United States Court of Appeals for the Federal Circuit

IOENGINE, LLC,
Appellant

v.

INGENICO INC.,
Appellee

KATHERINE K. VIDAL, UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE,
Intervenor

2021-1227, 2021-1331, 2021-1332

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2019-00416, IPR2019-00879, IPR2019-00929.

Decided: May 3, 2024

NOAH LEIBOWITZ, Dechert LLP, New York, NY, argued for appellant. Also represented by GREGORY CHUEBON; ROBERT W. ASHBROOK, JR., DEREK J. BRADER, MICHAEL A. FISHER, Philadelphia, PA; MICHAEL JOSHI, Palo Alto, CA.

LAWRENCE M. GREEN, Sunstein LLP, Boston, MA,

argued for appellee.   Also represented by ROBERT M. ASHER, KEVIN R. MOSIER, SHARONA STERNBERG, KERRY L. TIMBERS; TIMOTHY MICHAEL MURPHY, Nutter McClennen & Fisher, LLP, Boston, MA.

MICHAEL S. FORMAN, Office of the Solicitor, United States Patent and Trademark Office, Alexandria, VA, for intervenor.   Also represented by FARHEENA YASMEEN RASHEED.

Before LOURIE, CHEN, and STOLL, *Circuit Judges*.

CHEN, *Circuit Judge*.

Appellant IOENGINE, LLC (IOENGINE) appeals a series of Final Written Decisions of the United States Patent and Trademark Office's Patent Trial and Appeal Board (Board) finding unpatentable certain claims of U.S. Patent Nos. 8,539,047 ('047 patent), 9,059,969 ('969 patent), and 9,774,703 ('703 patent) (collectively, the Challenged Patents) during *inter partes* review (IPR).   The Board determined claims 1–21, 23–25, 27, and 28 of the '047 patent, claims 1, 2, 4–8, 13–16, 19–21, 24, 25, and 27–29 of the '969 patent, and claims 55, 57–63, 67–72, 74, 77, 78, 81–87, 89, 92–98, 100, 103, 104, 106–112, 116–121, 123, and 126–129 of the '703 patent to be unpatentable.   We *reverse* the Board's unpatentability determinations as to claims 4 and 7 of the '969 patent and claims 61–62 and 110–11 of the '703 patent because the Board erred in its application of the printed matter doctrine.   We *affirm* the Board's unpatentability determinations as to all other claims.

BACKGROUND

The Challenged Patents share an ancestor, written description, and title—"Apparatus, Method and System for a Tunneling Client Access Point."   The written description discloses a tunneling client access point (TCAP) that is a "highly secure, portable, power efficient storage and data

processing device" (i.e., a "portable device" as recited in the claims). '047 patent Abstract.[1] The TCAP, upon plugging in to an access terminal (e.g., any existing desktop or laptop computer) may make use of the terminal's traditional user interface and input/output peripherals, while the TCAP itself provides storage, execution, and/or processing resources. '047 patent col. 2 ll. 39–46. The TCAP thereby "tunnels" data through the access terminal by allowing data to be provided through the access terminal's input/output facilities for the user to observe without the data actually residing on the access terminal. '047 patent col. 4 ll. 26–28. The TCAP may also tunnel data through an access terminal across a communications network to access remote servers without requiring its own more complicated set of peripherals and input/output facilities. *Id.* col. 4 ll. 28–31.

The Challenged Patents claim a "portable device" (the TCAP) configured to communicate with a terminal. The claims recite a memory, on either the portable device or terminal, that stores first program code which, when executed, presents an interactive user interface. Also stored in memory are second, third, and fourth program code that are configured in various ways to facilitate communications, including with a communications network node.

Claim 1 of the '969 patent is illustrative, and recites:

1. A portable device configured to communicate with a terminal comprising a processor, an input component, an output component, a network communication interface, and a memory configured to store executable program code, including first program code which, when executed by the terminal

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[1]   Given the overlap between the specifications of the Challenged Patents, we cite only to the '047 patent for simplicity.

processor, is configured to present an *interactive user interface* on the terminal output component, and second program code which, when executed by the terminal processor, is configured to provide a communications node on the terminal to facilitate communications to the portable device and to a communications network node through the terminal network communication interface, the portable device comprising:

(a) an external communication interface configured to enable the transmission of communications between the portable device and the terminal;

(b) a processor; and

(c) a memory having executable program code stored thereon, including:

   (1) third program code which, when executed by the portable device processor, is configured to provide a communications node on the portable device to coordinate with the communications node on the terminal and establish a communications link between the portable device and the terminal, and facilitate communications to the terminal and to a communications network node through the terminal network communication interface; and

   (2) fourth program code which is configured to be executed by the portable device processor in response to a communication received by the portable device resulting from user interaction with the interactive user interface; wherein the portable device is configured to facilitate communications through the communication node on the terminal and the terminal network interface to a communications network node.

