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Datasheet for the decision of 9 September 2025

Case Number: T 1071/23 - 3.4.02

Application Number: 16718948.9

Publication Number: 3283913

IPC: G02B6/32

Language of the proceedings: EN

Title of invention:
OPTICAL ROTARY ELECTRICAL CONNECTION

Patent Proprietor:
Moog Inc.

Opponent:
Schleifring GmbH

Headword:

Relevant legal provisions:
EPC Art. 123(2), 54(1), 56

Keyword:
Amendments - added subject-matter (yes) - main request, auxiliary requests 1, 2 and 6
Novelty (no) - auxiliary requests 3 and 4
Inventive step (no) - common general knowledge - auxiliary requests 5 and 7

Decisions cited:
G 0001/24

Catchword:

Europäisches Patentamt
European Patent Office
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Beschwerdekammern

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Case Number: T 1071/23 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 9 September 2025

Appellant: (Patent Proprietor)	Moog Inc. Seneca and Jamison Road East Aurora, NY 14052 (US)
Representative:	Hey, Andrew Stuart Withers & Rogers LLP 2 London Bridge London SE1 9RA (GB)
Appellant: (Opponent)	Schleifring GmbH Am Hardtanger 10 82256 Fürstenfeldbruck (DE)
Representative:	Lohr, Jöstingmeier & Partner Patent- und Rechtsanwälte mbB Junkersstraße 3 82178 Puchheim/München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 30 March 2023 concerning maintenance of the European Patent No. 3283913 in amended form.**

Composition of the Board:

Chairman	R. Bekkering
Members:	A. Hornung
	D. Rogers

Summary of Facts and Submissions

I. Both the patentee and the opponent appealed against the interlocutory decision of the opposition division maintaining European patent No. 3283913 in amended form.

Opposition had been filed against the patent as a whole and based on the grounds for opposition under Article 100(a) EPC, together with Articles 54(1) and 56 EPC, and Articles 100(b) and 100(c) EPC.

The opposition division had found that the patent as amended according to a seventh auxiliary request then on file and the invention to which it related met the requirements of the EPC.

II. Oral proceedings before the board were held on 9 September 2025.

III. The patentee requested that the decision under appeal be set aside and that the patent be maintained as granted (main request), or alternatively that the patent be maintained upon the basis of one of auxiliary requests 1 to 7 all filed under cover of a letter dated 16 December 2023.

The opponent requested that the decision of the opposition division be set aside and that the patent be revoked.

IV. The following documents, which were relied on in the first-instance opposition proceedings, are referred to in the present decision:

D1: DE 102 30 537 A1,
D5: US 7,690,849 B2,
D7: US 2005/0036735 A1,
D8: US 5,442,721.

V. The patentee's written submissions are designated P1 to P5 as follows:
P1: statement of grounds of appeal, filed with letter dated 3 August 2023,
P2: letter dated 16 December 2023 (reply to the opponent's statement of grounds of appeal),
P3: letter dated 22 March 2024,
P4: letter dated 1 July 2024,
P5: letter dated 6 August 2025.

The opponent's written submissions are designated O1 to O5 as follows:
O1: statement of grounds of appeal, filed with letter dated 8 August 2023,
O2: letter dated 19 December 2023 (reply to the patentee's statement of grounds of appeal),
O3: letter dated 11 January 2024,
O4: letter dated 30 April 2024,
O5: letter dated 14 May 2025.

VI. Independent claim 1 according to the patentee's main request reads as follows (the features of claim 1 are preceded by a numbering **1.1** to **1.14**, as defined in the appealed decision, point XVI, and in the parties' submissions):

1.1. "A rotary connection (15) for transmission of signals across an interface defined by two relatively-movable members comprising:
1.2. a housing (16);
1.3. a first element (18) supported by said housing (16);
1.4. a second element (19) supported by said housing (16);
1.5. said first element (18) and said second element (19) configured and arranged such that one of said first (18) or second (19) elements rotates about a central axis (x-x) relative to the other of said first (18) or second (19) elements;

1.6. a rotary interface (20) between said first element (18) and said second element (19);
1.7. said first element (18) comprising:
1.7.1. an input electrical lead (21);
1.7.2. an electrical-to-optical E/O converter (22) coupled to said input electrical lead (21) and having an optical source (23);
1.7.3. a transmitting lens (28) coupled to said optical source (23) and configured to direct an optical signal across said rotary interface;
1.7.4. a transmitting optical fiber (26) coupled between said optical source and said transmitting lens (28); and
1.8. said second element (19) comprising:
1.8.1. a receiving lens (30) opposing said first element (18) across said rotary interface and configured to receive said optical signal from said transmitting lens (28);
1.8.2. an optical-to-electrical O/E converter (32) coupled to said receiving lens (30) and having an optical receiver (33); and
1.8.3. an output electrical lead (35) coupled to said O/E converter (32);
1.9. whereby an electrical input received by said first element (18) may be converted into light,
1.10. said light may be transmitted across said rotary interface (20) to said second element (19), and
1.11. said light may be converted into an electrical output by said second element (19) for transmission via said output electrical lead (35) of said second element (19);
characterised in that:
1.12. the rotary connection (15) is a non-contacting rotary connection (15) at said rotary interface between said first element (18) and said second element (19);
1.13. said rotary interface (20) between said first element (18) and said second element (19) comprises an air gap between said transmitting lens (28) of said first element

(18) and said receiving lens (30) of said second element (19); and

1.14. said first element (18) further comprises a focusing lens (25) coupled between said optical source and said transmitting optical fiber (26)".

