CONSTRAINING APPARATUS TO CONSTRAIN CONTAINERS ON A SHELF

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ABSTRACT
A retaining apparatus including a flexible sheet for deployment in blocking relationship over the front edge a horizontal shelf and anchored to anchor elements bonded to the wall surface of a refrigerator or shelving to retain containers from escaping therefrom.
CONSTRAINING APPARATUS TO CONSTRAIN CONTAINERS ON A SHELF

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part claiming priority to design application Ser. No. 29/328,806, entitled Constraining Apron For Constraining Items From Falling Off The Front Edge Of A Shelf filed on Dec. 2, 2008, and non-provisional application Ser. No. 11/949,644, entitled Constraining Apparatus To Constraining Containers On A Shelf filed on Dec. 3, 2007, and provisional application No. 60/872,295, entitled Christar’s Net, filed on Dec. 4, 2006 all of which are hereby incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to retainers for retaining products on a shelf against ejection movement under influence of acceleration and deceleration forces.

[0004] 2. Description of the Prior Art

[0005] With the growth of population in modern society and added leisure time, the attraction to recreational vehicles for quality transportation and relaxation has come to the fore. The quality of the experience is often enhanced by easy access to food stuffs and beverages. To minimize deterioration in food stuffs and to the attraction of beverages, it is important that the RV users have access to cold storage. Initially, it was popular to utilize so called coolers which could receive blocks or cubes of ice to maintain the beverage and food stuff cooled during the outings. These devices had the shortcoming that the food stuffs could only be maintained cold for a limited period of time and that the melting ice would often have deleterious affects on the food stuff and create an unhygienic situation within the confines of the boat, van or motor home.

[0006] In more recent times compact coolers have gained popularity. Coolers were initially cooled by heat exchange systems driven by liquid or gaseous fluids. More recently, such cooling refrigerators are powered by electrical power, either direct current or alternating current.

[0007] Inherent in the use of recreational vehicles are moving forces caused by the momentum of the vehicle during linear acceleration and deceleration, angular acceleration, and even rolling of the vehicle or of the road or marine vehicle during turns, tacking or jibing. Recreational vehicle refrigerators typically incorporate a limited number of horizontal shelves on which containers of food or beverages are stored. Barring any change in acceleration the containers tend to remain at rest on the shelf. When the vehicle carries the refrigerator through a change in direction of velocity, the containers on the shelves tend to maintain their original velocity typically sliding across the shelf, crashing against one another and against the sidewalls of the refrigerator or against the closed door or, if open, outwardly onto the floor of the house trailer or boat. This then often times results in crushing of the containers into one another and sometimes to spillage of food stuff and beverages or even breakage of fragile containers thereby to a great degree detracting from the quality of enjoyment. It is this problem to which is addressed by the present invention.

[0008] It is already been recognized that there is a need for containing articles from escape over the front edge of a horizontal shelf of cabinetry, refrigerators, medicine cabinets and the like. Examples of prior art work in this area includes snap-on guards for children’s high chair including tray portions for holding the food. The guards can be attached or detached from the tray and act as a guard to retain food, dishes, toys or the like on the tray. The guard is manufactured from a flexible transparent sheet of thin plastic material and must be of sufficient thickness to be self-supporting. Snap-on fasteners are provided for securing the guard to the high chair. A device of this type is shown in U.S. Pat. No. 2,807,312 to Florian.

[0009] Other efforts have led to a proposal of a network of welded wire construction incorporating a peripheral frame and a plurality of transversely extending wire like rods. A shelf is provided with a guard assembly with upper and lower rod members having integral legs. A device of this type is shown in U.S. Pat. No. 3,137,249 to Postula.

[0010] Other work has led to the proposal of a magnetic guard rail for medicine chest cabinets to prevent accidental breakage of bottles contained on the cabinet shelves. This device includes a complex array of components, including plastic front posts, and integrally formed connecting ribs, body members, a magnetizeable shelf, cup shaped circular shelves and permanent magnets of a circular shape. The body members are held in the position on the shelf by the attraction force of the attached magnets. A device of this type is shown in U.S. Pat. No. 3,212,755 to Liss.

