A lazy susan device (160) includes a centralized support pole (162) with an upper tube (164) and a lower tube (166). In one embodiment, a length adjustment mechanism (168) includes an expansion nut (172) and a threaded insert (170). Rotation of the upper tube (162) causes the expansion nut (172) to expand outwardly as the upper tube (164) is rotated. The expansion nut (172) moves away from the upper tube (164). In this matter, the effective length of the support pole (162) is lengthened. This and other embodiments of the lazy susan devices provide for installation and adjustment of the lazy susan devices in the absence of the need for any tooling.
FIG. 9
LAZY SUSAN DEVICE WITH TOOL FREE INSTALLATION

cross-reference to related applications


statement regarding federally sponsored research or development

[0002] Not applicable.

reference to a microfishe appendix

[0003] Not applicable.

background of the invention

[0004] 1. Field of the Invention

[0005] The invention relates to "lazy susan" devices and, more particularly, to rotatable devices having shelves and means for coupling supporting elements to cabinets or other architectural surfaces.

[0006] 2. Background Art

[0007] Various types of storage devices having shelves or receptacles for holding various items are utilized in numerous environments, including commercial, industrial and residential spaces. One type of storage device which has been found to be of value is a device which includes means for rotation. Rotatable storage devices have the capability of varying the "presentation" location of hooks, shelves or other hanger and container-like utilitarian articles. These rotatable storage devices are known by a number of relatively common names, such as carrousels. In addition, many of these storage devices have come to be known as "lazy susans." Although the dictionary definition of a lazy susan describes a large, revolving tray for food, placed at the center of a dining table, the term "lazy susan" has generically come to refer to a number of different types of rotatable storage devices. The term "lazy susan" will be used herein in its generic sense to refer to a rotatable storage device, and should not be construed to be limited to devices in accordance with its dictionary definition.

[0008] Lazy-susan-type storage devices are used in various locations in the aforementioned commercial, industrial and residential environments. The devices may comprise one or more horizontally-disposed platforms or shelves, with the shelves being vertically spaced apart. The spaced apart shelves are often rotatably coupled to a shaft which commonly extends along a vertical axis located at a center point of the horizontally disposed shelves.

[0009] One problem which exists with respect to various types of lazy susan devices relates to installation procedures. For example, in many conventional lazy susan devices, the aforementioned shaft or "support pole" is often positioned within a cabinet or other storage device. The bottom portion of the support pole or shaft is secured to a mount or similar connecting means, which, in turn, is physically secured to a cabinet for bottom or other similar surface. Correspondingly, the top end of the shaft or the support pole is coupled to a connecting mount or similar connecting means which is also physically secured to a surface. For example, the upper connecting mount may be secured to the lower surface of a cabinet top or similar structure.

[0010] It can be somewhat difficult to install lazy susan devices within cabinets or other storage facilities, particularly with respect to connection of the shaft or support poles to the connecting mounts, and the connecting mounts to the cabinet or other structural surfaces. These cabinets or other storage facilities are often located in kitchen corners or other areas where it can be difficult for an installer to "maneuver." In particular, maneuverability can be particularly difficult for the installer, if the installer needs to utilize tools for purposes of installation. In some instances, known lazy susan devices require special tools for installation. Acquisition and maintenance of such special tools present problems in and of themselves. However, even if the installation can be performed using conventional tools, procedures associated with such installation can be difficult.

[0011] As earlier mentioned, various types of lazy susan or similar devices exist in the prior art. For example, Preston, U.S. Pat. No. 3,628,844 issued Dec. 21, 1971 describes a storage cabinet with revolving shelves. The shelves have a kidney or three-quarter circle shape, with a diameter approximately equal to the square dimension of the cabinet. Each shelf has one straight edge which is located so that tiers of trays attached to two swinging cabinet doors may be made of an optimum depth, thereby permitting the trays to fill the space between the shelves and the doors when the doors are closed. Detent mechanisms hold the shelves in center positions within the cabinet, and resist a tendency for the shelves to spin uncontrollably when turned out of the center positions. The door trays are detachably hooked onto standards fastened to the inner sides of the doors, and are constructed so as to avoid leaving gaps between the doors and the trays.

[0012] With respect to lazy susan devices, installation will often require adjustment of the relative length of the support pole. Installation of lazy susan devices also involves setting the relative height or location of the shelves along the support poles. Various types of configurations have been utilized for providing adjustment of the length of the support poles, as well as height adjustments of shelves.

[0013] For example, one type of shelf height adjustment mechanism is disclosed in Domenig, et al., U.S. Pat. No. 6,626,305 B2 issued Sep. 30, 2003. The Domenig, et al. patent discloses a rotary shelf assembly mechanism having shelves mounted on a vertical post arrangement formed by a first lower post and second upper post. Domenig, et al. further disclose shelves comprising one piece elements. A post-securing shelf section is formed as an integral part of each shelf. Each shelf is molded as a plastic or other suitable material, and provided with a series of strengthening ribs that extend radially of the circular configured shelf from the post-securing shelf section. Circular supporting ribs are also provided for additional strength.

[0014] The post-securing shelf section is comprised of a circular hub. The circular hub houses, within its formed interior, a series of radially extending ribs emanating from a post encircling sleeve. Two pin receiving indents cooperatively open into the sleeve, so that a pin inserted through the post will nest within the indents, and be within the interior hub and post. During assembly, the one piece shelf can be positioned over the post and sustained at a predetermined location by the insertion of a pin through an aperture in the
Extending ends of the pin are cooperatively received by indents, so as to secure the shelf at a precise location on the post. With the foregoing, it is apparent that movement of the shelf along the post is limited in the number of positions available by the number of apertures in the support posts through which the supporting pin may be received. Further, with this type of arrangement, the vertical positions available for the shelf along the support post are not in the form of a “continuum,” but instead only discrete positions are available for vertical height adjustments. Still further, it is apparent that it would be substantially difficult to adjust the height of a shelf along the support post, while the shelf is supporting various items.

[0015] As earlier stated, various other types of lazy susan and similar devices are well known in the prior art. For example, Ballew, U.S. Pat. No. 5,813,736 issued Sep. 29, 1998 discloses the use of a carousel device having slidable sections connected to vertical pegboard supports. More specifically, a rotatable base has a series of sliding bases placed upon the rotatable base. The bases are supported by drawer slides which provide support when the base is extended out from the cabinet area. More specifically, the carousel or cabinet storage device is mounted within a cabinet and includes vertical panels mounted upon a rotating platform. Each of the vertical panels may be rotated to the front of the cabinet for purposes of access. The vertical panels are connected to individual sliding bases. Mounted to the sliding bases are pairs of slide rails. The slide rails allow the sliding bases to slide horizontally outward away from the rotating platform. The slide rails are connected to the sliding base and to the rotating platform. In this manner, the vertical panels are extended horizontally away from the cabinet to provide easy access to items which may be hung from the panels.

[0016] Each slide includes a support member for purposes of providing additional support for the sliding base, when the base is extended outwardly from the platform. The support member includes a retractable arm having one end pivotably attached to the slide rail, with a wheel rotatably attached to the opposing end or second end. The retractable arm is biased by a spring so as to cause it to extend downwardly to rest on the floor and thereby support the sliding base when it is in its extended position. When the sliding base is in a storage position, the arm pivots upwardly. The wheel engages the floor and allows the sliding base to be moved inwardly or outwardly while supplying support for the sliding base. When the sliding platform is pushed back into a storage position, the arm engages a rotating platform, thereby causing the arm to retract.

[0017] Twellmann, U.S. Pat. No. 4,832,300 issued May 23, 1989 discloses a half-moon lazy susan type shelf. The shelf is mounted in part on the back side of a door in a cabinet, and in part on a rotating element and support system. When the door is open, the shelf is extendable by rotation so as to expose substantially all of its surface area. This is provided through rotating portions of the support system and rails which operate in a fashion similar to a drawer slide.

[0018] Battles, U.S. Pat. No. 4,067,607 issued Jan. 10, 1978 discloses a combination stool and fishing tackle box. Battles discloses use of shelves which slide in and out of a circular container. Specifically, the Battles arrangement includes an upright cylindrical housing having closed ends. A wall is diametrically and longitudinally divided intermediate its ends so as to define a stationary wall portion and a movable wall portion. The movable wall portion forms a door slidably disposed in circular tracks formed by the respective end of the housing, so as to cover and uncover an access opening formed by the divided wall. The housing is transversely divided by a plurality of partitions arranged in vertically spaced relation, so as to form a plurality of compartments. Each of the partitions rotatably supports a circular upwardly opening fishing tackle receiving tray. Each of the trays is movable outwardly through the access opening with respect to its support partition by a radial slot formed in the respective partition.

[0019] Other prior art references relate to various types of adjustable poles and the like. As earlier stated, it is not uncommon for a lazy susan device to incorporate some type of support pole which may be adjustable in length. As an example, Murch, U.S. Pat. No. 918,579 issued Apr. 20, 1909 is directed to a telescopic clothes pole. The pole is arranged in sections and is telescopic in form. The pole includes an outer tubular socket closed at the bottom. A series of tubular members of varying diameters are arranged so that one telescopes within the other, and all telescopic within the socket member. The slots have, at the lower ends, an upwardly extending offset portion. Each of the members, with the exception of the upper one, is provided with an inwardly projecting pin. The pin operates in the slot of the enclosed tube so as to hold the tube elevated when the pin is in engagement with the upturned portion of the slot. A cap is mounted on the innermost tubular member, serving as a cover for the socket member and intermediate tubular member. In this manner, foreign substances are prevented from entering into the members.

[0020] Zierold, et al., U.S. Pat. No. 2,124,842 issued Jul. 26, 1938 discloses a telescopic umbrella frame. The frame includes a telescopic umbrella stick, and a sliding member adapted to move along the stick. Telescopic ribs comprising inner and outer sections are also provided. Spreaders exist for connecting the outer sections to the umbrella sliding member. Cooperating means on the inner and outer sections exist for simultaneously locking all of the extended outer rib sections to the inner rib sections, before the movement of the sliding member for opening the umbrella frame.

[0021] Booth, U.S. Pat. No. 2,350,582 issued Jun. 6, 1994 discloses a joint structure for metal tubing. More specifically, a metal tube is provided having a series of circumferential coplanar and arcuate slots near one end. The tube metal between each slot and the adjacent tube end is displaced radially inwardly so as to form a flume. Lands left between the flutes are displaced radially inwardly to an extent sufficient so as to permit the entry of the fluted tube end into a tube of the same diameter and a second tube of the same diameter as the first. The fluted end of the first tube is telescopically received within the second, and the end surface of the second tube abuts against the sides of the slots in the first tube. These are also provided for preventing axial separation of the tubes.

