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(54) **SOLAR-POWERED ROTATING ORNAMENTAL DEVICE**

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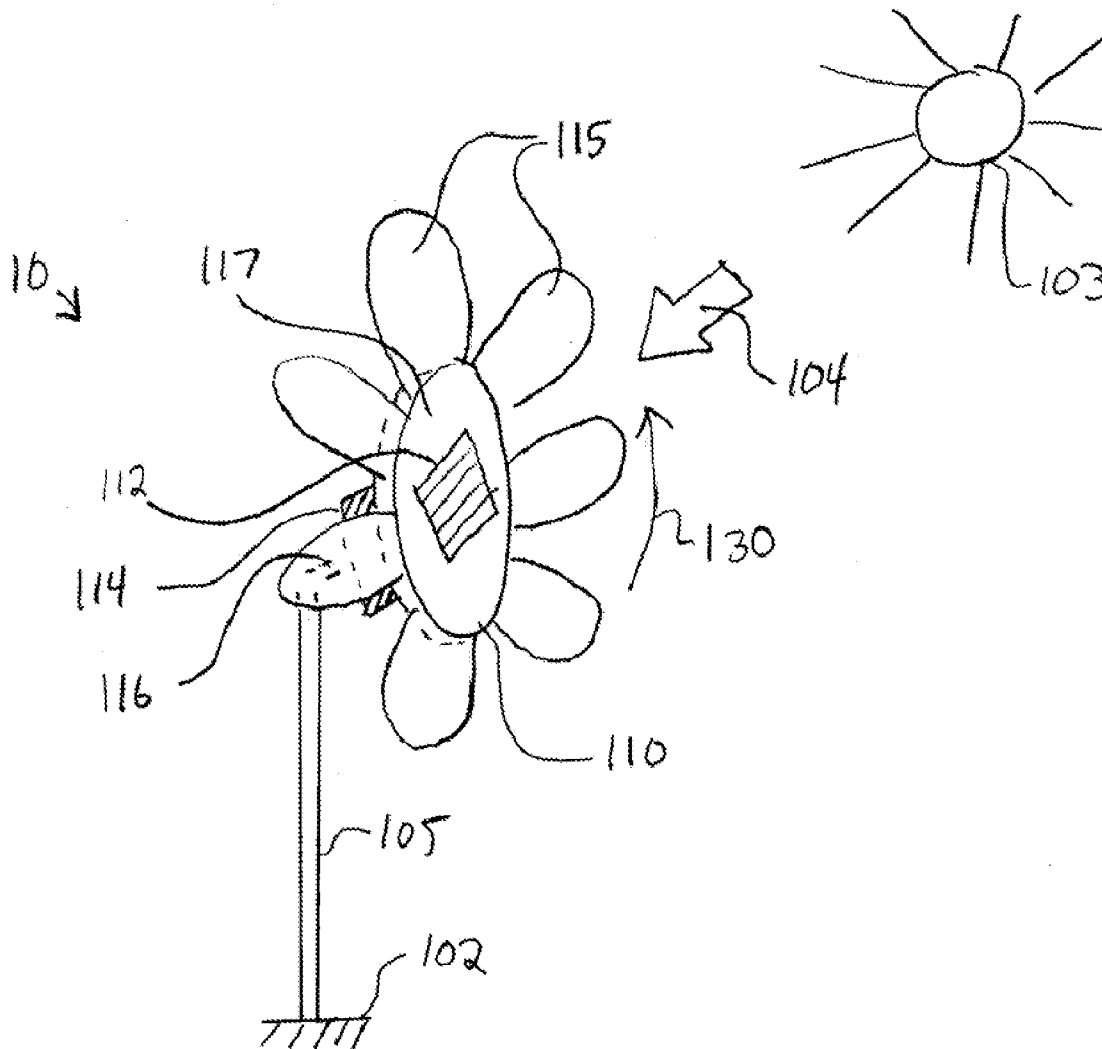
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USPC **446/236**

(57) **ABSTRACT**

A device providing a spinning ornamental design is provided. The device includes a fixed post, a spinning unit, and an electric motor. The spinning unit includes the ornamental design and a solar panel. The electrical motor receives power from the solar panel and includes a stator housing attached to the spinning unit and a rotor shaft fixed to the fixed post.

Related U.S. Application Data

- (60) Provisional application No. 61/850,160, filed on Feb. 11, 2013.



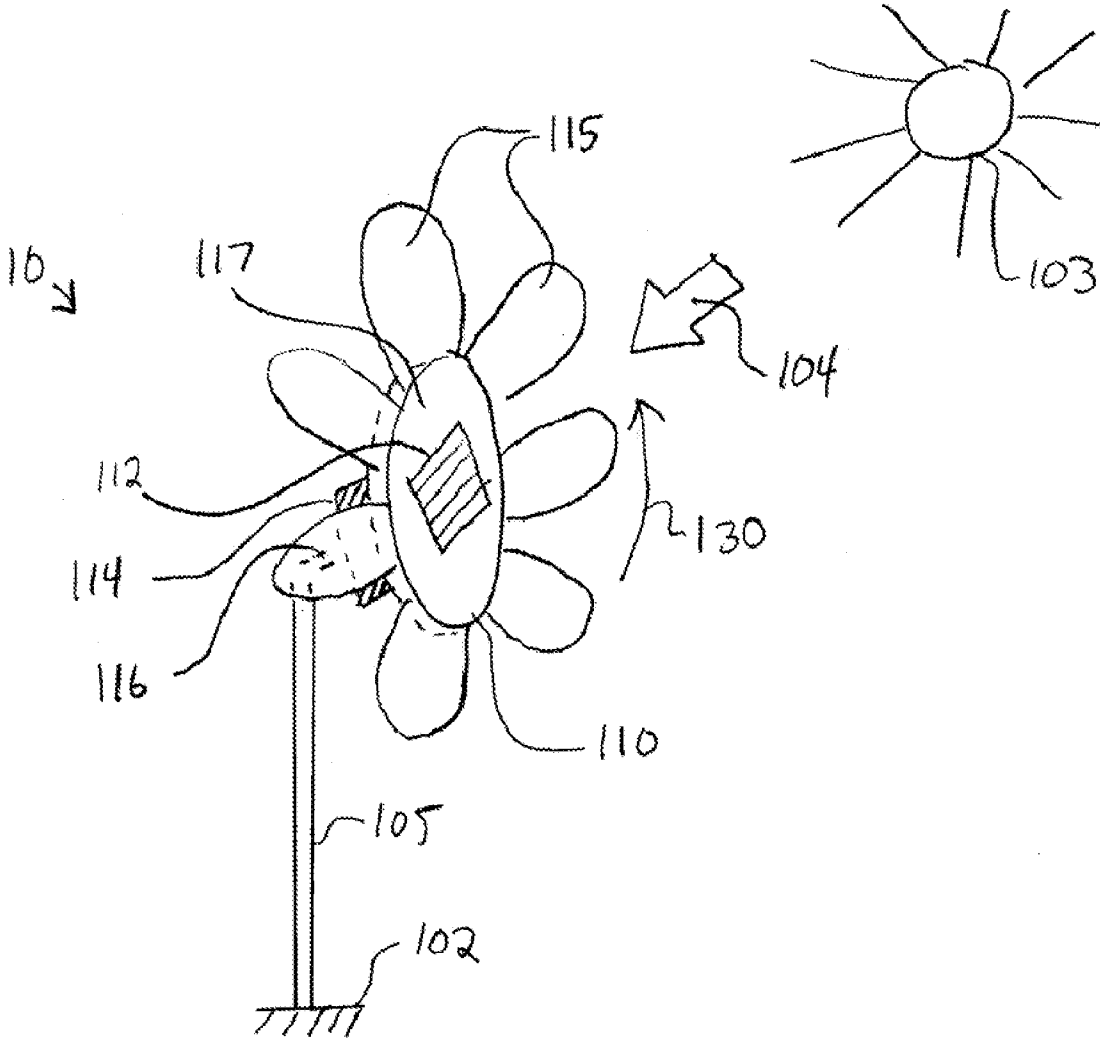


FIG. 1

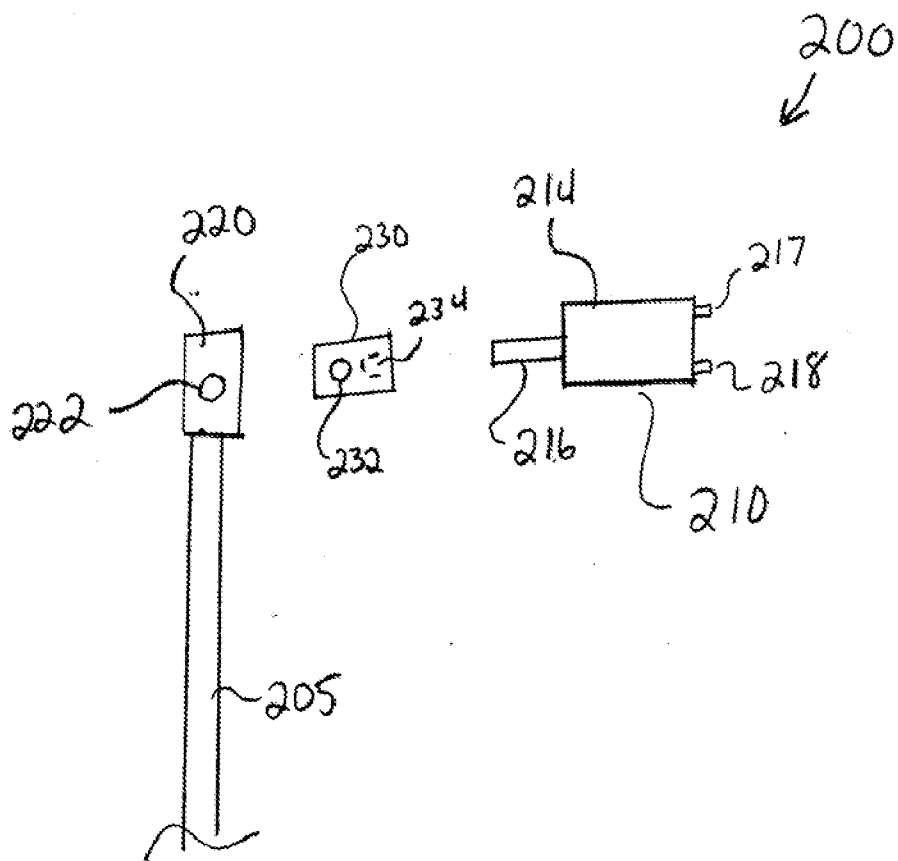


FIG. 2

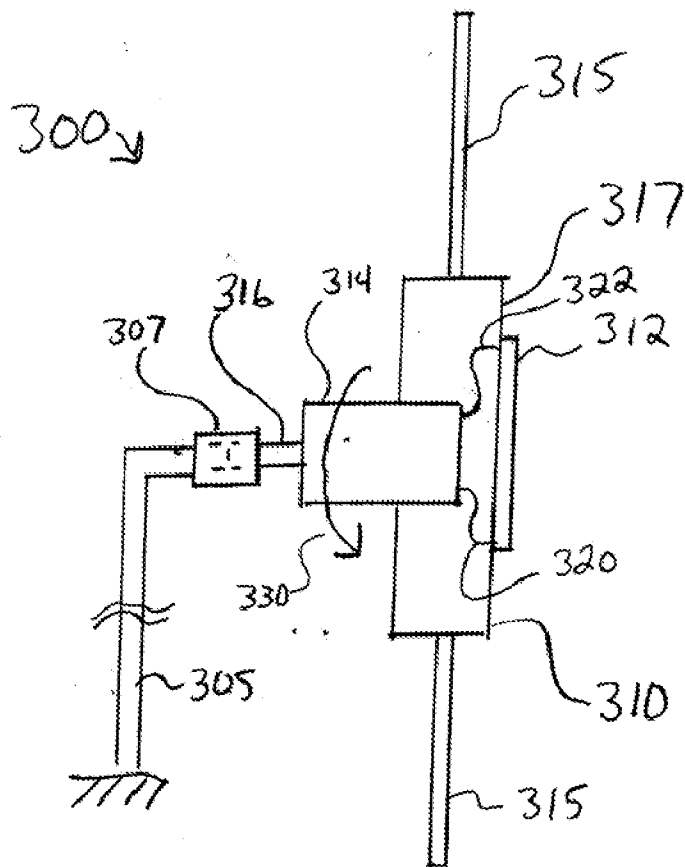


FIG. 3

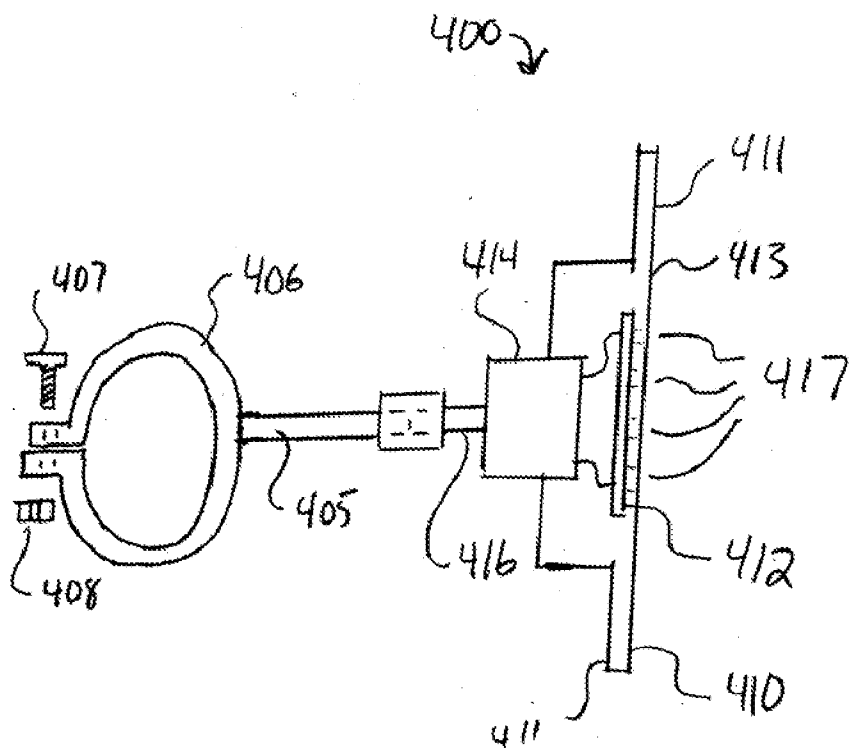
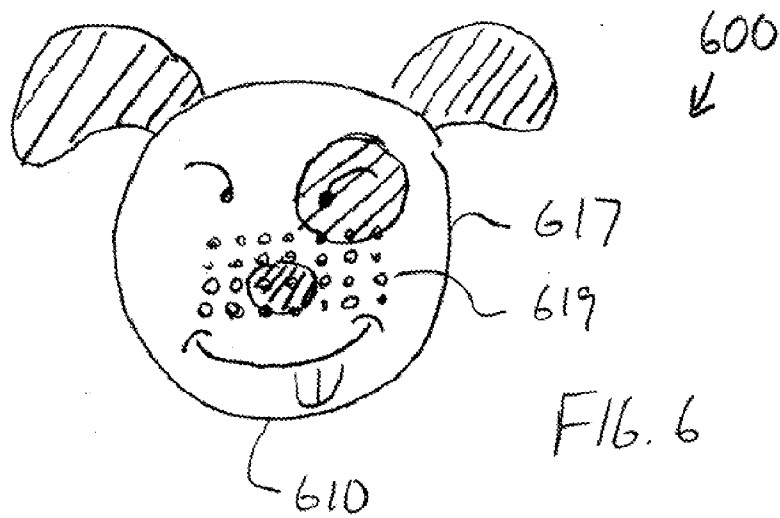


