide a shipping case which effectively minimizes disengagement of the articles from the indexing panels upon subjection of the case to impact.

It is a further object of this invention to provide flexible indexing panels which are readily disengaged from the article to permit removing one article at a time without the need for removing and then replacing an entire indexing panel.

These and other objects of this invention will be apparent to those skilled in the art from a complete reading of this specification and, in particular, the description of the preferred embodiments of this invention and drawings describing these preferred embodiments which are presented hereinbelow.

SUMMARY OF THE INVENTION

The advantageous features enumerated hereinabove are obtained by providing a shipping case which comprises a plurality of wall panels which are preferably foldably interconnected to form a wall panel unit, with an end panel of this unit having foldably attached thereto a sealing flap which is affixed to the opposed end panel of the unit.

The bottom portion of the case comprises at least one bottom flap which is preferably foldably connected to a wall panel, and a bottom indexing panel for indexing and supporting the articles to be packaged in the case. The bottom indexing panel contains therein at least one female recess projecting in a substantially downward direction from the plane of the panel; the female recess can take any of a variety of configurations which are adapted to receive at least a portion of the bottom section of the article to be packed so as to index the article in spaced lateral separation from adjoining articles and portions of the case and to effectively prevent any substantial lateral movement of the bottom section of the article relative to the bottom indexing panel. There is also provided an internal bottom panel which is disposed beneath the bottom indexing panel; this internal bottom panel has a transverse area which fits snugly between the wall panels of the case and contains therein at least one aperture which is adapted to fit snugly over the periphery of the downwardly projecting female recesses of the bottom indexing panel. Means are provided for maintaining the internal bottom panel in spaced relationship to the bottom of the case so as to allow the downwardly projecting female recesses to pass through, and be locked in place by, the apertures of the internal bottom panel. This locking feature effectively eliminates the possibility of any substantial lateral movement of the bottom indexing panel when the carton is subject to impact thereby assuring maintenance of the desired spaced lateral relationship between the articles during transit.

The top portion of the case comprises a top indexing panel for indexing the upper portion of the articles in the case, the top indexing panel containing therein at least one female recess projecting upwardly from the plane of the top indexing panel; this female recess is adapted to fit snugly over at least a portion of the top section of the article. There also is provided an internal top panel which contains therein at least a single aperture which is adapted to fit snugly over that portion of the periphery of the upwardly projecting female recess of the top indexing panel into which the top portion of the article is inserted. The internal top panel has a transverse area which fits snugly between the wall panels of the case. The case further comprises at least one top flap which is preferably foldably connected to a wall panel. Means are provided for maintaining the internal top panel in spaced relationship to the top of the case so as to allow the upwardly projecting female recesses to pass through, and be locked in place by, the apertures of the internal top panel. This locking feature effectively prevents any substantial lateral movement of the top indexing panel when the case is subjected to impact.

The shipping case of this invention can be employed to ship a plurality of articles either in a single layer or in a plurality of layers. Multi-layered shipping cases are readily prepared by providing a separator layer assembly between each layer of articles. A typical separator layer assembly is described in greater detail hereinbelow.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded view, in perspective, of a preferred embodiment of a shipping case of this invention and illustrates fiber pirns as a typical article for packaging in the case.

FIGS. **2**, **3**, **4** and **5** are sectional views taken along the lines **2—2**, **3—3**, **4—4**, and **5—5**, respectively, of FIG. **1**.

FIG. **6** is a sectional view taken along the line **6—6** of the assembled shipping case of FIG. **1**.

FIG. **7** is an exploded view in perspective illustrating an embodiment of a separator layer assembly used to separate adjoining layers of articles in a multi-layered shipping case of this invention.

FIG. **8** is a partial sectional view of the assembled separator layer of FIG. **7** taken along the line **8—8** of FIG. **7**.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

A preferred embodiment of the shipping case of this invention is conveniently prepared from three basic parts:

1. a conventional carton blank from which the wall panels, top flaps and bottom flaps of the case are fabricated;
2. an indexing panel which serves as both the top and bottom indexing panel, as hereafter described, and
3. an apertured panel which serves as both the internal top and bottom panel, as hereafter described.

