

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AXON ENTERPRISE, INC. AND DEDRONE HOLDINGS, INC.
Petitioners

v.

AIRSPACE DEFENSE, INC.
Patent Owner

Case No. IPR2025-00530
Patent 10,249,199

**DECLARATION OF DR. GIRISH CHOWDHARY IN SUPPORT OF
PETITIONERS' OPPOSITION TO PATENT OWNER'S NON-
CONTINGENT MOTION TO AMEND**

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Second Declaration of Dr. Girish Chowdhary

I. INTRODUCTION

1. My name is Dr. Girish Chowdhary. I make this declaration based upon my own personal knowledge and, if called upon to testify, would testify competently to the matters contained herein.

2. I had previously authored and then signed a declaration on February 10, 2025, which I understand was submitted as Exhibit 1003 to the Patent Trial and Appeal Board (“PTAB”) of the United States Patent and Trademark Office in case number IPR2025-00530. I may alternatively refer to the February 10, 2025, declaration as “Exhibit 1003” or “Original Declaration.”

3. In this Second Declaration, I incorporate the facts and opinions outlined in my Original Declaration.

II. EXPERIENCE AND QUALIFICATIONS

4. My experience, qualifications, CV, and consulting fee are outlined in my Original Declaration.

III. TASK SUMMARY AND MATERIALS REVIEWED

5. My Original Declaration addressed U.S. Patent No. 10,249,199 (EX1001, “’199 Patent”).

6. I have been informed that Airspace Defense, Inc. (“Patent Owner” or “PO”) submitted Non-Contingent Motion to Amend for the ’199 Patent (Paper 15, “Motion to Amend” or “MTA”) in case number IPR2025-00530 on December 20,

2025, in which it has proposed “Substitute Claims” 10-18 to replace “Original Claims” 1-9 of the ’199 Patent. Counsel has informed me that the Motion to Amend was filed as “non-contingent,” which I understand means that the Board will issue a final decision on the patentability of the Substitute Claims rather than determining the patentability of the corresponding Original Claims.

7. I have been asked to review the MTA filed by PO regarding the ’199 Patent, the proposed Substitute Claims, and the exhibits cited by PO. I have been asked to provide an understanding of the technology relevant to the MTA, to review certain prior-art references, and analyze whether or not those references disclose or teach limitations of the proposed Substitute Claims. The opinions stated in this declaration are from the perspective of a person of ordinary skill in the art (“POSITA”).

IV. LIST OF EXHIBITS

8. In forming my opinions, I have reviewed the ’199 Patent, its prosecution history and references cited by the Examiner, the materials cited in the List of Exhibits, and the materials cited throughout my Original Declaration, and this declaration.

Ex.	Description
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No. ¹	
1001	U.S. Patent No. 10,249,199 to Banga, “System and Method for Aerial System Discrimination and Action” (the “199 Patent”)
1002	File History for U.S. Patent No. 10,249,199
1003	Declaration of Dr. Girish Chowdhary
1004	Complaint for Patent Infringement, <i>Airspace Systems, Inc. v. Dedrone Holdings, Inc.</i> , Case No. 1-24-cv-01625 (E.D. VA), September 16, 2024
1005	U.S. Patent Application Publication No. 2019/0003807 to Whitmarsh <i>et al.</i> , “UAV Defense System,” (“ <i>Whitmarsh</i> ”) filed December 8, 2016 and published January 3, 2019
1006	U.S. Provisional Application No. 62/267,393 to Whitmarsh <i>et al.</i> , “UAV Defense System,” (“ <i>Whitmarsh Provisional</i> ”), filed December 15, 2015
1007	U.S. Patent Application Publication No. 2007/0239986 to Viggiano <i>et al.</i> , “Secure ADS-B Authentication System and Method,” (“ <i>Viggiano</i> ”) filed April 7, 2006 and published October 11, 2007
1008	U.S. Patent Application Publication No. 2016/0023760 to Goodrich, “Systems and Methods Countering an Unmanned Aerial Vehicle,” (“ <i>Goodrich</i> ”) filed July 16, 2015 and published January 28, 2016
1009	U.S. Patent No. 10,733,894 to Beard <i>et al.</i> , “Direct-broadcast Remote Identification (RID) Device for Unmanned Aircraft Systems (UAS),” filed February 26, 2018 and issued August 4, 2020

¹ Citations to patents are made by column and line cite; citations to patent publications are made by paragraph number; citations to Exhibit 1002 are made with reference to the Bates-stamped pagination; citations to other exhibits are made to the page number of the document itself.

1010	U.S. Provisional Application No. 62/209/221 to Beard, “Automatic Dependent Surveillance Broadcast Transmission within Whitespace,” filed August 24, 2015
1011	U.S. Patent No. 9,805,238 to Falk <i>et al.</i> , “System for Identifying and Controlling Unmanned Aerial Vehicles,” (“ <i>Falk</i> ”) filed July 11, 2016 and issued October 31, 2017
1012	U.S. Provisional Application No. 62/301,858 to <i>Falk</i> , “System for Identifying and Controlling Unmanned Aerial Vehicles (“ <i>Falk Provisional</i> ”), filed March 1, 2016
1013	Claim Listing of Challenged Claims
1014	Kayton, Myron and Fried, Walter, <i>Avionics Navigation Systems</i> , John Wiley and Sons, 1997.
1015	International Publication No. WO2016/154949 A1 to Gong <i>et al.</i> , “Authentication Systems and Methods for Generating Flight Regulations,” filed March 31, 2015 and published October 6, 2016
1016	International Publication No. WO2015/043123 A1 to Wang <i>et al.</i> , “Data Communication Systems and Methods,” filed January 14, 2014 and published April 2, 2015
1017	Burnside, Joseph E., “ADS-B Out: 978 UAT Or 1090ES?,” <i>AviationSafety Magazine</i> , published March 15, 2016.
1018	Nichols, Randall et al., <i>Counter Unmanned Aircraft Systems Technology and Operations</i> , New Prairie Press, 2020
1019	Austin, Reg, <i>Unmanned Aircraft Systems, UAVS Design, Development and Deployment</i> , Wiley, John Wiley and Sons, 2010
1020	Stipulation email on May 29, 2025
1022	International Publication No. WO2016/161637 to Gong et al., “Method, Apparatus and System of Providing Communication Coverage to an Unmanned Aerial Vehicle,” filed April 10, 2015 and published October 13, 2016 (“Gong637”)

V. TECHNICAL BACKGROUND

9. See Section IX of my Original Declaration (EX1003) for a technology background pertinent to the '199 Patent.

VI. OVERVIEW OF THE CHALLENGED PATENT

10. See Section VI of my Original Declaration (EX1003) for an overview of the '199 Patent.

VII. LEGAL STANDARDS

11. The Legal Standards provided to me were described in my Original Declaration.²

12. In addition to those legal standards, I have been informed by counsel as to a legal background on indefiniteness. I have been informed that, in order to be valid, the claims of a patent must be sufficiently definite that one skilled in the art can determine the metes and bounds of the claimed invention. I have been informed that a patent claim is deemed “indefinite” if the claim, read in light of the patent’s specification and prosecution history, fails to inform, with reasonable certainty, those skilled in the art about the scope of the invention. I understand that a claim

² EX1003 (Original Declaration), § V.

must be precise enough to afford clear notice of what is claimed, thereby apprising the public of what is still open to them.

