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(54) **LEVITATED FINNED BALL DEVICE**

**Related U.S. Application Data**

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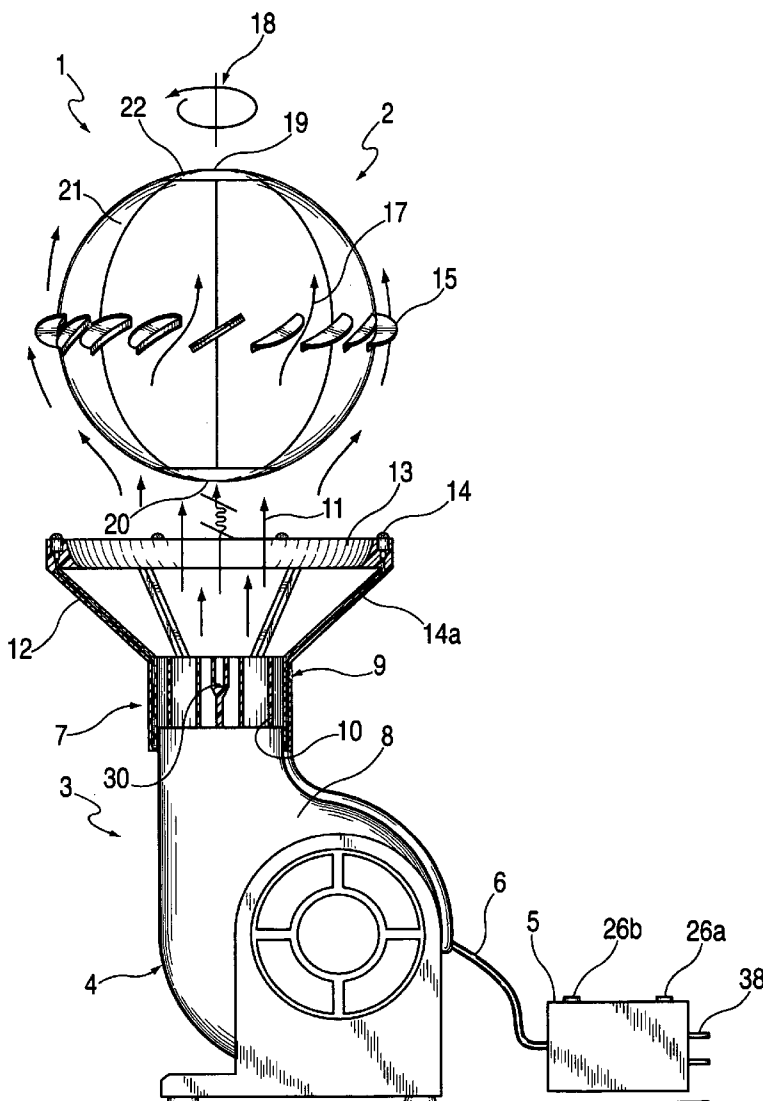
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(57) **ABSTRACT**

A levitated finned ball device includes a ball made of a lightweight material and a base that generates laminar air flow to levitate the ball in mid-air. The ball has at least one generally semi-circular shaped fin extending therefrom. When the laminar air flow strikes the fin, it imparts motion to the ball.