The Carton Blank

The assembled carton blank **30** is shown in FIG. **1** and comprises foldably interconnected wall panels **31**, **32**, **33** and **34**. Panel **34** is provided with a sealing flap **35** which is foldably connected to panel **34**. Flap **35** is affixed to the inner edge area of panel **33** by means of staples **36**, adhesive, glue, or other adhesive means. Wall panel dimensions are selected to provide an assembled shipping case of substantially rectangular configuration. The dimensions of the wall panels are not significant although it is preferred that opposed wall panels have substantially equal dimensions.

Bottom flaps **41**, **42**, **43** and **44** are foldably connected to wall panels **31**, **32**, **33** and **34**, respectively. Top flaps **45**, **46**, **47** and **48** are foldably connected to wall panels **31**, **32**, **33** and **34**, respectively.

The blank of FIG. **1** can be prepared from a variety of known packaging materials. It is preferably prepared from a single unit of die-cut corrugated board. The thickness of the blank is not significant and is ordinarily selected to provide the strength required for the envisioned use of the case.

The Indexing Panel

A preferred embodiment of the indexing panel **110** is shown in FIGS. **1**, **3** and **4**. As discussed hereinabove, and as will be made clear hereinbelow, indexing panel **110** serves as both the bottom indexing panel and top indexing panel of the case of this invention, depending upon the orientation of the projections **112** found on panel **110**. If these projections **112** extend downwardly from panel **110**, as in FIG. **4**, panel **110** serves as a bottom indexing panel since the bottoms of the articles can be inserted into the female recesses of these projections. If projections **112** extend upwardly from panel **110**, as in FIG. **3**, panel **110** serves as a top indexing panel since the female recesses of the projections can then be placed over the tops of the articles in the case, Since the top and bottom indexing panels are structurally identical, differing only in the orientation of projections **112**, common identifying numerals will be used.

Referring to FIGS. 1, 3 and 4, it is seen that indexing panel 110 comprises a flat planar sheet 111 having a transverse area adapted to fit snugly between the wall panels of the assembled shipping case. Panel 110 contains disposed therein a plurality of substantially evenly spaced projections 112 extending vertically away from the plane of sheet 111.

The nature of an illustrative projection 112 is best seen in FIGS. 3 or 4. Referring to these Figures, it is seen that projection 112 comprises a frustro-conical wall portion 113 to which is integrally attached a cylindrical wall member 114 containing disposed therein a recess 115 which defines an inwardly projecting male plug 116. The frustro-conical and cylindrical wall portions 113 and 114 define a female recess 117 extending away from sheet 111. The top portion 118 (see FIG. 6) or bottom portion 119 (see FIG. 6) of article 120 is snugly inserted into the female recess 117 of projection 112 engaging only the inner surfaces of the cylindrical wall 114. The frustro-conical section 113 of projection 112 is provided as a means for effectively guiding panel 110 over the top portions 118 of article 120 or for guiding the bottom of portion 119 of article 120 into recess 117.

The configuration of female recess 117 can be varied to suit whatever shape is required by the tops and bottoms of the articles to be packaged in the shipping case of this invention. The particular geometry described in FIGS. 3 and 4 is illustrative only.

Indexing panel 110 can be fabricated from various known materials. However, it is preferably fabricated from a plastic material which draws well on thermoforming equipment, and which has a smooth surface so that any contact which may occur between the indexing panel 110 and the articles in the shipping case will not cause abrasion or other damage to the articles. It is likewise preferred that the plastic be flexible and give somewhat upon impact so as to not cause shattering or cracking of the plastic upon subjection of the shipping case to impact.

A certain amount of clarity is also preferred to permit inspection, at a glance, of the contents of the case. Flexibility of the plastic is additionally preferred to permit one end of the indexing panel, when used as a top indexing panel, to be peeled away so as to allow removal of a single article from the package without the necessity of removing the entire panel. Among the plastics which may be employed in preparing panel 110 are polyethylene, polystyrene, and polypropylene; polyethylene is a preferred fabrication material.

