# United States Patent

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[54] **ELEVATOR RACK**
**7 Claims, 7 Drawing Figs.**


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198/24, 198/219, 312/214, 312/236
[51] **Int. Cl.** ..... **A47f 3/14,**
B65g 25/08, B65g 47/82
[50] **Field of Search** ..... 211/126,
133, 1.5, 176, 1 E; 198/219, 107, 24; 108/44, 59;
312/214, 236



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**ABSTRACT:** A rack for horizontally supporting a plurality of trays, baskets, or pans vertically spaced apart from each other and in vertical alignment. The rack includes a foot-operated elevator for simultaneously lifting all the trays supported by the rack form one level to the next higher level. The rack is adapted to receive and to be loaded with trays at a lower level and to deliver trays at an uppermost level.

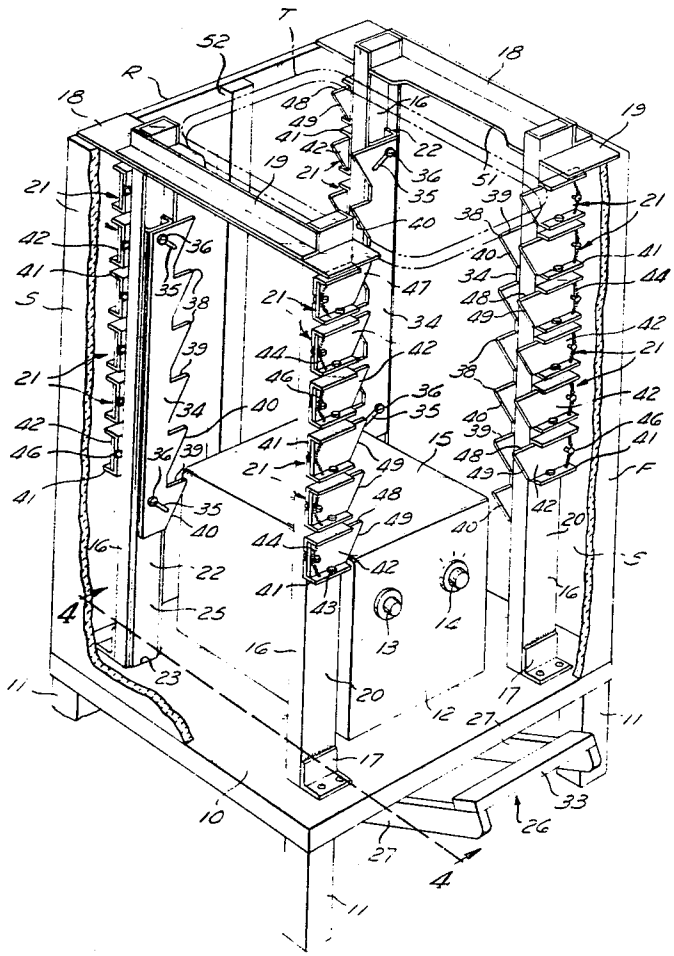



Fig. 2

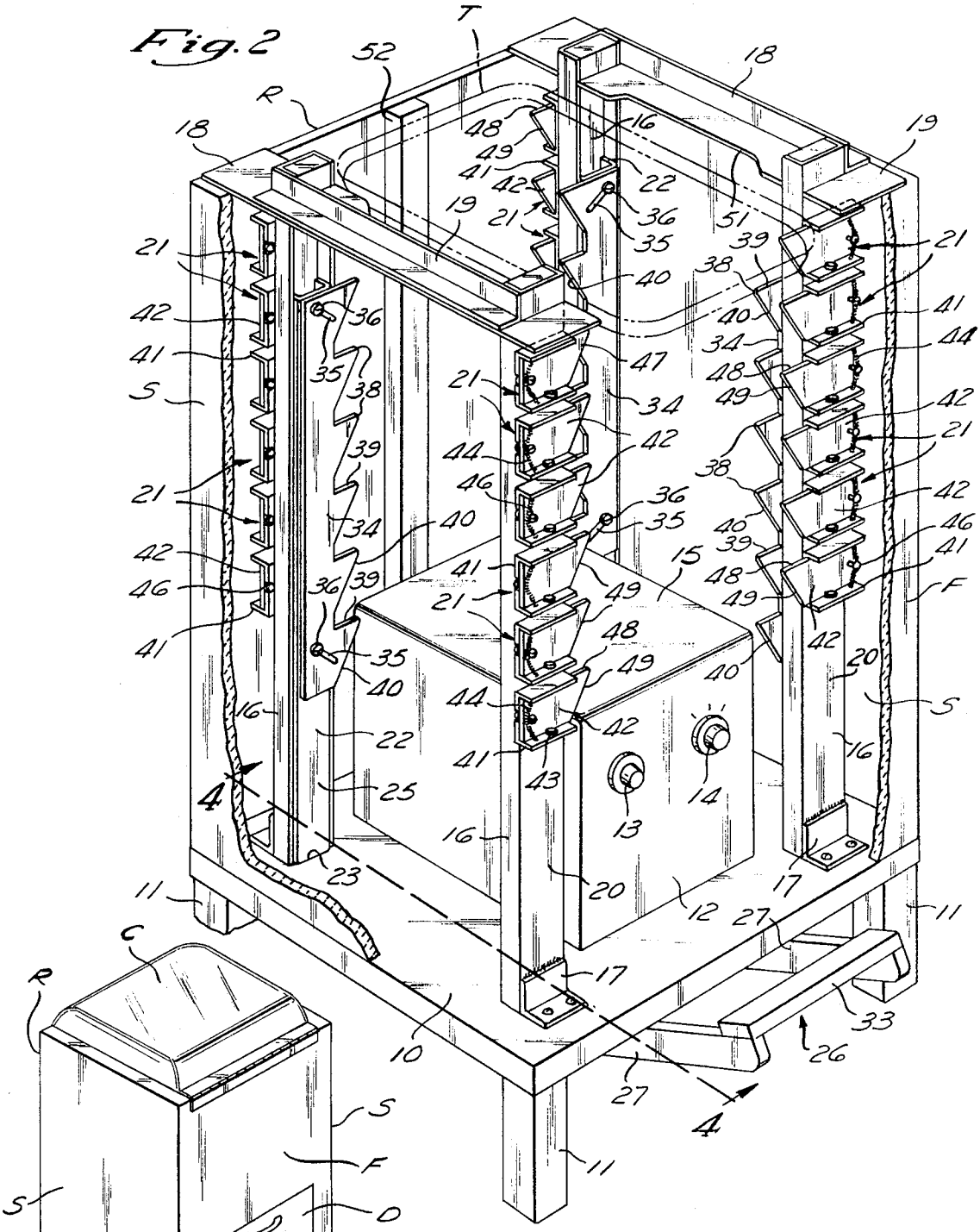



Fig. 1

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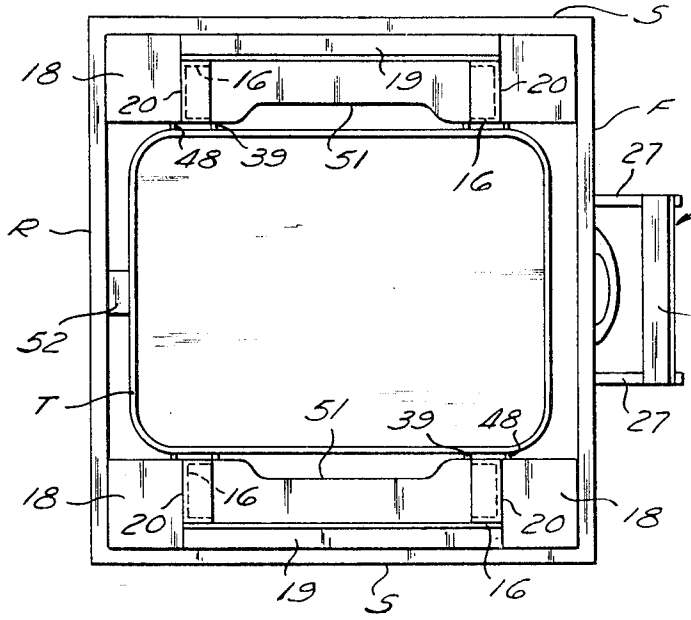