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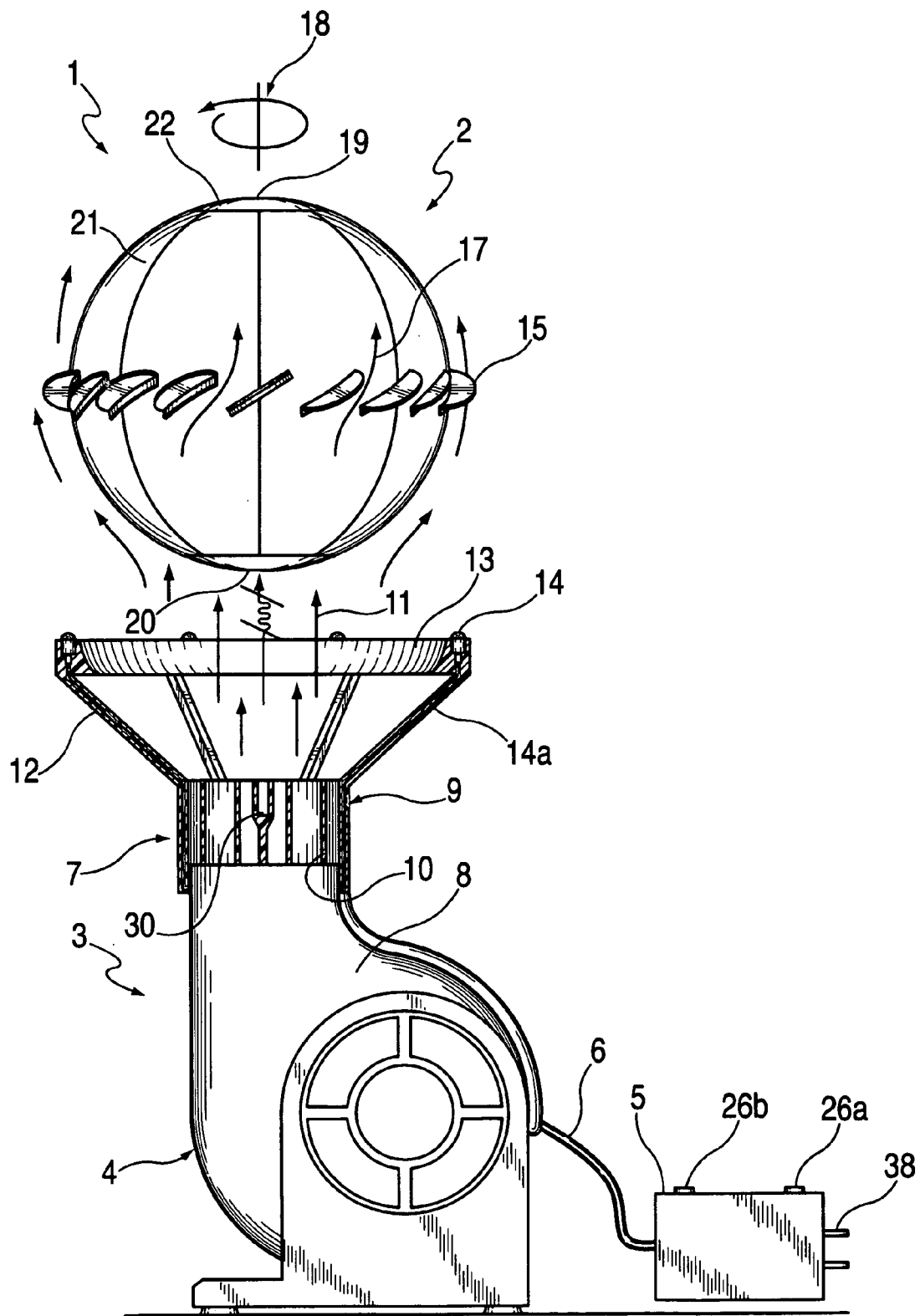


