

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(2) is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS

AND INTERFERENCES

Ex parte NORMAN G. CARDER

Appeal No. 95-1739  
Application 08/013,252<sup>1</sup>

ON BRIEF

MAILED

DEC 18 1995

PAT.&T.M. OFFICE  
BOARD OF PATENT APPEALS  
AND INTERFERENCES

Before THOMAS, FLEMING and LEE, Administrative Patent Judges.  
LEE, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of the appellant's claims 1-4, 8-9 and 11-14. Claims 1-3, 8 and 11-14 have been rejected as being unpatentable over prior art. Claims 4 and 9 have been rejected under 35 U.S.C. § 112 fourth paragraph.

The Rejections on Appeal

1. Dependent claims 4 and 9 were finally rejected by the examiner under 35 U.S.C. § 112 fourth paragraph as failing to further limit the independent claims from which they depend.

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<sup>1</sup> Application filed February 3, 1993. It is a continuation of Application 07/698,840, filed May 10, 1991, now abandoned.

Appeal No. 95-1739  
Application 08/013,252

2. Claims 1-3, 8 and 11-14 were finally rejected by the examiner under 35 U.S.C. § 102(b) as being anticipated by Crane et al., U.S. Patent No. 3,571,705, issued on March 23, 1971.

The Claims on Appeal

The last amendment proposed and entered in this application, as is indicated in the official file, is Amendment F (Paper No. 19) filed on November 1, 1993. Claims 3, 4 and 9 as reproduced in appellant's appendix attached to the appeal brief differ from claims 3, 4 and 9 as they appear in Amendment F.

Despite the examiner's statement (Answer at p. 3) that the copy of the claims contained in appellant's appendix to the brief is correct, we regard Amendment F as accurately presenting the text of claims 3, 4 and 9 on appeal. But in any event, the version in appellant's appendix simply makes clear that the counter starts counting at the "first" instant the "first predetermined" reference level is reached and that delaying stopping of the counter is for measuring that part of the input waveform prior to the "first predetermined" reference level. Those limitations are already implicit in respective corresponding claims 3, 4 and 9 as they appear in Amendment F. Our decision would remain unchanged, if claims 3, 4 and 9 as they appear in the appellant's appendix were regarded as accurately presenting those claims on appeal.

Appeal No. 95-1739  
Application 08/013,252

Background of Invention

The invention is directed to a method and apparatus for measuring the characteristics of an analog alternating waveform and reconstructing the waveform based on the measured characteristics. A particular alternating waveform is repeated to permit a different measurement to be made on each repetition. For each measurement, a time interval is determined between an instant when a first predetermined level of the waveform is attained and another instant when a second predetermined level of the waveform is attained. Successive measurements are taken as the second predetermined level is selectively varied. The shape of the waveform can be reconstructed on the basis of the various predetermined reference levels and the corresponding measured time intervals.

Claim 1 is representative of the subject matter on appeal and reads as follows:

1. A method of measuring the characteristics of an a.c. waveform comprising the following steps:

measuring the time interval between a first instant when the waveform level attains a first predetermined reference level and a second instant when the waveform level attains a second predetermined level;

repeating the measurements for a plurality of said second predetermined levels; and

reconstructing the waveform from said measured time intervals based on the time of the second instant and said second predetermined level.

Appeal No. 95-1739  
Application 08/013,252

OPINION

The rejection of claims 1-3, 8  
and 11-14 under 35 U.S.C. § 102

The rejection based on anticipation under 35 U.S.C. § 102 cannot be sustained.

Anticipation under 35 U.S.C. § 102 is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of the claimed invention. In re Spada, 911 F.2d 705, 707, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990). Obviousness under 35 U.S.C. § 103 is a different issue entirely.

The appellant asserts that claims 11-14 are separately patentable from claims 1-4 and 8-9, and has separately argued independent claim 11 on pages 17-18 of the appeal brief.

Crane et al. discloses an analogue signal analysis device which measures a time distribution of a range of signal amplitudes and the number of times the signal level exceeds various predetermined levels. The objective of Crane et al. is to provide a contemporaneous digital representation of the amplitude variations in an analogue voltage signal (column 2, lines 8-10).

For a given period of time, the apparatus of Crane et al. measures the number of times the amplitude of the input signal exceeds certain preselected levels. A number of comparators are

Appeal No. 95-1739  
Application 08/013,252

utilized, one for each preselected signal level (column 3, lines 49-54), and the output of each comparator is provided to a respective one-shot, a monostable multivibrator circuit (column 3, lines 64-70). The one-shots provide outputs which drive respective counters which count how many times the one-shots are activated by the associated comparators (column 3, lines 73-74). In order to keep track of the time period in which the respective counters are operative to accumulate counts with respect to an associated voltage level, another counter is utilized to record the total elapsed time during which the counters count (column 4, lines 14-22).

