Drones: over 150 years of innovation

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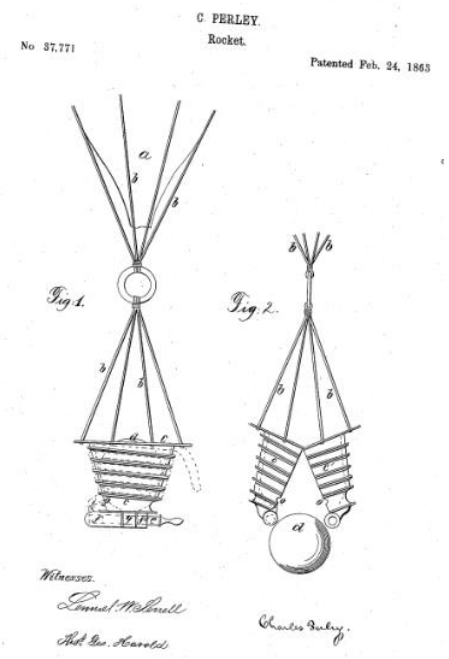
Unmanned aerial vehicles (commonly known as "**drones**") are amazing devices. Carrying a variety of payloads such as video cameras and other technologies, they can manoeuvre in tight spaces with accuracy and operate in groups. Their versatility makes them a viable option for a vast array of tasks. Constant advances in drone technology have given drones a commercial and competitive advantage, spurring the development of ever new applications. Not surprisingly, inventors are seeking patent protection for their ideas.

In fact, patent protection for unmanned aerial vehicles goes back over 150 years. In 1863, a US Patent (US 37,771) was issued for a device to discharge explosive shells remotely from balloons. The invention was for a clockwork mechanism to discharge explosive shells. The patent disclosed an ingenious process whereby the time lapse for explosion of the shell was regulated by varying the length of the fuse. Alternatively, the patent proposed to explode a shell remotely by running electricity through a wire. It should be noted that when this patent was issued, electricity use was expanding rapidly.



Figures 1 and 2 of US Patent 37,771 of 1863 illustrating the clockwork mechanism

Today, a US drone known as the *Predator* with a range of 1200 km, carrying a payload of over 200 kg at a speed of 200 km/h, can be used to launch missiles remotely.

Photo of the *Predator* (Source: U.S. Air Force)

Fortunately, drones are not just for military use any more. They can be used to deliver humanitarian aid, advance scientific research and perform surveillance and monitoring tasks.

Three recent patent applications described below give some idea of the latest innovations in the use of drones to deliver a variety of payloads.

A patent application filed by Google Inc., published under the number 2015/0158587 in 2015, concerns a mechanism for lowering a payload from a drone. The application includes a description of a control system that is configured to use a variable deployment-rate profile so that the payload can be lowered to or near the ground. Once the control system determines that the payload is touching or close to the ground, a payload release mechanism is operated. The control system takes account of various factors such as the drone's altitude, wind conditions, environmental factors (such as trees or power lines in the vicinity) and/or specific characteristics of the payload (size, shape, weight, fragility of the contents, etc.).

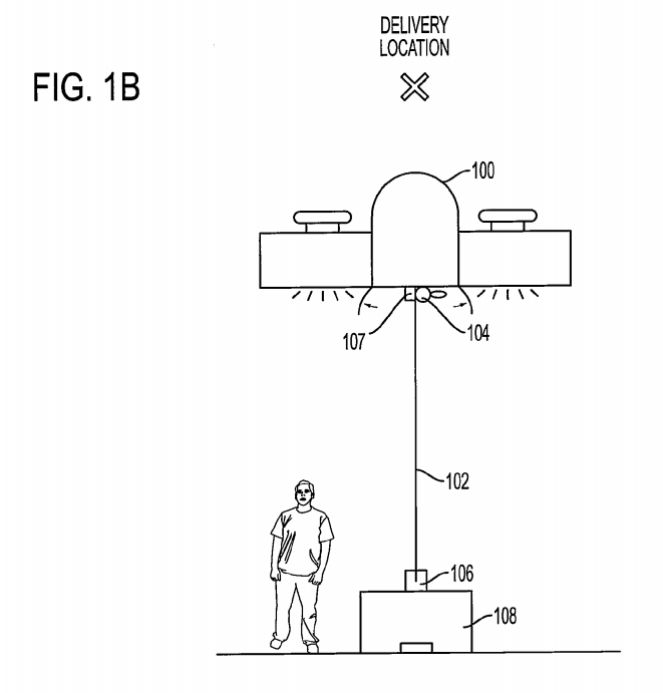


Figure 1B of the Google patent application illustrating a mechanism for lowering a payload from a drone

That same year, a patent application was filed by Amazon Technologies Inc. and published under the number 2015/0120094 for an unmanned aerial vehicle delivery system (drone). In addition to describing a drone configured to deliver a payload autonomously or semi-autonomously, the application discloses that the drone can communicate with other drones operating in the area to obtain information that can be used to plan a route and/or modify navigation of the route in real time. Such information may concern weather conditions, landing conditions, traffic, etc.

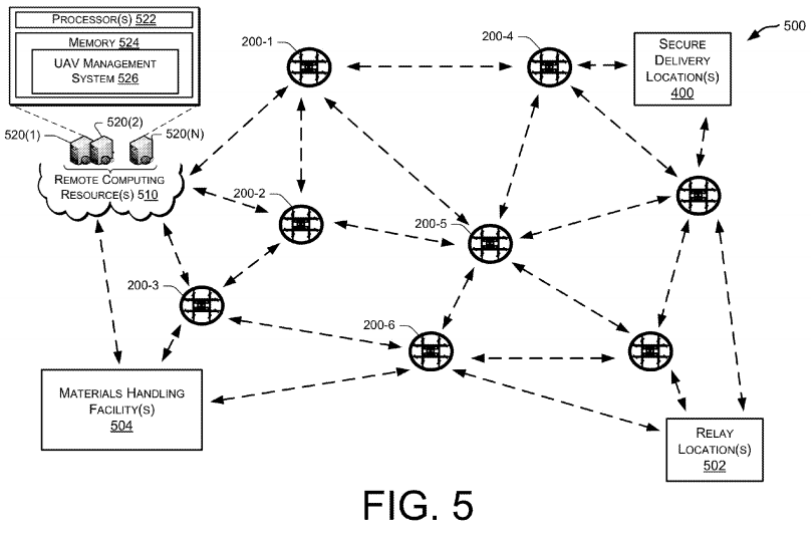


FIG. 5

Figure 5 of the Amazon patent application illustrating a drone communicating with other drones

In 2016, a patent application was filed by Disney Entreprises Inc. and published under the number 2016/0129363 for the delivery of special effects (for example, fireworks) from a specified position using an airborne discharge platform. The discharge platform is described as a remote-controlled or autonomous drone. Discharge of special effects from such a platform is more precise than discharge from a ground position, where gravity constrains the parabolic trajectory of the discharge.

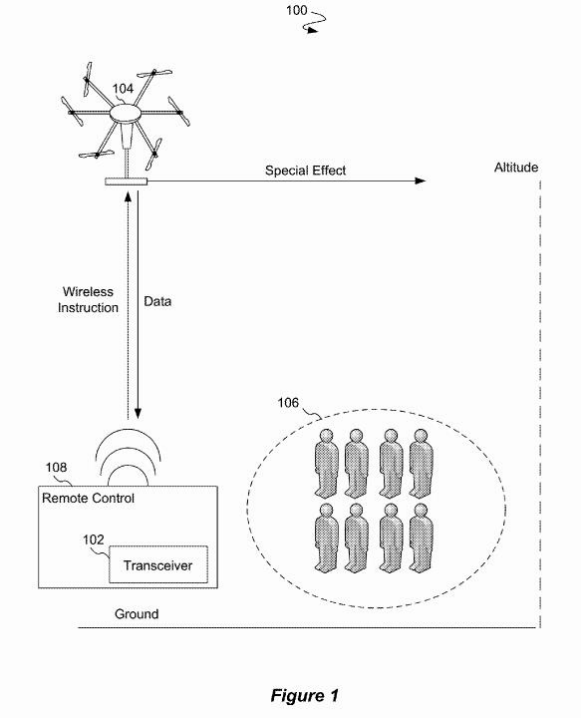


Figure 1 of the Disney patent application illustrating the drone for the delivery of special effects

Drones present unique features and are very versatile. That makes them an attractive and indispensable alternative to traditional aircraft.

With the active development of drone technology there is now a constant stream of new applications and commercial opportunities. Intellectual property rights, including patents, will play an important role in this innovative environment.

As the technology continues to evolve, drones may revolutionize the way we perform certain tasks and may take over certain hazardous operations, allowing us to enjoy new and improved fireworks displays at La Ronde!

Photo of the Loto-Québec International Fireworks Competition at La Ronde (Source: Parc Jean-Drapeau)

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