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Datasheet for the decision of 17 June 2008

Case Number: T 1435/05 - 3.2.01

Application Number: 01204148.9

Publication Number: 1201972

IPC: F16H 61/28

Language of the proceedings: EN

Title of invention:
Control device for a synchromesh-type transmission

Patentee:
AISIN AI Co., Ltd.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 123(2)

Relevant legal provisions (EPC 1973):
EPC Art. 84

Keyword:
"Extension of subject-matter (yes)"
"Clarity (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 1435/05 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 17 June 2008

Appellant: AISIN AI Co., Ltd.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 6 May 2005 refusing European application No. 01204148.9 pursuant to Article 97(1) EPC 1973.**

Composition of the Board:

Chairman: S. Crane
Members: P. L. P. Weber
G. Weiss

Summary of Facts and Submissions

I. The appeal is against the decision of the Examining Division posted on 6 May 2005 to refuse the patent application primarily because of infringement of Article 123(2) EPC.

In particular the feature of the characterising portion that the drive component in the shift direction is terminated by the actuator when the movement in the select direction is detected, was considered not supported by the originally filed application documents.

The notice of appeal was filed on 6 July 2005 and the appeal fee paid on the same day. The statements of the grounds of appeal were filed 15 September 2005.

II. Oral proceedings were held on the 17 June 2008.

The appellant requested that the decision be set aside and a patent be granted on the basis of claims 1 to 7 according to the main request or alternatively, on the basis of claims 1 to 6 according to the auxiliary request both filed during the oral proceedings.

III. Claim 1 according to the main request reads as follows:

"1. A control device for a synchromesh-type transmission, the device comprising :

a plurality of axially movable shift fork shafts (10/13/16 or 40/40/40) arranged in parallel with one another, each shift fork shaft carrying a pair of shift heads (11/12; 14/15; 17/18 or 40a/40a; 40a/40a; 40a/40a)

which are engageable by an inner lever (26 or 41a) of a shift and select means (20 or 41/42) movable in a shift gate;

the inner lever (26 or 41a) being carried by the shift and select means (20 or 41/42) and being positionable in the shift gate between selected pairs of shift heads (11/12; 14/15; 17/18 or 40a/40a; 40a/40a; 40a/40a) mounted on the shift fork shafts (10/13/16 or 40/40/40) based on a select movement of the shift and select means (20 or 41/42),

the inner lever (26 or 41a) moving in a first shift direction from any of a range of neutral positions to a first shift stage position and thereby coming into contact with one of the shift heads to effect shift movement thereof based on a shift movement of the shift and select means (20 or 41/42) in the first shift direction, and the inner lever returning from the first shift stage position to a first neutral position (S1) at which it is released from the one shift head based on a return shift movement of the shift and select shaft means (20 or 41/42)

and the inner lever (26 or 41a) moving in a second shift direction opposite to the first from any of the range of neutral positions to a second shift stage position and thereby coming into contact with another of the shift heads to effect shift movement thereof based on a shift movement of the shift and select means (20 or 41/42) in the second shift direction, and the inner lever returning from the second shift stage position to a second neutral position (S2) at which it is released from the other shift head based on a return

shift movement of the shift and select shaft means (20 or 41/42),

the first and second neutral positions (S1 and S2) defining the limits of the said range of neutral positions;

actuator means (25 or 43/44) for controlling the shift movements and the select movements of the shift and select means (20 or 41/42);

control means (35 or 45) for controlling the actuator means (25 or 43/44) and thus the shift and return shift movements of the shift and select means (20 or 41/42); and

movement measuring means (31/32 or 47/48) for monitoring the shift movement and the select movement of the shift and select means (20 or 41/42);

characterized in that

the measuring means (31, 32 or 47/48) comprise only a select movement sensor (31 or 47) and a shift movement sensor (32 or 48); and

for every return shift movement of the inner lever (26, 41a) involving both shift and select components of movement the control means (35 or 45) is effective to cause the actuator means (25 or 43/44) to bias the inner lever (26 or 41a) in a select direction against a shift head of a neighbouring shift fork shaft and to monitor the movement of the inner lever (26 or 41a) to identify when the select movement sensor (31 or 47)

produces an output indicating that the inner lever (26 or 41a) has passed a corner of the said neighbouring shift fork shaft; and

for every such return shift movement the control means (35 or 45) identifies the first or second neutral position (S1 or S2) of the inner lever (26 or 41a) based on the output of the shift movement sensor (32 or 48) at the time of that identified select movement."

