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T 63/83

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79 103 386.3

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Bezeichnung der Erfindung:
Title of invention:
Titre de l'invention :

Method and apparatus for magnetic recording detection

Klassifikation / Classification / Classement :

G 11 B5/02

ENTSCHEIDUNG / DECISION
vom / of / du

3 June 1986

Anmelder / Applicant / Demandeur :

Burroughs Corporation

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence :

EPÜ / EPC / CBE

Article 56
"Inventive step"

Leitsatz / Headnote / Sommaire

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Case Number : T 63 /83

D E C I S I O N
of the Technical Board of Appeal 3 5.1
of 3 June 1986

Appellant : Burroughs Corporation
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Representative : Eisenführ und Speiser
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Decision under appeal : **Decision of Examining Division 067 of the European Patent Office dated 11.11.82 refusing European patent application No 79 103 386.3 pursuant to Article 97(1) EPC**

Composition of the Board :

Chairman : G. Korsakoff
Member : W. Oettinger
Member : P. Ford

Summary of Facts and Submissions

I. European patent application No. 79 103 386.3 filed on 11.09.79 claiming a priority of 18.09.78 and published under No. 10 155 was refused by a decision of Examining Division 067 dated 11.11.82.

II. The reason given for the refusal was that the subject-matter of Claim 1 filed on 14.07.82, even if - for reasons of completeness - including the features of Claim 2 filed the same day, lacked an inventive step having regard to prior art documents US-A-3 735 372 and 3 840 892.

III. The Applicant lodged an appeal against this decision on 12.01.83, also paying the appeal fee.

A statement setting out the grounds of appeal, and a new single claim, were filed on 12.03.83.

IV. In the course of the appeal procedure, the claim was redrafted on 03.10.85 and amended as stated in the communication of the Rapporteur dated 21.10.85.

V. The claim reads :

"A system for detecting information according to one of the non-return-to-zero formats recorded on a magnetic recording device having a high storage density such as a rotating floppy disk, including an apparatus for evaluating signals reproduced by a magnetic transducer (MH) comprising a linear amplifier (LA) whose input is connected to said magnetic transducer (MH) and whose output is connected to a positive input terminal of a positive threshold detector means (TA1) as well as to the negative input terminal of a negative threshold detector means (TA2) and with a differentiator means (DF), said positive threshold detector

means (TA1) giving a first threshold signal (PP) as long as a received signal (P) is greater than a first given voltage level (+V), said negative threshold detector means (TA2) giving a second threshold signal (PN) as long as a received signal (P) is less than a second given voltage level (-V), said signal differentiator means (DF) generating a derivative signal (DP) whose waveform is the time derivative of a received signal (P), further comprising a zero-crossing detector means (TA3) for giving a zero-crossing signal (Z, ZI) whenever the amplitude of the derivative signal (DP) passes through a predetermined voltage level, the polarity of the zero-crossing signal (Z, ZI) being determined by the direction of the passage of the derivative signal (DP) through the predetermined voltage level, and a bistable means connected to said zero-crossing detector means (TA3) and said threshold detector means (TA1, TA2) and comprising a first coincidence means (G1) having inputs connected to one of said threshold detector means (TA1) and said zero-crossing detector means (TA3), a second coincidence means (G2) having inputs connected to the other of said threshold detector means (TA2) and said zero-crossing means (TA3), and a gating circuit being connected to the output of each of said coincidence means (G1, G2) for providing an information corresponding to said information recorded on said magnetic recording device, said bistable means giving a signal (LPP) which switches from a first signal level to a second signal level at the coincidence of the zero-crossing signal (ZI) of a first polarity and the first threshold signal (PP),

characterized in that said gating circuit comprises

a first latch (L1) having a set input (S), a reset input (R) and an output (Q), the set input (S) of said first latch (L1) being connected to the output of one of said coincidence means (G1) which upon receipt of a signal triggers the first latch (L1) to a first state;

a second latch (L2) having a set input (S), a reset input (R) and an output (Q), the set input (S) of said second latch (L2) being connected to the output of the other of said coincidence means (G2) which upon receipt of a signal triggers the second latch (L2) to a second state;

a first one shot pulse generator (OS1) for connecting the output (Q) of said first latch (L1) to the reset input (R) of the second latch (L2);

and a second one shot pulse generator (OS2) for connecting the output (Q) of said second latch (L2) to the reset input (R) of said first latch (L1);

and the output (Q) of said first latch (L1) being the output of said gating circuit and said signal (LPP) provided by said bistable means switching back from the second signal level to the first signal level at the coincidence of the zero-crossing signal (Z) of a second polarity and the second threshold signal (PN)."

