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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JIANGHUI WU

Appeal 2018-007747
Application 13/973,090
Technology Center 2800

Before CATHERINE Q. TIMM, MERRELL C. CASHION, JR., and JANE E. INGLESE, *Administrative Patent Judges*.

INGLESE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant[1] requests our review under 35 U.S.C. § 134(a) of the Examiner's decision to finally reject claims 1–21.[2] We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] Appellant is the Applicant, Baker Hughes Incorporated. According to the Appeal Brief, Baker Hughes, LLC is the real party in interest. Appeal Brief filed November 13, 2017 ("App. Br."), 1.

[2] Final Office Action entered May 12, 2017 ("Final Act.").

STATEMENT OF THE CASE

Appellant claims a method and apparatus for estimating a parameter of interest of an earth formation intersected by a borehole (independent claims 1, 14, and 18), and a non-transitory computer-readable medium product having instructions thereon that, when executed, cause at least one processor to perform a method (independent claim 19). Claim 1 illustrates the subject matter on appeal and is reproduced below with contested language italicized:

> 1. A method for estimating a parameter of interest of an earth formation intersected by a borehole, the method comprising:
>
> conducting a flow rate analysis on fluid sampled from the formation via a probe contacting a wall of the borehole,
>
> the flow rate analysis comprising using a processor to *adjust a pressure measurement using a correction factor*,
>
> wherein *the correction factor compensates for total compressibility*.

App. Br. 15 (Claims Appendix) (emphasis added and spacing altered relative to original).

The Examiner maintains the following rejections in the Examiner's Answer entered May 24, 2018 ("Ans."):

I. Claims 1–20 under 35 U.S.C. § 101 as directed to subject matter judicially excepted from patenting without significantly more;

II. Claims 1–18 and 21 under 35 U.S.C. § 103 as unpatentable over Pop et al. (US 2004/0045706 Al, published March 11, 2004); and

III. Claims 19 and 20 under 35 U.S.C. § 103 as unpatentable over Pop in view of Gutierrez Ruiz et al. (US 9,243,476 B2, issued January 26, 2016).

DISCUSSION

Upon consideration of the evidence relied upon in this appeal and each of Appellant's contentions, we affirm the Examiner's rejection of claims 1–20 under 35 U.S.C. § 101, and rejections of claims 1–21 under 35 U.S.C. § 103, for the reasons set forth in the Final Action, the Answer, and below.

We review appealed rejections for reversible error based on the arguments and evidence the Appellant provides for each ground of rejection the Appellant contests. 37 C.F.R. § 41.37(c)(1)(iv); *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (Explaining that even if the Examiner had failed to make a prima facie case, "it has long been the Board's practice to require an applicant to identify the alleged error in the examiner's rejections.")).

Rejection I

We turn first to the Examiner's rejection of claims 1–20 under 35 U.S.C. § 101 as directed to subject matter judicially excepted from patenting without significantly more. Final Act. 7. To address this rejection, Appellant does not present arguments directed to the separate patentability of any particular claim. App. Br. 5–9. We therefore select claim 1 as representative, and decide the appeal as to this rejection of claims 1–20 based on claim 1 alone. 37 C.F.R. § 41.37(c)(1)(iv)(2016).

35 U.S.C. § 101 states that "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof may obtain a patent therefor, subject to the conditions and requirements of this title." This section of the statute,

however, must be read within the confines of the U.S. Constitution, which states that Congress's power is limited to laws that "promote the Progress of . . . useful Arts." U.S. Const. art. I, § 8, cl. 8. According to the Supreme Court, "[p]henomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work." *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70–72 (2012) (quoting *Diamond v. Diehr,* 450 U.S. 175, 185 (1981) (quoting *Gottschalk v. Benson,* 409 U.S. 63, 67 (1972)). "And monopolization of those tools through the grant of a patent might tend to impede innovation more than it would tend to promote it." *Id.*

As stated in *Alice*:

> Accordingly, in applying the § 101 exception, we must distinguish between patents that claim the building blocks of human ingenuity and those that integrate the building blocks into something more, thereby transforming them into a patent-eligible invention. The former would risk disproportionately tying up the use of the underlying ideas and are therefore ineligible for patent protection. The latter pose no comparable risk of pre-emption, and therefore remain eligible for the monopoly granted under our patent laws.