[0022] Booth, U.S. Pat. No. 2,423,577 issued Jul. 8, 1947 also discloses a joint for metal tubes. In this disclosure, a metal tube is provided which has one end collapsed so as to form a single wall of double thickness. The wall is curved
transversely. A second tube is provided, with substantially the same diameter as the first tube. The outer surface of the collapsed portion substantially conforms in curvature to and engages the inner surface of the second tube to an angular extent of more than 180°. Means are provided for securing the two tubes together, with the collapsed portion of the first tube disposed within the second tube.

Kuo, U.S. Pat. No. 5,702,198 issued Dec. 30, 1997 discloses an umbrella rod structure having multiple tubes. The umbrella rod is formed with at least an outer tube and an inner tube. The tubes have arched grooves and positioning holes. A V-shaped stopper is provided which has a projection on one end disposed in the inner tube, so as to extend from positioning holes of both tubes. Arched contacts between the grooves of both tubes and the engagement of the projection and the positioning holes make the rod secure and firm when it is stretched.

Wu, U.S. Pat. No. 5,287,869 issued Feb. 22, 1994, disclose an improvement in a center post of a collapsible umbrella. The post includes a retainer body on which two guiding holes are formed, so as to respectively receive therein a first retaining pin biased by a spring, and a second retaining pin biased by a spring. The retainer body is inserted into an inner tubular section of the center post, so as to have the spring biased retaining pins partially project out of two through holes formed on the inner tubular section. The inner tubular section is telescopically received in an outer tubular section out of the center post. When the inner tubular section is in a fully extended position, the second retaining pin extends through one of the through holes of the inner tubular section, so as to be engaged by a stop piece formed on the outer tubular section. The first retaining pin, which extends through the associated one of the through holes, penetrates through an opening formed on the outer tubular section so as to retain the inner tubular section in the fully extended position in order to open the umbrella. When the umbrella is closed, the runner of the umbrella is slidably moved downwardly, through the opening of the outer tubular section so as to force the first retaining pin inward to allow the inner tubular section to telescopically slide into the outer tubular section.

McCaffrey, U.S. Pat. No. 5,354,025 issued Oct. 11, 1994, discloses a furniture shelf support bracket. The support bracket includes a semi-cylindrical cuff, with an inner surface for engaging a vertical tube, and outer surface from which a platform projects for engaging a bottom section of a shelf. A pair of alignment ridges are positioned on an upper surface of and extend along a platform. A lip extends from a marginal edge of the outer surface of the cuff, for purposes of engaging a top surface and side edge of the shelf. The alignment ridges fit within an alignment slot in the bottom surface of the shelf, and engage a clamping plate set into a clamping slot, which intersects and is transverse to the alignment slot.

In general, a substantial amount of prior art exists with respect to lazy susan devices, rotatable shelves, length-adjustable support poles and the like. However, known lazy susan devices typically require special or at least conventional tools for interconnecting the devices to storage cabinet surfaces or similar structures through connecting mounts and the like. As earlier stated, it is often difficult for an installer to maneuver and manipulate tools within storage cabinet spaces, when installing the lazy susan devices.

SUMMARY OF THE INVENTION

In accordance with the invention, a lazy susan-like apparatus is provided, and adapted for use in supporting items and facilitating access to the items by a user. The apparatus includes at least one shelf or support base. Support means are connected to a first structure separate from the apparatus, for supporting the apparatus and for supporting the shelf. First connector means are associated, at least in part, with the support means, for connecting together the support means and the first structure. Coupling means couple the shelf to the support means. The first connector means and the coupling means are operable so as to permit the shelf to rotate relative to the first structure. In accordance further with the invention, the coupling means, the support means and the platform are structured and operable so as to permit manual assembly and disassembly in the absence of any tools. In addition, the first connector means, the first support means and the coupling means are also structured and operable so as to permit manual assembly and disassembly in the absence of any tools.

The support means includes an upper portion and a lower portion. The first structure includes an upper structure located substantially above the apparatus, when the apparatus is installed with the upper portion of the support means connected to the upper structure through the first connector means. The first connector means is located, at least in part, on the upper portion of the support means. The first structure can include a lower structure, located substantially below the apparatus, when the apparatus is installed with a lower portion of the support means connected to the lower structure through the first connector means. The first connector means can be located, at least in part, on the lower portion of the support means.

The first connector means can include an outer sleeve, with a horizontally disposed flange connected to or otherwise integral with a top of the outer sleeve. A series of press-in barrels protrude upwardly from a top of the horizontal flange. The barrels are adapted to be pressed in the predrilled bar holes extending upwardly from a lower surface of the first structure. In accordance with another aspect of the invention, the first connector means can include a stabilization element coupled to the upper structure and received within or outside of the support means. Means can be included which are connected to the stabilization element and to the first structure for substantially preventing movement of the support means relative to the first structure.

The support means can include a centralized support pole, with an upper tube and a lower tube. A locking collar can be provided, which is coupled to one or both of the upper tube and lower tube. The locking collar maintains a coupling of the upper and lower tubes, and prevents axial movement of one of the tubes relative to the other of the tubes. Still further, the first connector means can include a threaded insert which is fixed to the upper tube, and projects upwardly so as to be received within a recess of the upper structure.

The first structure can include an upper structure and a lower structure. The apparatus can include a second connector means located, at least in part, on a lower portion of the support means. The lower structure is located below the apparatus when the apparatus is installed. The coupling means couples the shelf to the outer tube, so that the weight
of the shelf is not carried by the upper portion. In accordance with one aspect of the invention, the support pole can include an upper tube connected to the first connector means, and a lower tube connected to the second connector means. A length adjustment mechanism can be coupled to one or both of the tubes, with the length adjustment mechanism comprising means for adjusting the relative linear spatial relationship along a centralized axis between the upper and lower tubes. In this manner, an effective length of the centralized support pole can be selectively adjusted.

[0032] The length adjustment mechanism can be activated by a user, so that when the user wishes to adjust the effective length of the support pole from an initial first effective length to a second effective length, the user first manually applies forces to the length adjustment mechanism or to the pole. When the pole is at the desired effective length, the user can engage the manually applied forces, and the pole will maintain itself at the second effective length, absent the application of any additional externally applied forces. In accordance with another aspect of the invention, the length adjustment mechanism can be self-adjusting, so that the support pole will initially position itself and maintain a first effective length, when initially installed and assembled with the apparatus.

[0033] Still further, in accordance with another aspect of the invention, one of either of the upper tube or the lower tube can be an inner tube telescopingly received within an outer tube. The outer tube is the other of the upper and lower tubes. The length adjustment mechanism includes a threaded insert having a portion fitted so as to be received within the inner tube. An expansion nut is adapted to be received within the outer tube. The threaded insert further includes a threaded portion received within the expansion nut. With rotation of one of the tubes relative to the other of the tubes, and with the threaded portion being received within the expansion nut, the nut moves away from the inner tube, therein extending an effective length of the entirety of the support pole. Operation of the adjustment of the effective length is manually caused to occur, in the absence of any necessity of the use of any type of tooling. With respect to more specific aspects of the invention, with rotation of either the inner tube or the outer tube in a first direction, the expansion nut will be caused to expand and correspondingly move away from the inner tube. Still further, with rotation of either the inner tube or the outer tube in a first direction, and with the threaded portion being received within the expansion nut, the expansion nut is caused to expand. In accordance with all the foregoing, as the expansion nut moves away from the inner tube, the expansion nut is simultaneously expanding.

[0034] In accordance with a further aspect of the invention, the inner tube is the upper tube and the outer tube is the lower tube. The portion of the threaded insert is received within the upper tube, and the expansion nut is received within the lower tube. The first connector means can include an upper pole flange adapted to be secured within an upper portion of the support means. An upper attachment means is provided for securing the flange to the upper structure. The upper pole flange is secured within the upper portion of the support means, and the upper pole flange is secured to the upper structure in the absence of any need for any tools or other equipment. The second connector means can include a lower pole flange secured to the lower portion of the support means. A lower attachment means can be connected to the lower pole flange for securing the flange to the lower structure.

[0035] In accordance with another aspect of the invention, the length adjustment mechanism can include an elongated spring adapted to be received within the inner and outer tubes. A lower securing means is coupled to the lower outer tube so as to maintain a lower end of the spring at a predetermined position relative to the lower outer tube. An upper securing means is coupled to an upper inner tube for positioning an upper end of the spring at a predetermined position relative to the upper inner tube. The spring is self-adjusting, and sized and configured so that when the spring is received within the tubes, and coupled to or otherwise abutting against the upper and lower securing means, the spring is in a compressed state. The spring thus exerts upward and downward extending forces against the upper and lower securing means. In accordance with a further aspect of the invention, a spring can be utilized as described in the foregoing, but with the centralized support pole having an upper outer tube and a lower inner tube. In accordance with another aspect of the invention, when the spring exerts the upward extending forces against the upper securing means, the upper tube is caused to seat and abut against the structure. When a spring exerts the downward extending forces against the lower securing means, the lower tube is caused to seat and abut against the lower structure.

[0036] In accordance with a still further aspect of the invention, the lower securing means can include a lower metal insert having a resilient configuration, and sized and configured so as to be manually press-fitted into the lower tube. The upper securing means includes an upper metal insert having a resilient configuration, and manually press-fitted into the upper tube. The inserts form abutment walls against which ends of the spring exert forces. The forces are translated to the upper and lower tubes.

[0037] In accordance with a still further aspect of the invention, the upper tube can include a ratchet extending longitudinally along an outer surface of the upper tube. The ratchet includes a set of teeth. Length adjustment means are coupled to the upper and lower tubes, and are in a cooperative relationship with the ratchet so as to adjust the linear spatial relationship between the upper and lower tubes, and selectively adjust an effective length of the support pole.

[0038] The length adjustment mechanism includes a sleeve extending downwardly and coupled to an upper end of the lower tube. The adjustment mechanism can be relatively rigidly coupled to the end of the lower tube. A ratchet collar is located above the sleeve and includes a ratchet catch located at one side of the sleeve. The catch is sized and configured so as to manually operable along the teeth of the ratchet.

[0039] In accordance with another aspect of the invention, the support means includes a threaded bolt which is connected to or otherwise integral with a lower end of the upper tube. Threaded means are secured within an interior of the lower tube at a desired position. The upper tube is coupled to the lower tube through the threaded bolt being threadably received within the threaded means. With the threaded engagement, rotation of the upper tube causes the position of the upper tube to adjust linearly relative to the lower tube. The invention also includes the reverse of the foregoing,
with the centralized support pole having a lower tube and an upper tube, with the lower tube at least partially received within the upper tube. The threaded bolt is then connected to or otherwise integral with an upper end of the lower tube.

