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Bustos

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[54] **DISPLAY RACK WITH IMPROVED SHELF ASSEMBLY**

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Related U.S. Patent Documents

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Filed: **Oct. 21, 1977**

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[52] **U.S. Cl.** ..... **211/49 D;** 193/2 D
[58] **Field of Search** ..... 211/49 D, 121, 122, 211/151; 221/253; 312/45, 91; 193/2 D; 198/688

[56] **References Cited**

U.S. PATENT DOCUMENTS

997,276	7/1911	Cortis	193/2 D
1,495,402	5/1924	Daniel	193/2 D
2,218,444	10/1940	Vineyard	211/49 D
2,234,424	3/1941	Alley	312/45
3,203,553	8/1965	Pendergrast et al.	211/49 D
3,203,554	8/1965	Pendergrast et al.	211/49 D
3,776,145	12/1973	Anderson et al.	108/51.1
3,900,112	8/1975	Azzi et al.	211/151 X

FOREIGN PATENT DOCUMENTS

650703 2/1951 United Kingdom 108/51.3

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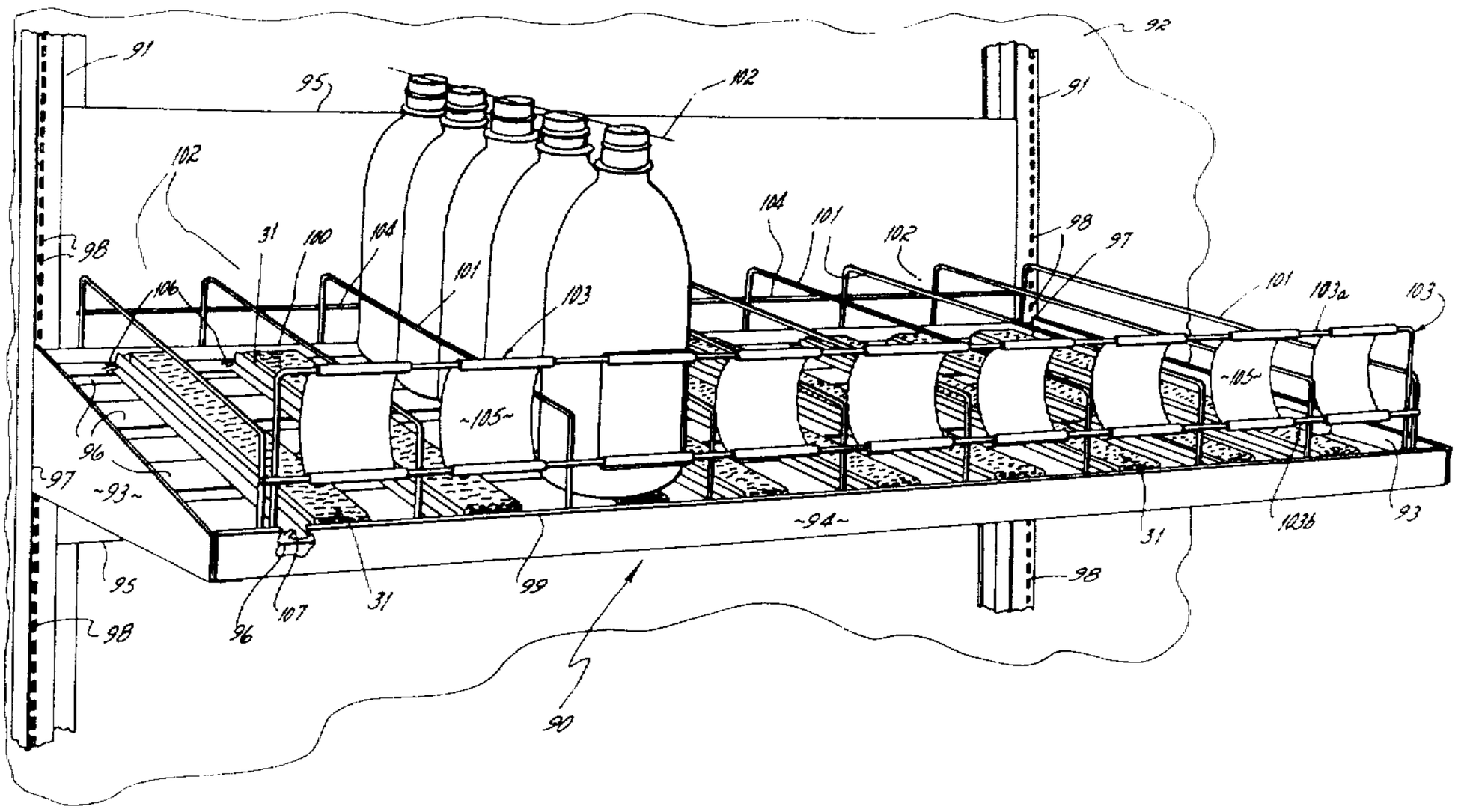
Assistant Examiner—Robert W. Gibson, Jr.
Attorney, Agent, or Firm—Wood, Herron & Evans

[57] **ABSTRACT**

A display rack with an improved shelf assembly that gravity feeds a column of containers one after another to the front edge of a shelf as that column's lead containers are successively removed by customers. The shelf assembly includes a conveyor belt oriented so that its travel path is generally perpendicular to the shelf's front edge, the belt being adapted to receive a plurality of containers, e.g., bottles or cans, in a vertical or stand-up fashion thereon. The inside surface of the belt rides over a support floor and has a low coefficient of friction, and the outside surface of the belt on which the containers rest has a high coefficient of friction, relative one to the other. When the lead container on the belt at the front edge of the shelf is removed, and because of the low friction coefficient on the belt's inside surface, gravity on the remaining containers causes the belt to slide or move forwardly over the stationary support floor, thereby moving all remaining containers in that column forwardly on the shelf until the next forward container abuts a bumper at the shelf's front edge. But the containers on the belt do not move relative to the belt as the belt moves or as it stops because of the high friction coefficient on the belt's outside surface, thereby preventing the containers from impacting against one another as the column moves forward after a customer removes the lead container thereon.

9 Claims, 7 Drawing Figures



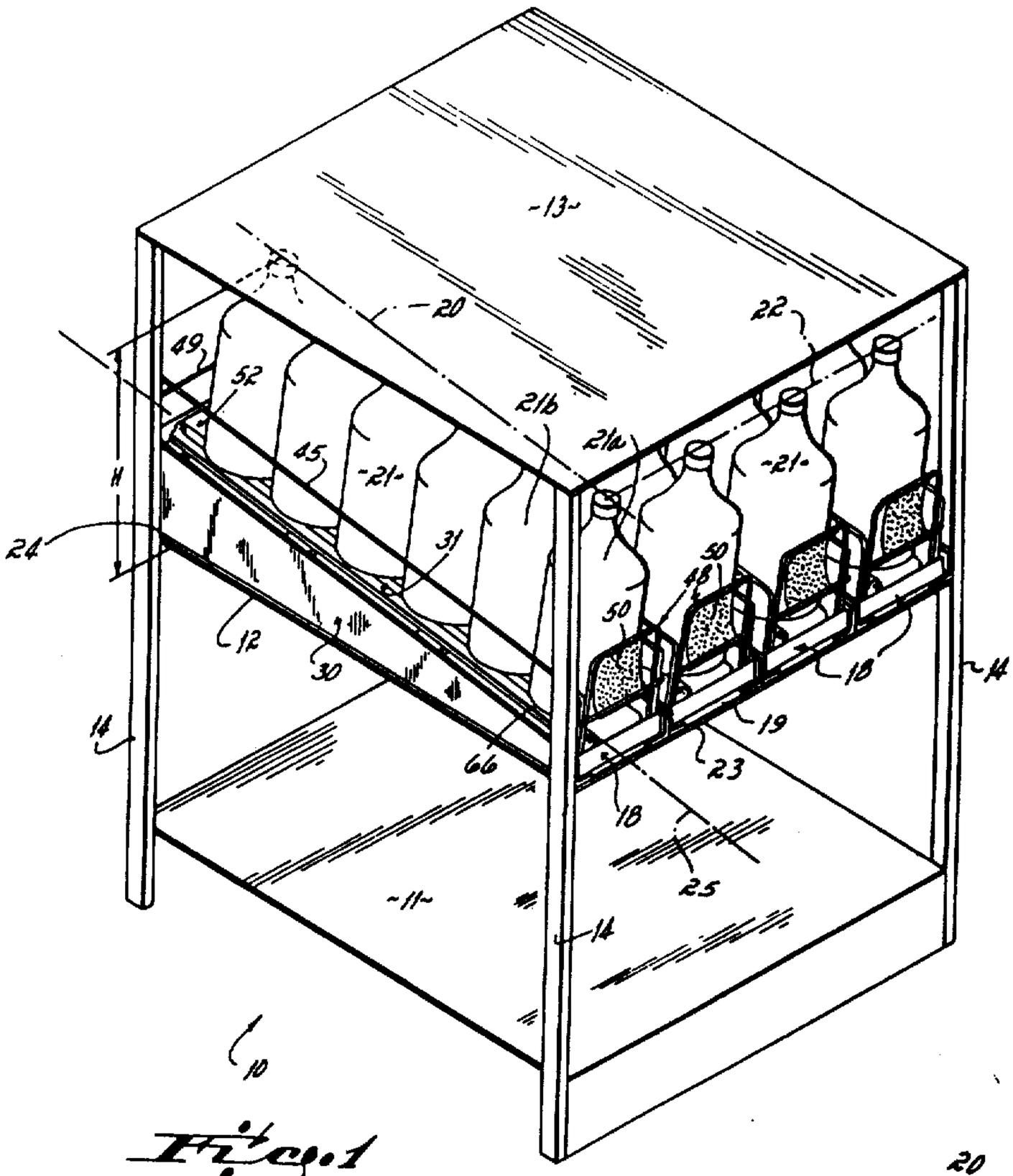


Fig. 1

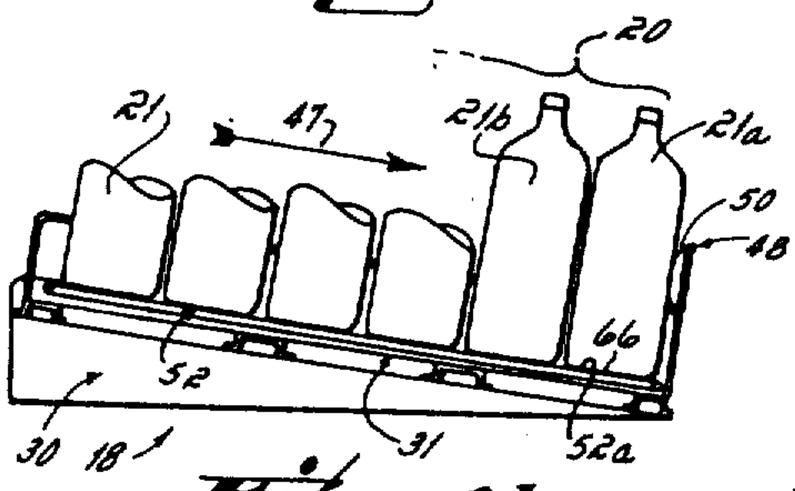


Fig. 2A

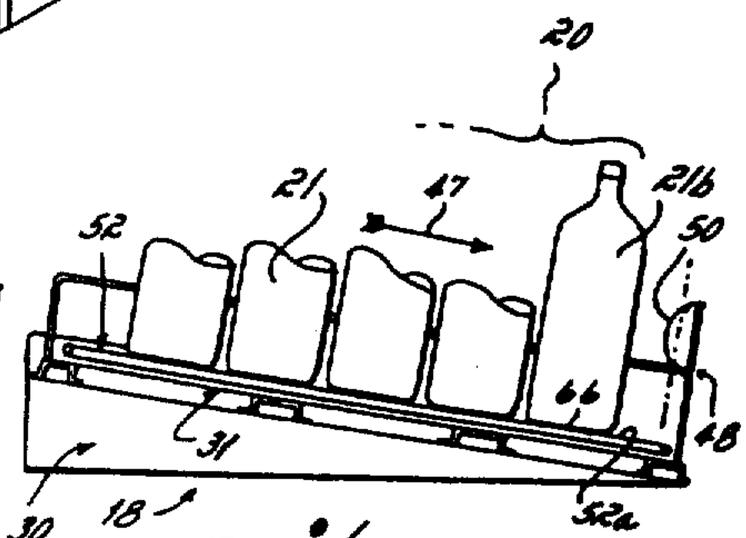


Fig. 2B

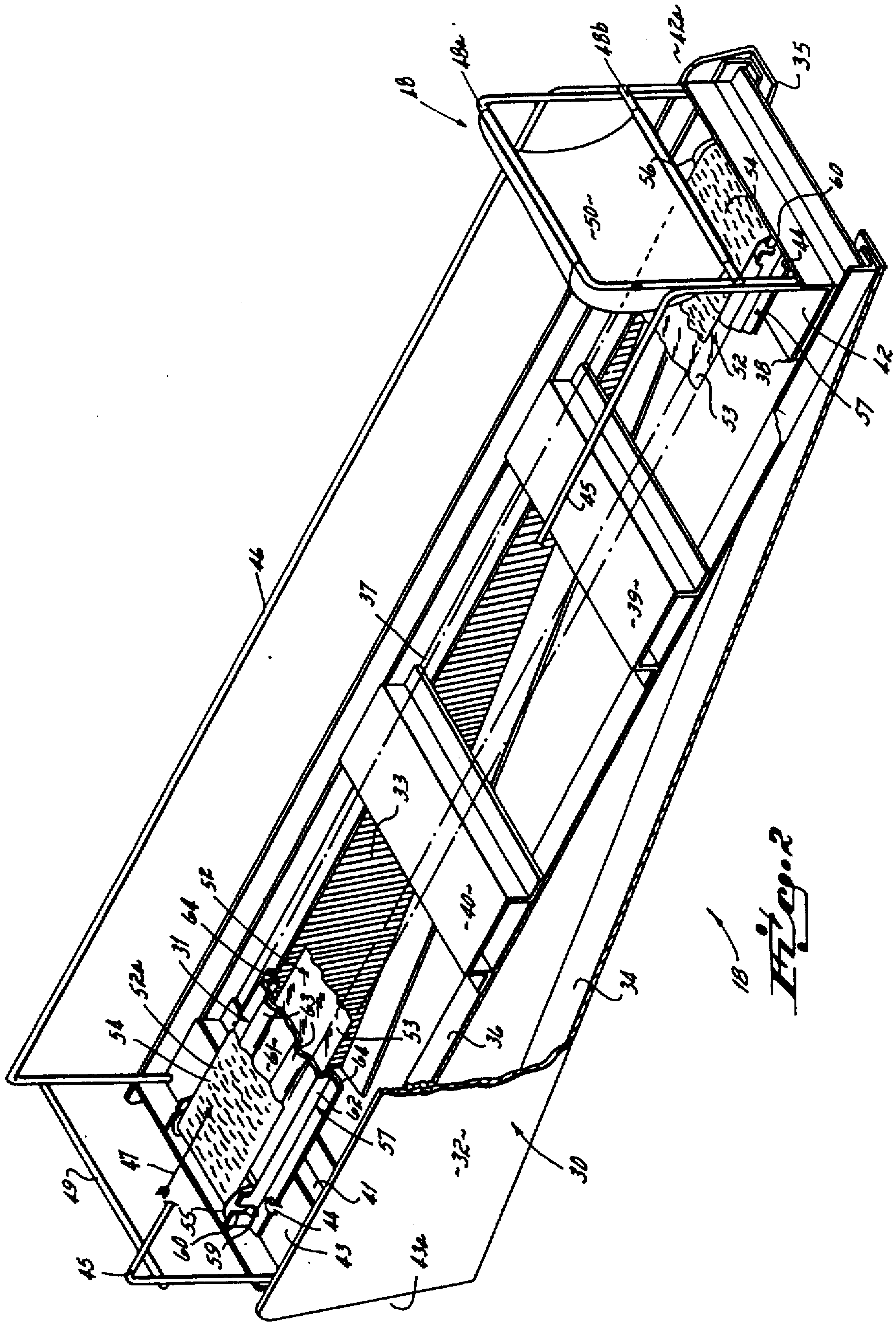


Fig. 2

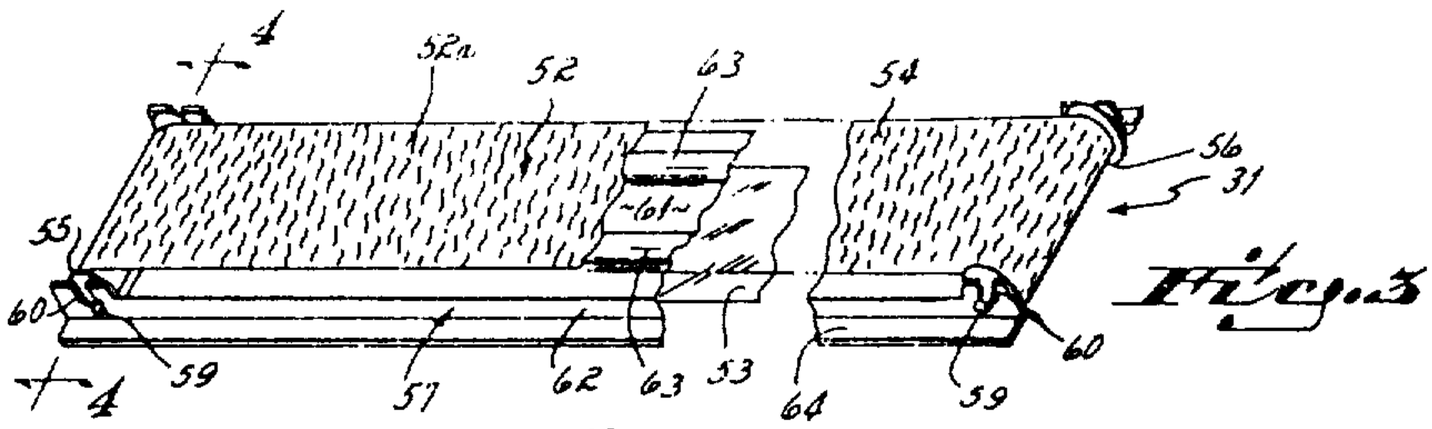


Fig. 3

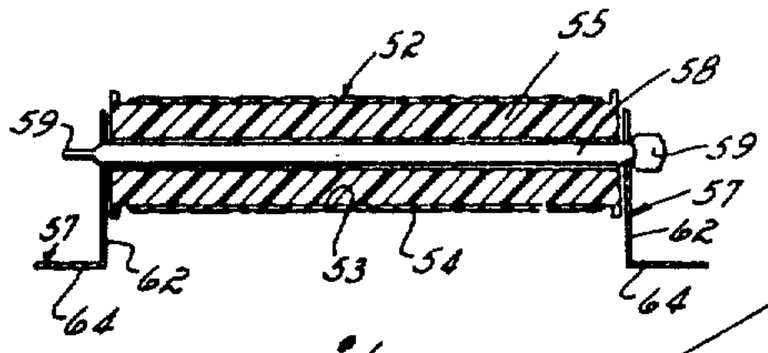


Fig. 4

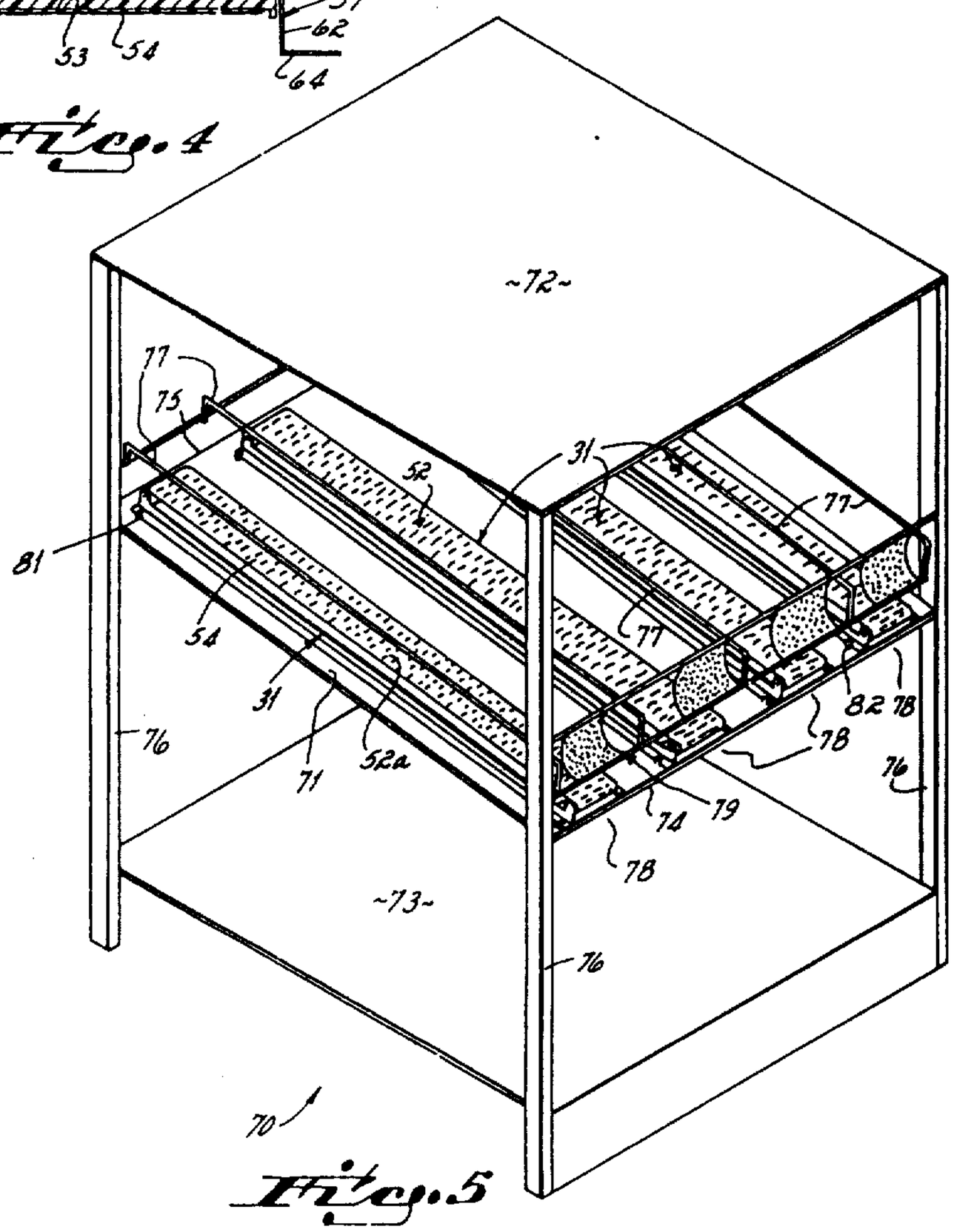


Fig. 5

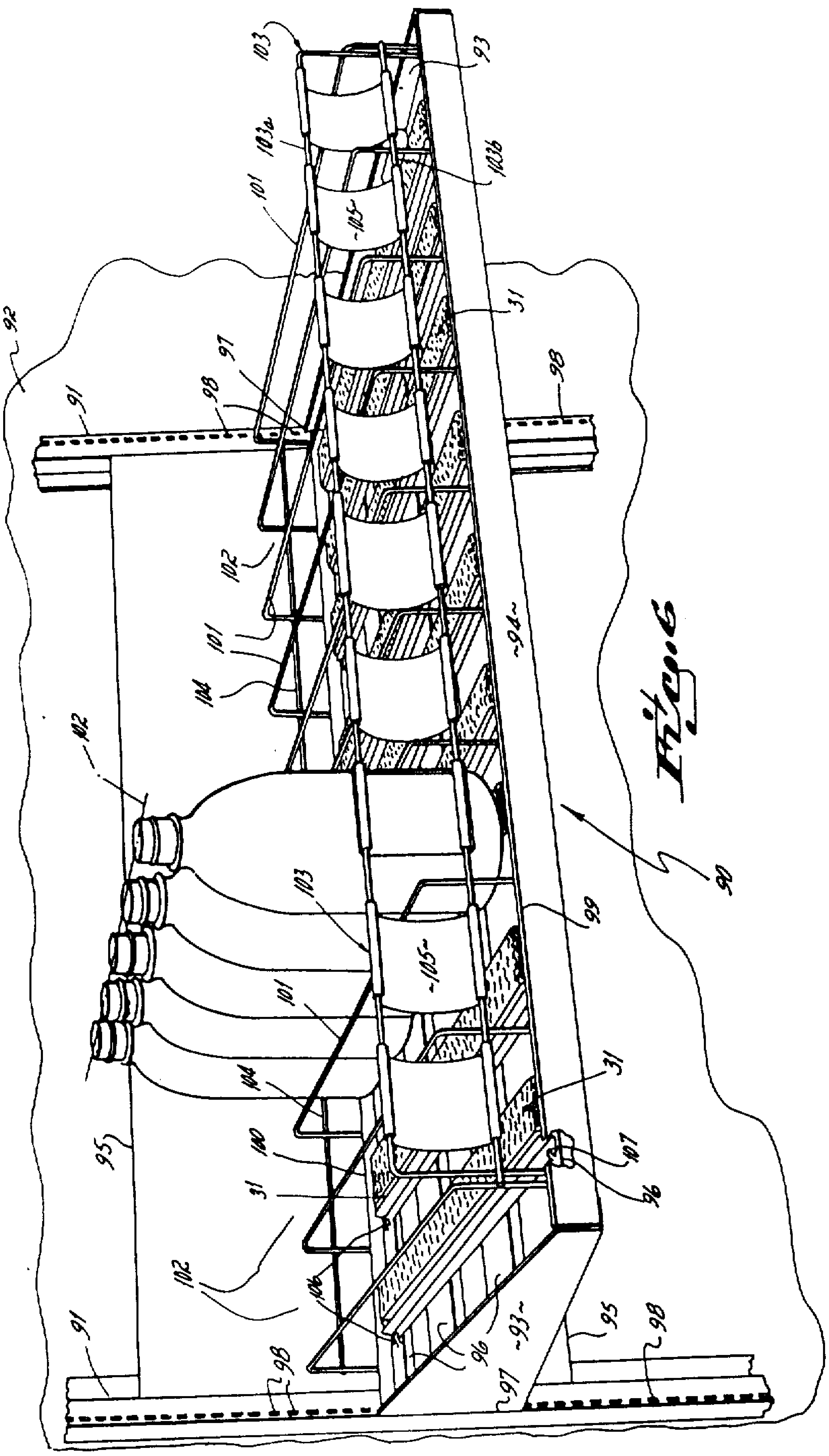


Fig. 6

DISPLAY RACK WITH IMPROVED SHELF ASSEMBLY

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

This invention relates to display racks. More particularly this invention relates to an improved display rack of the gravity feed type.

Display racks are often used in supermarkets, as well as in other types of stores, to display items of merchandise generally handled as self-service items. For example, display racks are often used in supermarkets to display cans or bottles of soft drinks, the cans or bottles being removable for purchase by the customer in a self-service manner from the display rack.

Historically, display racks originally were comprised of a plurality of planar horizontal shelves held in spaced relation by vertical cornerposts, the packages or containers thereon, e.g., cans or bottles of soft drinks, being arranged on each shelf in adjacent rows parallel to the shelf's front edge from the shelf's front edge to the shelf's rear edge. In this type of prior art display rack structure, the prospective customers first remove the containers at the front edge of the shelf, i.e., in the front row, then remove the containers in the second row, then from the third row, and so forth until the shelf is emptied. However, access to the containers on a shelf in the rear rows, and across the width of the rack, is impeded if the shelf is of significant depth or if another shelf is above that shelf. This makes it difficult for customers to reach the merchandise in the first instance and, perhaps as importantly, tends to hide the merchandise from display in the second instance if a partially filled shelf has another shelf disposed above it. Thus, it is highly desirable to provide a shelf structure for a display rack in which the front row of the shelf is always filled with containers for two reasons. The first reason is so that all the containers displayed on the shelf will be presented at an easily accesible position to the retail customer. The second reason is so that, after the front rows of containers have been removed from the shelf, the remaining product displayed on the shelf is still visually displayed in full to the customer at the rack's front face, and is not partially hidden by virtue of being disposed, e.g., in a rear area of the shelf.

A couple of different types of display rack structures have been developed over the years which tend to solve the merchandising problems present in the historical display rack structure as discussed above. These types of display rack structures incorporate the concept of slanted or sloped shelves on which the merchandise is stored or displayed. When the front product in a given column on a shelf is removed, gravity causes the products behind that front product to move forwardly in the column until stopped at the front edge of the shelf. One typical type of gravity feed shelf assembly for a display rack is illustrated in Pendergrast, Jr., et al. U.S. Pat. No. 3,203,553 and Shield U.S. Pat. No. 2,443,871. These two patents disclose gravity feed can racks in which the cans are disposed horizontal so that the rear cans in a shelf column can roll down the sloped shelf in response to removal of the lead can in that column. Another type of gravity feed shelf assembly is illustrated in Bergstedt U.S. Pat. No. 3,279,618. In the Bergstedt patent, vertically disposed cans slide down a sloped shelf structure to the front edge thereof. Another type rack structure, as used for a storage rack, is illustrated in Azzi et al. U.S. Pat. No. 3,900,112. The Azzi et al. rack structure incorporates skate wheels in a sloped shelf structure so as to promote movement of the articles from the rear of the shelf to the front of the shelf when the article at the front of the shelf has been removed.

In each of these prior art shelf assemblies, however, a significant problem arises particularly if the containers displayed thereon are of a frangible nature, e.g., glass bottles. In each of the prior art structural concepts, the remaining containers in any one shelf column impact against the new lead container in that column, and against one another, as the column moves forwardly due to gravity after removal of the old lead container in that column. In other words, and in the case of containers within a column in a gravity feed shelf structure of those types known to the prior art, the containers tend to move individually or independent one of another and, therefore, the containers tend to impact or hit one another in backlash fashion as they come to a stop against a new lead container, and against one another, upon moving forward due to gravity. This may create a problem of some significance for certain types of containers on a display rack in that it can result in broken or chipped bottles or dented cans, in the case of those types of containers. Also, this problem can result in disfigured or marked up artwork on the containers in the case of cans or bottles.

Accordingly, it has been one objective of this invention to provide a novel display rack incorporating an improved shelf assembly of the gravity feed type, that shelf assembly including a column feed unit that carries containers on a belt, the belt being movable in response to gravity so as to move the entire column of containers forwardly together after removal of the lead container in the column.

It has been another objective of this invention to provide a novel display rack incorporating an improved gravity feed shelf assembly in which a conveyor belt is supported by a sloping support floor on the underside of its container run, the conveyor having a low coefficient of friction on its inside surface and a high coefficient of friction on its outside surface, the high friction coefficient on the outside surface maintaining a plurality of containers on the belt in nonsliding relation one to the other, and the low friction coefficient on the inside surface permitting the belt to slide over the sloping support floor, thereby permitting the entire container column to move forward together in response to removal of a lead container from that column.

In accord with these objectives, the display rack of this invention includes an improved shelf assembly that gravity feeds a column of containers one after another to the front edge of a shelf as that column's lead containers are successively removed by customers. The shelf assembly includes a conveyor belt oriented so that its travel path is generally perpendicular to the shelf's front edge, the belt being adapted to receive a plurality of containers, e.g., bottles or cans, in a vertical or stand-up fashion thereon. The conveyor belt slopes upwardly from the shelf's front edge toward the shelf's rear edge at a shelf angle such that the containers on the belt do not tip over. The upper run of the conveyor belt is supported from the underside by a support floor. A bumper at the front edge of the shelf prevents the lead container on the belt from falling off over the front edge

of the shelf. The inside surface of the belt which rides over the support floor has a low coefficient of friction, and the outside surface of the belt on which the containers rest has a high coefficient of friction, relative one to the other. When the lead container on the belt at the front edge of the shelf is removed, and because of the low friction coefficient on the belt's inside surface, gravity on the remaining containers causes the belt to slide or move forwardly over the stationary support floor, thereby moving all remaining containers in that column forwardly on the shelf until the next forward container abuts the bumper at the shelf's front edge. But the containers on the belt do not move relative to the belt as the belt moves or as it stops because of the high friction coefficient on the belt's outside surface, thereby preventing the containers from impacting against one another as the column moves forward after a customer removes the lead container thereon.

Other objectives and advantages of this invention will be more apparent from the following detailed description taken in conjunction with the drawings in which:

FIG. **1** is a perspective view illustrating a plurality of container column feed units positioned on a horizontal shelf to provide an improved shelf assembly for a display rack in accord with the principles of this invention;

FIG. **2** is a perspective view, partially broken away, illustrating one of the container column feed units shown in FIG. **1**;

FIGS. **2A** and **2B** are side views of that unit shown in FIG. **2** illustrating use of the unit;

FIG. **3** is a perspective view, partially broken away, illustrating the friction belt assembly, of that unit illustrated in FIG. **2**;

FIG. **4** is a cross-sectional view taken along line **4—4** of FIG. **3**;

FIG. **5** is a perspective view illustrating a plurality of friction belt assemblies fixed to a slanted shelf in a four corner post rack structure to provide a first alternative embodiment of an improved shelf assembly for a display rack in accord with the principles of this invention; and

FIG. **6** is a perspective view illustrating a plurality of friction belt assemblies fixed to a cantilevered shelf in a two corner post rack structure to provide a second alternative embodiment.

A display rack **10** in accord with the principles of this invention is illustrated in FIG. **1**. As shown in that Figure, the display rack **10** includes three shelves **11**, **12**, **13** and four cornerposts **14**, the shelves being connected with the cornerposts at the respective corners thereof in any known fashion. Four container column feed units **18** are illustrated on one **12** of the shelves **11–13** of that display rack. The units **18** are separate one from another, and simply rest on the flat surface **19** of the shelf **12**. Each of the units **18** is adapted to receive a column **20** of containers, e.g., bottles **21** as shown, and the bottles in adjacent units **18** defining rows **22** of bottles parallel to the front **23** and rear **24** edges of the shelf **12**. The columns **20**, of course, are disposed normal or perpendicular to the front **23** and rear **24** edges of the shelf **12**. Note particularly that each container column feed unit **18** presents a support plane **25** defined by the unit that slopes or slants upwardly from the front edge **23** toward the rear edge **24** of the shelf **12** so that the bottles **21** toward the rear of the unit **18**, i.e., toward the rear edge of the shelf, are disposed at a height H above the horizontal shelf **12** substantially greater than the lead bottle **21a** at the front edge of the shelf. For purposes of this invention, the front edge **23** of the display rack **10**, and of each shelf **11–13**, is considered to be that edge normally approached by a customer when removing a container, e.g., bottle **21a**, from the display rack.

One of the container column feed units **18** illustrated in FIG. **1** is shown in structural detail in FIGS. **2–4**. As shown in those Figures each unit **18** is basically comprised of framework **30** (see FIG. **2**), and a friction belt assembly **31** (see FIGS. **3** and **4**). The unit's framework **30** includes opposed side walls **32**, **33**, each of the side walls including a linear inwardly turned foot flange **34**, **35** on which the unit **18** rests when seated or positioned on shelf **12**. Each side wall **32**, **33** also includes a linear inner rail **36**, **37** fixed to the respective side wall, each inner rail forming an acute angle with its respective foot flange **34** or **35** when viewed from the side of the unit **18**, the inner rails being parallel and coplanar one with the other within the framework **30**. The inner rails **36**, **37** cooperate to receive spaced brace members **38–41** in fixed relation between the rails **36**, **37** along the length thereof. The brace members **38–41** and the side walls **32**, **33** are preferably fabricated of sheet metal, and are welded one to the other to provide a rigid framework **30** for the container column feed unit **18**.

The unit's framework **30** also includes belt mounting plates **42**, **43** at the front **42a** and rear **43a** ends thereof, each of the mounting plates including tabs **44** struck upwardly therefrom adjacent opposite sides of that mounting plate. The mounting plates **42**, **43** are adapted to receive a belt assembly **31** in fixed relation therewith, thereby connecting the belt assembly (shown in FIG. **3**) in fixed relation with the unit's framework **30**. The unit's framework **30** also includes side rails **45**, **56** positioned on each side of the belt assembly **31**, and oriented parallel to the container feed path (indicated by arrow **47**) of the belt assembly **31**. The side rails **45**, **46** are welded to the shelf support structure and, in effect, function to define the effective width of the column **20** of containers served by a unit **18**. The unit's framework **30** also includes front **48** and rear **49** bumper rails welded between the side rails **45**, **46**, the bumper rails and the side rails serving to maintain the bottles **21** in columnar configuration on the container column feed unit **18**. Note particularly that the front bumper rail **48** is comprised of an upper **48a** and lower **48b** rail, a flexible plastic bumper **50** of concave configuration being carried between those upper and lower bumper rails. The flexible plastic front bumper so formed provides a soft cushion type bumper against which the lead bottle **21a** in the column **20** of bottles on the feed unit **18** can abut as the belt assembly **31** operates due to gravity after removal of the lead bottle as explained in detail below.

The belt assembly **31** itself is illustrated in FIGS. **3** and **4**. As shown in FIG. **3**, the belt assembly **31** includes an endless belt **52** having a low coefficient of friction on the inside surface **53** thereof, and having a high coefficient of friction on the outside surface **54** thereof, the degree of high friction and low friction being relative one to the other. The endless belt **52** is wound around idler spools **55**, **56** at each end of a floor frame **57**. Each of the spools **55**, **56** is a one-piece molded spool with a shaft **58** therethrough, the shafts being flatted at each end as at **59** for retaining the spool on the shaft. The idler spools **55**, **56** are carried in opposite ends of floor frame **57** in slots **60** defined in the floor frame.

The belt assembly's floor frame **57** is comprised of a support floor **61** with downwardly depending side walls

62. Note particularly that the support floor **61** is provided with two linear ribs **63** longitudinally thereof, the ribs underlying the inside surface **53** of the conveyor belt **52** for supporting the belt and, thereby for supporting bottles **21** loaded on the belt in columnar configuration. Thus, upper run **52**a of the conveyor belt **52** is supported on its underside by a support floor **61** which includes the two linear ribs **63** that parallel the container feed path **47** of the containers **21**. The belt assembly's floor frame **57** also includes connector flanges **64** extending outwardly from the side walls **62** from one end to the other. The connector flanges **64**, at each end, are adapted to be received under tabs **44** struck out of the belt mounting plates **42**, **43**, and are also adapted to rest on the intermediate structural brace member **39**, **40**, thereby supporting the floor frame **57** and, hence the support floor **61**, from one end thereof to the other in an angled or sloped attitude relative to horizontal.

Use of the container column feed unit **18** is as illustrated in FIGS. **2**A and **2**B. As shown therein, when fully loaded with bottles **21** the unit **18** is adapted to hold a column **20** of bottles from the front bumper **48** to the rear bumper **49** thereof, the column of bottles being sloped upwardly from the front edge **23** to the rear edge **24** of the shelf **12**. The bottles **21** are initially positioned on the high friction coefficient or outside surface **54** of the conveyor belt **52**, and the bottles are supported from underneath the belt **52** by the floor frame's longitudinal linear ribs **63** (the support floor **61** and floor frame **57** providing the sloped support plane **25**). The bottles **21** are positioned on the belt in generally vertical fashion (although the bottles tip forward slightly as shown in the Figures because of the slope of the support plane **25**), and may be spaced slightly one from another if desired. The rear bottles **21** of the column do not slide toward the front bottles in the column after being loaded on the unit **18** because of the high friction coefficient surface **54** of the belt, i.e., the bottles **21** stay in the spaced relation as initially presented because the high friction coefficient surface **54** prevents sliding of the bottles on the belt **52**. The column **20** of bottles **21** as initially loaded, and as shown in FIG. **2**A, is retained in the attitude shown in that Figure by virtue of the lead bottle's abutting contact with the flexible concave bumper **50**.

After the lead bottle **21**a has been removed by a prospective customer, gravity force on the remaining bottles in the column **20** overcomes the frictional contact between the belt's inside surface **53** and the floor's longitudinal linear ribs **63** so that the coveyor belt **52** moves forward in the direction illustrated by arrow **47**, thereby carrying with it the remaining bottles thereon, see FIG. **2**B. In other words, and after the old lead bottle **21**a has been removed from the column **20**, gravity induces the conveyor belt **52** to slide forwardly in the direction of arrow **47** on the support floor **61** until new lead bottle **21**b abuts bumper **50**. This forward motion is induced by gravity because of the low frictional resistance between the inside surface **53** of the belt **52** and the two longitudinal linear ribs on the floor. On the other hand, the bottles supported on the top surface **54** of the belt **52** remain in the predetermined, and preferably slightly spaced, relation as initially loaded onto that belt during forward sliding movement **47** of the belt because of the high friction contact between the bottles'bases **63** and the outside surface **54** of the belt **52**.

As the belt **52** moves forwardly in response to gravity, the second bottle **21**b in the original column **20** becomes the lead bottle and abuts the concave bumper **50**. When the second or new lead bottle **21**b abuts the concave bumper **50**, the bumper may flex slightly to provide an easy bumpered stop for the new lead bottle **21**b. When the new lead bottle **21**b is stopped by the bumper **50** (see phantom line position in FIG. **2**B), and because of the frictional relation between the new lead bottle's base **66** and the outside surface **54** of the conveyor belt **52**, the belt itself stops. Further, and because of the frictional contact between successive bottles behind the new lead bottle **21**b on the belt, those successive bottles are also immediately stopped. No significant sliding of the successive bottles on the belt **52** occurs against the new lead bottle **21**b, or against one another and, therefore, no significant impacting of the remaining bottles along the column **20** occurs as those bottles move forwardly in response to the withdrawal of the old lead bottle **21**a.

A first alternative embodiment of this invention is illustrated in FIG. **5**. As shown in the first alternative embodiment, the display rack **70** itself is provided a shelf **71** angled relative to horizontal. In the FIG. **5** structure, the middle shelf of the three shelves, **71**–**73** shown is angled upwardly from the front edge **74** to the rear edge **75** thereof, i.e., sloped relative to horizontal. All three of the shelves **71**–**73**, i.e., the top **72** and bottom **73** horizontal shelves, and the middle sloping shelf **71**, are connected at each of the four corners to respective cornerposts **76** in known fashion.

The sloping shelf **71** is provided, as shown in FIG. **5**, with a plurality of column side rails **77** normal or perpendicular to the front edge **74** thereof. The column side rails **77** sub-divide the shelf **71** across the width thereof into a plurality of columns **78**. Also, the sloping shelf **71** is provided with a front rail or bumper rail **79** that extends across the width of the shelf above the front edge **74** thereof. Each of the columned off areas **78** of each sloping shelf is provided with a friction belt assembly **31** as illustrated in FIGS. **3** and **4**. Each friction belt assembly **31** is connected with shelf **71** in a columnar area **78** through use of a pair of rear tabs **81**, and a pair of front tabs **82**. The tabs **81**, **82** cooperate with the connector flanges **64** on the friction belt assembly **31** to retain that assembly in fixed engagement with the sloping shelf **71**. Thus, the primary difference between the first embodiment illustrated in FIGS. **1**–**4** and the second embodiment illustrated in FIG. **5** is that a plurality of separate container column feed units **18** are simply positioned on a horizontal shelf in the FIGS. **1**–**4** embodiment across the width thereof, whereas in the FIG. **5** embodiment the shelf is already sloped and is adapted to interfit with a plurality of friction belt assemblies **31** only.

Use of the FIG. **5** embodiment is the same as described above in connection with the FIGS. **1**–**4** embodiment.

A second alternative embodiment of this invention is illustrated in FIG. **6**. As shown in the second alternative embodiment, a plurality of friction belt assemblies **31** are fixed to a cantilevered shelf **90** in a two corner post **91** display rack structure. The two corner posts **91** are fixed to, for example, a wall **92** in known fashion. The cantilevered shelf **90** is comprised of opposed side walls **93**, a front wall **94**, a rear wall **95**, and a floor flame comprised of a plurality of parallel floor rails **96** extending between the side walls, all of which are welded

together into a one-piece configuration. The rear corners **97** of the shelf structure are provided with hooked fingers (not shown) adapted to be received in connecting relation with slots **98** disposed on the corner posts **91** from the top to bottom thereof, thereby permitting the shelf **90** to be located at the desired height level relative to ground (not shown) in known fashion as desired by the user. The floor of the shelf, as defined by the floor rails **96**, is thereby angled relative to horizontal, the shelf's floor being angled upwardly from the front edge **99** to the rear edge **100** thereof.

The shelf **90** is provided, as shown in FIG. **6**, with a plurality of column side rails **101** normal or perpendicular to the front edge **99** thereof, the side rails defining nine columns **102** as shown in that Figure. Also, the sloping shelf **90** is provided with a front or bumper rail **103** that extends across the width of the shelf above the front edge **99**, and a rear bumper rail **104** that extends across the width of the shelf above the rear edge **100** thereof. The front bumper rail **103** is comprised of an upper **103**a and a lower **103**b bumper rail, flexible plastic bumpers **105** being interconnected therewith for each of the columns **102** defined. The side rails **101**, front **103** and rear **104** bumper rails are welded to the shelf **90** structure, and to one another, to provide an integrated and rigid structural definition for the columns **102**.

Each of the columned off areas **102** of the sloping shelf is provided with a friction belt assembly **31** as illustrated in FIGS. **3** and **4**. Each friction belt assembly **31** is connected with that shelf **90** in a columnar area **102** through use of a pair of rear tabs **106**, and a pair of front tabs **107**. The tabs **106**, **107** cooperate with the connector flanges on the friction belt assembly **31** to retain that assembly in fixed relation with the shelf.

Use of the FIG. **6** embodiment is the same as described above in connection with the FIGS. **1–4** embodiment.

A third alternative embodiment, not illustrated in the drawings, involves use of a conveyor belt having substantially the same coefficient of friction on both the inside and the outside surfaces thereof. However, and in this embodiment, the single surface friction coefficient belt is connected in operative relation with a sloping shelf that includes a belt support structure, e.g., similar to ribs **63** in the FIGS. **1–4** embodiment, which is of a significantly reduced friction coefficient relative to the belt surface's coefficient of friction. In this regard, and if the structural embodiment of FIGS. **1–4** was used with the belt **52** modified so that it had substantially the same friction coefficient on the inside surface **53** as on the outside surface **54**, it would be desirable to coat the rib **63** with a low coefficient of friction material relative to the friction coefficient of the belt. One useful low friction coefficient material would be, e.g., polytetrafluroethylene sold under the trademark TEFLON. In this alternative embodiment, and as in the earlier embodiments, the friction coefficient of the belt's outer surface would be sufficient to maintain the column of containers in relatively immobile relation thereon when the lead container in the column is withdrawn as the column moves forwardly and then abuts the front edge bumper of the display rack. Also as in the earlier embodiments, the forward movement of the belt would be achieved due to gravity because of the low coefficient of friction support surface, e.g., of TEFLON, for the inside surface of the conveyor belt.

Having described in detail the preferred embodiments of my invention, what I desire to claim and protect by Letters Patent is:

1. A display rack with an improved shelf assembly that gravity feeds a column of containers one after another to the front edge of a shelf as that column's lead containers are successively removed by a customer, said display rack comprising

a conveyor belt disposed at an angle relative to the horizontal, said conveyor belt sloping generally upward from the front edge of said shelf, each container in said column being positioned in generally vertical fashion on said belt during use of said rack,

a support floor disposed beneath said conveyor belt, said conveyor belt and said support floor cooperating to support said containers in said column on the upper surface of said belt,

the upper surface of said conveyor belt having a friction relation with said containers that inhibits movement on said belt of said containers relative one to the other, and said support floor and the under surface of said conveyor belt having a friction relation with one another that allows movement of said belt over said support floor when said belt is at least partially loaded with containers and when not restrained against movement, said friction relationships being such that said belt can slide over said support floor while said containers remain generally stationary relative one to the other on said conveyor belt after removal of the column's lead container during use of said rack, and

a bumper rail disposed adjacent the front edge of said shelf, said conveyor belt conveying all of said containers in said column forward together toward said bumper in response to gravity on the remaining containers in said column after removal of the lead containers from said column, said conveyor belt and said container column being stopped by contact of the container in back of the lead container with said bumper rail, thereby positioning a new lead container adjacent the front edge of said shelf.

2. A display rack as set forth in claim **1**,

the outside surface of said conveyor belt having a high coefficient of friction, and the inside surface of said conveyor belt having a low coefficient of friction, relative one to the other.

3. A display rack as set forth in claim **1** in which said conveyor belt is an endless conveyor belt, said endless conveyor belt passing around an idler spool at each end thereof, said idler spool permitting the upper run of said conveyor belt to pass above said support floor and the lower run to pass beneath said support floor.

4. A display rack as set forth in claim **3** in which said shelf is horizontal, said rack including

framework adapted to rest on said shelf, said framework carrying said conveyor belt and bumper rail thereon, thereby providing a removable container column feed unit for use with the horizontal shelf.

5. A display rack as set forth in claim **3** in which said shelf slopes upward from the front edge thereof, the upper run of said conveyor belt being disposed generally parallel to the sloping shelf.

6. A display rack as set forth in claim **3** including

side rails extending along the length of said conveyor belt from one end thereof to the other, said side rails cooperating with said front bumper rail to

define the columnar configuration for the containers carried on said conveyor belt.

7. A display rack with an improved shelf assembly that gravity feeds a column of containers one after another to the front edge of a shelf as that column's lead containers are successively removed by a customer, said display rack comprising

a conveyor belt disposed at an angle relative to the horizontal, said conveyor belt sloping generally upward from the front edge of said shelf, each container in said column being positioned in generally vertical fashion on said belt during use of said rack,

a support floor disposed beneath said conveyor belt, said conveyor belt and said support floor cooperating to support said containers in said column on the upper surface of said belt,

the upper surface of said conveyor belt having a friction relation with said containers that inhibits movement on said belt of said containers relative one to the other, and said support floor and the under surface of said conveyor belt having a friction relation with one another that allows movement of said belt over said support floor when said belt is at least partially loaded with containers and when not restrained against movement, said friction relationships being such that said belt can slide over said support floor while said containers remain generally stationary relative one to the other on said conveyor belt after removal of the column's lead container during use of said rack.

8. A display rack with an improved shelf assembly that gravity feeds a column of containers one after another to the front edge of a shelf as that column's lead containers are successively removed by a customer, said display rack comprising

a conveyor belt disposed at an angle relative to the horizontal, said conveyor belt sloping generally upward from the front edge of said shelf, each container in said column being positioned in generally vertical fashion on said belt during use of said rack,

a support floor disposed beneath said conveyor belt, said conveyor belt and said support floor cooperating to support said containers in said column on the upper surface of said belt,

the upper surface of said conveyor belt having a friction relation with said containers that inhibits movement on said belt of said containers relative one to the other, and said support floor and the under surface of said conveyor belt having a friction relation with one another that allows movement of said belt over said support floor when said belt is at least partially loaded with containers and when not restrained against movement, said friction relationships being such that said belt can slide over said support floor while said containers remain generally stationary relative one to the other on said conveyor belt after removal of the column's lead container during use of said rack, and

means at the front of said shelf for stopping the gravity-urged movement of said containers beyond the front of said shelf.

9. A display rack with an improved shelf assembly that gravity feeds a column of containers one after another to the front edge of a shelf as that column's lead containers are successively removed by a customer, said display rack comprising

a conveyor belt disposed at an angle relative to the horizontal, said conveyor belt sloping generally upward from the front edge of said shelf, each container in said column being positioned in generally vertical fashion on said belt during use of said rack,

a support floor disposed beneath said conveyor belt, said conveyor belt and said support floor cooperating to support said containers in said column on the upper surface of said belt,

the upper surface of said conveyor belt having a friction relation with said containers that inhibits movement on said belt of said containers relative one to the other, and said support floor and the under surface of said conveyor belt having a friction relation with one another that allows movement of said belt over said support floor when said belt is at least partially loaded with containers and when not restrained against movement, said friction relationships being such that said belt can slide over said support floor while said containers remain generally stationary relative one to the other on said conveyor belt after removal of the column's lead container during use of said rack, and

a bumper rail disposed adjacent the front edge of said shelf, said conveyor belt conveying all of said containers in said column forward together toward said bumper in response to gravity on the remaining containers in said column after removal of the lead containers from said column thereby positioning a new lead container adjacent the front edge of said shelf, said bumper rail being operative to prevent the lead container on said conveyor belt from falling off over the front edge of the shelf.

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