Unlike appellant's invention of all claims 1-4, 8-9 and 11-14, the apparatus of Crane et al. does not measure the time interval between a first instant when a first predetermined level is reached and a second instant when a second predetermined level is reached. The time period recorded by Crane et al. does not relate to when or if any particular voltage level has been attained. During any recorded measurement period, there may be no instance of any voltage level being reached or there may be many such instances. As is expressly stated by Crane et al. in column 4 at lines 58-62:

Analysis of the counts set in the various counters is an indication of the occurrence of various amplitudes within the analogue wave form, although the various times at which the various amplitudes were sensed are not, of course, indicated by the counters.

Appeal No. 95-1739  
Application 08/013,252

Also, because the apparatus of Crane et al. does not keep track of when the predetermined levels have been attained, it does not and is incapable of reconstructing the input waveform as is required by all claims 1-4, 8-9 and 11-14. The examiner erroneously regarded Crane et al.'s Figure 2 as illustrating a reconstructed waveform. Figure 2 of Crane et al. merely depicts the original input waveform in a side-by-side view with respect to the contents of the various counters 52-57 at the end of signal analysis. Indeed, the contents of the counters are insufficient for reconstructing the original waveform.

With regard to claim 11, the appellant further argues that Crane et al. does not disclose the particular structures described in appellant's specification which correspond to the claimed "waveform reconstruction means" (Br. at 17-18). We need not address this argument further or whether there is equivalent structure in Crane et al. for performing the same function because Crane et al. does not even disclose performing the function of reconstructing the original waveform.

The rejection of claims 4 and 9  
under 35 U.S.C. § 112, fourth paragraph

The rejection of claims 4 and 9 under 35 U.S.C. § 112, fourth paragraph, cannot be sustained.

The fourth paragraph of 35 U.S.C. § 112 requires that a dependent claim must refer to a claim previously set forth and

Appeal No. 95-1739  
Application 08/013,252

specify a further limitation of the subject matter claimed, and that a claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

The limitation at issue concerns when a counter is stopped.

Claim 4 is dependent on claim 3. Claim 3 recites:

3. The method according to claim 1, wherein the time intervals are measurable by starting a counter at the instant the reference level is attained and stopping said counter based on when the other level is attained (emphasis added).

Claim 4 recites:

4. The method according to claim 3, wherein stopping the counter is delayed after the second predetermined level is attained to allow measurement of that part of the waveform prior to the reference level (emphasis added).

Concerning when the counter is stopped, it would be improper for claim 4 to require something not consistent with what is required by claim 3. For instance, if claim 3 requires that the counter be stopped at the instant when the waveform reaches the second predetermined level, claim 4 cannot change that requirement by requiring that the counter not be stopped until after a delay has occurred from the time of reaching the second predetermined level.

But claim 3's "based on when" language in connection with when to stop the counter is generic and covers both the instant when the second predetermined level is attained and other moments delayed from the instant the second predetermined level is

Appeal No. 95-1739  
Application 08/013,252

attained. Thus, in claim 3, while the counter is started at the precise instant the input waveform reaches a first predetermined level, it is not necessarily stopped at the instant when the input waveform reaches a second predetermined level. The appellant correctly points out that claim 4 properly further limits claim 3.

The examiner appears to be concerned, however, not so much with claims 3 and 8 from which claims 4 and 9 depend, but on claim 1. Claim 4 depends from claim 1 through claim 3, and claim 9 depends from claim 1 through claim 8 and claim 2. The concern is misplaced, as is explained below.

Claim 1 recites measuring a time interval from "a first instant" when the waveform level attains a first predetermined level and "a second instant" when the waveform level attains a second predetermined level. According to the examiner, that would require stopping the counter of claim 4 at the instant the input waveform reaches the second predetermined level and yet claim 4 specifically requires not stopping the counter until a delay has occurred since the time the waveform reaches the second predetermined level.