FIG. 4



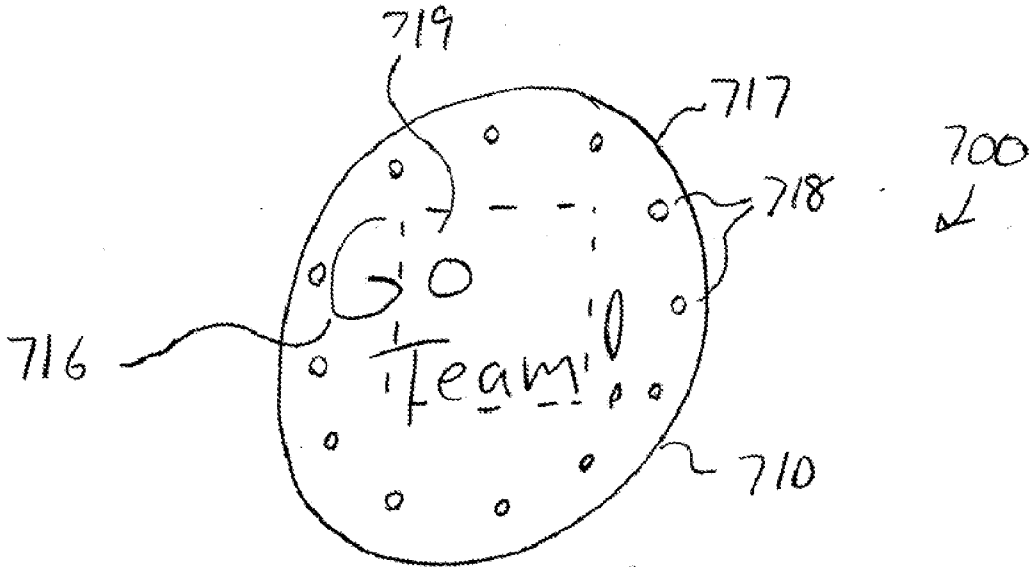


FIG. 7

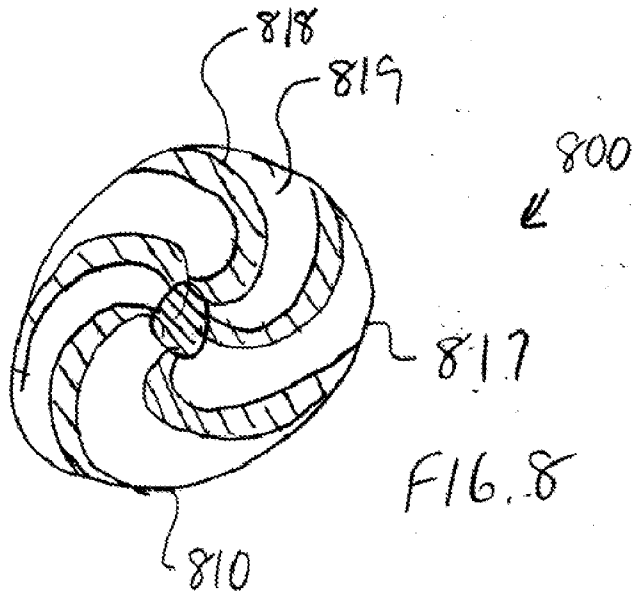


FIG. 8

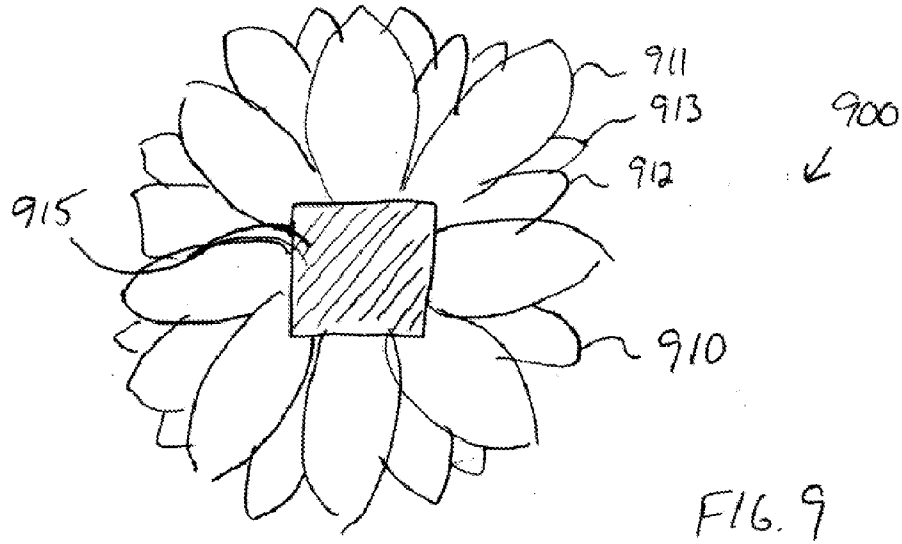


FIG. 9

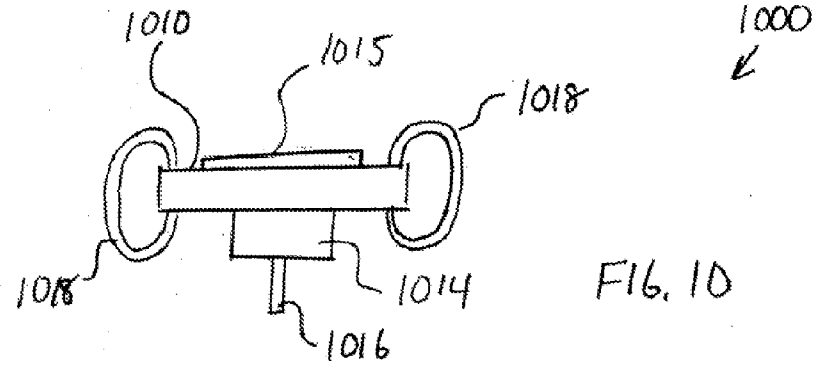


FIG. 10

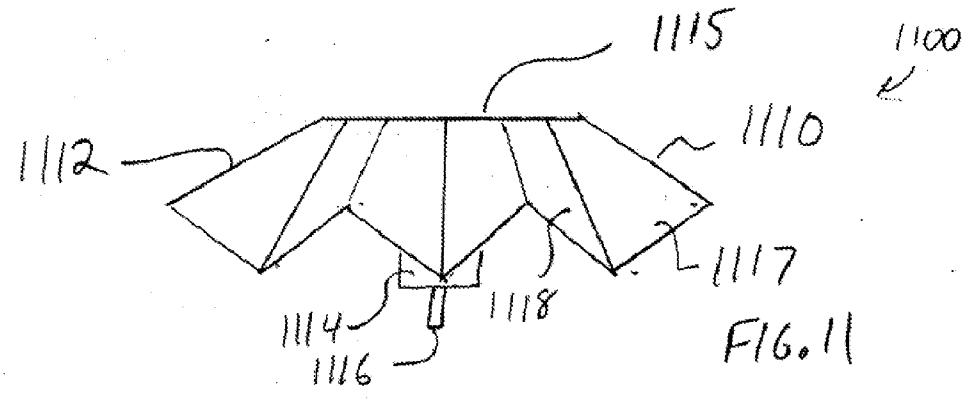


FIG. 11

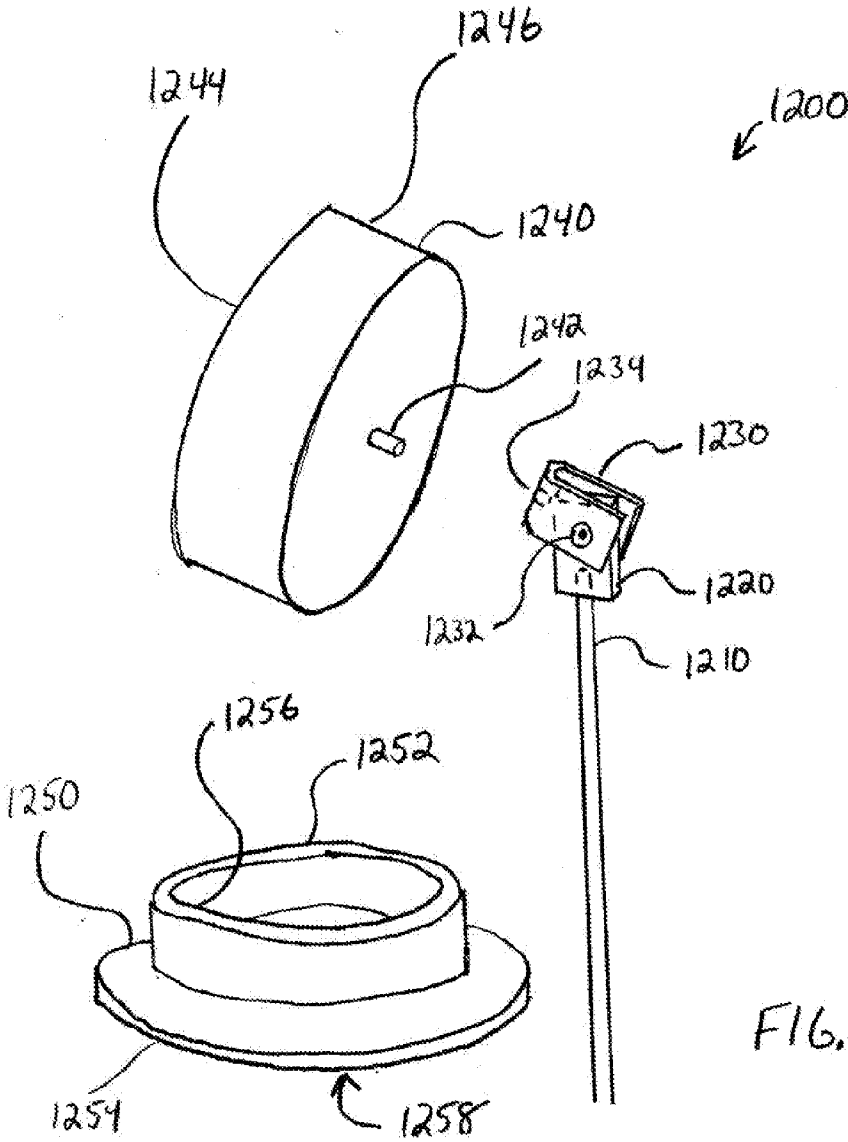
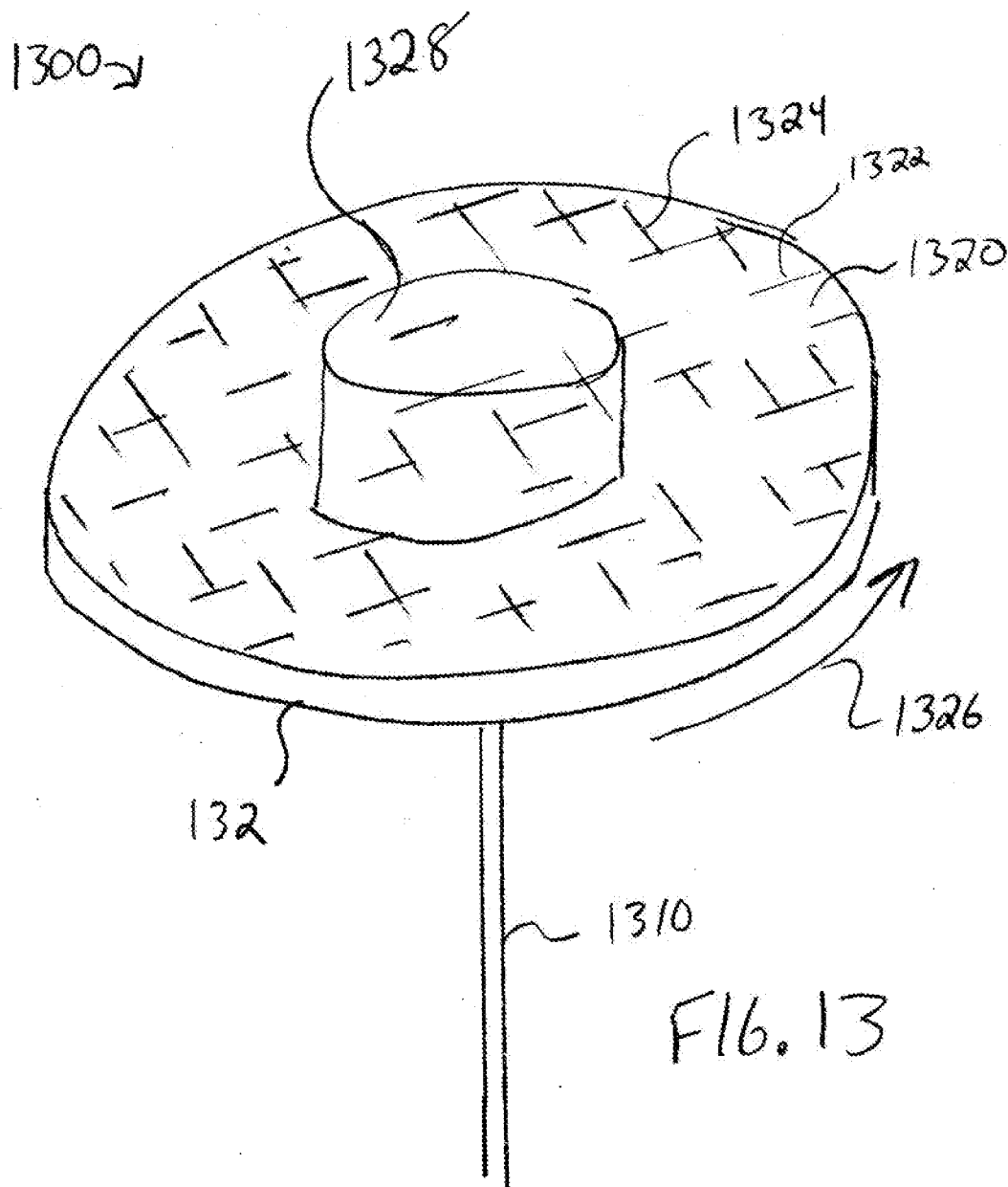