'969 patent at claim 1 (emphasis added).

Appellee Ingenico Inc. (Ingenico) filed three petitions for IPR of the Challenged Patents. The Board issued Final Written Decisions finding certain claims of the Challenged Patents unpatentable. IOENGINE appeals, arguing that the Board incorrectly construed the claim term "interactive user interface," incorrectly applied the printed matter doctrine, and otherwise erred in its anticipation and obviousness analysis. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

I

IOENGINE contends that the Board erroneously construed the claim term "interactive user interface" to mean "a display containing interface elements with which a user may interact to result in a computer taking action responsively." In each of its Patent Owner Responses, IOENGINE requested that the Board construe "interactive user interface" to mean "a display containing interface elements with which a user may interact to result in the terminal taking action responsively by responding to the user." On appeal, however, IOENGINE proposes a new claim construction that it never proffered to the Board: "a presentation containing interface elements with which a user may interact to result in the device executing code to present / affect the presentation taking action responsively by modifying what is presented." In contrast to its position during the IPRs, IOENGINE argues on appeal that the claims encompass *either* the terminal *or* the portable device taking responsive action. *Compare* J.A. 581–82 ("[T]he *Petition* actually agrees with Patent Owner that it is the *terminal* that must take action in response to the user interaction . . . ."), *with* Appellant's Br. at 23 ("[I]f the *terminal* processor executes code to present the IUI, an 'interactive' user interface means that the *terminal* responds to the user; if the *portable device* processor executes code to present the IUI, an 'interactive' user interface means that

the *portable device* responds to the user."). Furthermore, IOENGINE's new construction requires the responsive action to be "modifying what is presented," rather than "responding to the user," as IOENGINE proposed in its Patent Owner Response during IPR.[2]

IOENGINE forfeited its proposed claim construction by not presenting it to the Board during IPR. *See Monsanto Tech. LLC v. E.I. DuPont de Nemours & Co.*, 878 F.3d 1336, 1342 n.8 (Fed. Cir. 2018) (concluding patent owner waived new claim construction argument where the construction was not proffered to the Board in *inter partes* reexamination proceedings). While we retain case-by-case discretion over whether to apply waiver,[3] we have held that a party waives an argument that it failed to present to the Board because it deprives the court of the benefit of the Board's informed judgment. *In re Nuvasive, Inc.*, 842 F.3d 1376,

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[2]   IOENGINE's proposed construction in its Patent Owner's Preliminary Response included "the terminal taking action responsively by modifying what is presented." However, following the Board's institution decision, IOENGINE's Patent Owner Response switched its construction to require "the terminal taking action responsively by responding to the user." IOENGINE's choice before the Board to drop its argument for "modifying what is presented" and pivot to "responding to the user" seems to be a clear abandonment of "modifying what is presented."

[3]   "By and large, in reviewing this court's precedent, it is evident that the court mainly uses the term 'waiver' when applying the doctrine of 'forfeiture.'" *In re Google Tech. Holdings LLC*, 980 F.3d 858, 862 (Fed. Cir. 2020). "Though previous cases may have used the term 'waiver' instead of 'forfeiture,' their holdings are good law for a case, like this one, involving the issue of forfeiture." *Id.* at 862 n.8.

1380 (Fed. Cir. 2016) (citing *Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1251 (Fed. Cir. 2005); *In re Watts*, 354 F.3d 1362, 1367–68 (Fed. Cir. 2004)).

IOENGINE argues that it did not forfeit its proposed construction because, in IOENGINE's view, its constructions before the Board and this Court embody the same concepts. Appellant's Reply Br. at 9–10 (citing *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288 (Fed. Cir. 2004)). We disagree. Requiring a terminal to take responsive action differs meaningfully from requiring either the terminal or the portable device to take responsive action. Requiring the responsive action to respond to the user also differs meaningfully from requiring the responsive action to modify what is presented. We accordingly find that IOENGINE forfeited its proposed claim construction.

II

We next address IOENGINE's challenges to the Board's anticipation determinations. "[A]nticipation is a question of fact subject to substantial evidence review." *Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, 1068 (Fed. Cir. 2017). "Substantial evidence is 'such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.'" *In re Applied Materials, Inc.*, 692 F.3d 1289, 1294 (Fed. Cir. 2012) (quoting *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938)).

