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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte BAYRAM ANNAKOV, SERGEY PRONIN, and
TIMUR ABDUKERIMOV

Appeal 2023-003538
Application 16/902,544
Technology Center 3600

Before LARRY J. HUME, JASON J. CHUNG, and LISA A. MURRAY,
Administrative Patent Judges.

HUME, *Administrative Patent Judge.*

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–20. *See* Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM IN PART. STATEMENT OF THE CASE²

¹ “Appellant” refers to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as LiFE in the Air, Inc. Appeal Br. 1. Appellant is reminded of its obligation to update its real party in interest information within 20 days of any change during the appeal. *See* 37 C.F.R. § 41.8(a).

² Our decision relies upon Appellant's Appeal Brief (“Appeal Br.,” filed Mar. 21, 2023); Reply Brief (“Reply Br.,” filed June 26, 2023); Examiner's Answer (“Ans.,” mailed May 26, 2023); Final Office Action (“Final Act.,”

The claimed subject matter is directed to distributed service-and-transaction systems. *See* Spec. (Title). In particular, Appellant’s disclosed embodiments and claimed invention relate to “semi-automated service-provision systems and distributed database systems and is directed in particular to a semi-automated service-provision and transaction system incorporated in commercial aircraft and in other transportation systems.” Spec. ¶ 1.

Claims 1 and 15, reproduced below, are representative of the subject matter on appeal (*emphases* added to contested prior-art limitations):

1. A semi-automated, distributed service-and-transaction system ("STS") comprising:

processor-controlled passenger devices that each provide an execution environment for a client application or web browser;

processor-controlled transportation-personnel devices that each provide an execution environment for a service-provision application or web browser:

an on-board hub-and-server component installed within a transportation vehicle that interconnects the processor-controlled passenger devices and processor-controlled transportation-personnel devices with one another and with STS applications and services executing on the on-board hub-and-server component that are, in turn, interconnected with a remote STS backend application; and

a remote cloud-computing facility that provides a distributed execution environment for the STS backend application.

mailed Sept. 21, 2022); and the original Specification (“Spec.,” filed June 16, 2020).

15. A method that provides services and transactions to passengers within an aircraft, the method comprising:

downloading and installing a client application on processor-controlled passenger devices within the aircraft and/or providing, to the processor-controlled passenger devices, access to one or more web services:

downloading and installing a flight-attendant application on processor-controlled transportation-personnel devices within the aircraft and/or providing, to the processor-controlled transportation-personnel devices, access to one or more web services;

installing an on-board hub-and-server component within the aircraft to interconnect the processor-controlled passenger devices and processor-controlled transportation-personnel devices with one another and with STS applications and services that execute within the onboard hub-and-server component and that are, in turn, interconnected with a remote distributed STS backend application: and

installing and launching the distributed STS backend application on one or more remote cloud-computing facilities.

REFERENCES

The Examiner relies on the following references to reject the claims:

Name	Reference	Date
Zises	US 2015/0242888 A1	Aug. 27, 2015
Adams	US 2020/0342040 A1	Oct. 29, 2020
Sankrithi	US 2021/0027209 A1	Jan. 28, 2021
Panegro	CA 3090157 A1	Feb. 16, 2021

REJECTIONS³

The Examiner maintains the following rejections:

Rej.	Claim(s) Rejected	35 U.S.C. §	Reference(s)/ Basis	Citation
R1	1–20	101	Eligibility	Final Act. 2
R2	1, 2, 4–8, 15, 16, 18–20	103	Adams, Panegro	Final Act. 10
R3	9	103	Adams, Panegro, Zises	Final Act. 16
R4	10	103	Adams, Panegro, Zises, Sankrithi	Final Act. 17

CLAIM GROUPING

Based on Appellant’s arguments (Appeal Br. 21–48) and our discretion under 37 C.F.R. § 41.37(c)(1)(iv), we decide the appeal of obviousness Rejection R2 of claims 1, 2, 4–8, 15, 16, and 18–20 on the basis of representative claim 1. We address separately argued eligibility Rejection R1 of claims 1–20, and obviousness Rejections R3 and R4 of claims 9 and 10, not separately argued, *infra*.⁴

³ We note that claims 3, 11–14, and 17 are only subject to eligibility Rejection R1, and not any rejection over prior art.