FIG. 12



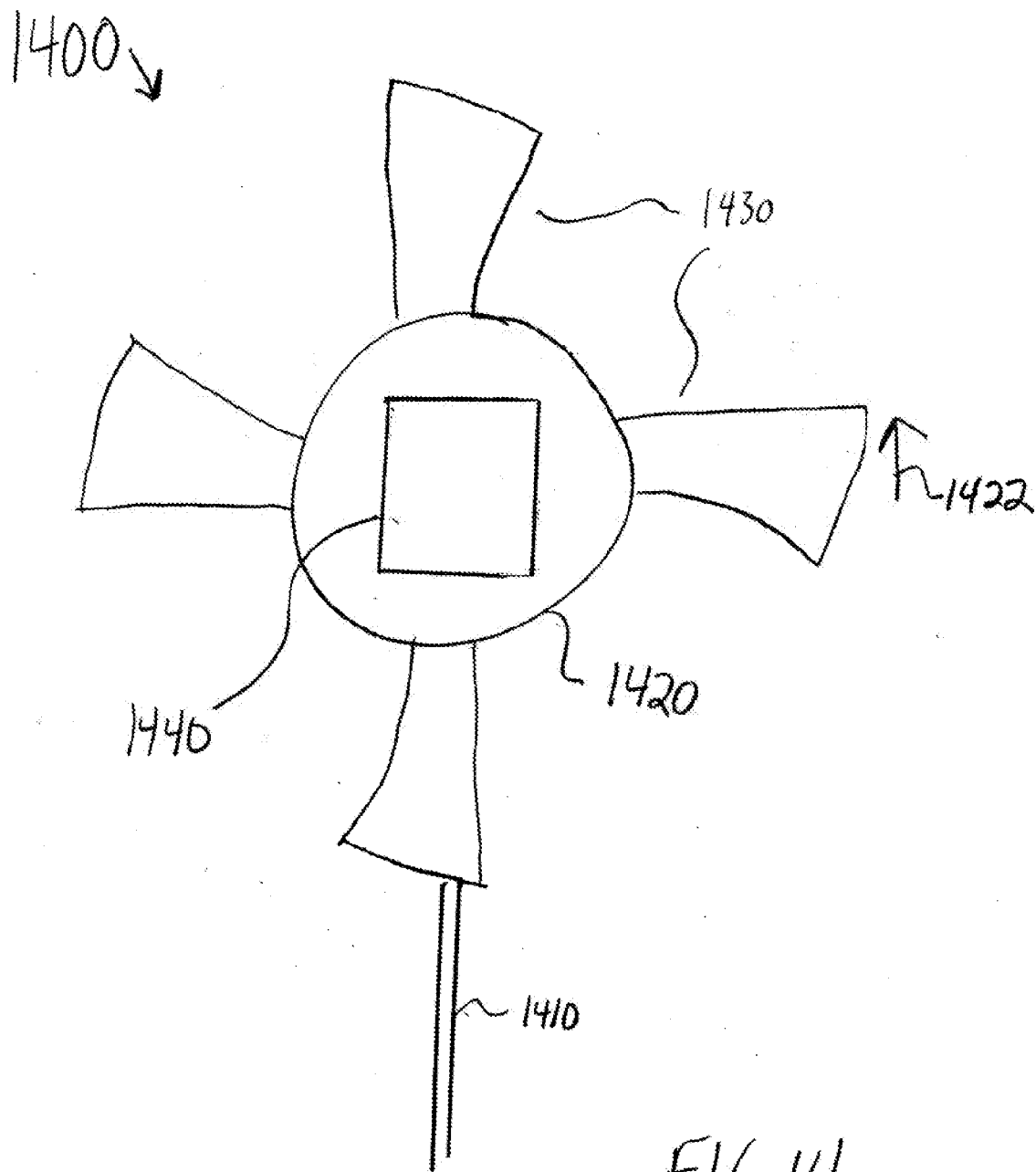


FIG. 14

**SOLAR-POWERED ROTATING
ORNAMENTAL DEVICE**

**CROSS REFERENCE TO RELATED
APPLICATIONS**

[0001] This disclosure claims the benefit of U.S. Provisional Application No. 61/850,160 filed on Feb. 11, 2013 which is hereby incorporated by reference.

FIELD OF THE DISCLOSURE

[0002] The present disclosure relates generally to decorative ornaments for the home. In particular, examples of the present disclosure are related to solar-powered rotating decorative ornaments for the home containing embossed or applied patterns that create optical illusions upon rotation of the device.

BACKGROUND

[0003] The statements in this section merely provide background information related to the present disclosure. Accordingly, such statements are not intended to constitute an admission of prior art.

[0004] Throughout the world, solar energy is harnessed and converted into electrical power. However, public knowledge and understanding of solar energy is not prevalent because few everyday objects are powered using solar energy. Gardens, yards, porches, patios, greenhouses and other areas that receive plentiful sunshine are suitable places for use of practical solar-powered devices that spark interest in solar energy and its capabilities. People are fascinated by solar energy, but lack a practical ornamental device for indoor or outdoor use that creates movement through solar power.

[0005] An optical illusion is characterized by visually perceived images that differ from objective reality. The information gathered by the eye of the viewer is processed in the viewer's brain to create the perception in the viewer's mind that does not correspond to physical measurements of the stimulus source.

[0006] Optical illusions created by rapidly spinning two-dimensional and three-dimensional shapes and objects, such as toy tops, are known. It is speculated that physical properties of the rotated two-dimensional and three-dimensional shapes and objects, such as luminance and texture, cause the distortions in visual perception that viewers perceive as optical illusions.

SUMMARY

[0007] A device is provided that utilizes a solar-powered direct current motor to rotate an ornamental design for both indoor and outdoor use. The device includes a solar cell and a direct current motor mounted in a rotatable housing constructed to appear as an ornamental shape. The device's ornamental shape can be coated in or embossed with holographic metal foils, and the rotation of the coated ornamental shape can create optical illusions.

[0008] According to one embodiment, the device provides a spinning ornamental design. The device includes a fixed post, a spinning unit, and an electric motor. The spinning unit includes the ornamental design and a solar panel. The electrical motor receives power from the solar panel and includes a stator housing attached to the spinning unit and a rotor shaft fixed to the fixed post.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Non-limiting and non-exhaustive embodiments of the present disclosure are described with reference to the following figures, wherein like reference numerals refer to like parts throughout the various views unless otherwise specified. One or more embodiments will now be described, by way of example, with reference to the accompanying drawings, in which:

[0010] FIG. 1 shows an exemplary embodiment of a spinning ornamental design, in accordance with the present disclosure;

[0011] FIG. 2 illustrates an exemplary adjustable connector that joins a support post to a spinning unit assembly, in accordance with the present disclosure;

[0012] FIG. 3 illustrates an exemplary solar-powered rotating ornamental device in profile, in accordance with the present disclosure;

[0013] FIG. 4 illustrates another exemplary solar-powered rotating ornamental device in profile, in accordance with the present disclosure;

[0014] FIG. 5 illustrates an exemplary solar-powered rotating ornamental device including a plurality of bands of diffracting material located around the device, in accordance with the present disclosure;

[0015] FIG. 6 illustrates an exemplary solar-powered rotating ornamental device including an animal face, in accordance with the present disclosure;

[0016] FIG. 7 illustrates an exemplary solar-powered rotating ornamental device including a logo, in accordance with the present disclosure;

[0017] FIG. 8 illustrates an exemplary solar-powered rotating ornamental device including a swirl design, in accordance with the present disclosure;

[0018] FIG. 9 illustrates an exemplary solar-powered rotating ornamental device including a layered flower design, in accordance with the present disclosure;

[0019] FIG. 10 illustrates an exemplary solar-powered rotating ornamental device including a ring attachment pattern in profile, in accordance with the present disclosure;

[0020] FIG. 11 illustrates an exemplary solar-powered rotating ornamental device including a swirl design, in accordance with the present disclosure;

[0021] FIG. 12 illustrates an exemplary embodiment of a solar-powered rotating ornamental device with a modular design, enabling interchangeable ornamental faces to be installed to a generic spinning unit base, in accordance with the present disclosure;

[0022] FIG. 13 illustrates an exemplary embodiment of a solar-powered rotating ornamental device with a diffraction grating coating providing an illusory shape as the device spins the diffraction grating, in accordance with the present disclosure; and

[0023] FIG. 14 illustrates an exemplary embodiment of a solar-powered rotating ornamental device with pinwheel vanes, such that wind acting upon the device will cause the associated spinning unit to spin, in accordance with the present disclosure.

[0024] Corresponding reference characters indicate corresponding components throughout the several views of the drawings. Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figures may be exaggerated relative to other elements to help to improve understanding of

various embodiments of the present disclosure. Also, common but well-understood elements that are useful or necessary in a commercially feasible embodiment are often not depicted in order to facilitate a less obstructed view of these various embodiments of the present disclosure.

DETAILED DESCRIPTION

[0025] In the following description, numerous specific details are set forth in order to provide a thorough understanding of the present disclosure. It will be apparent, however, to one having ordinary skill in the art that the specific detail need not be employed to practice the present disclosure. In other instances, well-known materials or methods have not been described in detail in order to avoid obscuring the present disclosure.

