

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

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Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte JOHN M. TURNER  
and JAN L. NETHERS

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Appeal No. 2000-1961  
Application 08/840,200<sup>1</sup>

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ON BRIEF

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Before BARRETT, DIXON, and SAADAT, Administrative Patent Judges.  
BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1-21.

We affirm-in-part.

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<sup>1</sup> Application for patent filed April 11, 1997, entitled "Self-Contained Steam Trap Monitor."

BACKGROUND

The disclosed invention relates to analyzing the on-line operation of a mechanism, such as a steam trap.

Claim 16 is reproduced below.

16. A method of analyzing the on-line operation of a monitored mechanism comprising the steps of:

monitoring said control mechanism, on-line, to detect a variable operating characteristic of said control mechanism;

determining, on-line, a time-based baseline data set for said operating characteristic representative of a normal sequence of on-line operations of said control mechanism;

comparing on-line operating characteristics of said control mechanism with operations represented by said baseline data set of operating characteristics; and

signaling when said operations represented by said baseline data set of operations and said on-line operations differ in a predetermined amount.

The examiner relies on the following references:

Yumoto et al. (Yumoto)	4,898,022	February 6, 1990
Hill et al. (Hill)	5,154,080	October 13, 1992
Hale	5,239,874	August 31, 1993
Arcella et al. (Arcella)	5,329,465	July 12, 1994
McDonald et al. (McDonald)	5,425,270	June 20, 1995

Claim 16 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Hill or Hale or Arcella.<sup>2</sup>

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<sup>2</sup> In the future, we recommend that the examiner pick what he considers to be the best two rejections. Normally, the best rejection should be made, but it is understood that sometimes there is doubt about the teachings of a reference which requires a backup rejection. However, unduly multiplicative alternative grounds of rejection are burdensome to applicants and the Board

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Claims 17-19 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hill or Hale or Arcella.

Claim 20 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hill in view of McDonald, or Hale in view of McDonald, or Arcella in view of McDonald.

Claims 1, 5-7, and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hill or Hale or Arcella.

Claims 2-4, 8-10, 12, 13, and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hill in view of Yumoto.

Claim 14 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Hill in view of McDonald, or Hale in view of McDonald, or Arcella in view of McDonald.

We refer to the final rejection (Paper No. 8) (pages referred to as "FR\_\_") and the examiner's answer (Paper No. 14) (pages referred to as "EA\_\_") for a statement of the examiner's rejection, and to the replacement appeal brief (Paper No. 13) (pages referred to as "Br\_\_") and reply brief (Paper No. 15) (pages referred to as "RBr\_\_") for a statement of appellants' arguments thereagainst.

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and should be avoided.

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OPINION

Claim 16: Hill or Hale or Arcella

Appellants present two basic arguments: (1) that each of Hill, Hale, and Arcella obtains a baseline data set "off-line" from the monitored system, instead of "on-line" as claimed; and (2) that the three references employ a fixed baseline reference, whereas appellants' method requires an evolving baseline.

The limitations at issue in claim 16 are "monitoring said control mechanism, on-line, to detect a variable operating characteristic of said control mechanism; determining, on-line, a time-based baseline data set for said operating characteristic representative of a normal sequence of on-line operations of said control mechanism."

Claim 16 requires determining baseline data "on-line," which is defined in the specification as follows (spec. at 11, lines 4-7): "As used herein, the term 'on-line' is intended to identify operation of the monitored device within its associated system while performing or attempting to perform intended fluid control or processing functions within the system." It is this definition that is controlling in the patentability determinations, not the other definition provided by the examiner (EA22). Nevertheless, the rejections are consistent with the definition in the specification.

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Claim 16 does not recite anything about the baseline data set "evolving" or changing over time, as argued. The term "time-based" in the phrase "time-based baseline data set," can mean many things and only broadly requires that the baseline data is somehow determined based on time, such as gathering baseline data over a period of time. It is improper to narrow the scope of the claim by implicitly reading in disclosed limitations from the specification which have no express basis in the claims. See In re Prater, 415 F.2d 1393, 1404, 162 USPQ 541, 550 (CCPA 1969); In re Priest, 582 F.2d 33, 37, 199 USPQ 11, 15 (CCPA 1978) (inferential limitations are not to be read into the claims); In re Self, 671 F.2d 1344, 1348, 213 USPQ 1, 5 (CCPA 1982) ("Many of appellant's arguments fail from the outset because . . . they are not based on limitations appearing in the claims."). Appellants have not explained why "time-based baseline data set" should be interpreted to require a continuously refined baseline data set. We note that appellants know how to claim such a meaning if it was intended, as evidenced by claims 19 and 20. Baseline data in claim 16 can be measured "on-line" as the system works at a first time and then operating characteristics can be measured "on-line" and compared to these fixed baseline data; claim 16 does not require the baseline data and the operating characteristics to be determined "on-line" at the same time.