VII. In all auxiliary requests the expression "characterised in that" is deleted.

VIII. First auxiliary request

Independent claim 1 according to the first auxiliary request further differs from claim 1 of the main request in that feature **1.7.3** reads (added feature is underlined):

"a transmitting lens (28) coupled to said optical source (23) and configured to direct an optical signal along the central axis (x-x) across said rotary interface;"

IX. Second auxiliary request

Independent claim 1 according to the second auxiliary request differs from claim 1 of the first auxiliary request in that:

(a) feature **1.7.4** reads as follows (added feature is underlined):
"a transmitting optical fiber (26) coupled between said optical source and said transmitting lens (28), said transmitting optical fiber carried by a first optical ferrule stub (27)",

(b) the following feature is added after feature **1.8.2**:
"a receiving optical fiber (31) coupled between said receiving lens (30) and said optical receiver (33), said receiving optical fiber (31) carried by a second optical fiber ferrule stub (37)" and

(c) the following feature is added after feature **1.14**:
"said second element (19) further comprises a second focusing lens (36, 136) coupled between said optical receiver (33) and said receiving optical fiber (31)".

X. Third auxiliary request

Independent claim 1 according to the third auxiliary request reads as follows (the differences with respect to claim 1 of the main request are marked up)

"A non-contacting rotary connection (15) for transmission of signals across an interface defined by two relatively-movable members comprising:
a housing (16);
a first element (18) supported by said housing (16);
a second element (19) supported by said housing (16);
said first element (18) and said second element (19) configured and arranged such that one of said first (18) or second (19) elements rotates about a central axis (x-x) relative to the other of said first (18) or second (19) elements;
a rotary interface (20) between said first element (18) and said second element (19);

said first element (18) comprising:
an input electrical lead (21);
an electrical-to-optical E/O converter (22) coupled to said input electrical lead (21) and having an optical source (23);
a transmitting lens (28) coupled to said optical source (23) and configured to direct an optical signal across said rotary interface;
a transmitting optical fiber (26) coupled between said optical source and said transmitting lens (28); and

said second element (19) comprising:

a receiving lens (30) opposing said first element (18) across said rotary interface and configured to receive said optical signal from said transmitting lens (28);
an optical-to-electrical O/E converter (32) coupled to said receiving lens (30) and having an optical receiver (33); and
an output electrical lead (35) coupled to said O/E converter (32);

said rotary interface (20) between said first element (18) and said second element (19) comprises an air gap between said transmitting lens (28) of said first element (18) and said receiving lens (30) of said second element (19);

whereby an electrical input received by said first element (18) may be converted into light,
said light may be transmitted across said rotary interface (20), via said air gap, to said second element (19), and
said light may be converted into an electrical output by said second element (19) for transmission via said output electrical lead (35) of said second element (19);
~~characterised in that~~ such that

the non-contacting rotary connection (15) is ~~a~~ non-contacting at said air gap; ~~rotary connection (15) at said rotary interface between said first element (18) and said second element (19);~~
wherein said first element (18) further comprises a focusing lens (25) coupled between said optical source and said transmitting optical fiber (26)".

XI. Fourth auxiliary request

Independent claim 1 according to the fourth auxiliary request further differs from claim 1 of the third auxiliary request in that the feature corresponding to

feature **1.7.3** of the main request reads (the added feature is underlined):

"a transmitting lens (28) coupled to said optical source (23) and configured to direct an optical signal along the central axis (x-x) across said rotary interface;".

XII. Fifth auxiliary request

Independent claim 1 according to the fifth auxiliary request differs from claim 1 of the fourth auxiliary request in that:

(a) the feature corresponding to the feature **1.7.4** of the main request reads (added feature is underlined):
"a transmitting optical fiber (26) coupled between said optical source and said transmitting lens (28), said transmitting optical fiber carried by a first optical fiber ferrule stub (27)",

(b) the following feature is added after the feature corresponding to feature **1.8.2** of the main request:
"a receiving optical fiber (31) coupled between said receiving lens (30) and said optical receiver (33), said receiving optical fiber (31) carried by a second optical fiber ferrule stub (37)",

(c) the feature corresponding to the feature **1.14** of the main request reads (added words are underlined):
"said first element (18) further comprises a first focusing lens (25, 125) coupled between said optical source and said transmitting optical fiber (26) and" and

(d) the following feature is added at the end of the claim:

"said second element (19) further comprises a second focusing lens (36, 136) coupled between said optical receiver (33) and said receiving optical fiber (31)".

XIII. Sixth auxiliary request

Claim 1 of the sixth auxiliary request reads as follows:

"A rotary connection (15) for transmission of signals across an interface defined by two relatively-movable members comprising:
a housing (16);
a first element (18) supported by said housing (16);
a second element (19) supported by said housing (16);
said first element (18) and said second element (19) configured and arranged such that one of said first (18) or second (19) elements rotates about a central axis (x-x) relative to the other of said first (18) or second (19) elements;
a rotary interface (20) between said first element (18) and said second element (19);

said first element (18) comprising:
an input electrical lead (21);
an electrical-to-optical E/O converter (22) coupled to said input electrical lead (21) and having an optical source (23);
a transmitting lens (28) coupled to said optical source (23), wherein the transmitting lens is an expanded beam collimating lens and is configured to direct an optical signal along the central axis (x-x) across said rotary interface, and wherein said transmitting lens is held in a first frame within a first sleeve (50);
a transmitting optical fiber (26) coupled between said optical source and said transmitting lens (28), said transmitting optical fiber carried by a first optical

fiber ferrule stub (27), wherein said transmitting optical fiber, said first optical fiber ferrule stub and said transmitting lens are oriented on the central axis; and

said second element (19) comprising:
a receiving lens (30) opposing said first element (18) across said rotary interface wherein the receiving lens is a collimating lens of the same size and type as the transmitting lens, and is configured to receive said optical signal from said transmitting lens (28), and wherein the receiving lens is held in a second frame within a second sleeve (51);
an optical-to-electrical O/E converter (32) coupled to said receiving lens (30) and having an optical receiver (33);
a receiving optical fiber (31) coupled between said receiving lens (30) and said optical receiver (33), said receiving optical fiber (31) carried by a second optical fiber ferrule stub (37), wherein said receiving optical fiber, said second optical fiber ferrule stub and said receiving lens are oriented on the central axis; and
an output electrical lead (35) coupled to said O/E converter (32);

whereby an electrical input received by said first element (18) may be converted into light, said light may be transmitted across said rotary interface (20) to said second element (19), and said light may be converted into an electrical output by said second element (19) for transmission via said output electrical lead (35) of said second element (19);

the rotary connection (15) is a non-contacting rotary connection (15) at said rotary interface between said first element (18) and said second element (19);

said rotary interface (20) between said first element (18) and said second element (19) comprises an air gap between said transmitting lens (28) of said first element (18) and said receiving lens (30) of said second element (19);
said first element (18) further comprises a first focusing lens (25, 125) coupled between said optical source and said transmitting optical fiber (26) and
said second element (19) further comprises a second focusing lens (36, 136) coupled between said optical receiver (33) and said receiving optical fiber (31)".

XIV. Seventh auxiliary request

Claim 1 of the seventh auxiliary request reads as follows (the features added in relation to claim 1 of the fifth auxiliary request are underlined):

"A non-contacting rotary connection (15) for transmission of signals across an interface defined by two relatively-movable members comprising:
a housing (16);
a first element (18) supported by said housing (16);
a second element (19) supported by said housing (16);
said first element (18) and said second element (19) configured and arranged such that one of said first (18) or second (19) elements rotates about a central axis (x-x) relative to the other of said first (18) or second (19) elements;
a rotary interface (20) between said first element (18) and said second element (19);

said first element (18) comprising:
an input electrical lead (21);
an electrical-to-optical E/O converter (22) coupled to said input electrical lead (21) and having an optical source (23);

a transmitting lens (28) coupled to said optical source (23), wherein the transmitting lens is an expanded beam collimating lens and is configured to direct an optical signal along the central axis (x-x) across said rotary interface, and wherein said transmitting lens is held in a first frame within a first sleeve (50);
a transmitting optical fiber (26) coupled between said optical source and said transmitting lens (28), said transmitting optical fiber carried by a first optical fiber ferrule stub (27), wherein said transmitting optical fiber, said first optical fiber ferrule stub and said transmitting lens are oriented on the central axis; and

said second element (19) comprising:
a receiving lens (30) opposing said first element (18) across said rotary interface wherein the receiving lens is a collimating lens of the same size and type as the transmitting lens, and is configured to receive said optical signal from said transmitting lens (28), and wherein the receiving lens is held in a second frame within a second sleeve (51);
an optical-to-electrical O/E converter (32) coupled to said receiving lens (30) and having an optical receiver (33);
a receiving optical fiber (31) coupled between said receiving lens (30) and said optical receiver (33), said receiving optical fiber (31) carried by a second optical fiber ferrule stub (37), wherein said receiving optical fiber, said second optical fiber ferrule stub and said receiving lens are oriented on the central axis; and
an output electrical lead (35) coupled to said O/E converter (32);

said rotary interface (20) between said first element (18) and said second element (19) comprises an air gap between

said transmitting lens (28) of said first element (18) and said receiving lens (30) of said second element (19);
whereby an electrical input received by said first element (18) may be converted into light, said light may be transmitted across said rotary interface (20), via said air gap, to said second element (19), and said light may be converted into an electrical output by said second element (19) for transmission via said output electrical lead (35) of said second element (19);
such that the non-contacting rotary connection (15) is non-contacting at the air gap;

said first element (18) further comprises a first focusing lens (25, 125) coupled between said optical source and said transmitting optical fiber (26) and
said second element (19) further comprises a second focusing lens (36, 136) coupled between said optical receiver (33) and said receiving optical fiber (31)".

Reasons for the Decision

1. Main request - Article 100 (c) EPC

The subject-matter of claim 1 extends beyond the content of the application as filed.

1.1 Feature **1.12** is not directly and unambiguously derivable from the patent application as originally filed

1.1.1 Feature **1.12** reads: "the rotary connection (15) is a non-contacting rotary connection (15) at said rotary interface between said first element (18) and said second element (19)".

1.1.2 According to features **1.1** to **1.6**, the "rotary connection (15)" is the entire claimed device comprising the housing (16), the two elements (18, 19) supported by said housing (16) and the rotary interface (20). It follows that the term "connection" in claim 1 designates a physical connector.

1.1.3 Feature **1.12** defines that "the rotary connection (15) is a non-contacting rotary connection (15)". This means that the entire claimed device is a physical connector in which the connecting parts rotating relative to each other are not in contact with each other. This is, however, in contradiction to the information provided in the application as originally filed. As stated in the appealed decision (point 4.1.3.5), "it is the engagement of the housing portions which provides the connection", and this engagement is *not* a non-contacting engagement.

1.1.4 Furthermore, when feature **1.12** defines that "the rotary connection (15) is a non-contacting rotary connection (15) at said rotary interface between said first element (18) and said second element (19)", then this means that the rotary connection (15), i.e. the entire physical connector, as defined in features **1.1** to **1.6**, comprising the entire claimed device, including the housing and the elements supported by the housing, would be located at the rotary interface. However, apart from the fact that it is not feasible for the entire claimed device to be located "at said rotary interface", there is no basis for this feature in the application as originally filed.

Therefore, as submitted by the opponent (appealed decision, point 4.1.1; O1, page 19, last paragraph) and as stated in the appealed decision, point 4.1.3, feature **1.12** has no basis in the patent application as originally filed because the originally filed application does not disclose a "rotary connection" **which is at the rotary interface**.

1.2 Patentee's arguments for showing that feature **1.12** had a basis in the patent application as originally filed

1.2.1 In writing (P1, points 21 to 44), the patentee essentially argued that it was generally known that "all non-contacting rotary joints are, by definition, non-contacting at a rotary interface" (P1, point 27). Feature **1.12** had therefore to be interpreted as meaning that the claimed rotary connection was a rotary connection which was non-contacting at the rotary interface. "Feature **1.12** indicates that, at the rotary interface, the connection is non-contacting" (P1, point 40). Such a rotary connection was clearly disclosed in the originally filed patent application.

The board is not convinced by the patentee's arguments, which are based on a claim wording which does not correspond to the actual claim wording, i.e. "the rotary connection (15) is [...] at said rotary interface". In particular, the patentee did not show in its extensive written argumentation where exactly in the patent application as filed the claimed feature of a "rotary connection (15) [being] [...] at said rotary interface" is disclosed, the "rotary connection (15)" being as defined in features **1.1** to **1.6**, i.e. comprising a housing (16), two elements (18, 19) supported by the housing (16) and a rotary interface (20) between the two elements (18, 19).

1.2.2 In writing (P5, points 14 to 21) and orally at the oral proceedings before the board, the patentee argued that "the skilled person reads the claims with a mind willing to understand" (P5, point 16). The board itself acknowledged that its interpretation of feature **1.12**, whereby the entire claimed device would be located at the rotary interface, was technically unfeasible. Therefore, a skilled person with a mind willing to understand would not adopt this interpretation, but would consult the description as stipulated by decision G1/24. Based on paragraphs [0006], [0007] and [0022] of the description

and figure 2 of the original patent application, it was clear to the skilled person that the claimed "rotary connection is non-contacting at a location corresponding to the rotary interface" (P5, point 18).

The board is not convinced by the patentee's arguments. The patentee refers to the skilled person "with a mind willing to understand", which the board considers to be a pleonasm given that the skilled person inherently strives to comprehend the invention and the claims. In the board's view, the skilled person "with a mind willing to understand" and reading claim 1 would conclude that feature **1.12**, in combination with features **1.1** to **1.6**, is technically not feasible and has no basis in the application as originally filed.