Alice, 573 U.S. at 217 (internal quotations and citations to *Mayo* omitted). In *Alice*, the Court extended a framework that had been used in *Mayo* for distinguishing claims pre-empting laws of nature, natural phenomena, and abstract ideas from claims amounting to patent-eligible applications of those concepts. As stated in *Alice*:

> First, we determine whether the claims at issue are directed to one of those patent-ineligible concepts. If so, we then ask, what else is there in the claims before us? To answer that question, we consider the elements of each claim both individually and as

> an ordered combination to determine whether the additional elements transform the nature of the claim into a patent-eligible application. We have described step two of this analysis as a search for an "inventive concept"—i.e., an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself.

Alice, 573 U.S. at 217–18 (internal quotations and citations omitted).

In 2014, the Office provided Interim Guidance on Patent Subject Matter Eligibility (79 Fed. Reg. 74618 (Dec. 15, 2014)), which added a first step of determining whether the claim is directed to one of the statutory classes of invention (process, machine, manufacture or composition of matter) enunciated in § 101.

In rejecting claim 1 under 35 U.S.C. § 101, the Examiner used the three-step framework of the 2014 Interim Guidance. Final Act. 7–8. For the first step, the Examiner determines that the method of independent claim 1 belongs to the statutory class of a process. Final Act. 8.

For the second step, the Examiner determines that the recitation in claim 1 of "conducting a flow rate analysis . . . wherein the correction factor compensates for total compressibility" describes "mathematical algorithms, mathematical relationships, mathematical formulas, and calculations without significantly more beyond the abstract idea of mathematically compensating for errors in total compressibility." Final Act. 8.

For the third step, the Examiner determines that claim 1 "analyzed as a whole" does not recite elements that are "significantly more" than the abstract idea itself. *Id.* Specifically, the Examiner determines that the preamble of claim 1 "describes only a technological environment," the recitation in claim 1 of "fluid sampled from the formation via a probe

contacting a wall of the borehole" describes insignificant pre-solution data gathering using conventional equipment, and the recitation in claim 1 of "the flow rate analysis comprising using a processor to adjust a pressure measurement using a correction factor" describes a generic processor used as a tool to perform the abstract mathematical algorithm. *Id.* (emphasis omitted).

Appellant argues that "the present claims entail an unconventional technological solution to a technological problem, even though employing arguably conventional components." App. Br. 7 (citing *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1300–01 (Fed. Cir. 2016)). Appellant argues that "[a]spects of the present disclosure" improve the accuracy of pressure measurements taken by a tool that samples fluids from a formation using a probe member in a borehole, by accounting for the effects of total system compressibility on the pressure measurements. App. Br. 6, 8 (citing Spec. ¶¶ 16–20, 35–40). Appellant argues that "[t]otal compressibility as used in the specification refers to compressibility of the fluid system modeled by taking into account compressibilities and saturations of predominant fluids in the tool-formation system along with the *compressibility of the rock matrix* corresponding to the portion of the formation containing such fluids and interacting with the sampling tool." App. Br. 8–9 (citing Spec. ¶ 19) (emphasis added).

Appellant's arguments are unpersuasive of reversible error in the Examiner's rejection, however, for reasons discussed below.

The PTO recently published revised guidance on the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed.

Reg. 50 (Jan. 7, 2019) ("2019 Guidance"). Under the 2019 Guidance, 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 practice, or mental processes); and
>
> (2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)).

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

> (3) adds a specific limitation beyond the judicial exception that is not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); 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.

2019 Guidance 54–57.

Under step 1 of the 2019 Guidance we determine that claim 1 recites mathematical concepts. The method estimates a parameter, i.e., a mathematical variable that represents a characteristic such as the permeability of a rock formation or the mobility of the fluid in the rock formation, based on pressure measurements. Spec. ¶¶ 2–3. The method uses a correction factor, i.e., a parameter obtained using a mathematical function, to adjust a pressure measurement. See claim 1, which recites, as its sole step, "conducting a flow rate analysis . . . comprising . . . adjust[ing] a

pressure measurement using a correction factor, wherein the correction factor compensates for total compressibility."

Review of Appellant's Specification confirms our determination that claim 1 recites a judicial exception based on mathematical concepts. The Specification describes calculating an adjustment pressure (p_a) (correction factor) that may be used to correct (or adjust) measured time-dependent pressure ($p(t)$) (a pressure measurement) by first applying equation (1) (below) to calculate dimensionless adjustment pressure ($p_{a,d}$) using, among other parameters, total compressibility (c_t):

$$p_{a,d} = \frac{1}{\sqrt{1-4c_d}}\left(e^{\beta_1^2 t_d}\cdot erfc\left(\beta_1\sqrt{t_d}\right) - e^{\beta_2^2 t_d}\cdot erfc\left(\beta_2\sqrt{t_d}\right)\right) \quad (1)$$

where

$$c_d = \frac{V_s c_s}{4\pi r_s^3 \phi c_t}$$

Spec. ¶¶ 34, 35. The Specification explains that adjustment pressure (p_a) (correction factor) can be calculated from the dimensionless adjustment pressure ($p_{a,d}$) determined from equation (1) using equation (2), and can be expressed as a function of time:

$$p_a = p_{a,d}\cdot\frac{q\mu}{G_o r_p k} \quad (2)$$

Spec. ¶ 36. The Specification explains that the adjustment pressure (p_a) (correction factor) so calculated may then be subtracted from measured time-dependent pressure ($p(t)$), to determine the adjusted pressure. Spec. ¶ 37.

The Specification thus describes adjusting a pressure measurement

using a correction factor that compensates for total compressibility by first calculating a correction factor (adjustment pressure) using a mathematical equation that takes into account total compressibility, and then adjusting a pressure measurement by subtracting the correction factor (adjustment pressure) from the measured pressure. Accordingly, consistent with this description in the Specification, the limitation in claim 1 of "conducting a flow rate analysis . . . comprising . . . adjust[ing] a pressure measurement using a correction factor, wherein the correction factor compensates for total compressibility" recites mathematical calculations, concepts, or relationships, which are the basic tools of scientific and technological work. And, in fact, claim 1 is not limited to the correction factor disclosed in the Specification, but seeks to pre-empt the use of any correction factor that compensates for total compressibility.

We next determine whether claim 1 as a whole integrates the recited mathematical concepts into a practical application. 2019 Guidance, 84 Fed. Reg. 54–55. In so doing, we look to whether an additional element or combination of elements recited in the claim—beyond the mathematical concepts—integrates the mathematical concepts into a practical application. *Id.*

The preamble of claim 1 ("[a] method for estimating a parameter of interest of an earth formation intersected by a borehole") merely links the mathematical estimation of a mathematical parameter to a particular technological environment. *Parker v. Flook*, 437 U.S. 584, 588–90 (1978). And the Specification explains that collecting fluid as recited in claim 1 ("fluid sampled from the formation via a probe contacting a wall of the borehole") is a well-known fluid collection technique in the art. Spec. ¶ 2.

Consequently, this step of claim 1 adds only insignificant extra-solution activity to the mathematical estimation. *Bilski v. Kappos*, 561 U.S. 593, 611–12, (2010) (well-known random analysis techniques to establish the inputs of an equation were token extra-solution activity). The further recitation in claim 1 of "conducting a flow rate analysis on [the] fluid . . . comprising using a processor" merely recites instructions to implement the mathematics on a generic processor. *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (holding that merely implementing a mathematical principle on a general purpose computer is a patent ineligible abstract idea).

The elements of claim 1 in their entirety, therefore, link the recited mathematical concepts to a particular technological environment, and recite instructions to implement the mathematical concepts on a generic processor, while also reciting insignificant extra-solution activity. Claim 1 as a whole does not apply, rely on, or use the mathematical concepts in a manner that imposes a meaningful limit on the mathematical concepts and, thus, does not integrate the mathematical concepts into a practical application. 2019 Guidance, 84 Fed. Reg. 54; *Diamond v. Diehr*, 450 U.S. 175, 192 n.14 (1981) (explaining that the process in *Flook* was ineligible not because it contained a mathematical formula, but because it did not integrate the formula into the process as a whole in a way that transformed the process into an inventive application of the formula).

As discussed above, Appellant argues that the method of claim 1 provides a technological solution to a technological problem because the method improves the accuracy of pressure measurements by correcting for the effects of total system compressibility, which Appellant asserts includes the compressibility of the rock matrix. App. Br. 6, 8–9.

Appellant, however, does not direct us to any factual evidence supporting this asserted improved pressure measurement accuracy achieved by the method of claim 1, such as evidence of record comparing pressure measurements determined using Appellant's method to those determined using technology that existed at the time of filing. *Id.* Moreover, evidence that the specific correction factor disclosed in the Specification results in technological improvement would not be convincing because claim 1 is not limited to the correction factor described in the Specification.

In addition, contrary to Appellant's arguments, "total compressibility" as recited in claim 1 need not include the compressibility of the rock matrix. Specifically, the paragraph of the Specification cited by Appellant as describing "[t]otal compressibility as used in the specification" (App. Br. 8–9), states that "[t]otal compressibility may be defined as compressibility of the fluid system modeled by taking into account compressibilities and saturations of predominant fluids in the tool-formation system along with the compressibility of the rock matrix corresponding to the portion of the formation containing such fluids and interacting with the sampling tool." Spec. ¶ 19. This paragraph goes on to state that, "[f]or example, total compressibility may be defined as compressibility of the fluid system modeled as a function of rock compressibility, oil compressibility, water compressibility, oil compressibility, gas compressibility, oil saturation, water saturation, gas saturation, and so on, or combinations of the same." *Id.*

This description of "total compressibility" in paragraph 19 of the Specification indicates that "total compressibility *may* be defined" in the manner described in the paragraph, and further provides an *exemplary* description of the phrase. Use of the permissive "may" and "for example"

indicates that the description in this paragraph does not constitute a limiting definition of "total compressibility," but, rather, provides an optional way to define this phrase. We accordingly examine whether the remainder of the Specification provides any disclosure that informs or limits interpretation of "total compressibility" as this phrase is used in claim 1.

Paragraph 35 of the Specification relates to "[*an*] *embodiment*[] of the present disclosure" that describes calculating an adjustment pressure that may be used as a correction factor. (Emphasis added.) In this paragraph, total compressibility is defined as the sum of rock formation compressibility, oil compressibility (times oil saturation), water compressibility (times water saturation), and gas compressibility (times water saturation), which is consistent with the description of "total compressibility" in paragraph 19. Other than repeatedly indicating that "the correction factor compensates for total compressibility" (¶¶ 7, 9, 10, 12, 15, 19, 42), and indicating that the method of the invention may include determining the product of formation porosity and total compressibility (¶¶ 7, 11, 44), we find no further description of "total compressibility" in the Specification.

Because limitations from the Specification may not be read into the claims, claim 1 does not require the recited "total compressibility" to include the compressibility of the rock matrix, although claim 1 does not exclude the compressibility of the rock matrix from being included in the "total compressibility." Accordingly, even if the method of claim 1 improves the accuracy of pressure measurements by correcting for the effects of total system compressibility, including the compressibility of the rock matrix as Appellant argues, it is unclear on the record before us how that specific improvement is reflected in claim 1 itself, which appears to be broader in

scope than the asserted improvement.

We also are not persuaded that *Amdocs* supports Appellant's assertion that "the present claims entail an unconventional technological solution to a technological problem, even though employing arguably conventional components." App. Br. 7. In *Amdocs*, the court determined that the claim at issue was tied to a specific structure of various components (network devices, gatherers, ISMs, a central event manager, a central database, a user interface server, and terminals or clients), and was narrowly drawn so as to not preempt any and all generic enhancements of data in a similar system. *Amdocs*, 841 F.3d at 1301. The court further determined that the claim at issue did not merely combine the components in a generic manner, but instead purposefully arranged the components in a distributed architecture to achieve a technological solution to a technological problem specific to computer networks. *Id.* Unlike the claim in *Amdocs*, claim 1 is not tied to a specific structure of various components, but recites only conducting a flow rate analysis on fluid sampled from a formation via a probe contacting a wall of a borehole. Furthermore, claim 1 is broadly drawn to preempt all methods of conducting a flow rate analysis on such fluid that involve using a generic processor to adjust a pressure measurement to compensate for total compressibility. Consequently, Appellant's reliance on *Amdocs* does not persuade us that the method of claim 1 integrates the recited abstract idea into a practical application.

We now look to whether claim 1 adds a specific limitation beyond the mathematical concepts that is not well-understood, routine, or conventional in the field, or simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of

generality, to the mathematical concepts. 2019 Guidance, 84 Fed. Reg. 56–57.

Although Appellant argues that the Examiner's determination that elements of claim 1 are well-understood, routine, and conventional "are [u]nsupported," Appellant's own Specification supports the Examiner's position, as discussed below. Reply Br. 1–2 (emphasis omitted).

As for the recitation in the preamble of claim 1 of "a method for estimating a parameter of interest of an earth formation intersected by a borehole," the Specification explains that "[h]istorically, flow rate analysis has been used to determine parameters of interest such as formation permeability and fluid mobility." Spec. ¶ 2. And, also relevant to the further recitation in claim 1 of "fluid sampled from the formation via a probe contacting a wall of the borehole," the Specification indicates that "[t]ools configured to extract formation fluids from the wall of a borehole are well known. Generally, such tools include a fluid entry port which may be part of a probe associated with a pad engageable to the wall of the borehole." *Id.* Appellant's Specification thus indicates that methods for estimating a parameter of interest of an earth formation intersected by a borehole, and sampling fluid from a formation via a probe contacting a wall of borehole as recited in claim 1, are well-understood, routine, and conventional activities in the field. And the recitation in claim 1 of using a processor to conduct the flow rate analysis simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the mathematical concepts.

Claim 1, therefore, does not add specific limitations beyond the mathematical concepts that are not well-understood, routine, or conventional in

the field, and simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the mathematical concepts. *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1369 (Fed. Cir. 2018).

Because claim 1 recites subject matter judicially excepted from patent eligibility, does not integrate the judicially excepted subject matter into a practical application, and simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicially excepted subject matter, we sustain the Examiner's rejection of claims 1–20 under 35 U.S.C. § 101.

Rejection II

Appellant presents arguments directed to independent claims 1, 14, 18, and 19, which Appellant argues together as a group. App. Br. 9–11. Appellant also presents separate arguments directed to each of dependent claims 10, 12, and 21. App. Br. 11–13. We accordingly select claim 1 as representative, and decide the appeal as to claims 1–9, 11, and 13–18 based on claim 1 alone, while separately addressing claims 10, 12, and 21. 37 C.F.R. § 41.37(c)(1)(iv).

Claims 1–9, 11, and 13–18

Appellant does not dispute the Examiner's finding that Pop discloses a method for estimating a parameter of interest of an earth formation intersected by a borehole that comprises conducting a flow rate analysis on fluid sampled from the formation via a probe contacting a wall of the borehole. *Compare* Final Act. 10 (citing Pop ¶¶ 3, 8, 54, 94, 125, 177; claims 38 and 39; Figs. 11A and 12), *with* App. Br. 9–11. As for the

limitation in claim 1 that the flow rate analysis comprises using a processor to adjust a pressure measurement using a correction factor that compensates for total compressibility, the Examiner finds that Pop discloses determining refined measurement parameters based at least in part on total compressibility, and applying the refined parameters as a correction factor to achieve improved estimates of formation pressure. Final Act. 10–11 (citing Pop ¶¶ 116–117); Ans. 4–5 (citing Pop ¶¶ 96–108, 115, 116–117). The Examiner finds that "Pop's use of the total compressibility itself as a correction within a parameter, in calculations which improve the estimates of the formation pressure, meets the claim limitation that 'the correction factor compensates for total compressibility,'" regardless of "whether the correction factor is taken to be the total compressibility itself, or whether the correction factor is taken to be another quantity within the calculations, which depends on the total compressibility." Ans. 5.

Appellant argues that the Examiner improperly "declines to use" the definition of "total compressibility" set forth in the Specification. App. Br. 9. Appellant argues that "total compressibility" as defined in the Specification refers to "compressibility of the fluid system modeled by taking into account compressibilities and saturations of predominant fluids in the tool-formation system *along with the compressibility of the rock matrix* corresponding to the portion of the formation containing such fluids and interacting with the sampling tool." App. Br. 10 (citing Spec. ¶ 19). Appellant argues that "Pop fails to disclose compressibility due to the rock matrix." App. Br. 10.

Appellant's arguments, however, are unpersuasive of reversible error in the Examiner's rejection, for reasons that follow.

Pop discloses a method for estimating the formation pressure and formation mobility of a subsurface formation penetrated by a wellbore that includes both an investigation phase and a measurement phase. ¶¶ 3, 8, 54. Pop discloses conducting the investigation phase to determine initial estimates of the formation pressure and formation mobility, and using the initial estimates to design a measurement phase. ¶ 60. More specifically, Pop discloses calculating the volume extracted during the measurement phase, and the phase's duration—referred to as the measurement phase "pretest parameters"—using the formation pressure and mobility determined in the investigation phase, along with certain pre-determined (or "assigned") parameters, which include "total compressibility." ¶¶ 94, 96–103. Pop discloses that total compressibility is "prescribed . . . from knowledge of the formation type and porosity through standard correlations." ¶ 96. Pop also discloses that total compressibility "may be obtained from known correlations which in turn depend on lithology and porosity." ¶ 116. Pop discloses performing the measurement phase using the calculated pretest parameters (or "refined parameters") to "achieve improved estimates of the formation pressure." ¶¶ 117, 118, 120.

