

DJI v. Autel

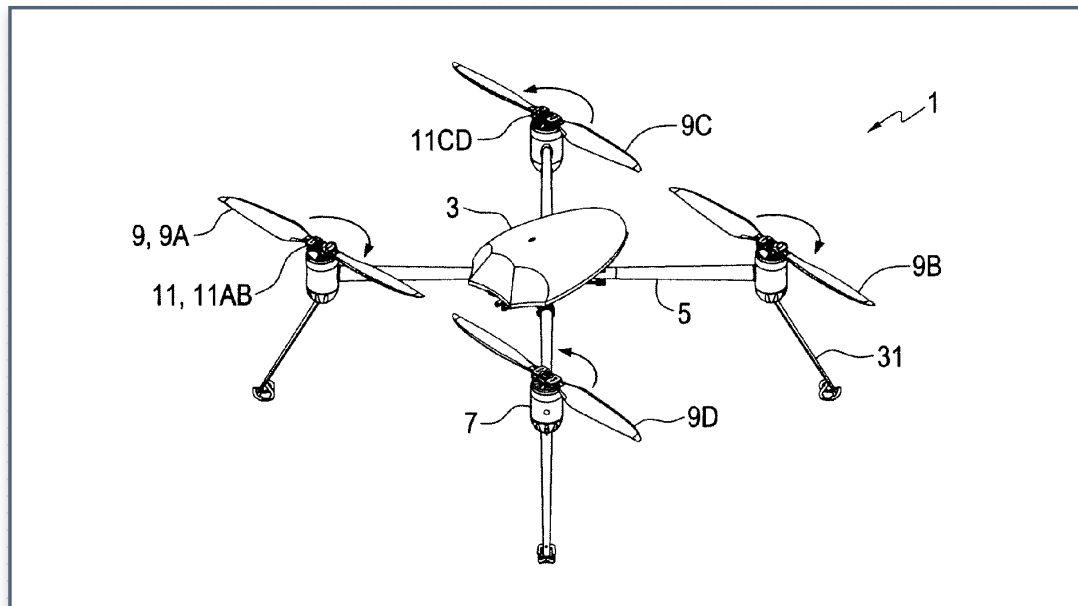
Patent Owner's Presentation



IPR2019-00846

U.S. Patent No. 9,260,184
August 13, 2020

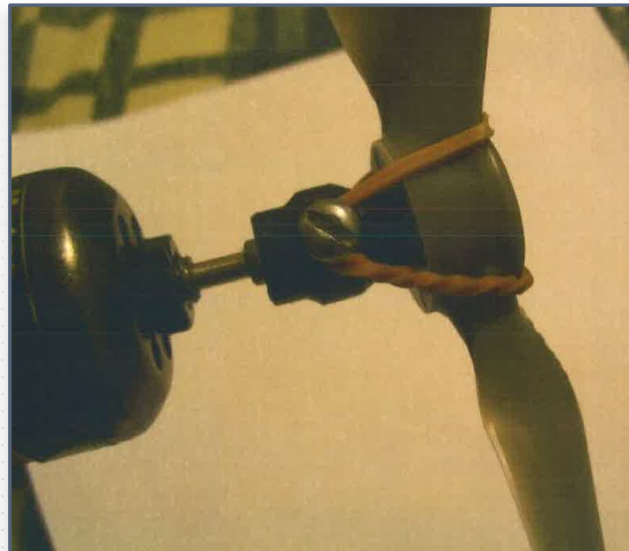
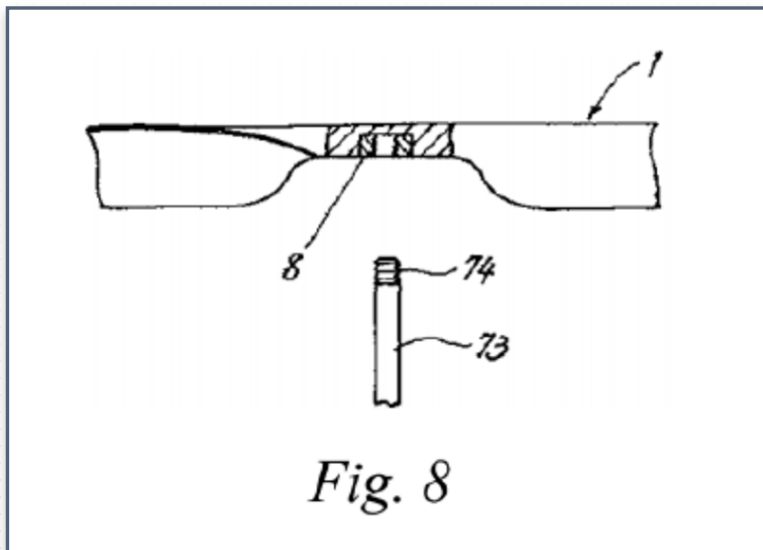
'184 Patent - Background