IOENGINE contends that the Board erred in concluding that U.S. Patent Application Pub. No. 2003/0020813A1 (Iida) anticipates certain challenged claims of the '969 and '703 patents. According to IOENGINE, Iida fails to disclose an interactive user interface even under the Board's construction, on the grounds that the "menus" of Iida are static images that provide no interactivity because they lack "clickable elements, checkboxes, or pointer events," "positional feedback," or any "other way to engage." Appellant's Br. 30. IOENGINE also argues that Iida's disclosure

of pressing a number on a separate keypad involves no in-
teraction with interface elements.

The Board considered these arguments and found them
unpersuasive. Relying on testimony by the petitioner's ex-
pert Mr. James Geier, the Board reasonably found that
Iida's menu screens, which display choices that a user can
select, disclose interactive interface elements, and that Iida
also discloses taking action in response to user selections.
J.A. 144–45. As to IOENGINE's argument that Iida's in-
teraction with a separate keypad does not disclose interac-
tion with interface elements, the Board "decline[d] to
import a limitation requiring that user interaction be
based on location and/or movement of a user's point of in-
teraction." J.A. 145. We see no reason to disturb these
findings by the Board.

IOENGINE also argues that Iida fails to disclose "sec-
ond program code" providing a "communications node" on
the terminal and "third program code" providing a "com-
munications node" on the portable device, as required by
certain claims of the Challenged Patents. According to
IOENGINE, the Board erred by relying on Mr. Geier's tes-
timony to infer a missing claim element not disclosed in
Iida. But the Board's findings relied on Mr. Geier's testi-
mony that (1) Iida's control unit (the disclosed terminal)
acts as a communications node by executing code to per-
form configurations to enable the terminal to communicate
over a network, and (2) Iida's camera (the disclosed porta-
ble device) establishes its own communications node to co-
ordinate network communications. J.A. 138–39, 140–41;
J.A. 233–34, 238–39. The Board also relied on disclosures
in the Challenged Patents' own written description that
the terminal or portable device may itself act as a commu-
nications node. Substantial evidence thus supported the
Board's finding that Iida discloses program code providing
a "communications node." We therefore affirm the Board's
anticipation determinations as to all claims aside from

claims 4 and 7 of the '969 patent and claims 61–62 and 110–11 of the '703 patent, which we discuss next.

III

We turn, then, to IOENGINE's argument that the Board erred in applying the printed matter doctrine to determine that Iida anticipates claims 4 and 7 of the '969 patent and claims 61–62 and 110–11 of the '703 patent. In particular, IOENGINE argues that the Board incorrectly applied the printed matter doctrine to accord no patentable weight to certain claim limitations that recite "encrypted communications" and "program code."

"This court and its predecessor have long recognized that certain 'printed matter' falls outside the scope of patentable subject matter under U.S. patent law." *C R Bard Inc. v. AngioDynamics, Inc.*, 979 F.3d 1372, 1381 (Fed. Cir. 2020) (citing *AstraZeneca LP v. Apotex, Inc.*, 633 F.3d 1042, 1064 (Fed. Cir. 2010); *In re Chatfield*, 545 F.2d 152, 157 (CCPA 1976)). Although "printed matter" historically referred to claim elements involving actual "printed" material, today the doctrine has expanded to include any information claimed for its communicative content, regardless of medium. *Id.*

We apply a two-step test to determine whether a limitation should be accorded patentable weight under the printed matter doctrine. First, we determine whether the limitation in question is directed toward printed matter. *In re Distefano*, 808 F.3d 845, 848 (Fed. Cir. 2015). A "limitation is printed matter only if it claims the content of information." *Id.* Put another way, printed matter is "matter claimed for what it communicates." *Id.* at 850. "Only if the limitation in question is determined to be printed matter" do we proceed to the second step, which asks "whether the printed matter nevertheless should be given patentable

weight."[4] *Id.* "Printed matter is given such weight if the claimed informational content has a functional or structural relation to the substrate." *Id.*

Claims 4 and 7 of the '969 patent, to which the Board applied the printed matter doctrine, both depend on claim 2, which requires the "fourth program code [] when executed by the portable device processor, [to be] configured to cause a communication to be transmitted to the communication network node." Claim 4 of the '969 patent recites "wherein the communication caused to be transmitted to the communication network node facilitates the transmission of *encrypted communications* from the communication network node to the terminal." In other words, claim 4 contemplates the portable device sending a communication to the communication network node, which in turn facilitates sending encrypted communications to the terminal. The Board determined that the term "'encrypted communications' claims only communicative content, i.e. printed matter" because it found "nothing in the claim that requires anything beyond sending and receiving data, even if the data is in an encrypted form." J.A. 151. The Board further found that there was "no functional relationship of the encrypted data to the communication carrying it" because nothing in the claims required "the data being used or manipulated" or "any processing of encrypted data beyond the transmission of the same." *Id.* The Board thus concluded that the limitation should be afforded no patentable weight.

We disagree with the Board that the claimed "encrypted communications" constitute printed matter. As discussed above, printed matter is matter that is claimed for its communicative content—i.e., the *content specifically*

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[4] Giving a limitation "patentable weight" means it may be used as a basis for distinguishing prior art. *Distefano*, 808 F.3d at 848.

being communicated. The fact that there is a communication itself is not content; content is what the communication actually says. Nor is the form of a communication, such as whether the communication is encrypted, considered to be content. Printed matter encompasses *what* is communicated—the content or information being communicated—rather than the act of a communication itself.

We have previously found that an FDA label providing dosage instructions for using a medical product is printed matter, that a label instructing a patient to take a drug with food is printed matter, that instructions on how to perform a DNA test are printed matter, and that numbers printed on a wristband are printed matter. *Distefano*, 808 F.3d at 849–50 (collecting cases). Unlike those examples, which claim communicative content such as medical instructions or numbers, the encrypted communications here are not being claimed for any content that they are communicating. We therefore find that the claimed "encrypted communications" do not constitute printed matter.

The Board also declined to afford patentable weight to the "program code" limitation recited in claim 7 of the '969 patent and claims 61–62 and 110–11 of the '703 patent. The relevant limitation in claim 7 of the '969 patent recites "the communication caused to be transmitted to the communication network node facilitates the download of *program code* on the communication network node to the terminal." That is, in claim 7, the communication to the communication network node facilitates the download of program code to the terminal, rather than the transmission of encrypted communications, as described above in claim 4. Similarly, claims 61–62 and 110–11 of the '703 patent recite "caus[ing] a communication to be transmitted to the communications network node to facilitate the download of *program code* from the communications network node to the" terminal or portable device. As to claim 7 of the '969 patent, the Board determined that "'program code' in claim 7 is not entitled to patentable weight" because the "recital

of 'downloading' of program code in claim 7 is limited to downloading (sending or transmitting) the code, which is a communication, and no other function is recited in the claim." J.A. 155. As to claims 61–62 and 110–11 of the '703 patent, the Board determined that "program code" "is 'printed matter' because it claims the content of the information that is downloaded," J.A. 253, and that it is not entitled to patentable weight because "the downloaded code is merely generic and has no functional relationship with either the portable device or the terminal," J.A. 255.

Here, too, we disagree with the Board. The "program code" is not claimed for its communicative content; no informational content is claimed. *See Distefano*, 808 F.3d at 851 ("Although the selected web assets can and likely do communicate some information, the content of the information is not claimed."). Indeed, the claim is altogether silent as to the contents of the claimed "program code." That the code is being downloaded does not change the analysis. Because there is no particular content being claimed, the program code is not printed matter. To conclude otherwise would impermissibly expand the printed matter doctrine far beyond its current scope.

Because "encrypted communications" and "program code" are not being claimed here for the content they communicate, they are not printed matter. The inquiry stops there; if the claim element is not printed matter, we need not consider whether it has a functional or structural relation to its substrate.

Finally, no remand is needed because Ingenico conceded at oral argument that it did not submit alternative grounds for invalidity, other than the printed matter doctrine, with respect to the "encrypted communications" and "program code" limitations. Oral Arg. at 20:47–21:31 (available at https://oralarguments.cafc.uscourts.gov/default.aspx?fl=21-1227_12072023.mp3). Accordingly, we reverse the Board's anticipation determinations as to claims

4 and 7 of the '969 patent and claims 61–62 and 110–11 of the '703 patent.

IV

We next address IOENGINE's challenges to the Board's obviousness determinations. This court reviews the Board's ultimate obviousness determinations de novo and its underlying factual findings for substantial evidence. *Novartis AG v. Torrent Pharms. Ltd.*, 853 F.3d 1316, 1327 (Fed. Cir. 2017). "Motivation to combine is one of those underlying factual issues." *Id.* (citing *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000)). "What a reference teaches and the differences between the claimed invention and the prior art" are also questions of fact. *In re Cuozzo Speed Technologies, LLC*, 793 F.3d 1268, 1280 (Fed. Cir. 2015).