13. In addition to these legal standards, I have been informed by counsel as to the legal background on lack of written description. I have been informed that, in order for claims to be valid, the claims of a patent must provide written description support for each limitation of the claims. I have been informed that a patent claim lacks written description if the specification fails to convey with reasonable clarity to a POSITA that the inventor was in possession of the invention as of the filing date sought. I have been informed that this requirement relies on an objective inquiry into what is contained within the specification, and that while the precise terms appearing in the claims need not necessarily appear in the specification, there must be sufficient detail in the specification that a POSITA can clearly conclude that the invention described in the claims had been invented as of the filing date sought.

14. I have been informed that to satisfy the written description requirement, the specification must actually or inherently disclose each element of the claims.

15. I have been informed that for the disclosure to be inherent, the missing descriptive matter must necessarily be present in or unavoidably be taught by the specification, such that a POSITA would recognize such disclosure.

16. I have been informed that subject matter that is not disclosed, but would be obvious over what is expressly disclosed, does not satisfy the written description requirement.

17. I have been further informed that a claim is not patentable if the claimed invention was otherwise available to the public before the effective filing date of the claimed invention.

VIII. OVERVIEW OF THE SUBSTITUTE CLAIMS

A. TABLE CORRELATING ORIGINAL CLAIM TO SUBSTITUTE CLAIM

18. I understand that in Patent Owner's Motion to Amend, Patent Owner has sought to amend the independent claims by proposing new substitute claims. The table below compares the Original Claims to the Substitute Claims, with independent claims emphasized in bold italics.

Original Claim	Dependency	Substitute Claim	Dependency
<i>1</i>	None	<i>10</i>	None
2	1	11	10
3	1	12	10
4	1	13	10
5	1	14	10
6	1	15	10
7	1	16	10

8	1	17	10
9	8	18	10

B. LIST OF SUBSTITUTE CLAIM

19. Patent Owner also provided annotations showing the changes it made to the Original Claims of the '959 Patent. This is found in "Claims Appendix" of the Motion to Amend. These changes are shown below.

20. Substitute Claim 10:

[[1]]10[.pre] A discrimination system comprising:

[10.a] an identifier transmission system coupled to an aerial system, wherein the identifier transmission system is configured to broadcast an aerial system identifier signal comprising an aerial system identifier unique to the aerial system;

[10.b] an identification system comprising an identification receiver;

[10.c] a permission module,

[10.d] wherein the identification receiver is configured to receive the aerial system identifier signal and a second factor identifier associated with the aerial system;

[[and]

[10.e1] wherein the identification system is configured to determine and verify an authenticity of the aerial system identifier of the aerial system identifier signal using the second factor identifier, and to provide an authenticated aerial system identifier

of the aerial system identifier signal when the authenticity has been determined and verified, and

[10.e2] to provide the authenticated aerial system identifier of the aerial system identifier signal to the permission module, and

[10.f] wherein the permission module is configured to determine that the aerial system associated with the authenticated aerial system identifier of the aerial system identifier signal is not permitted to be in an airspace; and

[10.g] a disruption system configured to disrupt an operation of the aerial system (i) when it is determined by the permission module that the aerial system associated with the authenticated aerial system identifier of the aerial system identifier signal is not permitted to be in an airspace, or (ii) when the authenticity of the aerial system identifier of the aerial system identifier signal is not verified, wherein the disruption system is preemptively enabled based on the received aerial system identifier signal.

21. Substitute Claim 11:

[[2]11. The system of claim 10, wherein the identifier transmission system and the identification receiver communicate using a radio chipset that is compatible with a communication protocol selected from the following: WiFi, LTE, or Bluetooth.

22. Substitute Claim 12:

[[3]]12. The system of claim 10, wherein the identification receiver is a mobile device.

23. Substitute Claim 13:

[[4]]13. The system of claim 10, wherein the identifier transmission system is configured to be reassigned from a first aerial system to a second aerial system.

24. Substitute Claim 14:

[[5]]14. The system of claim 10, wherein when the disruption system is enabled the aerial system is caused to be removed from the airspace.

25. Substitute Claim 15:

[[6]]15. The system of claim 10, wherein the disruption system comprises of a projectile launcher and an interdiction module.

26. Substitute Claim 16:

[[7]]16. The system of claim 10, wherein the disruption system comprises of an interceptor drone coupled with an interdiction module.

27. Substitute Claim 17:

[[8]]17. The system of claim 10, further comprising a control system for controlling the disruption system.

28. Substitute Claim 18:

[[9]]18. The system of claim [[8]]10, further comprising a logging system that is configured to record activity of at least one of the identification receiver, the permission module, or the control system.

IX. PRIORITY DATE OF THE SUBSTITUTE CLAIMS

29. The application leading to the '199 Patent was filed on May 17, 2017, as U.S. Application 15/598,303 (the "'303 Application"). Ex. 1001, items (21), (22). The '199 Patent claims priority to provisional application No. 62/309,838 (the "'838 Provisional"), which was filed on March 17, 2016. *Id.*, item (60). Because the '303 Application was filed more than 12 months after the '838 Provisional's filing date, applicant filed a petition to restore priority to the '838 Provisional on March 23, 2018. Ex. 1002, 157-158. This petition was granted on April 5, 2018. *Id.*, 146-149.

For the purposes of this petition, I assume without conceding that the priority date of the '199 Patent is March 17, 2016. However, I show below that many terms of the Substitute Claims are not supported by the '199 Patent, the '303 Application, or the '838 Provisional.

X. CLAIM CONSTRUCTION

30. I have been informed by counsel for Petitioner that the challenged claims of the '199 Patent are to be given their ordinary and customary meaning as understood by one of ordinary skill in the art at the time of the invention in light of the specification and the prosecution history pertaining to the patent. I also understand, however, that a claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the claim term in the specification. In this case, the claim term will receive the definition set forth in the patent. I have followed these principles in my analysis set forth in this Declaration.

31. To the extent the Applicant has expressly defined a claim term in the specification, I have used that definition. With respect to claim terms for which the applicant has not provided an express definition, I have applied the ordinary and customary meaning of the claim terms in light of the specification and the prosecution history in my analysis of the claims and the prior art herein.

