Unified Patent Court
Einheitliches Patentgericht
Juridiction unifiée du brevet

Milan - Central Division - First Instance

UPC_CFI_292/2026

Decision

of the Court of First Instance of the Unified Patent Court

issued on 11 November 2026

Headnotes

1. The patent in dispute constitutes the subject-matter of the Court's examination and may therefore be consulted ex officio *where a party has identified it but has not filed a copy. This does not apply to patents or patent applications (or file history) relied upon as evidence in support of invalidity objections: notwithstanding their public availability, such documents must be duly introduced into the proceedings by the party relying on them, in accordance with Article 54 UPCA and Rules 170.1(a) and 172 RoP. Such materials constitute procedural documents in the strict sense: they form the evidentiary basis of the parties' allegations under R. 170.1(a) RoP. Their public availability, and the Court's practical ability to access them, does not relieve the party relying upon them of its burden of pleading and allegation (§ 10-11).*

2. For the purpose of assessing novelty of a claim reciting a parameter range, where several technically reasonable methods are available to measure the parameter, and where the patent does not designate one in particular, it is sufficient that at least one of them, applied coherently to the prior-art disclosure, leads directly and unambiguously to a value within the claimed range, to consider that the corresponding feature is anticipated (§ 167).

3. Claim deletion occurs where part of the claim set is simply removed. In that event, the opposing party can only take note of the proprietor's decision to abandon a dependent claim. By contrast, when an amendment under Rule 50 RoP—although it may also take the form of a mere deletion—results in a reformulated claim set, including where dependent claims are concerned, this remains subject to the Court's assessment as to clarity, added matter and validity pursuant to R.50.2 RoP and also to observations by the opposing party under the adversarial principle (§ 184-185).

CLAIMANT:

Light Guide Optics International (registration no. 41503034724), with registered offices in Celtniecībasiela 8, Līvāni, Līvānu nov., LV-5316, Republic of Latvia,

Representatives under Article 48(1) UPCA: lawyers Maria Balestriero, Francesca Ellena, Irene Picciano and Martina Lucenti, Law Firm Portolano Cavallo, Piazza Borromeo 12, 20123 Milan, Italy.

Hereinafter the Claimant (or LGO)

DEFENDANT:

BIOLITEC Holding GmbH & Co. KG, Untere Viaduktgasse 6, 1030 Vienna, Austria

Representatives: CBH Rechtsanwälte PartG mbB, Paul Szynka, Hannes Jacobsen and Alexander Fischer, Ismaninger Straße 65a, 81675 Munich, Germany.

Hereinafter the Defendant (or BIOLITEC)

PATENT AT ISSUE: European Patent no. EP 4458303 (EP'303)

Deciding Judge:

This decision is issued by the panel composed of the following judges:

Andrea Postiglione	Presiding Judge and Judge-rapporteur
Anna-Lena Klein	Legally qualified Judge
Renaud Fulconis	Technically qualified Judge

Language of the proceedings:

English

SUBJECT MATTER OF THE PROCEEDINGS:

Revocation action. Final decision.

THE PARTIES

1. Light Guide Optics International (LGO), the claimant, is a Latvian company operating in the field of light-guide and optical-fiber technology. Its activities include laser-related optical solutions for medical applications, including devices intended for the endoluminal treatment of venous insufficiencies.

2. BIOLITEC Holding GmbH & Co. KG (BIOLITEC), the defendant, is an Austrian company active in medical laser technology and related optical-fiber systems.

FACTUAL BACKGROUND

3. The dispute concerns European Patent EP 4458303, entitled "Endoluminal laser ablation device for treating veins", which is owned by BIOLITEC. The patent relates to a medical device using a waveguide to deliver laser energy inside an insufficient vein, in particular a varicose vein, so as to damage and close the vessel. The claimed solution is intended to distribute the radiation laterally and annularly along the vein wall, at relatively low power density, rather than mainly forward from the tip of the fiber.

