

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PATRICK W. BOSSHART

Appeal No. 96-3054
Application 08/134,147¹

ON BRIEF

Before JERRY SMITH, BARRETT, and HECKER, **Administrative Patent Judges.**

HECKER, **Administrative Patent Judge.**

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 1 through 7 and 14 through 25. Claims 8 through 13 have been canceled, and claims 26 through 28 have been withdrawn from consideration as being directed to a non-

¹ Application for patent filed October 8, 1993.

elected invention.

The invention relates to a phase-locked loop circuit (PLL) for locking the phase of an oscillator output signal to the phase of a reference signal by detecting a phase difference through multiple clock cycles. In particular, looking at Figure 8, the phase-locked loop includes a multi-cycle phase detector 11, a charge pump 12, a loop filter 13 and a voltage controlled oscillator (VCO). The multi-cycle phase detector 11 detects a phase difference between a reference clock signal (input clock) from an off-chip source, and the generated clock signal from the VCO on line 30. The charge pump 12 connects to the phase detector 11 and provides output current pulses to increase or decrease the output voltage at the loop filter 13. The output voltage from filter 13 in turn adjusts the phase of the VCO.

Representative independent claim 15 is reproduced as follows:

15. A phase-locked loop circuit for locking the phase of an oscillator output signal to the phase of a reference signal, comprising:

a phase detector for detecting a phase difference between an input signal and said reference signal through multiple clock cycles, and for providing a first phase detector output signal representative of a detected phase difference less than a single cycle, and for providing a second phase detector output signal representative of a detected phase difference greater than a single cycle;

control means, receiving said first phase detector output signal and said second phase detector output signal, for providing a voltage controlled oscillator (VCO) control signal controlled by said first phase detector output signal and said second phase detector output signal;

a voltage controlled oscillator receiving said VCO control signal and providing said oscillator output signal which is applied to said phase detector as the input signal thereof.

The references relied on by the Examiner are as follows²:

Koskovich	5,168,245	Dec. 1, 1992
Wong et al. (Wong)	5,239,561	Aug. 24, 1993
Ogawa et al. (Ogawa)	5,285,483	Feb. 8, 1994 (filed Jun. 8, 1992)

Claims 1 through 7, 14 and 19 through 25 stand rejected under 35 U.S.C. § 112, first paragraph, as being directed to an invention which is not supported by the

² Although Liu et al. (5,278,874) is listed in the answer, it is not used in any outstanding rejection.

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specification as originally filed.³

Claims 15 and 16 stand rejected under 35 U.S.C. § 103 as being unpatentable over Wong in view of Koskowich.

Claims 17 and 18 stand rejected under 35 U.S.C. § 103 as being unpatentable over Wong in view of Koskowich and further in view of Ogawa.

Rather than repeat the arguments of Appellant or the Examiner, we make reference to the brief and the answer for the details thereof.

OPINION

After a careful review of the evidence before us, we agree with the Examiner that claims 1 through 7 and 14 are properly rejected under 35 U.S.C. § 112, first paragraph. Thus, we will sustain the rejection of these claims but we

³ The final rejection (page 4) states “if the new matter were withdrawn from the amended claims 1-7 and 14 and specification, old rejections made in the first Office Action dated 06/20/94 would still be sustained.” However, that rejection has not been made and is not before us. Likewise, at page 9 of the final rejection, it states “if new matter were withdrawn from the amended claims 19-25, claim 19,, is also rejected under 35 U.S.C. § 103 based on the same grounds for the rejection of claim 15.” However, that rejection has not been made and is not before us.

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will reverse the rejection of claims 15 through 18 under 35 U.S.C. § 103, and the rejection of claims 19 through 25 under 35 U.S.C. § 112, first paragraph.

