AUTOMATIC HANGING ITEM LEVELER

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ABSTRACT

A first suspension member can have a first end attached to a support structure and a second end attached to a first side of a hanging item. A second suspension member can have a first end attached to the support structure and a second end attached to a second side of the hanging item, with the hanging item being suspended from the first and second suspension members. A mechanism can be secured to the first suspension member, and a level indicator switch can be operable to activate the mechanism to level the hanging item by retracting the first suspension member if the hanging item is tilted in a first direction and extending the first suspension member if the hanging item is tilted in a second direction.
Start

Tilted in 1st Direction? 610

Retract 1st Member 620

Extend 2nd Member 630

Tilted in 2nd Direction? 640

No

Retract 2nd Member 650

Extend 1st Member 660

Manual Switch Off? 670

Yes

End

Figure 10
AUTOMATIC HANGING ITEM LEVELER

TECHNICAL FIELD

[0001] The description relates generally to hanging items, and more particularly to an automatic leveler for hanging items.

BACKGROUND

[0002] For many years, people have attempted to hang items such as picture frames so that they are level. However, even if such frames are initially level, they often tilt to one side or another over time. This may occur due to the frame being bumped or from other causes, such as mechanical shifts in buildings. In addition, the initial leveling of a suspended picture frame on a wall can be a tedious and frustrating task, often requiring several manual adjustments to make the picture frame level and to keep it in place. This frustration can increase over time if the picture frame must be repeatedly adjusted to keep it level.

[0003] Some attempts have been made to make leveling wall hangings and other hanging items easier. For example, U.S. Pat. No. 5,947,438 to Lemire (the Lemire '438 Patent) discloses a picture hanging apparatus that includes nuts that can be manually turned to raise, lower, and level a picture by manually adjusting the length of the wire supporting the picture. (See, e.g., Col. 2, lines 4-7; FIG. 2.)

[0004] Another example is U.S. Patent Publication No. 20060278790 by Newman (the Newman Publication). The Newman Publication discloses an automatic picture frame leveler. The Newman Publication notes that one of its objects is “to adjust the orientation of a frame with respect to gravity by causing the frame to move under the influence of gravity into a level configuration.” (See, e.g., ¶18.) The leveler includes cables and reels to align a frame. Specifically, the frame leveler is suspended on each of its two sides by one or more cables. When the frame is level, one or more suspended bobs keeps the frame from being pulled down by gravity. However, when the frame is not level, a bob moves so that the higher side of the frame is able to move down by the force of gravity, as the cable extends on that side. For example, the bob may engage a gear when level, and release from the gear when that side is higher than the other side. (See FIGS. 1A-2B.) As illustrated in FIG. 6, the bob may alternatively close an electrical switch, which causes solenoids to release the gear, allowing gravity to bring down one side of the picture frame.

SUMMARY

[0005] The present inventor has recognized shortcomings of prior hanging leveler devices. For example, the Lemire '438 Patent requires adjustments to be made manually. The Newman Publication provides an automatic leveling, but only allows one side of the sign to move down by the force of gravity at time. The overall result of this movement is that one side of the frame will move down on the wall each time it is adjusted. Thus, after a few adjustments, the overall picture frame may be level, but it will be lower than when a user originally hung it. Thus, a user will likely need to make periodic manual adjustments to bring the picture frame back to its original height.

[0006] Accordingly, for many years there has existed a need to provide a leveler for hanging items that effectively and automatically levels hanging items without significantly shifting the position of the picture frame on a wall. The described embodiments address this need, which has not heretofore been recognized and addressed.

[0007] According to one embodiment, a first suspension member can have a first end attached to a support structure and a second end attached to a first side of a hanging item. A second suspension member can have a first end attached to the support structure and a second end attached to a second side of the hanging item, with the hanging item being suspended from the first and second suspension members. A mechanism can be secured to the first suspension member, and a level indicator switch can be operable to activate the mechanism to level the hanging item by retracting the first suspension member if the hanging item is tilted in a first direction and extending the first suspension member if the hanging item is tilted in a second direction.

