

[54] CONTAINER FOR RECEPTACLES

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[51] Int. Cl. .... B65d 7/20, B65d 25/10, B65d 25/06

[58] Field of Search ..... 220/19, 20, 21; 217/19,  
217/20, 21, 22

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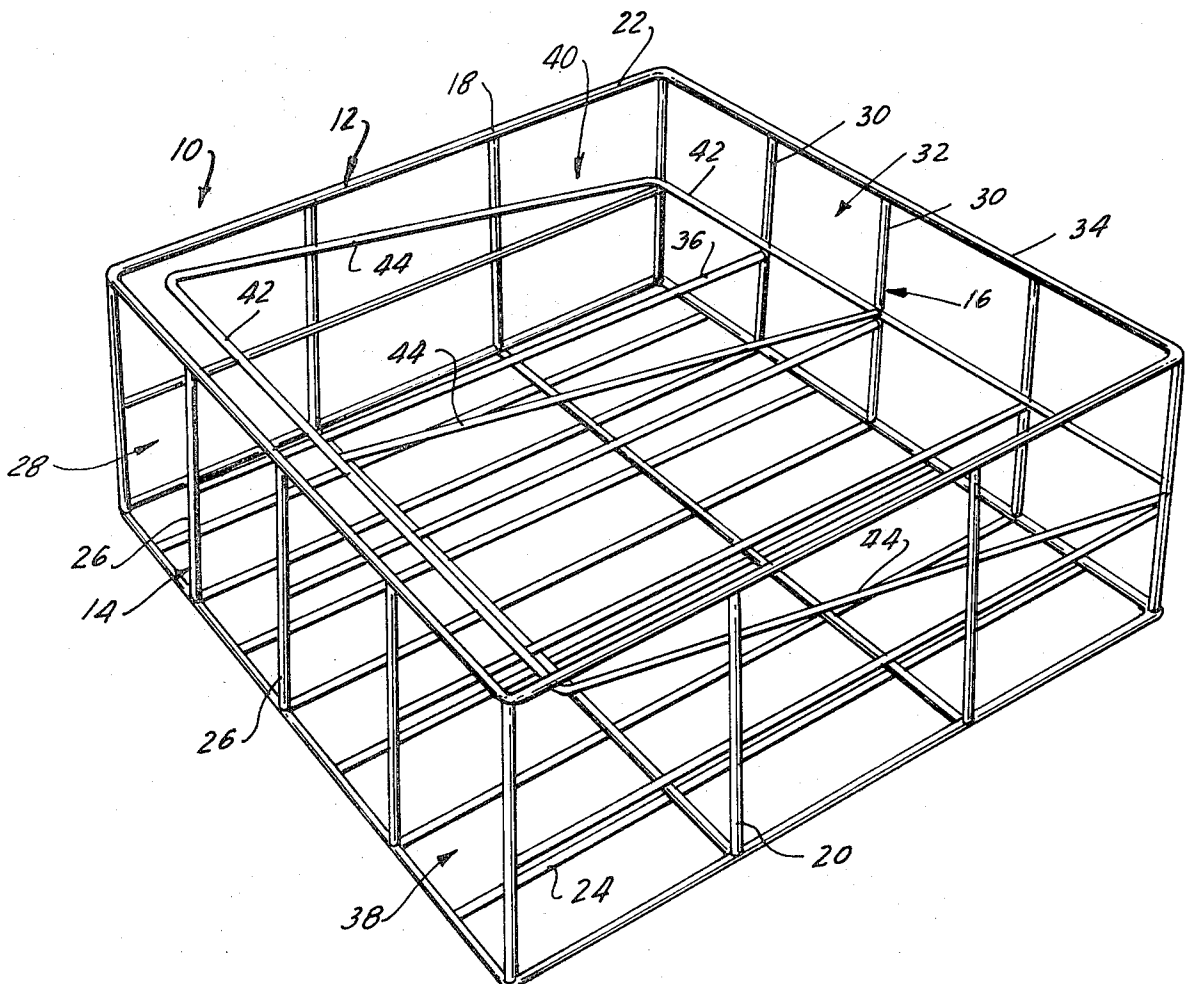
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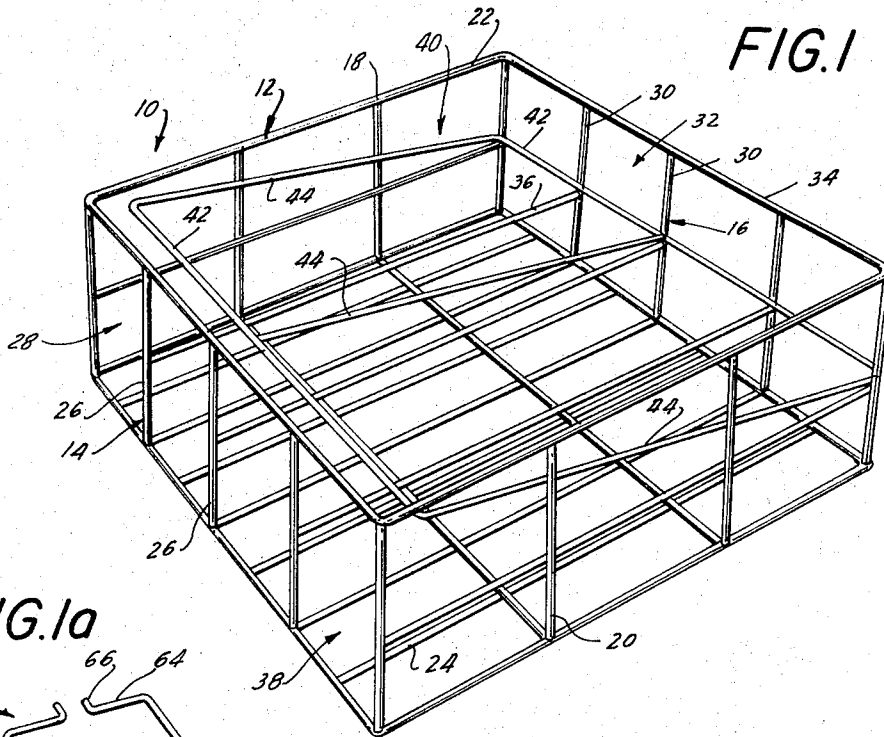
Primary Examiner—George E. Lowrance  
Attorney, Agent, or Firm—Curtis, Morris & Safford

[57] ABSTRACT

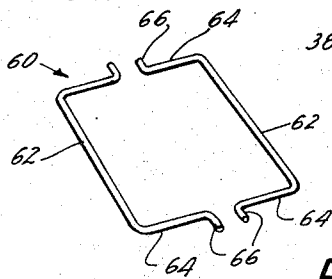
A container for storing, transporting and distributing receptacles which is adapted to be automatically loaded and unloaded is formed as a parallelepiped frame having a floor and a plurality of lateral sides. The frame is open at its top side opposite the floor and defines a hollow chamber for containing a plurality of individual receptacles. A plurality of divider members extend between one pair of opposed frame sides and divide the cavity into a plurality of internal channels extending between the opposed frame sides. At least one of the frame sides has a plurality of openings therein corresponding in number to, and aligned with, the channels defined in the cavity, with the openings extending from the floor of the container to a position adjacent its top edge in order to permit receptacles to pass therethrough into the channels. Blocking means are provided in the cavity adjacent the openings in its side wall for selectively blocking and unblocking the openings so that when the openings are unblocked, receptacles may pass therethrough into the channels and when the openings are blocked, receptacles in the channel are prevented from movement through the openings out of the cavity. A machine is also disclosed for loading and unloading these containers and is adapted to do so when the containers are in a stack.