Likewise, the fact that the decision G1/24 states that (in the context of assessing patentability of an invention - not added subject-matter) the description and drawings shall always be consulted to interpret the claims, does not cause the board to reconsider its view on the meaning of feature **1.12**. While the board did consult the description and the drawings, it remains the case that the claim clearly defines a feature (feature **1.12)** that is technically not feasible and not disclosed in the patent application as originally filed. Even consulting the description or the drawings cannot alter this finding, rather decision G1/24 confirms the primacy of the claims.

1.3 In conclusion, the patentee's arguments for showing that feature **1.12** has a basis in the patent application as originally filed are not found convincing by the board.

2. First, second and sixth auxiliary requests - Article 100 (c) EPC in combination with Article 123(2) EPC

2.1 Claim 1 of the first, second and sixth auxiliary requests comprises features **1.1** to **1.6** and **1.12**, which remain unchanged compared to claim 1 of the main request.

Therefore, feature **1.12** contains subject-matter extending beyond the disclosure of the patent application as originally filed for the same reasons as claim 1 of the main request.

2.2 Neither in writing nor during the oral proceedings before the board did the patentee submit arguments showing that feature **1.12** had a basis in the patent application as originally filed, additional to those submitted for claim 1 of the main request.

3. Third auxiliary request - Novelty

The subject-matter of claim 1 lacks novelty in view of D1 (Article 54(1) EPC).

3.1 The only features of claim 1 which were contested by the patentee in writing (P1, points 59 to 78; P5, points 24 to 28) and orally during oral proceedings before the board as being disclosed in figure 9 of D1 are features **1.2**, **1.3** and **1.4**. The remaining features of claim 1 are undisputedly disclosed in D1, as set out in point 13.3.2 of the contested decision.

3.2 Features **1.2**, **1.3** and **1.4**. are disclosed in D1 for the following reasons:

According to paragraph [0024] of D1, figure 1 shows the general structure and mechanics of the optical rotary transmitter according to the invention of D1. Figure 1 shows inter alia a housing. Moreover, paragraph [0028] of D1, describing the general structure and mechanics of the optical rotary transmitter, explicitly mentions a housing of the rotary transmitter. Still further, paragraph [0027] states that figures 4 to 9 of D1 show various concrete embodiments of the invention. From this disclosure of D1 alone, it is implicit that the elements shown in figure 9 are comprised in the housing shown in figure 1, thereby anticipating feature **1.2**.

With regard to features **1.3** and **1.4**, it is implicit that the elements shown in figure 9 must be precisely and firmly positioned in relation to each other. To achieve this, they must be implicitly supported in some way by the housing of figure 1, possibly by fasteners, intermediate frames and other mechanical structures that connect them to the housing.

The board further concurs with the opponent's additional argument submitted during the first-instance proceedings: "D1 discloses in paragraph [0022] the use of the D1 invention as shown in the figures in a range of machines. The machines all have housings which must support the D1 rotor and stator for mechanical reasons in order to function. Hence D1 at least implicitly discloses the subject-matter of claim 1" (appealed decision, page 16, second paragraph). The fact that the invention of D1 is effectively used in machines such as packaging machines, presses, plastic injection moulding machines, textile machines, printing machines etc., rules out the theoretical possibility that the elements of the embodiment shown in figure 9 are not supported in any way by a housing. In other terms, a housing supporting the elements of figure 9 is implicitly disclosed in D1.

3.3 Patentee's arguments in favour of novelty

3.3.1 The patentee argued that there was no direct and unambiguous disclosure in D1 that the housing of figure 1 was applicable to the embodiment of figure 9. Therefore, feature **1.2** was novel over figure 9 of D1.

The board is not convinced by this argument. In view of paragraphs [0024], [0027] and [0028] of D1, it follows that figure 1 shows a general mechanical structure of the rotary transmitter of D1, which is implicitly valid for all the embodiments of figures 4 to 9. It follows that the

housing of figure 1 is applicable to the embodiment shown in figure 9.

3.3.2 The patentee further argued that even if the housing of figure 1 were applicable to the embodiment of figure 9, D1 did not disclose a housing which *supports* a first and a second element as claimed. In particular, paragraphs [0028] and [0032] of D1 referred to bearings and seals, but no details were disclosed as to how the bearings and seals interacted with the components of the first and the second elements of figure 9, specifically how the components were *supported* by the housing.

The board cannot follow the patentee's argument. As put forward by the opponent during oral proceedings, claim 1 also does not define how the components of the two elements defined in features **1.3** and **1.4** are supported by the housing. Therefore, it is not necessary for D1 to disclose details of how the components are supported by the housing. As the opponent argued in the oral proceedings, the components shown in figure 1 "are not like pebbles in a box", i.e. the components cannot be loose, but must be held in place very precisely by the housing, potentially by mechanical structures and fasteners in between.