[0011] Hagerman in the U.S. Pat. No. 3,938,872 recognized the fact that the movement of recreational vehicles had a deleterious effect on items stored on the shelves of camper refrigerators, vans, trailers, mobile homes and various sailing or cruising boats. His solution was to provide a shelf retainer in the form of a plurality of elastic bands forming a network over the front edge of the shelves and carried from telescopic rods having their opposite ends biased longitudinally outwardly against the opposite sides of the refrigerator.

[0012] U.S. Pat. No. 3,827,754 to Craig shows a removable shelf edge and a plurality of clips extending from the lower edge of the shelf to hold a fence in place.

[0013] U.S. Pat. No. 3,752,324 to Moser shows a refrigerator shelf guard including a rigid fence-like arrangement of wires having a plurality of hooks hooked into spaces within the wire shelves of a refrigerator.

[0014] Other proposals have been made to provide laterally spaced upstanding posts on the front of shelving with hooks onto which a fence like retainer may be mounted. A device of this type is shown in U.S. Pat. No. 5,791,501 to Baldwin.

[0015] In my earlier application I disclosed a restraining net anchored to the side walls of a refrigerator or shelf by suction cups. While having utility, it was not obvious to me at the time that such passive anchoring would not serve the function of positively anchoring the net in place in a manner which would resist disconnection due to vibration forces and the like often encountered in the operation of recreational vehicles.

SUMMARY OF THE INVENTION

[0016] The retaining device of the present invention includes a net to be deployed in blocking relationship over the front edge of a shelf to be held in place by releasable anchors, each having at least one anchoring element embedded in or bonded to the wall or edge of the shelf to releasable hold a connector attached to the net.

[0017] Other features and advantages of the invention will become apparent from the following detailed description,
taken in conjunction with the accompanying drawings which illustrate, by way of example, the features of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] FIG. 1 is a front view of a container containing device depicting a net to constrain retainer on a shelf;
[0019] FIG. 2 is a front view thereof;
[0020] FIG. 3 is a back view, thereof;
[0021] FIG. 4 is a right hand end;
[0022] FIG. 5 is a vertical sectional view, in enlarged scale, taken along the line 5-5 of FIG. 4.
[0023] FIG. 6 is a bottom view thereof;
[0024] FIG. 7 is a top plan view of a constrain device embodying my present invention;
[0025] FIG. 8 is a partial perspective view, in enlarged scale, of anchor devices incorporated in the constraining device shown in FIG. 7;
[0026] FIG. 9 is a partial top plan view of a further embodiment of the constraining device of the present invention;
[0027] FIG. 10 is a perspective view of a even further embodiment of the constraining device of the present invention;
[0028] FIG. 11 is a transverse sectional view, in enlarged scale, taken along the lines 11-11 of FIG. 10;
[0029] FIG. 12 is back view, in reduced scale, of the constraining device shown in FIG. 9 but mounted to cabinet;
[0030] FIG. 13 is a front view of a still further embodiment of the constraining device of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0031] This application is a continuation-in-part of my prior application Ser. No. 11/949,644, filed Dec. 3, 2007. The constraining device shown in FIGS. 1-6 and disclosed in my earlier patent application, while having utility, lacks a major advantage of the present invention. While not apparent to me until after some extensive testing, the suction cup anchoring devices shown at 19 incorporated in my earlier device, failed to provide sufficient long term anchoring to allow the device to perform satisfactorily, particularly in cabinets or shelving incorporated in recreational vehicles which are subjected to vibration and movement during acceleration and deceleration thereof and operation over rough roads in parting vibration to the shelving.