10 Claims, 25 Drawing Figures

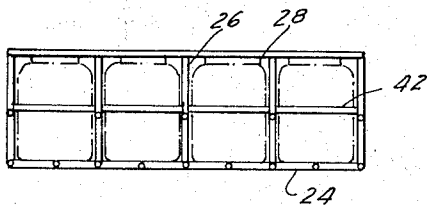




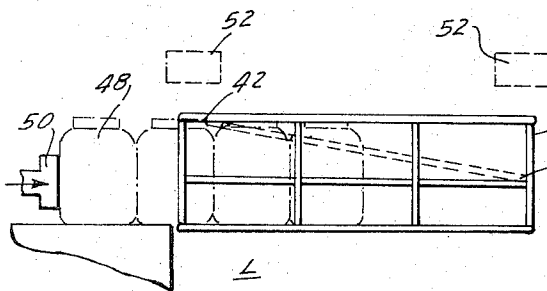
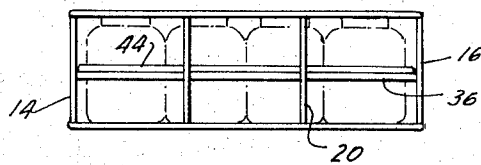
**FIG. 1a**



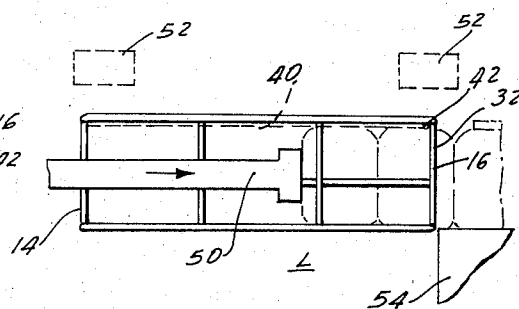
**FIG. 2**



**FIG. 3**



**FIG. 4**



**FIG. 5**

FIG. 6

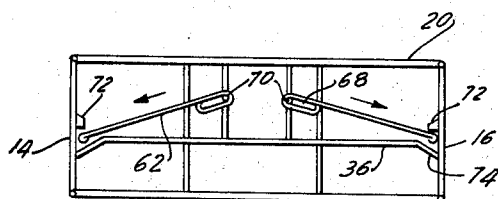


FIG. 7

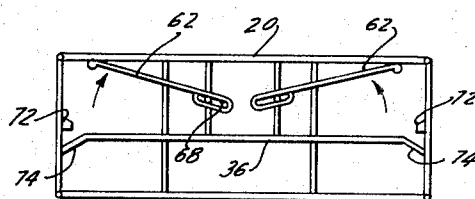
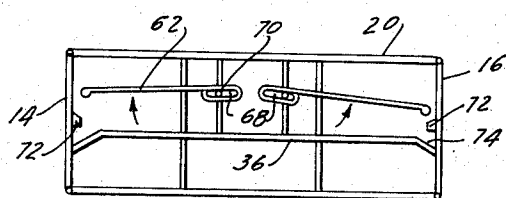
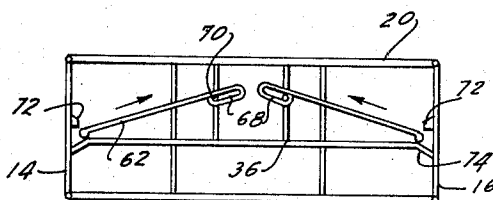


FIG. 8

FIG. 9

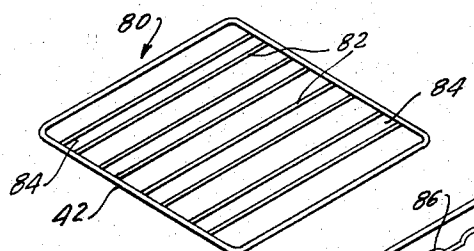


FIG. 10

FIG. 11

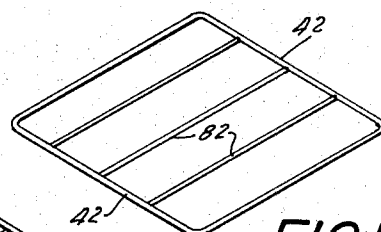
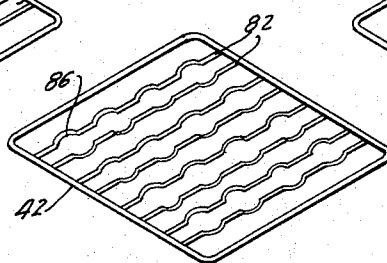