We consider first the rejections under the first paragraph of 35 U.S.C. § 112. Appellant has characterized these rejections as "being based on a non-enabling disclosure" (Brief, pages 3 and 4, items 3 and 9). The Examiner correctly notes that this is not correct (Answer, pages 2 and 3), and that the rejection is based upon lack of support in the specification. It should always be kept in mind that the written description requirement is a separate and distinct requirement under 35 U.S.C. § 112, first paragraph. It is clearly separate from the enablement requirement. ***Vas-Cath, Inc. v. Mahurkar***, 935 F.2d 1555, 1563, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991).

The rejection of claims 1 through 7 and 14 states:

Specifically, the limitation where "the multi-cycle phase detector provides a phase detector output signal representative of the detected phase difference updated at least every cycle of the reference signal" was not disclosed in the application, as originally filed. (Answer at page 3.)

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This rejection relates to the written description requirement of 35 U.S.C. § 112. The purpose of the written description requirement is to ensure that the applicant conveys with reasonable clarity to those skilled in the art that he was in possession of the invention as of the filing date of the application. For the purposes of the written description requirement, the invention is "whatever is now claimed." ***Vas-Cath, Inc. v. Mahurkar***, 935 F.2d at 1564, 19 USPQ2d at 1117 (Fed. Cir. 1991).

Appellant argues that the specification supports the claim recitation in that it is an "inherent property of the embodiment completely disclosed in the application as originally filed.", and explains how the invention operates. (Brief, pages 5-7.) The Examiner states "The [A]ppellant has cited several instances contending that they disclos[le] the above feature. However, none of them is seen to support the [A]ppellant's arguments." (Answer, bottom of page 9.) An invention claimed need not be described in ***ipsis verbis*** in order to satisfy the written description requirement of 35 U.S.C. § 112, first paragraph. ***In re Lukach***, 442 F.2d 967,

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969, 169 USPQ 795, 796 (CCPA 1971). However, we have also reviewed Appellant's explanation of inherency, and find no clear support for the recited claim limitation.

The noted claim language does not appear in the specification. Since Appellant has not demonstrated with **reasonable clarity** to those skilled in the art that he was in possession of the invention as of the filing date of the application, we will sustain the rejection of claims 1 through 7 and 14 under 35 U.S.C. § 112, first paragraph.

With regard to the rejection of claims 19 through 25 under 35 U.S.C. § 112, first paragraph, the Examiner holds that the claim limitation "said phase detector provides said first phase detector signal as duty cycle modulated pulses" is not supported by the specification as originally filed. Appellant contends that this limitation is disclosed in the specification as originally filed, and explains the circuit operation (brief-page 15). Reviewing these arguments, we agree with the Examiner that these arguments do not demonstrate with **reasonable clarity** to those skilled in the art that Appellant was in possession of the invention as of

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the filing date of the application. However, at page 7, lines 23-26 of the specification (as originally filed), it states:

The phase detector 11 sends phase adjustment signals to the charge pump 12 which are single and two-cycle, up/down, **pulse-width modulated**, digital control signals up-B, down, UP2-B, DOWN2.
(Emphasis added.)

We find **pulse-width modulated**, fully supports the claim language "duty cycle modulated pulses", and thereby will not sustain the rejection of claims 19 through 25 under 35 U.S.C. § 112, first paragraph.

Before we discuss the prior art rejections, we note that Appellant has argued several rejections which are not outstanding, i.e., a 35 U.S.C. § 112, second paragraph rejection of claims 15 through 24 which has been withdrawn, rejections using the reference Liu et al. against claims 15 through 18, and an art rejection of claims 19 through 25 using Wong and Koskovich. (Brief, pages 8-13 and 15.) We will not comment on the merits of rejections which are not before us.

Turning to the rejection of claims 15 and 16 under 35 U.S.C. § 103, the Examiner has failed to set forth a **prima**

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facie case. It is the burden of the Examiner to establish why one having ordinary skill in the art would have been led to the claimed invention by the reasonable teachings or suggestions found in the prior art, or by a reasonable inference to the artisan contained in such teachings or suggestions. **In re Sernaker**, 702 F.2d 989, 995, 217 USPQ 1, 6 (Fed. Cir. 1983).