[0026] Reference throughout this specification to “one embodiment”, “an embodiment”, “one example” or “an example” means that a particular feature, structure or characteristic described in connection with the embodiment or example is included in at least one embodiment of the present disclosure. Thus, appearances of the phrases “in one embodiment”, “in an embodiment”, “one example” or “an example” in various places throughout this specification are not necessarily all referring to the same embodiment or example. Furthermore, the particular features, structures or characteristics may be combined in any suitable combinations and/or sub-combinations in one or more embodiments or examples. In addition, it is appreciated that the figures provided herewith are for explanation purposes to persons ordinarily skilled in the art and that the drawings are not necessarily drawn to scale.

[0027] Embodiments in accordance with the present disclosure may be embodied as an apparatus or method.

[0028] A solar-powered rotating ornamental device is disclosed, the device including a solar panel and an integrated electric motor providing rotational power to a body of the device. The body of the device includes an ornamental structure, for example, including a flower shape, a bug shape, a sun shape, a moon shape, a shape of a dog or cat face, a goldfish shape, and a wild bird shape such as a sparrow or a cardinal. In other examples, the body of the device can include a single color or a plurality of colors. In one embodiment, colors can be selected in patterns that, when spun, cause the colors to merge in the view of the viewer, for example, with blue and yellow patterns on a spinning body appearing to turn green.

[0029] Solar-powered rotating ornamental devices serve the dual purposes of decorating the home, business or other sunlit space and sparking curiosity in solar power and its capabilities. Incorporation of other interesting and eye-catching properties into such solar-powered rotating ornamental devices further enhances the enjoyment of viewers as well as the usefulness of the device.

[0030] Optical illusions are created when two-dimensional and three-dimensional shapes and objects displaying certain patterns on their surfaces are rotated within a specific range of speeds. The patterns necessary to create optical illusions are known as diffraction gratings. A diffraction grating is an optical component with a periodic structure, which splits and diffracts light into several beams traveling in different directions. The directions of the beams depend on the spacing of the diffraction grating and the wavelength of light that is shined upon the diffraction grating. Diffraction gratings are typically composed of parallel lines.

[0031] Such diffraction gratings embossed or placed upon shapes or objects create a rainbow-like or oil slick-like surface where the image appears to lie in one plane, similar to the readable side of a CD or DVD. The parallel lines of the diffraction grating create a 180-degree symmetry, in which the colors change through a 180-degree rotation. In addition, the color of a surface containing such a diffraction grating changes as the viewing angle changes. Diffraction grating is available in the art in a wide variety of styles and patterns. Some types of diffraction grating include flat sheets of grating with adhesive backing. A number of different types and styles of diffraction grating are envisioned for the ornamental devices disclosed, and the disclosure is not intended to be limited to the examples provided herein.

[0032] When the pattern of lines forming the diffraction grating is twisted or altered in another way, a design is created that appears holographic or prismatic. For example, a plaid design exists wherein the design appears to have a depth separate from the plane of the object, and the design moves or changes color as the viewer changes his or her viewing angle. These embedded patterns are visible under diffuse light but do not exhibit colors. When viewed through 360 degrees, for example when a viewer looks at the holographic design while walking around it in a circle, such a design will remain visible and will appear to change color or size, while the holographic design remains visible and is easily perceived by the viewer.

[0033] If a small portion of the uniform diffraction grating is rotated with respect to the overall orientation of the material, and a shape or an object embossed or coated with such an altered diffraction grating is rotated at a specific range of speeds, optical illusions and other similar effects are produced. The uniformity of typical diffraction gratings can also be interrupted by the incorporation of dots or spots within the design.

[0034] To illustrate, FIG. 1 shows an exemplary embodiment of a spinning ornamental design. Solar-powered rotating ornamental device **10** is illustrated including a spinning unit **110** and support post **105**. Spinning unit **110** includes ornamental face **117**, solar panel **112**, and an integrated electrical motor including stator housing **114**. Ornamental face **117** is disclosed to include one of any of a wide number of ornamental designs selected to be pleasing to a viewer when spinning. Exemplary ornamental face **117** includes a flower pattern including a number of ornamental pedals **115** which spin with spinning unit **110**. Spinning unit **110** is illustrated spinning in direction **130**.

[0035] Device **10** is situated exposed to sunlight **104** from sun **103**. Solar panels are well known in the art. Such panels can be selected to provide a particular supply of power at a particular voltage based upon anticipated exposure to a light source. Solar panel **112** is selected to provide a desired voltage to an associated integrated electrical motor of device **10**, such that the spinning unit will spin at a desired rotational speed.

[0036] An electrical motor is known in the art to include a stator housing and a rotating rotor shaft. Electrical motors are well known in the art, and details of operation of an electrical motor will not be described in detail herein. A direct current electrical motor can be used wherein application of a voltage to two input terminals of the motor cause a rotational force to rotate the rotor shaft relative to the motor stator located within the stator housing. In many applications, a stator housing is held stationary while the rotor shaft is used to create a spinning object or create movement in an object. In the present

disclosure, this condition is reversed, with the rotor shaft being held stationary while the stator housing is permitted to spin. With the stator housing and a solar panel located upon a spinning unit, the spinning unit can spin about a fixed attachment with all of the required electrical components located upon and spinning with the spinning unit.

[0037] In some embodiments, the rotating ornamental design is a flower, a fruit or another plant. In other embodiments, the rotating ornamental design consists of simple geometric shapes, such as circles, triangles and squares, or combinations of these simple geometric shapes. In further embodiments, the rotating ornamental design is a type of ball or other object used in sports, for example, a football, a soccer ball, a baseball, a basketball, or a hockey puck. In other embodiments, the rotating ornamental design resembles an animal or part of an animal. In one example, a central stationary portion of the ornamental design is the face of a lion, and it is surrounded by a rotating portion that is the mane of a lion. Such an embodiment optionally includes a cover or housing for the support post which resembles the body of an animal.

[0038] In some embodiments, the support post is connected to a separate optional base instead of being pushed into a substrate, if a user lacks soil, packed snow or another similar suitable substrate. In other embodiments, the support post itself is manufactured with a base to avoid the need to push the support post into soil, packed snow or another similar suitable substrate. In further embodiments, such an optional base has optional decorative items.

[0039] In some embodiments, the rotating ornamental design is coated with a holographic metal foil sticker. In further embodiments, such a holographic metal foil sticker is optionally coated with a plastic film or coating spray to protect the pattern or metal foil and to permit outdoor and other uses. The finished film is applied to two-dimensional and three-dimensional surfaces using an adhesive. In other embodiments, a diffraction grating can be pressed or otherwise incorporated into the mold that forms the components of the rotating ornamental design such that the surface of the cast item diffracts light in the same manner as the holographic metal foil sticker.

[0040] In some embodiments, the rotation of the ornamental design between 50 and 1,400 rpm will create the illusion that portions of the rotating ornamental design are flashing or pulsating with different colors. Holographic foil, diffraction grating, alternating color panels or print designs, light emitting diode (LED) devices can each or in combination create visual effects upon a spinning unit.

[0041] In some embodiments, another effect is caused by the rotation of certain plaid-patterned holographic metal foils. A nonrotating plaid pattern on a holographic metal foil appears to have a depth, and the design appears to lie slightly above or below the actual surface of the holographic metal foil. When an object coated or embossed with such a plaid-patterned holographic metal foil is rotated between 50 and 1,400 rpm, a three-dimensional illusory shape of significant illusory depth or height appears. Such a three-dimensional illusory shape can in one example include a hexagonal cylinder. As the viewer changes his or her viewing angle, the color of the three-dimensional illusory shape also appears to change.

[0042] In some embodiments, an illusory shape generated by a spinning unit coated with a diffraction grating may include an unexpected results. Testing has shown that a simple diffraction grid pattern with diffraction lines etched in

the surface at 90 degree angles, when spun, can generate an exemplary cylindrical illusory shape that is not apparent to inspection of the diffraction grating when it is not spinning. Such a diffraction grating pattern, used upon the disclosed device, can increase the ornamental desirability of the device.

[0043] In some embodiments, the rotating ornamental design is a propeller-type or flower-type shape that, when rotated, creates the appearance of an illusory disk. The high-speed rotation of a propeller coated with holographic metal foil produces an illusory optical effect that appears to viewers upon rotation of the propeller-type shape. Typically, the high-speed rotation of a propeller-type or flower-type shape creates the appearance of an illusory disk wherein the color of the propeller blends with the color in the background to produce the outline of a blended translucent disk. Rotation of a propeller-type or flower-type shape coated with holographic metal foil produces the appearance of an illusory disk in which some sectors of such an illusory disk are invisible and others are colored.

[0044] In other embodiments, rotation of a propeller-type or flower-type shape coated with holographic metal foil produces the appearance of intermittent display of illusory shapes or patterns, such as stars, lines or crosshatches. In further embodiments, rotation of a propeller-type or flower-type ornamental design coated or embossed with a spotted holographic metal foil produces the appearance of an illusory sparkling outline. As the viewer changes his or her viewing angle, the sparkles randomly appear or appear to move. In some embodiments, the rotating ornamental design is a disk containing an eccentric circle shape. Rotation of such a disk creates the appearance of another optical effect. Strong flashing or pulsating of colors or white light is produced when a disk containing an eccentric circle is rotated. In other embodiments, uniformly spaced circles or shapes are placed on a rotating ornamental design shaped as a disk. As the viewer changes his or her viewing angle while such a disk-shaped rotating ornamental design is rotated at a uniform speed, the apparent direction and speed of rotation appear to the viewer to be controlled by his or her viewing angle. Furthermore, as the viewer changes his or her viewing position, the disk appears to stop or reverse direction.

[0045] FIG. 2 illustrates the connector that joins the support post to the spinning unit assembly. Configuration 200 includes support post 205, electrical motor 210, and a joint mechanism connecting the two. Electrical motor 210 includes stator housing 214 and rotor shaft 216. Post 205 includes first hinge unit 220. Second hinge unit 230 is illustrated. Hole 222 of hinge unit 220 and hole 232 of hinge unit 230 are configured to be aligned and accept a fastener such as a rivet. Hinge unit 230 is further configured with hole 234 to accept a rotor shaft 216 of electric motor 210, for example, permitting the shaft to be secured to the hole with glue or an interference fit. In another example, a small set screw can be used to secure shaft 216 to hole 234. When fastened to each other, hinge unit 220 and hinge unit 230 are configured to operate as a joint mechanism permitting adjustment of an orientation of electric motor 210 to post 205. When shaft 216 is secured to hinge unit 230, electrical motor 210, when a voltage is applied to terminals 217 and 218, causes stator housing 214 to rotate about fixed rotor shaft 216.

[0046] FIG. 3 illustrates an exemplary solar-powered rotating ornamental device in profile. Configuration 300 includes post 305, spinning unit 310, and connector 307. Post 305 and connection 307 are illustrated as separate items, although it

will be realized that the two can be provided as a unitary item. Spinning unit 310 includes ornamental face 317, attached spinning ornaments 315, and exposed solar panel 312. Solar panel 312 is attached to and provides power to stator housing 314 through electrical connections 320 and 322. Stator housing unit 314, spinning about fixed rotor shaft 316, causes spinning unit 310 to rotate in direction 330.

[0047] FIG. 4 illustrates another exemplary solar-powered rotating ornamental device in profile. Configuration 400 includes post 405 and spinning unit 410. Post 405 is illustrated connected to clamp device 406. Clamp device 406 can be fastened in place, for example, through attachment of bolt 407 and nut 408 according to fastening practices known in the art. Spinning unit 410 includes ornamental face 413. Ornamental face 413 includes a flat surface including flanges 411 extending radially outward from spinning unit 410. Hidden solar panel 412 is illustrated providing power to stator housing 414 such that housing 414 can rotate about fixed rotor shaft 416. Solar panel 412 is not on the surface of ornamental face 413 but is rather provided a number of through holes 417 for light to penetrate face 413 and reach solar panel 412. In another embodiment, a transparent or translucent layer can be provided over a solar panel, permitting light to reach the solar panel while maintaining an intended design on the material of the layer.

[0048] FIG. 5 illustrates an exemplary solar-powered rotating ornamental device including a plurality of bands of diffracting material located around the device. Configuration 500 includes spinning unit 510. Spinning unit 510 includes a central unit 512 including solar panel 519 and a plurality of bands 515. Each of bands 515 are constructed of a polymer flexible material. Bands 515 include a diffracting material which causes multi-frequency light hitting the bands 515 to break apart into rainbow spectrum colors. In an exemplary condition, visual effect 516 is visible upon bands 515 including a colorful display upon the bands that changes based upon a perspective angle of the viewer.

[0049] FIG. 6 illustrates an exemplary solar-powered rotating ornamental device including an animal face. Configuration 600 includes spinning unit 610. Spinning unit 610 includes an ornamental face 617 and a plurality of holes 619. Ornamental face 617 can include a painted, printed, or otherwise illustrated image. Holes 619 are provided in ornamental face 617 to permit light to reach a solar panel located thereunderneath.

[0050] FIG. 7 illustrates an exemplary solar-powered rotating ornamental device including a logo. Configuration 700 includes spinning unit 710. Spinning unit 710 includes an ornamental face 717 and a plurality of LED devices 718. Ornamental face 717 can include a painted, printed, or otherwise illustrated logo 716. Logo 716 can include a sports team logo, a college team logo, a trademark, or other symbol that can be commercially attractive to consumers. Ornamental face 717 includes a translucent section 719 to permit light to reach a solar panel located thereunderneath.

[0051] FIG. 8 illustrates an exemplary solar-powered rotating ornamental device including a swirl design. Configuration 800 includes spinning unit 810. Spinning unit 810 includes an ornamental face 817. Ornamental face 817 can include a painted, printed, or otherwise illustrated pattern. Ornamental face 817 includes an alternating color pattern between swirling areas 818 and 819. Ornamental face 817 can include holes, a transparent section, or a translucent section to permit light to reach a solar panel located thereunderneath.

[0052] Exemplary spinning units disclosed herein can be presented as flat designs, essentially existing in two dimensions. In the alternative, an artistic design upon a spinning unit can exist as a three dimensional object. FIG. 9 illustrates an exemplary solar-powered rotating ornamental device including a layered flower design. Configuration 900 includes spinning unit 910. Spinning unit 910 includes three exemplary layers of flower pedals 911, 912, and 913. Layer 911 is illustrated above layer 912, and layer 912 is illustrated above layer 913. Solar panel 915 is illustrated upon spinning unit 910. Layers 911, 912, and 913 can be relatively flat, with all of the pedals essentially coexisting within a thin region. In the alternative, layer 911, 912, and 913 can intentionally be disparate in depth or orientation, such that a complex flow shape is presented in three dimensions.

[0053] FIG. 10 illustrates an exemplary solar-powered rotating ornamental device including a ring attachment pattern in profile. Configuration 1000 includes spinning unit 1010. Spinning unit 1010 includes solar panel 1015, stator housing 1014 spinning about fixed rotor shaft 1016, and a plurality of ring shaped attachments 1018 connected to a perimeter of unit 1010. Attachments 1018 can be made of a polymer material. Attachments 1018 can include a diffracting pattern to create a colorful pattern upon the attachments 1018.

[0054] FIG. 11 illustrates an exemplary solar-powered rotating ornamental device including a swirl design. Configuration 1100 includes spinning unit 1110. Spinning unit 1110 includes an ornamental face 1115. Ornamental face 1115 can include a solar panel or a means for light to pass through the ornamental face to a solar panel located thereunderneath. Spinning unit 1110 includes stator housing 1114 spinning about fixed rotor shaft 1116 and a complex skirt 1112. Complex skirt 1112 includes a series of alternating panels 1117 and 1118.

[0055] FIG. 12 illustrates an exemplary embodiment of an exemplary solar-powered rotating ornamental device with a modular design, enabling interchangeable ornamental faces to be installed to a generic spinning unit base. Configuration 1200 includes support post 1210, hinge components 1220 and 1230, spinning unit base 1240, and interchangeable ornamental face 1250. Hinge component 1220 and hinge component 1230 are connected by fastener 1232 into an adjustable hinge connecting the fixed rotor shaft to the fixed support post. The hinge components permit adjustment of the device and further permits the device to lie flat for easy shipment from the manufacturer to a consumer. Hinge component 1220 includes a hole which fastens to post 1210. Hinge component 1230 is U-shaped, with arms on either side of hinge component 1220. Hinge component 1230 includes hole 1234 configured to accept and affix to rotor shaft 1242 of spinning unit base 1240. Spinning unit base 1240 includes an electrical motor as disclosed herein including rotor shaft 1242 extending from the unit base. Spinning unit base 1240 further includes a housing 1246 configured to accept and releasably attach to interchangeable ornamental face 1250. Housing 1246 is illustrated as a cylinder, although the housing can include any shape that can accept a correspondingly configured interchangeable ornamental face, for example, including a star-shaped or triangular housing. A solar panel can be affixed to face 1244 of unit base 1240. In another embodiment, face 1244 can include electrical connections that can connect with electrical connections upon face 1250, such that face 1250 can include solar panels providing power to an electrical motor in unit base 1240.

[0056] Interchangeable ornamental face **1250** is configured to snap on or otherwise easily attach to unit base **1240**. According to one embodiment, face **1250** and unit base **1240** can be collectively described as a spinning unit, as disclosed herein. Face **1250** includes a section **1252** with a cavity **1256** configured to fit upon unit base **1240**. Face **1250** further includes ornamental front section **1254** configured according to ornamental designs as disclosed herein. Front section **1258** can include holes or a transparent or translucent section permitting light to pass through to a solar panel located upon unit base **1240**. According to one embodiment, a device can be provided to a consumer with a plurality of interchangeable ornamental faces. For example, one can be provided for each of the four seasons. In another embodiment, different faces can be provided for each of a group of local sports teams. In another embodiment, different faces can be provided, each including a different forms of diffraction grating or different color patterns such that the consumer can choose and change different ornamental faces for the device.

[0057] FIG. 13 illustrates an exemplary embodiment of a exemplary solar-powered rotating ornamental device with a diffraction grating coating providing an illusory shape as the device spins the diffraction grating. Configuration **1300** includes support post **1310** and ornamental face **1320**. A diffraction grating coating is presented upon ornament face **1320**, wherein the diffraction grating includes lines **1322** and **1324** oriented at exemplary 90 degree angles to each other upon face **1320**. As ornamental face **1320** is spun in direction **1326**, an illusory shape **1328** is visible upon face **1320**. A number of different diffraction grating designs with different resulting illusory shapes are envisioned, and the disclosure is not intended to be limited to the particular examples provided herein.

[0058] The spinning unit of the disclosed device can include gears to change a reduction factor between the motor and the spinning of the device. However, such gears inhibit or prevent the spinning unit from freely spinning, for example, if the unit is acted upon by wind or a child playing with the spinning unit. FIG. 14 illustrates an exemplary embodiment of a solar-powered rotating ornamental device with pinwheel vanes, such that wind acting upon the device will cause the associated spinning unit to spin. Configuration **1400** includes support post **1410** including spinning unit **1420**. Solar panel **1440** is located upon a face of spinning unit **1420**. Pinwheel vanes **1430** are symmetrically located about spinning unit **1420** and include angled faces such that wind acting upon the vanes causes the unit **1420** to spin in direction **1422**. Solar power from solar panel **1440** can additionally cause the unit **1420** to spin in direction **1422**. In this way, either wind or solar power can cause the unit to spin. Spinning unit **1420** can include an electrical motor without reduction gears, such that the unit can spin under wind power by simply overcoming internal magnetic forces and minimal frictional forces inherent to an electrical motor.

[0059] Electrical devices can be added to the included spinning unit to provide for alternative features. For example, a switch or a knob can be used to provide for varying resistance elements in series with the solar panel and the electrical motor, such that a rotational speed of the device can be controlled. In another embodiment, a rechargeable battery can be incorporated within the spinning unit, for example, to provide for a semi-constant rate of rotation of the unit when clouds block the sunlight or permitting the device to spin for some portion of the night.

[0060] In order to be used outside, the solar panel can be enclosed or coated with a waterproof coating according to methods known in the art.

[0061] A number of artistic or ornamental configurations have been presented in combination with the spinning unit of the disclosed device. These examples are intended to be non-limiting examples of the disclosure.

[0062] The above description of illustrated examples of the present disclosure, including what is described in the Abstract, are not intended to be exhaustive or to be limitation to the precise forms disclosed. While specific embodiments of, and examples for, the disclosure are described herein for illustrative purposes, various equivalent modifications are possible without departing from the broader spirit and scope of the present disclosure. Indeed, it is appreciated that the specific example voltages, currents, frequencies, power range values, times, etc., are provided for explanation purposes and that other values may also be employed in other embodiments and examples in accordance with the teachings of the present disclosure.

What is claimed is:

1. A device providing a spinning ornamental design, the device comprising:

- a fixed post;
- a spinning unit comprising:
 - the ornamental design; and
 - a solar panel; and
- an electrical motor receiving power from the solar panel and comprising:
 - a stator housing attached to the spinning unit; and
 - a rotor shaft fixed to the fixed post.

2. The device of claim 1, wherein the ornamental design comprises a diffraction grating.

3. The device of claim 2, wherein the diffraction grating provides an illusory shape when the ornamental design is rotating.

4. The device of claim 3, wherein the illusory shape is not apparent when the ornamental design is not rotating.

5. The device of claim 1, wherein the solar panel is located upon a surface of the ornamental design.

6. The device of claim 1, wherein the solar panel is located below a surface of the ornamental design.

7. The device of claim 6, wherein the surface of the ornamental design is one of transparent and translucent, such that light can pass through the surface to the solar panel.

8. The device of claim 6, wherein the surface of the ornamental design comprises holes to permit light to reach the solar panel.

9. The device of claim 1, wherein the ornamental design comprises an alternating color design.

10. The device of claim 1, wherein the ornamental design comprises at least one light emitting diode.

11. The device of claim 1, wherein the ornamental design comprises a flower design.

12. The device of claim 1, wherein the ornamental design comprises a three dimensional design.

13. The device of claim 1, wherein the spinning unit comprises a plurality of angled vanes such that wind applied to the vanes will cause the spinning unit to rotate.

14. The device of claim 1, wherein the rotor shaft is affixed to the fixed post through an adjustable hinge.

15. The device of claim 1, wherein the ornamental design comprises a plurality of rings attached to a perimeter of the spinning unit.

16. The device of claim 1, wherein the spinning unit comprises a spinning unit base and an interchangeable ornamental face.

17. A device providing a spinning ornamental design, the device comprising:

a fixed post;

a spinning unit comprising:

the ornamental design comprising a plurality of layers of ornamental flower pedals located about a center portion of the spinning unit, such that the plurality of layers create a three dimensional representation of a flower; and

a solar panel; and

an electrical motor receiving power from the solar panel and comprising:

a stator housing attached to the spinning unit; and

a rotor shaft fixed to the fixed post.

18. A device providing a spinning ornamental design, the device comprising:

a fixed post;

a spinning unit comprising:

the ornamental design comprising a diffraction grating layer comprising a pattern of etched lines at ninety degree angles to each other, wherein the diffraction grating, when rotated, provides an illusory shape in form of a cylinder; and

a solar panel; and

an electrical motor receiving power from the solar panel and comprising:

a stator housing attached to the spinning unit; and

a rotor shaft fixed to the fixed post.

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