FIG. 12

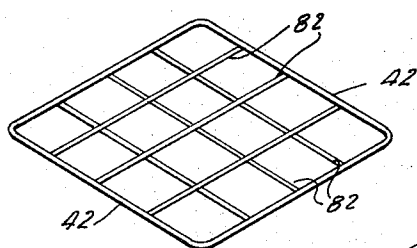


FIG. 13

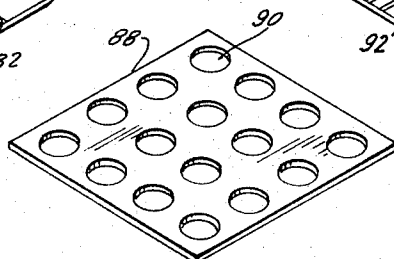


FIG. 14

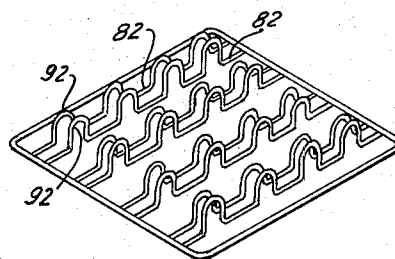


FIG. 15

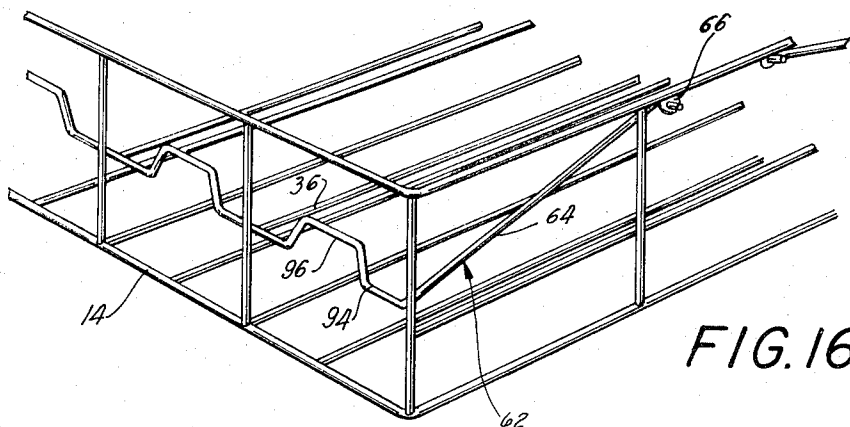


FIG. 16

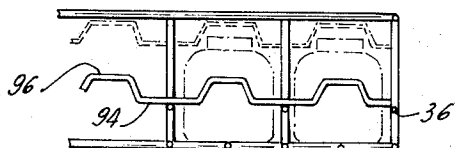


FIG. 17

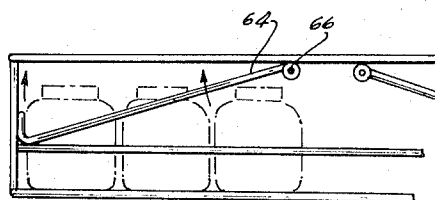


FIG. 18

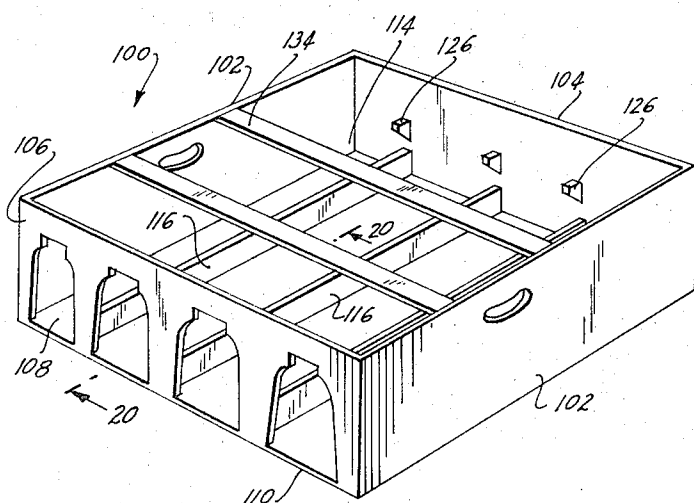


FIG. 19

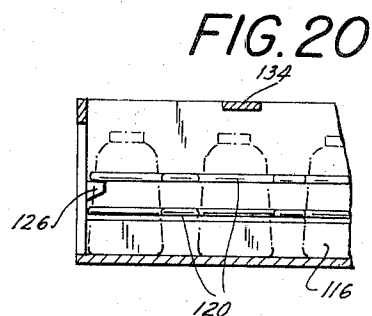
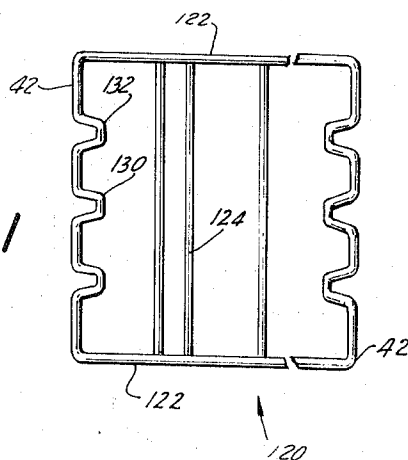