Ex. 1001, '184 Pat. Fig. 1

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

'184 Patent - Background



Ex. 1006, Sasaki, Fig. 8; Ex. 2017, p. 2



'184 Patent

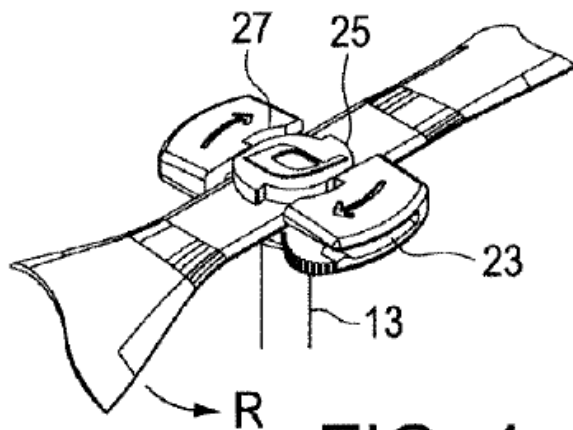


FIG. 4

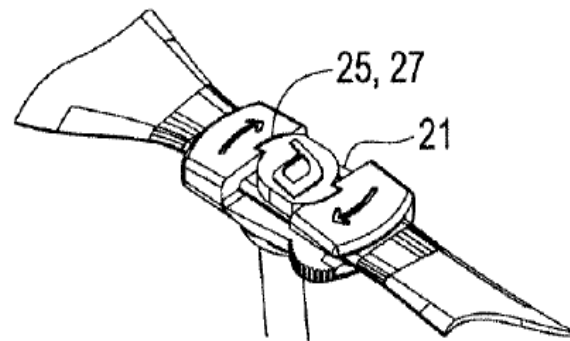


FIG. 5

Ex. 1001, '184 Pat., Figs. 4-5



'184 Patent – Proposed Claim 12

Claim 12. (Proposed substitute for claim 3) The apparatus of claim 1 wherein the blade lock portion of the clockwise lock mechanism is configured to engage with the shaft lock portion of the clockwise lock mechanism by partial ~~is rotated~~ counterclockwise rotation with respect to the shaft lock portion ~~thereof~~ of the clockwise lock mechanism to releasably attach the clockwise rotor blade to the first driveshaft.

PO Revised Motion to Amend, Paper No. 17 at Appendix A




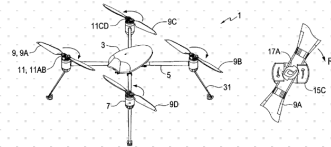
'184 Patent – Proposed Claim 13

Claim 13. (Proposed substitute for claim 4) The apparatus of claim 12 wherein the counterclockwise lock mechanism comprises a shaft lock portion attached to the second driveshaft and a blade lock portion attached to the counterclockwise rotor blade, and wherein the blade lock portion of the counterclockwise lock mechanism is configured to engage with the shaft lock portion of the counterclockwise lock mechanism by partial is ~~rotated~~ clockwise rotation with respect to the shaft lock portion of the counterclockwise lock mechanism thereof to releasably attach the counterclockwise rotor blade to the second driveshaft.