4. Fourth auxiliary request

The subject-matter of claim 1 lacks novelty in view of D1 (Article 54(1) EPC).

4.1 Claim 1 according to the fourth auxiliary request differs from claim 1 of the third auxiliary request only in that the feature "along the central axis (x-x)" is added to feature **1.7.3**.

4.2 In paragraph 10 of the communication of the board pursuant to Article 15(1) RPBA, the board informed the parties about its provisional view that the subject-matter of

claim 1 of the fourth auxiliary request was anticipated by D1 for the reasons provided essentially in the appealed decision, points 16.1 and 16.5, and by the opponent in O2, pages 4 and 5.

In particular, the board agrees with the opposition division "that there is no way the skilled person could interpret paragraphs [0016] and [0040] and figure 9 [of D1] other than with the optical signal being directed along a central axis which is the rotation axis. This is consistent with the skilled person's understanding of the basic requirements for a non-contacting rotary connection to function, i.e. that the coupling is maintained during rotation. Hence D1 discloses all features of claim 1 including the claim 1 feature 'along the central axis' and the subject-matter of claim 1 is not novel over D1" (appealed decision, point 16.5).

4.3 In response to the board's communication, the patentee did not submit in writing any further counter-arguments in favour of the novelty of the fourth auxiliary request due to the addition of the feature "along the central axis (x-x)". Indeed, the passage in P5, titled "Third and Fourth auxiliary Requests (sections 9 and 10 of the Preliminary opinion)" does not contain any reference to the added feature "along the central axis (x-x)".

During oral proceedings before the board, the patentee merely stated that it relied on its written submissions.

4.4 For the above reasons, and since the patentee has not submitted any counterarguments to the board's preliminary opinion on the lack of novelty of the subject-matter of claim 1 of the fourth auxiliary request, the board's opinion in its communication pursuant to Article 15(1) RPBA becomes final.

5. Fifth auxiliary request

The subject-matter of claim 1 does not involve an inventive step in view of D1 in combination with common general knowledge.

5.1 Closest prior art

It is undisputed that D1 represents the closest prior art document for assessing inventive step of the subject-matter of claim 1.

5.2 Distinguishing features

The subject-matter of claim 1 differs from the device of figure 9 of D1 in that the transmitting optical fibre and the receiving optical fibre are carried by a first and a second optical fibre ferrule stub, respectively.

5.3 Objective technical problem

D1 does not disclose how the optical fibres of figure 9 are held in place. Therefore, when putting the teaching of D1 into practice, the skilled person will be confronted with objective technical problem of how to hold the fibres in place. See also the appealed decision, points 20.1 and 20.3.3.

5.4 Obvious solution

In order to solve the objective technical problem, the skilled person will make use of its common general knowledge. In particular, the board concurs with the opposition division that "[t]he skilled person's common knowledge includes the widespread standard solution to carry the optical fibers in a ferrule" (appealed decision, point 20.3.4). Even though the opposition division rightly found that there are "several different ways known to the skilled person for mounting a fiber other than by means of a ferrule" (appealed decision, point 19.3.2), fibre ferrule stubs are common, if not the most commonly used

means of holding fibres in place in general. Selecting a known means of holding a fibre (i.e. by means of a ferrule stub) from among several known means does not involve an inventive step. It follows that the skilled person putting the teaching of D1 into practice would arrive at the subject-matter of claim 1 without exercising any inventive skills.

5.5 Patentee's arguments in favour of inventive step

5.5.1 The patentee contested that the objective technical problem to be solved was how to hold the fibres.

In the patentee's view, referring to the rectangular box in figure 9 surrounding the distal portion of the fibre and the lens, "a means for holding a distal portion of the fiber is already suggested" in D1 (P1, point 90).

According to the patentee, "[t]he use of the first and second optical fiber ferrule stub ensures better alignment for transmission along an axis of rotation. The cited prior art does not relate to this problem such that there is no motivation for the skilled person to look at the other cited prior art" (P5, point 31). Alternatively, the objective technical problem could be formulated "as how to provide a robust and space efficient rotary joint" (P1, point 94).

5.5.2 The patentee considered that none of the patent documents D5, D7 and D8 represented common general knowledge. Moreover, their disclosure differed too greatly in technical terms from the context of the device in figure 9 of D1 so that "any combination of D1 with any of these documents in combination would not obviously lead the skilled person to the claimed invention" (P5, point 33).

The patentee submitted that "[n]o evidence to support that [ferrule stubs] [...] are part of the common general knowledge has been cited" (P2, page 8, point 48).

5.6 The board is not convinced by the patentee's arguments.

5.6.1 Objective technical problem

First of all, figure 9 of D1, in particular the rectangular box surrounding the distal portion of the fibre and the lens, is only a schematic representation from which no information can be deduced about how the fibre end and the lens are held in place. Paragraph [0040], describing figure 9, does also not disclose any precise fastening means. Since D1 is silent about how to hold in place the fibre end and the lens, the skilled person has a clear motivation to look for a solution, contrary to the patentee's view.