FIG. 20

FIG. 21



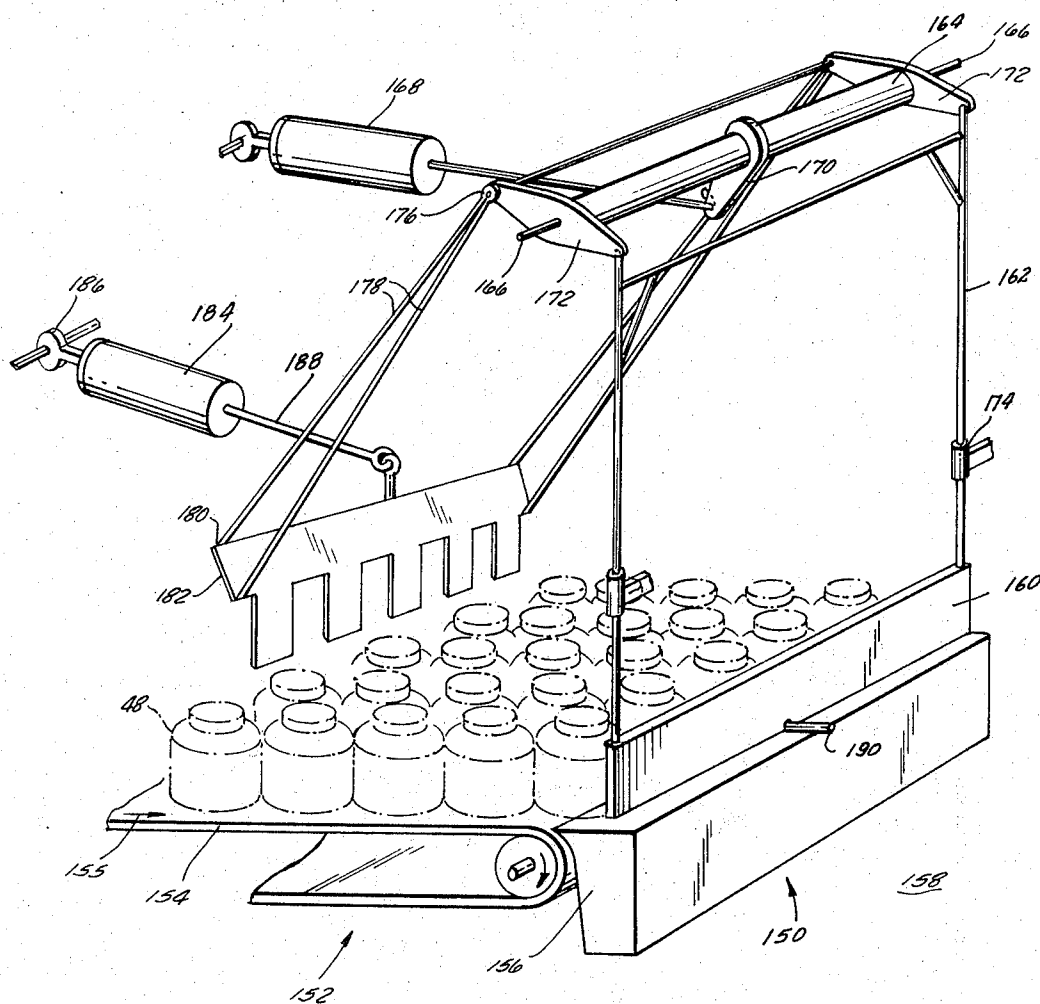


FIG. 22

FIG. 23

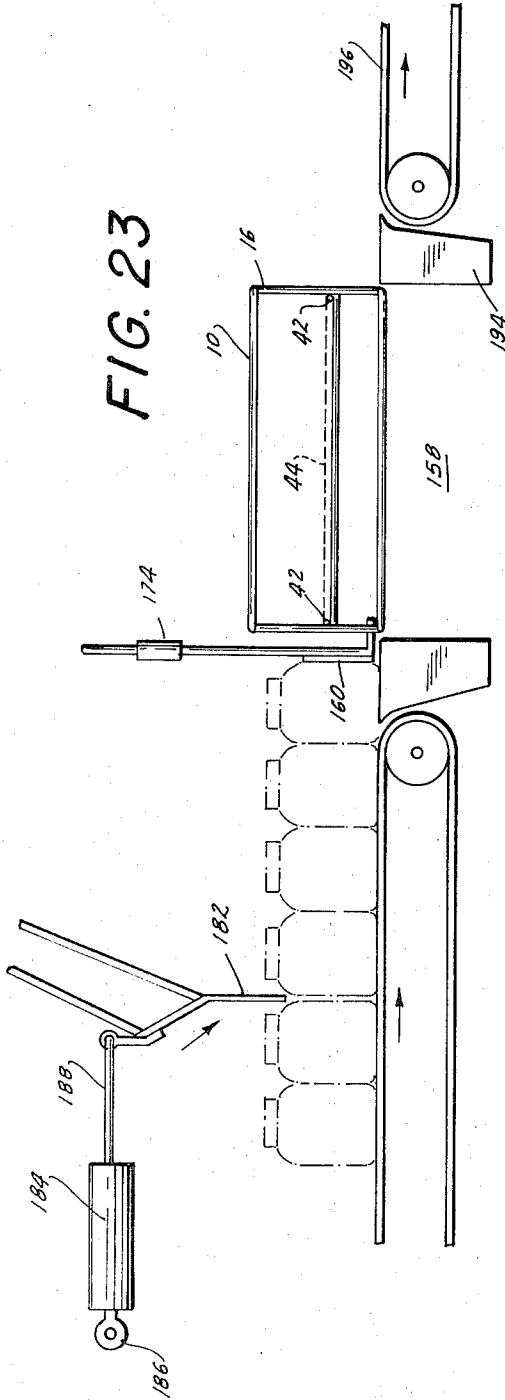
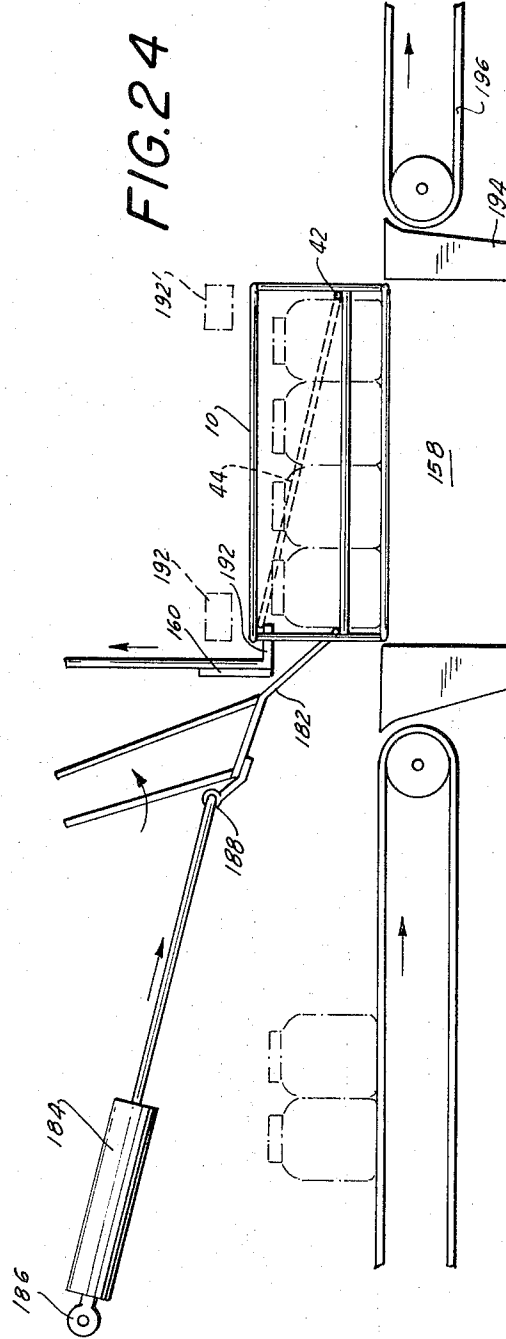


FIG. 24



## CONTAINER FOR RECEPTACLES

The present invention relates to containers for holding a plurality of individual receptacles or the like and more particularly to a container which is adapted to be loaded and unloaded automatically when the containers are arranged in a stack.

In prior container packaging systems, that is, in systems wherein a plurality of articles such as bottles or the like are to be placed in a container or case having an open top, a series of manual or automatic, time consuming operations are required in order to fill the containers. This is due to the fact that typically, the empty containers or cases are normally supplied in stacks, one upon the other, and these stacks must then be manually separated and placed in single file on a conveyor with their tops exposed so that receptacles, bottles or the like can be either manually or automatically placed in the container. After the individual containers or cases are filled, they must then be restacked for storage, shipment, and distribution.

This plurality of operations, whether manual or automatic, which are required to separate stacks of containers and then restack the filled containers is a time consuming and expensive operation which should be avoided.

Accordingly, it is an object of the present invention to automatically load and unload stacks of containers or cases while in a stack.

Yet another object of the present invention is to provide a container or case for holding receptacles for storage, transportation, and distribution which can be automatically loaded and unloaded while in a stack.

Yet another object of the present invention is to provide a machine for automatically loading and unloading such containers.

A further object of the present invention is to provide a container or case which is adapted to be automatically loaded and unloaded while in a stack and which is relatively inexpensive to manufacture and economical in use.

Still a further object of the present invention is to provide a machine for filling such containers or cases which is relatively inexpensive to manufacture and operate and which can rapidly load and unload such containers when in a stack.

In accordance with an aspect of the present invention, a container or box for carrying receptacles is provided, which can be loaded and unloaded automatically along at least one of its sides so that the container can be loaded and unloaded while it is in a stack of such containers. A container of this type represents a substantial advance in the packaging art because of its inestimable value and usefulness in reducing the space required for the packaging and unloading operations. In addition, it affords a substantial reduction in the number of steps heretofore required for loading and unloading containers. A further important factor is the result of savings in labor required for the accessory handling steps previously required in such packaging methods.