PO Revised Motion to Amend, Paper No. 17 at Appendix A

'184 Patent, Claim 1

	
US9260184B2	
(12) United States Patent Olm et al.	(10) Patent No.: US 9,260,184 B2 (45) Date of Patent: Feb. 16, 2016
(54) COMPACT UNMANNED ROTARY AIRCRAFT (71) Applicant: DRAGAN VUKOBRADEVIC, INC. , Belkanton, Saskatchewan (CA) (72) Inventor: Creville Olm, Saskatchewan (CA); Greg Wood, Saskatchewan (CA); Zoran Dragan, Saskatchewan (CA) (73) Assignee: Zoran Dragan, Saskatchewan (CA) (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days. (21) Appl. No.: 14/272,798 (22) Filed: May 16, 2014 (65) Priority Publication Data US 2014/035355 A1 Nov. 20, 2014 (30) Foreign Application Priority Data May 15, 2013 (CA) 2815883 (51) Int. Cl. (2006.01) B64C 27/08 (2006.01) B64C 29/02 (2006.01) (52) U.S. Cl. (2013.01) CPC: B64C 27/08 (2013.01), B64C 29/02 (2013.01), B64C 22/01 (2013.01), B64C 22/20 (2013.01), B64C 22/29 (2013.01) (53) Field of Classification Search None See application file for complete search history. (56) References Cited U.S. PATENT DOCUMENTS 1,880,837 A * 12/1923 Dekey 483:177 2,675,847 A * 8/1954 Sauer 367:6	



13 Claims, 4 Drawing Sheets

wherein the clockwise rotor blade is engageable only with the clockwise lock mechanism and cannot be engaged in the counterclockwise lock mechanism, and the counterclockwise rotor blade is engageable only with the counterclockwise lock mechanism and cannot be engaged in the clockwise lock mechanism; and wherein the clockwise lock mechanism comprises a shaft lock portion attached to the first driveshaft and a blade lock portion attached to the clockwise rotor blade, the shaft lock portion defining notches configured to engage corresponding lugs on the blade lock portion.

Ex. 1001, '184 Pat. at claim 1

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE



Quick Twist/Mistake-Proof

Q. Looking at the revised amended claims, we talked already about one particular feature, which I called the quick twist, and that is this concept of connecting the propeller blade by rotating less than a full revolution, right?

A. Yes.

Q. And then you would also agree that the revised amended claims include the other feature of mistake proofing, right?

MR. PETERS: Object to form.

THE WITNESS: Can you just give me a moment?

Yeah. And mistake proofing is considered to be the wrong propeller on the wrong motor. So I would say yes.

Ex. 2012, Ducharme Deposition Transcript at 51:24-52:13



Petitioner Opposition

The Petition presented numerous reasons why a POSITA would have combined Sasaki and Sokn, resulting in a system that renders claims 3-4 obvious. (Pet., pp. 32-38.) For example, the Petition explained that the combination maintains the “mistake-proof” design of the prior art (i.e., by having directional threading) without suffering from overtightening like the continuously threaded coupling mechanism disclosed in Sasaki.

Petitioner's Opposition to PO's Revised Motion to Amend, Paper 21 at p. 2



Engagement Limitation

Claim 1 recites that the rotor blade is “releasably attached” to the driveshaft by the lock mechanism (Ex. 1001, 5:39–40), that the attachment is accomplished by “engagement in a . . . lock mechanism” (id. at 5:45–47), and that, e.g., the “clockwise rotor blade is engageable only with the clockwise lock mechanism and cannot be engaged in the counterclockwise lock mechanism” (id. at 5:53–6:1). In other words, according to the claimed invention, a proper attachment requires an engagement in the lock mechanism. Insofar as Patent Owner’s position is based upon an attachment that does not include the required engagement, such is not an attachment as described by the claims.