In accordance with a further aspect of the invention, the first structure can include an upper structure located above the apparatus, with the structure including an upper, predrilled recess extending therein. The upper portion of the support means is sized so as to be manually securable within the upper recess. In accordance with a further aspect of the invention, the lower structure can include a lower, predrilled recess extending therein. The lower portion is sized so to be manually secured within the lower recess. The lower portion can include means connected to the lower recess so as to prevent rotation of the lower portion connected to the lower recess.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

The invention will now be described with reference to the drawings, in which:

FIG. 1 is a perspective view of a prior art lazy susan device employing a connecting mount for interconnecting the device to a surface of a top cabinet shelf or the like;

FIG. 2 is an exploded view of a full-round lazy susan device, showing prior art connecting mounts for both top and bottom attachments of the device to appropriate surfaces (not shown);

FIG. 3 is a “close-up” elevation view of a prior art connecting mount arrangement used with the lazy susan device, and corresponding to the connecting mount shown at the bottom of the lazy susan device in FIG. 2;

FIG. 4 is an exploded view of a tool-free support pole of a lazy susan device, showing interconnection of the support pole of the lazy susan device to a cabinet top and a cabinet bottom in accordance with the invention;

FIG. 4A is similar to FIG. 4, but illustrates the length adjustment mechanism shown in FIG. 4 as being in a reversed configuration, with the upper tube being an outer tube and the lower tube being an inner tube;

FIG. 4B is a view of the length adjustment mechanism shown in FIG. 4, in an assembled state;

FIG. 4C is similar to FIG. 4B, but shows the expansion nut as being further tightened onto the threaded insert;

FIG. 4D shows a length adjustment mechanism similar to that in FIG. 4, but with the fitted portion of the threaded insert being on the outside of the upper inner tube;

FIG. 5 is an exploded view of a second embodiment of an interconnection arrangement for a lazy susan device in accordance with the invention;

FIG. 5A is similar to FIG. 5, but shows the upper tube as being an outer tube and the lower tube as being an inner tube;

FIG. 6 is an exploded view of a third embodiment of an interconnection arrangement for a lazy susan device in accordance with the invention;

FIG. 7 is a fourth embodiment of an interconnection arrangement for a lazy susan device in accordance with the invention;

FIG. 8 is an exploded view of a further embodiment of an interconnection arrangement for a lazy susan device in accordance with the invention;

FIG. 9 is an exploded view of a still further embodiment of an interconnection arrangement for a lazy susan device in accordance with the invention;

FIG. 9A illustrates, in an enlarged and exploded view, a specific interconnection arrangement between a lower, outer tube and a cabinet bottom, similar to that shown in FIG. 9;

FIG. 10 is yet another embodiment of an interconnection arrangement for a lazy susan device in accordance with the invention;

FIG. 10A is an exploded view showing the specific collar device utilized in the length adjustment mechanism shown in FIG. 10;

FIG. 11 is a further embodiment of an interconnection arrangement for a lazy susan device in accordance with the invention;

FIG. 11A is an enlarged view of one of the bars utilized in the lazy susan device illustrated in FIG. 11;

FIG. 11B is similar to FIG. 11A, but shows a somewhat different type of attachment arrangement for attachment of the sleeve to the cabinet top;

FIG. 11C is a view similar to FIG. 1, but showing the sleeve of FIG. 11 as being in a “reversed” configuration;

FIG. 12 is an exploded view of a still further embodiment of an interconnection arrangement for a lazy susan device in accordance with the invention;

FIG. 13 is an exploded view of an interconnection arrangement for a lazy susan device in accordance with the invention;

FIG. 14 is a cross sectional plan view of an inner tube, taken along section lines 14-14 of FIG. 13;

FIG. 15 illustrates a further embodiment of the inner tube illustrated in FIG. 13, specifically illustrating a sectional plan view of an inner pole similar to the view of FIG. 14; and

FIG. 16 is a further embodiment of an interconnection arrangement for a lazy susan device in accordance with the invention.

DETAILED DESCRIPTION OF THE INVENTION

The principles of the invention are disclosed, by way of example, in a number of embodiments of lazy susan devices as illustrated in FIGS. 4-16. Lazy susan devices in accordance with the invention provide for tool free installation of the devices to storage cabinet surfaces or the like. That is, an installer can assemble the lazy susan device in accordance with the invention in a storage cabinet or similar structure, without the need of any special or conventional tools.
[0069] For purposes of understanding the environment in which lazy susan devices in accordance with the invention may be utilized, prior art lazy susan devices employing interconnection arrangements requiring tools are illustrated in FIGS. 1, 2 and 3. More specifically, FIG. 1 illustrates a prior art lazy susan device 100. The prior art lazy susan device 100 includes a centralized support pole 102. The centralized support pole 102 may be constructed of an upper post 104 and a lower post 106. In accordance with known lazy susan devices, the upper post 104 is adapted to be telescopically received, at least part, within the lower post 106. The centralized support pole 102 extends vertically upward.

[0070] FIG. 2 illustrates a partial second embodiment of a lazy susan device, identified as lazy susan device 200. FIG. 2 illustrates the lazy susan device 200 in an exploded configuration. The lazy susan device 200 is similar to the lazy susan device 100. For that reason, elements of each will be numbered with identical numerical references. For example, with reference to lazy susan device 200, the device 200 also includes the centralized support pole 202, with an upper post 204 and a lower post 206. With reference to lazy susan device 100 shown in FIG. 1, the device 100 includes an upper connecting mount 108. Similarly, the lazy susan device 200 also includes an upper connecting mount 208. Correspondingly, lazy susan device 200 further includes a lower connecting mount 110. The lazy susan device 100 illustrated in FIG. 1 will also have a lower connecting mount, similar to the connecting mount 110. However, the view of FIG. 1 does not show the lower connecting mount.

[0071] In FIG. 1, the lazy susan device 100 is shown as having a pair of rotatable shelves 112. The rotatable shelves 112 include an upper shelf 114 and a lower shelf 116. In the particular embodiment shown as the lazy susan device 100, the rotatable shelves 112 are what is commonly known as “kidney-shaped” shelves. Correspondingly the lazy susan device 200 also includes a rotatable shelf 118. However, the rotatable shelf 118, in contrast to the rotatable shelves 112, is typically characterized as a “full-round” shelf. That is, the shelf is in the form of a fully enclosed circle, rather than having a circular configuration with an omitted arc, such as exists in the kidney-shaped shelves 112.

[0072] As shown in FIG. 1, the lazy susan device 100 is adapted to be connected through its upper connecting mount 108 to a cabinet top 120 having a bottom surface 122. Although not shown in FIG. 1, the lazy susan device 100 would also be adapted to be mounted through a lower connecting mount to a cabinet floor having an upper surface (not shown). With the lazy susan device 200, the upper connecting mount 208 illustrated in FIG. 2 would be attached to a cabinet top (not shown). Correspondingly, the lower connecting mount 110 would be attached to a cabinet bottom or the like (not shown).

[0073] With specific reference to the lazy susan device 200 shown as prior art in FIG. 2, the upper post 104 is adapted to be telescopically received within the lower post 106. For purposes of adjusting the vertical length of the centralized support pole 102, various prior art arrangements can be used. For example, the upper post 104 can have a recessed slot (not shown) extending at least partially along the longitudinal length of the upper post 104. Correspondingly, the lower post 106 can include one or more apertures 124 (only one of which is illustrated in FIG. 2) extending longitudinally along the lower post 106, and formed through only a single surface of the lower post 106. A casting 126 can be provided which fits within the slot (not shown) of the upper post 104, in between the upper post 104 and the lower post 106, when the upper post 104 is telescopically received within the lower post 106. The casting 126 includes an aperture or through hole 128. A screw or similar connecting means 130 can be inserted through the aperture 128 of the casting 126, and through the aperture 124 in the lower post 106, thereby engaging the casting 126 within the slot (not shown) of the upper post 104. With the appropriate sizing and relative configurations of the slot (not shown) of the upper post 104 and the casting 126, the screw can be engaged with the interconnecting screw or other connecting means 130 on the casting 126 and into the slot (not shown) of the upper post 104 will cause the upper post 104 to be fixedly secured to the lower post 106, thereby preventing any relative longitudinal movement between the posts 104, 106. The upper post 104 can be telescopically received at various longitudinal positions relative to the lower post 106. When the upper post 104 is at an appropriate position relative to lower post 106, the casting 126 can be appropriately positioned so that the aperture 128 of the casting 126 is adjacent to and concentric with the aperture 124 and the lower post 106. The interconnecting screw or similar connecting means 130 can then be inserted through the aperture 124 and the lower post 106, and the aperture 128 of the casting 126, and into the slot (not shown) of the upper post 104. By tightening the interconnecting screw or similar connecting means 130, the upper post 104 can be fixedly secured at its desired position relative to the lower post 106. In this manner, the overall length of the centralized support pole 102 can be varied as desired, by varying the relative fixed position of the upper post 104 to the lower post 106. As apparent from the foregoing, tools would be required for purposes of threadably inserting the connecting screw 130 into the apertures 124 and 128.

[0074] Various prior art devices are known for rotatably mounting a lazy susan shelf to the appropriate centralized support pole. In the particular prior art embodiment shown as lazy susan device 200 in FIG. 2, a bearing hub 132 may be utilized, having a configuration as illustrated in FIG. 2. Although not shown in FIG. 2, a pin or similar device may be inserted through apertures (not shown) in the bearing hub 132 and one set of apertures 134 located in the lower support post 106. The pin (not shown) extending through the bearing hub 132 may extend through one set of the apertures 134 so as to appropriately support the bearing hub 132. Alternatively, the bearing hub 132 can be constructed so that it essentially “rests” on a pin extending through one set of the apertures 134. The bearing hub can then be utilized to support the rotatable shelf 118, in a manner so as to permit somewhat of a “floating” relationship between the shelf 118 and the bearing hub 132. In this manner, the rotatable shelf 118 can freely rotate relative to the centralized support pole 102. In addition, for kidney-shaped shelves, such as the shelves 112 shown in FIG. 1, the bearing hub 132 can include detents which, in a known way, permit self centering of the shelf 118.

[0075] For purposes of full description of an embodiment of the prior art known lazy susan devices, an interconnection between the lower connecting mount 110, the lower support post 106 and a cabinet bottom (not shown in FIG. 2) will
now be described. FIG. 3 is a “close up” view of such an interconnection. Specifically, FIG. 3 also illustrates the lower connecting mount 110, lower support post 106 and the rotatable shelf 118. FIG. 3 illustrates the lower connecting mount 110 as being fixedly attached to a cabinet bottom 138.

[0076] More specifically, the lower connecting mount 110 includes an upper collar 140, which surrounds a recess 142. The recess 142 is adapted to receive the lower end of the lower post 106. Within the recess 142 and the upper collar 140, a lug 144 (illustrated in FIG. 2 and partially illustrated in FIG. 3) extends upwardly, and is sized so as to fit within the lower post 106, when the lower post 106 is positioned within the recess 142. The lug 144 has an aperture 146 extending therethrough. Correspondingly, the lower post 106 has, at its lower end, an aperture 148 and a diametrically opposing notch 150.