More particularly, the present invention provides a container or case which is in the shape of a parallelepiped box formed from a wood frame, metal rods, or plastic or cardboard panels. The container is adapted to hold a plurality of receptacles of reduced height, such as for example, pots, jars, bottles of small height

for public consumption, and other types of containers, in the same general manner as a conventional soda bottle case. The sides of the container for these receptacles are slightly taller than the height of the receptacles to be placed therein and at least one of its sides has a plurality of openings therein through which the receptacles to be stored or transported can be introduced. A plurality of guide or divider members are secured with the interior of the container or case and extend between the side of the box having the openings therein and an opposed side thereof to define individual channels in the box so that receptacles or bottles can be passed through the openings in the side wall and guided in alignment with one another along as many channels as there are openings. The receptacles can be manually removed through the same openings as those through which they are introduced, or alternatively additional openings can be provided on the opposite side of the device so that receptacles already in the container can be pushed directly through the container and out the other side. Of course, removal of individual receptacles by the user or purchaser of the filled container can be effected directly through the open top side of the container.

In either case, the container is equipped with a removable blocking means of various configurations, more fully described hereinafter, which prevent the passage of receptacles from the interior of the container through the openings in the side walls once the containers have been placed therein. The blocking means are mounted for movement in a generally vertical direction with respect to the side walls, so that the openings in the side walls can be selectively blocked or unblocked in order to selectively retain receptacles in the container or permit the container to be loaded or unloaded as desired.

The blocking means can take a variety of configurations, one of which can simply be a generally U-shaped frame member pivotally mounted at its ends to the exterior frame of the container with its bight portion adjacent the openings in the side wall and resting upon the divider members of the container. In the down position, with the bight portion thereof resting upon the device, the bight portion of the bar crosses the openings in the side wall and prevents discharge of receptacles from the container through the openings. On the other hand, when it is desired to fill the container, the bight portion is merely raised by pivoting the frame about its pivotal connection so that the bight portion frees the openings to permit passage of receptacles therethrough. Various other embodiment of blocking members will be described more fully hereinafter.

The present invention also encompasses the use of a machine for loading and unloading the above-described containers so that the containers can be loaded and unloaded through their sides while they are in a stack. As mentioned above, previously proposed loading operations for containers having open tops required a number of manual steps in unstacking and restacking the unfilled and filled containers during the loading operation. This, of course, required a substantial amount of manual labor especially in those cases where the containers are required to be presented to a loading station in single file with their tops exposed. While some automatic container filling devices have been proposed which reduce the amount of manual labor needed, these devices require large investments

in mechanical equipment and therefore have not been found to be particularly practical in use.

The machine of the present invention overcomes these problems by a relatively simple construction in which a horizontal conveyor is provided for bringing the packages or receptacles to be loaded into the containers to a loading station in parallel rows. At the loading station a single container, or plurality of containers in a stack, are located with the container to be loaded having its base in horizontal alignment with the feeding conveyor. At the end of the conveyor adjacent the loading station a vertically displacable barrier plate is provided which, in its lower position, prevents the receptacles from continuing their forward motion along the conveyor. The barrier is automatically lifted by a simple pneumatic operation which acts in accordance with a controlled sequence of steps so as to permit the passage of receptacles to the containers at the proper moment and to permit them to pass through the openings in its sides.

A pushing plate for advancing the receptacles from the conveyor into the containers when the barrier plate is raised is operated in synchronization with the barrier plate so that upon vertical upward movement of the barrier the pusher plate moves downwardly across the width of the conveyor and between receptacles thereon. After the barrier plate is moved to its full elevation above the conveyor, the pusher plate urges receptacles on the side thereof towards the loading station through the openings in the container at the loading station in order to fill that container. In this manner a container is filled through its side and not through its opened top portion as occurs in previously proposed arrangements. As a result, it is possible for the containers to be presented at the loading station in a stack, for example on the fork lift of a movable truck, so that every time an individual container is filled, the lift is raised, and the next container is in position to receive receptacles. This operation continues until the stack is completely filled.

In another embodiment of the invention the machine is supplied with an additional conveyor on the side of the loading station opposite the first mentioned conveyor. This additional conveyor is provided when the container to be filled has openings on opposite sides thereof and are filled with empty containers when presented at the loading station. In this case, when the openings on both sides of the containers are freed (i.e., when the blocking means on both sides of the containers are moved to a position wherein the openings in the sides of the containers are free) the filling operation of receptacles on the first conveyor forces the empty receptacles already in the containers through the openings in the opposed side wall and onto the second conveyor where they are discharged from the loading station.

The machine of the present invention is also supplemented with a variety of systems for lifting the blocking bars of the containers so that the receptacles can freely pass through the openings therein. Such lifting means may be of a simple mechanical type secured to the barrier plate for engaging the blocking bar of the blocking means upon upward movement of that plate. Alternatively, magnetic devices can be positioned adjacent the loading station and actuated upon upward movement of the barrier plate in order to magnetically attract the

blocking bars upwardly past the openings in order to permit loading and unloading of the containers.

The above, and other objects, features and advantages of this invention will be apparent in the following detailed description of illustrative embodiments thereof which are to be read in connection with the accompanying drawings, wherein:

FIG. 1 is a perspective view of a container constructed in accordance with one embodiment of the present invention;

FIG. 1a is a schematic perspective view of one embodiment of a blocking means adapted for use in the container of FIG. 1;

FIG. 2 is a front elevational view of the container of FIG. 1 illustrating the openings through which the receptacles pass into the container;

FIG. 3 is a side elevational view of the container of FIG. 1;

FIG. 4 is a schematic illustration of the manner of loading the container illustrated in FIG. 1;

FIG. 5 is a side view similar to FIG. 4 illustrating the configuration of the device during unloading of the container;

FIGS. 6 through 9 are side elevational views of another embodiment of the present invention;

FIGS. 10 through 15 are schematic perspective views of other suitable blocking means adapted to be used with the container of FIG. 1;

FIG. 16 is a partial schematic perspective view of the container of FIG. 1 with yet another receptacle blocking means therein;

FIG. 17 is a partial front elevational view of the container illustrated in FIG. 16;

FIG. 18 is a partial side elevational view of the container illustrated in FIG. 16;

FIG. 19 is a perspective view of yet another embodiment of the container of the present invention;

FIG. 20 is a partial sectional view taken along lines 20-20 of FIG. 19 and illustrating a double receptacle blocking member;

FIG. 21 is a partial plan view of one of the receptacle blocking members utilized in the embodiment of FIG. 20;

FIG. 22 is a schematic perspective view of a machine constructed in accordance with one aspect of the present invention for loading and unloading receptacles from containers constructed in accordance with the invention;

FIG. 23 is a side elevational view of the machine illustrated in FIG. 22 during the preliminary phase of the filling operation; and

FIG. 24 is a side elevational view similar to FIG. 23 but illustrating the configuration of the apparatus at the completion of the loading operation.

Referring to the drawing in detail, and initially to FIG. 1 thereof, it will be seen that a container 10, constructed in accordance with one embodiment of the present invention, as shown therein, comprises a generally parallelepiped frame 12 formed from a plurality of metal bars or wires with front and rear sides 14, 16 and opposed lateral sides 18, 20, respectively. The container is open at its top 22 and has a base 24 formed from a plurality of metal bars of wires. Front side 14 is defined by a plurality of vertical bars 26 which define a plurality of receptacle inlet openings 28 through which receptacles may pass to the interior cavity formed by the receptacle. Similarly, the rear side 16 of



the container is formed by a corresponding number of vertical bars or wires 30 located in lateral alignment with bars 26 to define discharge openings 32 in the rear wall 16 (between the floor 24 and the upper edge frame member 34) that are in alignment with openings 28.