The Examiner cites Wong as teaching the claimed invention except for:

(a) the feature where a first control signal source provides a first control signal responsive to the first phase detector output signal when the phase difference is less than a single cycle, and where a second control signal source provides a second control signal responsive to the second phase detector output signal when the phase difference is greater than a single cycle (Answer, page 5.)

The Examiner then incorporates the control means (SPED, Figure 2) of Koskowich to provide a first control signal source (150, 152

of Koskowich) and the second signal source (160, 162 of Koskowich) in the multi-cycle phase detector taught by Wong (Answer, page 6).

Appellant argues that:

[T]he two detectors of Koskowich's circuit are not the same as those set forth in Claims 15 and 16. Thus, Claim 15 recites --a phase detector for detecting a phase difference between an input signal and said reference signal through multiple clock cycles, and for providing a first phase detector output signal representative of a detected **phase** difference less than a single cycle, and for providing a second phase detector output signal representative of a detected **phase** difference greater than a single cycle--(emphasis added). By contrast, Koskowich teaches providing a single phase detector, combined with a frequency detector. Koskowich thus teaches away from the invention as set forth in Claim 15, as he teaches using a frequency detector to address the problem of cycle slipping. Wong et al. is even less relevant than Koskowich. There is no teaching nor suggestion in either Koskowich or Wong et al. of detecting phase differences greater than a single cycle, and providing a signal representative thereof so as to achieve the improved functionality provided by the invention set forth in claim 15. (Brief, pages 13 and 14, underlining added.)

The Examiner responds that:

Koskowich's phase detector is equivalent to the recited first phase detector, which is used to detect a phase difference less than a single cycle. Moreover, Koskowich's frequency detector is actually a phase detector which detects a phase difference greater than a cycle, which is equivalent to the recited second phase detector. (Answer, pages 14 and 15.)

We agree with the Examiner that Koskowich's **phase**

detector is equivalent to Appellant's first phase detector. However, we do not agree that Koskowich's **frequency detector** is actually a phase detector which detects a phase difference greater than a cycle. Koskowich states, "The Sequential Error Detector (SPED) [hence the frequency detector] is active only while cycle slipping is occurring." (column 5, lines 37 and 38). Cycle slipping occurs when the phase error reaches 180 degrees (note Koskowich, column 5, lines 34-36, "thereby indicating the absence of cycle slips, i.e., the phase error never reaches 180 degrees.") Thus, Koskowich's frequency detector provides a second signal at **less than a single cycle** (at 180 degrees), a single cycle being 360 degrees (note Appellant's specification at page 23). This is contrary to that claimed by Appellant, i.e., "providing a second phase detector output signal representative of a detected phase difference **greater than a single cycle;**" (claim 15, lines 7 and 8, emphasis added). Thus, we need to go no further, and will reverse the Examiner's rejection of claims 15 and 16 since the necessary elements are not found in Wong or Koskowich.

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With regard to the rejection of claims 17 and 18 (dependent from claim 15) under 35 U.S.C. § 103 as being unpatentable over Wong in view of Koskowich and further in view of Ogawa, we find nothing in Ogawa to supply the elements missing from Wong and Koskowich as discussed *supra*. We, therefore, will not sustain the rejection of claims 17 and 18.

In view of the foregoing, the decision of the Examiner rejecting claims 1 through 7 and 14 under 35 U.S.C. § 112, first paragraph, is affirmed; however, the decision of the Examiner rejecting claims 19 through 25 under 35 U.S.C. § 112, first paragraph, and claims 15 through 18 under 35 U.S.C. § 103 is reversed.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).⁴

AFFIRMED-IN-PART

	JERRY SMITH)	
	Administrative Patent Judge)	
)	
)	
	LEE E. BARRETT)	BOARD OF
PATENT	Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
))
	STUART N. HECKER)	
	Administrative Patent Judge)	

⁴ We note that in the specification at page 10, lines 24 and 25, the co-filed application should be identified.

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SNH/cam

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