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Many of appellants' arguments expressly or impliedly rely on the unclaimed limitation of an evolving baseline. For example, appellants argue that "[i]f the baseline of any of the cited references was changed during the on-line operations, the system would not function" (Br4), implying that the claimed invention somehow takes account of a changing baseline; this has not been claimed. Appellant refers to the statement in the disclosure (spec. at 6, lines 7-11): "The system of the present invention also redefines 'normal' operation of the monitored component during the life of the component. Changes in system operation and component environment, and even changes in component operating characteristics, are considered in the operating program to continuously refine the normal baseline operating data set." This feature of the invention has not been claimed in claim 16. It is argued that "[t]he focus of the three cited patents is to find a change (defect) in the monitored mechanism measured against a fixed baseline, rather than to determine, on-line, a change in the overall process of which the mechanism is a part" (Br5). This implies that the change in the overall process includes a change in the baseline because it is in the same paragraph as the reference to page 6 of the specification; however, claim 16 does not recite changing the baseline once it has been determined. It is argued that "Applicants' method requires an evolving baseline determined on-line, whereas the

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method of the three cited patents employs a fixed baseline reference derived off-line" (Br5). There is no basis in claim 16 for the argument about an evolving baseline. Appellants proposed adding the term "evolving" to several of the claims, which amendment was denied entry. Appellants argue that they "do not consider the term 'evolving' to further limit Applicants' claims, as is evidenced by the use of the term in Applicants' specification and the consistent use of the term in explaining Applicants' claims to the Examiner" (RBr1). To the extent appellants consider claim 16 to capture the meaning of "evolving" or "continuously modified," appellants are in error.

Based on this claim interpretation, the only limitation at issue is whether the baseline data of the references are determined "on-line."

Hill teaches that baseline data is determined from actual sensor input during a baseline test, as shown in the acquisition option 102 in figure 5. "Baselines are the results of previous tests and analyses performed on that particular check valve assembly 40 which were designated as baseline data. Baselines represent results to which subsequent test results are compared." (Col. 7, lines 53-56.) Baselines are stored as a result of baseline tests (e.g., col. 7, line 58 to col. 8, line 36). This implies that the baselines are measured while the check valve is in operation, i.e., "on-line." Appellants do not explain why

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this is not so. Claim 16 does not preclude baseline data from being measured "on-line" and stored for later comparison with test data measured "on-line" at a later time. We find this measurement of baseline data from the working check valve assembly meets the limitation of "determining, on-line, a time-based baseline data set for said operating characteristic representative of a normal sequence of on-line operations of said control mechanism." Appellants' arguments that "[t]he baseline [in Hill] is not changed during the on-line operation of the valve" (Br5) and "[n]o provision is illustrated or described in the Hill disclosure for modifying the value of the baseline parameters loaded into the CPU RAM" (Br6) are not commensurate in scope with the claim because claim 16 says nothing about the baseline changing after it has been determined. Thus, we find that the rejection of claim 16 over Hill has not been shown to be in error. The rejection of claim 16 over Hill is sustained.

Hale teaches establishing baseline running conditions, baseline running conditions being defined as near to normal, non-degraded running conditions as possible for the valve (claim 1). The baseline condition is to be similar to the normal conditions at which the motor operated valve (MOV) operates during valve-in-use trending (col. 4, lines 38-40). This indicates that if valve-in-use trending values are taken under dynamic ("on-line") conditions, baseline measurements are also

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done under the dynamic ("on-line") conditions (col. 4, lines 41-49). We find this measurement of baseline running conditions meets the limitation of "determining, on-line, a time-based baseline data set for said operating characteristic representative of a normal sequence of on-line operations of said control mechanism." Appellants' argument that "[n]othing in the subsequently described steps of the Hale patent describe or suggest modifying the baseline, while the system is operating on-line, to produce a new baseline from which subsequent comparisons of valve operation are to be made" (Br6) is not commensurate in scope with the claim because claim 16 says nothing about the baseline changing after it has been determined. The rejection of claim 16 over Hale has not been shown to be in error. The rejection of claim 16 over Hale is sustained.

