

The opinion in support of the decision being entered today was not written for publication in a law journal and is not binding precedent of the Board.

Paper No. 42

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CORNELIS A. VAN HOLTEN,
KAIJA M. SALONEN and SEPPONEN E. SALOW

Appeal No. 2000-0471
Application No. 08/871,442

HEARD: January 23, 2002

Before HAIRSTON, KRASS and FLEMING, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 37-52, all of the pending claims.

The invention is directed to a method and apparatus for performing 3/5 majority voting. The invention obviates the need to store five repetitions of a digital word in order to

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carry out 3/5 majority voting on each bit position of a data word. It does this by maintaining a running count of the number of 1's in each bit position of the incoming data words. Once a count of three has been reached for any bit position, there is no need to continue counting for that bit position as the 3/5 majority voting result has essentially been produced. Since a count of three can be maintained and stored using a two-bit counter, only two bits of memory are required for each bit of the incoming data word.

Representative independent claim 37 is reproduced as follows:

37. A method for performing 3 out of 5 majority voting in a digital communications system, wherein a data word comprising a plurality of digital bits is transmitted five times to form a plurality of five bit repeats, one for each bit of the data word, and each of the plurality of five bit repeats is assigned a respective bit value based on 3 out of 5 majority voting, the method comprising the steps of:

counting up to a maximum number of three, the number of ones present in each of the plurality of five bit repeats;

storing the number of counted ones separately for each five bit repeat up to a maximum number of three for each five bit repeat in a memory means limited in size to storing a maximum number of three; and

performing 3 out of 5 majority voting on the stored number of counted ones for each of the plurality of five bit repeats after all five bits of each five bit repeat have been

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received by detecting whether each number of counted ones is three or less than three.

The examiner relies on the following references:

Koike	4,132,975	Jan. 2, 1979
Brown et al. (Brown)	4,400,811	Aug. 23, 1983

Claims 37-52 stand rejected under 35 U.S.C. 103 as unpatentable over Koike in view of Brown.

Reference is made to the briefs and answer for the respective positions of appellants and the examiner.

OPINION

At the outset, we note that while appellants group the claims into claims 37-44 and claims 45-52, each to be treated as a separate group, appellants' arguments do not indicate a distinction. Accordingly, all claims will stand or fall together.

The examiner's apparent position is that Koike discloses a majority decision device that is 2/3 majority voting. That is, a data word is transmitted three times and each bit position is compared to a corresponding bit position in the other two transmitted words. If at least two 1's are indicated, that bit position is interpreted as a "1." If not,

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the bit position is interpreted as a "0." While Koike shows 2/3 majority voting, rather than 3/5 majority voting, it is the examiner's position that it would have been a "matter of design choice" for a majority decision device to perform either 2/3 or 3/5 voting, depending on the necessary degree of accuracy.

The examiner also recognized that Koike did not disclose the feature of counting up to a maximum number of three, the number of 1's present in each of a plurality of five bit repeats. However, the examiner points to Brown for a teaching of terminating a read process when a count exceeds a preset threshold.

The examiner concluded that it would have been obvious to modify Koike to use Brown's plurality of count and compare logics 32 with a value which is one-half of the repetition number, in place of the adder used in Koike.

Appellants argue that the instant invention is "completely different" from what is suggested by Koike and Brown because when the count of 1's or 0's has reached the majority value, which in the case of 5 repeats is 3, then the

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count which is stored in memory will remain unchanged in the instant invention. This is because once a majority value has been reached, a decision may be made irrespective of the subsequent bit repeats.

Appellants argue that, contrary to the examiner's contention, Brown does not state that the " J_M value...is one-half of the repetition number (page 5 of principal brief)." In fact, argue appellants, Brown "teaches away" from the claimed invention because Brown indicates that the specific value should be a "fairly high percentage" of M and the majority value (just over one half) is not the same as a "fairly high percentage."

We disagree with appellants that Brown "teaches away" from the instant invention. Brown actually states that " J_M is usually chosen to be a fairly high percentage of M, depending on the degree of detection confidence desired" (column 3, lines 44-46, emphasis added). Thus, Brown actually teaches that the value is determined by the acceptable degree of confidence. Artisans would have recognized that while a high degree of confidence would require a "fairly high percentage of M," in cases where a lower degree of confidence is

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acceptable, this value may be a much lower percentage of M, even one more than one half being acceptable as a majority value.

Moreover, in our view, Brown would be merely cumulative to the already general knowledge of skilled artisans that when one has reached a majority number and the majority is the number of interest in a particular field, there is no need to count further.

Appellants contend that the "memory reduction aspect of the present invention is not disclosed or suggested, by either Koike or Brown" (page 6 of principal brief). However, we agree with the examiner that Koike clearly discloses, at column 5, lines 5-10, that an advantage of Koike's device is that the "capacity of the shift register...can be greatly reduced..." Therefore, Koike does teach that the advantage of memory reduction is obtained. Appellants also argue that Brown is not directed to memory reduction at all. To whatever extent this may be true, it is not relevant since the examiner relies on Koike for this teaching. Even if, arguendo, the instant invention may reduce memory to a greater extent than does

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Koike, Koike does, indeed, concern itself with memory reduction and this would have been enough for the claims appearing before us in our decision of May 16, 1997. However, the instant claims before us on this appeal specifically state that the memory means is now "limited in size to storing a maximum number of three." That means that there can be no more than two bits of memory for each bit of the transmitted data word. Thus, the instant claims are limited to a specific quantity of memory reduction which is not taught or suggested by Koike and/or Brown. As argued by appellants, Koike, at pages 6-7 of the principal brief, appears to suggest, in the case of 3/5 majority voting, that three bits of memory are required. The examiner has no convincing argument to the contrary, arguing, at pages 3-4 of the answer, that, in Koike, two bits of memory for each bit of the word are sufficient to perform 3/5 majority voting because it is suggested that "the result of addition for each bit position is compared with one-half of the repetition number to determine whether it is a '0' or '1' (where $5/2=2.5$)(column 2, lines 35-42)" so that it would have been obvious that "the result of addition for each bit position is reach [sic] a value of '3', the 2 bits of

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memory is [sic] sufficient to store such a value '3' and would not change the result of the majority decision. This is because '3' is a majority of '5'." This argument is not persuasive in view of appellants' showing, mathematically, that Koike requires three bits of memory.

The examiner's decision is reversed.

REVERSED

KENNETH W. HAIRSTON)	
Administrative Patent Judge)	
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ERROL A. KRASS)	BOARD OF PATENT
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