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Datasheet for the decision of 11 January 2021

Case Number: T 2537/18 - 3.2.08

Application Number: 12784307.6

Publication Number: 2766636

IPC: F16H3/089

Language of the proceedings: EN

Title of invention:
TRANSMISSION

Applicant:
Abu Al-Rubb, Khalil

Headword:

Relevant legal provisions:
EPC Art. 83, 123(2)
RPBA 2020 Art. 11

Keyword:
Sufficiency of disclosure - (yes)
Amendments - allowable (yes)
Remittal - special reasons for remittal

Decisions cited:
G 0001/03

Catchword:

Europäisches Patentamt
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Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 2537/18 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 11 January 2021

Appellant: (Applicant)	Abu Al-Rubb, Khalil Salwa Road KBAS Co. P. O. Box 22599 Doha (QA)
Representative:	Wallin, Nicholas James Withers & Rogers LLP 4 More London Riverside London SE1 2AU (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 11 May 2018 refusing European patent application No. 12784307.6 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	C. Herberhold
Members:	M. Foulger
	P. Schmitz

Summary of Facts and Submissions

I. With the decision according to the state of the file posted on 11 May 2018, the examination division refused the European patent application No. 12 784 307.6. The grounds as set out in the official communication dated 28 July 2017 referred to in said decision were that the application did not meet the requirements of Article 83 EPC.

II. The applicant filed an appeal against said decision in the prescribed form and within the prescribed time limits.

III. In reply to the Board's communication dated 25 September 2020 the appellant (applicant) filed amended claims and description pages with the letter dated 3 December 2020.

IV. The appellant (applicant) requests that the decision under appeal be set aside and the case be remitted to the examining division for further search and for consideration of novelty and inventive step based on the set of claims filed with the letter dated 3 December 2020.

V. Claim 1 reads:

"A transmission comprising a driven shaft having one or more driven gears and a driving shaft having a plurality of driving gears, wherein ~~a~~ one or more of the driven gear~~s~~ ~~may be may be~~ are arranged to engage~~d~~ with one or more of the driving gears to thereby alter a speed or torque of the driving shaft relative to a speed or torque of the driven shaft, wherein ~~the driven~~

a driving gear is brought into engagement with ~~the driving~~ one or more of the driven gears through the action of a pressurised fluid, and wherein the pressure of the pressurised fluid determines which of the ~~plurality of driving~~ one or more driven gears is engaged with a ~~driven~~ driving gear, and wherein each driven ~~driving~~ gear comprises a corresponding ~~torus~~ annulus, the plurality of ~~tori~~ annuli being arranged concentrically, and wherein adjacent ~~tori~~ annuli are brought into engagement with one another through an increase in the pressure of the pressurised fluid and are brought out of engagement with one another through a reduction in the pressure of the pressurised fluid."

Claim 8 reads:

"A method of gearing in a transmission, the transmission comprising a driven shaft having one or more driven gears and a driving shaft having a plurality of driving gears, wherein one or more of the driven gears ~~may be engaged~~ are arranged to engage with one or more of the driving gears to thereby alter a speed or torque of the driving shaft relative to a speed or torque of the driven shaft, the method comprising the steps of:
bringing a driving gear into engagement with one or more of the driven ~~driving~~ gears through the action of a pressurised fluid, wherein the pressure of the pressurised fluid determines which of the one or more driven ~~driving~~ gears is engaged with a driving ~~the driven~~ gear, and wherein each driven gear comprises a corresponding ~~torus~~ annulus, the plurality of ~~tori~~ annuli being arranged concentrically; and
bringing adjacent ~~tori~~ annuli into engagement with one another through an increase in the pressure of the pressurised fluid and bringing the adjacent ~~tori~~ annuli

out of engagement with one another through a reduction in the pressure of the pressurised fluid."

In the above, deletions are struck through and additions are underlined compared to the application as originally filed.

VI. The following documents are referred to in this decision:

D1: EP 2 339 209 A1
E1: LECHNER, NAUNHEIMER "Automotive Transmissions Fundamentals, Selection, Design and Application", Springer Verlag 1999
E2: Wikipedia "Freewheel", https://en.wikipedia.org/wiki/Freewheel

VII. The appellant argued essentially as follows:

The invention was disclosed in a manner sufficiently clear and complete for it to be carried out by a skilled person. In particular, the skilled person using their common general knowledge in conjunction with the description and drawings could realise the invention. It was not necessary that every detail be given in the application - see Guidelines, F-III, 5.2.

The skilled person was well aware of the use of freewheels (one-way clutches) in transmissions as shown by D1, E1 and E2. This common general knowledge would allow the skilled person to fill in any possible gaps in the disclosure.