4. LGO brought this revocation action challenging the validity of the patent on several grounds, including insufficient disclosure, added subject-matter, lack of novelty and lack of inventive step. BIOLITEC

disputes those objections and maintains that the patent is valid; in the alternative, it asks that the patent be maintained in amended form on the basis of 13 auxiliary requests (ARs), filed together with the DtR. BIOLITEC filed 10 additional ARs (1B to 8B, 12B and 13B) on 13 October 2026, shortly before the date of the oral hearing. Those additional ARs mainly relate to the modification of dependent claim 11 and deletion of dependent claim 12.

THE REQUESTS

5. LGO requests that the Court:

(i) revokes European Patent No. EP 4458303 in its entirety with effect in the Republic of Austria, the Kingdom of Belgium, the Republic of Bulgaria, the Kingdom of Denmark (excluding the Faroe Islands and Greenland), the Republic of Estonia, the Republic of Finland, the French Republic (excluding New Caledonia and French Polynesia), the Federal Republic of Germany, the Italian Republic, the Republic of Latvia, the Republic of Lithuania, the Grand Duchy of Luxembourg, the Republic of Malta, the Kingdom of the Netherlands (excluding Aruba), the Portuguese Republic, the Kingdom of Sweden, the Republic of Romania and the Republic of Slovenia, pursuant to Article 65(2) UPCA and Rule 118.3 RoP, on the ground that the patent does not meet the requirements of the EPC, in particular Articles 83, 76(1), 123(2), 54 and 56 EPC and, in respect of claim 16, also Article 53(c) EPC. In particular:

- Claim 1 is insufficiently disclosed, contrary to Article 83 EPC; the same applies to claims 2 to 16, at least by virtue of their dependency on claim 1;
- Claim 1 extends beyond the content of the earlier applications as filed, contrary to Article 76(1) EPC, and beyond the content of the application as filed, contrary to Article 123(2) EPC; the same applies to claims 2 to 16, at least by virtue of their dependency on claim 1;
- Claim 1 lacks novelty and inventive step, contrary to Articles 54 and 56 EPC;
- Dependent claims 2 and 3 lack novelty and inventive step, contrary to Articles 54 and 56 EPC;
- Dependent claims 4, 5 and 6 lack inventive step, contrary to Article 56 EPC;
- Dependent claim 7 lacks novelty and inventive step, contrary to Articles 54 and 56 EPC;
- Dependent claims 8 to 15 lack inventive step, contrary to Article 56 EPC;
- Dependent claim 16 is excluded from patentability under Article 53(c) EPC and, in any event, lacks inventive step under Article 56 EPC;
- The dependent claims also extend beyond the content of the earlier applications and of the application as filed, contrary to Articles 76(1) and 123(2) EPC.

(ii) orders the Defendant to pay all costs incurred by the Claimant in the revocation action pursuant to Article 69 UPCA.

BIOLITEC requests that:

The action for revocation is dismissed. The claimant bears the costs and expenses of the proceedings. In the alternative: The patent in suit EP 4458303 is maintained in amended form with effect for the Federal Republic of Germany, the Kingdom of Belgium, the Republic of Bulgaria, the Kingdom of Denmark (excluding the Faroe Islands and Greenland), the Republic of Estonia, the Republic of Finland, the French Republic (excluding New Caledonia and French Polynesia), the Italian Republic, the Republic of Latvia, the Republic of Lithuania, the Grand Duchy of Luxembourg, the Republic of Malta, the Kingdom of the Netherlands (excluding Aruba), the Republic of Austria, the Portuguese Republic, the Kingdom of Sweden, and the Republic of Slovenia on the basis of one of the sets of claims filed as auxiliary requests in the order listed in Chapter H of the Statement of Defence, the description and the figures as granted, and the claimant's request for revocation is dismissed insofar as it goes beyond these auxiliary requests.