FIG. 1

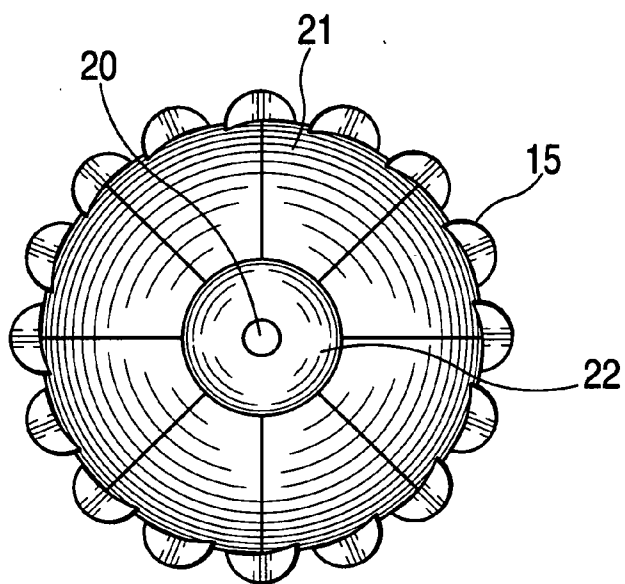


FIG. 2

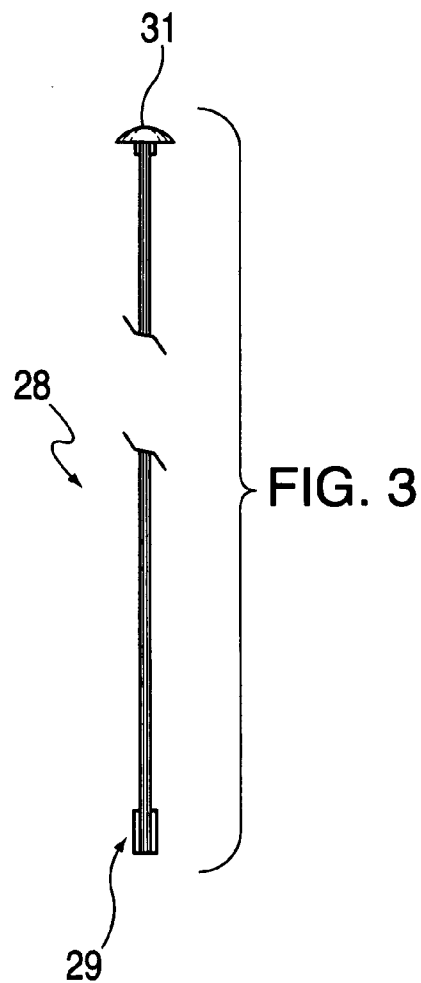


FIG. 3

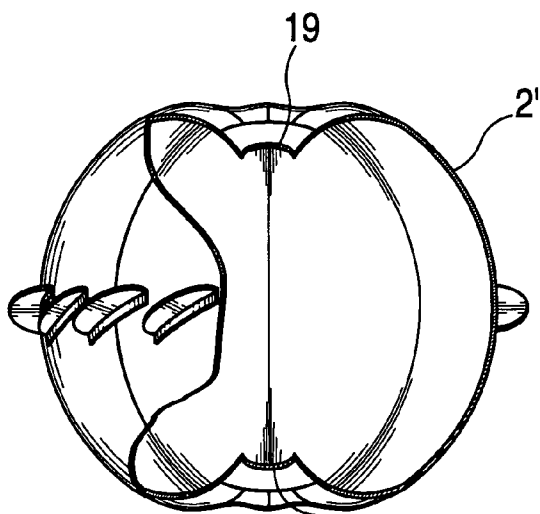


FIG. 4

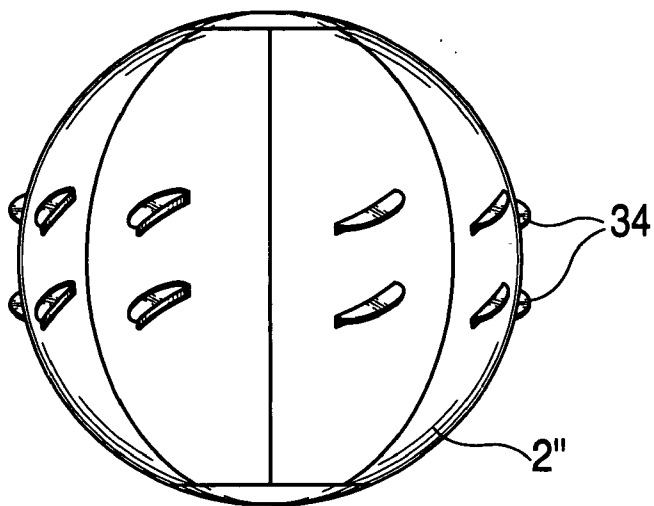


FIG. 5

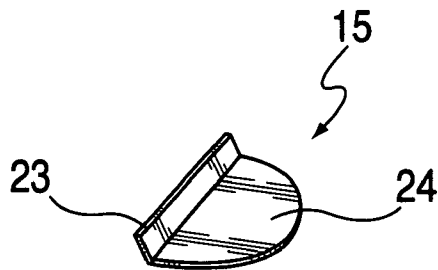


FIG. 7

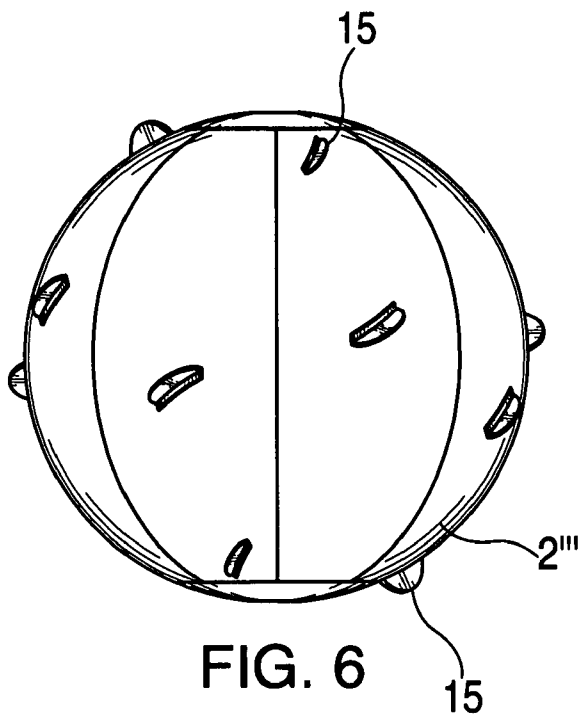


FIG. 6

## LEVITATED FINNED BALL DEVICE

### CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of provisional application No. 60/480,493 filed Jun. 23, 2003.

### FIELD OF THE INVENTION

[0002] The invention relates to a device for levitating a ball. In particular, a device is shown which provides entertainment and amusement, by levitating a light weight ball having at least one fin extending therefrom.

### BACKGROUND OF THE INVENTION

[0003] Suspension of balls by directing air at the ball for entertainment and amusement are available. For example, U.S. Pat. No. 4,045,906 discloses a hand-held fixed force blower unit for levitating a ball. The ball may be a light-weight foam plastic ball or a ping pong ball. With the ball levitated in the air by the blower, a user moves the blower unit to maneuver the ball to pass through certain obstacles. Similarly, U.S. Pat. No. 2,911,745 discloses a device that blows a stream of air upward at a light, hollow ball or balloon to suspend it in mid-air for display purposes. Both of these prior art references disadvantageously levitate a ball at a specific vertical axial position with no variation. Once the ball is levitated and suspended in mid-air, the ball is relatively static and provides minimal entertainment and amusement values.

[0004] U.S. Pat. No. 2,897,607 discloses a simulated satellite being suspended in the air with an electro magnetic device that counter balances a current of air directed at the satellite. The simulated satellite is a ball having a plurality of elongated arcuate fins extending peripherally about the ball. When the air strikes the arcuate fins, the ball rotates about its own axis. Although the ball is of a light weight material, it must have a metal cap for the magnetic forces to act on, which disadvantageously increases the weight of the ball and results in the need of substantial forces of air to maintain the ball in mid-air.