[0077] The connecting mount 110 also includes a ledge 152 which is sized and positioned so that it receives the notch 150 and assists in securing the lower post 106 to the connecting mount 110. Still further, the lazy susan device 200 also includes a bearing pin 136. The bearing pin 136 is appropriately sized and adapted to fit within the notch 150, and received within the apertures 146 and 148. The bearing pin 136, aperture 148, notch 150 and ledge 152 act as to secure the lower post 106 to prevent rotational and translational movement relative to the connecting mount 110.

[0078] Still further, the connecting mount 110 includes a series of apertures 156 (FIG. 2) through which screws 154 may be inserted. Corresponding apertures (not shown) would exist in the cabinet bottom 138, so that the connecting mount 110 is fixedly secured to the cabinet bottom 138. As apparent from the foregoing, tools would be required to threadably or otherwise insert the screws 154 or similar connecting means to the cabinet bottom 138.

[0079] The foregoing has described how the lower support post 106 may be connected to the lower connecting mount 110, and the lower connecting mount 110 connected to the cabinet bottom 138. As previously described, the lazy susan device 200 also shown in FIG. 2 also includes an upper connecting mount 108. The upper connecting mount 108 can also have apertures 158 and a configuration substantially corresponding to the configuration of lower connecting mount 110. Again, for purposes of interconnection of the upper connecting mount 108 to a cabinet surface 122 or the like, connecting screws or similar means (not shown) would be inserted through the apertures 158 and then through corresponding apertures in the cabinet surface 122. The interconnection or coupling of the upper post 104 to the upper connecting mount 108 may occur in a manner similar to the interconnection of the lower post 106 to the lower connecting mount 110. Alternatively, it is also possible to merely insert the upper portion of the upper support post 104 into a sleeve or collar corresponding to the upper collar 140 of the lower connecting mount 110. Rotational movement of the upper connecting post 104 would be prevented, in view of its secured connection to the lower post 106.

[0080] The foregoing lazy susan devices 100 and 200 of the prior art, as illustrated in FIGS. 1, 2 and 3, are merely examples of various types of lazy susan devices which require special or conventional tools for purposes of installation into storage cabinets or the like. The particular interconnection of the upper and lower support posts also requires a tool, such as a screwdriver or the like. As previously described, lazy susan devices in accordance with the invention do not require the use of tools for purposes of assembly and installation, at least for interconnection to cabinet or other surfaces. Embodiments of these lazy susan devices are illustrated in FIGS. 4-16.

[0081] Reference is first made to FIG. 4, showing a first embodiment of a tool free lazy susan device in accordance with the invention. Specifically, FIG. 4 illustrates a lazy susan device 160. For purposes of simplification, the lazy susan device 160 is illustrated in FIG. 4 without any shelving. Lazy susan or other types of shelving may be utilized with the lazy susan device 160 and supported thereon by any appropriate means well known to those of ordinary skill in the prior art. More specifically, the lazy susan device 160 includes a central support pole 162. The central support pole 162 includes an upper inner tube 164, and a lower outer tube 166. For purposes of coupling together the upper inner tube 164 and outer tube 166, and for purposes of adjusting the entirety of the central support pole 162, the lazy susan device 160 also includes a length adjustment mechanism 168. As shown in FIG. 4, the length adjustment mechanism 168 includes an upper threaded insert 170. The threaded insert 170 includes a fitted portion 171 which is fitted so as to be received within or otherwise coupled to the upper inner tube 164. The threaded insert 170 also includes a lower threaded portion 173. The lower threaded portion 173 comprises a conical-shape configuration, as illustrated in FIG. 4. The length adjustment mechanism 168 also includes an expansion nut 172 which is adapted to be received within the lower outer tube 166. The threaded portion 173 of the threaded insert 170 includes external threads 175. In accordance with the foregoing description, the external threads 175 are constructed so that their pitch diameter increases, as the distance from the lower end of the upper tube 164 increases. The threaded portion 173 of the insert 170 therefore resembles a cone or similar conical structure having external threads, with the base of the cone extending away from the upper inner tube 164.

[0082] The expansion nut 172, as installed, is threadably fitted to the threaded portion 173 of the insert 170. The expansion nut 172 includes internal threads 177. The pitch of the internal threads 177 of the expansion nut 172 match the pitch of the external threads 175 of the threaded portion 173 of insert 170. Further, the internal threads 177 taper, so as to appropriately mate with the external threads 175 of insert 170.

[0083] Although the expansion nut 172 can be constructed of various materials, the nut 172 may preferably be molded of a polymeric material. With this material construction, the expansion nut 172 can readily flex and expand, as required. As further shown in FIG. 4 (as well as FIGS. 4B and 4C), a segment of the expansion nut 172 circumference is essentially “missing,” forming a gap 179. With the gap 179, the expansion nut 172 is free to expand as the nut 172 expands in response to the increasing pitch diameter of the external threads 175 of the threaded insert 170. During expansion, the gap 179 will essentially widen.

[0084] Still further, the expansion nut 172 may preferably be molded, so that its outer diameter is slightly larger than the inner diameter of the mating lower outer tube 166. In
addition, the threaded insert 170 is preferably molded, so that when the expansion nut is positioned at the smallest portion of the cone of the threaded portion 173, the pitch diameter of the external threads 175 of the insert 170 is smaller than the mating pitch diameter of the internal threads 177 of the expansion nut 172. In this position, the nut 172 is slightly compressed when the nut 172 and threaded insert 170 are assembled together and inserted into the outer tube 166. With this compression, the friction between the nut 172 and the interior surface of the lower outer tube 166 will be sufficient so as to cause the nut 172 to rotate relative to the threaded insert 170 as the lower outer tube 166 is rotated relative to the upper inner tube 164 and corresponding threaded insert 170. It should be noted that the threaded insert 170 is prevented from rotation relative to the upper inner tube 164. This can be accomplished by utilizing various types of structural elements, such as the connecting pin 181 extending through an aperture 183 in the upper inner tube 164 and through an aperture 185 in the fitted portion 171 of the insert 170. The friction forces between the expansion nut 172 and the lower outer tube 166 should also be sufficiently small, so that the upper inner tube 164 and lower outer tube 166 can be telescoping and manually adjusted to a desired length using relatively “light” manual forces, before the tubes 164, 166 are turned so as to “lock” the length.

[0085] In accordance with the foregoing assembly, when the lower outer tube 166 is rotated in a first direction, the expansion nut 172 will move “away” from the lower end of the upper tube 164, and will expand in response to the increase in pitch diameter of the external threads 175 acting on the internal threads 177 of the expansion nut 172. This “wedge” action produces an ever increasing force between the nut 172 and the interior surface of the lower outer tube 166. In this manner, friction forces between the nut 172 and the lower outer tube 166 are increased, thereby providing a secure adjustment to the effective length of the entirety of the centralized support pole 162. Still further, because the expansion nut 172 is moving “away” from the lower end of the upper inner tube 164 as it expands, the expansion nut 172 acts to “slightly” telescopingly extend the lower outer tube 166 relative to the upper inner tube 164, as the expansion nut 172 is tightened. This slight extension causes the effective length of the support pole 162 to slightly extend, so as to fit “snugly” between a cabinet top 174 and a cabinet bottom 184 as described in subsequent paragraphs herein. Correspondingly, as the lower outer tube 166 is rotated in an opposing direction relative to the upper inner tube 164, the process is essentially “reversed.” That is, the friction force between the expansion nut 172 and the inner surface of the lower outer tube 166 will be reduced to an amount such that relatively “light” manual forces are sufficient to telescopingly adjust the effective length of the support pole 162 by adjusting the linear relationship between the upper inner tube 164 and the lower outer tube 166.

[0086] In addition to the elements of the length adjustment mechanism 168 and the lazy susan device 160 is described in the foregoing paragraphs, the lazy susan device 160 may also include a ribbed sleeve 185 which can be snugly received on the upper inner tube 164 as primarily illustrated in FIGS. 4B and 4C. The purpose of the ribbed sleeve 185 is to provide an alignment and a surface on which the lower outer tube 166 may ride when the outer tube 166 is telescopingly received on the inner tube 164.

[0087] The foregoing description described the structure of the lazy susan device 160 as illustrated in FIGS. 4, 4B and 4C. Specifically, FIG. 4A shows an exploded view of the length adjustment mechanism 168, while FIGS. 4B and 4C shows the length adjustment mechanism 168 in an assembled state, absent the lower outer tube 166. However, in addition to the foregoing assembly, a similar assembly can utilize a “reverse” configuration of the upper and lower tubes. That is, as illustrated in FIG. 4A, the lazy susan device 168 shown therein uses the length adjustment mechanism 168 with an upper outer tube 185 and a lower inner tube 187. This is the reverse configuration of the tubes 164, 166 illustrated in FIGS. 4, 4B and 4C. With the lazy susan device 168, the length adjustment mechanism 168 corresponds to the length adjustment mechanism 168 shown in FIGS. 4A and 4B, but further shows the mechanism 168 in a “reverse” or “upside down” configuration, so as to correspond in relationship to the upper outer tube 185 and the lower inner tube 187. The operation of the length adjustment mechanism 168 as shown in FIG. 4A substantially corresponds to the operation of the length adjustment mechanism 168 illustrated in FIGS. 4 and 4B.

[0088] Going back to the lazy susan device 160 shown in FIGS. 4A and 4B, the device 160 is adapted to be connected at the top to a cabinet top 174, and at the bottom to a cabinet bottom 184. Referring to the cabinet top 174, a pair of dowel holes 176 are predrilled in the cabinet top 174. The lazy susan device 160 further includes an upper pole flange 180 having a shape and configuration as illustrated in FIG. 4. The pole flange 180 includes a pair of upwardly extending dowels 182, mounted on an upper surface of the pole flange 180. The dowels 182 are sized and configured on the pole flange 180 so as to be capable of insertion into the dowel holes 176.

[0089] For purposes of installation, the pole flange 180 with its corresponding pair of dowels 182 is positioned below the cabinet top 174, and the dowels 182 are received within the dowel holes 176. A sleeve on the pole flange 180 is then received within the inner tube 164. Correspondingly, the cabinet bottom 184 includes a pair of predrilled dowel holes 186. A lower pole flange 188 is provided, which corresponds in structure to the pole flange 180. That is, the pole flange 188 includes a pair of downwardly extending dowels 190, extending downwardly from an upper surface of the pole flange 188. For installation purposes, the dowels 190 can be received within corresponding ones of the dowel holes 186, and are sized and configured so as to provide for such reception. The pole flange 188 includes an upwardly extending sleeve which is received within the bottom of the outer tube 166. With the pole flange 180 received within the inner tube 164 and the pole flange 188 received within the outer tube 166, the length adjustment mechanism 170 can then be utilized to extend the length of the entirety of the centralized support pole 162. This adjustment occurs until the inner tube 164 effectively “seats” against the flange of the pole flange 188, so as to secure the dowels 182 within the dowel holes 176. Correspondingly, this extension of the centralized support pole 162 will cause the outer tube 166 to seat against the pole flange 188. In this manner, the entirety of the lazy susan device 160 is installed in the cabinet top 174 and the cabinet bottom 184. This installation occurs without the use of any commercially available or special tools during installation. It is this concept of installation...
without the requirement of tools which forms a primary basis for the novel concepts of the invention.

In a preferred embodiment of the lazy susan device 160, the upper inner tube 164 is preferably relatively shorter in length than the lower outer tube 166. With this relative difference in length, the lazy susan shelves (not shown in FIG. 4) would be supported solely by the outer tube 166. By supporting the shelves (not shown) on the outer tube 166, the shelf loads would preferably not be on the inner tube 164 or the expansion nut 172.

In addition to the embodiments of the lazy susan device 160 and length adjustment mechanism 168 shown in FIGS. 4-4C, another version of the length adjustment mechanism 168 is illustrated in FIG. 4D. Specifically, in this configuration, the fitted portion 171 of the threaded insert 170 is structured so as to fit around the outside of the upper inner tube 164, rather than the interior of the upper inner tube 164. Otherwise, the length adjustment mechanism 168 illustrated in FIG. 4D operates substantially the same as that illustrated in FIGS. 4-4C.

A further embodiment of a lazy susan device in accordance with the invention is illustrated as lazy susan device 200 in FIG. 5. As with the lazy susan device 160, the lazy susan device 200 is illustrated without any shelving. Also, certain components of the lazy susan device 200 correspond in structure, design and function to various elements in the lazy susan device 160. These elements are like numbered. More specifically, the lazy susan device 200 includes, as does the lazy susan device 160, a cabinet top 174 with predrilled dowel holes 176. A cabinet bottom 184 is also provided, with predrilled dowels 186. An upper pole flange 180 is provided, with upwardly extending dowels 182. Correspondingly, a lower pole flange 188 is also provided, with downwardly extending dowels 190. These pole flanges, dowels and predrilled dowel holes have the same functions as like numbered elements in the lazy susan device 160 illustrated in FIG. 4.

Unlike the lazy susan device 160, the lazy susan device 200 includes a length adjustment mechanism different from the length adjustment mechanism 168. Specifically, the lazy susan device 200 includes a length adjustment mechanism 208. More specifically, the length adjustment mechanism 208 includes an elongated spring 202. The spring 202 is adapted to be received within the inner tube 164 and the lower outer tube 166. Positioned within the lower outer tube 166 is a lower pin 206. The lower pin 206 can preferably be inserted through diametrically opposing apertures (not shown) in the outer tube 166. In this manner, the lower pin 206 extends through the central axis of the lower outer tube 166. The lower end of the spring 202 is either secured to or otherwise abuts against the lower pin 206 in any suitable manner. Correspondingly, an upper pin 204 is inserted through apertures (not shown) in the upper inner tube 164. The upper end of the spring 202 is coupled to or otherwise abuts against the upper pin 204. The spring 202 is sized and configured so that when it is received within the tubes 164, 166 and coupled to or otherwise abutting against the upper pin 204 and lower pin 206, the spring 202 is in a "compressed" state. Accordingly, the spring 202 will exert upward and downwardly extending forces against the pins 204, 206, respectively. With the spring 202 maintained in a compressive state, the upwardly extending forces exerted against the upper pin 204 will cause the upper inner tube 164 to seat and abut against the upper pole flange 180. Correspondingly, the downwardly extending forces exerted against the lower pin 206 by the spring 202 will cause the lower outer tube 166 to seat and abut against the pole flange 188. In this manner, the length of the centralized support pole 162 is essentially "self-adjusting" and the spring 202 can be characterized as "self-adjusting." Also, as with the lazy susan device 160, the lazy susan device 200 can be essentially installed and coupled to the cabinet top 174 and cabinet bottom 184, without the use of any type of commercially available or special tools.

In addition to the lazy susan device 200 illustrated in FIG. 5, a somewhat modified version of the device 200 is illustrated in FIG. 5A. In this particular embodiment, most of the elements shown substantially correspond to those of the device illustrated in FIG. 5. However, the device 200 shown in FIG. 5A includes an upper outer tube 180 and a lower inner tube 166. This configuration is essentially the "reverse" of that shown in FIG. 5.

As still further embodiment of a lazy susan device in accordance with the invention is illustrated as lazy susan device 212 in FIG. 6. The lazy susan device 212 is substantially similar to the lazy susan device 200 illustrated in FIG. 5. That is, the device 212 includes a spring 202 for purposes of exerting forces so as to seat and abut the centralized support pole 162 to the cabinet top 174 and cabinet bottom 184. Also, the lazy susan device 212 includes predrilled dowel holes 176, upper pole flange 180 and dowels 182. Further, the lazy susan device 212 includes predrilled dowel holes 186, dowels 190 and lower pole flange 188. The spring 202 is part of a length adjustment mechanism 214. However, unlike the length adjustment mechanism 208 of lazy susan device 200, which utilizes upper and lower pins 204, 206, respectively, the length adjustment mechanism 214 of the lazy susan device 212 uses a lower metal insert 218 and an upper metal insert 216. The metal inserts can be somewhat flexible or otherwise resilient, and can be "pressed" into the tubes 164, 166 at a desired length along the corresponding tube. The metal inserts 216, 218 form abutment walls against which the ends of the spring 202 will exert forces. The forces exerted against the inserts 216, 218 are translated to the tubes 164, 166. In this manner, the centralized support pole 162 comprising the tubes 164, 166, is seated against the pole flanges 180 and 188. This will cause the pole flanges 180 and 188 to be appropriately secured against the cabinet top 174 and cabinet bottom 184, respectively. Again, the lazy susan device 212, as with the lazy susan devices 160 and 200, provides for installation without the use of any tools.

The embodiments of the lazy susan devices 160, 200 and 212 illustrated in FIGS. 4, 5 and 6, respectively, each use pole flanges 180, 188 with dowels 182, 190, respectively. In these embodiments, the dowels may be plastic molded dowels, and may be molded onto the pole flanges themselves. This, of course, would occur at the factory, so that the pole flanges would be provided as an assembly. In a slightly modified embodiment, FIG. 7 illustrates a pole flange 220. The pole flange 220 includes a sleeve 222 and dowels 224. However, instead of plastic molding the dowels to the pole flanges, the dowels 224 are coupled to the pole flange 220 by means of screws 226. However, in accordance with the invention, the dowels 224
would be secured to the pole flange 220 through use of the screws 226 at the factory. In this manner, the entirety of the pole flange 220 with the dowels 224 would be provided at the installation site as a fully assembled pole flange with dowels. Accordingly, even with the screws 226 utilized to attach the dowels 224 to the pole flange 220, installation of a lazy susan device utilizing in the pole flanges 220 would still not require tools at the installation site since these screws 226 would attach the dowels 224 to the pole flange 220 at the factory site. Further, it should be noted that the pole flange 220, with the screws 226 attaching the dowels 224 to the flange 220, may be utilized not only with the lazy susan device 160 illustrated in FIG. 4, but also the lazy susan devices 200 and 212 illustrated in FIGS. 5 and 6, respectively.

[0097] Still further embodiment of a lazy susan device in accordance with the invention is illustrated as lazy susan device 230 shown in FIG. 8. As with the lazy susan device 160, the lazy susan device 230 includes a centralized support pole 162 having an inner tube 164 and a lower outer tube 166. The tubes 164, 166 are coupled together through the use of a length adjustment mechanism 168, previously described with respect to the lazy susan device 160 in FIG. 4. However, distinguishable from the lazy susan device 160, the lazy susan device 230 includes a cabinet top 174 with an upper predrilled pole hole 232 extending therein. The upper pole hole 232 is sized so as to receive the top of the upper inner tube 164. Correspondingly, a cabinet bottom 184 includes a lower predrilled pole hole 234. The lower pole hole 234 is sized and configured so as to receive the lower end of the outer tube 166. Again, these components of the lazy susan device 244 are similar to components of the lazy susan device 230. However, unlike the lazy susan device 230, the lazy susan device 244 includes a length adjustment mechanism 246 similar to the length adjustment mechanism 208 of the lazy susan device 200. That is, the length adjustment mechanism 246 includes an elongated spring 202. The spring 202 is adapted to be received within the inner tube 164 and the lower outer tube 166.

[0100] Positioned within the upper inner tube 164 is a first support means 238 which is used to maintain the upper portion of the spring 202 in a predetermined position relative to the tube 164. This support means 238 can be in the form of a pin (such as the upper pin 204 of the lazy susan device 200 shown in FIG. 5) or a metal insert (such as a metal insert 218 of the lazy susan device 212 shown in FIG. 6). A similar second support means 240 can be located within the lower outer tube 166. The first and second support means 238, 240 are utilized to maintain the opposing ends of the spring 202 in particular positions relative to the tubes 164, 166, respectively. With the spring 202 in a tensioned state, the opposing ends of the spring 202 will exert forces against the first and second support means 238, 240, respectively. Dependent upon the configuration and tensile properties of the spring 202, these forces exerted by the ends of the spring 202 will cause the tube 164 to be extended outwardly from a telescoping relationship with the lower outer tube 166. The tubes 164, 166 with thus be extended so as to fit within the pole holes 232, 234, respectively. Again, the use of the spring 202 and the support means 238, 240 is similar in function and configuration to components of the lazy susan device 200 and the lazy susan device 212 previously described with respect to FIGS. 5 and 6, respectively.

[0101] In the lazy susan device 230 previously described with respect to FIG. 8, the device 230 included an optional point or stub 236 associated with the lower outer tube 166, for purposes of preventing rotation of the outer tube 166 within the pole hole 234. In a somewhat similar manner, the lazy susan device 244 can include an optional insert 242 which can be coupled or otherwise attached to the lower tube 166 and positioned above or inserted within the pole hole 234. An enlarged view of the optional insert 242 is illustrated in FIG. 9A. The insert 242 can be sized and configured in a manner such that its association with the tube 166 will prevent the tube 166 from rotation. As previously mentioned, with lazy susan devices of the type described herein, the rotatable shelves would typically be associated with the lower tubes 166. Accordingly, a coupling configuration in these lazy susan devices between the rotating shelves and the supporting tubes which would utilize “non-rotatable” supporting tubes would only require the prevention of rotation of the lower tube 166.

[0102] A still further embodiment of a lazy susan device in accordance with the invention is illustrated as lazy susan device 248 shown in FIG. 10. As with the lazy susan devices previously described herein, the lazy susan device 248 includes a centralized support pole 162 having an inner tube 164 and a lower outer tube 166. Similar to the lazy susan
devices 230 and 244, the lazy susan device 248 is adapted to be installed in a cabinet top 174 with an upper predrilled pole hole 232 extending therein. The upper pole hole is sized so as to receive the top of the upper inner tube 164. The lazy susan device 248 is also adapted to be installed and coupled to a cabinet bottom 184. The coupling to the cabinet bottom 184 occurs in a manner similar to that previously described with respect to lazy susan device 160 illustrated in FIG. 1. That is, a pole flange 188 is provided, with dowels 190 extending downwardly therefrom. The cabinet bottom 184 is provided with predrilled dowel holes 186. The pole flange 188 includes an upwardly extending sleeve which is received within the bottom of the outer tube 166. The dowels 190 are adapted to be received within the predrilled dowel holes 186. This configuration corresponds to the configuration utilized in the lazy susan device 160 illustrated in FIG. 4.

[0103] However unlike the prior lazy susan devices described herein, the lazy susan device 248 includes a locking adjustment mechanism comprising a locking collar 250 as shown in FIG. 10. The locking collar 250 is a conventional device which is typically referred to as a “quarter-turn locking collar.” Such locking collars are typically utilized on bicycle seats and the like. For purposes of assembly, the upper tube is inserted within the pole hole 232, while the pole flange 188 is inserted within the lower part of the lower outer tube 166. Correspondingly, the flange 188 is positioned so that the dowels 190 would be inserted within the predrilled dowels 186. With this configuration, the quarter-turn locking collar 250 would be configured so as to be coupled to the upper tube 164 and lower tube 166, and then locked so as to maintain a coupling of the tubes 164, 166, and to also prevent any axial movement of one of the tubes relative to the other tube. A somewhat modified version of the locking collar 250 is illustrated in FIG. 10A. As shown therein, the locking collar 250 is primarily designed to be received on the upper tube 164.

[0104] Another embodiment of a lazy susan device in accordance with the invention is illustrated as lazy susan device 252, shown in FIGS. 11, 11A, and 11B. As with the lazy susan device 248, the device 252 includes a centralized support pole 162 having an inner tube 164 and a lower outer tube 166. Received within the lower end of the outer tube 166 is a pole flange 188 as previously described with respect to FIG. 4. That is, the pole flange 188 includes a pair of dowel rods 190, adapted to be received within dowel holes 186 predrilled within the cabinet bottom 184. Like other lazy susan devices previously described herein, the lazy susan device 252 includes a connector mechanism 254, adapted to connect to the cabinet top 174. More specifically, the connector mechanism 254 includes an outer sleeve 256. Connected to or otherwise integral with the top of the outer sleeve 256 is a horizontally disposed flange 258. Projecting upwardly from the top of the horizontal flange 258, and connected to or otherwise integral therewith, are a pair of press-in bars 260. One of the bars 260 is shown in an enlarged view in FIG. 11A. A somewhat version of the bar 260 is illustrated in FIG. 11B.

[0105] To assemble the lazy susan device 252, the inner tube 164 is received within the sleeve 256 of the connector mechanism 254. The press-in bars 260 can then be pressed into predrilled bar holes 262 extending upwardly from the lower surface of the cabinet top 174. With this press-in fit of the bars 260 in the bar holes 262, the connector mechanism 254 is appropriately secured. In this particular embodiment, the inner tube 164 can be the same tube as the outer tube 166. With this configuration, there is no need for separate tubes, and therefore no need for any coupling mechanism between the tubes. Accordingly, the single tube 164, 166 would extend outwardly from the bottom of the sleeve 256 and would abut the flange 188 at the bottom of the lazy susan device 252. The length of the sleeve 256 would be sized so that it would not extend downwardly into the area where rotatable shelves would typically be mounted to the tube 166. As with the other lazy susan devices described herein, assembly and installation of the lazy susan device 252 requires no conventional or special tools.

[0106] Yet another embodiment of a lazy susan device in accordance with the invention is illustrated as lazy susan device 264 as shown in FIG. 12. As with other lazy susan devices previously described herein, the lazy susan device 264 includes a centralized support pole 162 having an upper inner tube 164 and a lower outer tube 166. As with the lazy susan device 160 previously described with respect to FIG. 4, the lazy susan device 264 includes a pole flange 188 at the lower portion of the device 264. The pole flange 188 is adapted to be received within the outer tube 166. The flange 188 also includes a pair of dowels 190. The dowels 190 are adapted to be received within dowel holes 186 predrilled within the cabinet bottom 184.

[0107] Unlike the previously described lazy susan devices, the lazy susan device 264 includes a threaded insert 266 which is adapted to be coupled to the top of the upper inner tube 164 by any suitable means. The threaded insert 266 is further adapted to be threadably received within the threaded hole 268 which is predrilled within the cabinet top 174. For purposes of installation, the inner tube 164 is first received within the top of the outer tube 166. The inner tube 164 is then moved upwardly so that the threaded insert 266 can be received within the threaded hole 268. The inner tube 164 is rotated so as to thread the insert 266 into the hole 268. After such assembly, the inner tube 164 is in a rigid and secure configuration. The outer tube 166 can then be moved downwardly and coupled to the pole flange 188. The dowels 190 of the pole flange 188 can then be moved inwardly into the dowel holes 186. With the configuration of the lazy susan device 264, it is optional whether there is any active coupling mechanism between the inner tube 164 and the outer tube 166.

[0108] A still further embodiment of a lazy susan device in accordance with the invention is illustrated in FIGS. 13, 14 and 15, and is designated lazy susan device 270. Referring primarily to FIG. 13, the lazy susan device 270 includes a centralized support pole 272 having an upper inner tube 274 and a lower outer tube 276. As with lazy susan devices previously described herein, the inner tube 274 is adapted to be telescopically received within the upper end of the lower outer tube 276. Unlike other lazy susan devices described herein, the lazy susan device 270 includes an upper inner tube 274 having a ratchet 278 associated with the tube 274. The ratchet 278 is a conventional ratchet and extends longitudinally along an outer surface of the inner tube 274. The ratchet 278 includes a set of teeth 280. The cross sectional configuration of the inner upper tube 274 can vary in design. For example, the inner tube 274 may have a cross
sectional configuration as shown in FIG. 14 or, alternatively, a cross-sectional configuration as shown in FIG. 15.

[0109] Also associated with the lazy susan device 270 is a coupling mechanism 282, utilized for purposes of coupling the inner upper tube 274 to the lower outer tube 276. In this specific embodiment, the coupling mechanism 282 comprises a sleeve 288 which extends downwardly and is designed to be received within the lower tube 276. The sleeve 288 is sized so that the coupling mechanism 282 can be relatively rigidly coupled to the end of the lower tube 276. The coupling mechanism 282 also includes a ratchet collar 284. The ratchet collar 284 includes a conventional ratchet catch 286 located on one side thereof. The ratchet catch 286 is sized and configured so as to operate along the teats 280 of the ratchet 278.

[0110] The inner upper tube 274 also includes, at its upper end, a pole support 290. The pole support 290 is rigidly secured or otherwise integral with the tube 274. The pole tube 290 is connected to a pair of dowels 292 which are adapted to be received within dowel holes 176 previously drilled within the cabinet top 174. Correspondingly, at the bottom portion of the lazy susan device 270, a pole flange 188 is provided, corresponding to the pole flange 188 previously described with respect to FIG. 4. The pole flange 188 can be appropriately secured to the cabinet bottom 184, with the dowels 190 being received within the previously drilled dowel holes 186. The upper inner tube 274 is then press fitted into the cabinet top 174, through the use of the dowels 292 being received within the dowel holes 176. However, prior to the inner tube 274 being coupled to the cabinet top 174, the coupling mechanism 282 is secured to the outer tube 286, and then the coupling mechanism 282 and the outer tube 286 are moved upwardly so that the upper tube 274 is telescopically received within the outer tube 276. With this movement, the ratchet catch 286 will move along the teats 280 of the ratchet 278. When the inner tube 274 is appropriately coupled to the cabinet top 174, the outer tube 276 can be moved downwardly by operating the ratchet catch 286 along the ratchet 278. The outer tube 276 is moved downwardly until it abuts against the pole flange 188 and is thereby secured to the cabinet bottom 184. Again, as with other lazy susan devices in accordance with the invention, assembly of the lazy susan device 270 to the cabinet top 174 and cabinet bottom 184 requires no conventional or special tools.

[0111] Another embodiment of a lazy susan device in accordance with the invention is illustrated in FIG. 16 as lazy susan device 294. The lazy susan device 294 is adapted to be coupled to a cabinet top 174 and a cabinet bottom 184. The device 294 includes a centralized support pole 296. As with other devices described herein, the centralized support pole 296 includes an upper inner tube 298, and a lower outer tube 300. The upper inner tube 298 is adapted to be telescopically received within the upper end of the outer tube 300. However, unlike other devices described herein, the inner tube 298 includes a threaded bolt 302 connected to or otherwise integral with the lower end of the inner tube 298. The threaded bolt 302 is adapted to be received within the top of the outer tube 300 and threadably connected to a press fit or other means within the interior of the outer tube 300 at a desired position.

[0112] For purposes of assembly, the inner tube 298 can be coupled to the outer tube 300 through the action of the threaded bolt 302 being threadably received through the press fit 304. After partially adjusting the length of the centralized support pole 296 in this manner, the upper end of the inner tube 298 can be received within a pole hole 232 previously configured within the lower surface of the cabinet top 174. After this coupling, the inner tube 298 can be twisted so as to be extended outwardly from the lower outer tube 300. With this extension, the outer tube 300 will abut against the pole flange 188. The pole flange 188 has been previously described herein, and includes a pair of dowels 290 which fit within dowel holes 186 of the cabinet bottom 184. The upper inner tube 298 is rotated sufficiently so that the lower outer tube 300 securely abuts the pole flange 188.

Again, as with other lazy susan devices previously described herein, the lazy susan device 294 requires no conventional or special tools for assembly and installation.

[0113] It should be noted that the length adjustment mechanisms described herein, and corresponding to such devices as the mechanism 168, have been described with respect to lazy susan devices. However, it should be emphasized that the concepts associated with the length adjustment mechanism 168 as described herein and illustrated in FIGS. 4, 4a, 4b and 4c, are not limited to use with lazy susan devices. In fact, the concepts associated with the length adjustment mechanism 168 can be utilized in any type of configuration where it is desired to effectively adjust the effective length of a pole or similar device employing two or more telescoping elements. That is, with reference to FIG. 4, the concept of utilizing elements such as the threaded insert 170 and expansion nut 172 can be applied to various devices. For example, length adjustment mechanism such as mechanism 168 can be readily utilized for purposes of fitting a pole or similar device between two opposing surfaces, where the fit is a friction fit or the like. As a more specific example, a length adjustment mechanism in accordance with the invention could be utilized for purposes of supporting a shower curtain rod between two opposing walls spanning a bath tub or a shower. It would be appreciated that other uses can also be made of mechanisms in accordance with the invention.

[0114] It will be apparent to those skilled in the pertinent arts that other embodiments of lazy susan devices in accordance with the invention may be designed. That is, the principles of a lazy susan device are not limited to the specific embodiments described herein. Accordingly, it will be apparent to those skilled in the art that modifications and other variations of the above-described illustrative embodiments of the invention may be effected without departing from the spirit and scope of the novel concepts of the invention.

1. A lazy susan-like apparatus adapted for use in supporting items and facilitating access to said items by a user, said apparatus comprising:
   at least one shelf or support base;
   support means connected to a first structure separate from said apparatus, for supporting said apparatus and for supporting said at least one shelf;
   first connector means associated, at least in part, with said support means, for connecting together said support means and said first structure;
coupling means for coupling said at least one shelf to said support means;
said first connector means and said coupling means being operable so as to permit said at least one shelf to rotate relative to said first structure;
said coupling means, said support means and said at least one shelf being structured and operable so as to readily permit manual assembly and disassembly in the absence of any tools; and
said first connector means, said support means and said first structure being structured and operable so as to readily permit manual assembly and disassembly in the absence of any tools.

2. A lazy susan-like apparatus in accordance with claim 1, characterized in that:
said support means comprises an upper portion and a lower portion; and
said first structure comprises an upper structure located substantially above said apparatus, when said apparatus is installed with said upper portion of said support means connected to said upper structure through said first connector means.

3. A lazy susan-like apparatus in accordance with claim 2, characterized in that said first connector means is located, at least in part, on said upper portion of said support means.

4. A lazy susan-like apparatus in accordance with claim 1, characterized in that:
said support means comprises an upper portion and a lower portion; and
said first structure comprises a lower structure located substantially below said apparatus, when said apparatus is installed with said lower portion of said support means connected to said lower structure through said first connector means.

5. A lazy susan-like apparatus in accordance with claim 4, characterized in that said first connector means is located, at least in part, on said lower portion of said support means.

6. A lazy susan-like apparatus in accordance with claim 1, characterized in that:
said first structure comprises an upper structure located substantially above said apparatus, when said apparatus is installed with an upper portion of said support means coupled to said upper structure through said first connector means; and
said first connector means comprises an outer sleeve, a horizontally disposed flange connected to or otherwise integral with a top of said outer sleeve, and at least one press-in barb projecting upwardly from a top of said horizontal flange, said press-in barb adapted to be pressed into at least one predrilled barb hole extending upwardly from a lower surface of said first structure.

7. A lazy susan-like apparatus in accordance with claim 1, characterized in that:
said first structure comprises an upper structure located substantially above said apparatus, when said apparatus is installed with an upper portion of said support means coupled to said upper structure through said first connector means; and
said first connector means comprises a stabilization element coupled to said upper structure and received within or outside of said support means, and further including means connected to said stabilization element and to said first structure for substantially preventing movement of said support means relative to said first structure.

8. A lazy susan-like apparatus in accordance with claim 1, characterized in that:
said first structure comprises an upper structure located substantially above said apparatus, when said apparatus is installed with an upper portion of said support means coupled to said upper structure through said first connector means; and
said first connector means comprises a sleeve and means connected to said sleeve and to said first structure for preventing movement of said support means relative to said first structure.

9. A lazy susan-like apparatus in accordance with claim 1, characterized in that:
said support means comprises a centralized support pole having an upper tube and a lower tube;
said apparatus further comprises a locking collar coupled to one or both of said upper tube and said lower tube, with said locking collar maintaining a coupling of said upper tube and said lower tube, and also preventing axial movement of one of said tubes relative to the other of said tubes; and
said locking collar is structured and operable within said apparatus so as to permit manual assembly and disassembly in the absence of any tools.

10. A lazy susan-like apparatus with claim 1, characterized in that:
said first structure comprises an upper structure located substantially above said apparatus, when said apparatus is installed;
said support means comprises an upper tube;
said first connector means comprises a threaded insert fixed to said upper tube, and projecting upwardly so as to be received within a recess of said upper structure; and
said threaded insert is structured and operable with said apparatus so as to permit manual assembly and disassembly in the absence of any tools.

11. A lazy susan-like apparatus in accordance with claim 1, characterized in that:
said support means comprises an upper portion and a lower portion;
said first structure comprises an upper structure and a lower structure;
said upper structure being located substantially above said apparatus when said apparatus is installed with said upper portion of said support means connected to said upper structure through said first connector means;
said first connector means is located, at least in part, on said upper portion of said support means;
said apparatus further comprises a second connector means located, at least in part, on said lower portion of said support means; and

said lower structure is located below said apparatus when said apparatus is installed with said lower portion of said support means being connected to said lower structure through said second connector means.

12. A lazy susan-like apparatus in accordance with claim 11, characterized in that said coupling means couples said at least one shelf to said lower portion, so that the weight of said at least one shelf is not curried by said upper portion.

13. A lazy susan-like apparatus in accordance with claim 11, characterized in that said support means comprises:

a centralized support pole having an upper tube connected to said first connector means, and a lower tube connected to said second connector means;

a length adjustment mechanism coupled to one or both of said upper tube and said lower tube, said length adjustment mechanism comprising means for adjusting the relative linear spatial relationship along a centralized axis between said upper tube and said lower tube, so as to selectively adjust an effective length of said centralized support pole; and

said length adjustment mechanism is structured and operable with said apparatus so as to permit manual assembly and disassembly in the absence of any tools.

14. A lazy susan-like apparatus in accordance with claim 13, characterized in that:

said length adjustment mechanism can be activated by a user, so that when said user wishes to adjust said effective length of said support pole from an initial first effective length to a second effective length, said user first manually applies forces to said length adjustment mechanism or to said pole; and

when said pole is at the desired said second effective length, said user can release said manually applied forces, and said pole will maintain itself at said second effective length, absent the application of any additional externally applied forces.

15. A lazy susan-like apparatus in accordance with claim 13, characterized in that said length adjustment mechanism is self adjusting, so that said support pole will initially position itself and maintain a first effective length, when initially installed and assembled with said apparatus. 

16. (canceled)

17. A lazy susan-like apparatus in accordance with claim 13, characterized in that:

one of either of said upper tube or said lower tube is an inner tube telescopingly received within an outer tube, where said outer tube is the other of said upper tube or said lower tube;

said length adjustment mechanism comprises a threaded insert having a portion which is fitted so as to be coupled to said inner tube;

said length adjustment mechanism further comprises an expansion nut adapted to be received within said outer tube;

said threaded insert further having a threaded portion received within said expansion nut; and

with rotation of either said inner tube or said outer tube in a first direction, said expansion nut is caused to expand and simultaneously move away from said inner tube.

18. A lazy susan-like apparatus in accordance with claim 13, characterized in that:

one of either of said upper tube or said lower tube is an inner tube telescopingly received within an outer tube, where said outer tube is the other of said upper tube or said lower tube;

said length adjustment mechanism comprises a threaded insert having a portion which is fitted so as to be coupled to said inner tube;

said length adjustment mechanism further comprises an expansion nut adapted to be received within said outer tube;

said threaded insert further having a threaded portion received within said expansion nut; and

with rotation of either said inner tube or said outer tube in a first direction, and with said threaded portion being received within said expansion nut, said expansion nut is caused to expand.

19. A lazy susan-like apparatus in accordance with claim 17, characterized in that:

said inner tube is said upper tube;

said outer tube is said lower tube and is of a relatively larger diameter than said upper tube, and said lower tube is telescopingly received outside of said upper tube;

said portion of said threaded insert is received within said upper tube; and

said expansion nut is adapted to be coupled to said lower tube.

20. A lazy susan-like apparatus in accordance with claim 11, characterized in that:

said first connector means comprises an upper pole flange adapted to be secured to said upper portion of said support means, and an upper attachment means for securing said upper pole flange to said upper structure; and

said upper pole flange is secured to said upper portion of said support means, and said upper pole flange is secured to said upper structure in the absence of any need for any tools or other equipment.

21. A lazy susan-like apparatus in accordance with claim 11, characterized in that said second connector means comprises a lower pole flange secured to said lower portion of said support means, and a lower attachment means connected to said lower pole flange for securing said lower pole flange to said lower structure.

22. A lazy susan-like apparatus in accordance with claim 11, characterized in that:

said support means comprises a centralized support pole having an upper inner tube and a lower outer tube; and

said coupling means couples said shelf to said lower outer tube.

23. A lazy susan-like apparatus in accordance with claim 11, characterized in that said support means comprises:
a centralized support pole having an upper tube and a lower tube, with one of said upper and lower tubes being an inner tube adapted to be telescopingly received within the other of said upper and lower tubes, said other of said upper and lower tubes being an outer tube;

a length adjustment mechanism comprising an elongated spring adapted to be received within both said upper tube and said lower tube, a lower securing means coupled to said lower tube for maintaining a lower end of said spring at a predetermined position relative to said lower tube, and an upper securing means coupled to said upper tube for positioning an upper end of said spring at a predetermined position relative to said upper tube; and

said spring being self-adjusting, and sized and configured so that when said spring is received within said tubes, and coupled to or otherwise abutting against said upper securing means and said lower securing means, said spring is in a compressed state, with said spring exerting upward and downward extending forces against said upper securing means and said lower securing means, respectively.

24. A lazy susan-like apparatus in accordance with claim 23, characterized in that said coupling means couples said at least one shelf to said lower tube.

25. A lazy susan-like apparatus in accordance with claim 23, characterized in that:

said lower securing means comprises a lower pin coupled to said lower tube; and

said upper securing means comprises an upper pin coupled to said upper tube.

26. A lazy susan-like apparatus in accordance with claim 23, characterized in that:

when said spring exerts said upward extending forces against said upper securing means, said upper securing means is coupled to said upper tube so that said upper tube is caused to seat and abut against said upper structure; and

when said spring exerts said downward extending forces against said lower securing means, said lower tube is caused to seat and abut against said lower structure.

27. A lazy susan-like apparatus in accordance with claim 23, characterized in that:

said lower securing means comprises a lower insert having a somewhat flexible or otherwise resilient configuration, and sized so as to be manually press-fitted into said lower tube at a desired length along said lower tube; and

said upper securing means comprises an upper insert having a somewhat flexible or otherwise resilient configuration, and sized so as to be manually press-fitted into said upper tube at a desired length along said upper tube; and

said lower insert and said upper insert form abutment walls against which ends of said spring exert forces, with said forces exerted against said inserts being translated to said upper and lower tubes.

28. A lazy susan-like apparatus in accordance with claim 1, characterized in that:

said support means comprises a centralized support pole having an inner tube and an outer tube, with said inner tube adapted to be telescopingly received within an end of said outer tube;

said inner tube comprises a ratchet extending longitudinally along an outer surface of said inner tube, said ratchet comprising a set of teeth; and

said apparatus further comprises a length adjustment mechanism coupled to said inner tube and said outer tube, and in a cooperative relationship with said ratchet so as to adjust a relative linear spatial relationship along a centralized axis between said inner tube and said outer tube, and further so as to selectively adjust an effective length of said centralized support pole.

29. A lazy susan-like apparatus in accordance with claim 28, characterized in that said length adjustment mechanism comprises:

a sleeve coupled to an end of said outer tube, and sized so that said adjustment mechanism can be relatively rigidly coupled to said end of said outer tube;

a ratchet collar located in the proximity of said sleeve and comprising a ratchet catch located on at least one side thereof; and

said ratchet catch is sized and configured so as to be manually operable along said teats of said ratchet.

30. A lazy susan-like apparatus in accordance with claim 1, characterized in that said support means comprises:

a centralized support pole having an inner tube and an outer tube, with said inner tube adapted to be at least partially received within said outer tube;

a threaded bolt connected to or otherwise integral with an end of said inner tube, and adapted to be received within an end of said outer tube;

threaded means secured within an interior of said outer tube at a desired position; and

said inner tube is coupled to said outer tube through said threaded bolt being threadably received within said threaded means, and with said threaded engagement between said threaded means and said threaded bolt, rotation of said inner tube causes the position of said inner tube to adjust linearly relative to said outer tube.

31. A lazy susan-like apparatus in accordance with claim 1, characterized in that said support means comprises:

a centralized support pole having an outer tube and an inner tube, with said inner tube adapted to be at least partially received within said outer tube;

a threaded bolt connected to or otherwise integral with an end of said outer tube, and adapted to be received within an end of said inner tube;

threaded means secured within an interior of said inner tube at a desired position; and

said outer tube is coupled to said inner tube through said threaded bolt being threadably received within said threaded means, and with said threaded engagement between said threaded means and said threaded bolt, rotation of said outer tube causes the position of said outer tube to adjust linearly relative to said inner tube.
32. A lazy susan-like apparatus adapted for use in supporting items and facilitating access to said items by a user, said apparatus comprising:

- at least one shelf or support base;
- support means comprising an upper and lower portion, for supporting said apparatus and for supporting said at least one shelf;
- a first structure comprising an upper structure located substantially above said apparatus, when said apparatus is installed with said upper portion of said support means coupled to said upper structure;
- a second structure comprising a lower structure located substantially below said apparatus, when said apparatus is installed with said lower portion of said support means coupled to said lower structure;
- a length adjustment mechanism coupled to said upper portion and to said lower portion, said length adjustment mechanism comprising means for adjusting the relative linear spatial relationship along a centralized axis between said upper portion and said lower portion, so as to selectively adjust an effective length of said support means;
- said upper structure comprises an upper, predrilled recess extending therein, and said upper portion of said support means is sized so as to be manually securable within said upper recess; and
- said length adjustment mechanism structured and operable with said apparatus so as to permit manual assembly and disassembly in the absence of any tool.

33. A lazy susan-like apparatus in accordance with claim 32, characterized in that said lower structure comprises a lower, predrilled recess extending therein, and said lower portion is sized so as to be manually secured within said lower recess.

34. A lazy susan-like apparatus in accordance with claim 32, characterized in that said lower portion comprises means connected to said lower recess so as to prevent rotation of said lower portion relative to said lower recess.

35. A lazy susan-like apparatus in accordance with claim 32, characterized in that:

- said upper portion comprises an upper tube;
- said lower portion comprises a lower tube;
- one of either of said upper tube or said lower tube is telescopingly received within the other of said upper tube or said lower tube;
- said length adjustment mechanism comprises a threaded insert having a portion which is fitted so as to be coupled to the tube which is telescopingly received within the other of said tubes;
- said length adjustment mechanism further comprises an expansion nut adapted to be received within the one of said tubes which is telescopingly received outside of the other of said tubes;
- said threaded insert further having a threaded portion received within said expansion nut;
- with rotation of one of said tubes relative to the other of said tubes in a first direction, and with said threaded portion being received within said expansion nut, said expansion nut moves away from said inner tube, and adjustment of said effective length of said centralized support pole is manually caused to occur, in the absence of any necessity of the use of any type of tooling.

36. A lazy susan-like apparatus in accordance with claim 35, characterized in that when said expansion of said expansion nut is occurring, said nut is moving away from said inner tube.

37. A lazy susan-like apparatus in accordance with claim 32, characterized in that:

- said support means comprises a centralized support pole comprising an upper tube and a lower tube, and where one of either of said upper tube or said lower tube is an inner tube which is telescopingly received within the other of said upper tube or said lower tube, and said other of said upper tube or said lower tube is an outer tube;
- said length adjustment mechanism comprises an elongated spring adapted to be received within both said upper tube and said lower tube, and lower securing means coupled to said lower tube for maintaining an end of said spring at a predetermined position relative to said lower tube, and an upper securing means coupled to said upper tube for positioning an end of said spring at a predetermined position relative to said upper tube; and
- said spring being self adjusting, and sized and configured so that when said spring is received within said tubes, and coupled to or otherwise abutting against said upper securing means and said lower securing means, said spring is in a compressed state, with said spring exerting upward and downwardly extending forces against said upper securing means and said lower securing means, respectively.

38. A lazy susan-like apparatus in accordance with claim 33, characterized in that:

- one of either of said upper tube or said lower tube is an inner tube telescopingly received within an outer tube, where said outer tube is the other of said upper tube or said lower tube;
- said length adjustment mechanism comprising a threaded insert having a fitted portion which is coupled to said inner tube, and rotates in correspondence with said inner tube;
- said length adjustment mechanism further comprises an expansion nut adapted to be received within said outer tube, said expansion nut comprising internal threads; said threaded insert further having a threaded portion receivable within said expansion nut, and having external threads adapted to threadably engage said internal threads of said expansion nut;
- said external threads of said threaded insert comprise a pitch diameter which increases as the distance from an end of said inner tube increases;
- said internal threads of said expansion nut substantially match the pitch of said external threads of said threaded
insert, with said internal threads having a tapered configuration so as to mate with said external threads of said threaded insert; and

said expansion nut is configured so that said expansion nut expands in response to said threaded insert being received within said expansion nut and further in response to an increase in pitch diameter of said external threads.

39. A lazy susan-like apparatus in accordance with claim 38, characterized in that:

said expansion nut is molded so that an outer diameter of said expansion nut, when said expansion nut is in a free state, is slightly larger than an inner diameter of said outer tube; and

said threaded insert is molded so that when said expansion nut is positioned at a smallest portion of a conical configuration of said external threads, the pitch diameter of said external threads is smaller than a mating pitch diameter of said internal threads of said expansion nut.

40. Lazy susan-like apparatus in accordance with claim 39, characterized in that:

said expansion nut is slightly compressed when said nut and said threaded insert are assembled together, and inserted into one end of said outer tube, so that friction between said expansion nut and said outer tube will cause said expansion nut to rotate relative to said threaded insert, as said outer tube is rotated relative to said inner tube and said threaded insert; and

said friction between said nut and said outer tube is sufficiently small so that said inner tube and said outer tube can be axially and telescopingly adjusted to a desired length, using relatively light and manually applied forces.

41. A lazy susan-like apparatus in accordance with claim 40, characterized in that:

when said outer tube is rotated in a first direction, said expansion nut will move away from an end of said inner tube, and will expand in response to an increase in pitch diameter of said threaded insert acting on said internal threads of said expansion nut;

expansion of said expansion nut will produce increasing forces between said expansion nut and an interior surface of said outer tube;

said increasing forces between said expansion nut and said outer tube provide a substantially secure adjustment to an effective length of said support pole; and

as said expansion nut is moving away from an end of said inner tube as said expansion nut expands, said expansion nut acts so as to telescopingly extend said outer tube relative to said inner tube, thereby causing an effective length of said support pole to be slightly increased.

42. A lazy susan-like apparatus in accordance with claim 41, characterized in that when said outer tube is rotated in a direction opposing said first direction relative to said inner tube, friction forces between said expansion nut and an interior surface of said outer tube are reduced to a level so that relatively light manually applied forces are sufficient so as to telescopingly adjust an effective length of said support pole.

43. A length adjustment mechanism adapted for use in facilitating the adjustment of the effective length of an inner tube and an outer tube, where said inner tube is adapted to be telescopingly received within said outer tube, said length adjustment mechanism comprising:

a threaded insert having a fitted portion which is coupled to said inner tube;

an expansion nut adapted to be received within said outer tube;

said threaded insert further having a threaded portion received within said expansion nut; and

with rotation of one of said tubes relative to the other of said tubes in a first direction, and with said threaded portion being received within said expansion nut, said expansion nut moves away from an end of said inner tube while simultaneously expanding, therein extending an effective length of the entirety of said inner tube and outer tube.

44. A length adjustment mechanism in accordance with claim 43, characterized in that:

said fitted portion is coupled to said inner tube so that said fitted portion rotates in correspondence with said inner tube;

said threaded portion of said insert comprises external threads having a pitch diameter which increases as a distance from an end of said inner tube increases, said threaded portion having a conical configuration, with a base of said conical configuration extending away from an end of said inner tube;

said expansion nut comprises internal threads matching a pitch of external threads of said threaded insert, with said internal threads tapered so as to mate with said external threads of said threaded insert; and

said expansion nut having friction and expansion properties, with said expansion nut configured so as to be free to expand as said nut expands in response to an increase in pitch diameter of said threaded insert during threaded engagement with said threaded insert.

45. A length adjustment mechanism in accordance with claim 44, characterized in that:

an outer diameter of said expansion nut is slightly larger than an inner diameter of said outer tube;

when said expansion nut is positioned at a smallest portion of said conical configuration, said pitch diameter of said external threads of said threaded insert is smaller than a mating pitch diameter of said internal threads of said expansion nut;

when said expansion nut is positioned at said smallest portion of said conical configuration, said expansion nut is slightly compressed when said nut and said threaded insert are assembled and inserted into said outer tube;

with said insertion into said outer tube, friction between said expansion nut and said outer tube will cause said
nut to rotate relative to said threaded insert, as said outer tube is rotated relative to said inner tube and said threaded insert; and said friction force is sufficiently small so that said inner and outer tubes can be telescopingly adjusted to a desired length using manually applied forces, prior to said tubes being rotated in a relative configuration so as to maintain a desired length.

46. A length adjustment mechanism in accordance with claim 45, characterized in that:

when said outer tube is rotated in a first direction, said expansion nut will move away from an end of said inner tube, and will expand in response to said increase in pitch diameter of said threaded insert acting on said internal threads of said expansion nut;

said expansion of said expansion nut produces increase in friction forces between said expansion nut and said outer tube, thus providing a substantially secure adjustment to an effective length of said inner and outer tubes; and

with said expansion nut moving away from an end of said inner tube as said expansion nut expands, said expansion nut acts as to telescopingly extend said outer tube relative to said inner tube as said expansion nut is tightened, thus causing an effective length of said inner and outer tubes to fit snugly between two supporting surfaces.

47. A length adjustment mechanism in accordance with claim 43, characterized in that operation of adjustment of said effective length is manually caused to occur in the absence of any necessity of the use of any type of tooling.