⁴ “Notwithstanding any other provision of this paragraph, the failure of appellant to separately argue claims which appellant has grouped together shall constitute a waiver of any argument that the Board must consider the patentability of any grouped claim separately.” 37 C.F.R. § 41.37(c)(1)(iv). In addition, when Appellant does not separately argue the patentability of dependent claims, the claims stand or fall with the claims from which they depend. *In re King*, 801 F.2d 1324, 1325 (Fed. Cir. 1986).

ISSUES AND ANALYSIS

In reaching this decision, we review the appealed rejections for error based upon the issues identified by Appellant and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential). To the extent Appellant has not advanced separate, substantive arguments for particular claims, or other issues, such arguments are either forfeited or waived. 37 C.F.R. § 41.37(c)(1)(iv).

Based upon our review of the record, we find a preponderance of the evidence supports particular arguments advanced by Appellant with respect to eligibility Rejection R1 of claims 1–20 for the specific reasons discussed below.

However, we disagree with Appellant’s arguments with respect to obviousness Rejections R2 through R4 of claims 1, 2, 4–10, 15, 16, and 18–20 and, unless otherwise noted, we incorporate by reference herein and adopt as our own: (1) the findings and reasons set forth by the Examiner in the action from which this appeal is taken, and (2) the reasons set forth in the Examiner’s Answer in response to Appellant’s arguments.⁵

We highlight and address specific findings and arguments regarding claims 1 and 15 for emphasis as follows.

⁵ See *Icon Health and Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1042 (Fed. Cir. 2017) (“As an initial matter, the PTAB was authorized to incorporate the Examiner’s findings.”); see also *In re Brana*, 51 F.3d 1560, 1564 n.13 (Fed. Cir. 1995) (upholding the PTAB’s findings, although it “did not expressly make any independent factual determinations or legal conclusions,” because it had expressly adopted the examiner’s findings).

1. § 101 Rejection R1 of Claims 1–20

Issue

Appellant argues (Appeal Br. 21–31; Reply Br. 2–12) the Examiner’s rejection of claim 15 under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter is in error. These contentions present us with the following issue:

Under the USPTO’s Revised Guidance, informed by our governing case law concerning 35 U.S.C. § 101, are system claim 1 and method claim 15 patent-ineligible under Section 101?

Principles of Law

A. 35 U.S.C. § 101

An invention is patent-eligible if it is a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101.⁶ However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: “[l]aws of nature, natural phenomena, and abstract ideas” are not patentable. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70 (2012) (brackets in original) (citing *Diamond v. Diehr*, 450 U.S. 175, 185 (1981)).

⁶ This threshold analysis of whether a claim is directed to one of the four statutory categories of invention, i.e., a process, machine, manufacture, or composition of matter, is referred to as “*Step I*” in the USPTO’s patent-eligibility analysis under § 101. Manual of Patent Examining Procedure (“MPEP”) § 2106. All references to the MPEP are to the Ninth Edition, Revision 07.2022 (published Feb. 2023), unless otherwise indicated.

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court’s two-step framework, described in *Mayo* and *Alice*. *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 217–18 (2014) (citing *Mayo*, 566 U.S. at 75–77). In accordance with that framework, we first determine what concept the claim is “directed to.” *See Alice*, 573 U.S. at 219 (“On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk.”); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) (“Claims 1 and 4 in petitioners’ application explain the basic concept of hedging, or protecting against risk . . .”).

Concepts determined to be abstract ideas, and thus patent-ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Concepts determined to be patent-eligible include physical and chemical processes, such as “molding rubber products” (*Diehr*, 450 U.S. at 191); “tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1853))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

Abstract ideas may include, but are not limited to, fundamental economic practices, methods of organizing human activities, and mathematical formulas or relationships. *Alice*, 573 U.S. at 217–21. Under this guidance, we must therefore ensure at step one that we articulate what the claims are directed to with enough specificity to ensure the step one

inquiry is meaningful. *Id.* at 217 (“[W]e tread carefully in construing this exclusionary principle lest it swallow all of patent law.”).

Examples of claims that do not recite mental processes because they cannot be practically performed in the human mind include: (a) a claim to a method for calculating an absolute position of a GPS receiver and an absolute time of reception of satellite signals, where the claimed GPS receiver calculated pseudoranges that estimated the distance from the GPS receiver to a plurality of satellites, *SiRF Technology, Inc. v. International Trade Commission*, 601 F.3d 1319, 1331–33 (Fed. Cir. 2010); (b) a claim to detecting suspicious activity by using network monitors and analyzing network packets, *SRI Int’l, Inc. v. Cisco Systems, Inc.*, 930 F.3d 1295, 1304 (Fed. Cir. 2019); (c) a claim to a specific data encryption method for computer communication involving a several-step manipulation of data, *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016) (distinguishing *TQP Development, LLC v. Intuit Inc.*, 2014 WL 651935 (E.D. Tex. Feb. 19, 2014)) (the specific data encryption method “could not conceivably be performed in the human mind or with pencil and paper”). Whereas a claim limitation to a process that “can be performed in the human mind, or by a human using a pen and paper” qualifies as a mental process, a claim limitation that “could not, as a practical matter, be performed entirely in a human’s mind” (even if aided with pen and paper) would not qualify as a mental process.⁷

⁷ *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372, 1375–76 (Fed. Cir. 2011) (distinguishing *Research Corp. Techs. v. Microsoft Corp.*, 627 F.3d 859 (Fed. Cir. 2010), and *SiRF Tech., Inc. v. Int’l Trade Comm’n*, 601 F.3d 1319 (Fed. Cir. 2010)).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we must examine the elements of the claim to determine whether it contains an “‘inventive concept’” sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 221 (citation omitted). “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’” *Id.* (alterations in original) (quoting *Mayo*, 566 U.S. at 77). “[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention.” *Id.*

B. USPTO Revised Guidance

In January 2019, the U.S. Patent and Trademark Office (“USPTO”) published revised guidance on the application of Section 101.⁸ The Manual of Patent Examining Procedure (“MPEP”) now incorporates this revised guidance and subsequent updates at Section 2106.

Under MPEP § 2106, we first look to whether the claim recites:

(1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic

⁸ *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (hereinafter “Revised Guidance”) (<https://www.govinfo.gov/content/pkg/FR-2019-01-07/pdf/2018-28282.pdf>). In response to formal public comments, the Office issued further guidance on October 17, 2019, clarifying the Revised Guidance. USPTO, October 2019 *Update: Subject Matter Eligibility* (the “October 2019 Update”). “All USPTO personnel are, as a matter of internal agency management, expected to follow the guidance.” 84 Fed. Reg. at 51; *see also* October 2019 Update at 1.

practice, or mental processes) (“Step 2A, Prong One,” referred to herein as “*Step 2A(i)*”); and

(2) additional elements that integrate the judicial exception into a practical application (“Step 2A, Prong Two,” referred to herein as “*Step 2A(ii)*”).⁹

MPEP § 2106.04(a)) and § 2106.04(d).

Under this guidance, if the claim does not recite a judicial exception (a law of nature, natural phenomenon, or subject matter within the enumerated groupings of abstract ideas above), then the claim is patent-eligible at *Step 2A(i)*. This determination concludes the eligibility analysis, except in situations identified in the Revised Guidance.¹⁰

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application,¹¹ do we then look, under Step 2B, to whether the claim:

⁹ “Examiners evaluate integration into a practical application by: (1) identifying whether there are any additional elements recited in the claim beyond the judicial exception, and (2) evaluating those additional elements individually and in combination to determine whether the claim as a whole integrates the exception into a practical application, using one or more of the considerations introduced in subsection I *supra*, and discussed in more detail in MPEP §§ 2106.04(d)(1), 2106.04(d)(2), 2106.05(a) through (c) and 2106.05(e) through (h).” MPEP § 2106.04(d)II.

¹⁰ In the rare circumstance in which an examiner believes a claim limitation that does not fall within the enumerated groupings of abstract ideas should nonetheless be treated as reciting an abstract idea, the procedure described in the MPEP for analyzing the claim should be followed. *See* MPEP § 2106.04(a)(3)(“Tentative Abstract Ideas”).

¹¹ This corresponds to *Alice* part one where it is determined whether the claim is “directed to” an abstract idea. *See Alice*, 573 U.S. at 219. If a claim is “not directed to an abstract idea under part one of the *Alice* framework, we

(3) adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field; or

(4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.¹²

MPEP § 2106.05(d).

In the *Step 2B* analysis, an additional element (or combination of elements) is not well-understood, routine or conventional unless the examiner finds an evidentiary basis, and expressly supports a rejection in writing with, one or more of the following:

1. A citation to an express statement in the specification or to a statement made by an applicant during prosecution that demonstrates the well-understood, routine, conventional nature of the additional element(s). . . .

2. A citation to one or more of the court decisions discussed in MPEP § 2106.05(d)(II) as noting the well-understood, routine, conventional nature of the additional element(s).

3. A citation to a publication that demonstrates the well-understood, routine, conventional nature of the additional element(s). . . .

do not need to proceed to step two.” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1339 (Fed. Cir. 2016).

¹² Items (3) and (4) correspond to *Alice* part two where it is determined whether the claim contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application” (*Alice*, 573 U.S. at 221) and continue to be collectively referred to as “*Step 2B*” of the Supreme Court’s two-step framework, described in *Mayo* and *Alice*.

4. A statement that the examiner is taking official notice of the well-understood, routine, conventional nature of the additional element(s). . . .

See MPEP §§ 2106.05(d)(I)(2); 2106.07(a).

If the Examiner or the Board determines under *Step 2B* that the element (or combination of elements) amounts to significantly more than the exception itself, the claim is eligible, thereby concluding the eligibility analysis.

However, if a determination is made that the element and combination of elements do not amount to significantly more than the exception itself, the claim is ineligible under *Step 2B*, and the claim should be rejected for lack of subject matter eligibility.

Analysis

Based upon our review of the record, we find a preponderance of the evidence supports particular arguments advanced by Appellant with respect to claims 1–20 for the specific reasons discussed below. We highlight and address specific findings and arguments regarding claims 1 and 15 for emphasis as follows.

Step 1 – Statutory Category

Claim 1, as a system (machine or apparatus) claim, and claim 15, as a method (process) claim recite one of the enumerated categories of eligible subject matter in 35 U.S.C. § 101. Therefore, the issue before us is whether they are directed to a judicial exception without significantly more.

Step 2A(i): Does the Claim Recite a Judicial Exception?

With respect to independent method claim 15, the Examiner determined:

[T]he claim describes a process for downloading and installing a web application on an aircraft between a passenger and attendant for airplane seating. These limitations, as drafted, are processes that, under its broadest reasonable interpretation, covers performance of the limitations in the mind or via manual human activity, but for the recitation of generic computer components. That is, other than reciting “by a classical computer,” nothing in the claim precludes the limitations from practically being performed in the human mind or by organizing human activity. *These limitations are mental processes or organizing human activities (Step 2A1-Yes).*

Final Act. 3 (emphasis added).

In making this determination, it appears the Examiner did not identify *specific limitations* in claim 15 deemed to recite abstract ideas, as required by our guidance.

The claim recites the limitations of downloading and installing a client application on processor-controlled passenger devices within the aircraft and/or providing, to the processor-controlled passenger devices, access to one or more web services; downloading and installing a flight-attendant application on processor-controlled transportation-personnel devices within the aircraft and/or providing, to the processor-controlled transportation-personnel devices, access to one or more web services. . . .

Id. at 2.

We disagree with the abstract idea analysis provided by the Examiner, because such a broad-brush approach in identifying purported recitations of abstract ideas is overly inclusive, and runs counter to the *Revised Guidance*,

as incorporated in the MPEP. “[T]he Court [in *Alice*] has explained that ‘[a]t some level, all inventions embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas,’ and has cautioned ‘to tread carefully in construing this exclusionary principle lest it swallow all of patent law.’” MPEP § 2106.04(II)(A)(1) (citing *Alice*, 573 U.S. at 216). “The ‘directed to’ inquiry, therefore, cannot simply ask whether the claims involve a patent-ineligible concept, because essentially every routinely patent-eligible claim involving physical products and actions involves a law of nature and/or natural phenomenon’). Examiners should accordingly be careful to distinguish claims that **recite** an exception (which require further eligibility analysis) and claims that merely **involve** an exception (which are eligible and do not require further eligibility analysis.” *Id.* (citing *Enfish*, 822 F.3d at 1335).

We disagree with the Examiner’s analysis that claim 15 recites mental processes or that it can be reasonably construed to include organizing human activities.¹³ We also disagree with the Examiner that “[t]he analysis above applies to all statutory categories of the invention including claims [sic] 1. Furthermore, the dependent claims 2–14, and 16–20 do not resolve the issues raised in the independent claim 8.” Final Act. 4.¹⁴

In this case, we determine that system claim 1 recites a structurally complete invention in which the recited structural components interact with

¹³ We further disagree with the Examiner’s analysis under *Step 2A(ii)* because system claim 1 does not recite downloading and installing a client application or any other application. *See generally*, claim 1.

