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Bezeichnung der Erfindung:
Title of invention:
Titre de l'invention : Recording and/or reproducing apparatus with rotary head for recording and reproducing signals in a magnetic tape cassette.

Klassifikation / Classification / Classement : G11B 15/665

ENTSCHEIDUNG / DECISION

vom / of / du 12 July 1990

Anmelder / Applicant / Demandeur : Sony Corporation

Patentinhaber / Proprietor of the patent / Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Art. 56

Schlagwort / Keyword / Mot clé : "Inventive step (no)"

Leitsatz / Headnote / Sommaire

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Case Number : T 421/89 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 12 July 1990

Appellant : Sony Corporation
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Representative : Purvis, William Michael Cameron et al.
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Decision under appeal : Decision of Examining Division 067 of the European Patent Office dated 10 February 1989 refusing European patent application No. 86 301 040.1 pursuant to Article 97(1) EPC

Composition of the Board :

Chairman : P.K.J. van den Berg
Members : W. Riewald
E. Persson

Summary of Facts and Submissions

I. European patent application No. 86 301 040.1, claiming priority from an application in Japan, of 14 February 1985, was filed on 14 February 1986.

The application was refused by a decision of the Examining Division dated 10 February 1989.

The decision was based on Claims 1 to 28 filed on 19 August 1988. The reason given for the refusal was that the claimed subject-matter lacked an inventive step having regard to the prior art known from the following documents:

D1: US-A-4 126 888
D2: EP-A-0 083 932
D3: GB-A-2 140 960.

The Examining Division considered that D1 represented the closest prior art, that the claimed form of paths for the movable members resulted readily from an obvious choice of a tape wrap angle and that the claimed tilt direction of the head drum is a parameter already known from both D2 and D3.

II. The Applicant filed a notice of appeal on 7 April 1989 by telex which was confirmed by letter received on 11 April 1989. The appeal fee was paid on 7 April 1989. A statement of grounds of appeal was received on 15 June 1989 together with a new set of claims and amendments to the description.

In a communication dated 23 October 1989, the Rapporteur expressed doubts in respect of inventive step and stated that there appeared to be no possibility to allow the appeal.

In answer to that, the Appellant, with letter dated 27 February 1990, made a minor amendment to Claim 1 and deleted Claims 9 to 18 indicating that he was filing on the same day a divisional application with corresponding claims. Claims 19 to 28 of the present application were renumbered as 9 to 18 and amendments were made to the description.

The Appellant's request to set aside the Examining Division's decision and to grant the patent is, therefore, based on the thus amended application documents.

III. The independent Claim 1 reads as follows:

"Recording and/or reproducing apparatus (1) for a magnetic tape cassette (131), comprising:

first means for receiving the magnetic tape cassette (131) drivingly to cooperate therewith;

a rotary head means (6) to perform recording and/or reproducing signals on the magnetic tape (135) of the cassette (131);

second means (28) for extracting a length of the magnetic tape from the magnetic tape cassette (131) and moving said length of magnetic tape to various positions corresponding to various operation modes of the recording and reproducing apparatus, the second means including first (23) and second (24) movable members respectively movable along predetermined first (16) and second (17) paths and a mechanical chassis (2) mounting the rotary head means (6) thereon and defining the first (16) and second (17) paths for the first (23) and second (24) members, the first (16) and second (17) paths being of

different lengths with the second path (17) longer than the first path (16) and with the paths (16) and (17) each formed to extend in a respective substantially straight line so that the motion of the first (23) and second (24) movable members along the respective first (16) and second (17) paths is substantially straight line motion;

third means for mounting the rotary head means (6) on the recording and/or reproducing apparatus such that an axis of rotation of the rotary head means (6) lies oblique (α) to a vertical axis in such a manner that first ends of the first (16) and second (17) paths lie adjacent the rotary head means in a plane extending through the uppermost point (6U) and the lowermost point (6L) of a top surface of the rotary head means (6), and proximal to the first means, whereby the difference between the lengths of the first (16) and second (17) paths can be minimized, the third means mounting the rotary head means (6) in such a manner that the axis of the rotary head means lies oblique to the vertical axis such that the vertical plane extending through the uppermost point (6U) and the lowermost point (6L) of the top surface of the rotary head means (6) lies oblique (β) to a reference line (A-A) connecting the reel axes of a pair of tape reels (533) in the magnetic tape cassette (131) and the rotary head means (6) is disposed at an off-set position from the longitudinal axis of the mechanical chassis, that is to say the perpendicular bisector of the reference line (A-A); and

fourth means for driving the recording and/or reproducing apparatus through various modes of operation, the fourth means actuating the second means (28) so as to shift the first (23) and second (24) members along the first (16) and second (17) paths to an extent in accordance with the operational mode of the recording and reproducing apparatus."

IV. The Appellant's arguments can be summarised as follows:

Nowhere in the prior art is there a disclosure or even a suggestion of the combination of features set out in Claim 1 which gives the advantageous result of the invention, such combination comprising essentially;

1. Substantially straight line paths of different lengths;

2. Path ends on either side of the rotary head means lying on a vertical plane which extends through the uppermost point and the lowermost point of the top surface of the rotary head means oblique to a reference line connecting the reel axes; and

3. The rotary head means disposed at an offset position from the longitudinal axis of the mechanical chassis, i.e. from the perpendicular bisector of the line connecting the reel axes.

The substantially straight path construction is not disclosed in any of the citations which disclose path constructions which are much more complicated.

D1 discloses a rotary head position offset from the longitudinal axis of the mechanical chassis according to item 3 but not the oblique positioning of the path ends according to item 2.

D2 discloses an oblique positioning of the path ends on either side of the rotory head means in relation to the reference line connecting the reelaxes but not the offset position of the rotary head.

Reasons for the Decision

1. The appeal is admissible.

2. **Novelty**

2.1 Document D1 can be considered as disclosing the closest prior art:

The recording and/or reproducing apparatus for a magnetic tape cassette (1) comprises:

- first means for receiving the magnetic tape cassette drivingly to co-operate therewith (column 3, lines 3 to 33);
- a rotary head means to perform recording and/or reproducing signals on the magnetic tape (column 1, lines 5 to 13);
- second means for extracting a length of the magnetic tape from the magnetic tape cassette and moving said length of magnetic tape to a position corresponding to an operation mode of the recording and reproducing apparatus (column 1, lines 13 to 19);

- the second means including first and second movable members (tape lead-out mechanisms I and II) which are respectively movable along predetermined first and second paths (guide grooves 19,19');
- a mechanical chassis (base plate 10) mounting the rotary head means (13) thereon and defining the first and second paths for the first and second members;
- third means for mounting the rotary head means (13) on the recording and/or reproducing apparatus such that the axis of rotation of the rotary head means lies oblique to a vertical axis (Figure 14) in such a manner that first ends of the first and second paths lie adjacent

the rotary head means and that second ends lie proximal the first means, the rotary head means being disposed at an offset position from the longitudinal axis of the mechanical chassis;

- fourth means for driving the recording and/or reproducing apparatus that actuate the second means so as to shift the first and second members (tape lead-out mechanisms I and II) along the first and second paths to an extent in accordance with the operational mode of the recording and reproducing apparatus.

2.2 D1 recites, besides the unloaded position of the tape lead-out mechanism only one further position for the operating mode in which the tape is wound around a section of the head cylinder (column 3, lines 33 to 38; column 4, lines 53 to 55 and column 7, lines 11 to 20). But it is common teaching that usual operating modes must be taken into account and may entail various magnetic tape positions (see e.g. D3, page 8, lines 65 to 76).

2.3 The remaining features in Claim 1 on which the Appellant based his arguments are the following:

- the first and second paths for the first and second members are of different lengths with the second path longer than the first path and with the paths each formed to extend in a respective substantially straight line so that the motion of the first and second movable members along the respective first and second paths is a substantially straight line motion;

- the third means mounts the rotary head means in such a manner that the axis of the rotary head means lies oblique to the vertical axis such that the vertical plane extending through the uppermost point and the lowermost point of the top surface of the rotary head

means lies oblique (ß) to a reference line (A-A) connecting the reel axes of a pair of tape reels in the magnetic tape cassette.

2.4 Recording and/or reproducing apparatuses with the first and second paths being of different lengths and the rotary head means apparently being mounted with its axis at an angle ß as defined above are known per se from the documents D2 and D3. However, in both cases, at least one of the paths for the movable members is not substantially straight (D2, Figure 1: slot 87, Figure 8: slots 285 and 311; D3: guide groove 91).

2.5 The subject-matter is therefore novel.

3. **Inventive step**

3.1 The design of the paths provided for the first and second members for moving the extracted length of magnetic tape into contact with the rotary head means depends, as clearly understandable from the prior art, essentially on two preconditions:

- the tape wrap angle (which, if large, requires that the movable members are partially led around the rotary head means) and

- the position of the magnetic tape cassette relative to the rotary head means.

In the present case, the additional features cited above (point 2.3), can be regarded as ensuing from the following two modifications of the apparatus disclosed in D1:

(1) Whereas the Figures of D1 disclose a wrap angle of the magnetic tape (4) round the rotary head means

(13) of about 180°, the embodiment of the present application is apparently adapted for a tape wrap angle of considerably less than 180° (e.g. about 90°) which obviously has the effect that the paths become more straight (a similar conclusion can be drawn from the apparatus shown in Figure 8 of D2).

(2) In both cases (D1 and the present application), the rotary head means is disposed at an offset position from the perpendicular bisector of a reference line connecting the reel axes of the tape reels in the magnetic tape cassette. However, according to D1, the front ends of the paths (guide grooves 19,19') for the movable members are correspondingly offset, so that there is a symmetrical arrangement of the paths with respect to the rotary head means. In contrast to this, the present application discloses an embodiment in which the said front ends of the paths are only slightly offset from a position symmetrical to the said perpendicular bisector connecting the reel axes, which leads to an out-of-line allocation of the rotary head means in respect of the said front ends of the paths.

Both modifications fall within the range of the normal discretion of a skilled person. There is no principal restriction in the choice of any possible tape wrap angle within the range of a full circumference of the rotary head means. The disposition of the front ends of the paths for the movable members must be adapted to the necessity that the movable members must take up the tape from the cassette at points which are not too much offset from the said bisector.

The Board is satisfied that the skilled person would have no difficulties to adapt the different means of the

recording and/or reproducing apparatus known from D1 (Fig. 1) to the said modifications and thus to arrive at a subject-matter with the features of Claim 1. He only needs to shorten the guide grooves (19,19') in accordance with the envisaged smaller tape wrap angle and, when shifting the front ends of the guide grooves somewhat to the right, i.e. to the said bisector (longitudinal axis of the mechanical chassis), to jointly rotate the orientation of the plane extending through the uppermost point and the lowermost point of the top surface of the rotary head means at an angle ß as defined in the claim, in order to minimise the ensuing difference between the lengths of the guide grooves. The Examining Division was right in drawing attention to the documents D2 and D3 which show already possibilities of modified tilt directions of the head drum. Notwithstanding the fact that these documents show the application of such possibilities in connection with clearly different path lengths (D2, Fig. 1; D3, Fig. 1 and 2), the Board takes it as a mere workshop modification of embodiments with paths of substantially equal lengths (D1; D2, Fig. 8) to apply the same concept of modifying the tilt direction of the head in order to avoid great differences in the path lengths.

3.2 Thus, Claim 1 is not allowable because its subject-matter is considered not to involve an inventive step within the meaning of Article 56 EPC.

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

P. Martorana P.K.J. van den Berg