The invention was therefore sufficiently disclosed.

Reasons for the Decision

1. Amendments

1.1 The appellant filed new claims with the letter dated 3 December 2020. Their allowability with regard to Article 123(2) EPC is therefore to be examined.

1.2 Claims 1 and 8 are based on claims 1 and 10 as originally filed wherein "driving" and "driven" have been exchanged. Moreover, "tori" has been replaced with "annuli".

1.3 These modifications do not extend the subject-matter of the claims beyond that of the application as originally filed. The changing around of driving and driven brings the claim into consistency with the originally filed description. In particular, as disclosed on p. 6, l. 2 - 3, the driven shaft is connected to the engine. Furthermore, p. 6, l. 8 - 10 discloses that the driven gears engage driving gear 50 connected to a driving shaft 47 which is connected in a known manner to the wheels.

1.4 The "annuli" are disclosed on p. 5, l. 20 and p. 7, l. 5 of the originally filed description where reference is made to annular discs. Moreover, as "torus" is generally regarded, in modern usage, as a "doughnut" shape, i.e. with circular cross-section, the language of the claim now corresponds with the original disclosure.

1.5 The amendments are thus allowable with respect to Article 123(2) EPC.

2. Sufficiency of disclosure

2.1 According to Article 83 EPC the patent application shall disclose the invention in a manner sufficiently clear and complete for it to be carried out by a skilled person.

The invention provides a transmission comprising a driven shaft having one or more driven gears and a driving shaft having a plurality of driving gears, wherein one or more of the driven gears are arranged to engage with one or more of the driving gears to thereby alter a speed or torque of the driving shaft relative to a speed or torque of the driven shaft (see independent claim 1).

The invention also provides a method of gearing in a transmission, the transmission comprising a driven shaft having one or more driven gears and a driving shaft having a plurality of driving gears, wherein one or more of the driven gears are arranged to engage with one or more of the driving gears to thereby alter a speed or torque of the driving shaft relative to a speed or torque of the driven shaft (see independent claim 8).

2.2 According to the respective independent claims adjacent annuli are brought into engagement with one another through an increase in the pressure of the pressurised fluid and are brought out of engagement with one another through a reduction in the pressure of the pressurised fluid.

2.3 The description explains that driving disc 28 rotates with driving shaft 22 (p. 6, l. 24 - 25). Around this are annular discs 30, 32, 34 which can rotate independently of one another and of driving disc 28 or selectively together with driving disc 28(page 7, lines 1 - 3).

Each of the discs 28, 30, 32, 34 is connected to a corresponding driven gear 36, 38, 40, 42. The rotation of the discs causes the rotation of the corresponding driven gear (p. 6, l. 6 - 7).

Each of the driven gears engage with a driving gear 50 which is connected to "a driving shaft 47" which may be connected to wheels (p. 6, l. 8 - 10).

2.4 Engagement of the annuli is achieved by altering the pitch of the swash plate 16 to alter the pitch of the propeller 18. The housing 14, Venturi cone 20, impeller 17, hollow shaft 22 and housing 24 are all in fluid communication with one another. Therefore, the action of the propeller 18 affects the flow and pressure of the hydraulic fluid within these components, in particular the fluid pressure in the central disc 28 may be varied.

2.5 By varying the pressure in the central disc 28 the ball bearings may be made to move in a radially outward direction whereas their movement in a radially inward direction occurs due to the action of the respective springs (cf. Fig. 3). Thus, the ball bearings 50 of disc 30 are caused to move from their rest position (illustrated in Fig. 3) to an engaging position (illustrated in Fig. 4).

2.6 Each ball bearing 50 which is in the correct position will engage with a corresponding receptacle 60. This, in turn, causes the annulus (disc) 32 to rotate along with annulus (disc) 30. Each of the discs 30 and 32 (as well as the discs 28 and 34 illustrated in Fig. 2) are connected to corresponding gears. In this manner the disc arrangement 26 illustrated in Figure 2 acts as a clutch to engage the selected gear.

2.7 Thus, through the selection of different annuli the speed of the driving shaft may be altered.

2.8 In the impugned decision it was, however, found that if all gears were engaged then the transmission would block. In this respect it was found that the disclosure on p.6, l. 8-9) referring to "a driving gear 50, which is ... connected to a driving shaft 47" was incomplete with regard to a feature essential for the proper functioning of a shiftable transmission (point 3.2.1 of the communication dated 28 July 2017). Thus the claimed transmission was not sufficiently disclosed because it was not suitable to alter a speed or torque of the driving shaft relative to a speed or torque of the driven shaft. It was not disputed that the transmission would function if a one-way clutch was provided between the driving gear wheels and the driving shaft, nor that over-running clutches per se constituted well-known devices (point 3.2.4 of the communication dated 28 July 2017). Such a connection was not however disclosed in the application.