The examiner erred in construing claim 1 as requiring the counter recited in claim 4 to be stopped at the instant the input waveform reaches the second predetermined level. Claim 1 does not recite any counter, much less the precise moment when the

Appeal No. 95-1739  
Application 08/013,252

counter is started or stopped. Claim 4's reciting that the counter first defined in claim 3 is stopped after a delay from when the waveform reaches the second predetermined level is not necessarily contrary to any limitation required by claim 1. Not stopping the counter until after a delay has occurred does not require preclusion of the time interval measuring step specified in claim 1. The specification discloses that the amount of delay is predetermined (p. 3, line 34). The precise instant just before the delay can be back-calculated from the counter's content and the predetermined delay. Also, according to claims 3 and 4, delaying stopping of the counter is a part of the time interval measuring step first defined in claim 1.

Claim 9 properly further limits claim 8 and claim 1 in the same manner that claim 4 further limits claim 3 and claim 1.

#### New Ground of Rejection

Per 37 CFR § 1.196(b), claims 4 and 9 are rejected under 35 U.S.C. § 112, first paragraph, as being based on an unenabling disclosure.

Each of claims 4 and 9 requires that stopping the counter is delayed for some time after the second predetermined reference level has been reached, "to allow measurement of that part of the waveform prior to the reference level." The "reference level" in that context refers back to "the reference level" recited in claim 3, which is the first predetermined reference level recited

in claim 1. It is not evident and the specification nowhere explains how the part of the waveform prior to the first predetermined reference level can be measured by delaying stopping of the counter after the second predetermined reference level is reached. It would appear that the part of the waveform prior to when the first predetermined reference level is attained is irretrievably lost if no comparator is set to trigger on that part of the waveform and if the counter does not start to count until when the first predetermined reference level is reached.

According to the appellant's disclosure, the counter starts counting when the first predetermined reference level is reached and stops counting when the second predetermined reference level is reached. (Spec. at 3, lines 18-22). By carrying out such measurements for a plurality of different stop thresholds, i.e., second predetermined reference levels, the input waveform can be measured point-by-point. (Spec. at 3, lines 22-25).

Delaying the stopping of counter 35 after the second predetermined reference level is reached, as is shown in appellant's Figure 3, does not add any more measurement points to the sampling of the waveform. It merely increases the counter's content corresponding to when the second predetermined reference level, as the current stop threshold, has been reached.

For the foregoing reasons, we find that it would require undue experimentation for one with ordinary skill in the art to

Appeal No. 95-1739  
Application 08/013,252

measure that part of the input waveform before the first predetermined reference level is reached by delaying stopping of the counter until after the second predetermined reference level is reached. Accordingly, claims 4 and 9 are rejected under 35 U.S.C. § 112, first paragraph.

Conclusion

The rejection of claims 1-3, 8 and 11-14 under 35 U.S.C. § 102(b) as being anticipated by Crane et al. is reversed.

The rejection of claims 4 and 9 under 35 U.S.C. § 112 fourth paragraph is reversed.

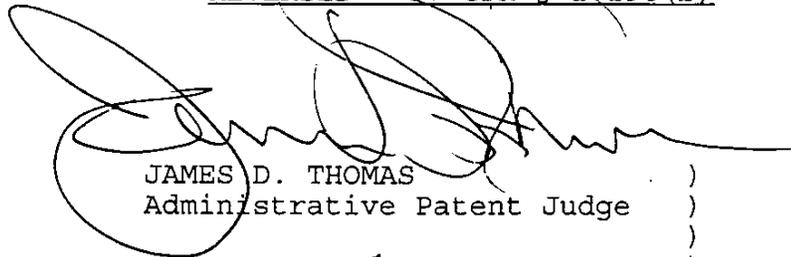
Claims 4 and 9 are rejected based on a new ground of rejection entered pursuant to 37 CFR § 1.196(b).

Any request for reconsideration or modification of this decision by the Board of Patent Appeals and Interferences based upon the same record must be filed within one month from the date of the decision. 37 CFR § 1.197. Should appellant elect to have further prosecution before the examiner in response to the new rejection under 37 CFR § 1.196(b) by way of amendment or showing of facts, or both, not previously of record, a shortened statutory period for making such response is hereby set to expire two months from the date of this decision.

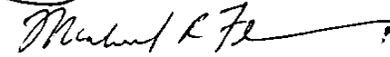
Appeal No. 95-1739  
Application 08/013,252

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

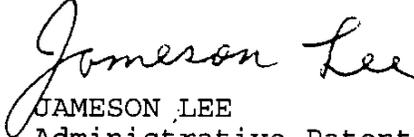
REVERSED - 37 CFR § 1.196(b)



JAMES D. THOMAS )  
Administrative Patent Judge )



MICHAEL R. FLEMING )  
Administrative Patent Judge )



JAMESON LEE )  
Administrative Patent Judge )

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Appeal No. 95-1739  
Application 08/013,252

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