According to IOENGINE, a skilled artisan would not have been motivated to combine Iida with U.S. Patent Application Pub. No. 2002/0065872 (Genske) because "Genske's computer-based GUI contradicts Iida's core reliance on the camera to provide static images to ensure compatibility with even the lowest-common-denominator phone." Appellant's Br. 44. IOENGINE also argues that the combination was based on hindsight, given certain gaps in Iida and Genske's disclosures. *Id.* at 45. IOENGINE further argues that the Board improperly mixed and matched embodiments disclosed in those references to arrive at the claimed invention. *Id.* at 47.

We find each of these arguments to be unpersuasive. The Board relied on the petitioner's expert testimony, as well as the disclosures in Iida and Genske themselves, to conclude that a skilled artisan would have been motivated to combine Iida and Genske. J.A. 41–48. Substantial evidence supported the Board's finding. The Board also addressed IOENGINE's argument as to the purported gaps in Iida and Genske's disclosures by noting that "'[t]he question in an obviousness inquiry is whether it would have

been obvious to a person of ordinary skill in the art to combine the relevant disclosures of the two references, not whether each individual reference discloses all of the necessary elements.'" J.A. 40 (quoting *Game & Tech. Co., Ltd. v. Wargaming Grp. Ltd.*, 942 F.3d 1343, 1352 (Fed. Cir. 2019)). We find that the Board appropriately combined relevant disclosures of the two references in its obviousness analysis, and that there was no impermissible "mixing and matching," as IOENGINE contends.

IOENGINE further argues that the Board erred in determining that Iida discloses certain claim limitations in the '047 patent. First, IOENGINE contends that the Board erred in finding that Iida teaches the "second program code" which, when executed, "enables the portable device to . . . cause a communication to be sent," as recited in claims 1, 24, and 27 of the '047 patent. Appellant's Br. 54 (emphasis omitted). IOENGINE argues that claims 1 and 24 expressly require the second program code to be stored in the memory of the portable device, but that Iida discloses the code being stored on the terminal. Appellant's Br. 54–55. The Board disagreed, finding that the petitioner sufficiently showed that "program code stored on Iida's camera (portable device) performs the functions required in claim 1 for 'second program code.'" J.A. 50–51 (citing Iida, J.A. 1229, at ¶¶ 54, 65; FIG. 4C). Moreover, the Board noted that "[n]othing in the claim language requires that all communication-related program code reside[] on the portable device, as opposed to the terminal." J.A. 51. We find the Board's analysis reasonable, and thus supported by substantial evidence.

Second, IOENGINE contends that the Board erred in finding that Iida discloses the limitation reciting that "executing the first program code . . . causes the terminal processor to present an interactive user interface on the first output component" in claim 25 of the '047 patent. The Board considered and reasonably rejected this argument, noting that IOENGINE's position is "premised on an

implicit claim construction" that "present an interactive user interface" refers to controlling and generating the content of the interface. J.A. 68. The Board relied on "the '047 patent's other uses of the word 'present'" to conclude that "'present' simply refers to showing or displaying," with no requirement that the presentation be generated by a certain device. J.A. 69. From this, as well as Iida's disclosures, the Board concluded that Iida discloses the disputed limitation of claim 25. We see no error in the Board's understanding of the claim term "present," and thus find that substantial evidence supported the Board's conclusion.

Finally, IOENGINE argues that the Board erred in its determination that claims 74, 89, 100, and 123 of the '703 patent, which include the limitation "wherein the data stored on the portable device memory comprises a digital certificate," are rendered obvious by Iida in combination with U.S. Patent No. 6,088,805 (Davis). IOENGINE alleges that it would not have been obvious to substitute Iida's username and password for Davis's certificates because the certificate in Davis is associated with a client device, not a user. Appellant's Br. 63. But the disclosure in Davis that the Board relied on expressly discusses individual user HTTP-layer authentication that may be accomplished via digital certificates. J.A. 274 (citing J.A. 14837 col. 1 ll. 38–45). We find no error in the Board's determination that it would have been obvious to a skilled artisan to combine Iida and Davis to arrive at the claimed "digital certificate."

Based on the foregoing, we affirm the Board's determinations as to all claims found to be obvious.

CONCLUSION

We find none of IOENGINE's remaining arguments persuasive. For the foregoing reasons, we reverse the Board's determinations of unpatentability as to claims 4 and 7 of the '969 patent and claims 61–62 and 110–11 of

the '703 patent. We affirm the Board's determinations of
unpatentability as to all other claims.

REVERSED-IN-PART, AFFIRMED-IN-PART

COSTS

No costs.