The interior of container 10 includes a plurality of longitudinally extending divider members or guides 36 which extend between the bars 26, 30 of front and rear walls 14, 16. These bars serve to divide the interior of the receptacle into a plurality of channels 38 extending between openings 28 and 32 and into which receptacles, bottles or the like may be placed. In addition, these bars serve to guide the receptacles as they are inserted into the container and to maintain the receptacles in alignment during storage, transportation and distribution.

Openings 28 and 32 are normally blocked by a frame member 40 which, in the embodiment illustrated in FIG. 1, is a generally rectangular open frame formed from rigid metal bars, wires or the like, having a configuration in plan which corresponds substantially to the open top of the container. Frame 40 includes end bars 42 which extend across front and rear sides 14, 16 of container 10 and a plurality of longitudinally extending frame members 44 which integrally interconnect bars 42. This frame normally rests upon dividers 36 (FIGS. 2 and 3), during storage, transportation and distribution of receptacles in the container, so that end bars 42 thereof span openings 28 and 32 and prevent passage of receptacles through these openings either into or out of the container.

When it is desired to load a container 10, bar 42 adjacent front side 14 is raised, as illustrated schematically in FIG. 4, so as to move the bar away from openings 28, thereby freeing the openings to permit passage of receptacles 48 therethrough under the influence of a pusher 50. Bar 42 can be raised in any convenient manner, such as for example manually, or by magnetic attractors 52 located at the loading station L. These attractors are activated when it is desired to fill container 10 so that bar 42 is attracted upwardly away from openings 28. As illustrated in FIG. 4, with this arrangement bar 42 adjacent rear wall 16 remains down so that the receptacles cannot be pushed out or fall from container 10.

If container 10 is already filled with empty receptacles, rear bar 42 can also be raised, as illustrated in FIG. 5, (as for example by a magnet 52) so that the empty receptacles can pass through openings 32 in the rear of the container onto a discharge platform or conveyor 54. Pusher 50 can be of any convenient construction, as would occur to those skilled in the art, such as for example a pneumatic ram or the like; however, a specialized machine, more fully described hereinafter, has been developed for this purpose.

As would be understood from the illustrations in FIGS. 4 and 5, containers 10 can be presented at loading station L in a stacked formation without interference with the loading operation since the containers are loaded through their sides. Accordingly, a number of containers can be presented at the loading station on any type of vertically movable device, such as the fork lift of a truck, and merely be vertically displaced after each container is filled for the next loading operation. This, as mentioned above, greatly reduces the amount of machinery required for filling containers of this type and while also reducing the number of manual opera-

tions required to stack and unstack containers during the filling operation.

In accordance with another embodiment of the receptacle blocking means utilized in the present invention there is schematically illustrated in FIG. 1a a receptacle blocking system 60 including a pair of generally U-shaped frame members 62 having leg portions 64 whose ends 66 are adapted to be pivotally connected to the frame 10. With the bight portions of U-shaped members 62 positioned adjacent the openings in front and rear walls 14, 16, it is seen that the frame 62 provides the same function as the previously described frame 40. In order to free the openings 28 in front wall 14, the bight portion of frame 62 is merely lifted with respect to openings 28 by pivoting the frame member about its connections 66. In this manner either or both of the frame members may be lifted to free the openings in the front and rear walls as may be desired.

As a further variation of the receptacle blocking members of the present invention, the U-shaped frame members 62 can be provided with generally elongated openings or eyelets 68 (FIGS. 6-9) at their ends in lieu of the extensions 66. These eyelets can be pivotally mounted on studs 70 secured to the opposed side walls 18, 20 of the container 10 (only side 20 of which is seen in FIGS. 6 through 9) so that the frame members can, while pivoting, also simultaneously move laterally within the container in the direction illustrated by the arrows in FIGS. 6 and 7. This arrangement permits the use of stop members 72 on front and rear walls 14, 16 which prevent lifting of the bight portions of the frame members during storage, transportation and distribution of the containers.

During normal use of the container, i.e., when it is in the configuration illustrated in FIG. 9, the action of gravity will cause the frame members 62 to pivot downwardly so that their bight portions will extend below stop members 72. For this purpose, guide or divider members 36 can have their ends 74 bent downwardly in order to accommodate the bight portions of the frame.

When it is desired to load or unload the container illustrated in FIG. 6, it is first necessary to move the frame members laterally, as illustrated in FIG. 7, to free the bight portions thereof from beneath stops 72 and then pivot them upwardly as illustrated in FIGS. 8 and 9. The frame members, as in the embodiment of FIG. 1a, can be operated independently or simultaneously, and either automatically or manually as desired.

In lieu of the pivoting frame members in FIGS. 1a and 6-9, rigid frame members, similar to that illustrated in FIG. 1, can be used and this type of frame can have a large number of variations in order to carry out a variety of functions and to fasten or securely hold the receptacles within the container. Some of these variations have been illustrated in FIGS. 10-15, but it is to be understood that, within the inventive concept of the present invention, other variations are possible and the disclosed variations are not intended in any way to limit the scope of protection of the invention.

Referring to FIG. 10, there is illustrated a receptacle blocking frame 80, which has pairs of guide members 82 mounted between blocking bars 42 thereof to define spaces 84 therebetween for receiving receptacles placed in the container. This type of arrangement is preferably used with bottles having a small neck, for example, beer bottles, since members 82 will act as guides

on either side of the neck to hold the receptacles or bottles in a relatively fixed position in the container during shipment and distribution. In a similar embodiment, illustrated in FIG. 11, guide rods 82, extending between blocking bars 42, can have curved sections 86 therein to better receive and conform to the curvature of the receptacle neck or body and thereby obtain a better purchase or grip on a receptacle within the container to hold it in a stable position.

FIG. 12 illustrates a configuration wherein bars 82 are more widely spaced than illustrated in FIG. 10 for the retention of bottles having larger necks or which have no necks and are merely cylindrical, or even square, such as for example, beer cans or milk cartons.

The reticulated configuration of bars 82 illustrated in FIG. 13 is also suitable for use when glass jars and cylindrical receptacles are used since the square spaces defined by the bars in this case define individual spaces for each of the receptacles or bottles placed in the container and help to prevent the bottles from moving against one another during transportation and shipment of the container.

FIG. 14 represents a similar concept, however, instead of a wire frame, such as those of the above described embodiments, a flat plate 88 formed of plastic, wood, cardboard or the like, is utilized having a plurality of circular shaped openings 90 therein which are adapted to receive individual receptacles. In yet another embodiment of the blocking frame the wires or bars 82 can be provided with bent or arcuate portions 92 which extend vertically with respect to the frame to form clamping faces between which the receptacles within the container are firmly held in order to avoid movement of the receptacle in any direction.