Fig. 3

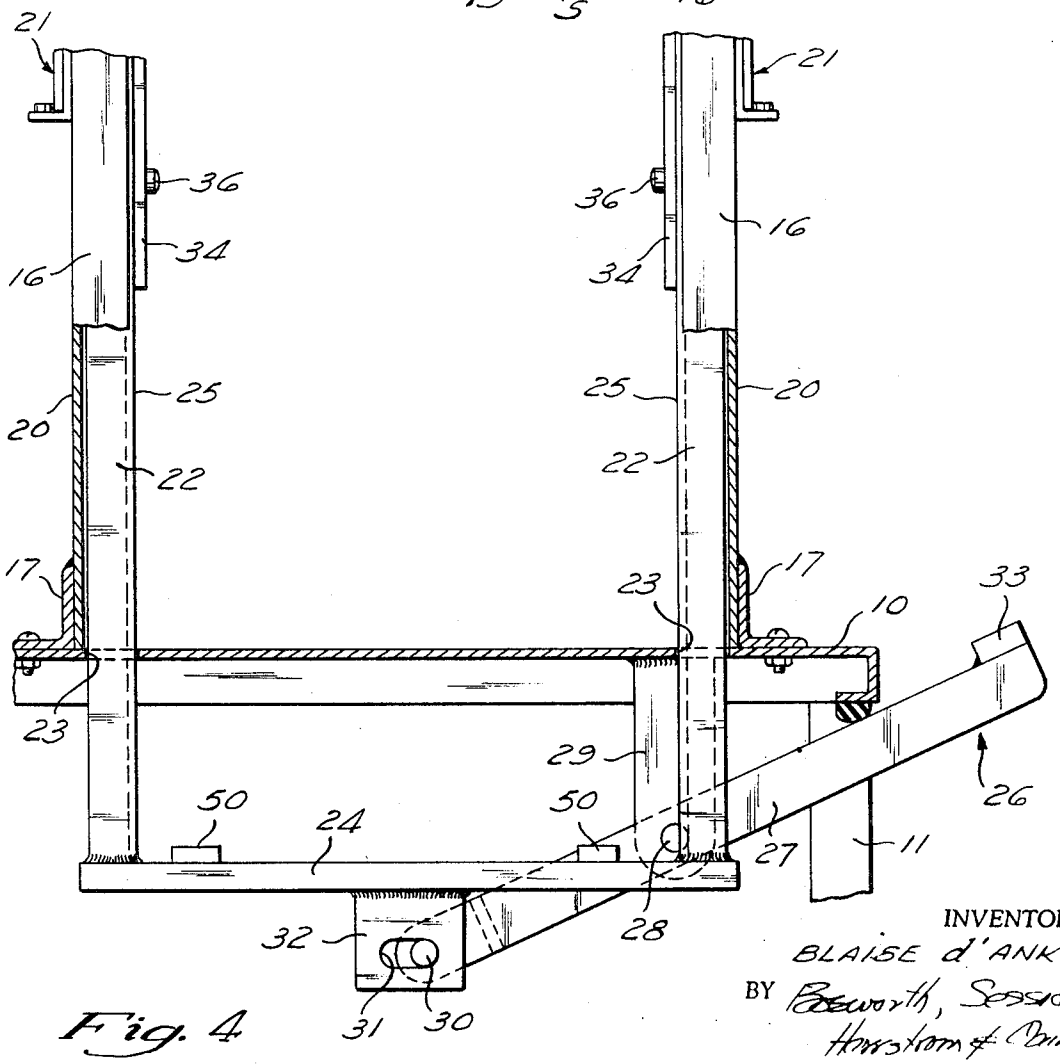



Fig. 4

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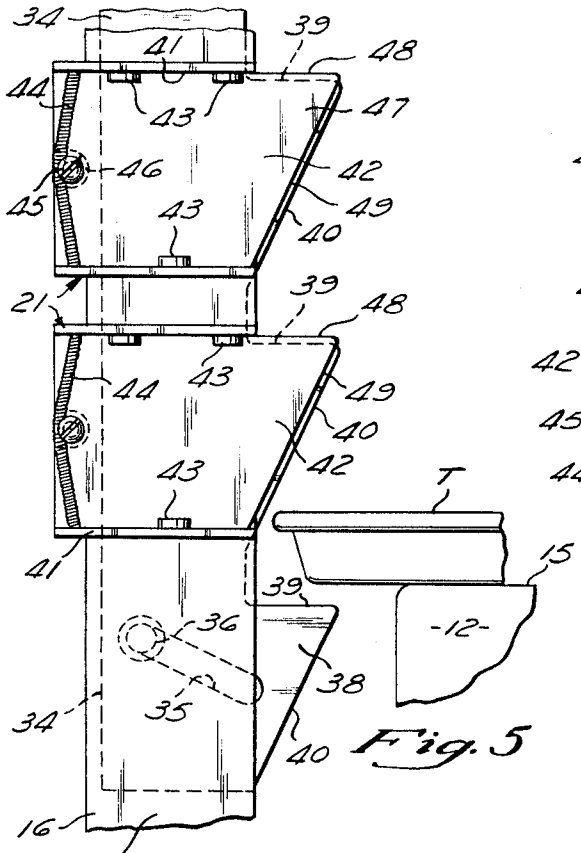



Fig. 5

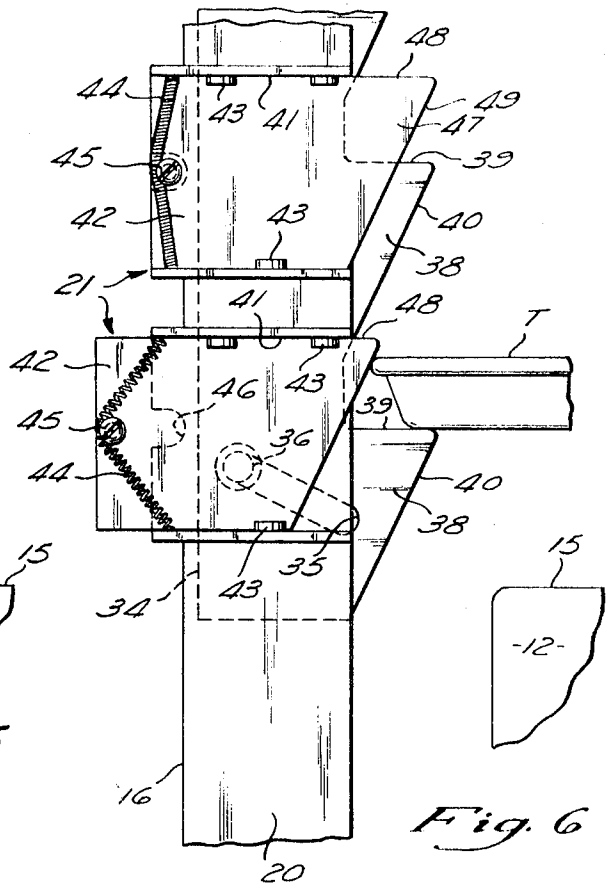



Fig. 6

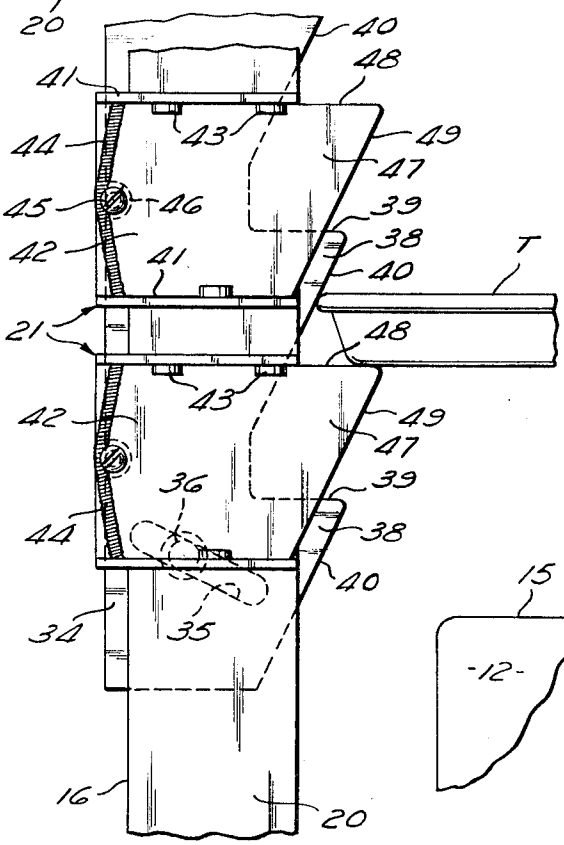



Fig. 7

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# ELEVATOR RACK

## BRIEF SUMMARY OF THE INVENTION

This invention is directed to a rack for holding and supporting horizontally a plurality of trays, baskets, or pans at vertically spaced-apart individual tray support levels in a substantially vertically aligned arrangement and for simultaneously lifting or elevating all the trays, baskets, or pans supported from one support level in the rack to the next by a single motion of a foot-operated treadle. The rack may be enclosed in an insulated cabinet maintained at a preselected condition of temperature and/or moisture by appropriate apparatus such as a heater, refrigerator, humidifier, or dehumidifier.