IV. Claim 1 according to the auxiliary request differs from that of the main request solely in the introduction of a new first clause into the characterising portion. This clause reads as follows:

"a lock ball mechanism is provided for locking any one of the shift fork shafts (10/13/16 or 40/40/40) at the neutral position;"

V. The arguments of the appellant can be summarized as follows:

The first clause of the characterising portion of claim 1 according to the main request is based on paragraph [0011] of the published original application documents in which the drawbacks of the use of load detecting sensors are presented. It is thus clear for the skilled man reading the application that in the invention the load detecting sensors are avoided by only using a select movement sensor and a shift movement sensor.
In the second clause of the characterising portion of this claim it is mentioned that the movement of the inner lever is monitored to identify when the select

movement sensor produces an output indicating that the inner lever has passed a corner of the neighbouring shift fork shaft. This is based on the paragraphs [0047] to [0049] of the application in which the movement of the inner lever relative to the shift heads is explained. In particular it is explained that when the shift and select shaft starts moving in the axial direction, the movement of the shift and select shaft is detected by the first position sensor and the rotational movement of the inner lever is interrupted. Thus the select movement sensor produces an output indicating that the inner lever has passed a corner. It is to be noted that in the case of the tapered corner it is not because the inner lever is no more driven to rotate it towards the neutral position once it has passed the first corner that the inner lever stops moving towards that neutral position. There is a cam effect which will bring it to the neutral position S2.

Concerning the second and the last clause of the characterising portion of the claim, it has been mentioned that the return shift movements concerned by these clauses are only the ones including both shift and select components of movement, the application being silent about the movements only including shift components of movement.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. The first clause of the characterising portion requires the measuring means only to comprise a select movement sensor and a shift movement sensor. It is said to be based on the introductory part of the description in which the drawbacks of the load detecting sensors are described.

The board cannot share the appellant's view.

It is accepted that the man skilled in the art would conclude from the introductory part of the description mentioning the drawbacks of the load detecting sensors that one aim of the invention is to avoid the use of such detectors. It is also accepted that the main embodiment described uses first and second sensors 31 and 32 to detect the axial and respectively rotational movements of the shift and select shaft 20.

The board could however not find any passage in the description in which it is mentioned that exclusively these two sensors are used as movement measuring means. In the absence of such a clear statement it cannot be concluded that it is directly and unambiguously derivable from the originally filed application documents that no other sensor is used in addition. In particular it seems at least necessary to have a kind of reset position sensor or zeroing sensor to be able to initiate the system or to reset if something occurs disturbing the position of the shift and select shaft relative to the sensors.

Already for this reason claim 1 according the main request is considered to infringe Article 123(2) EPC.

3. In the second clause of the characterising portion it is mentioned that the movement of the inner lever is monitored to identify when the select movement sensor produces an output indicating that the inner lever has passed a corner of the said neighbouring shift fork shaft.

This clause is considered not to be clear contrary to Article 84 EPC 1973. According to the wording of the clause an output should indicate that the inner lever has passed a corner of the neighbouring shift fork shaft. First of all it seems that the neighbouring shift head is meant and not the neighbouring shift fork shaft. But even then, any shift head neighbouring the inner lever during a shift movement has at least two corners (the inner one and the outer one) in the shift direction and two corners in the select direction. It is unclear which one of the corners has to be passed by which part of the inner lever for the select movement sensor to produce an output indicating that the inner lever has passed a corner. The situation is even more complex when the corner is provided with an inclined portion since there is then an additional corner which can be passed. In particular, when considering the inclined portion 15a of the shift head 15 shown in Figures 2(a) to 2(c) it is apparent that transverse movement of the inner lever starts when the inner lever starts to move down the inclined portion, ie the inner lever has passed the "corner" of the shift head defined between its inclined portion and its surface parallel to the shaft, but the select movement sensor produces

no output at that time. Instead the output is only produced once the inner lever disengages from the inclined portion of the shift head, ie passes the "corner" between this inclined portion and its surface transverse to the shaft.

4. The clauses of the characterising portion of claim 1 of the main request objected to above are both present in the characterising portion of claim 1 of the auxiliary request. Thus the same objections apply.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

A. Vottner S. Crane