Pairs of elongated rigid rollers are spaced apart and supported by flexible webbing hung from rafters or a ceiling or interior roof of a vehicle. The rollers have a rubberized coating to secure surfboards, kayaks, ladders, or other long objects while loading, unloading, and storing the objects. A more or less vertical pair of webbing supports hang by rings on hooks from rafters or a ceiling. Other strips of webbing are attached horizontally and in a criss-crossed pattern between spaced apart pairs of vertical webbing supports. The webbing may be adjustable in length.
FLEXIBLE LIGHTWEIGHT OVERHEAD STORAGE RACK

BACKGROUND OF THE INVENTION
[0001] 1. Field of the Invention
[0002] The present invention relates to storage racks, and
in particular to a flexible lightweight overhead storage rack
suitable for use in garages, attics, regular rooms, vehicles,
such as vans, or any facility with an overhead support for
storing surfboards, kayaks, skis, ladders, and other long
items, as well as long shelving for storing small items, such
as books, wherein the storage rack uses lightweight webbing
for hanging support and is easily assembled and installed
and easily collapsible and fits within a small roll which is
easily carried or stored.
[0003] 2. Description of the Prior Art
[0004] Storage is a problem that everyone faces with so
many things and so little space. Finding and utilizing large
unused spaces for storage is a great luxury. The overhead
space above your parked vehicles in your garage is one
element of a great “found” storage space. Attic space
hanging from the rafters is another example of “found”
storage space.
[0005] Ceiling space in regular rooms, especially rooms
with high ceilings, presents storage and display opportuni-
ties if an attractive display system is used. This is especially
useful when floor space is limited. The stored or displayed
items can be elevated off the floor.
[0006] Having an attractive suspended display system
would also present added product display opportunities
to any commercial spaces, which typically have high ceilings.
[0007] Storage for large or odd-shaped items is a partic-
ular problem. Surfboards, kayaks, skis, ladders, and other
long items are a particular problem, since the average ceiling
height does not accommodate these long items, so that
closets and other usual storage locations in the average room
will not allow storage of these items. Again, the overhead
spaces in a garage or an attic are great storage solutions since
the garage and attic spaces are very long and can accom-
modate any items that are as long as a car.
[0008] While other attempts have been made at providing
storage racks for long items, they are often permanent or
heavy structures and do not lend themselves to easy fast
assembly and disassembly and often present a problem if the
storage racks themselves need to be stored.
[0009] A couple of surfboard racks have been the subjects
of patents. U.S. Pat. No. 5,950,844, issued Sep. 14, 1999 to
Taylor, provides a pair of wall hung looped ropes to support
a number of surfboards. U.S. Pat. No. 5,833,079, issued
Nov. 10, 1998 to Roberts shows a series of paired pegs
angled out from the wall. These might work if you don’t
mind having your surfboard hanging on the wall in a room.
Exceptionally long surfboards or other longer items would
not work with Taylor’s invention, and heavy or thick items
wouldn’t work with Roberts pegs.
[0010] Several rafter hanging storage devices for the
garage overhead space or the ceiling have been patented.
U.S. Pat. No. 3,556,320, issued Jan. 19, 1971 to Henderson,
claims a pair of large overhead web loops supporting a boat
in a garage. U.S. Pat. No. 6,286,691, issued Sep. 11, 2001 to
Oberhaus, describes a series of shelves hung on four rods
from garage rafters. U.S. Pat. No. 6,145,678, issued Nov. 14,
2000 to Morrison, discloses paired hooks with cross mem-
bers hung in a series on rafters to support long items. U.S.
Pat. No. 3,945,462, issued Mar. 23, 1976 to Griswold,
indicates paired hanger brackets hung from overhead beams
or rafters for supporting objects. U.S. Pat. No. 6,155,440,
issued Dec. 5, 2000 to Arce, illustrates a series of ceiling-
mounted storage brackets with a horizontal rod support.
Loading and unloading long items into these inventions
could be a problem, particularly with the Henderson patent.
Oberhaus is not intended for large or heavy items. Morrison,
Griswold, and Arce use rigid metal support members which
must be installed or hung on metallic I-beams in the case of
Griswold, and they lack flexibility.
[0011] A couple of patents show shelving supports hung
by rope or webbing. U.S. Pat. No. 5,542,530, issued Aug. 6,
1996 to Freelander, puts forth adjustable shelves hung on
20, 1981 to Hulke, concerns shelves hung from four strips of
webbing. These patents are not appropriate for long or heavy
items.
[0012] Several patents were found to use rubberized roll-
cers. U.S. Pat. No. 6,332,715, issued Dec. 25, 2001 to Kozua,
is for a rubber roller bearing device. U.S. Pat. No. 3,999,673,
issued Dec. 28, 1976 to Anderson, U.S. Pat. No. 3,387,727,
issued Jun. 11, 1968 to Michael, and U.S. Pat. No. 3,128,
893, issued Apr. 14, 1964 to Jones are all for boat loading
racks using rubber rollers. None of these are intended for
overhead garage storage.
[0013] There is a need for an attractive easily mountable
and dismountable, easily stored rack using flexible elements
for support and bracing and rollers for paired horizontal
supports for ease of loading and unloading.

SUMMARY OF THE INVENTION
[0014] A primary object of the present invention is to
provide a flexible lightweight overhead storage rack using
webbing or straps for hanging vertical support and triangula-
tion stabilization and lightweight rigid plastic rollers for
horizontal support.
[0015] A related object of the present invention is to
provide a ceiling or rafter mounting storage rack which is
easy to install and uninstall by simply hanging four rings on
hooks preinstalled on the ceiling or rafters.
[0016] Another object of the present invention is to pro-
vide an overhead storage rack which utilizes rollers as
support members to make it easy to use the rack to store and
remove long items, such as surfboards, kayaks, ladders, and
other long objects.
[0017] One more object of the present invention is to
provide a flexible overhead storage rack which flexes and
moves when accidently bumped by a vehicle or carried item,
or even bumped by someone’s head, thereby preventing
injury to anything stored on the rack as well as preventing
injury to whatever or whoever bumps the rack.
[0018] An additional object of the present invention is to
provide a flexible overhead storage rack with flexible hang-
ing members which can be adjusted in length to accommodate different storage and space needs.

[0019] A further object of the present invention is to provide an overhead storage system which can be used in found spaces, such as an overhead space in a garage above the vehicle or vehicles parked in the garage and can be easily adjusted, installed and uninstalled to accommodate other uses of the garage space, especially parking vehicles. Other found spaces include rafters in attics, ceiling space in regular rooms, and hanging displays from ceilings in commercial spaces.

[0020] A related object of the present invention is to provide a hanging storage system which can be adjusted to tighten up on the stored items so that the invention may be used to hang items in moving vehicles.

[0021] An added object of the present invention is to provide a storage rack that is lightweight and uses only a few rigid horizontal support members and all flexible webbing or straps for vertical hanging members, which rack can be disassembled and stored in a small duffel bag, sack, box or other small storage means and easily transported or stored.

[0022] Yet another object of the present invention is to provide a hanging storage system which can accommodate long items or be used with boards or shelving placed on the horizontal supports of the rack to store small items or be used as shelving, such as book shelves.

[0023] In brief, the present invention provides an easily mountable and dismountable, easily stored rack using webbing for support and bracing and rubberized rollers for paired horizontal supports hung by rings on hooks on garage ceiling rafters for any applications as a hanging support for surfboards, ladders or anything else. The webbing may be adjusted in length by tieing an unteicing the strips of webbing or by providing adjustable buckles or clamps in the webbing.

[0024] The only rigid components are the rollers which, after disassembly may be aligned together and the webbing folded to fit the entire rack in a small duffel bag or box or other storage container for easy transportation and storage.

[0025] Boards or shelves may be placed on the rollers for storing smaller items or for using the invention as shelving, such as book shelves.

[0026] An advantage of the present invention is that it is lightweight and easy to install, uninstall, store, and transport.

[0027] Another advantage of the present invention is that it provides “found” storage space in space that normally goes unused.

[0028] An additional advantage of the present invention is that it can store very long items normally difficult to store or display and allows for easy storage and removal of the items on rollers.

[0029] One more advantage of the present invention is that it provides a flexible resilient storage rack which moves upon being impacted and helps to prevent damage to stored items or anyone or anything bumping the rack.

[0030] Yet another advantage of the present invention is that it may also be used in moving vehicles because the hanging supports can be adjustably cinched up to secure the items being transported.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] These and other details of my invention will be described in connection with the accompanying drawings, which are furnished only by way of illustration and not in limitation of the invention, and in which drawings:

[0032] FIG. 1 is a perspective view of the invention showing a double layer unit hung from rafters, the unit storing a surfboard and a ladder;

[0033] FIG. 2 is a perspective view of the invention showing the horizontal rigid roller supports aligned together and the webbing folded up for storage in a small duffel bag;

[0034] FIG. 3 is an exploded partial perspective view of the roller components of the invention aligned for assembly;

[0035] FIG. 4 is a perspective view of the invention showing a double layer unit hung from rafters, the unit having shelves and storing books and boxes;

[0036] FIG. 5 is a perspective view of the invention attached to the roof structure of a vehicle showing the hanging supports adjusted tightly to secure the transported items (surfboards in this case) for transporting.

BEST MODE FOR CARRYING OUT THE INVENTION

[0037] In FIG. 1 a hanging storage device comprises at least one pair of rigid horizontal support members 20 spaced apart to accommodate an elongated external object, such as a surfboard 40 or ladder 50 (shown dashed) supported therebetween. A pair of flexible hanging support elements 31 attached to and supporting each member of the at least one pair of horizontal support members 20. Each of the pair of flexibly hanging support elements 20 has a top attaching means, such as a ring 30 which is hung on an external overhead support, such a hook 61 on a rafter 60 or ceiling.

[0038] The hanging storage device preferably further comprises at least one flexible horizontal stabilizing element 34 connected between the two pair of flexible hanging support elements 31 to maintain a tension force therebetween for stabilization.

[0039] For even greater stabilization, the hanging storage device preferably comprises an array of flexible stabilizing elements connected between the two pair of flexible hanging support elements 31 to maintain a tension force therebetween for stabilization, such as crossed flexible stabilizing elements 32 creating a system of triangulation which stabilizes the hanging storage rack longitudinally.

[0040] The flexible hanging support elements 31 and crossed flexible stabilizing elements 32, and horizontal flexible stabilizing elements 34 are preferably fabricated of webbing or straps, such as nylon webbing. The overlapping webbing or straps are preferably interconnected by a pivotably means such as rivets 36 to permit variation of the angle between straps as the straps are adjusted in length. Alternatively the overlapping straps may be sewn together, and may use a triangulated strip of fabric 35 (shown dashed in FIG. 1) sewn to the straps.

[0041] Triangulation of the flexible straps 31, 32 and 34 creates a stability in the lateral direction that helps to maintain the stored items securely on the rollers if there is contact with the hanging suspension system, earthquakes, or
if used in a vehicle in motion. The triangulation also stabilizes the hanging suspension system while loading and unloading.

[0042] The webbing may be adjustable in length by tying or untieing portions of the webbing with knots 39 or further comprises a means to adjust the length of each of the flexible elements with overlapping lengths of the webbing and adjustment devices 38, such as buckles or clamps.

[0043] In FIGS. 1 and 3, each of the rigid horizontal support members 20 preferably comprises a roller capable of receiving an external object rolled onto the roller and supported by the roller. The roller comprises an elongated rigid element, preferably a hollow rigid cylinder 22 (light weight) of aluminum or steel tubing, which cylinder receives at each end a solid cylindrical block 24, preferably a nylon plug, inserted within the cylinder with a tight friction fit, and a shoulder bolt 25 at each end screwed into the cylindrical block. The smooth portion of the shoulder bolt is supported rotatably within metal grommets 26 in the flexible straps 31 and 32 and the roller 20 is capable of rotating within the supporting flexible straps. The exterior of the roller comprises a rubberized high friction surface 21 which could be foam or rubber cylinders used in cushioning or insulation or a sprayed on rubberized coating or other high friction surfaces to assist in retaining external objects thereon during loading, unloading, and storing.

[0044] Alternately any other rotatable rollers may be used such as a rigid shaft of metal or plastic housed in a hollow cylinder, such as PVC or other plastic pipes, and the rigid shaft supported at each end by one of the pair of flexible hanging support elements with the hollow cylinder rotating freely around the rigid shaft. This assembly would also have a high friction external covering similar to that mentioned in the previous paragraph.

[0045] The entire hanging storage rack is preferably made lightweight and flexible by using nylon or other fabric webbing or strapping for hanging vertical supports 31, 32, and 34 and lightweight rigid tubing for horizontal support members 20, making the entire hanging storage rack easy to work with to install, uninstall, and transport.

[0046] In FIG. 2 the rigid horizontal support members 20 are aligned together and the flexible hanging support elements 31, 32, and 34 folded up and stored within an elongated storage container, such as a small duffle bag 60 capable of receiving the horizontal support members 20 and hanging support elements 31, 32, and 34 therein for transportation and storage.