[0032] The retaining device shown in FIGS. 1-6 includes, generally, a net device 14 including a sheet or mesh net 16 which may be reinforced about its border by means of a nylon reinforcing belt 15. The net device includes a plurality of tethers 17 connected on their respective one ends in spaced relationship about the border for attachment at their free extremities to respective fasteners, such as suction cups 19, which may be attached to the vertical walls of, for instance, a refrigerator. The mesh net 16 includes a slit longitudinally down the middle thereof and a closure device in a form of a zipper, generally designated 27, for closing the slit. Consequently, the suction cup fasteners 19 may be attached about the periphery of the interior wall of a refrigerator to dispose the net of blocking arrangement in front of a shelf so the zipper tab 29 can be grasped to gain access to the products constrained behind the net.

[0033] Recreational vehicle refrigerators 21, FIG. 8, are in common usage in mobile homes, campers, and all different types power and sailing boats. An important aspect of enjoyment for RV users is the selection, planning, use and consumption of food stuffs and beverages during the recreational outing. Many such beverages must be chilled to enhance the flavor and food stuffs should have the heat removed therefrom for health reasons and often times to enhance flavor. Every experienced owner and operator of an RV is aware of the fact that containers of food stuffs on the shelves of the refrigerator under influence of acceleration forces often times slamming against the door of the refrigerator or, if open, being ejected all too often resulting in spillage or fragmentation of fragile containers. The device of the present invention is intended to constrain such containers from slamming against the refrigerator door under the influence of acceleration and deceleration forces.

[0034] The net 16 is conveniently constructed of course weave, nylon or plastic mesh to minimize absorption of fluids and food stuffs and to provide for viewing of the food stuffs through the interstices of the webbing of the net while providing flexibility for folding and storage. In one embodiment the net is elastic so it can be stretched slightly under tension.

[0035] The net may be in the form of a sheet 16 conveniently made up of two separate flexible panels abutting one another along the center line and, in some embodiments, joined together by a releasable fastener such as, for instance, stiffening cords incorporated in the edges along the slit to, in their normal configuration, hold the net stretched taught and hold the slit closed. Other examples include hook and pile fasteners, snap fasteners and the zipper type construction shown in the preferred embodiment.

[0036] The border may take many different forms, such as folded over strips or heat treated marginal edges of the mesh, reinforcing belt or heat sealed or bonded to the mesh or, as in the preferred embodiment, the belting folded over longitudinally on itself to sandwich the marginal edges of the mesh between layers of the belting and secured in position by double stretching the longitudinal lengths thereof.

[0037] Referring to FIGS. 7 and 8, the tethers 17 may be constructed of elastic cord and, in one preferred embodiment, are received at their proximate extremities through openings formed in the edges of the folded over belting and captured within the stitching of such belting.

[0038] In one preferred embodiment, the distal extremities of the tethers are telescoped through the respective bores of hard plastic stub tubes 31 and configured on respective distal ends in enlarge-in-cross-section knots 34 having and outside diameters greater than that of the inside of the tube to block withdrawal back there through. The tubes 31 are housed in anchor devices, generally designated 33 which includes a rigid base plates 35 and cover band 37 entrapping the respective tube stubs 31. For one exemplary embodiment 1 have mounted on the underside of the base plates 35 respective hook strips 39 for mechanically engagement in releasable fashion with pile strips 41 adhered to the side wall 21 of the refrigerator, shelf or the like. In practice I actually prefer to mount the hook strip on the refrigerator wall and the pile strip on the underside of the cover band 37, and as will be appreciated by those skilled in the art such hook and pile strips may be interchanged without materially detracting from my invention. In a preferred embodiment, the underside of the strip is covered with a release strip which sandwiches an adhesive layer or bond between it and the surface of the strip 41 for removal to expose the adhesive to positively bond to the refrigerator wall. Preferably anchor devices and constructed so the interlocking strips will be mounted so that the tension
forces are applied laterally in shear fashion to move effectively resist any tendency of the hook and pile to release under the tensioning forces.

[0039] It will be appreciated that the net tethers and anchor devices of the present invention may be manufactured and packaged together for distribution in, for instance, recreational vehicle doors and ship supply houses. The nets will typically be provided in, for instance, three main sizes, large, medium and small to fit in captive relationship over the opening at the edge of a refrigerator or cup or shelf.