[0005] Therefore, there is a need for a device that levitates a ball in mid-air and yet allows the ball to be in motion using minimal forces of air to provide entertainment and amusement values.

### SUMMARY OF THE INVENTION

[0006] The present invention provides a device that levitates a ball having at least one fin extending therefrom with air, imparting motion to the ball.

[0007] The device of the present invention comprises a base and a ball for levitating above the base by means of the Bernoulli Effect. The base comprises a pivotable blower assembly, which comprise a ball interface assembly, a blower that generates a stream of air, and an air laminating means directing the air perpendicularly away from the blower towards the ball, which could be at an angle less than ninety degree (90°) from a horizontal surface supporting the blower. The ball interface assembly includes a basket for holding the ball when it is not levitated. The ball is made of a lightweight material, such as an inflated balloon or a ball made of waxed paper, such that minimal forces of air are

required to levitate the ball. At least one fin extends from the ball, either about the equator/circumference or randomly around the ball. When a stream of air strikes the ball, the ball is levitated and may rotate about its axis or spin and stop erratically, depending on the location of the fins, to provide entertainment and amusement values. The blower may be pivoted to direct the stream of air at an angle to the horizontal blower support surface while continuing to levitate the ball in mid-air, which appears to defy logic, also adding to the entertainment and amusement values.

[0008] In an alternate embodiment, a set of lights in the base illuminate the levitated ball. The lights, ball and fins may be of more than one color, including fluorescent and phosphorescent colors. Using UV LEDs to illuminate a ball having fluorescent colors provides additional unusual visual effects with entertainment and amusement value.