¹⁴ We note that claim 8 is dependent on claim 1, and is not independent as stated by the Examiner.

each other and *involve* using additional applications and services executing on a server, which we determine do not recite one or more judicial exceptions. We further determine that method claim 15 likewise recites a complete, non-abstract invention, that utilizes various types of tangible hardware components to carry out the recited steps and/or functions of the claimed process.

Therefore, we conclude claims 1 and 15 are not directed to the alleged abstract idea of mental processes and certain methods of organizing human activity (Final Act. 11), but instead are directed to the non-abstract idea of implementing a “distributed service-and-transaction system (‘STS’)” (Claim 1, preamble) or, alternatively, a “method that provides services and transactions to passengers within an aircraft”) (Claim 15, preamble). *See also*, Spec. ¶¶ 1, 4.

Because the claim does not recite a judicial exception (a law of nature, natural phenomenon, or subject matter within the enumerated groupings of abstract ideas above), in accordance with the Revised Guidance, we conclude the claim is patent-eligible at *Step 2A(i)*. This determination concludes the eligibility analysis. Thus, we do not affirm the Examiner’s rejection of claims 1–20 under 35 U.S.C. § 101.

2. § 103 Rejection R2 of Claims 1, 2, 4–8, 15, 16, and 18–20

Issue

Appellant argues (Appeal Br. 31–47; Reply Br. 13–17) the Examiner’s rejection of claim 1 under 35 U.S.C. § 103 as being obvious over the combination of Adams and Panegro is in error. These contentions present us with the following issue:

Did the Examiner err in finding the cited prior art combination teaches or suggests “[a] semi-automated, distributed service-and-transaction system (‘STS’)” that includes, *inter alia*, the limitations:

(a) processor-controlled passenger devices that each provide an execution environment for a client application or web browser;

(b) an on-board hub-and-server component installed within a transportation vehicle that interconnects the processor-controlled passenger devices and processor-controlled transportation-personnel devices with one another and with STS applications and services executing on the on-board hub-and-server component that are, in turn, interconnected with a remote STS backend application; and

(c) a remote cloud-computing facility that provides a distributed execution environment for the STS backend application,

as recited in claim 1?

Principles of Law

Exemplary rationales that may support a conclusion of obviousness are provided by the holding in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) and include:

(A) combining prior art elements according to known methods to yield predictable results;

(B) simple substitution of one known element for another to obtain predictable results;

(C) use of known technique to improve similar devices (methods, or products) in the same way;

(D) applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;

(E) “obvious to try” — choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

(F) known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and,

(G) some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

In *KSR*, the Court stated “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 550 U.S. at 416.

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. . . . [A] court must ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

Id. at 417; *see also* MPEP § 2141(III).

In addition, the relevant inquiry is whether the Examiner has set forth “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (cited with approval in *KSR*, 550 U.S. at 418).

Further, “one cannot show non-obviousness by attacking references individually where . . . the rejections are based on combinations of references.” *In re Keller*, 642 F.2d 413, 426 (CCPA 1981). “The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference Rather, the test is what the combined teachings of those references would have suggested to those of ordinary skill in the art.” *Id.* at 425.

During prosecution, claims must be given their broadest reasonable interpretation when reading claim language in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). Under this standard, we interpret claim terms using “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

Analysis

Preamble

Appellant first argues “[t]he Examiner has not indicated how the Examiner interprets the phrase ‘semi-automated, distributed service-and-transaction system (STS).’” Appeal Br. 33. Appellant further argues “this phrase constitutes the initial portion of the preamble of claim 1 prior to the final term in the preamble ‘comprising.’ This means that the phrase ‘semiautomated, distributed service-and-transaction system (STS)’ includes

what is claimed in the body of claim 1, namely all four elements of claim 1.”
Appeal Br. 33–34.

We are not persuaded by Appellant’s argument regarding the preamble of claim 1. We are not persuaded because, as our reviewing court has held, “the preamble does not limit the claims.” *Allen Eng’g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002). Nonetheless, the preamble may be construed as limiting “if it recites essential structure or steps, or if it is ‘necessary to give life, meaning, and vitality’ to the claim.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (quoting *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)).