32. I note that I identified and construed “permission module” under 35 U.S.C. §112(f) in my Original Declaration. EX1003, ¶¶65-68. I agree with that construction. I note that the Board construed permission module under 35 U.S.C. §112(f) in the Institution Decision (Paper 10), stating “[t]he recited function of the claimed permission module is ‘determining that the aerial system associated with the aerial system identifier signal is not permitted to be in an airspace,’ and the corresponding structure is ‘storage on-board the disruption system, storage on-board the identification receiver, a remote computing system connected to the disruption system or any other suitable computing system programmed to compare an aerial system parameter, such as an identifier, with the permissions for the airspace.’” Paper 10, 6-8. I have applied that construction in my analysis as well.

XI. SUMMARY OF CONCLUSIONS AND GROUNDS FOR CHALLENGE

33. Based upon my review of the Petition, the Motion to Amend, the materials cited in my Original Declaration and this Second Declaration, and the materials listed in the LIST OF EXHIBITS above, it is my opinion that Substitute Claims 10-18 of the ’199 Patent are rendered obvious by the Grounds listed in the table below:

Ground	Substitute Claim	Basis (35 U.S.C. §)	Prior Art
7	10-12, 14-18	103	Whitmarsh, Viggiano, and Gong637
8	13	103	Whitmarsh, Falk, Viggiano, and Gong637

9	10-12, 14-18	103	Whitmarsh, Goodrich, Viggiano, and Gong ⁶³⁷
10	13	103	Whitmarsh, Goodrich, Falk, Viggiano, and Gong ⁶³⁷

34. It is further my opinion that Substitute Claim 10 is invalid as indefinite because a POSITA lacks reasonable certainty as to the scope of “wherein the identification receiver is configured to receive the aerial system identifier signal and a second factor identifier associated with the aerial system” as recited in this claim.

35. It is further my opinion that Substitute Claim 10 is invalid as indefinite because a POSITA lacks reasonable certainty as to the scope of “wherein the disruption system is preemptively enabled based on the received aerial system identifier signal” as recited in this claim.

36. It is further my opinion that Substitute Claims 11-18 are invalid as indefinite at least because they depend on indefinite claim 10.

37. It is further my opinion that Substitute Claim 18 is indefinite because there is no antecedent basis for the “the control system” within claim 18 itself or claim 10 on which it depends.

38. It is additionally my opinion that Substitute Claim 10 is invalid for lack of written description because the specification of the '199 Patent does not reasonably convey to a POSITA that the inventor had possession of “wherein the

identification receiver is configured to receive the aerial system identifier signal and a second factor identifier associated with the aerial system.”

39. It is additionally my opinion that Substitute Claim 10 is invalid for lack of written description because the specification of the '199 Patent does not reasonably convey to a POSITA that the inventor had possession of “wherein the identification system is configured to determine and verify an authenticity of the aerial system identifier of the aerial system identifier signal using the second factor identifier, and to provide an authenticated aerial system identifier of the aerial system identifier signal when the authenticity has been determined and verified.”

40. It is additionally my opinion that Substitute Claim 10 is invalid for lack of written description because the specification of the '199 Patent does not reasonably convey to a POSITA that the inventor had possession of “the authenticated aerial system identifier.”

41. It is further my opinion that Substitute Claims 11-18 are invalid for lack of written description at least because they depend on independent substitute claim 10 that is invalid for lack of written description.

XII. THE SUBSTITUTE CLAIMS ENLARGE CLAIM SCOPE

42. In the MTA, PO amended the claims such that substitute dependent claim 18 (original dependent claim 9) now depends directly on substitute independent claim 10 rather than on intervening substitute dependent claim 17

(original dependent claim 8). MTA at 17. In my opinion, this amendment broadens substitute dependent claim 18 because the claim no longer requires “a control system for controlling the disruption system” as recited by substitute dependent claim 17 (original dependent claim 8). *Id.*

XIII. THE SUBSTITUTE CLAIMS LACKS WRITTEN DESCRIPTION SUPPORT

A. INDEPENDENT SUBSTITUTE CLAIM 10: ELEMENT [10.D]

43. Element [10.d] recites “wherein the identification receiver is configured to receive the aerial system identifier signal and a second factor identifier associated with the aerial system.” MTA at 6-7. In my opinion, PO has not demonstrated written description support for this element.

44. PO first refers to its analysis of “element [10.b]” as alleged support, stating that it “disclos[es] the identification receiver receives from the identifier transmission system broadcast signals that include the aerial system identifier signal and the secondary / second factor.” MTA at 6. The portions cited for element [10.b] do not disclose this. The ’199 Patent does not describe any broadcast signals received from “the identifier transmission system” that include an “aerial system identifier signal and the secondary / second factor.” See EX2002 at 4:15-24 (EX1001 at 2:57-3:3) (describing transmissions from “first and second transmission system” where a “first transmission system” is a “WiFi chipset” and a “second transmission system” is an “optical signal generator (e.g., a blinking LED)”). Instead, the analysis of

element [10.b] cites to disclosures that describe an “identification system” that receives an “identifier signal 300” and how generic “broadcast signals” are received by the identification system. MTA at 5 (element [10.b], citing EX2002 at 2:18-20, 3:3-6, 8:7-8, 8:16-9:1, Figs. 1, 6; EX2003, ¶¶12, 13, 29, 30-32, Figs. 1, 6; EX1001, 1:60-63, 2:5-10, 4:44-46, 4:57-5:2, Figs. 1, 6). None of the disclosures provide details regarding the reception of both an “aerial system identifier signal” and a “second factor identifier,” let alone an “identification receiver” that is configured to “receive the aerial system identifier signal **and a second factor identifier associated with the aerial system**” as claimed (emphasis added). The analysis of element [10.b] does not demonstrate written description support for element [10.d].

45. The other portions cited by the PO for element [10.d] are also not supportive. PO points again to EX2002 at 8:16-9:1 and Figure 6, EX2003 at ¶¶30-32 and Figure 6, and EX1001 at 4:57-5:2 and Figure 6, but these sections do not support element [10.d] as noted previously. And the additional citations to EX2002 at 9:13-17 and 28:8-9, EX2003 at ¶59, and EX1001 at 5:20-27 and 14:60-64 do not support element [10.d], because they only describe reception by a receiver of a signal that is “interpreted” into an “aerial system identifier 310” using, for example, “decryption.” MTA at 6-7. These citations say nothing about the receiver receiving an aerial system identifier and additionally receiving a “second factor identifier,” and thus do not support an “identification receiver” that is configured to “receive the

aerial system identifier signal **and a second factor identifier associated with the aerial system**” as claimed.