IPR2019-00343, Paper 40 (Final Written Decision) at pp. 17-18.



Engagement Limitation

A. Yeah. The engagement limitation, Claim 1, 1G and 1H as it's shown on Exhibit 103 on Page 67, does not include locks and notches -- I'm sorry -- lugs and notches.

Ex. 2012, Ducharme Deposition Transcript at 58:10-13



Engagement Limitation

And so Petitioner never took the Position that engagement was mere attachment. It has to be attachment by engagement, the mating of two components, and the claim tells us that for the clockwise lock mechanism, it's the lugs and the notches.

IPR2019-00343, Paper 39 (Record of Oral Hearing) at 51:6-7



Engagement Limitation

Dictionary definitions of the word “mate” include “connect or be connected mechanically” and “to join closely or combine.” (Exs. 2013 and 2014). Dictionary definitions of the word engage include “establish a meaningful contact or connection with” and “to become meshed or interlocked.” (Exs. 2013 and 2014).

Ex. 2016, Third Reinholtz Declaration at ¶ 24



Engagement Limitation

Whenever a UAV threaded connection is misthreaded such that a right-handed thread is screwed onto left-handed thread or vice versa, whether threads are carved (as Dr. Ducharme asserts) or deformed, in each instance, the threads of the blade become mated or interlocked with the threads of the driveshaft, such that mechanical forces created by the engagement secure the blade to the driveshaft. It is these mechanical forces caused by the thread engagement that secure the blade to the driveshaft.

Ex. 2016, Third Reinholtz Declaration at ¶ 23



Engagement Limitation

When a blade is forced onto the driveshaft and the threads are “stripped,” the blade is not, and cannot be, “engaged” with the lock mechanism. Rather, the metal threads on the shaft lock portion are likely carving out new notches in the blade lock portion.

Ex. 1028, Second Ducharme Declaration at ¶ 49



Engagement Limitation

DJI argues that the term “engagement” used in limitation 1[h] requires that the blades be properly affixed to their corresponding rotor. This argument is not persuasive. Engagement does not require a blade to be affixed per factory instructions. Rather, a rotor blade is engaged when a user can twist the threads on the improper shaft such that the blade will not fall off. By DJI’s own admission, the blade and rotor shaft could engage together to such an extent that their threads began to permanently deform.

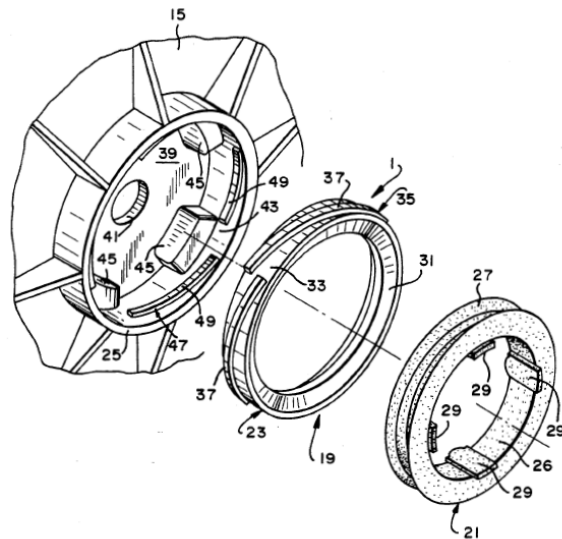
Ex. 2011, Excerpts from Initial Determination in 337-TA-1133, p. 4, fn. 28 (citations omitted).