Another embodiment of the pivotal blocking bars illustrated in FIG. 1a is shown in FIG. 16, which embodiment is particularly suitable for use when receptacles having a small height or a neck are to be carried in container 10. In this embodiment bight portions 94 of the frames 62 are each provided with a series of inverted U-shaped bends 96 therein. These bends provide a broad surface, as illustrated in solid lines in FIG. 17, to prevent movement of the receptacles from container 10 when they are in the down position, with bight portion 94 resting on the guide members 36. In the raised position, bends 96 permit passage of the neck portions of the receptacles 48 so that the container can be filled or unfilled as required.

Referring now to FIGS. 19 through 21 there is illustrated another embodiment of the present invention in which the container 100 is formed from panels of a solid material and in which yet another receptacle blocking arrangement is utilized. It is to be understood, however, that the receptacle blocking arrangement illustrated in this embodiment can be utilized in the wire containers discussed above and that the receptacle blocking arrangements discussed above can be utilized with the solid container 100 to be presently described.

Container 100 has solid or closed side walls 102 and a solid rear wall 104. The front wall 106 of container 100 has a plurality of apertures 108 therein which have a generally complementary configuration to the configuration of the receptacles to be placed in the container. The container also includes a base 110 which encloses the bottom of the container and top 112 of the container being open. In this case the container side walls and base can be formed of plastic, wood, or other suit-

able conventional materials for additional strength and stability.

In either case, the container is divided into channels 114 by a plurality of dividing members 116 which extend between front and rear walls 106, 104, between openings 108. These divider members serve as guides in the container, in a manner similar to the guides 36 discussed above, and also serve to support one of the receptacle blocking frames 120. In this embodiment two blocking frames 120 are utilized, which frames are of substantially complementary configuration. The lowermost of the blocking frames is illustrated in FIG. 21, and as seen therein, the frame includes blocking bars 42 and side members 122 extending therebetween, with additional rigidifying bars 124 extending between members 122.

The lowermost of the receptacle blocking frames rests on guide members 116, as mentioned above, and the upper of the guide members rests on a plurality of aligned support members 126 secured on front wall 106 and rear wall 104. The blocking frame members of this embodiment operate substantially in the same manner as the frame member illustrated in FIGS. 1-5, that is the ends of the frame members at blocking bars 42 can be lifted as illustrated in FIGS. 4 and 5 in order to permit passage of receptacles 130 through the openings 108 in the container. In order not to obstruct the upward movement of blocking bar 42 of the lowermost of frames 120, that frame has a plurality of bends or recesses 132 formed therein to permit that portion of the frame to pass the stops 126 as it is moved upwardly.

As a further feature of the invention, in order to prevent receptacle blocking frames 120 from being inadvertently removed from container 100, the container can be provided with an open cover formed with lath or cross members 134. These members will prevent the inadvertent removal of the frame members from the container but of course would permit complete removal therefrom when desired. Alternatively, a mesh-like cover or even a closed cover can be placed on the container to prevent the removal of both the receptacle blocking frames and the receptacles themselves, if that is desired.

Again, with the embodiment illustrated in FIGS. 19-21 it is also contemplated that the rear wall 42 have openings 108 therein complementary to the configuration of the receptacles 148 to be transported by the container so that the container can be loaded and unloaded automatically in a manner similar to that described above with reference to FIGS. 4 and 5. In addition, it is to be understood that the channels 114 formed in container 100 and the channels 38 formed in the container of FIG. 1 can be of a variety of sizes within the same container, depending upon the location of the divider members placed therein. In that case the containers would be adapted to be automatically loaded and unloaded with several sizes of receptacles as may be desired.

Referring now to FIGS. 22-24 of the drawings, a machine 150 is schematically illustrated which is adapted to carry out the loading and unloading operation of containers constructed in accordance with the present invention. As seen in FIG. 22, machine 150 includes a relatively flat horizontally extending conveyor 152 which may be of conventional construction, such as, for example, a conveyor formed of metal links, known as "Rex" chains or the like or they may alternatively be

of rubber or cloth, in accordance with the requirements of the particular application to which the machine is to be placed. Conveyor 152 has an upper flight 154 moving in the direction of the arrow 155 which is generally coplanar to an end platform member 156. The latter is adjacent a loading station 158 at which the containers 10 are located either individually or in a stack, with their opened front sides facing conveyor 152. A flat barrier plate 160 is positioned above member 156 and is pivotally connected through rods 162 to a rocker arm 164 for vertical reciprocal motion in the direction of the arrows between a lowermost position wherein the plate is against member 156 and an uppermost position illustrated in FIG. 24. Rocker arm 164 is pivotally mounted on pivots 166 in a support frame (not shown) and is oscillated about pivots 166 by a conventional pneumatic ram 168, through a crank 170 rigidly secured to rocker 164. Links 162 are pivotally connected to crank arms 172, rigidly secured to rocker arm 164, and upon oscillation of rocker 164 arms 172 cause barrier plate 160 to move in a vertical direction. Bars 162 are guided to assure vertical movement by a conventional guide system 174, schematically illustrated in FIG. 22.

The opposite sides of crank arms 172 are respectively connected to a pair of support bars 178. The latter, at their ends 180, are rigidly secured to a pusher plate 182 which is adapted to engage the receptacles 48 passing therebelow on conveyor flight 154.

In the operation of the device, pneumatic ram 168 is initially activated to oscillate rocker arm 164 in a counter-clockwise direction (as seen in the drawings), thereby causing barrier plate 160 to move upwardly from the position illustrated in FIG. 24. As barrier plate 160 moves upwardly, pusher plate 182 moves downwardly because of its pivotal connection to crank arms 172 on the side thereof opposite barrier plate 160. This causes pusher plate 182 to move downwardly, as illustrated in FIG. 23, in between a series of receptacles 48 on conveyor flight 154. It is noted that the distance between barrier plate 160 and pusher plate 182 is predetermined so that only the number of receptacles required to fill container 10 will fit therebetween and be pushed by the pusher plate 182.

After barrier plate 160 has reached its uppermost position, illustrated in FIG. 24, pusher plate 182 is rocked forwardly about pivots 176 by a ram 184 which is pivotally connected at one end 186 in a support frame (not shown), with its actuator 188 at its other end pivotally connected to pusher plate 182 so that it does not interfere with vertical movement of the pusher plate during raising of the barrier plate and lowering of the pusher plate. When ram 184 is actuated, pusher plate 182 is pivoted forwardly about pivots 176, as mentioned above, so as to force receptacles 48 between the pusher plate and the barrier plate through the openings in the front wall of container 10 and therefore into the container. The actuation of rams 168 and 184 are in timed relation through a pneumatic control circuit, or other means, such as would be obvious to those skilled in the art.

It is noted that the receptacles can be supplied to conveyor flight 154 in rows corresponding to the number of openings in the containers to be loaded and that the pusher plate 182 has a series of fingers therein corresponding to each of the rows of the receptacles to be placed in the containers.

During the loading portion of the operation, conveyor 154 is preferably stopped by the control circuitry so that receptacles 48 behind the pusher remain in position and do not move forwardly during this period.