Arcella teaches measuring baseline data by recording the first ten actuations of a valve to determine average and standard deviations for the signals from each of the sensors of each of the valves (col. 7, lines 30-37). We find this measurement of baseline data meets the limitation of "determining, on-line, a time-based baseline data set for said operating characteristic representative of a normal sequence of on-line operations of said control mechanism." Appellants' argument that Arcella has a fixed baseline is not commensurate in scope with the claim because claim 16 says nothing about the baseline changing after

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it has been determined. The rejection of claim 16 over Arcella has not been shown to be in error. The rejection of claim 16 over Arcella is sustained.

Claims 17-19 and 21: Hill or Hale or Arcella

Claim 17

Claim 17 recites that "said comparison of on-line operating characteristics and baseline data set operating characteristics is repeated at selected intervals during the on-line operation of said mechanism." The examiner concludes that it would have been obvious to monitor the valve at regular intervals because the operating characteristics of a mechanism may change over time (FR4). Appellants argue that the examiner has not cited a reference to support this conclusion (Br7-8) and that where the applicant traverses the taking of Official Notice, the examiner should cite a reference in support of his or her position (Br9).

The examiner does not really take Official Notice of a fact, so much as make a conclusion without providing any evidence in support. The case law generally requires that all material facts be documented on the record to guard against hindsight. See In re Lee, 277 F.3d 1338, 1344-45, 61 USPQ2d 1430, 1434-35 (Fed. Cir. 2002); In re Zurko, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001) ("With respect to core factual findings in a determination of patentability, however, the Board cannot

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simply reach conclusions based on its own understanding or experience - or on its assessment of what would be basic knowledge or common sense."); In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("The range of sources available [for motivation to combine] . . . does not diminish the requirement for actual evidence."). While it is said that a convincing line of reasoning why one of ordinary skill in the art would have found the claimed invention obvious in light of the teachings of the references is an alternative to an express or implicit suggestion in the references, Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Int. 1985), this statement was never intended to mean that an invented plausible reasons for a modification is what is meant by a convincing line of reasoning. Nevertheless, as to this limitation, we believe the examiner's reasoning is defensible based on the references themselves.

Hill is directed to a system for non-intrusively testing check valves to determine inoperability or wear (e.g., col. 5, lines 58-66; col. 11, lines 66-68). One of ordinary skill in the art would have recognized that the comparison must be repeated at intervals or the system would not work for its intended purpose of detecting inoperability and wear over time. Appellants have provided no logic as to why the comparison would not be repeated. The rejection of claim 17 over Hill is sustained.

Hale discloses in the background of the invention that "[f]ollowing this initial (or baseline) testing, periodic testing is required to identify degradations and to insure that settings remain adequate during the life of the facility" (col. 1, lines 37-40). The "periodic testing" in Hale expressly suggests repeating the comparison between on-line operating characteristics and baseline operating characteristics. Moreover, the valve-in-use trending indicates periodic comparison to determine a trend, as recognized by appellants (Br6, lines 11-13). Thus, the rejection of claim 17 over Hale is sustained.

Arcella samples on-line characteristics of a valve (step 72 in figure 3) and compares them to the baseline characteristics and logs the event if there is a deviation from the baseline data (step 76 in figure 3; col. 8, line 64 to col. 9, line 5). This is repeated as shown by the loop in figure 3. The frequency with which data from each of the valves is recorded for trend analysis is defined in a configuration database (col. 7, lines 8-26) and the recorded historical data can be analyzed for trend analysis to detect a trend in changes in the sensor signals (col. 10, lines 27-32). Trend analysis requires repeating the comparison between on-line operating characteristics and baseline operating characteristic to determine a trend. The rejection of claim 17 over Arcella is sustained.

Appellants further argue that the prior art of Hill, Hale, and Arcella employ a fixed baseline against which comparisons are made (Br8). As noted in the analysis of claim 16, supra, claim 16 does not require an evolving baseline and does not distinguish over the fixed baselines in Hill, Hale, and Arcella, which were determined "on-line," i.e., while the mechanisms were in operation.

Claim 18

Claim 18 recites "wherein the on-line operation of said mechanism includes repeated opening and closing operation of a valve device and the time between baseline valve operations is compared with the time between corresponding on-line valve operations."

The examiner states that it would have been obvious that in the normal operation of a plant there may be repeated openings and closings of valves and that it would be important to know if there is a timing difference between the actual time between on-line valve operations and the time between baseline valve operations because it would indicate that either a problem has developed in the mechanism or some change has occurred in the system in which the mechanism operates to result in such a timing difference (FR6-7).

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Appellants argue that the missing limitations are not of such a notorious character as to admit of Official Notice (Br10).

Again, the examiner is not so much taking Official Notice of a notorious fact, as making a conclusory statement for a modification based on made-up reasons without any factual evidence in support. In this case, we agree that a reference is necessary. It is not sufficient to make up plausible reasons for a modification because there is no way for us or our reviewing court, the U.S. Court of Appeals for the Federal Circuit, to determine whether the reasons are factually correct. Since none of the references deals with measuring the time between opening and closing of a device, the examiner's reasons appear to be based on pure hindsight. We conclude that the examiner has failed to establish a prima facie case of obviousness with respect to claim 18. The rejection of claim 18 is reversed.

#### Claim 19

Claim 19 refers to the method of claim 16 "further comprising the step of modifying said time-based data set based on time-related changes occurring in the operating characteristics of said mechanism during the on-line operation of said mechanism." The "time-based data set" must refer to the "time-based baseline data set."

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The examiner states that it would have been obvious that there may be changes over time in the operating characteristics of a mechanism, such as due to normal component wear and tear, thus there would have been a need to modify the baseline data set for the mechanism (FR7).

Appellants argue that none of the references teaches modifying the baseline during on-line operations (Br11).

This claim recites changing the baseline data set during the on-line operation, which we interpreted was not recited in claim 16, and is part of what appellants have argued as the point of novelty of their invention. Again, more than mere made-up reasons are required from the examiner to show obviousness, especially where the limitation occurs at the point of novelty of the invention. The examiner has provided no evidence of modifying the baseline data based on time-related changes in the operating characteristics or other conditions. We conclude that the examiner has failed to establish a prima facie case of obviousness with respect to claim 19. The rejection of claim 19 is reversed.

#### Claim 21

Claim 21 refers to the method of claim 16, "further including the step of identifying and processing data generated between shutdown and start-up of a system associated with the

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device to prevent corruption of the time-based baseline data set generated during on-line operations of said device."

The examiner states that it would have been obvious that, in the proper monitoring of a mechanism, all the time of life of the mechanism would need to be monitored including the time between shutdown and startup of the system so as to be able to distinguish characteristics acquired when the mechanism is on-line from characteristics acquired when the mechanism is offline (FR7).

Appellants argue that the cited prior art are not concerned with data generated between shutdown and startup, are incapable of performing such a step, and neither teach nor suggest such a step (Br11). It is argued that the step should not be determined obvious as being of a well-known or notorious character (Br11).

The claim implies that the "time-based baseline data set" will be corrupted by data generated between shutdown and startup and thus implies that the "time-based baseline data set" is an evolving data set, although this meaning does not come through from claim 16. We agree that a reference is necessary. It is not sufficient to make up reasons for a modification, especially where, as here, the limitation is one of the asserted points of novelty of the invention. Since the baseline data in the references is fixed, and is not updated over time, it cannot be corrupted by data generated between shutdown and startup of a

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system. Thus, the examiner's reasons do not fully address the motivation question. We conclude that the examiner has failed to establish a prima facie case of obviousness with respect to claim 21. The rejection of claim 21 is reversed.

Claim 20: Hill in view of McDonald, or Hale in view of McDonald, or Arcella in view of McDonald

Claim 20 refers to the method of claim 16 "further comprising the step of modifying said time-based data set as a function of changes in the operating characteristics of said mechanism caused by changes in the environment of said mechanism." The "time-based data set" must refer to the "time-based baseline data set."

The examiner finds that McDonald provides a record of the environmental data for comparison to baseline data and concludes that it would have been obvious to modify the time-based baseline data set to reflect the changes brought about in the mechanism's performance due to environmental condition changes (EA9).

Appellants argue that McDonald does not make on-line changes to baseline data. It is argued (Br12) that the environment in McDonald is monitored to determine if a valve has become faulty, whereas appellants' invention monitors the environment to establish a new baseline "as a function of changes in the

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operating characteristics" of the monitored mechanism "caused by changes in the environment of the mechanism."

We find no suggestion in Hill, Hale, Arcella, or McDonald of making changes to the baseline data as claimed. The examiner's conclusion that it would have been obvious to modify the baseline data set is based on made-up reasons, not any factual teachings or suggestion in the references. We conclude that the examiner has failed to establish a prima facie case of obviousness with respect to claim 20. The rejection of claim 20 is reversed.

Claims 1, 5-7, and 11: Hill or Hale or Arcella

Claim 1 recites a "self-contained" system for analyzing the online operation of a monitored mechanism and having "a housing for assembling said system in a unitary assembly in operative communication with said mechanism."

The examiner states that although none of Hill or Hale or Arcella clearly disclose "a housing for assembling said system in a unitary assembly in operative communication with said mechanism," it would have been obvious "that a housing would be needed to protect the sensitive electronic components and that by having the system in a unitary assembly such a system would be more compact resulting in greater economy of space and that such a system in the housing must be in communication with the

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mechanism in order to detect the characteristics of the mechanism" (FR10; FR12; FR13-14).

Appellants argue that the references do not show a "self-contained" system comprising a housing the system in a unitary assembly (Br13).

Again, the examiner must do more than just make up reasons for the obviousness conclusion even on simple issues such as providing a unitary assembly in a housing. The examiner has failed to provide a reference showing "a housing for assembling said system in a unitary assembly in operative communication with said mechanism" and, thus, has failed to establish a prima facie case of obviousness with respect to claim 1. The rejection of claims 1, 5-7, and 11 is reversed.

Claims 2-4, 8-10, 12, 13, and 15: Hill in view of Yumoto

Claims 2-4, 8-10, 12, and 13

Yumoto shows a detecting section 1 attached to an arithmetic section 50 by a cable 51 and, so, it does not cure the deficiencies of Hill with respect to "a housing for assembling said system in a unitary assembly in operative communication with said mechanism." Nor does the examiner rely on Yumoto for this teaching. The examiner has failed to establish a prima facie case of obviousness. The rejection of claims 2-4, 8-10, 12, and 13 is reversed.

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Claim 15

The examiner finds that Hill teaches the claimed invention except for the audio detector. The examiner finds that Yumoto discloses this feature and concludes that it would have been obvious to utilize the techniques of Hill in the environment of Yumoto because steam traps generally include a valve body and the techniques of Hill would be useful in steam trap monitoring (FR18).

Appellants argue that "Claims 12, 13, and 15 depend directly and indirectly from Claim 1 and are distinguished over the references for the reasons already advanced with regard to the inapplicability of the teachings of Hill and Yumoto to Applicants' invention" (Br22). It is argued that the examiner proposes combining Hill and Yumoto is a way suggested only by appellants' disclosure and Hill could not be modified as suggested by the examiner without changing the basis operation and use of the Hill system (Br22).

This argument is inaccurate as to claim 15 because claim 15 is an independent claim. Claim 15 recites a "self-contained" monitor for analyzing and signaling the operation of a steam trap in the preamble, but, unlike claim 1, does not recite in the body "a housing for assembling said system in a unitary assembly in operative communication with said mechanism." We will not give patentable weight to "self-contained" in the preamble because

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nothing in the body of the claim gives life and breath to this limitation. The body of the claim does not define what is meant by "self-contained" and the term, by itself, does not suggest a unitary assembly in a housing. To the extent the term is given weight, "self-contained" could refer to the fact that the monitor is a distinct entity. The "integrated" check valve testing system of Hill is considered "self-contained" in this broad sense because it is an "integrated" system (see title and abstract).

Appellants provide no reasons why the examiner erred in concluding that it would have been obvious to employ the techniques of Hill (comparison of on-line operating characteristics to baseline data which was determined on-line) to a steam trap, as required to contest an obviousness rejection. See 37 CFR § 1.192(c)(8)(iv) (the arguments shall explain why the references do not suggest the claimed subject matter). It appears that appellants rely on a misunderstanding of the claim dependency in not arguing the details of claim 15. Because appellants have not shown error in the examiner's rejection, the rejection of claim 15 is sustained.

Claim 14: Hill in view of McDonald, or Hale in view of McDonald, or Arcella in view of McDonald

Claim 14 refers to the invention of claim 1 "further comprising a long-term processor for updating said baseline data

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set in response to changes in the operating environment of said mechanism."

The examiner finds that McDonald provides a record of the environmental data for comparison to baseline data and concludes that it would have been obvious to apply the techniques of McDonald to each of Hill, Hale, or Arcella because McDonald teaches that valve performance is influenced by ambient temperature and humidity and because changes in valve performance cannot be fully evaluated without comparing test environmental data with baseline environmental data (FR18-20).

As noted in the analysis of claim 20, we find no suggestion in Hill, Hale, Arcella, or McDonald of making changes to the baseline data as claimed. The examiner's conclusion that it would have been obvious to modify the baseline data set is based on made-up reasons, not any factual teachings or suggestions in the references. Moreover, McDonald does not cure the deficiencies of Hill, Hale, and Arcella with respect to the limitation of "a housing for assembling said system in a unitary assembly in operative communication with said mechanism" in claim 1. We conclude that the examiner has failed to establish a prima facie case of obviousness with respect to claim 14. The rejection of claim 14 is reversed.



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