Secondly, as stated in the appealed decision, point 20.3.3, "[t]here are no features in claim 1 which go beyond requiring standard alignment". In particular, there is no technical reason why a general ferrule stub as claimed, contrary to the patentee's assertion, should ensure "better alignment" than a standard alignment, or offer a more "robust and space efficient rotary joint".

Therefore, the board maintains its view that the objective technical problem solved by the distinguishing feature of a general optical fibre ferrule stub is how to hold an optical fibre in position.

5.6.2 Common general knowledge

Irrespective of whether patent documents D5, D7 or D8 represent common general knowledge, combining D1 with any of the documents D5, D7 or D8 is not required to demonstrate the obviousness of the claimed subject-matter, since a general ferrule stub is a "widespread standard solution" (appealed decision, point 20.3.4) for holding an optical fibre in place. Actually, as pointedly stated by the opponent during oral proceedings before the board, an

optical fibre ferrule stub is a common means for holding an optical fibre in position.

6. Seventh auxiliary request

The subject-matter of claim 1 does not involve an inventive step in view of D1 in combination with common general knowledge.

6.1 The following features are added to claim 1 of the seventh auxiliary request with respect to claim 1 of the fifth auxiliary request (the numbering proposed by the opponent in O1, pages 3 and 4, is used):

- feature **{B}**: "wherein the transmitting lens is an expanded beam collimating lens",
- feature **{D}**: "wherein said transmitting lens is held in a first frame within a first sleeve",
- second part of feature **{E}**: "wherein said transmitting optical fiber, said first optical fiber ferrule stub and said transmitting lens are oriented on the central axis",
- feature **{F}**: "wherein the receiving lens is a collimating lens of the same size and type as the transmitting lens",
- feature **{G}**: "wherein the receiving lens is held in a second frame within a second sleeve",
- second part of feature **{H}**: "wherein said receiving optical fiber, said second optical fiber ferrule stub and said receiving lens are oriented on the central axis".

6.2 Features **{B}**, **{D}**, **{E}**, **{F}**, **{G}** and **{H}**, if novel at all, do not involve an inventive step in view of D1 and common general knowledge for the following reasons:

6.2.1 Features **{B}** and **{F}**

According to the opponent, features **{B}** and **{F}** are anticipated by the embodiment shown in figure 9 of D1 (O5, page 3, third paragraph), because figure 9 of D1 disclosed two identical ball lenses, the first ball lens converting the diverging light emitted from the optical fibre into parallel light and the second ball lens converting the parallel light into light converging onto a light receiver.

While the Board doubts that features **{B}** and **{F}** are disclosed in D1 (since figure 9 of D1 is only a schematic drawing from which features generally cannot be directly and unambiguously derived), it is convinced that a person skilled in the art, faced with the task of putting the embodiment of figure 9 of D1 into practice, would interpret the optical arrangement in such a way that the two ball lenses of figure 9 of D1 are in fact identical collimating lenses within the meaning of features **{B}** and **{F}**. This is not only because the schematic drawing of figure 9 shows exactly two identical collimating lenses, but also because it is notoriously known in the art that one of the most common types of optical coupling of two optical fibres is achieved by using two identical collimating lenses.

Therefore, if novel at all, features **{B}** and **{F}** do not involve an inventive step in view of D1 and common general knowledge.

6.2.2 Features **{D}** and **{G}**

As submitted by the opponent (O5, page 3, sixth and seventh paragraphs) the patent description discloses neither a particular technical advantage related to features **{D}** and **{G}** nor a technical problem solved by

them. The opponent concluded rightly that it can therefore be assumed that these features merely correspond to a simple constructive measure within the scope of ordinary technical practice, which does not require any inventive activity. During the oral proceedings before the board, the opponent further argued that, since there is no description of a technical benefit arising from features **{D}** and **{G}** that goes beyond the provision of general holding means for a lens, the claimed holding of the lenses by a frame within a sleeve merely represented an arbitrary selection of one type of holding means from a plurality of known equivalent holding means. The board concurs with the opponent's view.

In fact, the frame within a sleeve is merely a two-part frame. The use of a general two-part frame instead of a general one-part frame is an obvious possibility that does not involve an inventive step.

6.2.3 Features **{E}** and **{H}**

According to the opponent (O5, page 4, third paragraph; it is to be noted that there is a typo in this paragraph of O5 because it refers to features "**{D}** and **{E}**" instead of features "**{E}** and **{H}**"), the objective technical problem solved by features **{E}** and **{H}** was to arrange the fibres, the ferrules and the lenses so that an optical signal was transmitted between the fibres. Moreover, it was obvious for the skilled person to arrange these components on a axis as claimed in order that the transmitted optical signal was received by the optical receiver. In fact, it would have been incomprehensible if features **{E}** and **{H}** were not implemented in the embodiment of figure 9 of D1.

