

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte YOSUF M. TARAKI, DALE A. TRSAR,
RICHARD H. SHEPHERD, MARK H. PETERSON
and TYRONE J. MORITZ

Appeal No. 2000-0968
Application No. 08/629,484

ON BRIEF

Before RUGGIERO, LEVY, and SAADAT, Administrative Patent Judges.
SAADAT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the Examiner's final rejection of claims 1 through 6 and 8 through 21. Claim 7 has been canceled.

We reverse.

BACKGROUND

Appellants' invention relates generally to digital waveform analyzers or oscilloscopes and more specifically, to engine

analyzers incorporating such oscilloscopes as display devices (specification, page 1). According to Appellants, conventional engine analyzers may be operated in both ignition and lab scope modes to provide multiple display traces utilizing either engine sweeps or fixed time sweeps on their horizontal scale (specification, pages 1 & 2). The analyzer, in either mode, may further display the results in live mode, by using data obtained from engine probes, or in freeze mode, which uses data stored in a memory. Conventional analyzers have little room for manipulating or reconfiguring the waveform data displayed on the screen in the freeze mode (specification, pages 2 & 3). In freeze mode, Appellants' invention stores certain parameters of the frozen screen display format as well as the initial waveform signals and display settings for each trace (specification, pages 13-15). Thus, a user can reconfigure the frozen screen display format by altering at least one of the different display parameters such as the number of traces and the specific signal displayed on each trace (specification, pages 15-17 & 30).

Representative independent claim 1 is reproduced as follows:

1. Apparatus for monitoring analog input waveforms comprising:

 waveform acquisition circuitry including signal pickup leads adapted to be coupled to an associated source for

respectively receiving different analog input signals and generating digitized waveform data representative of such analog signals,

a memory for storing digitized waveform data,

a display device having a display screen for displaying stored waveform data from one or more input signals in a screen display format which includes one or more waveform representations on one or more traces, and

a processor coupled to said waveform acquisition circuitry and to said memory and to said display device and operable under stored program control for controlling storage and display of waveform data,

said processor executing a program which includes:

- (a) a mode control routine for selectively operating said display device in either a live mode in which acquired waveform data is displayed in a predetermined format substantially currently as acquired or a freeze mode in which a previously acquired waveform screen display is frozen on the screen in the predetermined format, said mode control routine including a portion cooperating with said memory to store for at least one trace selected display format parameters corresponding to waveform signals, if any, initially displayed on the at least one trace and another trace when the freeze mode is entered, and
- (b) a freeze control routine selectively operable in the freeze mode for reconfiguring a frozen screen display format by altering the number of traces and/or the assignment of plural signals to plural traces.

The prior art references of record relied upon by the Examiner in rejecting the appealed claims are:

Jonker et al. (Jonker)	5,250,935	Oct. 5, 1993
Moriyasu	5,444,459	Aug. 22, 1995

Appellants' admitted prior art, pages 1-3.

Claims 1 through 6 and 8 through 21 stand rejected under 35 U.S.C. § 103 as being unpatentable over Jonker in view of Moriyasu and the admitted prior art.

Rather than reiterate the conflicting viewpoints advanced by the Examiner and Appellants regarding the above-noted rejection, we make reference to the answer (Paper No. 16, mailed December 6, 1999) for the Examiner's complete reasoning in support of the rejection, and to the brief (Paper No. 15, filed September 27, 1999) for Appellants' arguments thereagainst.

OPINION

At the outset, we note that Appellants indicate that claims 1 through 6 stand or fall together, claims 18 and 19 stand or fall together and claims 9 through 14 and 17 stand or fall with one another and with either claim 1 or claim 18. Appellants further indicate that claims 8, 15, 16, 20 and 21 are separately argued (brief, pages 5 & 6). We also note that Appellants have, in the arguments section of the brief, provided separate

arguments for claims 1 and 9 as one group, claims 8, 16 and 21 as the second group and claims 9 and 18 as the third group, as required by 37 CFR § 1.192(c)(7) (July 1, 1999). Therefore, we will consider Appellants' claims as standing or falling together as argued in the brief.

As a general proposition, in rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993) and In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). A prima facie case of obviousness is established when the teachings of the prior art itself would appear to have suggested the claimed subject matter to one of ordinary skill in the art. See In re Bell, 991 F.2d 781, 783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993); In re Fritch, 972 F.2d 1260, 1266 n.14, 23 USPQ2d 1780, 1783-84 n.14 (Fed. Cir. 1992); Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 293, 227 USPQ 657, 664 (Fed. Cir. 1985). In considering the question of the obviousness of the claimed invention in view of the prior art relied upon, the Examiner is expected to make the factual determination set forth in Graham v. John Deere Co., 383

U.S. 1, 17, 148 USPQ 459, 467 (1966), and to provide a reason why one having ordinary skill in the pertinent art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. See also In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453, 1456 (Fed. Cir. 1998). Our reviewing court requires this evidence in order to establish a prima facie case. In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984); In re Cofer, 354 F.2d 664, 668, 148 USPQ 268, 271-72 (CCPA 1966).

Additionally, motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved. See In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). However, "the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion." In re Lee, 277 F.3d 1338, 1344, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002).

With respect to representative claim 1, the Examiner indicates that the only missing element from Jonker is "change [sic] display format, or operation mode, in the freeze mode"

(answer, page 4). The Examiner relies on Moriyasu for disclosing the missing element and concludes that it would have been obvious for one of ordinary skill in the art "to include digitizing means for generating digital representations of a signal and memory means for storing the digitized data as taught by Moriyasu in the device of Jonker so as to allow the display, comparison, and manipulation of the acquired signal flexibly" (answer, page 5). The Examiner justifies this conclusion by further stating (id.) that:

In other words, the device of Jonker as modified would have been able to change display format in either the live mode and the freeze mode since all data has been digitized and stored in the memory. Furthermore, the device of Jonker as modified inherently includes means for storing selected display format parameters corresponding to waveform signals of the initially displayed trace or any trace in the freeze mode otherwise it can not generate the graphic of the acquired data. [Emphasis added.]

The Examiner further indicates that altering the number of traces is well known according to the admitted prior art. The examiner takes the position that it would have been obvious to alter the number of traces of the display in the freeze mode of Jonker in order to view the acquired data in a different format (id.).

Appellants argue that there are no reasons to combine the teachings of the prior art and even if combining the references would have been obvious, the combination would not result in the

claimed invention. Additionally, Appellants assert that unlike Jonker, Moriyasu cannot display engine waveforms with engine sweeps since digitizing and memory means which can capture per-cylinder data are missing in Moriyasu (brief, page 8). In particular, Appellants point to the claimed freeze control routine "for reconfiguring a frozen screen display format by altering the number of traces and/or the assignment of plural signals to plural traces" and indicate that neither reference mentions plural scope traces (brief, page 11). With respect to changing the display format of Moriyasu, Appellants argue that the only change is made to the time base or the horizontal axis of the displayed waveform (id.). Appellants dispute the Examiner's contention that once the waveform is digitized and stored, it would have been obvious to alter a waveform in freeze mode to any previously-known live format (brief, pages 12 & 13).

In response, the Examiner merely indicates that the digitized and stored digital representation of a signal allows "the display, comparison, and manipulation of the acquired signal flexibly" (answer, page 6). The Examiner does not specifically point to any relevant teachings in the prior art that relate to reconfiguring a frozen screen display format by altering plural frozen display traces.

After a review of Jonker, we find that the reference relates to a digital engine analyzer that displays digitized engine information on an oscilloscope display (col. 1, lines 7-12). The only disclosure of Jonker related to frozen data, is with regard to a "FREEZE function" that freezes a live screen (col. 5, lines 39-45). The "FREEZE function" is further described as including a memory for storing digitized display samples (col. 25, lines 16-31). However, we find no teachings in Jonker related to reconfiguration of frozen screen display format, let alone changing the number of traces and assignment of plural signals to plural traces.

We next focus our review on Moriyasu to determine the disclosed manner of reconfiguration of the display format. Although Moriyasu does not explicitly refer to live or frozen display formats, we find that sampled and digitized data obtained over an ultra-wide time range is stored in a memory, which is recalled and processed for display (col. 1, lines 52-65). Moriyasu further discloses that the data for the signal being measured is stored as two values, one to show the value of the signal and the other to show the time at which the measurement is taken (col. 8, lines 62-66). The stored data is then used for plotting time versus measurement values in zoomed (expanded) or

panned (horizontally scrolled) ways (col. 9, lines 12-14), logarithmic scale (col. 9, lines 36-39) and time spectrum (col. 9, lines 49). However, we agree with Appellants (brief, page 11) that the only altered display parameter in Moriyasu is the time scale on the horizontal axis, and not any other parameters such as the number of traces.

With respect to Examiner's assertion that altering the number of traces is well known according to the admitted prior art (answer, page 5), Appellants argue that the admitted prior art merely refers to either single-trace or dual-trace mode for operating a digital oscilloscope (brief, page 12) and not switching between the two modes while displaying a waveform by stating that:

More importantly, this reference is to scopes operating in the live mode. There is no suggestion whatsoever in applicants' disclosure that it is known that the number of traces, or the waveform displayed on a given trace, can be altered in **freeze mode**, and there is no support whatsoever for the examiner's contention that it would have been obvious to do so.

In response, the Examiner concludes (answer, page 7) that:

[I]t should be noted that the various types of display format of the acquired data as recited in the claims, such as single-trace display mode or dual-trace display mode, are well known in the art (either taught by Jonker or applicant's admitted prior art).

Our review of the disclosure reveals that, as argued by Appellants (brief, page 12), admitted prior art merely indicates that a dual-trace scope can be operated either in single-trace or dual-trace mode (specification, page 1). In our view, the Examiner's conclusion that the dual-trace mode of admitted prior art applies to the claimed reconfiguration of "a frozen screen display format by altering the number of traces and/or the assignment of plural signals to plural traces," is based on unwarranted conjecture and speculation that are not supported by any disclosure in prior art. In order for us to agree with the Examiner's position, we would need to resort to speculation or unfounded assumptions to supply deficiencies in the factual basis of the rejection. In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967), cert. denied, 389 U.S. 1057 (1968), reh'g denied, 390 U.S. 1000 (1968). This we cannot do.