However, a preamble is not regarded as limiting “when the claim body describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention.” *Catalina*, 289 F.3d at 809. Furthermore, the preamble has no separate limiting effect if, for example, “the preamble merely gives a descriptive name to the set of limitations in the body of the claim that completely set forth the invention.” *IMS Tech., Inc. v. Haas Automation, Inc.*, 206 F.3d 1422, 1434-35 (Fed. Cir. 2000). *See also Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1359 (Fed. Cir. 2010).

*Limitation (a): processor-controlled passenger devices
that each provide an execution environment for
a client application or web browser. . .*

In the Final Office Action (11), the Examiner finds Adams teaches limitation (a) in Figure 1, i.e., Personal Device 114 interfaced with

Entertainment Platform 102 via Network 120; and Figures 8 and 9 reflect applications deployed on Personal Device 114 (e.g., a cell phone).

Appellant argues, “[t]here is nothing in Figure 1 of Adams labeled ‘processor-controlled passenger devices.’ There is no indication of passengers in Figure 1 of Adams. What in Figure 1 of Adams constitutes ‘processor-controlled transportation-personnel devices?’ No personnel are shown in Figure 1 of Adams and there is nothing in Figure 1 of Adams labeled ‘processor -controlled transportation-personnel devices.’” Appeal Br. 34.

The Examiner responds by pointing out “Adams discloses the claim limitation of a ‘processor-controlled passenger device that provide an execution environment for a client application’ as noted in Para. 31, personal device 114 considered a smart phone, tablet, etc.; See also [¶]40, describing the process in which 114 works.” Ans. 5.¹⁵

Paragraph 30 of Adams discloses:

[0030] Referring now to the figures, FIG. 1 is a schematic diagram of a system 100 for onboard entertainment. The system 100 may be applied in any means for transportation, including for example, an aircraft, a train, a bus, a boat or ship, and so forth. The system 100 includes an entertainment platform 102 in communication with an onboard interface server 110 and a network 120. The network 120 is in communication with the onboard interface server 110 and an entertainment server 122. Onboard access to the network 120 may be provided during transit by way of a network connection 118 that may be connected with the onboard interface server and/or individual

¹⁵ We note the Examiner omitted pagination in the Answer. We provide our own page numbering for ease of reference, starting with page 1 having the caption “**(1) Grounds of Rejection to be Reviewed on Appeal.**”

devices such as a transport entertainment device 116 and/or a personal device 114.

Adams ¶ 30.

As cited by the Examiner, Adams discloses, “entertainment platform 102 can be accessed by way of a transport entertainment device 116 that may be integrated or permanently fixed in a transport vessel,” and platform 102 “may further be accessed by way of a personal device 114 such as a smart phone, a tablet, a laptop, a personal computer, and so forth.” Adams ¶ 31. Adams further discloses:

[0034] In an embodiment, the rewards component 106 determines a “leaderboard” style reward based on competition between users of the system 100. In an embodiment, the leaderboard reward system enables managers to oversee crewmembers’ participation along with passengers’ participation. In an embodiment, *users accessing the system 100 includes passengers, crewmembers, managers, and account administrators.*

Adams ¶ 34 (emphasis added, illustrating that the disclosed system of Adams teaches “processor-controlled transportation-personnel devices.”).

Appellant also argues that Adams does not teach or suggest a service-and-transaction system (STS) because “neither the term ‘transact’ nor the term ‘transactions’ appears anywhere in Adams. Appellants’ representative can find no description or mention of any type of transaction carried out through any type of service-and-transaction system anywhere in Adams.”

Appeal Br. 34.

We disagree because, under the broadest reasonable interpretation, an STS reads on Adams’ teaching in paragraph 67 of the collection of ancillary revenue from users’ purchase of items.