[0047] In FIG. 4 the hanging storage device may further comprise elongated rigid flat elements, such as boards or shelves 70 positioned between and supported by the at least one pair of rigid horizontal support members 20, the flat elements being capable of receiving and supporting external objects thereon, such as shelves for books 71 or boxes 72 or other smaller items that would not normally fit between the horizontal support members 20.

[0048] In FIG. 5 the hanging storage device is attached to the roof structure 60A of a vehicle by hooks 61 receiving the rings 30 of the hanging support straps 31 and the hanging supports 31 are adjusted tightly with overlapping straps and adjusting means 38 or tying the straps in knots 39 to secure the transported items (surfboards 40 in this case) for transporting.

[0049] In use, in FIGS. 1 and 4, the rings 30 of the four flexible hanging support elements 31 are hung on hooks 61 installed on rafters 60 or a ceiling (vehicle roof structure 60A in FIG. 5). The webbing or straps 31, 32, and 34 may be adjusted by adjusting means 38 or by tying knots 39 to the desired lengths to fit the space, such as making sure the system leaves enough room for a car, van or SUV to be parked underneath if the system is used in a garage.

[0050] The long items such as the surfboard 40 and ladder 50 and the shelves 70 are first positioned on one of the rigid horizontal support members 20, then rolled along the first support member with the far end of the long item or shelf then contacting the second horizontal support member and then roll on both horizontal support members until the long item or shelf is equally supported between the two rigid horizontal support members 20. If it is a shelf 70, then the smaller items, such as books 71 or boxes 72 may be stored on the shelves.

[0051] In FIG. 2, to store the hanging storage system, all items are removed from the rigid horizontal support members 20, the rings 30 are released from the hooks 61. Then the hinge horizontal members or rollers 20 are aligned and positioned together and the webbing or straps 31, 32 and 34 are folded up or wrapped around the rollers and then the whole storage system is stored in a small duffle bag 60 or other container means for storing or transporting.

[0052] It is understood that the preceding description is given merely by way of illustration and not in limitation of the invention and that various modifications may be made thereto without departing from the spirit of the invention as claimed.

What is claimed is:

1. A hanging storage device comprising:

   at least one pair of rigid horizontal support members spaced apart to accommodate at least one elongated external object supported therebetween;

   a pair of flexible hanging support elements attached to and supporting each member of the at least one pair of horizontal support members at, each of the pair of flexible hanging support elements having a top attaching means.

2. The hanging storage device of claim 1 wherein each of the at least one pair of rigid horizontal support members comprises a roller being capable of receiving an external object rolled onto the roller and supported by the roller.

3. The hanging storage device of claim 2 wherein the flexible hanging support elements further comprise a series of grommets installed therein and the roller comprises a hollow rigid cylinder, which cylinder receives at each end a solid cylindrical block inserted within the cylinder with a tight friction fit, and a shoulder bolt having a smooth portion at each end screwed into the cylindrical block, the smooth portion of the shoulder bolt capable of being supported rotatably within the metal grommets in the flexible hanging support elements and the roller is capable of rotating within the flexible hanging support elements.

4. The hanging storage device of claim 3 wherein the exterior of the roller comprises a rubberized high friction surface to assist in retaining external objects thereon during loading, unloading, and storing.
5. The hanging storage device of claim 3 wherein the flexible hanging support elements comprise nylon webbing.

6. The hanging storage device of claim 1 further comprising at least one flexible stabilizing element connected between the two pair of flexible hanging support elements to maintain a tension force therebetween for stabilization.

7. The hanging storage device of claim 1 further comprising an array of flexible stabilizing elements connected between the two pair of flexible hanging support elements to maintain a tension force therebetween for stabilization.

8. The hanging storage device of claim 7 where in the array of flexible stabilizing elements comprises a number of elongated webbing means angularly intersecting and interconnected by pivotable means to create triangulated stabilization means.

9. The hanging storage device of claim 1 wherein the flexible hanging support elements further comprise a means to adjust the length of the flexible hanging support elements.

10. The hanging storage device of claim 9 wherein the flexible hanging support elements further comprise a means for attachment a roof structure of a vehicle and the hanging supports are capable of being adjusted to secure the at least one elongated external object for transporting.

11. The hanging device of claim 1 wherein the rigid horizontal support members are capable of being aligned together and the flexible hanging support elements folded up and further comprising an elongated storage container capable of receiving the aligned horizontal support members and folded hanging support elements therein for transportation and storage.

12. The hanging device of claim 1 further comprising elongated rigid flat elements positioned between and supported by the at least one pair of rigid horizontal support members, the flat elements being capable of receiving and supporting external objects thereon.