2.9 It is established practice that for the purposes of sufficient disclosure the specification does not need to describe all the details of the operations to be carried out by the person skilled in the art on the basis of the instructions given, if these details are

well-known and clear from the definition of the class of the claims or on the basis of common general knowledge.

2.10 For example, in the current case the applicant has not given details of how the swash plate is actuated nor how the shafts are supported. These are however considered to be well known details that the skilled person could carry out without any problem to put the invention into practice. The examining division has also not raised any objection in this respect.

2.11 Regarding the mounting of the gears 50, p. 6, l. 6 states that "Each of the discs 28, 30, 32 and 34 are connected to corresponding driven gears 36, 38, 40 and 42 so that rotation of a disc causes rotation of the corresponding gear." This is neither a disclosure of a fixed, permanent connection nor of a connection via a clutch or a freewheel - the actual form of the connection is left open.

2.12 It is, however, immediately evident to the person skilled in the art that some sort of torque transmitting coupling is necessary between shaft 47 and gearwheels 50. Moreover it is evident that a permanently torque transmitting coupling between gears 50 and shaft 47 would block the transmission. Such a construction makes no technical sense and the person skilled in the art would therefore exclude an interpretation of the disclosure in which the gear wheels 50 are permanently coupled to the shaft (the inclusion of such non-working embodiments in the claimed subject-matter being of no harm with respect to sufficiency of disclosure, cf. G 1/03, Reasons 2.5.2).

2.13 As the disclosure is silent on which coupling means to select between gears 50 and shaft 47 in order to put the invention into practice, the appellant has argued that suitable coupling means such as freewheels were known to the skilled person from the common general knowledge, as shown for example in E2.

2.14 E2 is a Wikipedia article about freewheels or overrunning clutches. The article covers the use of such devices in several fields of mechanics, in particular in vehicle transmissions, i.e. the field of the present invention. Due to its general nature and overview-like character, the Board in the present case accepts E2 as evidence of the common general knowledge of the skilled person.

2.15 E2 discloses (page 2, first paragraph) that a common use of "freewheeling mechanisms is in automatic transmissions. For instance, traditional hydraulic General Motors transmissions such as the Turbo-Hydramatic 400 provide freewheeling in all gears lower than the selected gear".

2.16 The reference to the "traditional hydraulic General Motors transmissions such as the Turbo-Hydramatic 400" further shows that the particular common general knowledge cited above was available well before the priority date of the application.

2.17 With such freewheeling mechanisms being known in the common general knowledge for coupling driving gears (such as gears 50) with different rotational speed selectively to a shaft (such as shaft 47) in automatic hydraulic transmissions, the Board is convinced that the person skilled in the art would recognise how the known freewheeling mechanism could be employed for the

coupling needed between driving gears and driving shaft. Indeed, what is required in the disclosed transmission is freewheeling of all gears lower than the higher selected gear, precisely as commonly known in automatic transmissions according to E2.

2.18 According to point 3.2.4 of the impugned decision, the examining division agreed in principle that over-running clutches constitute well known devices. In view of document E2 - which was not yet available in examination proceedings - it may now be concluded that their use in automatic transmissions to allow free-wheeling of all gears lower than the selected gear formed part of the common general knowledge available to the the person skilled in the art at the date of priority, in addition to the specific disclosure, for putting the invention into practice.

2.19 Hence, the invention is disclosed in a manner sufficiently clear and complete for the skilled person to carry it out (Article 83 EPC).

3. Remittal

According to Article 11 RPBA, the Board shall not remit a case to the department whose decision was appealed for further prosecution, unless special reasons present themselves for doing so. Neither clarity nor novelty nor inventive step were considered in the decision under appeal and indeed, according to the International Search Report, Box No. II the invention has not even been completely searched. The Board considers that these are special reasons in the sense of Article 11 RPBA. As stated in Article 12(2) RPBA, the primary object of the appeal proceedings is to review the decision under appeal in a judicial manner. This

principle would not be respected if the Board were to conduct a complete examination of the case.

As the arguments presented in appeal proceedings have overcome the grounds underlying the decision, the Board considers it appropriate to remit the case to the examining division for a complete search of the invention and further examination, in particular of clarity, novelty and inventive step.

Order

For these reasons it is decided that:

The case is remitted to the examining division for further prosecution.

The Registrar: The Chairman:

D. Magliano C. Herberhold

Decision electronically authenticated