[0009] The device of the present invention is non-intrusive in a home environment with respect to noise level due to the light weightness of the ball such that a low velocity blower is adequate to sufficiently levitate the ball. Further, a low velocity, but high volume blower in the form of a large air flow cross-section provides a large lift area for the ball.

### BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Preferred embodiments of the present invention have been chosen for purposes of illustration and description and are shown in the accompanying drawings forming a part of the specification wherein:

[0011] **FIG. 1** is a partial cross-sectional view of the levitated finned ball device of the present invention.

[0012] **FIG. 2** is a top view of the ball for use with the levitated finned ball device of the present invention.

[0013] **FIG. 3** is an optional stabilization mast for use with the levitated finned ball device of the present invention.

[0014] **FIG. 4** is a partial cross-sectional view of an alternate embodiment of the ball having indented top and bottom portions for use with the levitated finned ball device of the present invention.

[0015] **FIG. 5** is another alternate embodiment of the ball having two rows of fins for use with the levitated finned ball device of the present invention.

[0016] **FIG. 6** is another alternate embodiment of the ball having random fins for use with the levitated finned ball device of the present invention.

[0017] **FIG. 7** is an enlarged view of a single fin for attaching to the ball for use with the levitated finned ball device of the present invention.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] With reference to the drawings, wherein the same reference number indicates the same element throughout, there is shown in **FIG. 1** a levitated finned ball device **1** of the present invention. Device **1** comprises a ball **2** and a base **3** for levitating the ball **2** above the base **3**.

[0019] As shown in **FIG. 1**, the base **3** includes a blower assembly **4** and a power and control box **5** which supplies low voltage power to the blower assembly **4** via a cable

bundle or wires 6. The base 3 may be pivotable to direct air from blower assembly 4 at different directions. The power and control box 5 includes plugs adapted to be plugged into a wall outlet. Alternatively, the blower assembly 4 may be powered by batteries. Although the power and control box 5 is shown as a distinct unit separate from the base 3, the power and control box 5 may be incorporated into the housing of the base 3.

[0020] The blower assembly 4 includes a ball interface assembly 7, a blower 8 and an air laminating means that directs the air perpendicularly away from the blower 8 towards the ball 2. The blower 8 may be of the type similar to a household blow dryer, but preferably has a larger air flow cross section and at a lower velocity to reduce the noise produced by the blower 8. For example, a typical household blow dryer runs its impeller at 1,500 to 2,400 rpm and the impeller of blower 8 may be ran at 600 to 900 rpm, which is sufficient to lift a hand-grippable ball 2 12 to 24 inches. As shown in the cross-sectional portion of FIG. 1, the air laminating means includes a laminar flow duct 9 and laminar flow baffles 10, which results in a stream of laminar air flow 11 directed parallel to the baffles 10 and perpendicular to the blower 8. The ball interface assembly 7 further includes a basket ring 13 supported by a plurality of struts 12 for cradling and holding the ball when the blower 8 is not actuated.

[0021] As shown in FIGS. 1 and 2, ball 2 is made of a light weight material, preferably waxed paper. The ball 2 may be deflated for packing and shipping and inflated with air by blowing into one of the two holes 19 and 20 while covering the other hole with a finger. As air is blown into the ball 2, the paper expands to form a ball shape that is rigid enough to hold its shape without any air pressure. Other lightweight material that holds its shape with or without air pressure known to one skilled in the art may be used. Due to the lightness of the ball, the blower 8 can be run at a very low speed and with minimal noise.

[0022] The ball 2 may be constructed of one or more pieces of material as known to one skilled in the art. Ball 2 as shown in FIGS. 1 and 2 is constructed of eight wedges 21. With each wedge 21 of the ball 2 colored with the same or different colors provide added entertainment and amusement value. The wedges 21 are joined to each other and to a paper disk 22 at each of the top and bottom portions of the ball 2.

[0023] A plurality of fins 15 are evenly spaced around the equator or circumference of the ball 2. Each fin is tilted at an angle from horizontal. As a stream of air 11 is directed towards ball 2, the stream of laminar flow air as shown by arrow 17 is deflected by the fins 15 and imparts a rotary motion to the ball 18 about its axis 18.

