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BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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File Number: T 34/91 - 3.2.1

Application No.: 83 902 897.4

Publication No.: 0 118 520

Title of invention: Self-adjusting clutch mechanism

Classification: F16D 13/75

D E C I S I O N
of 18 May 1992

Proprietor of the patent: Hoyle, Edgar

Opponent: Acco Cable Controls Ltd.

Headword:

EPC Article 56

Keyword: "Inventive step (no)"

Headnote

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number : T 34/91 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 18 May 1992

Appellant : (Opponent)
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Decision under appeal :
Decision of Opposition Division of the European Patent Office dated 5 November 1990, and posted on 5 December 1990, rejecting the opposition filed against European patent No. 0 118 520 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : F. Pröls
Members : S. Crane
J.-C. de Preter

Summary of Facts and Submissions

I. European patent No. 0 118 520 was granted on 25 January 1989 on the basis of European patent application No. 83 902 897.4 filed on 14 September 1983.

Claim 1 of the granted patent reads as follows:

"An engine clutch control mechanism incorporating a flexible remote control cable comprising an inner member (1, 26, 50), (hereafter called "core"), longitudinally displaceable within a conduit (2, 27, 51), and incorporating an abutment (5, 29, 52), located adjacent the cable control near one end of the conduit (2, 27, 51), via which load on the conduit can be transmitted to a fixture (4, 53), and a conduit-anchoring device (13, 34, 42, 55) having at least one tooth (17, 39) which under a displacement force exerted on said device during an initial part of each clutch-disengaging stroke of the core moves into intermeshing relationship with co-operating projections (18) thereby to anchor the said one end of the conduit against axial displacement relative to said abutment (there being a series of such projections extending along at least part of the conduit so as to afford a succession of adjustment positions), said device (14, 34, 42, 55) becoming automatically returned to conduit-release position as the pedal or other actuating member approaches the end of its return (clutch-engaging) stroke, thereby to allow change in the effective length of the cable control to take place under any residual loading of the cable by the clutch-return spring; characterised in that there is means (12, 20, 24-25, 37-30, 44-46-48-30) forming a yielding coupling between said conduit-anchoring device (13, 34, 42, 55) and the core (1, 26, 50), which coupling services during an initial part of a clutch-releasing stroke of the core to transmit force from the

core to the said conduit-anchoring device (13, 34, 42, 55) thereby to cause said displacement thereof into conduit-anchoring position, whereafter said coupling yields to allow said clutch-disengaging stroke of the core (1, 26, 50) to continue while the conduit (2, 27, 51) remains anchored by said conduit-anchoring device."

Dependent Claims 2 to 14 relate to preferred embodiments of the mechanism according to Claim 1. Claim 15 is directed to a vehicle fitted with a mechanism according to any one of Claims 1 to 14.

II. The patent was opposed by the Appellants on the grounds inter alia that its subject-matter lacked novelty and/or inventive step with respect to the state of the art. Among the prior art documents referred to were:

(D1) GB-A-2 016 634
(D3) EP-A-55 649
(D4) EP-A-48 620.

III. By its decision taken at oral proceedings on 5 November 1990, and issued in written form on 5 December 1990, the Opposition Division rejected the opposition.

In the decision, Document D3 was identified as constituting the closest state of the art, the subject-matter of Claim 1 being distinguished therefrom in that the balls-and-cone like conduit-anchoring device had been replaced by one having at least one tooth which engaged with projections on the conduit. Nothing in the state of the art would lead the skilled man to make this modification.

IV. The appeal against this decision was filed on 28 December 1990, the appeal fee having been paid on 18 December 1990. The Statement of Grounds of Appeal was filed on 3 April 1991.

The Appellants requested that the patent be revoked in its entirety.

V. In a communication of the Board dated 11 November 1991 pursuant to Article 11(2) RPBA the Board indicated that the introductory description of Document D1, in which the relative merits of a balls-and-cone coupling and a toothed coupling were discussed, could be of significance to the question of inventive step.

VI. Oral proceedings were held on 18 May 1992.

VII. The arguments put forward by the Appellants in support of their request can be summarised as follows:

In the last paragraph of the description of Document D3 it was stated that alternatives to the balls-and-cone conduit-anchoring device could be envisaged, provided these had a wedging action proportional to the force applied to the core and conduit of the control cable. Toothed couplings were well known in this context as witnessed by Documents D1 and D4. The Respondent had in fact recognised this by placing the relevant features in the preamble of the claim. Accordingly the skilled man would recognise this statement in Document D3 as implicitly referring to such toothed couplings with the result that this document completely anticipated the subject-matter of Claim 1 of the patent.

However, even if novelty were to be recognised, then the subject-matter of Claim 1 lacked inventive step. The

skilled man would be encouraged by the above statement in Document D3 to consider other forms of conduit-anchoring device rather than the balls-and-cone device particularly described there. Document D1 contained a clear statement of the advantages associated with a toothed coupling over one of the balls-and-cone type in a cable control mechanism with adjustment of the effective length of the core. The same considerations applied to a mechanism as claimed where the effective length of the conduit was adjusted and a toothed conduit-anchoring device had furthermore already been proposed in this context by Document D4.