Such racks are useful, for example, for receiving and storing prepared food and maintaining it in a desired condition after it has been prepared and for successively presenting the food stored at a dispensing station or level. The food to be stored in the cabinet is placed on or in trays, baskets, and pans. Each tray, for example, is successively placed in the lowermost support position or level of the rack. As each new tray is added to the rack, the preceding trays are lifted by the rack elevator to the next higher tray-supporting position. The cabinet is arranged so that the tray in the top position is readily accessible for presentation and delivery of the food on it.

Such an elevator rack is especially useful when food must be continuously prepared and available to be served on demand. In this kind of service, the food, as prepared, is loaded into the bottom of the rack. The food to be served is taken from the top tray in the rack. The trays inbetween hold a reserve supply of prepared food and maintain it at a desired condition. By use of such an elevator rack, the food is presented for service in the same order in which it was prepared and loaded onto the rack, thus, insuring the orderly and timely serving of the food and preventing the retention of prepared food in the rack for an overly long time.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a preferred embodiment of this invention showing primarily the exterior appearance and detail;

FIG. 2 is a perspective view with two walls of the cabinet shown in FIG. 1 broken away to reveal the supporting and elevating mechanism and structural details of the FIG. 1 embodiment;

FIG. 3 is a top plan view of the cabinet and rack shown in FIG. 1;

FIG. 4 is a partial section through the apparatus shown in FIG. 2, taken in the plane of line 4–4; and

FIGS. 5, 6, and 7 are sequential elevation views of a portion of the supporting and elevating means of a preferred embodiment and illustrating its operation.

## DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

A rack embodying this invention is shown in FIG. 1 as preferably enclosed in a cabinet. For convenience in describing the invention, side F will be referred to as the front of the cabinet and/or rack; the opposite face R will be referred to as the rear; and the faces therebetween marked S will be referred to as side faces.

The rack, with cabinet, is provided with insulated sidewalls on each of the faces mentioned above and a base **10** supported on legs **11**. If desired, legs **11** may be fitted with casters or wheels. A loading door D is provided in the lower part of front face F and a transparent protective cover C is hinged along one edge, for example, and covers the top of the rack and the tray, baskets, or pans therein. The cabinet and rack is loaded through door D and the contents are removed from the rack at the upper or top surface by lifting cover C.

Trays, wire baskets, pans or other similar containers can be used with elevator racks embodying this invention. All such articles will be collectively referred to in the description that follows as trays. Limitation as to size, kind, or type, if any, will become apparent as an understanding of the invention is gained. The preferred embodiment shown and described is adapted for use with conventional metal or Fiberglas trays and the particular trays shown form no part of the invention themselves.



In FIG. 2, the left side panel S and the front panel F are broken away to reveal the operational structure for supporting horizontally a plurality of trays at vertically spaced-apart tray support levels arranged in vertical alignment and for simultaneously elevating or lifting all the trays from their supported positions to the next higher support level. A conditioning apparatus such a a heater or cooling unit, is shown at **12** and is intended to represent any type of device for heating, cooling, or otherwise conditioning the interior of the cabinet and its contents. This device may be provided, for example, with suitable manual or automatic controls such as on-off switch **13** and a thermostatic control **14** on its front face.

As shown, the top of conditioning apparatus **12** is provided with a flat surface **15** of substantial area well adapted to receive and support the tray, basket, or pan being loaded into the rack. Obviously, other appropriate means, such as rails, plates, grids, and the like, may be provided for this purpose. It will be understood that the use of the top surface **15** of conditioning apparatus **12** is limited to supporting the tray being loaded into the cabinet and is not necessarily related to its conditioning function. Whatever means are employed for receiving the tray at the loading level in the cabinet, it is preferred that the entering tray be well supported and guided in and to its proper position in the rack to make loading as easy an operation as possible and to prevent any inadvertent or accidental tipping. The continuous front-to-back and side-to-side support provided by the flat surface of conditioning unit **12**, as shown provides the preferred kind and extent of support and guidance for the entering tray.

A vertical post or column **16** is mounted and fixed by an angle bracket **17** to each of the four corners of base **10**. As seen in the plan view of FIG. 3, the four posts stand at the corners of a rectangle. The upper ends of posts **16** are held in fixed relationship by any suitable means, such as structural plates and angles **18** and **19**. Preferably, base **10** and posts **16**, interconnected and stiffened by angle brackets **17**, plates **18**, and angles **19**, comprises a substantially rigid interconnected self-supporting framelike structure which does not depend upon the exterior panels of the cabinet for structural support. Rather, the exterior panels are preferably supported by and attached to the structural elements of the rack described above. It is convenient and preferred to have the panels attached to the rack by some means permitting them to be easily removed and replaced for ease in cleaning and caring for the apparatus.

Posts **16** on the left side of the rack are laterally spaced from those on the right side by a distance sufficient to permit the trays intended for use with the rack to easily fit between them. The two posts **16** at the front side F of the rack are spaced from the two posts **16** at the back R a distance substantially less than the corresponding front-to-back dimension of the trays to be used in order that tray supports attached to the posts can positively engage the trays to be supported at points intermediate their ends and without risk of missing engagement.

Each post **16** preferably comprises a U-shaped channel standing vertically on base **10** and attached thereto by means of an angle bracket **17**. The two posts **16** on the left side of the rack are oriented with their open sides facing each other. The two posts **16** on the right side of the cabinet are similarly oriented. The flat sides or faces **20** of the channels comprising posts **16** face forwardly or rearwardly of the cabinet as shown.

A plurality of tray supports indicated generally at **21** are mounted in vertical arrangement on the flat sides **20** of posts **16** at horizontally corresponding levels so that a plurality of trays can be supported in parallel, vertically spaced horizontal planes by sets of four tray supports **21** on the four cornerposts

16 at each level in the manner of the tray shown in FIG. 2 in phantom outline supported at the top level of the rack. The details of structure and operation of the tray supports 21 will be described in detail later in connection with an explanation of the elevator operation of the rack.

All the trays contained in the rack are simultaneously elevated from one support level to the next support level by four movable lifting columns 22, one associated with each corner post 16. Base 10 is provided with four apertures 23 at the bottom ends of posts 15 which permit the lifting columns 22 to move up and down and to extend downwardly through and below base 10. The lower ends of lifting columns 22 on the left side of the rack are rigidly connected beneath base 10 by a horizontal yoke member 24 and, together, comprise a U-shaped lifting structure for lifting the left side of the trays supported in the rack. The two right-hand movable columns 22 are similarly rigidly connected together at their lower ends and beneath base 10 by another yoke member 23 and, together, comprise a U-shaped lifting structure for lifting the right side of the trays supported in the rack.

Each lifting column 22 preferably comprises a channel or other suitable shape adapted to loosely fit within the channel of a corner post 16 and is free to slide vertically up and down within the channel of its associated post while being guided and maintained in vertical alignment by it. The channel side of each lifting column 22 faces inwardly its flat face 25 is exposed. Because of the orientation of the cornerposts as described above, the flat faces 25 of the two left-hand lifting columns 22 face each other as shown in FIG. 1. Similarly, the flat faces 25 of the two right-hand lifting columns 22 also face each other. Thus the two left-hand lifting columns 22, rigidly connected by yoke 24, and guided by the two left-hand posts 16, are free only to move together vertically up and down relative to posts 16 and base 10. The two right-hand lifting columns 22 are similarly constrained to move together with a vertical up and down motion.

The left and right U-shaped lifting structures are raised and lowered together by operation of a foot treadle indicated at 26 in FIGS. 1, 2, and 4. Foot treadle 26 comprises a pair of operating levers 27 pivotally mounted for rocking motion beneath base 10 by means of shaft 28 supported by brackets 29. Treadle 26 is connected to the two U-shaped lifting structures by means of a cross-shaft 30 passing through slotted apertures 31 of brackets 32 depending from the yokes 24 and the ends of operating levers 27. The opposite ends of operating levers 27 extend outwardly from beneath base 10 and are joined together by a foot bar 33. It will be apparent that downward motion of the foot bar 33 from its position as shown in FIG. 4 will cause the opposite end of the levers 27 to swing upwardly and carry with them the left- and right-hand U-shaped lifting structures. The mechanical arrangement of treadle 26 and the U-shaped lifting structures as described above insures the simultaneous and equal movement of all four elevating columns throughout the range of their up and down travel.

The four lifting columns 22 are provided with means for cooperatively engaging a tray, basket, or pan at one support level, lifting it to the next support level and disengaging from the elevated tray to return to the lower level in preparation for engaging and lifting again. In the preferred embodiment as shown in FIGS. 2, 5, 6, and 7, such means comprise simply a vertically extending heavy, flat plate 34 having two slots 35 for engagement with a pair of pins 36 extending normally from the flat face 25 of each of the elevating columns 22. Enlarged heads on the ends of the pins 36 hold plates 34 on them. The two slots 35 in each plate 34 are angularly related and parallel as shown so that the plate is free to move in one direction inwardly and upwardly of the rack against the force of gravity and, in the other direction, downwardly and outwardly and aided by the force of gravity. Slots 35 fit pins 36 loosely so that the weight of plates 34 easily maintains them in the rest position shown in FIG. 2, for example. The ease of sliding movement of plates 34 on pins 36 may be promoted by bushing the pins with loose rollerlike sleeves.

The inwardly facing, vertically extending sides 37 of each plate 34 are provided with a series of congruent projections 38, each having a horizontal upper edge 39 and an inclined lower camming edge 40. Projections 38 extend well into the space between the left- and right-hand posts 16 when plates 34 are in their gravity-induced rest position as shown in FIG. 2, for example. When the plates are moved upwardly and outwardly until pins 36 engage the opposite ends of slots 35 from that shown in FIG. 2, the projections project little, if at all, beyond the inside faces of posts 16.

Further details of tray supports 21 on posts 16 and of lifting plates 34 on lifting columns 22 can best be described in terms of their cooperative operation. FIGS. 5, 6, and 7 each shows a portion of the same post 16 from a point below the upper surface 15 of conditioning apparatus 12 and extending upwardly some distance therefrom. The post 16 is shown in a view from the front, for example, of the rack so that plate 34 carried on lifting column 22 appears in phantom except for projections 38 extending into the interior space of the rack. In FIG. 5, a tray is shown positioned at the loading level, the lowest level of the rack. The loading level, as explained above, comprises top surface 15 of conditioning apparatus 12 or any other suitable means for receiving and holding the tray in a horizontal position. The large area flat surface as shown herein is preferred in order to insure and simplify the successful loading of a tray of food, for example, into the lowermost level of the rack. Such an arrangement eliminates the need for careful, critical alignment of the tray and serves to position and align the tray in its proper position with little, if any, guidance from the operator. It will be noted that the lowermost projection 38 of each plate 34 when in the rest position as shown in FIG. 5 is such that horizontal upper edge 39 is below and preferably clear of the underside of the tray and extends a substantial distance under the tray for positive engagement with it.

In FIGS. 5—7, two tray supports 21 are shown on the face 20 of post 16. Each tray support 21 comprises a horizontally extending guide channel 41 and a lateral slide 42 guided therein. Each slide 42 is free to move horizontally back and forth in its guide channel 41 fastened to the face 20 of post 16. Slide 42 is retained in the channel by nylon buttons 43 press-fitted into suitable holes in the guide channel flanges. Each slide 42 is resiliently urged to its extended supporting position as shown in FIG. 5 by springs 44 extending between opposite points on flanges of the associated guide channel 41 and behind a projecting post 45 carried on slide 42. Each slide 42 is free to move back and forth in its guide channel 41 in response to applied force. Slide 42 is prevented from sliding out of its guide channel in one direction by spring 44 and in the other direction by engagement of the edge of a notch 46 in guide channel 41 and the end of post 45 projecting from the backside of slide 42. The projecting portion 47 of each slide 42 comprises a horizontal upper edge 48 joined by an inclined camming edge 49. All the lateral slides 42 on each of the posts 16 are free to move independently of the other.

FIG. 5 shows a tray supported at the lowest or loading level of the rack. FIG. 6 shows the same tray engaged and supported by a projection 38 on plate 34 and lifted part of the distance between successive support levels. As the tray is lifted, its rolled edge engages the lower inclined camming edge 49 of the slides 42 of the adjacent tray support 21 and cams it outwardly from its normal projecting position. As soon as the bottom of the tray being lifted is raised above the upper end of inclined camming edge 49 of the slide 42 of a tray support 21, the slide is free and is resiliently returned by spring 44 to its projecting position with its horizontal upper edge 48 extending beneath the underside of the tray for full supporting engagement with it. See FIG. 7.

All plates 34 and the lifting columns 22 upon which they are mounted are moved upwardly together to raise the tray upon operation of foot pedal 26. Full depression of foot pedal 26 brings the two yokes 24 into engagement with the underside of base 10. Yokes 24 or the underside of base 10 is preferably provided with cushioning and quieting elements such as rubber stops 50 shown in FIG. 4. The positive parallel rela-

tionship of connecting yokes **24** with the flat underside of base **10** when foot pedal **26** is fully depressed insures that all lifting columns **22** are raised the same amount and, thus, the horizontal alignment of the trays being lifted is insured. This is an important feature of the apparatus embodying this invention and contributes substantially to its desirability and reliability in successfully handling with a minimum of effort and attention quantities of trays, baskets, or pans containing food without spillage or similar accident.

It should be noted that full depression of the foot pedal **26** preferably provides an upper extension of lifting columns **22** sufficient to raise the tray slightly above horizontal upper edges **47** of all adjacent slides **42** so that the tray in no way interferes with the resiliently urged extension of slides **42** into their inwardly projecting tray supporting positions. Thus, the upper tray-supporting edges **39** of projections **38** on plates **34** of the lifting columns **22** must be able to be raised a distance slightly greater than the spacing between the upper supporting edges **48** of adjacent slides **42**. For example, if the tray supports **21** are arranged to support the bottoms of successive trays a distance of 4 inches apart, it is preferred that the total travel of the tray-lifting columns **22** and their plates **34** be 4⅝ 5/8 inches, permitting the projections **38** to start from position five-sixteenth inches below the supported tray and lift or elevate it to a position five-sixteenth inches above the next support level.

In FIG. 7, it will be observed that the tray first appearing in FIG. **5** at the loading level has been elevated and is now supported at the next higher level on slides **42**. The elevating means is shown in a partially lowered position to illustrate how the edge of the tray engages the inclined lower camming edge **40** of projection **38** on plates **34** to urge the plates outwardly and necessarily upwardly, withdrawing the projections so they may pass by and below all trays supported in the rack. Once lifting columns **22** and their associated plates **34** have been lowered to a point where all projections **38** are out of engagement with supported trays, the plates are free to slide by the force of gravity inwardly and outwardly and as limited by the slots.

Repeated operation of the foot pedal raises all the trays contained in the rack in successive steps, one level at a time. In the condition shown in FIG. **7**, the rack is able to receive another tray in the bottom loading position. The tray already in the rack may be maintained at the level shown in FIG. **7** until another tray is loaded or it may be elevated by repeated operations of the foot pedal until it reaches the top support level on the uppermost supporting slides. A tray in this position is shown in FIG. **3** and indicated in dotted outline in FIG. **2**.

The uppermost tray support level is the serving position for the food contained on the tray theresupported. If a protective cover, such as the transparent hinged lid shown in FIG. **1**, is provided, food can be obtained by raising the cover and removing it from the tray now presented at substantially the top surface of the cabinet. When the tray is empty, it is removed through the upper face of the cabinet. For convenience, the sideplates are cut away as at **51** in order to provide hand room next to the edges of the tray. After the empty tray is removed, the tray underneath it is raised into the uppermost food-dispensing position. Thus, as trays are emptied by service of food from the top of the cabinet, filled trays can be presented for service by operation of the foot pedal.

As trays of food are prepared for service, they can be introduced to the cabinet at the lowermost position. While in the cabinet and waiting to be served, the food is maintained at its predetermined desired condition by appropriate apparatus preferably mounted on the base of the cabinet. It will be observed that the operator loads all newly prepared food into only one position. All food to be served appears and is dispensed from another position. The operation of the elevating mechanism is such that the prepared food first loaded into the rack is the food first presented for service. This "first in, first out" order of presentation of the food is highly desirable from a food-handling standpoint and insures uniformly fresh food for service from an adequate prepared supply so often desirable in continuous food service establishments. The relatively small opening areas in the cabinet permits the desired conditions to be easily maintained within the cabinet. The operation of the elevating means is simple and requires but a single motion of the operator's foot so that his hands are free to safely and effectively handle his duties. It will be understood that racks of various dimensions holding different numbers of trays, baskets, or pans may be provided and are comprehended by this invention. The spacing between the supported elements may be varied, as desired.

From the foregoing, it will be apparent that the invention comprehends a rack for supporting a plurality of trays at vertically spaced levels and for repeatedly lifting simultaneously all supported trays from one support level to the next support level by successive actuating operations. The rack comprises a base, a fixed pair of multilevel tray-supporting structures fixedly mounted laterally opposite each other on the base. These structures, one on each side of the trays to be supported, are adapted to releasably engage and support at predetermined vertically spaced levels the laterally opposite sides of trays received between them. The rack also comprises a pair of movable multilevel tray-supporting structures, one of the two being adjacent one of the fixed tray-supporting structures, and the other of the movable pair being adjacent the other of said fixed tray structures for releasably engaging and movably supporting the laterally opposite sides of trays received therebetween in fixed vertically spaced relationship at and between adjacent levels of support provided by the fixed supporting structures and for passing supported trays from supported engagement at one level of the fixed supporting structures to the next higher level of supported engagement. The two movable supporting structures are interconnected to each other and to an actuating lever whereby a single stroke of the operating lever moves both movable tray-supporting structures together in the direction from one tray support level of the fixed supporting structures to the next higher of such levels.

The movable supporting structures comprising lifting columns **22** connected at their lower ends by yokes **24** may be provided with tray supports such as independently movable tray supports **21** described in connection with the fixed tray-supporting structures rather than the type described comprising plates **34**. Indeed, other than tray-supporting means may be used on both the fixed and movable tray supporting structures so long as they provide the cooperative operation and relationship of the fixed and movable tray-supporting structures found in the preferred embodiment described above.

The operation of the rack embodying this invention described above may be carried out with wire baskets, pans, or the like as well as the trays shown and mentioned in connection with the preferred embodiment. Also, the invention is not, of course, limited to a rack having any particular number of tray-supporting levels including the number illustrated in the preferred embodiment. Finally, it will be understood that the foot treadle operation could easily be converted to hand operation by appropriate extensions and handle additions to the structure shown and described.

Those skilled in the art will appreciate that various changes and modifications can be made in apparatus described herein without departing from the spirit and scope of the invention.

I claim:

1. A rack for supporting a plurality of trays at vertically spaced levels and for successively lifting simultaneously all supported trays from one support level to the next support level by repeated actuating operations, said rack comprising

a base,

a fixed pair of multilevel tray-supporting structures fixedly mounted laterally opposite each other on said base for releasably engaging and supporting at predetermined vertically spaced levels the laterally opposite sides of trays received therebetween, said fixed pair of tray-supporting

structures comprising two laterally spaced, vertical posts fixed to said base, a plurality of independently movable tray supports vertically aligned and mounted on each of said posts at corresponding predetermined support levels, each of said movable tray supports comprising a fixed horizontal aligned guide, a slide freely slidable in said guide toward and away from the other of said tray supporting structures and to and between extended tray-engaging and retracted disengaging positions, means resiliently biasing said slides to their extended engaging and supporting position, said slides having a projecting inclined camming surface adapted to cam said slide into its retracted position against the force supplied by said resilient biasing means upon application of an upwardly directed force,

a pair of movable multilevel tray-supporting structures, one of said pair being adjacent one of said fixed tray-supporting structures and the other of said pair being adjacent the other of said fixed tray structures, for releasably engaging and movably supporting the laterally opposite sides of trays received therebetween in fixed vertically spaced relationship at and between adjacent levels of support of said fixed supporting structures and for passing supported trays from supported engagement at one level of said fixed supporting structure to the next higher level of supported engagement, said movable supporting structures being interconnected to each other and to an actuating lever for moving said movable tray-supporting structures together the distance between adjacent support levels and in the direction from one tray support level of said fixed supporting structures to the next higher of such levels.

2. A rack for supporting a plurality of trays at vertically spaced levels and for successively lifting simultaneously all supported trays from one support level to the next support level by repeated actuating operations, said rack comprising

a base,

a fixed pair of multilevel tray-supporting structures fixedly mounted laterally opposite each other on said base for releasably engaging and supporting at predetermined vertically spaced levels the laterally opposite sides of trays received therebetween,

a pair of movable multilevel tray-supporting structures, one of said pair being adjacent one of said fixed tray-supporting structures and the other of said pair being adjacent the other of said fixed tray structures, for releasably engaging and movably supporting the laterally opposite sides of trays received therebetween in fixed vertically spaced relationship at and between adjacent levels of support of said fixed supporting structures and for passing supported trays from supported engagement at one level of said fixed supporting structure to the next higher level of supported engagement, said movable supporting structures being interconnected to each other and to an actuating lever for moving said movable tray-supporting structures together the distance between adjacent support levels and in the direction from one tray support level of said fixed supporting structures to the next higher of such levels, said movable tray-supporting structures comprising a generally U-shaped lifting assembly having a pair of laterally spaced-apart longitudinally extending lifting columns passing through and movable up and down with respect to said base, a horizontal yoke element connecting the lower ends of said lifting columns together beneath said base for holding said columns in a fixed lateral relationship and for engagement with stops having a fixed relationship with the underside of said base upon operation of said actuating lever to insure the equal elevation of said connected lifting columns, and tray-supporting and engaging means mounted on each of said lifting columns and each movable between extended tray-engaging and supporting and retracted disengaging positions, biasing means tending to urge said tray-engaging means toward the extended position, said tray-engaging and supporting means adapted to be cammed into its retracted position against the force of said biasing means upon application of an upwardly directed force.