[0024] FIG. 7 illustrates an enlarged view of a single paper fin 15 for attaching to ball 2. Fin 15 includes a tab portion 23 and a fin portion 24. The tab portion 23 is for attaching to the surface of the ball 2. The attachment can be accomplished by any method known to one skilled in the art, such as by gluing, sewing, stapling, hook and loop combination, etc. The tab portion 23 is generally rectangular in shape and the fin portion 24 is generally semi-circular in shape.

[0025] In an alternate embodiment, one or more lights 14 are used to illuminate the ball 2. Preferably, LEDs are used,

which are small and can be imbedded in the basket ring 13 to be directed towards the ball 12. The LEDs are powered by the power and control box 5 or batteries in the base 3 (as discussed above) via wiring through strut 14a. The lights 14 may be controlled by the power and control box 5 to flicker (i.e. on and off) at particular or variable frequencies, which can be accomplished as known to one skilled in the art of electronic circuitry.

[0026] With the wedges 21 and fins 15 of the ball 2 having fluorescent or phosphorescent color, and using UV LEDs as lights 14 will provide a stunning and exceptional visual lighting effect for added entertainment and amusement value. Similarly, using red, green and blue (RGB) LEDs as lights 14 can provide a totally different visual effect depending on the phase relationship and relative intensity of the RGB LEDs. The control of the phase relationship and relative intensity of the RGB LEDs can be accomplished by the power and control box 5, which is known to one skilled in the art of electronic circuitry. Another way to provide another different visual effect is to provide patterns at a specific order or location, such as by preprinting and applying patterns on the ball 2 or by painting patterns directly on the ball 2, on the wedges 21. For example, a spiral pattern on the wedges 21 of ball 2 can yield images that coherently cross over the wedge boundaries.

[0027] The power and control box 5 uses common electrical elements known to one skilled in the art to produce the proper current for the blower assembly 4. The power and control box 5 may include a button or switch 26a that controls the speed of the blower 8, i.e. high, medium, low or an automatic sequence of high, medium to low to impart a variable stream of air 11 to provide a bouncing motion to the ball 2. The power and control box 5 may also include a button or switch 26b that controls the sequence, intensity and/or blinking pattern of the lights 14 to provide different visual effects of the ball 2.

[0028] FIG. 3 shows an optional stabilization mast 28 for use with the ball 2 when the ambient wind condition is too strong for the ball 2 to stay captured by the Bernoulli Effect alone. Mast 28 has an upper end and a lower end 29, with the lower end 29 adapted to fit into a central shaft mounting hole 30 at the base 3 (see FIG. 1). After the mast 28 is inserted into the central shaft mounting hole 30, ball 2 is placed on the mast 28 through its holes 19 and 20. A cap 31 is provided at the upper end of mast 28 to prevent the ball 2 from levitating beyond the length or height of the mast 28. The mast 28 is sufficient in length to accommodate the vertical height of the levitated ball 2. With the use of mast 28, the ball 2 may still spin, rise and fall with the air flow 11, as confined by the vertical axis of the mast 28.

[0029] FIG. 4 shows an alternate ball 2', which is similar to ball 2 of FIGS. 1 and 2, except that the top and bottom portions of the ball 2' adjacent holes 19 and 20 are indented. Ball 2' performs well and more stable than ball 2 when the ball 2' spins around its axis at a high speed.

[0030] FIG. 5 shows another alternate ball 2'', which is similar to ball 2 of FIGS. 1 and 2, except that two rows of fins 34 are spaced an equidistant from the equator. Ball 2'' is advantageous over balls 2 and 2' to facilitate packing of the ball 2'' in a folded manner with minimal damage to the fins 15 without having fins 15 at the equator.

[0031] FIG. 6 shows another alternate ball 2''', which is similar to ball 2 of FIGS. 1 and 2, except that fins 15 are

randomly placed on the surface of the ball 2" such that a stream of air 11 directed at ball 2" will cause the ball 2" to spin and stop and tumble in an erratic and random fashion.

[0032] The features of the invention illustrated and described herein is the preferred embodiment. Therefore, it is understood that the appended claims are intended to cover the variations disclosed and unforeseeable embodiments with insubstantial differences that are within the spirit of the claims.

What I claim is:

- 1. A device comprising:
  - a ball made of a lightweight material, said ball having an outer surface, at least one generally semi-circular shaped fin extending from said outer surface; and
  - a base comprising means for generating laminar air flow to levitate said ball in mid-air, which imparts motion to said ball as air strikes said fin.
- 2. The device of claim 1 wherein said base further comprising means for supporting said ball when said ball is not levitated.
- 3. The device of claim 1 wherein said base further comprising means for varying the direction of the laminar air flow.
- 4. The device of claim 1 wherein said generating means comprising a blower, an air laminating means directing the air perpendicularly away from said blower.
- 5. The device of claim 4 wherein said blower having an impeller that runs at a speed of 600 to 900 rpm.
- 6. The device of claim 2 wherein said supporting means comprising a basket formed of a basket ring supported by a plurality of struts extending from said base.
- 7. The device of claim 3 further comprising a housing, said base is contained within said housing and said varying means comprising a pivotable housing.
- 8. The device of claim 4 wherein said air laminating means comprising a laminar flow duct and at least one laminar flow baffle.
- 9. The device of claim 1 wherein said ball is made of waxed paper.
- 10. The device of claim 1 wherein said ball is an inflated balloon.
- 11. The device of claim 1 wherein said ball is hollow.
- 12. The device of claim 1 wherein said ball is fluorescent.
- 13. The device of claim 1 wherein said ball is phosphorescent.
- 14. The device of claim 1 wherein said ball is colored.
- 15. The device of claim 1 wherein said outer surface of said ball has at least one pattern thereon.
- 16. The device of claim 1 wherein said ball having top and bottom portions, a hole at the top portion and a hole at the bottom portion.
- 17. The device of claim 16 wherein said top and portion portions are indented.
- 18. The device of claim 16 wherein said ball comprising a plurality of wedges, top and bottom annular disks for interconnecting said plurality of wedges at said top and bottom portions, respectively.
- 19. The device of claim 16 further comprising a stabilization mast for maintaining said ball within the laminar air flow of said generating means, wherein said mast is insertable through said holes at said top and bottom portions.

- 20. The device of claim 19 wherein said stabilization mast having an upper end a lower end, said lower end is attachable to said base, a cap for attaching to said upper end to prevent said ball from levitating beyond the length of said mast.
- 21. The device of claim 1 wherein said ball having an equator and a plurality of said fins extending from said outer surface of said ball spaced apart and at an angle to said equator around said equator.
- 22. The device of claim 1 wherein said ball having an equator and two rows of a plurality of said fins extending from said outer surface of said ball spaced apart and at an angle to said equator, each row of said plurality of said fins being equidistant from and around said equator.
- 23. The device of claim 1 wherein a plurality of said fins extending randomly from said outer surface of said ball.
- 24. The device of claim 1 further comprising means for illuminating said ball.
- 25. The device of claim 6 further comprising means for illuminating said ball, said illuminating means being imbedded in said basket ring.
- 26. The device of claim 1 further comprising at least one light source.
- 27. The device of claim 24 wherein said illuminating means comprising at least one LED.
- 28. The device of claim 27 wherein said LED is a UV LED.
- 29. The device of claim 26 wherein said illuminating means comprise at least one red, one green and one blue light.
- 30. The device of claim 1 wherein each of said fins comprising a generally rectangular tab portion and a generally semi-circular fin portion, further comprising means for attaching said tab portion of said fin to said outer surface of said ball.
- 31. The device of claim 1 wherein said fin is fluorescent.
- 32. The device of claim 1 wherein said fin is phosphorescent.
- 33. The device of claim 1 wherein said fin is colored.
- 34. The device of claim 1 further comprising a power and control box for supplying power to and controlling said generating means.
- 35. The device of claim 4 further comprising a power and control box for supplying power to and controlling the sequence and/or speed of said blower.
- 36. The device of claim 24 further comprising a power and control box for supplying power to and controlling said illuminating means.
- 37. The device of claim 26 further comprising a power and control box for supplying power to and controlling the on/off, sequence, phase and/or intensity of said at least one light source.
- 38. The device of claim 7 further comprising a power and control box within said housing for supplying power to and controlling said generating means.
- 39. The device of claim 24 further comprising a power and control box within said housing for supplying power to and controlling said illuminating means.