The claimed advantageous effect that only initial partial engagement of the teeth on the anchoring device and on the conduit need be provided by the yielding coupling was dependent on the anchoring device being subjected to a wedging action, which features did not appear in granted Claim 1. In any case similar considerations applied to the balls-and-cone device of Document D3.

The mechanism according to Document D3 had, in contrast to the assertions of the Respondent, been a commercial success. The fact that the company making these mechanisms had only some time after publication of the application on which the present patent was based switched to a toothed conduit-anchoring device had a commercial rather than a technical background and was of no relevance to the evaluation of inventive step.

VIII. The arguments presented in reply by the Respondent (Proprietor of the patent) were in essence as follows:

The mechanism shown in Document D3 had not operated reliably and had not been a commercial success. The Respondent had recognised that the reason for this was

that the force available from the yielding coupling between the core and the balls-and-cone conduit-anchoring device was insufficient to ensure proper engagement of that device which relied for its operation on frictional forces. With a toothed device positive partial engagement was achieved between the device and the conduit on initial movement of the device by the core, and thereafter full intermeshing occurred automatically due to the reaction movement of the conduit. The force required to be transferred from the core to the conduit-anchoring device could therefore be kept to a minimum which was advantageous in operation of the mechanism.

In Document D4 toothed collets were used for anchoring the conduit but these collets were not associated with a yielding coupling as in the invention claimed. Instead, they were spring-urged to a conduit-anchoring position and released to move under the action of the spring on operation of the cable control mechanism. This mechanism therefore operated on a different principle to that claimed and accordingly could give no incentive to the skilled man to replace the balls-and-cone conduit-anchoring device of Document D3 by one having teeth.

In the cable control mechanism of Document D1 wear compensation was effected by adjusting the effective length of the core and not of the conduit so that it was of a basically different type to that claimed. All of the force applied to the operating lever of the mechanism was available for moving toothed members displaced longitudinally by that lever into engagement with the core and these toothed members then transferred the force from the lever to the core. There was therefore nothing here which could influence the skilled man in his choice of conduit-anchoring means since the technical problem involved was entirely different.

An indication for the inventive step associated with the claimed mechanism was that it had been a commercial success whereas the mechanism of Document D3 had not. Furthermore, it had taken five years of development before the company associated with Document D3 had come to the same conclusion as the Respondent and replaced the balls-and-cone device with a toothed device, as could be seen from its subsequent European patent application under EP-A-196 931, and this despite it necessarily having been aware of Document D4, which derived from a sister company.

Accordingly the Respondent requested that the appeal be rejected and the patent maintained in granted form.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC; it is therefore admissible.

2. State of the art

It is well known that flexible cable control mechanisms can be adjusted by changing the effective length of either the conduit or the core of the mechanism. Arrangements for automatically effecting such adjustment, in particular to compensate for the wear of a clutch or brake controlled by the mechanism, are also well known in the art.

Thus, Document D3 proposes an engine clutch control mechanism wherein the conduit is divided into two sections each of which has one end abutting a respective fixture, the other end portions of the sections being capable of

telescoping with respect to each other. Between these end portions of the conduit sections there is located a set of balls which engage the outer surface of the inner conduit section and and inner surface of the outer conduit section. The balls are mounted in a cage that has a part in frictional engagement with the core of the mechanism. When force is applied to the core to operate the clutch the cage moves the balls so that these engage a frusto-conical part of the inner surface of the outer conduit section and the ensuing wedging action clamps the two conduit sections together.

The wear compensation arrangement shown in Document D4 also operates to adjust the effective length of the conduit. In this arrangement one end of a section of the conduit is provided with a series of projections which on operation of the clutch are engaged by a set of toothed collets. These collets have an outer wedge surface which cooperates with a corresponding wedge surface of an opening in a fixture. The collets are urged by a spring towards their conduit-anchoring position and in the normal rest position of the mechanism are held out of engagement with the projections on the conduit by a sleeve associated with the operating lever of the mechanism.

In the clutch control mechanism according to Document D1 wear compensation is performed by adjusting the effective length of the core of the flexible cable control. A sleeve member, through which force is inputted to the mechanism, is formed at one end with a set of fingers which surround a toothed end section of the core. The free end of each of the fingers has a toothed inner surface and a wedge-shaped outer surface. When the sleeve is displaced to operate the clutch these wedge-shaped outer surfaces engage the inner surface of a housing member to move the fingers radially

inwardly and engage their teeth with the teeth of the core.