THE PATENT

6. EP 4458303, (hereafter EP'303 or the patent) entitled "Endoluminal laser ablation device for treating veins" is a European Patent concerning laser endovascular treatment and, more particularly, the treatment of venous insufficiency by means of laser energy delivered through an optical fiber, see paragraph [0001]. EP'303 is a fourth-generation divisional patent, namely:

- based on application EP 24188670.4, published as EP 4458303 A2 (hereafter the application as filed or A2);
- stemming from application EP 19207282.5, published as EP 3685783 A1 (hereafter parent application 0);
- itself stemming from application EP 15181794.7, published as EP 2974687 A1 (hereafter parent application 1);
- itself stemming from EP 13165050.9, published as EP 2620119 A1 (hereafter parent application 2);
- Itself stemming from EP 09713883.8, which is a Euro-PCT application based on the PCT application published as WO 2009/108956 A1 filed on 02.03.2009 and having the European publication number EP 2254495 A1 (hereafter the PCT application).

7. The patent claims four U.S. priorities, dated from 28.02.2008 to 27.02.2009. The validity of the priority seems to be of no relevance to the dispute, although LGO challenges the validity of the first priority claim (SfR, 5.273-5.275).

8. The patent was granted on 28.01.2026. An opposition, still pending, was filed on 19.02.2026 by Light Guide Optics Germany GmbH.

9. The Claimant did not file a copy of the patent in suit, but only a digital copy of the patent application EP 4458303 A2.

10. The Court nevertheless considers that it may read the patent text of its own motion.

11. This follows from Rule 13.1(g) and 44.1(i) RoP, read in the context of the inherent jurisdiction conferred on the Court by Article 3 UPCA. Although proceedings before the UPC are governed by the principle that each party must prove the facts it alleges (burden of proof) and by the requirement that

evidence be submitted in due time (front-loaded system), the UPC is a specialized patent court whose jurisdiction concerns, inter alia, European patents with unitary effect, European patents that have not been opted out, supplementary protection certificates and the other matters specified in Article 3 UPCA. The patent in suit constitutes the subject matter of the Court's examination and may therefore be consulted *ex officio* where a party has identified it but has not filed a copy.

12. This does not apply, however, to patents or patent applications (or file history) relied upon as evidence in support of invalidity objections: notwithstanding their public availability, such documents must be duly introduced into the proceedings by the party relying on them, in accordance with Article 54 UPCA and Rules 44.1(i), 170.1(a) and 172 RoP (the Court decides *iuxta alligata et probata*).

13. Such materials constitute procedural documents in the strict sense: they form the evidentiary basis of the parties' allegations under R. 170.1(a) RoP. Their public availability, and the Court's practical ability to access them, does not relieve the party relying upon them of its burden of pleading and allegation.

THE TECHNICAL BACKGROUND

14. The technical field in which the invention is situated is the treatment of venous insufficiencies. Venous insufficiency results from malfunctioning venous valves and may lead to enlarged and twisted veins, pain, swelling and ulceration (paragraph [0004]). The patent presents endoluminal laser treatment as a minimally invasive alternative to surgery, sclerotherapy and radio-frequency treatment (paragraphs [0005]-[0012]).