The interactive information platform is part of the in-flight entertainment system and is deployed by an onboard interface server 110 on each flight. Each airplane serviced by the aircraft carrier has its own onboard interface server 110 that deploys the in-flight entertainment system (i.e., the entertainment platform 102 and the interactive information platform) to transport entertainment devices 116 on seatbacks in the airplane and further to any compatible personal devices 114 brought on to the airplane by passengers. *The aircraft carrier wishes to collect ancillary revenue from businesses that are featured on the interactive information platform. The aircraft carrier receives ancillary revenue based on how long users interact with the interactive information platform, which items users select in the interactive information platform, whether users purchase any items in the interactive information platform, and so forth.*

Adams ¶ 67 (emphasis added, illustrating a “service-and-transaction” function involving payment for services); *and see* Adams ¶ 68 (“The aircraft carrier may further enable passengers to purchase goods or services through the interactive information platform, and the aircraft carrier may receive additional ancillary revenue when a passenger books a good or service through the interactive information platform”); *see also* Spec. ¶ 59 (disclosing payment functions as part of the STS).

Accordingly, we are not persuaded by Appellant’s arguments, and agree with the Examiner’s broad but reasonable interpretation, which we find is consistent with the Specification.¹⁶

¹⁶ We note Appellant makes a statement which we determine is an admission against interests, i.e., “[a]lthough the Examiner has failed to point to a teaching or suggestion of the phrase ‘processor-controlled passenger devices that each provide an execution environment for a client application or web browser,’ *there are passages in Adams that do, in fact, teach*

Limitation (b): an on-board hub-and-server component installed within a transportation vehicle that interconnects the processor-controlled passenger devices and processor-controlled transportation-personnel devices

Appellant argues, “[t]he Examiner appears to have made no attempt to interpret the phrase ‘on-board hub-and-server component,’” but “[i]nstead, the Examiner simply arbitrarily reads the phrase onto the phrase ‘onboard entertainment server’ used in Adams.” Appeal Br. 36.

The Examiner cites Adams’ teaching in paragraph 30¹⁷ of “[o]nboard access to network 120 provided during transit by network connection 118 through onboard interface server” by which processor-controlled passenger devices are interconnected with each other “and “with STS applications and services executing on the on-board hub-and-server component that are in turn, interconnected with a remote STS backend application.” Final Act. 11 (citing Adams ¶¶ 30; Fig. 4). In response to Appellant’s argument cited above, the Examiner clarifies the rejection in the Answer:

Further, the on-board hub-and-server is the onboard entertainment server from Adams, Para. 30, with onboard access to network 120 provided during transit by network connection 118 through the onboard interface server 110. Appellant notes in paragraph 4 of applicant current application, that “[t]he on-board hub-and-server component interfaces to a

processor-controlled passenger devices that each provide an execution environment for a client application. But it is not Appellants’ role or obligation to search the contents of the cited reference in order to find support for an Examiner’s claim rejections.” Appeal Br. 35 (emphasis added).

¹⁷ We note Adams does not include a paragraph 130, the paragraph cited by the Examiner, but, as pointed out by Appellant (Appeal Br. 40), we assume the Examiner intended to cite paragraph 30 of Adams.

distributed-service-and-transaction application within the cloud computing facility.” Examiner notes to Appellant that claims are read in the light [of the] specification. Appellant’s own listed and defined specification paragraphs 41–45, infer that the hub-and-server component is a communication tool, which given its broadest reasonable interpretation, is noted in Adams above and shown in Adams figure 1.

Ans. 6.¹⁸

We agree with the Examiner’s findings and legal conclusions that the claimed “on-board hub-and-server component” reads on Adams’ teaching of an onboard entertainment server because Adams’ server carries out the claimed functions performed by Appellant’s hub-and-server, i.e., interconnecting the processor-controlled passenger devices with one another and with the STS application and services.

Limitation (c): a remote cloud-computing facility that provides a distributed execution environment for the STS backend application

The Examiner cites Panegro in combination with Adams as teaching or suggesting limitation (c). Final Act. 11 (citing Panegro Fig. 1, Ground

¹⁸ We further note paragraph 40 of Adams discloses:

In the illustrated implementation. a hub-and-server component 606 is located within an overhead baggage compartment. Passenger devices. such as smart phone 608 in the lapel pocket of passenger 610, communicate with the hub-and-server component via wireless, radio-frequency communications. Similarly, flight-attendant devices, such as the smart phone 612 carried by flight attendant 614 or the tablet 616 being used by flight attendant 618, also communicate with the hub-and-server component 606 via wireless, radio-frequency communications.

Spec. ¶ 40.

Computing Device(s) 102 communicating with Aircraft Interface Computing Device(s) 116 via Network 124).