The Apertured Panel

A preferred embodiment of the apertured panel 200 is shown in FIGS. 1, 2 and 5. As discussed hereinabove, and as will be made clear hereinbelow, apertured panel serves as both the internal bottom panel and the internal top panel of the case of this invention, depending upon the orientation of flaps 201 and fingers 202 with respect to panel 200.

If flaps 201 and fingers 202 project downwardly from panel 200, as in FIG. 5, panel 200 serves as an internal bottom panel; if flaps 201 and fingers 202 project upwardly from panel 200, as in FIG. 2, panel 200 serves as an internal top panel. Since the internal bottom panel and internal top panel are structurally alike, differing only in the orientation of flaps 201 and fingers 202, common identifying numerals will be used.

The downwardly projecting flaps 201 and fingers 202 of panel 200 (see FIG. 5) are disposed to communicate with the inner surfaces of bottom flaps 41 and 43 and serve to maintain panel 200 in spaced relationship from bottom flaps 41 and 43. The upwardly projecting flaps 201 and fingers 202 of panel 200 (see FIG. 2) are disposed to communicate with the inner surfaces of top flaps 45 and 47 and serve to maintain panel 200 in spaced relationship from top flaps 45 and 47.

Panel 200 contains therein a plurality of apertures 203 which are adapted to peripherally circumscribe the portion of the downwardly projecting female recesses 117 of panel 110 into which the bottom portion of the article to be packaged is inserted and the upwardly projecting female recesses 117 of panel 110 into which the top portion of the article to be packaged is inserted.

Apertured panels 200 are maintained in spaced relationship from the bottom and top flaps of the case, in order to allow the projecting female recesses 117 of panel 110 to pass through, and be locked in place by, the apertures 203 of panel 200. Panel 200 has a transverse area adapted to fit snugly between the walls of the assembled shipping case thereby cooperating with indexing panel 110 to prevent any substantial lateral movement of either the tops or bottoms of the articles in the shipping case.

Panel 200 can be maintained in spaced relationship from the top and bottom flaps of the case by flaps 201 alone. As is shown in the drawings, flaps 201 are foldably connected to the periphery of panel 200 and are dimensioned to produce the desired spacing between panel 200 and the bottom or top of the case.

When panel 200 is provided with flaps 201 for maintaining said spaced relationship. fingers 202, which are foldably attached at one end to panel 200, are provided to keep panel 200 from sagging or coming into close proximity with the adjoining bottom or top flaps of the case, thus preventing female recesses 117 of panel 110 from possibly dislodging from apertures 203 of panel 200. Thus fingers 202 are oriented in a direction identical to that of flaps 201 and serve the same general purpose as flaps 201.

In another embodiment of apertured panel 200, the desired spaced relationship between panel 200 and the adjoining bottom or top flaps of the shipping case is achieved solely by the use of fingers 202, with flaps 201 being omitted entirely from panel 200. Other suitable means for maintaining the requisite spacing between panel 200 and the adjoining bottom or top flaps of the shipping case can be employed.

Assembly of the Shipping Case

At this point, it becomes convenient to discuss the assembly of a preferred embodiment of the case of this invention. FIG. 1 is an exploded view of such a preferred embodiment and shows the packing therein, in a single layer, of a plurality of typical fiber pirns 120 and the positioning and arrangement of indexing panels 110 and apertured panels 200 within the case.

A corrugated board carton blank 30, as described hereinabove, is partially assembled in a conventional manner to the extent shown in FIG. 1. It can be seen that the walls 31, 32, 33 and 34 of the carton have been formed but that the bottom flaps 41, 42, 43 and 44 and top flaps 45, 46, 47 and 48 remain open. Bottom flaps 41–44 are then folded into place to form a bottom for the carton; external bottom flaps 42 and 44 are sealed

in place with a strip of tape **140** (see FIG. **6**) or other suitable means. An internal bottom panel **200** is then placed within the carton with downwardly projecting flaps **201** and fingers **202** maintaining internal bottom panel **200** in spaced relationship (see FIG. **6**) from the bottom of the carton formed by bottom flaps **41** and **43**. Bottom indexing panel **110** is then placed within the carton on top of internal bottom panel **200** in such manner that the downwardly projecting female recesses **117** of the panel **110** are inserted into apertures **203** of internal bottom panel **200** and pass through these apertures and into the space **160** (see FIG. **6**) between internal bottom panel **200** and the bottom of the carton, space **160** being provided by downwardly projecting flaps **201** and fingers **202**. The bottoms **119** of pirns **120** are then carefully inserted into the downwardly projecting female recesses **117** of bottom indexing panel **110**. Apertures **203** of internal bottom panel **200** engage the downwardly projecting female recesses **117** of bottom indexing panel **110** to lock panel **110** in place so that any substantial lateral movement of bottom indexing panel **110** relative to internal bottom panel **200** is prevented. Similarly, since the transverse area of internal bottom panel **200** is such as to allow its snug fit between the walls of the shipping case, any substantial lateral movement of internal bottom panel **200** within the case is effectively prevented. Thus, bottom indexing panel **110** and internal bottom panel **200** cooperate to simultaneously maintain the bottoms **119** of the pirns **120** in spaced relationship to each other while preventing any substantial lateral movement of the pirns within the case relative to each other or adjoining surfaces of the case.

Assembly of the top portion of the case is initiated by placing the top indexing panel **110** over the top portions **118** of the mounted pirns **120**, so that the top portion **118** nests within the upwardly projecting female recesses **117** of top indexing panel **110**. The frustoconical shape of the female recesses **117** of both the top and bottom indexing panels **110** facilitates entry of the appropriate portion of the pirn **120** into these indexing panels. Once top indexing panel **110** is firmly mounted on the tops **118** of pirns **120**, internal top panel **200** is placed on top of top indexing panel **110** so that the apertures **203** of internal top panel **200** peripherally circumscribe the upwardly projecting female recesses **117** of top indexing panel **110**. Flaps **201** and fingers **202** of top internal panel **200** project upwardly from panel **200** to provide the desired spaced relationship between internal top panel **200** and the top of the shipping case as formed by top flaps **45** and **47**. The upwardly projecting female recesses **117** of top indexing panel **110** pass through, and are locked in place by, the apertures **203** of internal top panel **200**. These recesses **117** are permitted to pass through the apertures **203** of internal top panel **200** by the spacing **180** (see FIG. **6**) maintained between internal top panel **200** and the adjacent top flaps **45** and **47**. Apertures **203** embrace female recesses **117** of top indexing panel **110** to effectively lock panel **110** in place and prevent any substantial lateral movement of top indexing panel **110** relative to internal top panel **200**. Since the transverse area of internal top panel **200** is such as to permit its snug fit between the walls of the shipping case, any substantial lateral movement of internal top panel **200** is also effectively prevented. Thus, top indexing panel **110** and internal top panel **200** cooperate to maintain the tops **118** of pirns **120** in the desired spaced relationship in the shipping case while simultaneously preventing any substantial lateral movement of the tops **118** of pirns **120**.

Assembly of the case is then completed by folding top flaps **45–48** into place to form the top of the case and sealing these panels in place with a strip of tape **190** (see FIG. **6**) or other suitable sealing means.

Multi-layered Shipping Case

The shipping cases of this invention are adaptable for packaging a plurality of articles in a plurality of adjoining vertical layers. In such a case, the carton blank **30** used is identical in all respects to that already described except that wall panels **31–34** are of extended height to accommodate whatever case height is necessitated by the plurality of layers of articles present therein. In a multi-layered shipping case, the bottoms of the articles comprising the bottom layer of the case are inserted in the downwardly projecting female recesses **117** of a bottom indexing panel **110** in a manner similar to that already described. However, it becomes necessary to provide a separator layer assembly between each adjoining vertical layer of articles as the additional layers are added. In general, such an assembly consists of a multi-layered unit which comprises a top indexing panel, as described hereinabove, whose upwardly projecting female recesses engage the tops of the articles of the bottom layer; an apertured first separator panel disposed above the top indexing panel, with the apertures peripherally circumscribing the upright female recesses of the top indexing panel; an apertured second separator panel disposed above said apertured first separator panel; a bottom indexing panel, as described hereinabove, whose downwardly projecting female recesses receive the bottoms of the articles in a first upper layer and are peripherally circumscribed by the apertures of said second separator panel; and means for maintaining said apertured first and second separator panels in spaced relationship so that the female recesses of the top and bottom indexing panel will pass through, and be locked in place by, the apertures of the first and second separator panels, respectively. The tops of the articles comprising the upper most layer of the case are secured in a manner described hereinabove for single layered cases. If more than two layers of articles are contemplated, the number of such separator assemblies required in the finished case is one less than the number of layers of articles in the case.

An exploded view of a preferred embodiment of a separator layer assembly is shown in FIG. **7** with FIG. **8** showing a sectional view of the assembled separator layer. Referring to FIGS. **7** and **8**, the separator layer assembly comprises a top indexing panel **110**, identical to that already described in FIGS. **1** and **3** which fits over the tops of pirns **191** which make up the lower layer of the case in a manner shown in FIG. **7**. Resting on top of top indexing panel **110** is an apertured first separator panel **200** identical to internal top panel **200** previously described in FIGS. **1** and **2**. The apertures **203** of panel **200** peripherally circumscribe the upward projections **112** of top indexing panel **110**. Resting on top of the first separator panel **200** is an optional

separator panel **400** which is maintained in spaced relationship from underlying first separator panel **200** by means of upwardly projecting foldable flaps **201**. First separator panel **200** may optionally be provided with fingers **202** as shown in FIGS. **1** and **2**. Resting on top of optional separator panel **400** is a second separator panel **200** which is identical to internal bottom panel **200** previously described in FIGS. **1** and **5**. The second separator panel **200** is maintained in spaced relationship from separator panel **400** by downwardly projecting foldable flaps **201**. Again, fingers **202** as described in FIGS. **1** and **5** can optionally be provided in second separator panel **200**. Resting on top of second separator panel **200** is a bottom indexing panel **110** which is substantially identical to the bottom indexing panel **110** previously described in FIGS. **1** and **4**. The downwardly projecting female recesses **117** of bottom indexing panel **110** pass through and are locked in place by, the apertures **203** of the second separator panel **200**. The bottoms of the upper most layer of pirns **192** are then inserted into the downwardly projecting female recesses **117** of bottom indexing panel **110**. Once the uppermost layer of pirns **192** is in place, the top of the case is formed, closed, and sealed in a manner substantially identical to that already described hereinabove.

If optional separator panel **400** is eliminated, the upwardly projecting flaps **201** of first separator panel **200** will communicate with downwardly projecting flaps **201** of second separator panel **200** to maintain the first and second separator panels in the requisite spaced relationship which permits the female recesses **117** of the top and bottom indexing panels **110** to pass through, and be locked in place by, the apertures **203** of the first or second separator panels **200**, respectively.

FIGS. **7** and **8** provide an illustrative separator layer assembly only and, of course, a variety of other such assemblies can be employed in the novel shipping case of this invention.

The specific embodiments and structure shown herein are illustrative only and such modifications and alterations thereof as would be apparent to those skilled in the art are contemplated to fall within the scope and spirit of the claims appended hereto.

What is claimed is:

1. A case for the shipment of an article in a substantially upright position and in spaced lateral separation from adjoining articles and portions of said case, comprising:

1. a plurality of wall panels surrounding the article contents;
2. at least one bottom flap forming the bottom of said case;
3. at least one top flap forming the top of said case;
4. a bottom indexing panel, said bottom indexing panel containing therein at least one female recess projecting in a substantially downward direction from said bottom indexing panel, said recess peripherally circumscribing at least a portion of the bottom of an article;
5. an internal bottom panel disposed between said bottom indexing panel and the bottom of said case, said internal bottom panel containing therein at least one aperture peripherally circumscribing the portion of said female recess of said bottom indexing panel into which said portion of the bottom of said article is inserted;
6. means maintaining said internal bottom panel in spaced relationship to the bottom of said case so as to allow said downwardly projecting female recess to pass through the aperture of said internal bottom panel;
7. a top indexing panel containing therein at least one female recess projecting in a substantially upright direction from said top indexing panel, said recess peripherally circumscribing at least a portion of the top of said article;
8. an internal top panel disposed between said top indexing panel and the top of said case, said internal top panel containing therein at least one aperture peripherally circumscribing the portion of said female recess of said top indexing panel into which said portion of the top of said article is inserted; and
9. means maintaining said internal top panel in spaced relationship to the top of said case so as to allow said upwardly projecting female recess to pass through the aperture of said internal top panel.