46. PO provides commentary at the end of the element [10.d] analysis that purports to summarize PO’s cited sections. This commentary is wrong. MTA at 7. PO states that “[t]he ’303 App. and the ’838 Prov. each [] teaches that the identification receiver receives ‘information broadcast by the aerial system’ and ‘broadcast signals from an aerial system,’ **which include the secondary / second factor identifier that is included in, and is thus associated with, the aerial system.**” *Id.* (emphasis added). But nothing in the cited portions of the ’303 App., the ’838 Prov., or the ’199 Patent describe signals that include a “secondary / second factor identifier that is included in, and is thus associated with, the aerial system,” and PO provides no further explanation for where support can be found. Similarly, PO asserts that the ’199 Patent describes “determining the identifier includes ‘verifying the authenticity’ of the aerial system identifier, which is accomplished using the second factor identifier.” *Id.* The cited portions say nothing about using a “second factor identifier” in this manner, and PO has not provided any explanation or citations that support its assertion.

47. Element [10.d] further lacks written description because the claim places no restriction on where the “second factor identifier associated with the aerial system” is “receive[d]” from. MTA at 6-7. By omitting where the “second factor

identifier” is transmitted and received from, the claim effectively claims that the “second factor identifier” can be transmitted and received from anywhere. The specification is not so broad. The only reference in the specification to a “second factor identifier” is found in EX2002 at 4:15-24, but this section requires that it is transmitted by a “second identifier transmission system.” This narrow disclosure thus does not provide adequate written description support for the “second factor identifier” of element [10.d] that has no restriction on where it is received from. By omitting where the “second factor identifier” is transmitted and received from, PO lacks written description support. PO has not demonstrated that element [10.d] has sufficient written description support.

B. INDEPENDENT SUBSTITUTE CLAIM 10: ELEMENT [10.E1]

48. Element [10.e1] recites “wherein the identification system is configured to determine and verify an authenticity of the aerial system identifier of the aerial system identifier signal using the second factor identifier, and to provide an authenticated aerial system identifier of the aerial system identifier signal when the authenticity has been determined and verified.” MTA at 7-8. PO has not demonstrated written description support for this element. PO cites to EX2002 at 30:17-18, 30:24-31:1, and 4:15-20, EX2003 at ¶¶14 and 66, and EX1001 at 2:57-64, 16:6-8, and 16:17-18 as alleged support, but none of these sections support the claimed subject matter. *Id.*

49. For example, element [10.e1] recites an “identification system is configured to **determine and verify an authenticity** of the aerial system identifier of the aerial system identifier signal **using the second factor identifier.**” MTA at 7-8. None of the cited sections support this. EX1001 at 16:6-7 states that “[d]etermining an aerial system identifier 310 can optionally include verifying the authenticity of the aerial system identifier 310”—i.e., the determining of an **identifier** (not determining an “authenticity”) can include verifying authenticity of the identifier—but PO has not shown that EX1001 (or the other cited exhibits) describe separate steps of “determin[ing]” an authenticity and separately “verify[ing]” an authenticity, let alone doing such “determin[ing]” and “verify[ing]” of authenticity using a “second factor identifier” as claimed.

50. And for the same reasons, the cited disclosure does not support “to provide an **authenticated aerial system identifier** of the aerial system identifier signal **when the authenticity has been determined *and* verified**” of element [10.e1]. The cited sections do not describe to both “determine” and “verify” **authenticity** of an aerial system identifier using a “second factor identifier” as discussed above.

51. I further note the following with respect to use of an “aerial system identifier” and “second factor identifier.” In my opinion, the ’199 patent does not include support regarding the claimed “determine[ing]” and “verify[ing]”

functionality using an “aerial system identifier” and “second factor identifier.” The written description does not provide a mechanism in which an “aerial system identifier” is authenticated in this manner. Additionally, none of the figures show any indication of how this would be implemented. Thus, PO’s inclusion of these elements in Substitute Claim 10 is not warranted, and the claim does not have written description support.

C. **INDEPENDENT SUBSTITUTE CLAIM 10: ELEMENTS [10.E2], [10.F], [10.G]**

52. Elements [10.e2], [10.f], and [10.g] each recite “the authenticated aerial system identifier,” referring to the previously recited “authenticated aerial system identifier” of element [10.e1]. As discussed with respect to element [10.e1], PO has not demonstrated written description support for the “authenticated aerial system identifier” of element [10.e1]. Section XIII.B, *supra*. The citations provided by PO with respect to elements [10.e2], [10.f], and [10.g] also do not support this term. MTA at 8-12. For example, EX2002 at 9:20-22 states that the chipset 608 “sends the *raw or processed signal* to the permissions module 103 for permissions determination, but that does not provide sufficient support for providing the “*authenticated* aerial system identifier” to the permissions module as claimed. As another example, EX2002 at 9:13-17 states that the chipset 608 “interprets the signal 300 into the aerial system identifier 310,” but that again does not mean it provides the “*authenticated* aerial system identifier” to the permissions module. Nor does the

bare description at EX2002 at 9:13-17 of “[d]etermining an aerial system identifier 310 can optionally include verifying the authenticity of the aerial system identifier 310” provide support for “providing the *authenticated* aerial system identifier to the permissions module.” As such, PO has not demonstrated written description support for at least “the authenticated aerial system identifier” of elements [10.e2], [10.f], and [10.g].

53. Element [10.g] is unsupported for an additional reason. As amended, this element requires “a disruption system configured to disrupt an operation of the aerial system (i) when it is determined by the permission module that the aerial system associated with the authenticated aerial system identifier of the aerial system identifier signal is not permitted to be in an airspace.” MTA at 8-12. But none of the cited portions support disrupting operation of an aerial system associated with an authenticated aerial system identifier. Rather, each of the cited portions relate to disrupting “unauthorized” aerial systems or aerial systems that lack “permissions,” not *authenticated* ones. *See, e.g.*, EX2002 at 3:10-17 (disruption system “automatically activated” for “unauthorized” UAV). Far from disrupting *authenticated* aerial systems, the cited portions in fact *disable* the disruption system when a UAV is “authorized.” *Id.* In short, there is no disclosure of first authenticating a UAV and then disrupting it. Element [10.g] lacks support for this additional reason.

D. DEPENDENT SUBSTITUTE CLAIMS 11-18

54. Because independent substitute claim 10 does not have written description support, dependent substitute claims 11-18 also do not have written description support.