Appellant argues “[t]here is no indication anywhere in Figure 1 of Panegro that item 102 is a cloud-computing facility that provides a distributed execution environment for the STS backend application” (Appeal Br. 44), and further argues “[t]here is no occurrence of the phrase ‘execution environment’ anywhere in Panegro,” and “[t]here is no occurrence of the phrase ‘cloud-computing facility’ anywhere in Panegro.” *Id.*

In response, the “Examiner disagrees, as Panegro clearly shows a cloud-based network with element 102 that communicates with 116.”
Ans. 7.

In further support of the Examiner’s findings, we note Panegro discloses:

As shown in Fig. 1, the ground computing device 102 is connected to one or more of third party computing devices 114, remote aircraft interface computing devices 116, other remote aircraft interface computing devices 118, local storage locations 120, and transient storage locations 122 via network 124. In various embodiments, network 124 is a wired network, a wireless network, or a combination of both. Examples of network 124 include the internet, a wide area network, a local area network, or a combination thereof. *Network 124 also may be referred to herein as ground network 124, and in some examples, the network 124 includes a cloud computing network 126.*

Panegro, 6:9–16 (emphasis added, illustrating cloud-based storage).

Based upon the findings above, on this record, we are not persuaded of error in the Examiner’s reliance on the cited prior art combination to teach or suggest the disputed limitations of claim 1, nor do we find error in the

Examiner's resulting legal conclusion of obviousness. Therefore, we sustain the Examiner's obviousness rejection of independent claim 1, and grouped claims 2, 4–8, 15, 16, and 18–20, which fall therewith. *See* Claim Grouping, *supra*.

2. § 103 Rejections R3–R4 of Claims 9 and 10

In view of the lack of any substantive or separate arguments directed to obviousness Rejections R3 and R4 of claims 9 and 10 under § 103 (*see* Appeal Br. 47–48), we sustain the Examiner's rejection of these claims. Arguments not made are waived or forfeited. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2019).¹⁹ *See also In re Google Tech. Holdings LLC*, 980 F.3d 858, 862 (Fed. Cir. 2020) (explaining the distinction between the legal doctrines of waiver and forfeiture).

REPLY BRIEF

To the extent Appellant *may* advance new arguments in the Reply Brief (Reply Br. 2–17) not in response to a shift in the Examiner's position in the Answer, arguments raised in a Reply Brief that were not raised in the Appeal Brief or are not responsive to arguments raised in the Examiner's

¹⁹ With respect to claims 9 and 10, Appellant merely argues, “[a]s discussed above, a combination of Adams and Panegro teaches only the ‘processor-controlled-passenger devices’ element of claim 1.” “Notwithstanding any other provision of this paragraph, the failure of appellant to separately argue claims which appellant has grouped together shall constitute a waiver of any argument that the Board must consider the patentability of any grouped claim separately.” 37 C.F.R. § 41.37(c)(1)(iv). In addition, when Appellant does not separately argue the patentability of dependent claims, the claims stand or fall with the claims from which they depend. *In re King*, 801 F.2d 1324, 1325 (Fed. Cir. 1986).

Answer will not be considered except for good cause (*see* 37 C.F.R. § 41.41(b)(2)), which Appellant has not shown.

CONCLUSION

We AFFIRM IN PART the Examiner's rejections. More specifically:

(1) Under our Revised Guidance, governed by relevant case law, Appellant has persuasively argued that claims 1–20 are patent-eligible under 35 U.S.C. § 101, and we do not sustain the rejection.

(2) Appellant has not persuasively argued that the Examiner erred with respect to obviousness Rejections R2 through R4 of claims 1, 2, 4–10, 15, 16, and 18–20 under 35 U.S.C. § 103 over the cited prior art combinations of record, and we sustain the rejections.

DECISION SUMMARY

The following table summarizes our decision:

Claim(s) Rejected	35 U.S.C. §	Reference(s)/ Basis	Affirmed	Reversed
1–20	101	Eligibility		1–20
1, 2, 4–8, 15, 16, 18–20	103	Adams, Panegro	1, 2, 4–8, 15, 16, 18–20	
9	103	Adams, Panegro, Zises	9	
10	103	Adams, Panegro, Zises, Sankrithi	10	
Overall Outcome			1, 2, 4–10, 15, 16, 18–20	3, 11–14, 17

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TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv). *See* 37 C.F.R. § 41.50(f).

AFFIRMED IN PART