Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [X] To Chairmen
(D) [-] No distribution

Datasheet for the decision of 6 February 2025

Case Number: T 0746/22 - 3.4.02

Application Number: 11835736.7

Publication Number: 2635932

IPC: G02B21/02, A61B1/00, G02B23/24, G02B13/00, G02B13/06, G02B9/60

Language of the proceedings: EN

Title of invention:
OPTICAL SYSTEMS FOR MULTI-SENSOR ENDOSCOPES

Patent Proprietor:
EndoChoice Innovation Center Ltd.

Opponent:
Karl Storz SE & Co. KG

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no)

Decisions cited:
T 0176/97, T 0661/09

Catchword:

In a claimed optical lens system comprising a plurality of lenses, it must be examined whether the feature distinguishing the claimed lens system over the prior art has a technical effect. If no effect beyond an arbitrary modification of the prior art lens system can be attributed to the distinguishing feature over the whole scope of the claim, the claimed lens system does not involve an inventive step. See Reasons, point 1.5.

Europäisches Patentamt
European Patent Office
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

Case Number: T 0746/22 - 3.4.02

D E C I S I O N
of Technical Board of Appeal 3.4.02
of 6 February 2025

Appellant: (Patent Proprietor)	EndoChoice Innovation Center Ltd. 2 Hatochen Street North Industrial Park 30889 Caesarea (IL)
Representative:	Vossius & Partner Patentanwälte Rechtsanwälte mbB Siebertstrasse 3 81675 München (DE)
Appellant: (Opponent)	Karl Storz SE & Co. KG Dr.-Karl-Storz-Strasse 34 78532 Tuttlingen (DE)
Representative:	Weidner Stern Jeschke Patentanwälte Partnerschaft mbB Wilhelm-Herbst-Straße 5 28359 Bremen (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 14 January 2022 concerning maintenance of the European Patent No. 2635932 in amended form.**

Composition of the Board:

Chairman	R. Bekkering
Members:	A. Hornung
	B. Müller

Summary of Facts and Submissions

I. Both the opponent and the patentee appealed against the interlocutory decision of the opposition division maintaining European patent No. 2635932 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, Article 100(b) EPC and Article 100(c) EPC.

The opposition division had found that the patent as amended according to a third 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 6 February 2025.

The patentee initially requested that the decision under appeal be set aside and the patent be maintained as amended on the basis of the claims according to the

- main request filed with letter dated 19 August 2020 or
- auxiliary request 1 filed with letter dated 6 October 2021,
- auxiliary requests 2 and 3 filed during the oral proceedings before the opposition division on 7 December 2021,
- auxiliary request 4 and 5 filed with letter dated 6 October 2021 (then filed as auxiliary requests 2 and 3),
- auxiliary request 6 filed with letter dated 28 September 2022.

The patentee's final requests were identical to its initial requests, except that the fourth and fifth auxiliary requests were withdrawn during the oral proceedings before the board.

The opponent requested that the decision under appeal be set aside and that the patent be revoked.

III. The following documents, which were relied on in the first-instance opposition proceedings, are referred to in the present decision:
D1: US 2007/0203396 A1,
D4: US 2010/0245653 A1.

The patentee's written submissions are designated P1 to P5 as follows:
P1: statement of grounds of appeal, filed with letter dated 24 May 2022,
P2: letter dated 28 September 2022 (reply to the opponent's statement of grounds of appeal),
P3: letter dated 21 December 2022,
P4: letter dated 25 May 2023,
P5: letter dated 2 January 2025.

The opponent's written submissions are designated O1 to O5 as follows:
O1: statement of grounds of appeal, filed with letter dated 5 May 2022,
O2: letter dated 29 September 2022 (reply to the patentee's statement of grounds of appeal),
O3: letter dated 2 March 2023,
O4: letter dated 26 July 2023,
O5: letter dated 17 December 2024.

IV. Claim 15 of the main request reads as follows:

"An objective lens system (132, 232) for at least one of a front-pointing camera sensor (134) and a side-pointing camera sensor (234) of a multi-sensor endoscope, the objective lens system comprising:

a front sub-system (510a, 520a, 530a) and a rear sub-system (510b, 520b, 530b) separated by a stop diaphragm, wherein

said front sub-system (510a, 520a, 530a) comprises a first front negative lens (430, 430', 430") and a second front positive lens (431, 431', 431"), and

said rear sub-system (510b, 520b, 530b) comprises a first rear positive lens (432, 432', 432"), an achromatic sub-assembly comprising a second rear positive lens (433, 433', 433") and a third rear negative lens (434, 434', 434"), wherein said side-pointing camera sensor (234) and said side objective lens system (232) have a total optical length of 5 mm or less and/or said front-pointing camera sensor (134) and said front objective lens system (132) have a total optical length of 5 mm or less,

wherein the following condition is satisfied:

$f_{(\text{first rear positive lens})} \leq 1.8f$, where f is the composite focal length of the total lens system (132, 232) and $f_{(\text{first rear positive lens})}$ is the focal length of said first rear positive lens (432, 432', 432")".

- Claim 1 according to the first auxiliary request reads as follows:

"An optical system for a tip section of a multi-sensor endoscope, the system comprising:
a front-pointing camera sensor (134);

a front objective lens system (132);
a side-pointing camera sensor (234); and
a side objective lens system (232),
wherein at least one of said front and side objective lens systems (132, 232) comprises a front sub system (510a, 520a, 530a) and a rear sub-system (510b, 520b, 530b) separated by a stop diaphragm (S_1),

wherein said front sub-system (510a, 520a, 530a) comprises, in order from the object side, a first front negative lens (430, 430', 430") and a second front positive lens (431, 431', 431"),

said rear sub-system (510b, 520b, 530b) comprises, in order from the object side, a first rear positive lens (432, 432', 432"), an achromatic sub-assembly comprising a second rear positive lens (433, 433', 433") and a third rear negative lens (434, 434', 434"), wherein the following condition is satisfied:

$f_{(\text{first rear positive lens})} \leq 1.8f$, where f is the composite focal length of the total lens system (132, 232) and $f_{(\text{first rear positive lens})}$ is the focal length of said first rear positive lens (432, 432', 432")".

- Claim 1 of the second and the third auxiliary request are identical. They differ from claim 1 of the first auxiliary request only in that they comprise the following additional feature:

"wherein said side-pointing camera sensor (234) and said side objective lens system (232) have a total optical length of 4 mm or less".

- Claim 1 of the sixth auxiliary request differs from claim 1 of the second and the third auxiliary request

only in that the expression "total optical length of 4 mm or less" was replaced by:

"total optical length of 3 mm or less".

Reasons for the Decision

1. Main request - inventive step

The subject-matter of independent claim 15 lacks an inventive step in view of document D4.

1.1 Closest prior art - inconsistency between table 1 and figure 1 of D4

The objective lens described in table 1 of D4 represents the closest prior art.

1.1.1 In spite of the inconsistency between table 1 and figure 1 of D4, and contrary to the patentee's opinion that "Table 1 [of D4] does not appear to provide a basis for a direct and unambiguous disclosure" (P1, sentence bridging pages 3 and 4), the board agrees with the opponent that "Table 1 alone would disclose enough information for a person skilled in the art to find all necessary information pertaining to the lenses to be combined to form an optical system as discussed" (O2, [11]). Indeed, "said Table 1 is consistent in itself and could (...) be a single source of correct disclosure without any relation to Figure 1. The person skilled in the art will of course (...) recognize the obvious mistake" (O4, [14]) in figure 1 of D4 and correct it by renumbering adequately the radii of curvatures in figure 1. See also, e.g., the opponent's explanation in O2, [05] to [11].

1.1.2 In response to the board's communication pursuant to Article 15(1) RPBA, the patentee submitted that, "[t]he Board's assertions are incorrect and not aligned with the EPO's practice for dealing with errors in prior art documents" (P5, page 2, second paragraph) and referred to *inter alia* the Guidelines for Examination, G-IV,9.

The patentee's general statement is not relevant since the board is not constrained by a general "EPO's practice" nor by the Guidelines for Examination.

1.1.3 The patentee further argued that in case of an error in a prior art document, "the skilled person must be able to directly and unambiguously derive from the prior art document that it contains an error and what the only possible correction should be" (P5, page 2, fourth paragraph). The patentee went on explaining that in the present case "the skilled person would certainly not be able to determine a single possible correction for the errors in Table 1 and Fig. 1. In fact, a plurality of possible corrections to said error are feasible" (P5, page 2, fifth paragraph).

The board is not convinced because the patentee's explanations of how the skilled person might interpret the inconsistency between figure 1 and table 1 of D4 (other than considering table 1 to be flawless) are not plausible. For instance, the patentee's allegation that "the skilled person just as well could derive from Fig. 1 that the reference sign 'R5' shown in Fig. 1 is indicative of the radius of the stop 12, in particular since the reference line associated with the reference sign 'R5' appears to be substantially pointing to the stop 12" (P5, page 2, fifth paragraph) is not comprehensible: the reference line associated with the reference sign 'R5' clearly points to the input surface of lens L3 and not to

the stop 12. Moreover, the opponent asserted at the oral proceedings (not disputed by the patentee) that an attempt to design an objective lens according to figure 1 (i.e. based on the references signs as defined in figure 1 but using the numerical values of table 1) would not result in an objective lens with an optically acceptable performance anyway.

1.1.4 During the oral proceedings, the patentee further submitted that, even if the discrepancy in D4 could perhaps be resolved for the purpose of assessing novelty by considering table 1 as an accidental disclosure of the claimed subject-matter, this was not acceptable for the purpose of assessing inventive step of the claimed subject-matter, as was the case here.

The board is unable to follow the patentee's reasoning. The skilled person would clearly identify the discrepancy between figure 1 and table 1 and then resolve it by understanding that an inadvertent shift of the reference signs in figure 1 has occurred, regardless of whether novelty or inventive step is being considered.

1.2 Distinguishing feature

1.2.1 According to the board's communication annexed to the summons to oral proceedings, point 7.1.5, the subject-matter of claim 15 differs from the objective lens system of D4 only in that it comprises the following feature **F2**:

F2: "wherein the following condition is satisfied:

$$f_{(\text{first rear positive lens})} \leq 1.8f,$$

where f is the composite focal length of the total lens system (132, 232) and $f_{(\text{first rear positive lens})}$ is the focal length of said first rear positive lens (432, 432', 432")".

1.2.2 During oral proceedings before the board, both parties stated that they agreed with the board's finding that feature **F2** was the only distinguishing feature in view of the embodiment of D4, table 1.

1.3 Technical effect of the distinguishing feature **F2**

1.3.1 Feature **F2** is a feature related to the entire objective lens system of claim 15 which comprises five lenses in total. More precisely, feature **F2** defines a mathematical relation between the focal length of a "first rear positive lens" (hereafter referred to as f3) and the total focal length (hereafter referred to as f) of the five lenses of the claimed objective lens system. Actually, feature **F2** defines that the first rear positive lens has an optical power (1/f3) which is at least equal to 1/1.8 = 0.56 times the total optical power (1/f), i.e. feature **F2** defines the minimum contribution of optical power of the first rear positive lens to the total optical power of the objective lens system.

1.3.2 As such, merely defining a minimum contribution of the optical power of a lens in a group of five lenses (all of which are barely defined by optical parameters) has no relevant technical effect on any of the optical characteristics of the objective lens system, such as reducing the total optical length, reducing the optical aberrations, improving the optical quality or increasing the field of view. Indeed, all of these optical characteristics of the objective lens system result from precise optical parameters of the objective lens system (e.g. radii of curvature of the constituting lenses, lens materials, distances between the lenses). In order to provide at least a contribution to a well-defined optical characteristic of the objective lens system, it would be

necessary that the claimed objective lens system be defined in greater detail by optical parameters, such as the radii of curvature of the lenses, the relative positions of the lenses and the aperture stop, the material of the lenses. However, apart from feature **F2**, the lenses are defined, in claim 15, exclusively by the sign of their optical power, the maximum of the "total optical length" and the fact that two lenses form an achromatic sub-assembly. With such a general definition of the objective lens system of claim 15, the optical power (1/f3) of a single lens cannot technically imply on its own a specific optical characteristic of the objective lens system. The board sees no causal connection between the optical power of the first rear positive lens and any overall optical characteristic of the objective lens system.

1.3.3 The board is unable to see any effect of feature **F2** other than to arbitrarily define a mathematical relationship ($f3 \leq 1.8f$) between the focal length f3 of one of the lenses of the objective lens system with respect to the total focal length f of the objective lens system. However, in the present case, where the optical parameters of the claimed objective lens system are only very incompletely defined, the selection of a maximum value of f3 when f is fixed, or the selection of a minimum value of f when f3 is fixed, does not provide a technical effect relevant to the claimed invention.

1.4 Objective technical problem solved by feature **F2**

In view of the absence of any relevant technical effect related to the feature **F2** (see point 1.3 above), no objective technical problem solved by feature **F2** can be defined.

1.5 Involvement of an inventive step

As for instance explained in T 176/97, point 4.4 of the Reasons for the Decision, if the distinguishing feature of a claim has no effect of technical relevance on the claimed subject-matter and does not credibly solve an objective technical problem, then no inventive step can be based on it. In the present case, the objective lens system of claim 15 is considered to be no more than an arbitrary modification of the objective lens system of D4 which does not involve an inventive step within the meaning of Article 56 EPC.

1.6 Patentee's arguments in favour of inventive step

1.6.1 The patentee argued during oral proceedings before the board that, starting from the very precise lens design defined in table 1 of D4, the skilled person would have a "perfect" lens design and would therefore have no incentive to change any optical parameter of the lens design of D4. Only with the benefit of hindsight of the invention defined in claim 15 could the skilled person consider modifying the focal lengths f3 and f in any way. However, even if the skilled person had considered modifying f3 and f, there was no hint in D4 or in any other prior art document to modify the focal lengths f3 and f precisely to satisfy the equation defined in feature **F2**. Finally, considering that f3 in D4 was equal to 2.45 mm and 1.8f was equal to 2.322 (cf. the board's communication, point 7.1.5), f3 would have to be reduced. However, decreasing the focal length f3 implied that the radii of curvature of the lens L3 would also have to be decreased, thereby increasing the centre thickness of the lens L3 (corresponding to the "first rear positive lens" of claim 15) and, in turn, increasing the total optical length. Referring to paragraphs [0021] and [0022] of D4,

the patentee submitted that increasing the central thickness of the lens L3 and, in turn, the total optical length, was contrary to the teaching of D4. The patentee therefore concluded that not only would the skilled person have no motivation to reduce the focal length f3, but he would even be taught not to do so in D4.

The patentee's argumentation is not convincing because it assumes that, starting from the objective lens system disclosed in table 1 of D4, the skilled person would need a concrete incentive to modify it in a certain direction. This overlooks the point that the difference between the lens systems of claim 15 and of D4 is only an arbitrary modification of the lens design of D4 (in this case, providing a certain focal length ratio f3/f). The question of whether there is a motivation to change the lens design of D4 does not arise in the present case. An arbitrary change to the lens design resulting in no relevant technical effect is in itself devoid of any inventive step.

Moreover, even if there were a relevant technical effect associated with fulfilling the equation defined in feature **F2**, i.e. with reducing the focal length f3 in D4, the patentee's argument that D4, [0021] and [0022], taught not to reduce the focal length f3 is not convincing. D4, [0022], merely discloses that the "refracting power of a lens is the product of the curvature and the difference of the refractive index and the surrounding medium [...]. When the curvature is lower, the radius of the lens surface can be flatter" and therefore "the center thickness of lens L3 can be reduced to reduce the overall length of an optical system. [...] Thus, a plan convex lens with the same refractive power can be shorter if the refractive index of the glass is higher". In essence, this amounts to the teaching of the use of lenses with a high

index of refraction to reduce the overall length of the lens system. However, from such a general statement, it cannot be deduced that the focal length f3 of D4 may not be reduced.

1.6.2 The patentee submitted during oral proceedings before the board that the technical effect of feature **F2** was to contribute to the reduction of the total optical length of the objective lens system. While acknowledging that the patent description did not demonstrate in detail how the fulfilment of the optical power condition of lens L3 (i.e. $f3 \leq 1.8f$) of claim 15 resulted in a reduction of the total optical length, the patentee submitted that a comparison of the lens thicknesses of the lenses in the objective lens systems of the patent (embodiment of table T_1 on page 10 of the patent) and of D4, table 1, confirmed the technical relevance of lens L3 in the obtention of a reduced total optical length. In particular, the lens thicknesses of lenses L1, L2, L4 and L5 were of a similar magnitude in both embodiments, whereas the lens thickness of lens L3 was significantly different. The patentee further opined that specifying the entire optical set-up in claim 15, in order to define more concretely how the effect of reducing the total optical length is achieved, would unduly limit the scope of the claim.

The board is not convinced by the patentee's argument. That feature **F2** specifically contributes to reducing the total optical length, while claim 15 defines hardly any optical parameter of the lens design, is only an allegation without any substantive evidence in the patent description. In fact, the achievement of a short total optical length is the result of the combination of many optical parameters (radii of curvature of the lenses; lens materials; positions of the lenses) which are undefined in present claim 15.

The board cannot follow the patentee's argument with respect to the magnitude of the lens thicknesses. Indeed, the lens thicknesses of the five lenses in the embodiments of the patent and D4 are, respectively:

- 0.20, 0.56, 0.75, 0.75, 0.30 (patent, table T_1),
- 0.20, 0.50, 0.60, 0.70, 0.35 (patent, table T_2),
- 0.30, 0.60, 0.45, 0.85, 0.25 (D4, table 1).

It can be seen from this that, contrary to the patentee's assertion, not only is the lens thickness of the third lens quite different between the embodiments of the patent and D4, but also the lens thickness of the first and fifth lenses. More importantly, regardless of whether the lens thicknesses differ substantially between the embodiments, the patentee did not show (nor can the board see any reason) why a difference in lens thickness between the embodiments of the patent and D4 would at all demonstrate that the third lens plays a particular role in achieving a short total optical length.

Moreover, the fact that the scope of protection of a claim comprising all relevant optical parameters necessary to achieve a desired optical characteristic of a lens design is rather limited cannot generally be a reason for omitting the optical parameters from the claim.

2. First auxiliary request - inventive step

The subject-matter of claim 1 lacks an inventive step in view of D1 in combination with D4.

2.1 It is undisputed between the parties that the optical system for a tip section of a multi-sensor endoscope of D1 represents the closest prior art and that the subject-matter of claim 1 differs from the optical system of D1

only in that it comprises on objective lens system as defined in claim 1.

2.2 The technical effect of the objective lens system defined in claim 1 is to further concretise the general lens design for a tip section of a multi-sensor endoscope.

An endoscope requires in general a compact optical system having high optical quality and a wide field of view. Therefore, "the objective technical problem can be defined as [how] to provide an objective lens system having a wide field of view while keeping the objective compact and maintaining a high image quality" (appealed decision, page 11).

Starting from D1, the skilled person, wanting to put into practice the disclosure of D1, will indeed be confronted with the problem of how to realise effectively the lens of D1, since the lens of D1 is only disclosed in vague and general terms in D1, such as "lens module" ([0029]), "side view lens" ([0029]), "fish-eye" ([0032]) or "very wide angle view-[lens]" ([0032]). No concrete details about the optical set-up of the lens are disclosed in D1. "When trying to solve this problem the skilled person will inevitably consider document D4. This document discloses an endoscope objective lens assembly providing a particularly wide field of view, a high image quality while being compact (see paragraph [0007], last two sentences, paragraph [0023] last sentence" (appealed decision, page 11).

In this way, the skilled person will arrive at an optical system for a tip section of a multi-sensor endoscope from which the claimed optical system differs only in that the condition $f3 \leq 1.8f$ is fulfilled. However, this

distinguishing feature does not contribute to inventive step for the reasons set out in points 1.3 to 1.5 above.

It follows that the subject-matter of claim 1 does not involve an inventive step over D1 in combination with D4.

2.3 Patentee's arguments in favour of inventive step

2.3.1 The patentee submitted in writing and orally during oral proceedings before the board that the lens used in D1 was a *single* lens. "Hence, if the skilled person were to consult documents with the aim of reducing the length of the lens of D1, the skilled person certainly would not consider D4, since this would increase the length of the length *[sic]* of D1" (P5, page 6, penultimate paragraph).

Contrary to the patentee's assumption, D1 does not disclose that the lens of D1 is a single lens, nor does it disclose a numerical value of the total optical length of the lens of D1. D1 merely generally discloses a lens having a wide field of view and being suitable for use in an endoscope. Therefore the skilled person is obliged to look for a concretisation of the general lens of D1 and would consult D4 which discloses a concrete objective lens system which is compact, has high optical quality and a wide field of view.

2.3.2 During oral proceedings before the board, the patentee argued that D1 already disclosed a perfectly optimised lens system and that the objective lens system of D4 was no better than that of D1. Therefore, the skilled person would have no reason to look for a another prior art document (such as D4) to further improve the lens of D1. Only with hindsight would the skilled person consider replacing the lens of D1 with the lens of D4.

The board is unable to follow the patentee's argument. D1 merely discloses a general lens without further details of its optical characteristics, such as the concrete optical set-up, the image quality or the total optical length. Thus, it is not hindsight, but simply the fact that the teaching of D1 is put into practice that leads the skilled person to search for a specific lens design and eventually find the objective lens system of D4.

2.3.3 The patentee submitted in writing and orally during oral proceedings before the board that "neither D1 nor D4 discloses or suggests the feature that the following condition is satisfied:
$f_{(\text{first rear positive lens})} \leq 1.8f$ [...]. Hence, a hypothetical combination of D1 and D4 would not result in the subject-matter of claims 1 and 15" (P5, page 5, last paragraph). If the skilled person were to consider using the objective lens system of D4 in the optical system of D1, they would take it without modifying it, i.e. the above condition would not be fulfilled.

The board is not persuaded by this argument. As explained in points 1.3 to 1.5 above, fulfilling the condition $f_{(\text{first rear positive lens})} \leq 1.8f$ in the context of present claim 1 provides no technical effect other than arbitrarily modifying the lens design of D4. Therefore, this distinguishing feature does not contribute to inventive step.

3. Second and third auxiliary requests - inventive step

The subject-matter of claim 1 lacks an inventive step in view of D1 in combination with D4.

3.1 Claim 1 of the second and the third auxiliary requests differs from claim 1 of the first auxiliary request only

in that the objective lens system has a total optical length of 4 mm or less (instead of 5 mm or less).

3.2 The only features of the claimed optical system which in principle are suitable to contribute to achieving the desired result of a total optical length of 4 mm or less (instead of 5 mm or less, as disclosed in D4) are the sign of the optical power of the five lenses included in the claimed optical system, as well as the condition $f_{(\text{first rear positive lens})} \leq 1.8f$. These few features are far from sufficient to achieve the desired result. Indeed, optical parameters such as the radii of curvature of the lenses, their material and the distance between them would have to be defined in claim 1 to achieve a total optical length of 4 mm or less.

Therefore, the feature of a total optical length of 4 mm or less expresses "no more than a set of desiderata, without any indication of a causal link between the desired properties and the constitution of the claimed device. Insofar as the claim does not define any concrete measures on how to ensure that the claimed properties are effectively obtained, the claimed properties remain at an abstract or conceptual level. Accordingly, the issue of inventive step [relating to the feature of a total optical length of 4 mm or less] boils down to the question of whether or not the skilled person [...] would in an obvious way have envisaged the claimed set of desiderata" (T 661/09, catchword).

The closest prior art document D1 relates to "devices for use in performing medical procedures including delivery devices and procedures for the lungs" (D1, [0002]). In particular, the endoscope of D1 "is adapted to be inserted into the lung via a patient's mouth" (D1, [0010]). Similarly, D4 relates to medical endoscopes, for which

compactness of the rigid tip of the endoscope, where the objective lens system is located, is very important. "To keep the overall length of the rigid portion of this tip short, extreme length constraints have arisen for the construction of the objective lens for such video endoscopes" (D4, [0004]). In this context, the skilled person starting from the medical endoscope of D1 and putting it into practice by implementing the objective lens system disclosed in D4 (having a total optical length of 4.96 mm) will be motivated to further reduce the total optical length of the objective lens system, e.g. to 4 mm or less.

It follows that the feature of a total optical length of 4 mm or less merely amounts to an obvious desideratum.

Since the remaining features of claim 1 of the second and the third auxiliary requests do not contribute to inventive step for the same reasons as those for claim 1 of the first auxiliary request, the subject-matter of claim 1 of the second and the third auxiliary requests lacks an inventive step in view of D1 in combination with D4.

3.3 Patentee's arguments in favour of inventive step

3.3.1 The patentee essentially argued that "the aim or motivation of reducing the total optical length of a lens system" (P5, page 8, last paragraph) was not disclosed or at least hinted at in the prior art documents.

The board is not persuaded by the patentee's argument because, for both applications of the endoscopes of D1 and D4, the shorter the objective lens system, the easier is it to insert the endoscope into the human body. Therefore, the desire to reduce the total optical length of the

objective lens system is self-evident for the skilled person.

3.3.2 Moreover, the patentee alleged that "none of the cited documents D1 and D4 even mentions that a total optical length of a lens system of 4 mm or less is even technically achievable based on the configurations disclosed in D1 and D4 [...]. The skilled person would certainly not be able to achieve a total optical length of 4 mm or less [...] without exercising inventive skill" P5, page 9, second paragraph).

The patentee's argument is moot because the question is not whether the skilled person would actually be able to modify the optical set-up of D4 so that the total optical length is 4 mm or less. As explained in point 3.2 above, the claimed property remains at an abstract or conceptual level in the absence of structural technical features which establish the claimed property. In such a situation, it is irrelevant to assess whether the skilled person possesses the technical competence to actually redesign the lens system of D4 (the case of insufficient disclosure of a feature is discarded here). Regardless of this, and contrary to the patentee's assertion, the board sees no technical reason why the skilled person (i.e. an optical designer using conventional optical design software) would not be able to reduce the total optical length to 4 mm or less. The patentee also failed to substantiate its allegation with thorough and comprehensible arguments.

4. Sixth auxiliary request - inventive step

The subject-matter of claim 1 lacks an inventive step in view of D1 in combination with D4.

4.1 Claim 1 of the sixth auxiliary request differs from claim 1 of the second auxiliary request only in that the objective lens system has a total optical length of 3 mm or less (instead of 4 mm or less).

4.2 Since claim 1 of the sixth auxiliary request lacks structural technical features for achieving the desired result of a total length of 3 mm or less, this feature amounts to an obvious desideratum. Therefore, the subject-matter of claim 1 of the sixth auxiliary request lacks an inventive step for the reasons corresponding to those given for the subject-matter of claim 1 of the second auxiliary request.

4.3 The patentee submitted that a total length of 3 mm was even further away from the teaching of D1 and D4 than a total length of 4 mm and that the skilled person was even less able to achieve such a short length.

The board is not convinced by the patentee's argument for reasons corresponding to those given in point 3.3 above.

5. For the above reasons the board comes to the conclusion that none of the patentee's requests is allowable and that the patent must 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:

S. Lichtenvort R. Bekkering

Decision electronically authenticated