XIV. THE SUBSTITUTE CLAIMS ARE INDEFINITE

A. INDEPENDENT SUBSTITUTE CLAIM 10: ELEMENT [10.D]

55. Element [10.d] recites “wherein the identification receiver is configured to receive the aerial system identifier signal and a second factor identifier associated with the aerial system.” MTA at 6-7. This element renders substitute claim 10 indefinite. First, it is unclear from the claims, specification, and prosecution history what a “second factor” identifier entails or what makes an identifier a “second factor” identifier. This ambiguity alone renders substitute claim 10 indefinite. Additionally, “a second factor identifier associated with the aerial system” is unclear because it is unclear whether the “second factor identifier” is received from the previously recited “identifier transmission system” (see element [10.a]) or an unrecited component. Moreover, PO suggests in its alleged specification support for this element that the “second factor” is a signal received from the claimed identifier transmission system, but the ’199 Patent includes no such disclosure. MTA at 7 (“The ’303 App. and the ’838 Prov. each also teaches that the identification receiver receives ‘information broadcast by the aerial system’ and ‘broadcast signals from an aerial system,’ which include the secondary / second

factor identifier that is included in, and is thus associated with, the aerial system”); *supra*, Section XIII.A. Instead, the ’199 Patent explains that a second factor is received from a second identifier transmission system that is different from a first identifier transmission system that sends a first identifier EX1001, 2:57-3:3. Due to the ambiguity introduced by element [10.d], a POSITA would not have been able to ascertain the scope of PO’s alleged invention and substitute claim 10 is indefinite.

B. INDEPENDENT SUBSTITUTE CLAIM 10: ELEMENT [10.G]

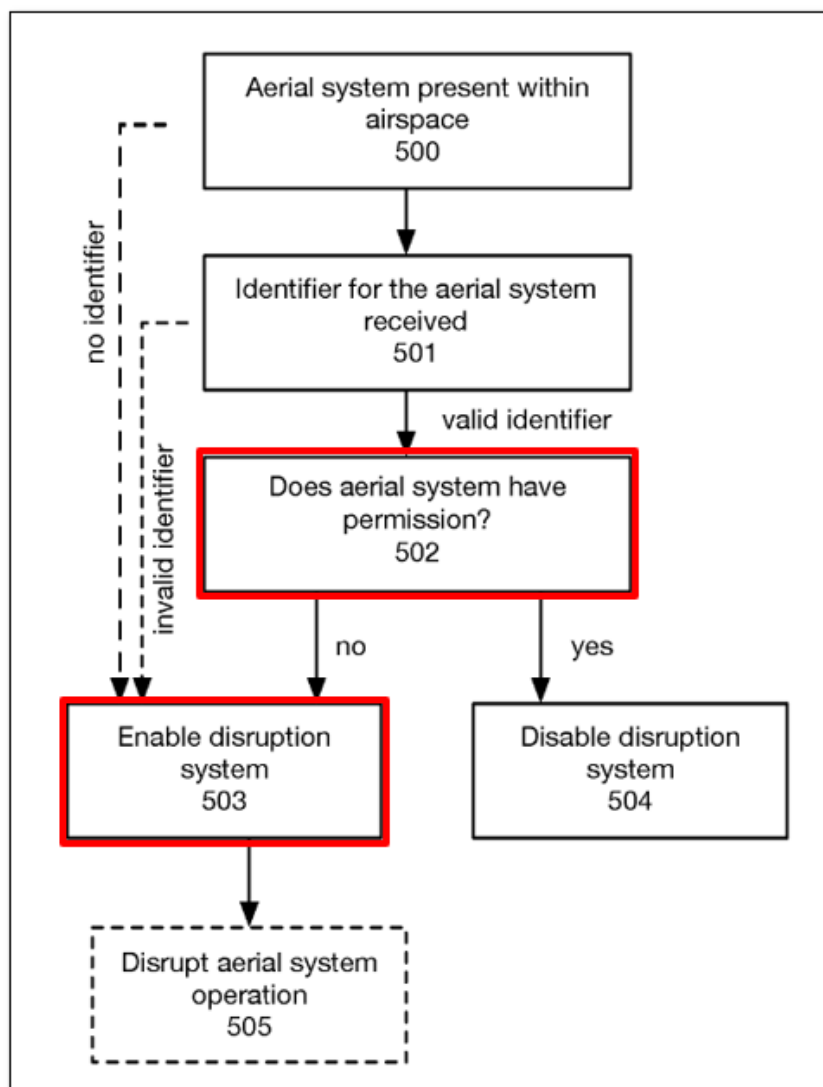
56. Element [10.g] recites, in part, “wherein the disruption system is preemptively enabled based on the received aerial system identifier signal.” MTA at 10-11. This element renders substitute claim 10 indefinite, because the claims, specification, and prosecution history of the ’199 Patent do not provide any insight into the meaning of “preemptively enabled,” making the scope of substitute claim 10 ambiguous and unclear.

57. The ’199 Patent’s only reference to “preemptively enabled” is that “certain scenarios may require the disruption system 105 to be ready to engage on short notice” and “[a]s **depicted in FIG. 5, the disruption system 105 may thus be preemptively enabled if certain conditions are met** (e.g. aerial system detected w/o an identifier 500, identifier is received but is invalid 501, identifier is valid but is not permissioned 502, etc.). EX1001, 19:14-25 (emphasis added). The patent uses the term without explaining what it means for disruption system 105 to be

“preemptively enabled.” As such, the scope of substitute claim 10 would have been ambiguous and unclear to POSITAs.³

58. Figure 5 of the '199 Patent adds to the confusion. This figure shows the three “conditions” 500, 501, and 502 that the specification says cause disruption system 105 to be “preemptively enabled.” EX1001, Fig. 5. But as shown below in annotated Figure 5, for condition 502 (“identifier is valid but is not permissioned”), the disruption system goes directly to being “enable[d]” at step 503 rather than “preemptively enabled.” EX1001, Fig. 5.

³The Petition addressed “preemptively enabled” as recited by the original claims under multiple possible interpretations. Pet. at 25-27, 44-47, 63-65.



EX1001, Fig. 5 (annotated)

59. The '199 Patent is thus unclear in whether the meaning of “preemptively enabled” is the same or different to simply “enabled.” The term therefore has multiple potential meanings and claim 10 is thus indefinite.

C. DEPENDENT SUBSTITUTE CLAIMS 11-18

60. Because independent substitute claim 10 is indefinite, dependent substitute claims 11-18 are also indefinite.

61. Moreover, claim 18 is further indefinite, because there is no antecedent basis for the “the control system” within claim 18 itself or claim 10 from which it depends.

XV. THE SUBSTITUTE CLAIMS ARE OBVIOUS

62. In my opinion, the Substitute Claims would have been obvious under 35 U.S.C. §103. In the grounds, I address the limitations from the Substitute Claims added by PO in the MTA and certain other relevant limitations; limitations from the original claim not addressed below are addressed in the Petition and in my original declaration. I note that elements that are indefinite and/or lack written description support are addressed based on my understanding of PO’s position and as best understood by a POSITA.

63. In particular, Grounds 7-10 rely on original grounds 1-4 from the Petition and add Viggiano (EX1007) and Gong637 (EX1022).⁴

64. Viggiano was used in grounds 5 and 6 of the Petition, and is prior art to the ’199 Patent, as the Petition demonstrated. Pet. at 8. Viggiano is from the same field of art as the ’199 Patent. *Id.*

⁴ I note that Gong637 is not the same as U.S. Patent No. 9,792,613 to Gong listed on the face of the ’199 Patent. EX1001, Cover Page.

65. Gong637 (filed April 10, 2015) is prior art to the Substitute Claims under 35 U.S.C. §102(a)(2) as of the '199 Patent's earliest claimed priority date of March 17, 2016. EX1022, Cover Page; EX1001, Cover Page. Gong637 is in the same field of art as the '199 Patent and describes aircraft authentication similar to the '199 Patent. EX1022, ¶¶0094, 0122; EX1001, Abstract, 2:10-15

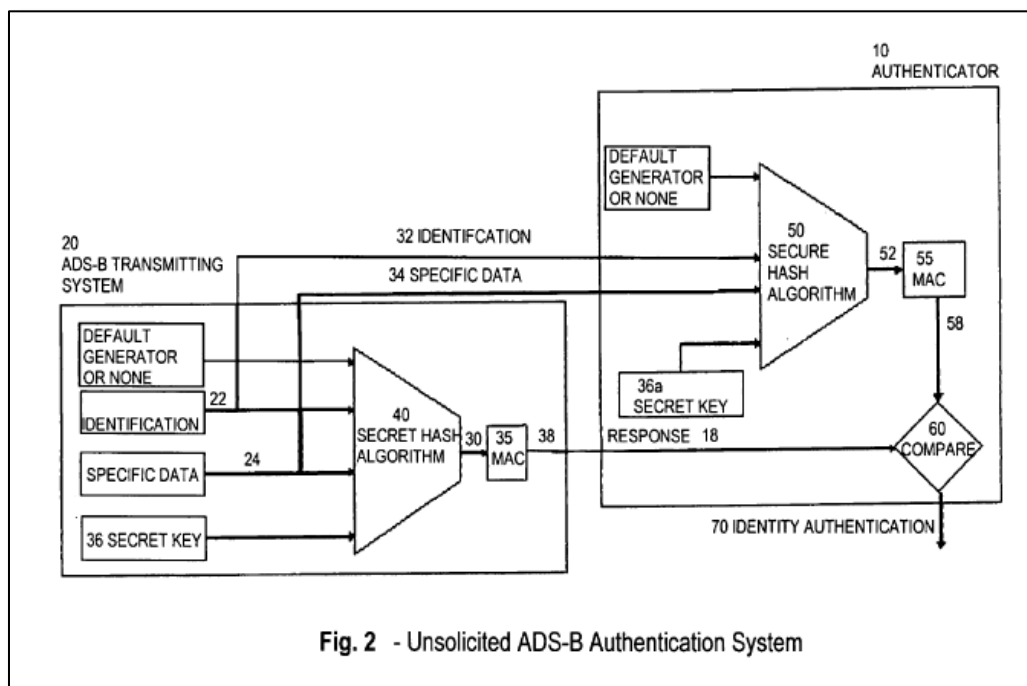
A. OVERVIEW OF VIGGIANO (EX. 1007)

66. Viggiano discloses a “system for authenticating the identity of ADS-B systems.” EX1024, Abstract. Viggiano's system involves generating a “message authentication code” (MAC) 38 from an ADS-B transmitter (and thus aircraft) identification information 22 and secret key 36 which is “unique” to the transmitter (and thus aircraft). *Id.*; EX1024, ¶¶0012-0015, 0019-0027, Figs. 1-3. Moreover, information 22 may be encrypted when it is used to form MAC 38, and MAC 38 is generated by using a “secure hash algorithm” and a “moving bit pattern” that truncates the result of the algorithm. *Id.*, ¶¶0017, 0019, 0026-0027. The MAC 38 is transmitted to an authenticator 10 by the ADS-B transmitter. *Id.*, ¶¶0002, 0012-0019, 0024-0027, 0028, Figs. 1-3.

67. Viggiano further discloses that identification information 32 is also transmitted by the ADS-B transmitter to authenticator 10. EX1024, ¶¶0002, 0012-0019, 0024-0027, 0028, Figs. 1-3, Claims 1, 5, 8, 21, 39. The authenticator 10 generates a MAC 58 using identification information 32. *Id.* The MAC 38 and MAC

58 are then compared by comparator 70 to determine a match. *Id.* If a match exists, the identity of the ADS-B transmitter (and thus aircraft) is authenticated. *Id.*

68. I note that Viggiano discloses embodiments in which a “challenge-response methodology” between the ADS-B transmitter and the Authenticator is employed. EX1024, ¶0012. However, I also note that Viggiano’s system is not so limited to “challenge-response,” and Figure 2 shows an example technique of “identity authentication” using the same components described in relation to Figure 1 and Figure 2 but “without using the authentication challenge-response methodology for airspace.” *Id.*, ¶0019, Fig. 2.



EX1024, Fig. 2

B. OVERVIEW OF GONG637 (EX. 1022)

69. Gong637 discloses UAV aircraft authentication in which a UAV “may be authenticated through the entire flight path.” EX1022, ¶¶0094, 0122. Gong explains that UAV identification can be “authenticated by checking and confirming the identification with an authentication center on the communication network.” *Id.* Failed authentication results in the UAV being “forced to land.” *Id.*

C. GROUND 7 AND 9: SUBSTITUTE CLAIMS 10-12 AND 14-18 ARE OBVIOUS OVER WHITMARSH, VIGGIANO, AND GONG637 (GROUND 7)/WHITMARSH, GOODRICH, VIGGIANO, AND GONG637 (GROUND 9)

1. Motivation to Combine

70. A POSITA would have been motivated to combine Whitmarsh, Viggiano, and Gong637 and to combine Whitmarsh, Goodrich, Viggiano, and Gong637 with a reasonable expectation of success.⁵ Viggiano is directed to aircraft authentication techniques in which multiple forms of aircraft identification are used to authenticate the aircraft’s identity. EX1007, ¶¶0004, 0006-0007, 0011-0024, Figs. 1-3. Specifically, an authenticator receives from an aircraft identification information 32 and a message authentication code 38 that is formed from identification information 22 and a secret key 36 unique to the aircraft. *Id.* At the authenticator, another message authentication code 58 is formed using the received

⁵ A POSITA would have been motivated to combine Whitmarsh and Goodrich as discussed in the Petition. Pet. at 40-44.