After container 10 is filled, ram 184 is retracted and barrier plate 160 is lowered. At this point, after pusher plate 182 is above receptacles 48 remaining on the conveyor, the conveyor is reactivated to bring additional receptacles into position adjacent barrier plate 160. The latter prevents the receptacles from moving off the conveyor until rams 168 and 184 are again actuated in sequence.

In order to raise the receptacle blocking means in containers 10, a finger or extension rod 190 is secured to the side of barrier plate 160 which faces loading zone 158. Finger 190 is located at the base of the barrier plate and thus when a receptacle 48 is placed adjacent the barrier, against support platform 156, the finger extends into the container below blocking bar 42. As the barrier plate is raised, the finger will engage the lower side of the blocking bar to lift the blocking bar into the position illustrated in FIG. 4 to permit passage of the receptacles 48 into the container 10. Alternatively, a magnetic device, schematically illustrated at 192 can be located in the machine adjacent the uppermost portion of the location of the containers 10 when at loading station 158 so that it will attract blocking bar 42 to an upward position during the filling operation.

In the event that the containers 10 which are supplied to loading station 158 have empty receptacles therein, the container can be automatically unloaded by the machine of the present invention by merely providing an apparatus similar to the barrier plate 160 and finger 190 on the opposite side of loading station 158 in order to lift the blocking bar 42 at the rear 16 of the container. Alternatively, a magnetic device 192' can be located in a position adjacent the rear side of the container when it is in loading station 158, to lift the rear portion of the barrier frame or the blocking bar 42 and thereby unblock the openings at the rear of the receptacle. In this case a platform 194 is provided adjacent the loading station with an auxiliary conveyor 196 that receives empty receptacles discharged from container 10 during the filling operation. As mentioned above, as the container is filled, the empty containers will be pushed therefrom by the filled containers.

The machine of the present invention can be programmed in accordance with the types and sizes of receptacles to be contained therein and also in accordance with a number of containers in each stack of containers. As a result, an operating unit is obtained which practically eliminates all manual labor, takes up only a small amount of space, and requires less space for the placement of containers to be loaded since the containers can be kept in stacks. This avoids the requirement of previously proposed devices which required that the containers be separated from their stacks in order to be loaded or unloaded.

Although illustrative embodiments of the present invention have been described herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to those precise embodiments and that various changes and modifications may be effected therein by one skilled in the art without departing from the scope or spirit of this invention.

What is claimed is:

1. A container for storing, transporting and distributing receptacles, which container is adapted to be filled and unfilled automatically and comprises, a parallelepiped frame having a floor and a plurality of lateral sides, said frame being open at its top side opposite said floor and defining a hollow chamber for containing receptacles, a plurality of divider members extending across said cavity between one pair of opposed frame sides and dividing said cavity into a plurality of internal channels extending between said pair of opposed frame sides; at least one of said frame sides having a plurality of openings therein corresponding in number to and aligned with the channels defined in said cavity, said openings extending from said floor to a position adjacent the top edge of said at least one side to permit receptacles to pass therethrough into said channels, and means positioned in said cavity adjacent said openings for selectively blocking and unblocking said openings whereby when said openings are unblocked, receptacles may pass therethrough into said channels and when said openings are blocked, receptacles in said channel are prevented from movement through said openings out of said cavity; each of said pair of sides having a plurality of openings therein; and said blocking and unblocking means comprising at least a pair of bars positioned adjacent said openings and extending parallel to said pair of sides, said bars resting upon said divider members and being adapted to move vertically with respect thereto for selectively blocking and unblocking said openings.

2. The container as defined in claim 1 wherein said bars comprise opposed sides of a rigid frame rectangular member resting on said divider members.

3. The container as defined in claim 1 including arm members extending from opposite ends of said bars and pivotally mounted in said frame whereby each of said bars are pivotally mounted for independent selective vertical movement in said cavity.

4. The container as defined in claim 3 wherein the free ends of each of said arms has an elongated slot therein, said arms being pivotally mounted on said frame by pivot pins secured to said frame and extending through said slots, whereby said bars are adapted to move laterally away from said openings as well as to pivot vertically with respect thereto.

5. The container as defined in claim 1 wherein said rigid rectangular frame member is open between its periphery and includes a plurality of interior rods extending between said bars for holding the receptacles positioned in said channels.

6. A container for storing, transporting, and distributing receptacles, which container is adapted to be filled and unfilled automatically and comprises, a parallelepiped frame having a floor and a plurality of lateral sides, said frame being open at its top side opposite said floor and defining a hollow chamber for containing receptacles, a plurality of divider members extending across said cavity between one pair of opposed frame sides and dividing said cavity into a plurality of internal channels extending between said pair of opposed frame sides; at least one of said frame sides having a plurality of openings therein corresponding in number to and aligned with the channels defined in said cavity, said

openings extending from said floor to a position adjacent the top edge of said at least one side to permit receptacles to pass therethrough into said channels, and means positioned in said cavity adjacent said openings for selectively blocking and unblocking said openings whereby when said openings are unblocked, receptacles may pass therethrough into said channels and when said openings are blocked, receptacles in said channel are prevented from movement through said openings out of said cavity; said blocking and unblocking means comprising a plate complementary in plan to the open top of said frame and resting on said divider members, said plate having a plurality of openings therein located in vertical alignment with said channels to engage and hold receptacles plates therein.

7. A container for storing, transporting, and distributing receptacles, which container is adapted to be filled and unfilled automatically and comprises, a parallelepiped frame having a floor and a plurality of lateral sides, said frame being open at its top side opposite said floor and defining a hollow chamber for containing receptacles, a plurality of divider members extending across said cavity between one pair of opposed frame sides and dividing said cavity into a plurality of internal channels extending between said pair of opposed frame sides; at least one of said frame sides having a plurality of openings therein corresponding in number to and aligned with the channels defined in said cavity, said openings extending from said floor to a position adjacent the top edge of at least one side to permit receptacles to pass therethrough into said channels, and means positioned in said cavity adjacent said openings for selectively blocking and unblocking said openings wherein when said openings are unblocked, receptacles may pass therethrough into said channels and when said openings are blocked, receptacles in said channel are prevented from movement through said openings out of said cavity; said blocking and unblocking means comprising a first open frame conforming in plan to the top opening of said container frame and resting on said divider members and a second open frame conforming in plan to the top opening of said container frame, a plurality of brackets mounted on said container frame above said divider members and extending into said cavity, said second open frame being supported by said brackets in vertical spaced relation to said first frame, and said first and second frames each having a pair of bars located respectively on opposite sides thereof adjacent said openings in the container frame.

8. The container as defined in claim 7 including means spanning the open top of said container frame to prevent inadvertent removal of said first and second frames from said cavity.

9. The container as defined in claim 1 wherein said frame is formed of rigid wire members defining said openings therebetween and said divider members comprise elongated rigid wire bars extending between opposed sides.

10. The container as defined in claim 1 wherein said frame is formed of a rigid plastic material and said divider members comprise elongated walls extending upwardly from said floor between said opposed sides.

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