As discussed above, the Specification does not provide a limiting definition of "total compressibility," but merely describes an optional way to define the phrase. Spec. ¶ 19. The fundamental problem with Appellant's arguments is that even if the relied-upon description in the Specification were taken as a limiting definition of "total compressibility," we find no evidence on this appeal record that establishes any difference between "total compressibility" so defined and "total compressibility" as disclosed in Pop. Although Appellant argues that "Pop fails to disclose compressibility due to

the rock matrix," Appellant does not identify any disclosure in Pop, or point to any other evidence, indicating that "total compressibility" as described in the reference—"prescribed . . . from knowledge of the formation type and porosity through standard correlations"—does not include or take into account compressibility due to the rock matrix. App. Br. 9–10. Appellant's conclusory assertion that "Pop fails to disclose compressibility due to the rock matrix" amounts to unsupported attorney argument, which does not constitute evidence necessary to resolve a disputed question of fact. *In re Schulze*, 346 F.2d 600, 602 (CCPA 1965) ("Argument in the brief does not take the place of evidence in the record.").

Appellant argues that Pop discloses using "total formation compressibility" for "testing time estimation." App. Br. 10 (citing Pop ¶ 96). Appellant argues that, "[a]s evidenced in *Pop*, this 'total formation compressibility' does not compensate for compressibility of the fluid system including a compressibility of a rock matrix . . . [and] is not used to adjust a pressure measurement." App. Br. 10; Reply Br. 2–4.

Appellant's arguments are again unpersuasive of reversible error. As discussed above, Pop discloses obtaining initial estimates of formation pressure and formation mobility in an investigation phase, and using these estimates—along with a pre-determined or "assigned" total compressibility value—to calculate the volume extracted during a subsequent measurement phase and the measurement phase's duration ("pretest parameters"), to obtain improved (or adjusted) estimates of the formation pressure. Contrary to Appellant's arguments, because Pop uses total compressibility to calculate the pretest parameters used in the measurement phase to obtain improved (adjusted) estimates of the formation pressure, the pretest parameters are

analogous to correction factors that take into account, or compensate for, total compressibility, as recited in claim 1. Furthermore, the pretest parameters or "correction factors" are used to obtain improved—or adjusted—estimates of the formation pressure, as also recited in claim 1.

Because we find no evidence on this appeal record that the "total compressibility" disclosed in Pop does not include compressibility due to the rock matrix (as discussed above), Appellant's argument that the total compressibility disclosed in Pop "does not compensate for compressibility of the fluid system including a compressibility of a rock matrix," constitutes unsupported attorney argument, which lacks persuasive merit.

We accordingly sustain the Examiner's rejection of claims 1–9, 11, and 13–18 under 35 U.S.C. § 103.

Claim 10

Claim 10 depends from claim 1 and recites that the correction factor is determined using both draw-down and build-up measurements.

Appellant asserts that Pop does not disclose or suggest determining a correction factor using both draw-down and build-up measurements, but instead discloses determining parameters of interest from draw-down and build-up measurements. App. Br. 11. Appellant's conclusory assertions—which are not supported by a citation to disclosures in Pop—do not identify any specific error in the Examiner's factual findings or conclusion of obviousness. Final Act. 14 (citing Pop ¶¶ 13, 177); Ans. 20–21 (citing Pop ¶¶ 116–117). Consequently, Appellant's arguments are unpersuasive of reversible error in the Examiner's rejection of claim 10 under 35 U.S.C. § 103, which we accordingly sustain. *Jung*, 637 F.3d at 1365.

Claim 12

Although Appellant sets forth separate arguments for claim 12, Appellant's arguments are not substantively distinct from the arguments Appellant provides for claim 1. App. Br. 11–12. Because we are unpersuaded of reversible error in the Examiner's rejection of claim 1 for the reasons discussed above, Appellant's position as to claim 12 is also unpersuasive of reversible error.

We accordingly sustain the Examiner's rejection of claim 12 under 35 U.S.C. § 103.

Claim 21

Appellant argues that claim 21 is patentable for the same reasons Appellant provides for claim 1. App. Br. 13. Because we are unpersuaded of reversible error in the Examiner's rejection of claim 1 for the reasons discussed above, Appellant's position as to claim 21 is also unpersuasive of reversible error.

We accordingly sustain the Examiner's rejection of claim 21 under 35 U.S.C. § 103.

DECISION

We affirm the Examiner's rejection claims 1–20 under 35 U.S.C. § 101 and rejections of claims 1–21 under 35 U.S.C. § 103.

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).

AFFIRMED