3. The rack according to claim 2 in which said tray-engaging and supporting means are spaced on said lifting column to support trays engaged by them at vertical intervals corresponding to the intervals between the tray support levels provided by said multilevel tray-supporting structures and in which said lifting columns are movable up and down a distance at least slightly greater than the intervals between said tray support levels.

4. The rack according to claim 2 in which said movable tray-engaging supporting means comprises a plate slidably mounted on and associated with each lifting column by at least two inclined slots in said plate and associated pins extending from its associated column and received in their associated slots to permit said plates lifting assembly of one of said movable tray-supporting structures to move in one direction upwardly and away from the other of said movable tray-supporting structures to a retracted position and in the opposite direction t an extended position, each of said plates having a plurality of projections spaced up and down said plates at intervals corresponding to the spacing of said tray support levels of said fixed tray-supporting structures and extending from one toward the other of said movable tray-supporting structures, each of said projections having an inclined cam adapted to cam said projection and the plate it comprises into its retracted position upon application of an upwardly directed force.

5. The rack according to claim 1 in which each of said movable tray-supporting structures comprises

a generally U-shaped lifting assembly having a pair of laterally spaced-apart longitudinally extending lifting columns passing through and movable up and down with respect to said base,

a horizontal yoke element connecting the lower ends of said lifting columns together beneath said base for holding said columns in a fixed lateral relationship and for engagement with stops having a fixed relationship with the underside of said base upon operation of said actuating lever to insure the equal elevation of said connected lifting columns,

and tray engaging and supporting means mounted on each of said lifting columns and each movable between extended tray engaging and supporting and retracted disengaging positions, biasing means tending to urge said tray engaging means toward the extended position, said tray-engaging and supporting means adapted to be cammed into its retracted position against the force of said basing means upon application of an upwardly directed force.

6. The rack according to claim 5 in which said vertical posts and said lifting columns comprise longitudinally extending channel sections, each having an open-channeled face and a flat face, and in which each post has lifting column associated with it, the open-channeled faces of associated posts and lifting columns facing toward each other and fitted together for guiding engagement of the movable lifting columns by the fixed posts during relative longitudinal movement between them, and with the flat faces of associated posts and lifting columns facing away from each other, said movable tray supports being mounted on the flat faces of said posts and said tray engaging and supporting means being mounted on the flat faces of said lifting columns.

7. A rack for supporting a plurality of trays at vertically spaced levels and for successively lifting simultaneously all supported trays from one support level to the next support level by repeated actuating operations, said rack comprising

a base,

a fixed pair of multilevel tray-supporting structures fixedly mounted laterally opposite each other on said base for releasably engaging and supporting at predetermined vertically spaced levels the laterally opposite sides of trays

received therebetween, said fixed pair of tray-supporting structures comprising two laterally vertical posts of channel cross section having an open-channeled face and a flat face, said posts being fixed to said base, and a plurality of independently movable tray supports vertically aligned and mounted on the flat face of each of said posts at corresponding predetermined support levels, and

a pair of movable multilevel tray-supporting structures, one of said pair being adjacent one of said fixed tray-supporting structures and the other of said pair being adjacent the other of said fixed tray structures, for releasably engaging and movably supporting the laterally opposite sides of trays received therebetween in fixed vertically spaced relationship and and between adjacent levels of support of said fixed supporting structures and for passing supported trays from supported engagement at one level of said fixed supporting structure to the next higher level of supported engagement, said movable supporting structures being interconnected to each other and to an actuating lever for moving said movable tray-supporting structures together the distance between adjacent support levels and in the direction from one tray support level of said fixed supporting structures to the next higher of such levels, each of said movable tray-supporting structures comprising a lifting column associated with each of said posts and passing through and movable up and down with respect to said base, said lifting columns being of channel cross section having an open-channeled face and a flat face, and a plurality of tray engaging and supporting means mounted on the flat face of each of said lifting columns at vertically spaced intervals corresponding to said predetermined support levels, the open-channeled faces of associated posts and lifting columns facing toward each other and fitted together for guiding engagement of the movable lifting columns by the fixed posts during relative longitudinal movement between them.

# UNITED STATES PATENT OFFICE
# CERTIFICATE OF CORRECTION

Patent No. 3,591,015 Dated July 6, 1971

Inventor(s) Blaise d'Anka

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

Title Page, change the inventor's name from "Blasie d'Anka" to --Blaise d'Anka--.

Abstract, line 5, change "form" to --from--.

Column 3, line 26, after "inwardly" insert --and--.

Column 5, lines 22 and 23, change "and their plates 34 be 4 5/8 inches" to read --and their plates 34 be 4-5/8 inches--;

line 23, after "from" insert --a--.

Column 7, line 6, change "horizontal" to --horizontally--.

Column 8, line 22, change "direction t an extended position" to read --direction to an extended position--.

Signed and sealed this 25th day of January 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

FORM PO-1050 (10-69)

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