15. The relevant technical field is not, however, limited to a specific medical treatment.

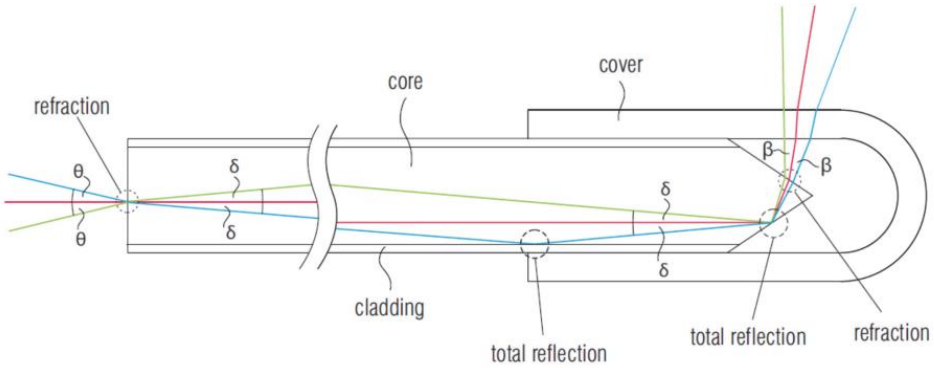
16. Although the patent states that the invention relates to laser endovascular treatments and, more particularly, to the treatment of vascular pathologies such as venous insufficiency by means of laser energy delivered through an optical fiber (paragraph [0001]), the claimed subject-matter is not a medical use or a therapeutic method as such, but a technical apparatus intended to be suitable for a specific medical use. The relevant technical contribution therefore lies principally in the construction and operation of an energy-delivery device: a flexible waveguide with a distal emitting region, optical interfaces, covers, reflective surfaces and control arrangements capable of directing energy laterally and annularly at comparatively low power density (paragraphs [0022]-[0026], [0032]).

17. The device of claim 1 is typically a laser probe, which is inserted into a vein and emits electromagnetic waves (*i.e.* radiation) to ablate/coagulate the vein wall. The laser probe comprises a "*waveguide*", which is typically an optical fiber. An optical fiber transmits electromagnetic waves along a core circumscribed by a cladding. The transmission along the optical fiber takes place because the radiation is reflected on the inner surface of the cladding. The waveguide is connectable to a "*radiation source*", which is typically the laser which feeds the probe with the electromagnetic waves.

18. The waveguide as such performs the conventional function of transmitting radiation from the source to the treatment site and does not provide the technical effect relied upon by the patent. That effect arises from the distal optical arrangement, including the shape of the distal end of the waveguide, and the presence of a cover, leading to a waveguide-gas interface, which redirects and distributes the radiation laterally and annularly towards the vessel wall.

19. The distal end of the waveguide (*i.e.* the end furthest from the operator and deepest within the patient's vasculature) emits radiation owing to a "*radiation emitting surface*". This radiation-emitting surface can notably be conical according to the patent, although this is not specified in claim 1 as granted.

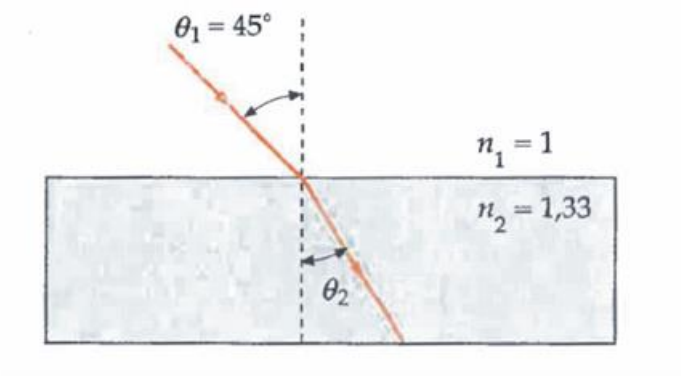
20. Radiation is emitted laterally and annularly, *i.e.,* according to a circular pattern around the longitudinal axis of the waveguide. The distal tip of the waveguide is within a sealed transparent cover, defining a gas chamber. See the drawing from BIOLITEC's DtR, p. 47:



21. In this drawing, the radiation-emitting surface is on the right-hand side (label "*refraction*"). The "*spread of the annular beam*" represents the angular extent of the emitted radiation (*i.e.* the breadth of the annulus). In the above drawing, it would be the angular span between the blue line and the green line on the right; these lines represent the outermost limits of the emitted beam.

22. The description confirms that the invention is not confined to a narrowly defined clinical specialty or to one specific biological effect. It presents alternative geometries and modes of operation, including conical emitting and reflecting surfaces, multiple emission grooves, transparent or opaque protective caps, extended emission zones and feedback control of power and pullback speed (paragraphs [0023]-[0024], [0032], [0040]-[0047]). Depending on the material of the cap, the wavelength, the power density and the manner in which energy is applied, the device may act by direct laser irradiation or by conversion of radiation into heat (paragraph [0045]). It may thermally damage or close a vessel (paragraphs [0027]-[0031]), and the description expressly contemplates different forms of energy and different energy-application devices (paragraph [0080]).

23. The most appropriate technical field of the patent in suit is therefore optics, and more specifically the design and operation of optical fibers and related energy-delivery systems. The core of the teaching concerns the propagation, emission, refraction and reflection of radiation at interfaces formed by the waveguide, the emitting surface, the gas space and the protective cover (paragraphs [0022]-[0026], [0032], [0040]-[0045]). "Refraction" occurs, namely, when radiation passes from one medium to another (*e.g.:* fiber core to gas, gas to cover material, cover material to blood) and refers to the change in direction of a wave due to a change in the refractive index of the medium through which the wave propagates, causing its direction of propagation to change upon transition into the other medium. According to the Huygens-Fresnel principle, the wave therefore continues in a different direction after passing through the interface. Furthermore, the wavelength becomes longer or shorter during the transition, but the frequency remains constant.



24. The formula describing the relationship between the angle of incidence and the angle of refraction of a light ray as it passes through the interface is known, among other names, as "*Snell's law of refraction*," which can be written as:

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

where θ is the angle (of incidence or refraction) and n is the refractive index in the respective medium.

25. Medical and vascular knowledge remains relevant to determine whether the resulting device is objectively suitable and safe for its intended endoluminal use, but it does not displace optics as the principal technical field.

26. For the same reason, the tissue absorption coefficient at a given wavelength and the laser dose required to obtain a particular biological result are of limited significance when the device *per se* is considered. Likewise, the distinction between coagulation, ablation, cauterisation and vaporisation primarily describes different tissue responses to variations in wavelength (the thermal destruction of tissues), power, exposure time and operating conditions, rather than different categories of instrument. The skilled person's attention is therefore primarily directed to the structural and optical characteristics of the device and to its objective technical suitability, not to the specific manner or therapeutic purpose for which it was previously operated.

27. It follows that the instrument belongs to the broader field of laser medicine and may be used in different medical specialties in which optical energy is delivered to biological tissue. Laser medicine includes *inter alia* endoluminal treatment of venous or arterial insufficiencies, angioplasty, coagulation or ablation of tissues, partial resection of the prostate and photodynamic therapy of tumors or other tissue lesions. The resulting medical effect depends on the laser parameters which are selected and on the clinical context in which the instrument is used.

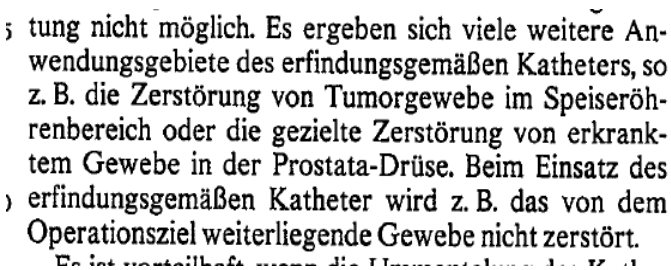
28. BIOLITEC's Exhibit W05 (Christine Burgmeier's thesis work, "*Endoluminale Behandlung der Varikosis – Analyse der Rolle kollagener Fasern und experimentelle Evaluation der thermischen Gewebeveränderungen durch Laser- und Radiofrequenzenergie*"), although post-published, may be taken into account as corroborative evidence insofar as it explains established principles governing laser–tissue interaction and confirms the dependence of the biological response on wavelength, power, energy density and exposure time.