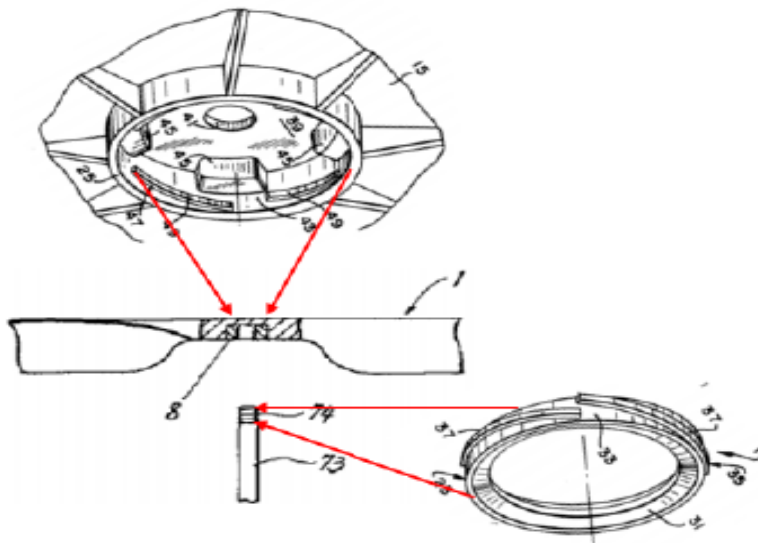
Furthermore, since the nut (8) and the rotating 10 shaft (73) receive a force in the tightening direction due to the rotation of the propeller, when the nut (8) and the rotating shaft of the propeller (73) are tightened more than necessary, the problem that it is difficult to remove the propeller when it is necessary to be replaced, occurs.

In addition, the present invention is intended to define a fixture of a propeller which can easily be attached to and detached from a rotating shaft without depending on the direction of rotation of the propeller

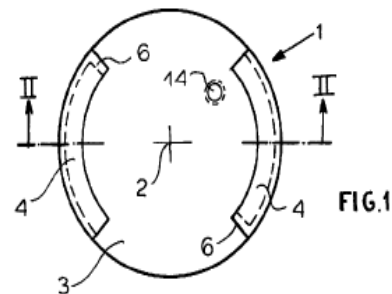
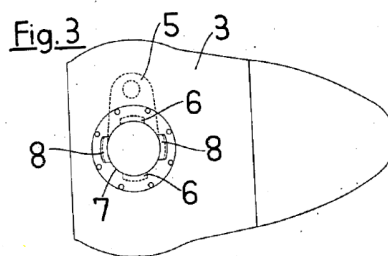
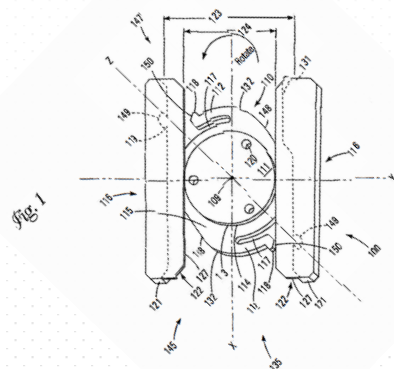
Ex. 1006, Sasaki at 2:9-28



Ex. 1007, Sokn at Fig. on cover page



Ex. 1003, First Ducharme Declaration at ¶ 107



Ex. 1026, '226 Pat, Fig. 1; Ex. 1017, '517 Pat, Fig. 3; Ex. 1018, EP0921067, Fig. 1



Philistine/Obrist/EP067

A POSITA would have been motivated to use Philistine or Obrist or EP067 to mount a UAV blade onto a driveshaft for several reasons. First, the mechanisms of Philistine, Obrist, and EP067 each solves the overtightening problem of Sasaki's prior art threads while maintaining the well-known "mistakeproof" design.

Ex. 1028, Second Ducharme Declaration at ¶ 57



Philistine/Obrist/EP067

Based on the teachings of Sasaki and the well-known prior art design goal of directional or keyed attachment mechanisms for UAV blades, a POSITA would have been motivated to mirror the design (e.g., the lugs and notches) of Philistine's Figure 1 embodiment to form a “counterclockwise lock mechanism” for blades that spin in counterclockwise.

Ex. 1028, Second Ducharme Declaration at ¶ 59