2. The case of claim **1** wherein said bottom indexing panel and said top indexing panel are fabricated from a thermo-formed plastic material.

3. The case of claim **2** wherein said plastic material is polyethylene.

4. The case of claim **1** wherein said top and bottom indexing panels contain a plurality of female recesses, and wherein said internal bottom panel and internal top panel each contain a plurality of apertures corresponding, respectively, to the number of said female recesses.

5. The case of claim **1** wherein said internal top and bottom panels each have a transverse area permitting a snug fit of said panels between the wall panels of said case.

6. The case of claim **1** wherein said means maintaining said internal bottom panels in spaced relationship to the bottom of said case comprises flaps foldably connected to the periphery of said internal bottom panel, said flaps being folded downwardly from said internal bottom panel and contacting the bottom of said case, said flaps dimensioned to produce the desired spacing between said internal bottom panel and the bottom of the case.

7. The case of claim **1** wherein said means maintaining said internal top panel in spaced relationship to the top of said case comprises flaps foldably connected to the periphery of said internal top panel, said flaps being folded upwardly from said internal top panel and contacting the top of said case, said flaps dimensioned to produce the desired spacing between said internal top panel and the top of the case.

8. The case of claim **6** wherein said means maintaining said internal top panel in spaced relationship to the top of said case comprises flaps foldably connected to the periphery of said internal top panel, said flaps being folded upwardly from said internal top panel and contacting the top of said case, said flaps dimensioned to produce the desired spacing between said internal top panel and the top of the case.

9. The case of claim **1** wherein said means maintaining said internal bottom panel in spaced relationship to

the bottom of the case comprises a plurality of downwardly projecting fingers foldably attached, at one end, to said internal bottom panel, the unrestrained end of said fingers contacting the bottom of the case, said fingers dimensioned to produce the desired spacing between said internal bottom panel and the bottom of the case.

10. The case of claim **1** wherein said means maintaining said internal top panel in spaced relationship to the top of said case comprises a plurality of upwardly projecting fingers foldably attached, at one end, to said internal top panel, the unrestrained end of said fingers contacting the top of the case, said fingers dimensioned to produce the desired spacing between said internal top panel and the top of the case.

11. The case of claim **9** wherein said means maintaining said internal top panel in spaced relationship to the top of said case comprises a plurality of upwardly projecting fingers foldably attached, at one end, to said internal top panel, the unrestrained end of said fingers contacting the top of the case, said fingers dimensioned to produce the desired spacing between said internal top panel and the top of the case.

12. The case of claim **8** wherein said internal bottom panel and said internal top panel each further includes a plurality of fingers foldably attached, at one end, to said internal bottom panel and said internal top panel, said fingers projecting downwardly from said internal bottom panel and upwardly from said internal top panel and contacting the bottom and top respectively, of the case, said fingers dimensioned to produce the desired spacing between said internal bottom and top panels and the bottom and top, respectively, of the case.

13. The case of claim **1** containing a plurality of vertical layers of articles and further including means preventing any substantial lateral movement of, and for maintaining spaced lateral separation of, the top and bottom portions of articles in adjoining vertical layers of said case.

14. The case of claim **1** wherein a plurality of layers of packaged articles are employed further including a separator layer assembly disposed between adjacent layers of articles, said assembly comprising:

a. a top indexing panel containing therein at least one female recess projecting in a substantially upright direction from said top indexing panel, said recess peripherally circumscribing at least a portion of the top section of an article in a first lower layer of the case;

b. a first separator panel disposed above said top indexing panel, said first separator panel containing therein at least a single aperture peripherally circumscribing the portion of said upwardly projecting female recess of said top indexing panel into which said portion of the top section of said article is inserted;

c. a bottom indexing panel, said bottom indexing panel containing therein at least one female recess projecting in a substantially downward direction from said bottom indexing panel, said recess peripherally circumscribing at least a portion of the bottom section of an article in a second upper layer in the case;

d. a second separator panel disposed beneath said bottom indexing panel, said second separator panel containing therein at least a single aperture peripherally circumscribing the portion of said downwardly projecting female recess of said bottom indexing panel into which said portion of the bottom section of said article is inserted; and

e. means maintaining said first and second separator panels in spaced relationship so as to allow the female recess of said top and bottom indexing panels to pass through, and be locked in place by, the aperture of said first and second separator panels, respectively.