[0040] A user may then purchase the package which may also include an adhesive or bond, or in some instance, may include the 41 fabricated with a adhesive back side thereof and covered by a peel off cover strip.

[0041] The user will purchase the restraining device of a size which may complementarily fit the access opening or openings of his or her shelving or refrigerators and can readily install the device by peeling the cover strip off the backing off the pile strip 41 and adhering the respective strips to the wall of the refrigerator or shelving in spaced relationship around the opening to be covered.

[0042] It will be appreciated that the user has the option of, prior to installation, sizing up the arrangement by placing the net temporarily over the opening and positioning the respective anchor devices 33 in the approximate intended locations to determine where the knots 34 will be formed to provide the appropriate length of the tether for maintaining a somewhat tensioned condition for the net. In other instances, the operator may want to first position, for instance, the anchor device for the upper central and upper corners and opposite ends of the net in position and thread the respective tethers through the respective tube stubs 31 and form the knots to establish a reference position. Then, the anchor devices for the central bottom and bottom corners of the net may be adhered into position and the tethers threaded through the respective tube stubs and the respective knots 34 formed to cooperate with the previously installed anchor devices to maintain the net in a relatively snug taught condition.

[0043] Once installed, it will be appreciated that access can be had to the products on the shelving by merely unzipping the zipper 27 to reach through by viewing the targeted product for grasping and withdrawing through the opening defined by such zipper.

[0044] Once the products have been withdrawn and utilized, they may then be reinserted through the open zipper and the zipper closed so that the products will remain constrained on the shelf itself irrespective of whether the refrigerator door or any cabinet door is open.

[0045] In another embodiment of the present invention (FIGS. 9 and 12), the tethers are in the form of respective elastic loops, generally designated 49, which substitute for the tethers 17 and, in use, may be stretched to pass through the stub tubes 31 or to hook over, for instance, conventional screw hooks 50 (FIG. 12) screwed into the interior wall of a cabinet or behind border rails 52 and 54. In this manner, the tether loops 49 may be stretched out and hooked in place to maintain the net 16 tensioned in place.

[0046] Referring to FIGS. 10-11, in a further embodiment of the present invention, the constraining net, generally designated 55, may be anchored about a portion or parts of its periphery to the back side of vertical and horizontal rails bordering the opening to a cabinet, generally designated 61, to retain products on shelving in the cabinet.

[0047] The net may be anchored to the back sides of the rails 57 and 59 by peripheral pile strips 67 attached to the front side of the net 55 around the periphery thereof to be removable anchored to hook strips 71 adhered to the back side of the rails.

[0048] With the device of this embodiment, the net will be made available in standard configurations to fit standard openings in a cabinet along with hook strips 71 which may be cut to length, a cover strip peeled off to expose an adhesive layer which will adhere to the back side of the rails to positively anchor the net in place against unwanted dislodgment, even holding its position irrespective of flexure of the cabinet rails or vibration thereof due to high velocity travel of the recreational vehicle over the highway or over bumpy roads.

[0049] Referring to FIG. 13, in a still further embodiment of the constraining device of the present invention, a net device 14 is made up of a mesh net 16 circumscribed be a border 15 having hook strip 75 along the bottom thereof to mate with a hook strip (not shown) mounted along the backside of a rail at the bottom of an RV or boat cabin.

[0050] From the foregoing it will be appreciated that the constraining net of the present invention provides for convenient and inexpensive installation presenting the utility that the anchor is positively anchored in place by anchor devices adhered to the wall of the refrigerator or cabinetry to positively anchor the net in place against dislodgment under application of relatively high acceleration and deceleration forces and against dislodgement on being vibrated under normal condition of a normal recreational vehicle.

We claim:

1. Retaining apparatus for retaining containers against ejection from the front edge of a horizontal shelf fixture having spaced apart walls and comprising:
  fastener devices for mounting to the walls and including respective anchor elements to be affixed by bonding or screwing into the fixture in spaced apart relationship and including respective fastener devices to releasable fastening to the respective anchor elements;
  a net configured to be deployed in blocking relationship over the front edge of the shelf and including an opening for access to the containers and including a parametrical border;
  tethers attached to opposite sides of the border and including free ends to be drawn tight and attached to the respective fastener elements to hold the net deployed in the blocking relationship.

2. The retaining apparatus of claim 1 wherein:
  the border is constructed of reinforcing material.

3. The retaining apparatus of claim 1 wherein:
  the net is constructed of plastic mesh.

4. The retaining apparatus of claim 1 wherein:
  the border is constructed of a nylon belt.

5. The retaining apparatus of claim 1 wherein:
  the anchor elements anchor rings to receive the tethers.

6. The retaining apparatus of claim 1 wherein:
  the tethers include means for adjusting the lengths thereof.

7. The retaining apparatus of claim 1 wherein:
  the fastener elements include open tubes for receipt of the respective free end tethers; and
  the tethers project through the respective tubes.

8. The retaining apparatus of claim 1 that includes:
  hook and pile elements interposed between the anchor and fastener elements.
9. The retaining apparatus of claim 1 wherein:
the respective anchor devices include respective anchor
pads to be adhered to the respective walls, respective
connector elements configured with the respective
hooks and releasable mechanical interlocks for connect-
ing the perspective pads and connector elements
together.
10. A retaining apparatus for retaining containers on a
horizontal shelf of a storage fixture having spaced apart walls
and comprising:
a net device including a nylon mesh to be deployed in
blocking relationship in front of the shelf and circum-
scribed by a reinforcing belt, the net being formed with
an access slit for access to the containers located on the
shelf;
a releasable fastener attached to the mesh for closing the
slit;
a plurality of anchor devices to be bonded or screwed to the
fixture;
a plurality of tethers attached on their respective one ends
to in spaced relation about the belt and configured on
their respective opposite ends with respective anchor
devices; and
elastic means in the mesh or tethers to, when the fasteners
are attached to the walls and the opposite ends of the
respective tethers are attached to the anchor devices and
drawn tight to cooperate in holding the net in the blocking
relationship.
11. Retaining apparatus for retaining containers from
escape of the opening at the front edge of a horizontal shelf of
a storage fixture having spaced apart walls and comprising:
a sheet to be deployed in blocking relationship adjust the
front edge for overlying the containers;
a reinforcing border about the sheet;
anchor devices adhered in spaced relation to the fixture
about the opening and including first mechanical inter-
lock elements; and
attachment devices including respective second mechani-
cal interlock elements for releasably mechanically inter-
locking with the first mechanical interlock elements to
draw the sheet tight to cooperate in holding the sheet in
the blocking relationship in front of the shelf.
12. The retaining apparatus set forth in claim 11 wherein:
the first and second mechanical interlock elements are in
the form of loop and pile.
13. The retaining apparatus of claim 11 that:
the attachment devices include tethers.
14. The retaining apparatus of claim 11 wherein:
the anchor device include hooks; and
the attachment devices include tethers for releasably
attachment to the respective hooks.
15. The retaining apparatus of claim 11 wherein:
the first mechanical interlock elements include pile; and
the second interlock element include hooks for releasably
engaging “the pile”.
16. The retaining apparatus of claim 11 wherein the retaining
apparatus is adapted for securement to the backside of
rails defining an access opening over a shelf to receiving
individual products and comprising;
a net sized to be received in covering relationship over the
opening and having border strips for being received in
overlapping relationship on the backside of at least some
of the rails and formed with a closable opening for retrieval
of the products;
first strips of anchoring elements to be bonded to the back-
side of the rails; and
second strips of anchoring elements mounted on the oppo-
site ends of the net and configured to release engage the
first strips in locking relationship whereby the second
strips may be boded to the backside of the rails and the
net positioned in the opening and the second strips
releasably lock to the first strips.
17. The retaining apparatus of claim 16 wherein:
the first and second strips are constructed of loop and pile
material.
18. The retaining apparatus of claim 16 wherein:
the net is constructed of resilient material.
19. The retaining apparatus of claim 16 wherein:
the net is formed with an elongated slit defining the open-
ing and includes a closure device for closing the slit.
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