[0008] According to another embodiment, an apparatus can include a first suspension member having a first end adapted to be attached to a support structure and a second end adapted to be attached to a first side of a hanging item. The apparatus can also include means for automatically leveling the hanging item by retracting the first suspension member.

[0009] According to yet another embodiment, it can be determined whether a hanging item is tilted in a first direction. The hanging item can be suspended from a first suspension member on a first side of the hanging item and from a second suspension member on a second side of the hanging item. If the hanging item is tilted in the first direction, then a mechanism can be activated to retract the first suspension member. It can also be determined whether the hanging item is tilted in a second direction. If the hanging item is tilted in the second direction, then a mechanism can be activated to extend the first suspension member.

[0010] This Summary is provided to introduce a selection of concepts in a simplified form. The concepts are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter. Similarly, the invention is not limited to implementations that address the particular techniques, tools, environments, disadvantages, or advantages discussed in the Background, the Detailed Description, or the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a cut-away front view of an apparatus including a wall hanging frame suspended from a supporting structure, with an automatic hanging item leveler shown in dashed lines.

[0012] FIG. 2 is a cut-away sectional top view taken along line 2-2 of FIG. 1.

[0013] FIG. 3 is a rear view taken along line 3-3 of FIG. 2.

[0014] FIG. 4 is a sectional rear view of an automatic hanging item leveler taken along line 4-4 of FIG. 2.

[0015] FIG. 5 is a schematic diagram illustrating the electrical supply system for the automatic hanging item leveler of FIGS. 1-4.

[0016] FIG. 6 is a cut-away sectional top view of a level indicator switch taken along line 6-6 of FIG. 4.

[0017] FIG. 7 is a cut-away sectional rear view taken along line 7-7 of FIG. 6.

[0018] FIG. 8 is a cut-away sectional rear view similar to FIG. 7, but showing the level indicator switch tilted in a first direction.
FIG. 9 is a cut-away sectional rear view similar to FIG. 8, but showing the level indicator switch tilted in a second direction.

FIG. 10 is a flowchart illustrating automatic leveling of a hanging item.

FIG. 11 is a view similar to FIG. 4, but illustrating an alternative automatic hanging item leveler.

The description and drawings may refer to the same or similar features in different drawings with the same reference numbers.

DETAILED DESCRIPTION

Referring to FIGS. 1-3, a hanging item apparatus, and specifically a wall hanging apparatus (100), is illustrated. However, the apparatus could work for other types of hangings, such as picture frames or signs hanging from ceilings.

The apparatus (100) can include a wall (110) that acts as a support structure. A wall fastener (112), such as a standard wall hanging hook, nail, or screw, can support a wall hanging frame (114), such as a mirror or picture frame. A wall hanging lever (120) can include a right suspension member such as a cord (122) and a left suspension member such as a cord (124). The terms right and left are used herein for the convenience of the reader, and are taken from the rear view perspective, as in FIGS. 3-4 and 7-9. These and similar terms of orientation should not be taken as limitations on the invention unless they are expressly set limitations of the appended claims. The suspension cords (122 and 124) can be of one of many types of cords, such as cables, solid flexible polymer cords, or strings. For example, each suspension cord can be a high strength nylon string. Each suspension cord (122, 124) is secured to the wall fastener (112) at one end and to the wall hanging lever (120) at an opposite end, as will be described in more detail below. The suspension cords (122 and 124) can be different segments of a single cord, where the single cord is fixed to the wall fastener (112) to prevent sliding, such as by taping or gluing the cord to the fastener (112), clamping the cord to the fastener (112), wrapping the cord around the fastener (112), or having the wall fastener (112) include members such as teeth that engage the cord. In some situations, simple friction between the wall fastener (112) and the cord may be sufficient to prevent slipping. Alternatively, the cords (122 and 124) can be two separate cords. For example, each cord (122 and 124) can end in a loop that extends over the wall fastener (112).

The lever (120) can be attached to the frame (114) in such an orientation that bringing the lever (120) to a level position also brings the frame (114) to a level position. For example, the lever (120) can include a right mounting arm (130) that can be secured to a right side of the frame (114) by right frame fasteners (132), such as standard screws or nails. Similarly, the lever (120) can include a left mounting arm (136) that is secured to a left side of the frame (114) by left frame fasteners (138), which can also be standard screws or nails, or some other type of fastener(s). The mounting arms (130 and 136) can be extendable and retractable mechanisms, such as the types of extendable sliding brackets that are used in some drawers. Alternatively, the lever (120) can be attached directly to the frame (114), or attached in some other manner, such as being formed as an integral part of the frame (114).

As is described in more detail below, the lever (120) can automatically bring the frame (114) to a level position by extending and/or retracting the appropriate suspension cord(s) (122, 124).

This arrangement produces substantial benefits that are not present in or predictable from prior leveling devices. For example, the lever (120) is able to maintain a frame in a level position automatically. Also, because the lever (120) can retract one or both of the cords (122, 124), rather than just being able to extend them, the lever (120) can automatically maintain the frame (114) in a level orientation while minimizing the effect of the leveling movements on the position of the frame on the wall (110).

The subject matter defined in the appended claims is not necessarily limited to the benefits described herein. A particular implementation of the invention may provide all, some, or none of the benefits described herein, so long as it falls within the appended claims and equivalents thereof. Although operations for the various techniques are described herein in a particular, sequential order for the sake of presentation, it should be understood that this manner of description encompasses rearrangements in the structure or order of operations, unless a particular ordering or structure is required. For example, operations described sequentially may in some cases be rearranged or performed concurrently. Techniques described herein with reference to flowcharts may be used with one or more of the systems described herein and/or with one or more other systems. Moreover, for the sake of simplicity, flowcharts may not show the various ways in which particular techniques can be used in conjunction with other techniques. Described in more detail, though the invention is not limited to that particular lever (120). The lever (120) can include a housing (150) that is secured to the mounting arms (130 and 136) discussed above (see FIGS. 2-3). The housing (150) may be generally rectangular in shape and include a cover (152) secured to the remainder of the housing (150) by cover fasteners (154) (see FIG. 3). The housing (150) can be made of a standard non-conductive polymer housing material. However, the housing (150) may be formed of some other material or be some other shape.

Referring still to FIGS. 4-5, the lever (120) can include a drive mechanism (160) that is operable to extend or retract the suspension cords (122, 124). This adjusts the orientation of the lever (120) and thus the orientation of the frame (114) to which the lever (120) is attached. The drive mechanism (160) can include a motor (162), which can be a standard reversible direct current electric motor, such as the motors available from MicroMo Electronics, Inc. of Clearwater, Fla. The motor (162) can rotate a main mechanism shaft (164) that can in turn rotate a right spool (166) mounted on a right spool pin (168) and a left spool (170) mounted on a left spool pin (172). The shaft (164) can extend substantially horizontally between the right spool (166) and the left spool (170). An end of the right suspension cord (122) can be wound around the right spool (166) and an end of the left suspension cord (124) can be wound around the left spool (170). Thus, the motor (162) can be activated to wind the suspension cords (122, 124) on, or unwind the suspension cords (122, 124) from, the corresponding spools (166, 170).

Each spool (166 and 170) can have an interference fit with the corresponding stationary spool pin (168 and 172) to inhibit movement of the spools by producing a sufficient amount of friction so that the spools (166 and 170) do not rotate under the sole effect of gravity on the apparatus (100).
(see FIGS. 1-3). However, the frictional forces from the interference fits with the spool pins (168 and 172) can be small enough so that they can be overcome by force produced by the motor (162) when the motor (162) is activated. Alternatively, the spools (166 and 170) can be inhibited from moving when the motor (162) is not activated in some other manner. For example, friction can be applied to some other component of the drive mechanism (160), such as the main shaft (164). As another example, one or more spring-loaded pins can generally be biased into engagement with one or more components of the drive mechanism (160) to prevent rotation of the spools (166, 170), but can be actuated out of engagement by one or more solenoids to release the spools (166, 170) when the motor (162) is activated.

[0031] The motor (162) output shaft can be rotationally coupled to the main shaft (164) by a spur gear coupling (174), which can include a driving spur gear (176) mounted on the motor output shaft and a driven spur gear (178) centrally mounted on the main shaft (164). The main shaft (164) can be rotationally coupled to the right spool (166) by a right worm gear coupling (180), which can include a right worm gear (182) on the right end of the main shaft (164). The right worm gear coupling (180) can also include a right spur gear (184), which is secured to the right spool (166), and is arranged to mate with and be driven by the right worm gear (182). Similarly, the main shaft (164) can be rotationally coupled to the left spool (170) by a left worm gear coupling (190), which can include a left worm gear (192) on the left side of the main shaft (164). The left worm gear coupling (190) can also include a left spur gear (194), which is mounted on the left spool (170) and is arranged to mate with and be driven by the left worm gear (192). The drive mechanism (160) need not wind and unwind the suspension cords (122 and 124) quickly. Indeed, it may be desirable to wind and unwind them slowly so that the leveling occurs smoothly, and so that the mechanical advantage of the gear system provides added force to the winding and unwinding operations. For example, the drive mechanism may rotate the spools (166 and 170) at a rate of about one revolution per minute, one revolution per hour, or even one revolution per twelve hours.

[0032] All the gears and shafts in the drive mechanism (160) can be made of conventional gear and shaft materials, such as steel or other metals, in some situations. The components of the drive mechanism can also be mounted in conventional ways.

[0033] Many different arrangements and types of drive mechanisms could be used, such as mechanisms with different types of gears, hydraulic or pneumatic mechanisms, or other types of mechanisms that transmit power from a power source to extend and retract suspension members.

[0034] Referring to FIGS. 4-5, the drive mechanism (160) can be activated and supplied power by an electrical supply system (210). In other embodiments, some other type of power supply system can be used, such as a pneumatic or hydraulic supply system. The electrical supply system (210) can include a power source (220), which can include a right battery (222) and a left battery (224). The power source can be some other type of power source, such as an alternating current source connected to an AC/DC converter, a fuel cell, or a solar cell. A manual switch (230) can be opened by a user to turn the lever off, or closed by a user to turn the lever on, as desired.

[0035] The electrical supply system (210) can also include a level indicator switch (238), which is illustrated in more detail in FIGS. 6-9. The level indicator switch (238) can include a switch housing (240) and a cover (242) secured in place with cover fasteners (244). The housing (240) and the cover (242) can be made of conventional housing materials, such as non-conductive polymers.

[0036] The level indicator switch (238) can include a ball (246) that acts as a moving switch contact. The ball (246) is able to roll along a track (248), which can be formed by a pair of parallel rods extending from left to right. The track (248) can be generally straight and level, but can include a non-conductive center seat (260), which can define an indentation (270) in which the ball (246) can rest when it is seated in the center seat (260) (see FIG. 7). Alternatively, the track (248) can include a slight curve with the center of the track (248) being lower than the left and right sides of the track (248). This curve can be in addition to, or instead of, the indentation. The indentation can be sized so that the ball will remain in the seat (260) when the level indicator switch (238) is level, but will roll out of the seat (260) when the level indicator switch is tilted. The ball (246) will remain in the seat (260) with small amounts of tilt. With such small amounts of tilt, the level indicator switch (238) is still considered to be in a level position. The geometry of the indentation (270) in the seat (260) can be modified to adjust the amount of tilt that is required before the ball (246) will roll out of the seat and the level indicator switch (238) will be considered to be in a tilted position.

[0037] The level indicator switch (238) can include a right switch (280). The right switch (280) can include the ball (246) as a moving contact, and two right contact rods (282) (which form a right side of the track (248)) can form a pair of stationary contacts for the right switch (280). Similarly, the level indicator switch (238) can include a left switch (286). The left switch (286) can include the ball (246) as a moving contact, and two left contact rods (288) (which form a left side of the track (248)) can form a pair of stationary contacts for the left switch (286). The ball (246) and the contact rods (282 and 288) can be made of standard conductive material, such as copper, aluminum, or stainless steel. The ball (246) and the contact rods (282 and 288) need not be any particular size or dimensions, so long as the ball (246) is able to roll onto the contact rods (282 and 288) when the level indicator switch (238) is tilted. For example, the moving contact could be cylindrical, rather than spherical in shape. Also, the contact rods (282 and 288) could be shorter, and the indentation (270) could be shallower than what is illustrated in FIGS. 6-9. The seat (260) can be made of standard non-conductive material, such as a rigid non-conductive polymer material. Alternatively, some other type of level indicating switch could be used, such as a mercury switch and/or multiple switches (e.g., one switch for right tilt and one switch for left tilt, which would both be part of the level indicating switch).

[0038] Referring to FIGS. 4-5, a pair of motor contacts (290 and 292) can provide electrical connections between the electrical supply system (210) and the motor (162). Referring to FIG. 5, the electrical supply system (210) can include a right tilt circuit (294) that can supply power to the motor (162) if the right side of the level indicator switch (238) is tilted down relative to a horizontal plane (296) (see FIG. 8). The electrical supply system (210) can also include a left tilt circuit (298) that can supply power to the motor (162) if the left side of the level indicator switch (238) is tilted down relative to the horizontal plane (296) (see FIG. 9). The right tilt circuit (294) can include wiring that connects a negative pole of the right
battery (222) to a first motor contact (290) via the manual switch (230), and a positive pole of the right battery (222) to a second motor contact (292) via the right switch (280) of the level indicator switch (238). The left tilt circuit (298) can include wiring that connects a positive pole of the left battery (224) to the first motor contact (290) via the left switch (286) of the level indicator switch (238) and the manual switch (230), and a negative pole of the left battery (224) to the second motor contact (292).

[0039] The wiring and the manual switch (230) can be conventional wiring and a conventional switch. Electrical connections can also be made in conventional ways, such as standard electrical connectors and/or solder.

[0040] Referring now to FIG. 10, the operation of the wall hanging apparatus (100) will be described. The description includes references to apparatus features of FIGS. 1-9 for convenience, but the operations described below can be performed with a leveling apparatus other than the ones described herein. In operation, it is determined (610) whether the leveler (120) is tilted in a first direction, such as the right side being tilted down. When the manual switch (230) is closed and the level indicator switch (238) right side of the leveler (120) is tilted down (see FIG. 8), the ball (246) in the level indicating switch (238) rolls onto the right contact rods (282) so that the right switch (280) and the right tilt circuit (294) are closed. Thus, the right tilt circuit (294) activates the motor by connecting the first motor contact (290) to a negative battery pole of the right battery (222) and the second motor contact (292) to a positive battery pole of the right battery (222). This polarity causes the motor (162) to turn in a first direction to retract (620) the first (right) suspension cord (122) by winding it on the right spool (166) and to extend (630) the second (left) suspension cord (124) by unwinding it from the left spool (170). This raises the right side of the leveler (120) and the frame (114), and lowers the left side of the leveler (120) and the frame (114). This continues until the ball (246) in the level indicator switch (238) rolls off the right contact rods (282) and onto the seat (260), so that the right tilt circuit (294) is open.

[0041] It is also determined (640) whether the leveler (120) is tilted in a second direction, such as the left side being tilted down. When the manual switch (230) is closed and the left side of the level indicator switch (238) is tilted down, the ball (246) rolls onto the left contact rods (288) to close the left switch (286) and the left tilt circuit (298). Thus, the left tilt circuit (298) activates the motor (162) by connecting the first motor contact (290) to a positive battery pole of the left battery (224) via the left switch (286) and the manual switch (230), and connecting the second motor contact (292) to a negative battery pole of the left battery (224). This left tilt circuit polarity is the opposite of the polarity when the right tilt circuit (294) supplies power to the motor (162). Thus, when the left tilt circuit (298) supplies power to the motor (162), the motor (162) turns in the opposite direction from the turning direction when the right tilt circuit (294) supplies the power. Accordingly, when the left side of the level indicator switch (238) tilts down, the left tilt circuit (298) activates the motor (162) to retract (650) the second (left) suspension cord (124) by winding it on the left spool (170) and to extend (660) the first (right) suspension cord (122) by unwinding it from the right spool (166).

[0042] If it is determined (670) that the manual switch (230) is off, then this automatic leveling ceases, but if the manual switch (230) is on, then this automatic leveling continues.

[0043] Referring now to FIG. 11, an alternative wall hanging apparatus is illustrated. The apparatus includes a right wall fastener (712) secured to a wall and a left wall fastener (713) also secured to the wall. The apparatus also includes a wall hanging leveler (720) that can be attached to a wall hanging frame, as discussed above with reference to wall hanging leveler (120) of FIGS. 1-9. The wall hanging leveler (720) includes a right suspension cord (722) and a left suspension cord (724) that support the leveler (720). A drive mechanism (760) includes a motor (762) and a main shaft (764) that is driven by the motor (762). A right suspension pin (766) is secured to a right side of the housing (750) and is secured to a lower end of the right suspension cord (722). The opposite top end of the right suspension cord (722) is connected to a right wall fastener (712), so that the length of the right suspension cord (722) between the right wall fastener and the right suspension pin (766) is fixed during use. The shaft (764) drives a left spool (770) that is mounted on a left spool pin (772) with a friction fit to prevent rotation of the left spool (770) when the motor (762) is not activated. However, the friction fit can produce a sufficiently small amount of friction that the motor (762) can overcome the friction when the motor (762) is activated.

[0044] The output shaft of the motor (762) can be coupled to the shaft (764) by a right spur gear coupling (774) that includes a driving spur gear (776) mounted on the output shaft of the motor (762). The driving spur gear (776) can engage a driven spur gear (778) that is centrally mounted on the shaft (764). The shaft (764) can be coupled to the left spool (770) by a left worm gear coupling (790). The left worm gear coupling (790) can include a left worm gear (792) mounted on the main shaft (764) and a left spool gear (794) that is fixed to the left spool (770) and that engages the left worm gear (792).

[0045] The leveler (720) can also include an electrical supply system (810), which can be similar to the electrical supply system (210) discussed above. Thus, the electrical supply system (810) can include a power source (820) that is connected to a manual switch (830), to a level indicator switch (838), and to the motor (762), as with the electrical supply system (210) discussed above.

[0046] The wall hanging apparatus of FIG. 11 can operate similarly to the wall hanging apparatus (100) discussed above. However, only the length of the left suspension cord (724) is adjusted, rather than both suspension cords being adjusted, when the motor (762) is activated. Accordingly, the motor (762) can be automatically activated to raise or lower the left side of the leveler (720) (and thus the left side of a frame to which the leveler is attached), to bring the leveler (720) and a frame to which the leveler (720) is attached to a level position.

[0047] While the invention has been particularly shown and described with reference to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention. For example, one of the suspension members may be a fastener that directly fastens a frame or a leveler to a support structure, such as a wall. As another example, the leveler may include
one motor to rotate one spool and another motor to rotate another spool, to extend and retract a pair of suspension members.

1. An apparatus comprising:
a first suspension member having a first end attached to a support structure and a second end attached to a hanging item;
a second suspension member having a first end attached to the support structure and a second end attached to the hanging item, the hanging item being suspended from the first and second suspension members;
a mechanism secured to the first suspension member; and
a level indicator switch that is operable to activate the mechanism to level the hanging item by retracting the first suspension member if the hanging item is tilted in a first direction and extending the first suspension member if the hanging item is tilted in a second direction.

2. The apparatus of claim 1, wherein the level indicator switch is operable to deactivate the mechanism if the hanging item is level.

3. The apparatus of claim 1, wherein the first suspension member is a flexible line.

4. The apparatus of claim 3, wherein the mechanism comprises:
a spool at the second end of the flexible line, wherein retracting the first suspension member comprises winding the flexible line on the spool by rotating the spool, and wherein extending the first suspension member comprises unwinding the flexible line from the spool by rotating the spool.

5. The apparatus of claim 4, wherein the mechanism further comprises:
a movement inhibitor that is operable to inhibit rotation of the spool when the mechanism is not activated.

6. The apparatus of claim 1, wherein the mechanism comprises an electric motor.

7. The apparatus of claim 1, wherein the level indicator switch is further operable to activate the mechanism to extend the second suspension member if the hanging item is tilted in the first direction, and the level indicator switch is operable to activate the mechanism to retract the second suspension member if the hanging item is tilted in the second direction.

8. The apparatus of claim 1, wherein the level indicator switch comprises a rolling movable contact.

9. An apparatus comprising:
a first suspension member having a first end adapted to be attached to a support structure and a second end adapted to be attached to a first side of a hanging item; and
means for automatically leveling the hanging item by retracting the first suspension member.

10. The apparatus of claim 9, wherein the means for leveling comprises means for activating a mechanism to retract the first suspension member if the hanging item is tilted in a first direction and to extend the first suspension member if the hanging item is tilted in a second direction.

11. The apparatus of claim 10, wherein the means for leveling comprises a movement inhibitor that inhibits extension of the length of the first suspension member when the mechanism is not activated.

12. The apparatus of claim 10, wherein the means for activating comprises a level indicator switch.

13. The apparatus of claim 10, wherein the means for activating comprises:
means for activating the mechanism if the hanging item is not level; and
means for deactivating the mechanism if the hanging item is level.

14. The apparatus of claim 9, wherein the apparatus further comprises:
a second suspension member having a first end adapted to be attached to the support structure and a second end adapted to be attached to a second side of the hanging item, and wherein the means for leveling comprises means for automatically leveling the hanging item by retracting the second suspension member.

15. The apparatus of claim 14, wherein the means for leveling comprises means for automatically leveling the hanging item by retracting the first suspension member and extending the second suspension member if the hanging item is tilted in a first direction, and by extending the first suspension member and retracting the second suspension member if the hanging item is tilted in a second direction.

16. A method comprising:
automatically determining whether a hanging item is tilted in a first direction, the hanging item being suspended from a first suspension member on a first side of the hanging item and from a second suspension member on a second side of the hanging item;
if the hanging item is tilted in the first direction, then automatically activating a mechanism to retract the first suspension member; and
if the hanging item is tilted in the second direction, then automatically activating the mechanism to extend the first suspension member.

17. The method of claim 16, wherein the method further comprises activating the mechanism to retract the second suspension member if the hanging item is tilted in a second direction.

18. The method of claim 16, wherein the method further comprises:
if the hanging item is tilted in the first direction, then activating the mechanism to extend the second suspension member; and
if the hanging item is tilted in the second direction, then activating the mechanism to extend the first suspension member and retract the second suspension member.

19. The method of claim 16, wherein the mechanism comprises:
a spool connected to a motor, the motor being operable to rotate the spool to retract the first suspension member.

20. The method of claim 19, wherein the spool is a first spool, the mechanism comprises a second spool, and the motor is operable to rotate the second spool to retract the second suspension member.