15. The case of claim **14** further including a third separator panel disposed between said first and second separator panels, said first and second separator panels each being maintained in spaced relationship from said third separator panel.

16. The case of claim **14** wherein said means maintaining said first and second separator panels in spaced relationship comprises flaps foldably connected to the periphery of said first and second separator panels, the flaps of said first separator panel being folded upwardly and those of said second separator panel being folded downwardly, said folded flaps of said first and second separator panel communicating with each other to provide required spaced relationship.

17. The case of claim **16** further including a third separator panel disposed between said first and second separator panels, said first and second separator panels each being maintained in spaced relationship from said third separator panel.

18. The case of claim **17** wherein said first and second separator panels each further includes a plurality of fingers foldably attached, at one end, to said panels, said fingers projecting upwardly from said first separator panel and downwardly from said second separator panel and contacting a surface of said third separator panel, said fingers dimensioned to produce the desired spaced relationship between said first and second separator panels and said third separator panel.

19. A case for the shipment of an article in a substantially upright position and in spaced lateral separation from adjoining articles and portions of said case, comprising:

1. a carton comprising wall panels and a top and bottom;

2. a bottom indexing panel, said bottom indexing panel containing therein at least one female recess projecting in a substantially downward direction from said bottom indexing panel, said recess peripherally circumscribing at least a portion of the bottom of an article;

3. means distinct from said bottom indexing panel communicating with said downwardly projecting female recess of said bottom indexing panel preventing substantial lateral movement of said downwardly projecting female recess;

4. a top indexing panel containing therein at least one female recess projecting in a substantially upright direction from said top indexing panel, said recess peripherally circumscribing at least a portion of the top of an article; and

5. means distinct from said top indexing panel communicating with said upwardly projecting female

recess of said top indexing panel preventing substantial lateral movement of said upwardly projecting female recess.

20. A case for the shipment of an article in a substantially upright position and in spaced lateral separation from adjointing articles and parts of said case, comprising:

1. a plurality of wall panels surrounding the article contents;
2. at least one bottom flap forming the bottom of said case;
3. at least one top flap forming the top of said case;
4. a bottom indexing panel, said bottom indexing panel containing therein at least one female recess projecting in a substantially downward direction from said bottom indexing panel, said recess peripherally circumscribing at least a portion of the bottom of an article;
5. an internal bottom panel disposed between said bottom indexing panel and the bottom of said case, said internal bottom panel containing therein at least one aperture which peripherally circumscribes the bottom of said female recess of said bottom indexing panel into which said portion of the bottom of said article is inserted;
6. means distinct from said internal bottom panel and from said wall panels and bottom flap of said case maintaining said internal bottom panel in spaced relationship to the bottom of said case so as to allow said downwardly projecting female recess to pass through the aperture of said internal bottom panel;
7. a top indexing panel containing therein at least one female recess projecting in a substantially upright direction from said top indexing panel, said recess peripherally circumscribing at least a portion of the top of an article;
8. an internal top panel disposed between said top indexing panel and the top of said case, said internal top panel containing therein at least one aperture which peripherally circumscribes the portion of said female recess of said top indexing panel into which said portion of the top of said article is inserted; and
9. means distinct from said internal top panel and from said wall panels and top flap of said case maintaining said internal top panel in spaced relationship to the top of said case so as to allow said upwardly projecting female recess to pass through the aperture of said internal top panel.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,709,325 Dated January 9, 1973

Inventor(s) Robert Louis Gordon and John Charles Siegele

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

Column 2, line 12, "become" should be -- becomes --;

Column 4, line 63, " , " should be -- . --;

Column 6, line 35, " . " should be -- , --;

Column 10, line 12, "said" should be -- an --.

Signed and sealed this 29th day of May 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents