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Datasheet for the decision of 18 August 2015

Case Number: T 1407/12 - 3.5.03

Application Number: 04761716.2

Publication Number: 1673881

IPC: H04B10/08, H04B17/00

Language of the proceedings: EN

Title of invention:
Method and apparatus for testing optical networks

Patent Proprietor:
EXFO INC.

Opponent:
JDSU Deutschland GmbH

Headword:
Testing optical networks/EXFO

Relevant legal provisions:
EPC Art. 56
RPBA Art. 12(4), 13(1)

Keyword:
Main request and first auxiliary request - inventive step (no)
Second and third auxiliary requests - admissibility (no)

Decisions cited:
G 0009/91

Catchword:

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Case Number: T 1407/12 - 3.5.03

D E C I S I O N
of Technical Board of Appeal 3.5.03
of 18 August 2015

Appellant: (Patent Proprietor)	EXFO INC. 400 Godin Avenue Vanier QC G1M 2K2 (CA)
Representative:	Dixon, Philip Matthew HGF Limited 140 London Wall London EC2Y 5DN (GB)
Respondent: (Opponent)	JDSU Deutschland GmbH Mühleweg 5 72800 Eningen (DE)
Representative:	Klocke, Peter ABACUS Patentanwälte Lise-Meitner-Strasse 21 72202 Nagold (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 23 April 2012 revoking European patent No. 1673881 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	F. van der Voort
Members:	T. Snell
	O. Loizou

Summary of Facts and Submissions

I. This appeal was lodged by the proprietor against the decision of the opposition division revoking European patent No. EP 1673881 on the ground that the subject-matter of the claims of a main request and first auxiliary request respectively did not involve an inventive step.

II. The decision was based essentially on the disclosure of D3, consisting of a group of documents, inter alia:

(i) Excerpts from "Acterna OLC-65 - Optical Level Controller, V 1.00 - Operating Manual - BN 2276/01, Series A ...", and
(ii) a circuit diagram, entitled "OLC_65_Block Service.jpg".

The decision also mentions D6, which was cited in the notice of opposition:

H. Dutton, "Understanding Optical Communications", IBM - International Technical Support Organisation, September 1998, pages 185 to 193, 228, 237 and 420 to 422.

III. In the notice of appeal, the proprietor (henceforth, appellant) requested that the decision be set aside and that the patent be maintained in accordance with either the main request or the auxiliary request refused in the decision. In the subsequently filed statement of grounds of appeal, the appellant requested that the patent be maintained on the basis of the main request refused in the decision, a fresh copy of which was enclosed, or alternatively on the basis of either a

first or a second auxiliary request both filed with the statement of grounds.

The appellant also requested that the following document "JJ" cited during the opposition procedure, but not admitted by the opposition division, be admitted to the appeal proceedings:

D. Cleary, "Fundamentals of a Passive Optical Network (PON)", FTTH Conference 2004, Orlando USA, Oct. 4-6 2004.

The appellant also cited four more documents, D9 to D12, of which D12 is the most relevant to the present decision:

J. George, "Optical Design Considerations for FTTP Networks", FTTH Conference 2003, New Orleans USA, Oct. 7-9 2003.

IV. In a response to the appeal, the opponent (henceforth, respondent) requested that the appeal be dismissed.

The respondent submitted four new documents D13 to D16, which however are not relevant to the present decision.

V. Both parties conditionally requested oral proceedings.

VI. In a communication accompanying a summons to attend oral proceedings, the board gave a preliminary opinion that the subject-matter of claim 1 of the main request and of the first and second auxiliary requests did not involve an inventive step. It also expressed doubts that the second auxiliary request should be admitted. The board also noted that the request for admitting document JJ was not reasoned and that the documents D9

to D11 were not prior art documents within the meaning of Article 54(2) EPC and therefore did not appear to be prima facie relevant.

VII. In a response to the board's communication, the appellant submitted, inter alia, arguments in respect of the relevance of document JJ to inventive step and maintained the requests on file.

VIII. Oral proceedings took place on 18 August 2015.

During the oral proceedings, the appellant filed a new third auxiliary request.

The appellant requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the claims of the main request or, in the alternative, on the basis of the claims of either the first or the second auxiliary request, all requests as filed with the statement of grounds of appeal dated 23 August 2012, or on the basis of the claims of the third auxiliary request as filed during the oral proceedings.

The respondent requested that the appeal be dismissed.

At the conclusion of the oral proceedings, after due deliberation, the chairman announced the board's decision.

IX. Claim 1 of the **main request** reads as follows:

"A portable test instrument for measuring a parameter of each of a first optical signal (S1) and a second optical signal propagating concurrently in opposite directions in an optical transmission path (16,

16/1 ,... , 16/9) between two network elements (10, 14/1,..., 14/9), at least one (14/1,.., 14/9) of the network elements being operative to transmit the first optical signal (S1) only if it continues to receive the second optical signal (S2) from the other (10) of said network elements, the portable test instrument comprising first and second connector means (22, 24) for temporarily connecting the portable test instrument into the optical transmission path in series therewith, and propagating and measuring means (32, 38, 46) connected between the first and second connector means for propagating at least said second optical signal (S2) towards said at least one (14) of the network elements, the propagating and measuring means (32, 38, 46) being operable to measure a parameter of each of the first optical signal (S1) and the second optical signal (S2)
wherein the propagating and measuring means comprises coupler means (32) having first and second ports (28,30) connected to the first and second connector means, respectively, so that a path therebetween within the coupler means completes the optical transmission path, a third port (36) for outputting a portion of each optical signal received via the second port (30) and a fourth port (34) for outputting a portion of each optical signal received via the first port (28) and detection means (38, 42, 44) coupled to the third and fourth ports for converting the optical signal portions into corresponding electrical signals."

X. Claim 1 of the **first auxiliary request** reads as follows:

"A portable test instrument for measuring a parameter of each of a first optical signal (S1) and a second optical signal propagating concurrently in opposite

directions in an optical transmission path in a passive optical network (16, 16/1 ,... , 16/9) between an optical line terminal (10) and an optical network terminal (14/1,..., 14/9), the optical network terminal (14/1,.., 14/9) being operative to transmit the first optical signal (S1) only if it continues to receive the second optical signal (S2) from the optical line terminal (10), the portable test instrument comprising first and second connector means (22, 24) for temporarily connecting the portable test instrument into the optical transmission path in series therewith, and propagating and measuring means (32, 38, 46) connected between the first and second connector means for propagating at least said second optical signal (S2) towards said optical network terminal (14), the propagating and measuring means (32, 38, 46) being operable to measure a parameter of each of the first optical signal (S1) and the second optical signal (S2) wherein the propagating and measuring means comprises coupler means (32) having first and second ports (28,30) connected to the first and second connector means, respectively, so that a path therebetween within the coupler means completes the optical transmission path, a third port (36) for outputting a portion of each optical signal received via the second port (30) and a fourth port (34) for outputting a portion of each optical signal received via the first port (28) and detection means (38, 42, 44) coupled to the third and fourth ports for converting the optical signal portions into corresponding electrical signals."

XI. Claim 1 of the **second auxiliary request** is the same as claim 1 of the first auxiliary request except that the following wording is added to the end of the claim:

", and

wherein, where the measured optical signals (S1, S2) comprises [sic] bursts of digital data alternating with lulls, the measuring means (46) is arranged to extract the average of the optical power averaged over the duration of the individual bursts."

XII. Claim 1 of the **third auxiliary request** is the same as claim 1 of the first auxiliary request except that the wording "a parameter" is replaced throughout the claim by "optical power".

Reasons for the Decision

1. Main request - claim 1 - inventive step

1.1 The patent in suit relates to a portable test instrument for taking measurements of a parameter (in particular optical power) of an optical transmission path. The patent is directed to testing paths within a passive optical network, although claim 1 is not limited in this respect. The portable test instrument includes first and second connector means enabling it to be inserted temporarily in series with the optical path, e.g. in order to make measurements at an optical network terminal ONT located at a customer premises. The instrument is able to take measurements of first and second signals propagating concurrently in opposite directions.

1.2 The closest prior art is considered to be document D3, which discloses a portable test instrument, which, like the instrument described in the patent, is designed to be temporarily connected in series with an optical transmission path in order to take power measurements.

1.3 Document D3 submitted by the opponent with the notice of opposition in fact consists of a group of documents, including excerpts from the operating manual of the "Acterna OLC-65" optical level controller and a circuit diagram entitled "OLC_65_Block Service.jpg" purportedly relating to the same device. The appellant acknowledged at the oral proceedings before the board that the skilled person who opened up the OLC-65 device would have found the circuit represented in the circuit diagram. Consequently, there was no dispute that the operating manual and the circuit diagram could be considered jointly as a single prior art disclosure.

1.4 During the opposition procedure, the proprietor had also filed the complete operating manual of the Acterna OLC-65. Where passages are referred to from the complete manual, this will be indicated.

1.5 The OLC-65 device comprises connectors for connecting the device into the optical path (cf. page 3-13, section 3.5.4). Inside the device, there is a controllable attenuator connected to a 4-port coupler (cf. the circuit diagram, above right). The circuit diagram shows that the input signal to the device is attenuated by the controllable attenuator and is passed to a first terminal of the 4-port coupler. The signal is output from a second port of the coupler and passed to the output connector of the device. A part of the signal is tapped off at the third port of the coupler and fed to a power meter. The fourth port of the coupler is unconnected.

1.6 The OLC-65 device is a multimode device. One of the modes is a "Power Meter Function" mode, which is the mode most relevant to claim 1 (cf. page 1-2, first paragraph). As the signal to be measured first passes

through the controllable attenuator, the power measurement takes the attenuation value of the controllable attenuator into account (cf. page 1-4, section 1.3).

1.7 When connected into a transmission path, the OLC-65 test instrument can take a power measurement of a signal propagating in one direction only. However, the device is, in the board's judgement, suitable for taking bi-directional measurements by being connected in a first direction (say, downstream) to measure the power of the downstream optical signal and then connected in the reverse direction (upstream) to measure the power of the second upstream optical signal. It is also to be noted that, although the instrument is primarily intended for unidirectional use, light is able to pass in both directions through the device. This follows from the reciprocity principle of propagation through couplers (cf. e.g. D6, page 189, section 5.4.1.1), and is corroborated by the safety information given on D3 (complete version), page 2-3, section 2.2, in which it is stated that light will emerge from any open connection, in particular when connected back to front.

1.8 Claim 1 requires that the first optical signal (upstream signal) will only be transmitted if the network element continues to receive the second optical signal (downstream signal). When the OLC-65 device is connected to measure the upstream signal from an ONT, this means that the downstream signal must be receivable by the ONT, i.e. be sufficiently strong to overcome the insertion loss of the device, mostly caused by the controllable attenuator. The minimum insertion loss of the test instrument is 3 dB (cf. D3, full version, page 7-2, section 7.3). The appellant

argued that an insertion loss of 3 dB would result in the downstream signal not being received at the destination network element so that this element would not transmit the upstream signal. Consequently, the OLC-65 device was not suitable for measuring upstream power. However, this argument would only be relevant for downstream links designed with less than a 3 dB margin. Claim 1 however puts no limits on the power level of the downstream signal or the loss margin of the transmission link. Consequently, the board concludes that the OLC-65 is suitable for measuring the upstream power within the terms of claim 1.

1.9 It follows that, using the wording of claim 1, D3 discloses a portable test instrument [suitable] for measuring a parameter ("optical power") of each of a first optical signal [upstream] and a second optical signal [downstream] propagating concurrently in opposite directions in an optical transmission path between two network elements, at least one of the network elements being operative to transmit the first optical signal [upstream] only if it continues to receive the second optical signal [downstream] from the other of said network elements, the portable test instrument comprising first and second connector means for temporarily connecting the portable test instrument into the optical transmission path in series therewith, and propagating and measuring means (4-port coupler and power meter) connected between the first and second connector means for propagating at least said second optical signal towards said at least one of the network elements, the propagating and measuring means being operable to measure a parameter (optical power) of each of the first optical signal and the second optical signal, wherein the propagating and measuring means comprises coupler means (4-port coupler) having first

and second ports connected to the first and second connector means, respectively, so that a path therebetween within the coupler means completes the optical transmission path, a third port for outputting a portion of each optical signal received via the second port and a fourth port [suitable] for outputting a portion of each optical signal received via the first port and detection means (power meter) coupled to the third port for converting the optical signal portions into corresponding electrical signals.

1.10 The subject-matter of claim 1 differs from the disclosure of D3 in that there are detection means coupled to the fourth port as well as the third port of the coupler means. This has the technical effect that measurements of both the first and second signals can be taken without having to reconnect the device.

1.11 In the board's view, the problem to solved starting out from D3 is to provide a test instrument which enhances user comfort with regard to obtaining measurements from both upstream and downstream directions of a bi-directional optical link, in particular with regard to the inconvenience of having to reverse the connections as explained above.

1.12 The skilled person in this case is an optical communications engineer who understands the principles of bi-directional light propagation through optical components, especially couplers, based on the principle of reciprocity (cf. D6, referred to above). The skilled person would understand that the upstream signal can be measured by connecting the OLC-65 device in reverse to the downstream direction, because then a portion of the upstream signal is directed to the third port, i.e. the port connected to the power meter. The skilled person

with a knowledge of optical couplers would also understand that when a bi-directional signal is passed through the coupler of the OLC-65 device, a portion of the signal propagating from the "output" connector to the "input" connector is emitted from the fourth port of the 4-port coupler. In the board's view, the skilled person faced with the above problem would therefore, without requiring inventive skill, provide a means for detecting the signal emanating from the fourth, hitherto unused, port of the 4-port coupler and thus arrive at the subject-matter of claim 1.

1.13 The appellant presented the following main counter-arguments:

(i) At the claimed priority date, no one had contemplated performing measurements of the uplink signal, or knew how to do it. This was evidenced by the conference document JJ in which it is stated that "only the downstream light can be measured" (cf. page 8, lines 9 to 10).

(ii) In D3, there is no mention of the possibility of using the OLC-65 device to test passive optical networks.

(iii) D3 is a unidirectional device. No one would have contemplated using it for a bi-directional link. This is clear from the safety information in D3 which warns against connecting the device in the reverse direction. There is no bi-directional pass-through and no possibility of simultaneous upstream and downstream measurement.

(iv) D3 is not primarily a power measuring device. Essentially, it is a device for controlling output power for test purposes.

(v) If the skilled person did use the device of D3 to measure power, he would measure the downstream power by connecting only the input signal, since there is no use in outputting a signal. This would not result in an improvement over the use of a light meter, as known in the prior art.

(vi) If the skilled person tried to adapt the device of D3, he would leave out components unnecessary for measuring power, namely the attenuator and the coupler. He would thus arrive only at a light meter, and not at the claimed apparatus.

(vii) In passive optical networks, a 3 dB loss through the device would be unacceptable. As shown by document D12, typically in passive optical networks there is a maintenance margin of only 1 dB. Consequently, no downstream signal would be received by the ONT and hence no upstream signal transmitted.

1.14 Re (i): The board is unconvinced that there would have been no interest in measuring the upstream signal, since in communications engineering there is a general requirement to test any communications link. The statement in document JJ appears to state nothing more than that there is no possibility to measure the upstream light with "a light meter". This statement is of no relevance in respect of taking measurements with the OLC-65 device.

Re (ii): Claim 1 is not limited to passive optical networks. This argument will be considered in connection with claim 1 of the first auxiliary request.

Re (iii): The board agrees that the OLC-65 device of D3 was not designed for bi-directional links. The safety advice in the operating manual is however plausibly aimed at a service technician who needs to use the device but who may only have a limited knowledge of optical transmission fundamentals and no knowledge of the internal circuit of the device, and not at the skilled person who is an optical communications engineer. The skilled person would readily understand that connecting the OLC-65 into a bi-directional link would not as such be problematic, since the light passing in the reverse direction would simply pass through the device. He would therefore understand that the OLC-65 device can be used to take measurements on a bi-directional link.

Re (iv): Power measuring is explicitly one of the functions of the device of D3. Whether or not it is the main function, in the board's view, is not relevant.

Re (v) and (vi): In order to measure the upstream power, the device needs to be connected to the network terminal unit and the coupler needs to be present. Therefore, in order the solve the problem of improving operator comfort when using the device for taking both downstream and upstream measurements these features would be retained.

Re (vii): Claim 1 is not limited to passive optical networks. This argument will be considered in connection with claim 1 of the first auxiliary request.

The board consequently found the appellant's arguments to be unconvincing.

1.15 The board concludes that the subject-matter of claim 1 does not involve an inventive step (Articles 52(1) and 56 EPC).

2. First auxiliary request - claim 1 - inventive step

2.1 Claim 1 of the first auxiliary request differs from claim 1 of the main request in that it is limited to a portable test instrument for testing a passive optical network.

2.2 The appellant's arguments set out in (ii) and (vii) above are relevant to this request.

2.2.1 The main issue is whether the 3 dB loss introduced by the OLC-65 device of D3 renders the device inherently unusable for passive optical networks, as argued by the appellant. The appellant referred to document D12, Figure 2. This figure shows a table of design data for "BPON Link Models using ITU 983.3 Methodology". A reach value in km is shown for two examples of network design, under the assumption of a "maintenance margin" of 1 dB. The appellant argued that it followed from this that 3 dB was far too great a loss for ensuring continuity of the downstream signal. The board however regards this table as merely setting out the practical limits on the maximum reach achievable. D12 does not imply that all links in passive optical networks are to be designed close to these limits. Therefore, while a 3 dB loss would make a test device unsuitable for testing links with a maintenance margin of only 1 dB, those with a higher margin can be tested, e.g. links where the fibre length to the ONT is much shorter. In any

case, claim 1 does not stipulate the type of passive optical network to be tested or set limits on the power margin to be respected. In particular, there is no requirement for the maintenance margin to be only 1 dB. The board also notes that in the main embodiment of the patent in suit, the coupler uses an 80:20 split, which causes an attenuation of approximately 1 dB (referring to signal strength). In paragraph [0042] of the patent it is stated that different ratios may be used, whereby lower ratios entail more attenuation, while higher ratios lead to more polarisation-dependence. Despite the fact that the patent embraces embodiments with an insertion loss greater than 1 dB, there is no mention here that the insertion loss resulting from the coupler split ratio must be low enough to ensure correct reception of the signal by the ONT.

2.2.2 The board notes further that having arrived at a test instrument capable of measuring the power of bi-directional links of a passive optical network with a power margin greater than 3 dB, but not those with a power margin less than 3 dB due to the insertion loss caused by the attenuator, the skilled person would find it an obvious step to look to reduce the insertion loss of the test instrument in order to test links with a lower power margin. An obvious solution that would occur to the skilled person would be to remove the attenuator entirely.

2.2.3 In view of the above, the subject-matter of claim 1 of the first auxiliary request does not involve an inventive step either (Articles 52(1) and 56 EPC).

3. Second auxiliary request - admissibility

3.1 The claims of the second auxiliary request were filed for the first time together with the statement of grounds of appeal, i.e. the request was not presented during the opposition procedure.

3.2 In accordance with Article 12(4) RPBA, the admissibility of requests which could have been presented in the first instance proceedings is at the discretion of the board.

3.3 The Enlarged Board of Appeal has established that the primary purpose of opposition appeal proceedings is to challenge the decision of the opposition division on its merits, i.e. to examine the correctness of the decision (cf. e.g. G 9/91, point 18 of the reasons). Even if amended claims in appeal proceedings may be admitted, it follows that they should generally bear at least some relation to the issues discussed during the opposition procedure, and not result in an entirely fresh case.

3.4 In the present case, claim 1 has been amended by the addition of a feature concerned with the bursty nature of the communication. This technical problem was neither mentioned by the proprietor during the opposition procedure, nor was any feature relating to this aspect included in the independent claims. Instead, as a fallback position during the opposition procedure, the proprietor submitted an auxiliary request based on an entirely different aspect. Consequently, the amendments to claim 1 of the second auxiliary request result in an entirely fresh case being presented.

3.5 The appellant argued that a patent proprietor in appeal was entitled to rely on fallback positions provided by

the dependent claims. Claim 1 was based on a combination of granted claims 1, 2 and 10. Furthermore, the request was filed in response to seeing the detailed reasons set out in the impugned decision. In particular, the proprietor had been taken by surprise by the broad interpretation given by the opposition division to D3 in the decision. Having read the decision, the proprietor had needed time to regroup. Only then had it been possible to identify potentially inventive subject-matter.

3.6 The board however notes that the preliminary view of the opposition division as regards the present main request had been set out in the communication accompanying the summons to oral proceedings (cf. points 3.1 and 3.2 of the communication dated 19 December 2011). Therefore, the proprietor should have been aware that the request might not succeed. It was incumbent on the proprietor at that stage to consider which aspects of the patent to pursue by means of auxiliary requests, particularly those raising completely new issues, so that these could be examined by the opposition division and the opponent. The board therefore finds the appellant's arguments for admitting the request at this late stage unconvincing.

3.7 The board therefore decided not to admit the second auxiliary request (Article 12(4) RPBA).

4. Third auxiliary request - admissibility

4.1 The third auxiliary request was filed during the oral proceedings. Claim 1 of the request is amended with respect to claim 1 of the first auxiliary request by replacing the wording "a parameter" by "optical power".

4.2 In accordance with Article 13(1) RPBA, amendments submitted after the appellant filed its grounds of appeal may be admitted at the discretion of the board. One established criterion is whether the amendments result in the request being clearly allowable.

4.3 In the present case, the "parameter" defined in claim 1 has in the above discussion of claim 1 of the main and first auxiliary requests with respect to D3 been considered as the optical power in any case. Consequently, the amendment makes no difference to the assessment of inventive step. The third auxiliary request is therefore prima facie not allowable.

4.4 The appellant argued that the request had been filed in response to a comment made by the chairman of the board to the effect that claim 1 was not limited to measuring optical power. However, whilst that was true, this aspect finally played no role in the board's deliberations.

4.5 The board therefore decided not to admit the third auxiliary request (Article 13(1) RPBA).

5. Documents D9 to D11

These documents were filed by the appellant with the statement of grounds of appeal, but were not referred to at the oral proceedings. The board considers that these documents are not prima facie relevant to the assessment of inventive step given above. Consequently, there is no need to consider them further.

6. Conclusion

As there is no allowable request, it follows that the appeal must be dismissed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Rauh F. van der Voort

Decision electronically authenticated