The board agrees with the opponent that orienting the optical fibres, the fibre ferrule stubs and the lenses on

the central axis of rotation as claimed is, if novel at all, an obvious solution to ensure that the optical signal is transmitted between the two bidirectional transceivers BIDI 1 and BIDI 2 in figure 9 of D1 while they rotate relative to each other.

6.2.4 In view of the fact that claim 1 of the seventh auxiliary request consists of the features of claim 1 of the fifth auxiliary request, to which features **{B}**, **{D}**, **{E}**, **{F}**, **{G}** and **{H}** have been added, and that neither the features of claim 1 of the fifth auxiliary request nor any of the additional features **{B}**, **{D}**, **{E}**, **{F}**, **{G}** and **{H}** involve an inventive step, it follows that the subject-matter of claim 1 of the seventh auxiliary request does not involve an inventive step.

6.3 Patentee's arguments in favour of inventive step

6.3.1 According to the patentee (P5, point 43), features **{D}** and **{G}** "ensure improved alignment of optical components". Starting from D1, the skilled person, in order to solve this technical problem, would not consider holding the lenses in a frame within a sleeve, as claimed, because "D1 already teaches a solution to ensuring better alignment. When considering improvements in alignment, the skilled person is taught from Figure 5 of D1 to implement a FORJ [Fiber Optic Rotary Joint]" (P5, point 49).

The board cannot follow the patentee's assertion that features **{D}** and **{G}** would improve the alignment of optical components in any way. Not only is it unclear in relation to which situation the alignment would be improved, but it is also incomprehensible why a general frame within a general sleeve would improve the alignment in relation to any holding device. Moreover, simply because D1 describes the use of a FORJ in certain embodiments other than the

embodiment of figure 9 does not mean that the skilled person would be deterred from implementing holding means consisting of a frame within a sleeve. Independently of this, it is to be noted that D1, [0040], discloses that the embodiment of figure 9 does not use a FORJ.

6.3.2 During the oral proceedings, the patentee submitted that the technical effect related to features **{B}**, **{D}**, **{E}**, **{F}**, **{G}** and **{H}** as an assembly consisted in holding the lenses and components of the first and the second elements mechanically in place. The mechanical assembly defined in claim 1 was not, however, a conventional assembly, as the lenses were held in position not by a single frame but by two separate components, namely by a frame within a sleeve. This type of separate holding means was easier to manufacture. "It is noted that provision of a frame, as a separate component to the sleeve, beneficially provides a means that can be tailored to support the specific lenses employed" (P5, point 56).

As explained in point 6.2.2 above, the board is unable to see in a general two-part frame instead of a general one-part frame any technical effect supporting the presence of an inventive step. Depending on the circumstances (e.g. shape of the lens; alignment requirements; spatial constraints), the skilled person would choose an adequate frame, such as a frame within a sleeve.

6.3.3 Concerning features **{E}** and **{H}**, the patentee stated in writing that they were not arbitrary "but serve a technical purpose" (P5, point 57), and that therefore the opponent's reasoning was incomplete.

Contrary to the patentee's assertion, the opponent in O5 correctly argued that features **{E}** and **{H}** solved the objective technical problem of ensuring the transmission

of the optical signal between the two elements rotating relative to each other in an obvious manner.

6.4 Opposition division's arguments in favour of inventive step

The board cannot follow the opposition division's reasoning in the appealed decision, point 25.3.2, which arrived at the conclusion that the subject-matter of claim 1 involved an inventive step over D1 as closest prior art.

In particular, it is not clear from the appealed decision which precise features were considered to be new with respect to the closest prior art represented by D1 and which objective technical problem was precisely associated with the distinguishing features. It is therefore unclear why the conventional mechanical fixing arrangement defined in claim 1 was considered to involve an inventive step by the opposition division.

Their statement in point 25.3.2 of the appealed decision that "[t]he requirement of multiple steps confirms the conclusion that it is not obvious to combine D1 with D7 such that it results in the subject-matter of claim 1" does not convince the board. Since the description of the embodiment of figure 9 of D1 is rather general, it is to be expected that the skilled person would have to carry out multiple steps in order to close the gap in the disclosure of the embodiment of Figure 9 of D1 and to implement the teaching of D1. However, this does not amount to an inventive step, as these multiple steps consist simply in implementing well-known measures in the art.

6.5 For the reasons above, and since the patentee's and opposition division's arguments in favour of inventive step are not found convincing, the board concludes that the subject-matter of claim 1 lacks an inventive step in view of D1 and common general knowledge.

7. For the above reasons the board comes to the conclusion that none of the patentee's requests is allowable, that the decision under appeal must be set aside and the patent be revoked.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

L. Gabor R. Bekkering

Decision electronically authenticated