VI. According to the description (pages 2a/2b filed on 03.10.85) the problem to be solved by the claimed invention is to avoid irritating the self-clocking of the system and thus misinterpreting the read signal in the presence of spurious pulses, in particular of spurious pulses due to the "shouldering" effect occurring when the time between peaks exceeds a given interval.

VII. In a communication pursuant to Article 11(2) of the Rules of Procedure dated 03.03.86, the Rapporteur informed the Appellant of the Board's provisional opinion that the subject-matter of the claim lacked an inventive step having regard to prior art documents US-A-3 735 372, disclosing the appropriate starting point for the invention claimed, and US-A-4 016 599, disclosing the principal solution for the problem underlying the claimed invention, and the general knowledge about details of the circuit used for solving this problem, represented by "Sourcebook of Electronic Circuits" by J. Markus, McGraw-Hill, 1968, pages 231 to 239.

VIII. On the Appellant's request, oral proceedings were held on 03.06.86.

IX. In the oral proceedings the Appellant maintained that the subject-matter of the claim involves an inventive step. He argued essentially as follows :

Combining - in order to arrive at the invention claimed - a part of the circuit known from US-3 735 372 with a part of the circuit known from US-4 016 599 disregarding their particular functions would only be possible in a hindsight approach and therefore not acceptable.

The proper functioning of the downstream part (flip-flop 80) of the circuit of US-4 016 599 relies on the use of a (disadvantageous) delay line (20) in the upstream part of this circuit and its applicability with a different upstream part (US-3 735 372) is therefore not obvious.

Spurious pulses if occurring in the "wrong" input signal (G instead of H) to the flip-flop (80) of US-4 016 599 would not be eliminated.

X. The Appellant requested to cancel the decision under appeal and to grant a patent on the basis of the claim as on file.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 EPC and Rule 64 EPC and is, therefore, admissible.

2. The claim is based on former Claim 2 which itself is based on original Claim 7.

The amendments made are therefore admissible.

3. The subject-matter of the claim, while novel, does not however involve an inventive step.

4. An information detecting system according to the prior art portion of the claim is known from US-3 735 372, the output signals (F, I) of the gates (42, 44) of this known system containing spurious pulses as explained in Figure C filed with the Appellant's observations dated 20.08.85, the downstream part fed by these signals not being relevant to the case.

5. From US-A-4 016 599 it is known, for eliminating, from the same kind of output signals (G, H) of a circuit (10-70) to be used in a system of principally the same kind (cf. description), spurious pulses of the same origin and kind, to feed said output signals to the set and reset inputs repsectively of a flip-flop (80), i.e. of a bistable circuit which - as is generally known ("Sourcebook of Electronic Circuits" by J. Markus, pages 231-239) - usually

comprises a kind of "latch" (implemented by switching transistors) for each of the set and reset inputs, the output of each "latch" being cross-connected to the input of the respective other "latch" via some kind of "one-shot pulse generator".

6. Any restriction of the use of said flip-flop (80) of US-4 016 599 to the particular kind of circuit (including delay circuit 20) used ahead of it, is not seen, the only condition being that output signals of the same kind (G, H) containing spurious signals (such as in H), are delivered.

The Appellant's view that spurious pulses occurring in signal G would not be eliminated is not shared because it is held that the elimination of spurious pulses is, in any case, ensured by the inherent properties of the flip-flop with its (usual) cross-connection between its outputs and (reset) inputs.

The Board considers it therefore to be obvious to the person skilled in the art that, if the same problem caused by spurious pulses occurs in the system of US-3 735 372, he need only, in order to solve this spurious pulse problem, feed the corresponding output signals (F,I) of its gates (42, 44) to such a flip-flop (having said cross-connection).

7. This view takes account of the well-known functions and purposes of the prior circuits and relies only on those.

It cannot therefore - in the opinion of the Board - be regarded as based on a hindsight approach.

Order

For these reasons it is decided that :

The appeal is dismissed.

The Registrar

J. Rückerl

The Chairman

G. Korsakoff