identification information 32. *Id.* A comparator compares the message authentication code 58 and message authentication code 38, and a match that results from the comparison indicates that the transmitting aircraft's identity (and thus identification information 32 and 22) is authenticated. *Id.*, ¶¶0015. "[T]wo or more consecutive" comparisons can take place, where two or more fail comparisons (i.e., no match) results in a "responsible higher command authority" being notified so they can "respond appropriately." *Id.* Gong637 discloses UAV aircraft authentication in which a UAV "may be authenticated through the entire flight path." EX1022, ¶¶0094, 0122. Gong637 explains that UAV identification can be "authenticated by checking and confirming the identification with an authentication center on the communication network." *Id.* Failed authentication results in the UAV being "forced to land." *Id.*

71. A known problem in UAV systems was "spoofing" or fraudulent UAV identities. EX1007, ¶¶0003-0004. Bad actors using such techniques could gain access to unauthorized airspace. *Id.* Because Viggiano and Gong637 are highly relevant to addressing such known problems, a POSITA thus would have combined both Whitmarsh and Whitmarsh and Goodrich with Viggiano and Gong637. Indeed, Whitmarsh, as well as Whitmarsh and Goodrich, teach using a UAV MAC address to identify a UAV, and Viggiano and Gong637 provide enhancements by teaching identification authorization techniques as discussed above that help ensure such a

UAV MAC address is properly authenticated. *Id.*; EX1005, ¶¶0020, 0027; EX1006, ¶¶0008, 0010, 0013, 0015-0017; Pet. at 18-19; EX1007, ¶¶0004, 0006-0007, 0011-0024, Figs. 1-3; EX1022, ¶¶0094, 0122. The combinations would have provided that the UAV MAC address is authenticated by “checking and confirming” the address, including by running consecutive authentication comparisons, and that action is taken (e.g., forcing landing) if authentication fails, as taught by Viggiano and Gong637. EX1007, ¶¶0004, 0006-0007, 0011-0024, Figs. 1-3; EX1022, ¶¶0094, 0122. After successful authentication, an authenticated UAV MAC address would have then been usable by both Whitmarsh’s and Whitmarsh and Goodrich’s system, which would have benefitted the systems by ensuring that the MAC address is not fraudulent. The combinations represent the mere application of known techniques (*i.e.*, known aircraft identification authentication techniques, as taught by Viggiano and Gong637) to a known system (e.g., Whitmarsh/Whitmarsh and Goodrich systems that utilize the MAC address of a UAV for identification) ready for improvement, the results of which would have been predictable and had a reasonable expectation of success for at least the reasons discussed above.

2. Claim 10

***a)* Element [10.a]**

72. Whitmarsh discloses wireless communications transmitted by UAVs comprise information or signatures unique to UAVs, such as a MAC address of the

UAV, that is used to identify the transmitting UAV (*aerial system identifier signal comprising an aerial system identifier*). EX1005, ¶¶0020, 0027; EX1006, ¶¶0008, 0010, 0013, 0015-0017; Pet. at 16-18, 44.

b) Element [10.b]

73. Whitmarsh teaches that its UAV defense system would have included an *identification receiver* for the reasons discussed in the Petition. EX1005, ¶¶0020, 0027; EX1006, ¶¶0008, 0010, 0013, 0015-0017; Pet. at 16-25, 44. Moreover, Whitmarsh discloses that the UAV defense system can “identify the UAVs 14 by passive means, i.e., by simply detecting radio signals 54” and that “by capturing the MAC address, which is unique to each UAV 14, the UAV defense system 10 will be able to specifically identify the detected UAV 14.” EX1005, ¶¶0020, 0027; EX1006, ¶¶0008, 0010, 0013, 0015-0018, pp. 23-25. Due to this functionality that the UAV defense system implements, a POSITA would have thus understood, or at least found obvious, that Whitmarsh’s UAV defense system comprises a computer system, processor, or similar component that identifies UAVs based on their received MAC addresses (*identification system*), and that the computer system, processor, or similar component would have further included the parts forming an *identification receiver* that receives wireless communications and identification

information (e.g., the MAC addresses) contained therein that is transmitted by UAVs (*identification system comprising an identification receiver*). *Id.*; Pet. at 16-25, 44.

c) Element [10.d]

74. Viggiano discloses an “authenticator” that receives both (1) an identification information 32 of an aircraft transmitter (which identifies an aircraft) and (2) a message authentication code 38 formed from identification information 22 of the aircraft transmitter (which identifies the aircraft) and a secret key 36 of the aircraft. EX1007, ¶¶0004, 0006-0007, 0011-0028, Figs. 1-3. Identification information 22 is a “unique id 22, for example, a Mode S address” of the aircraft that is “identifying content.” *Id.*, ¶¶0012, 0023. The secret key 36 is also unique to each aircraft transmitter. *Id.*, ¶0021. The message authentication code 38 is used to ensure that the “identity” of the aircraft transmitter (and thus, the aircraft) is authenticated. *Id.*, ¶0015. Viggiano thus teaches that Whitmarsh’s parts forming an *identification receiver* would have received (1) UAV aircraft identification information that is the wireless communication signal including the MAC address of a UAV (*wherein the identification receiver is configured to receive the aerial system identifier signal*) as well as (2) a message authentication code formed from identification information of the UAV and a secret key of the UAV (*and a second factor identifier associated with the aerial system*). Sections XV.C.1, XV.C.2.a-b; Pet. at 16-25, 44. The message authentication code forms a *second factor identifier*

at least because it is formed from identification information and a unique secret key of the UAV and is a *second* piece of identification information that is received (the first piece of identification information is the MAC address of the UAV) and used to authenticate the UAV aircraft's identity. *Id.*; EX1007, ¶¶0004, 0006-0007, 0011-0027, Figs. 1-3, claims 1-4, 8-11, 17, 19.