3. Novelty

The Board cannot accept the contention of the Appellants that the disclosure of Document D3 destroys the novelty of the subject-matter of Claim 1 of the granted patent. The general statement at the end of the description of Document D3 that other forms of anchoring device may be envisaged provided that they operate on the same basic principle as the balls-and-cone device specifically disclosed teaches the skilled man no more than what it literally says. It is the well-established practice of the Boards of Appeal and of the EPO in general that when considering novelty it is not correct to interpret the teaching of a prior art document as embracing well-known equivalents which are not disclosed in that document.

It is also apparent from the above discussion of the disclosures of Documents D1 and D4 that these do not anticipate the subject-matter of Claim 1 of the granted patent.

4. Inventive step

In the course of pre-grant examination proceedings Claim 1 was, at the behest of the Examining Division, drafted in two-part form taking as the basis for its preamble the disclosure of Document D4, even though, in an earlier communication, the Examining Division had clearly identified Document D3 as constituting the most relevant state of the art. In the proceedings before the Opposition Division the question of inventive step was however at all times considered on the basis that Document D3 represented the most appropriate starting part.

The Board concurs with this view. As can be seen from the above discussion of Document D3, the mechanism disclosed there comprises all of the features of the characterising clause of granted Claim 1 and the claimed subject-matter is distinguished from this mechanism in that the conduit-anchoring device has at least one tooth which under a displacement force exerted on the device during an initial part of each clutch-disengaging stroke of the core moves into intermeshing engagement with cooperating projections on the conduit, there being a series of such projections extending along at least a part of the conduit. In this context it is to be noted that the "abutment" required by Claim 1 is constituted in this state of the art by that end portion of one conduit section which surrounds the end portion of the other conduit section, the force applied to that end portion being transferred to the fixture via the relevant conduit section itself. The Respondent has not disputed this interpretation.

In relation to the state of the art according to Document D3 the technical problem solved by claimed invention is to be seen in the provision of a clutch control mechanism with high efficiency and reliability which can nevertheless be manufactured at reasonable cost.

Once the skilled man has established that the mechanism of Document D3 does not always function adequately he will investigate the reasons for this and inevitably be led to the conclusion that it is due to the clamping forces generated by the balls-and-cone anchoring device being insufficient. Having regard in particular to the statement at the end of the description of Document D3 he will be encouraged to seek another form of anchoring device which will give better performance. In the introductory description of Document D1 reference is made to a prior

art assembly in which, for wear compensation purposes, a balls-and-cone coupling device is used to transfer force between two sections of a control linkage. It is then stated that the assembly is relatively complex and that because of the frictional forces involved and wear of the surfaces which co-operate with the balls, correct operation is not assured. Accordingly Document D1 proposes the use of a toothed coupling of the form discussed in point 2 above. Thus this document gives a clear teaching to the skilled man concerned with the technical problem identified above to replace the balls-and-cone anchoring device of Document D3 by an anchoring device which engages the conduit by means of intermeshing teeth. That there existed no technical prejudice against, or difficulties associated with, the provision of the necessary projections along a length of the conduit and the use of a toothed anchoring device can be seen from Document D4.

The Respondent has argued that in contrast to the mechanism claimed the teeth of the coupling according to Document D1 are forced into full engagement by the wedge surfaces and held in this position. This is correct. The Board can however not accept that for this reason the skilled man would disregard the information contained in Document D1 about the merits of the positive engagement given by a toothed coupling device with respect to one of the balls-and-cone type, since this information is of a general character. Furthermore, the special effect put forward by the Respondent as being associated with the use of a toothed anchoring device in the mechanism claimed, that is that the yielding coupling only needs to cause initial engagement of the teeth with the conduit whereafter movement of the conduit completes the engagement and effects anchoring, is in fact no different to the way in which a balls-and-cone anchoring device in principle operates. Thus, once initial movement of the

ball cage engages the balls with the outer conical surface further movement of the conduit will by friction drive the balls further up the conical surface and increase the anchoring force accordingly to a level at which further movement of the conduit is impeded. All that the teeth on anchoring device and conduit ensure is that the movement of the conduit is transferred without frictional slip to the anchoring device. In any case, as pointed out by the Appellants, the features necessary for achieving this alleged special effect are not stated in Claim 1.

Accordingly, the Board cannot recognise any inventive step in the subject-matter of Claim 1 of the granted patent.

The further arguments presented by the Respondent with regard to commercial success and alleged subsequent imitation of the claimed subject-matter are not such as to call the above conclusion into question. Even if, as is denied by the Appellants and not supported by any evidence, the mechanism of Document D3 had not been a commercial success whereas that of the patent had been, there is no indication that this success was directly related to the features specified in Claim 1. Furthermore, the reasons why the proprietors of Document D3 proposed at a later date (see EP-A-196 931) an alternative to the balls-and-cone couplings involving a toothed anchoring device cannot be ascertained and could, as argued by the Appellants, have as much to do with commercial considerations as technical ones.

5. Since the Board is bound by the single request of the Respondent that the patent be maintained unamended, the remaining Claims 2 to 15 do not fall to be considered.

Order

For these reasons, it is decided as follows:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

S. Fabiani F. Pröls