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Beschwerdekammern | Boards of Appeal | Chambres de recours

T140

Case Number: T 46 / 82

DECISION

of the Technical Board of Appeal 3.2.1

of 19 March 1984

Appellant: EATON CORPORATION
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Cleveland Ohio 44114 (US)

Representative: Scherrmann Walter
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Decision under appeal: Decision of Examining Division 116 of the European Patent Office dated 27 October 1981 refusing European patent application No 79 103 679.1 pursuant to Article 97(1) EPC

Composition of the Board:

Chairman: G. Andersson
Member: P. Ford
Member: K. Schügerl

The ground for refusal was that the subject matter of claim 1 did not involve an inventive step, having regard to the professional knowledge of the skilled person. In its decision, the Examining Division referred to the following prior art documents:

US-A-3 924 484 (1)
US-A-3 983 979 (2) and
US-A-3 265 173 (3)

hereinafter referred to citations (1), (2) or (3) respectively.

II. Against that decision, the appellant lodged an appeal on 2 December 1981 with payment of the appeal fee. The statement setting out the grounds of appeal was received in due time.

The appellant argued that the special conditions and the operation of blocked transmissions are markedly different from the conditions in other systems (syncronised transmissions, non-blocked, non-synchronised transmissions according to citation (3)), so that the subject matter of claim 1 was not obvious to the skilled person having regard to the state of the art.

The appellant requested cancellation of the decision and grant of the patent, with amendments if necessary.

III. In the course of the preliminary study of the appeal, the rapporteur drew the appellants attention to some inconsistencies in the description and the drawings. The appellants submitted finally a new page 10 of the description, a new sheet of the drawings (figures 3-9)

and requested omission of certain passages in the description and correcting some clerical errors.

REASONS FOR THE DECISION

1. The appeal complies with Articles 106-108 EPC and with Rule 64 EPC; it is therefore allowable.

2. Some amendments requested by the applicant are intended to correct errors of transcription and mistakes in the description and the drawings. These corrections are obvious in the sense that it is immediately evident that nothing else would have been intended other than what is offered as the correction (Rule 88 EPC). The remaining amendments are necessary in order to harmonise the description with the wording of the claims now on file (Rule 27(1)(d) in combination with Rule 36(1) EPC). Further, the amendments are in conformity with Article 123(2) EPC. They are therefore allowable.

3. As stated in the description, page 7, lines 12-25, the known speed transmissions of the blocked jaw clutch type (citations (1) and (2)) suffer from the disadvantage that the leading edges or tips of the interengageable clutch teeth can become damaged. This observation forms the starting point; the problem to be solved by the invention may be defined as the substantial reduction or elimination of such damage.

4. The more specific problem "to maximise the initial axial penetration of the clutch teeth" is already the result of a substep on the way leading from the state of the art to the solution. Indeed, the description

states page 7, line 12 "applicants have discovered that .... the period of time .... was insufficient for the clutch teeth .... to sufficiently axially penetrate". Since the documents (1),(2) and (3) do not contain any corresponding pointers, the fact that the aforementioned discovery is new has to be accepted as such and duly considered in assessing inventive step.

5. Starting therefore from the actual problem defined in para. 3, the question has to be answered whether the skilled person, faced with that problem and having regard to the state of the art, could find the claimed subject-matter. In the normal synchronised transmissions, the clutch members are maintained in synchronised condition by the synchroniser clutch (description of the application page 8, line 33). Under these conditions, a crossing of the state of synchronism and, consequently, a short time interval during which the engagement of the clutch members has to be brought about, does not exist. In the absence of any indications concerning the backlash in such synchronised transmissions in the available documents, the applicant's assertion (description, page 8 line 33) that in such transmissions "increased backlash might result in marginally undesirable operating characteristics without providing a needed benefit" can be accepted. Consequently, the state of the synchronised transmissions art cannot be said to suggest to the skilled person increased backlash as a means to eliminate the disadvantage of damaged tips.

6. In another known type of transmission, the non-synchronised non-blocked transmission, a sliding of the tips of the interengaging teeth occurs during the shifting process together with a reciprocating axial movement.

These movements are more or less irregular and difficult to determine in detail; the result however, is to bring the cooperating parts gradually closer to synchronism, so that at a given moment the operator can bring about the final axial penetration and thus engage the gears. The appellant submits that in such a transmission the skilled person would follow the general rule that the greater the backlash, the greater the impact of the teeth due to engagement in a stage of incomplete synchronisation and, therefore, the greater the risk of wear and damage of the cooperating parts. This submission is clearly correct.

7. Citation (3), which is directed to such a non-blocked non-synchronised transmission, discloses, first, a special configuration of the tips in order to facilitate the entry of the teeth and to minimise clashing, hammering and wear (see col. 3, line 50), and, secondly, the refinement of increasing the circumferential teeth clearance, such increased clearance being said to further minimise the shifting time and the tooth hammering (claim 6, line 43). The stated aim of such an increased clearance is therefore to improve the conditions during the stage of establishing the necessary synchronism for the engagement of the clutch.

The skilled person, on reading citation (3), will therefore assume that the benefits to be gained from an increased clearance are linked to the specific conditions to be encountered in the before-mentioned stage.

8. Indeed, the wear in a device described in citation (3) has to be attributed to the irregular axial movements. There being no such movements in a transmission according to the application, the skilled person would presume that the remedy against wear described in citation (3) is inoperative in the case in hand. It is only after having perceived the idea - not disclosed nor suggested in the available documents - that the wear in the present case is due to imperfect axial penetration, that the known means could acquire relevance. Since this idea has to be regarded as new, the question whether it would have been obvious or not to improve axial penetration with regard to citation (3) or by applying elementary engineering principles need not be discussed here.

9. Similarly, considerations concerning the numerical values of the backlash are superfluous, since the basic underlying principle has to be regarded as inventive in character and the figures serve only to define this basic principle in an appropriate way.

10. To sum up, the subject matter of claim 1 is the result of a perceptive analysis of the facts and of applying a purposeful imagination to the solution of the real problem, both lying beyond the level to be attributed to the average skilled person. Claim 1 and the dependent claim 2 are therefore allowable pursuant to Article 52(1) and Article 56 EPC

11. No application has been made for reimbursement of the appeal fee (Rule 67 EPC). It is considered that the circumstances of the case would not justify a reimbursement.

Order

For these reasons,

it is decided that:

the decision of the Examining Division 116 dated 27 October 1981 is set aside.

The case is remitted to the first instance with the order to grant a European patent on the basis of the following documents:

Description as published, pages 1-9 and 11-28 with the following amendments:

page 5, line 14: "Radom" should read "Random",
page 7, line 23: "demage" should read "damage",
page 8, lines 6 to 12: The sentence beginning with "The above is accomplished ..." and ending with "... ten times greater than normal back-lash" should be deleted,
page 9, lines 11 to 22: The whole paragraph should be deleted,
page 13, line 10: After "clutch" a full stop should be inserted,
page 13, lines 11 and 12: The part of the sentence beginning with "and is ..." and ending with "... jaw clutch structure" should be deleted,
page 16, line 26: "convential" should read "conventional",
page 25, line 26: "of" (last word of the line) should be replaced by "in",
page 25, line 27: "about" should be replaced by "the range of",
page 27, lines 14 to 18: The sentence beginning with "By providing a ... and ending with "... come into contact" should be deleted.

Description, page 10, received on 4 June 1983,
Claims 1 and 2, received on 4 September 1981
Drawings, figs. 1 and 2 as originally filed,
Drawings, figs. 3-9 received on 1 April 1983.

The Chairman: The Registrar: