Pro-Flight QuadPad

Technical Field – Applicability

This invention will serve as a multi-functional takeoff/landing and calibration platform for commercial or recreational Unmanned Aerial Vehicles (UAVs) such as remote controlled helicopters, quad and multi-rotor systems commonly known as drones.

Background

UAVs are sophisticated aerial robots that can carry onboard camera with advanced optics, sensors and gimbal with moving parts that are susceptible to damage while landing on a hard or uneven surfaces.

Although UAV manufacturers are developing better technologies to make UAV flight safer and more accurate, landing on an uneven soft surface such as grass, gravel and sand could still poses risk of flip-overs and/or exposure to mud, water or dust. It is certain that the risk of damage during landing is increased in the hands of a beginner pilot, while flying at night or in a First-Person-View (FPV) flight. Some pilots try to prevent damage to their UAV by so-called “hand-catching” their aircraft while it is landing. This practice exposes them to finger decapitation and other personal injuries.

It is evident that UAV pilots would benefit of having a portable, well lit and elevated from the ground landing platform that would provide a safe, cushioned landing for their aircraft anywhere, while in any flight mode and during any light condition.

In addition, this landing platform would have an integrated bullseye level on its surface that would be ideal for IMU, gimbal as well as other electronic calibrations and would allow the user to set their UVA on a leveled surface away from metal objects and electromagnetic fields that could cause interference during the calibration process.

Brief Description of the Drawings

FIG. 1 is a schematic 3D view from the back top angle. FIG. 2 is a 3D top back side-view from the right. FIG. 3 is 2D view from the top. FIG. 4 is 2D view from the bottom. FIG. 5 is 3D front side-view. FIG. 6 is 3D bottom back side-view revealing inside of the landing board. FIG. 7 is a cross sectional view of the landing board.

Specification

FIG. 1 is schematic 3D view of Pro-Flight QuadPad. FIG. 2 is a 3D top back side-view from the right of Pro-Flight QuadPad with number labels indicating each of the components. The landing board of Pro-Flight QuadPad is composed of three components 1, 18 and 16. 1 is a white foam board and it is a top component of the landing board on which UAV will be landing. It will serve as the main cushioning support at impact during landing. 2 is white PVC frame that goes around the edges of the landing board. It gives additional enforcement to the landing board and improves esthetics of the design. 2 also serve as a support onto which 14 (left mini LED strobe light) and 15 (right min LED strobe light) are attached with four metal screws. 3, 4, 5, 6, 8, 10 and 21 (visible on FIG. 3) are square labels made of thin brushed aluminum metal film and are glued on the top surface of 2 (white foam board). Purpose of 3, 4, 5, 6, 8, 10 and 21 is to improve esthetics of the design. 3, 4, 5, 6, and 10 contain holes in the middle so that multi-colored LED lights can come out on the surface from within the middle of the landing board. 7 is a wire string with eighteen ultra bright cold-white LED lights that goes around in a square. Power source for 7 is 23 on FIG. 4 that is powered by 3 AA batteries. 21 (brushed aluminum metal film) covers 7 and contains eighteen holes to expose LED lights to the surface (visible on FIG. 3). 11, 12, 13, 20 (visible on FIG. 3) and 22 are multi-colored LED string lights. 11 and 12 are colored yellow indicating the left side of the landing board, 13 and 20 are colored in red indicating the right side of the landing board and 22 is in green color indicating front of the landing board. Purpose of those five multi-colored LED lights is to assist when landing in a low light setting or complete darkness. Multi-colored LED lights have the option to stay lit up or be flashing. 14 and 15 are mini LED strobe lights emitting ultra-bright cold white light

with adjustable flashing frequency. 14 and 15 serve to inform UAV pilot of the position of Pro-Flight QuadPad from far distances when flying First-Person-View (FPV) in a low light setting or complete darkness. 14 and 15 are positioned in a way that Pro-Flight QuadPad can be visible from front, left and right in wide angles. 9 is a bullseye level glued to the surface of 2. 9 serves to keep Pro-Flight QuadPad in level during IMU, gimbal and other UAV calibrations. FIG. 3 is 2D drawing of Pro-Flight QuadPad from the top. Each component that is shown in FIG. 3 is already described in FIG. 2. The only difference between FIG. 3 and FIG. 2 is that in FIG. 3 component 20 and component 21 are visible and that component 7 is covered with component 21. FIG. 4 is a 2D view of the bottom of Pro-Flight QuadPad. 17 are four square Styrofoam cubes that serve as leg support for the landing board and are glued to the bottom black foam board indicated by the number 16. Styrofoam cubes have rubberized pads on the bottom to prevent Pro-Flight QuadPad from slipping when on a slippery surface. 23 and 24 are power sources powered by 3 and 2 AA batteries respectively. 23 is a power source for 7 and 24 is a power source for 11, 12, 13, 20 and 22 multi-colored LED lights. 2 is the white PVC frame already described in FIG. 2. FIG. 5 is 3D front side-view of Pro-Flight QuadPad. All components of FIG. 5 are described in the previous figures. FIG. 6 is a 3D bottom back side-view from the left revealing inside of the landing board with the bottom black foam board 16 removed. 18 is a wooden lattice molding which serves as a spacer to make space between 2 and 16 that fits string wiring 19 for multi-colored LED lights. FIG. 7 is cross-sectional view of the landing board showing top white foam board 1, bottom black foam board 16 and wooden lattice molding 18 forming a sandwich structure with white PVC frame 2 protecting it. 19 is wiring for multi-colored LED lights that is packed in the space between 1 and 16.