75. With respect to Viggiano, PO states in the MTA that the “challenge response received from the aircraft by the ground station, whether unencrypted or encrypted, is not a second factor identifier.” MTA at 21-22. Here, PO is apparently referring to response 18 of Viggiano that includes the message authentication code 38. EX1007, 0011-0024, Figs. 1-3. Notwithstanding the fact that PO's statement is bare attorney argument without any support, PO is wrong. The message authentication code forms a *second factor identifier* for at least the reasons above, and PO's unsupported and generic disagreement that provides no explanation does not demonstrate otherwise. Moreover, while Viggiano discloses embodiments in which a “challenge-response methodology” between the ADS-B transmitter and the Authenticator is employed, it also describes an embodiment that does not use “challenge-response.” EX1024, ¶¶0012, 0019. For example, Figure 2 shows an example technique of “identity authentication” using the same components described in relation to Figure 1 and Figure 3 but “without using the authentication challenge-response methodology for airspace.” *Id.*, ¶0019, Fig. 2.

d) Element [10.e1]

76. Viggiano discloses that its “authenticator” uses the received identification information 32 to form a message authentication code 58 and then compares the message authentication code 58 to the received message authentication code 38. EX1007, ¶¶0004, 0006-0007, 0011-0024, Figs. 1-3. If a match results from the comparison, the identity (and thus identification information 32 and 22) of the transmitter aircraft is authenticated. *Id.*, ¶0015. “[T]wo or more consecutive” comparisons can take place, teaching that this comparison to determine an authenticated identity occurs for an aircraft multiple times. *Id.* Gong637 discloses that an “identification” of a UAV is “authenticated through the entire flight plan,” where the UAV’s identification is “authenticated by checking and confirming the identification with an authentication center.” EX1022, ¶¶0094, 0122.

77. Viggiano and Gong637 thus teach that Whitmarsh’s computer system, processor, or similar component that identifies UAVs based on their received MAC addresses (*identification system*) would have authenticated the identity of a UAV by (1) forming a first message authentication code using the received UAV MAC address and (2) comparing the first message authentication code to the received message authentication code, where a match that results from the comparison indicates an authenticated UAV MAC address (*configured to determine...an authenticity of the aerial system identifier of the aerial system identifier signal using*

the second factor identifier). EX1007, ¶¶0004, 0006-0007, 0011-0024, Figs. 1-3; EX1022, ¶¶0094, 0122; Sections XV.C.1, XV.C.2.a-c; Pet. at 16-25, 44. Moreover, Viggiano and Gong⁶³⁷ teach that this authentication comparison is performed consecutive times and “check[ed] and confirm[ed],” thus teaching that this comparison performed consecutive times not only determines but also verifies that the authentication is accurate (*wherein the identification system is configured to...verify an authenticity of the aerial system identifier of the aerial system identifier signal using the second factor identifier*). *Id.* And successful authentication would have resulted in Whitmarsh’s UAV MAC address having been authenticated, and thus provided an authenticated UAV MAC address (*to provide an authenticated aerial system identifier of the aerial system identifier signal when the authenticity has been determined and verified*). *Id.*

e) Element [10.e2]

78. The Petition explains that Whitmarsh teaches the UAV MAC address is provided to the components forming the *permission module*. Pet. at 19-20, 44. The combination teaches that successful authentication would have resulted in Whitmarsh’s UAV MAC address having been authenticated, and thus provided the authenticated UAV MAC address to the *permission module* (*to provide the authenticated aerial system identifier of the aerial system identifier signal to the permission module*). Sections XV.C.1, XV.C.2.d.

f) Element [10.f]

79. The Petition explains that Whitmarsh teaches the components forming the *permission module* determine that a UAV associated with a UAV MAC address is not authorized to be in a particular area. Pet. at 21-25, 44. The combination teaches that successful authentication would have resulted in Whitmarsh's UAV MAC address having been authenticated, and thus the components forming the *permission module* would have determined that a UAV associated with the authenticated UAV MAC address is not authorized to be in a particular area (*wherein the permission module is configured to determine that the aerial system associated with the authenticated aerial system identifier of the aerial system identifier signal is not permitted to be in an airspace*). *Id.*; Sections XV.C.1; XV.C.2.d.

g) Element [10.g]

80. The Petition explains that Whitmarsh teaches a countermeasures system that is configured to disrupt operation of the detected UAV by dispatching one or more security vehicles to intercept and collide with the UAV (*disruption system configured to disrupt an operation of the aerial system*). Pet. at 25-27, 44. This disruption occurs when the components forming the *permission module* determine that the UAV associated with the UAV MAC address is not authorized to be in a particular area. *Id.*, 21-27, 44; EX1005, ¶¶0017, 0018, 0028, 0029; EX1006, ¶¶0009-0011, 0013, 0016-0018. The combination teaches that successful

authentication would have resulted in Whitmarsh's UAV MAC address having been authenticated, and thus the disruption provided by the countermeasures system would have occurred when the components forming the *permission module* determine that the UAV associated with the authenticated UAV MAC address is not authorized to be in a particular area (*disruption system configured to disrupt an operation of the aerial system (i) when it is determined by the permission module that the aerial system associated with the authenticated aerial system identifier of the aerial system identifier signal is not permitted to be in an airspace*). *Id.*

81. Viggiano and Gong637 teach that the authentication comparison is performed consecutive times and “check[ed] and confirm[ed],” thus teaching that this comparison is performed consecutive times to verify that the authentication is accurate. Sections XV.C.1, XV.C.2.d. Moreover, Viggiano discloses that “two or more” consecutive comparisons that are not a match means identity authentication has failed and results in a “responsible higher command authority” being notified so they can “respond appropriately,” and Gong637 discloses that a UAV having a failed authentication of UAV identification is “forced to land.” EX1007, ¶0015; EX1022, ¶¶0094, 0122. As such, Viggiano and Gong637 teach to Whitmarsh that Whitmarsh's countermeasures system (*disruption system*) disrupts operation of the UAV by forcing it to land (*configured to disrupt an operation of the aerial system*) when the authentication comparison involving the UAV MAC address fails

consecutive times and its authenticity is thus not verified (*when the authenticity of the aerial system identifier of the aerial system identifier signal is not verified*). Sections XV.C.2.a, XV.C.2.d. The combination further teaches *wherein the disruption system is preemptively enabled based on the received aerial system identifier signal* for the same reasons discussed in the Petition. Pet. at 25-27, 44-47.

3. Claims 11-12 and 14-18

82. The combinations teach claims 11-12 and 14-18 for the same reasons as in the Petition for original claims 2-3 and 5-9. Pet. at 27-35, 47-51.

D. GROUND 8 AND 10: SUBSTITUTE CLAIM 13 IS OBVIOUS OVER WHITMARSH, FALK, VIGGIANO, AND GONG637 (GROUND 8)/WHITMARSH, GOODRICH, FALK, VIGGIANO, AND GONG637 (GROUND 10)

83. The combinations teach claim 13 for the same reasons as in the Petition for original claim 4. Pet. at 35-40, 51. Moreover, a POSITA would have been motivated to combine Viggiano and Gong637 with Whitmarsh and Falk/Whitmarsh, Goodrich, and Falk for the same reasons discussed in Section XV.C.1.

XVI. CONCLUSION

84. All statements made herein of my own knowledge are true, and all statements made on information and belief are believed to be true. I further understand that willful false statements and the like are punishable by fine or

imprisonment, or both, under Section 1001 of Title 18 of the United States Code. I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 9, 2026.



Dr. Girish Chowdhary