With respect to the claimed memory for storing "selected display format parameters" along with the stored waveform data, Appellants further argue that the prior art, even if combined, fails to disclose the specific claimed mode control routine (brief, page 10). Appellants point out that reconfiguring a frozen screen display format by altering the number of traces and/or the signal displayed on a trace, is performed in a

specific way (brief, page 13). Appellants specifically state that the invention utilizes a series of storage registers for keeping track of, for each trace, "the display parameter settings for the signal (if any) initially displayed on that trace, as well as the setting for the signal (if any) displayed on the other trace" (id.).

We are unpersuaded by the Examiner's arguments (answer, page 6) which are limited to a general statement of what Moriyasu teaches. The Examiner merely refers to "memory means" of Moriyasu that are used for "storing the digitized data so that the acquired signal could be displayed in linear, logarithmic or other manner". It is not clear from the Examiner's position which specific memory elements in Moriyasu store display format parameters when the freeze mode is entered. Additionally, based on our review of the reference, we find that the linear, logarithmic or other display formats are virtually pre-set display formats used for plotting the obtained data and not parameters that are stored when the freeze mode is entered (col. 9, lines 3-7). From all of the above, we find that the examiner has not provided a convincing line of reasoning to support any correspondence between the teachings of Moriyasu and the claimed "display format parameters".

Thus, assuming, arguendo, that it would have been obvious to combine the engine analyzer of Jonker with the digital oscilloscope of Moriyasu and the admitted prior art as held by the Examiner, the combination would still not disclose storing of "display format parameters" as well as the reconfiguration of frozen display format by plural traces when the freeze mode is entered. Therefore, the Examiner has failed to establish a prima facie case of obviousness with respect to claim 1. Accordingly we do not sustain the rejection of claim 1 under 35 U.S.C. § 103(a) over Jonker, Moriyasu and the admitted prior art.

We next consider the rejection of representative claim 18. As the basis for obviousness rejection of claim 18, the Examiner merely refers to the rejection of claim 17 and apparently relies on the same reasoning. With respect to claim 17, the Examiner states that admitted prior art shows that it is known to display the engine data in three different types of sweep for displaying a waveform over a complete engine cycle (answer, page 6).

Appellants argue that Moriyasu teaches nothing about ignition waveforms or engine sweeps. Appellants further point out that while Jonker teaches different types of engine sweep for live ignition waveform displays, the reference discloses nothing about reconfiguring or altering the engine sweep pattern in the

freeze mode (brief, page 14). Additionally, Appellants point out that the single frozen waveform of Moriyasu is derived from a single trigger event and does not suggest reconfiguring a compound waveform derived from multiple trigger events (brief, page 15).

The Examiner responds to Appellants' arguments by stating that the combined teachings of the references would have suggested the claimed invention to those of ordinary skill in the art (answer, pages 6 & 7).

From our review of prior art, we remain unpersuaded by the Examiner's assertion that different engine sweeps in live mode, as disclosed by Jonker and Appellants' admitted prior art, would have suggested to one of ordinary skill in the art reconfiguring a frozen screen display format to reconfigure a frozen screen display format in the manner recited in the claim. The Examiner's reliance on Jonker and admitted prior art is misplaced since both discuss different types of sweep only in live mode. Based on our analysis of Moriyasu, as discussed above with respect to claim 1, we find that the reference displays sampled and digitized data according to various pre-set time base scales. Moriyasu provides no teachings related to reconfiguring a frozen screen display format in freeze mode, let alone changing the

screen display format by altering the engine sweep. Therefore, the Examiner has failed to establish a prima facie case of obviousness with respect to claim 18. Accordingly, the rejection of claim 18 under 35 U.S.C. § 103(a) over Jonker, Moriyasu and the admitted prior art cannot be sustained.

With respect to the remaining claims, we note that independent claim 9 recites storing "display format parameters" and "reconfiguring a frozen screen display format" by altering the number of traces (as in claim 1) and by altering the engine sweep (as in claim 18). For the same reasons discussed above, with respect to claims 1 and 18, we also find that the invention of claim 9 is unobvious over Jonker, Moriyasu and the admitted prior art. Therefore, we also do not sustain the rejection of claims 2 through 6, 8, 10 through 17 and 19 through 21 over Jonker, Moriyasu and the admitted prior art, which depend from one of independent claims 1, 9 and 18. Because the examiner has failed to establish a prima facie case of obviousness, we need not reach the declaration submitted under 37 CFR § 1.132.

CONCLUSION

In view of the foregoing, the decision of the Examiner rejecting claims 1 through 6 and 8 through 21 under 35 U.S.C. § 103 is reversed.

REVERSED

JOSEPH F. RUGGIERO)	
Administrative Patent Judge)	
)	
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)	
STUART S. LEVY)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
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