29. According to W05, in fact, the interaction between biological tissue and laser radiation depends, on the one hand, on wavelength, power, energy density and irradiation time and, on the other hand, on

the characteristics of the tissue. Incident light may be reflected, refracted, transmitted or absorbed. The absorbed fraction is decisive: endogenous molecules convert photon energy into molecular motion and ultimately heat, while the tissue-specific and wavelength-dependent absorption coefficient μ expresses the magnitude of absorption within the irradiated tissue. How that result is achieved, however, belongs primarily to the field of optics: the skilled person focuses on the propagation, redirection and distribution of radiation by the device, while considering the resulting medical effects only as an additional constraint on its design and operation.

30. Against this background, the laser device of the invention might well also be used for partial resection of the prostate or cancer therapy or other purposes. Its principal, even though not exclusive, use remains, though, for varicose veins: varicose veins, also known as *varicoses*, are a medical condition in which superficial veins become enlarged and twisted. Compared with prostate treatment, vein treatment imposes no further requirement on the probe's emitted radiation. Power and wavelength—and thus whether coagulation or ablation occurs—are set by the laser source, which claim 1 does not cover. The probe need only be capable of transmitting radiation suitable for treating venous insufficiencies.

31. Moreover, LGO's Exhibit 059 (filed on 19 October 1995 and published on 24 April 1997) shows that the use of laser devices not only in vein treatment but also in other medical domains was widespread at the priority date. This document addresses a catheter for medical procedures on the human body using laser beams. Furthermore, it is not disputed by BIOLITEC that it was common general knowledge, at the priority date, that laser probes could be used not only for treating veins but also in various other medical procedures, as explained on page 2 of Exhibit 059:


tung nicht möglich. Es ergeben sich viele weitere Anwendungsgebiete des erfindungsgemäßen Katheters, so z. B. die Zerstörung von Tumorgewebe im Speiseröhrenbereich oder die gezielte Zerstörung von erkranktem Gewebe in der Prostata-Drüse. Beim Einsatz des erfindungsgemäßen Katheter wird z. B. das von dem Operationsziel weiterliegende Gewebe nicht zerstört.

32. BIOLITEC submits that, immediately after the priority date of the patent in suit, the physical and biological mechanisms underlying endoluminal laser treatment had not yet been fully elucidated and that the appropriate wavelength, power and optical fiber had not yet been conclusively determined. The patent nevertheless places the claimed device within the treatment of venous insufficiencies, of which varicose veins are one manifestation (paragraph [0004]). In describing the prior art, paragraph [0013] refers to US Patent No. 6,398,777 to Navarro et al. (BIOLITEC's Exhibit W14), based on an application filed in 1999. Navarro et al. discloses the method known as endoluminal laser ablation (ELA), in which an optical fiber with a flat, bare distal end is inserted into a vein and irradiates the vessel as the fiber is withdrawn.

33. Paragraph [0014] of Navarro et al. expresses the energy delivered to the vein wall in joules per centimetre (J/cm). In the relevant technical field, that quantity is commonly termed linear endovenous energy density (LEED) and is calculated as the ratio between laser power and pullback speed (W05, p. 44, paras. 2–3). The value describes the energy deposited along a unit length of the treated vessel and therefore links the operating parameters of the laser and the rate at which the fiber is withdrawn. The

Court reiterates that, although the energy-delivery rate is described in the patent, it is not a feature of the device of independent claim 1 and can be adjusted independently of the device itself. Claims 13 and 14 recite the presence of a laser source and introduce specific wavelength and power limitations, whereas the energy-delivery rate itself is expressly claimed only in dependent claim 15 (which recites the presence of an electric pullback device). It cannot therefore be read into the main claim as an implicit limitation.

34. Thus, since the principal technical focus of the claimed subject matter lies in optics—particularly the propagation, emission, refraction and distribution of radiation—the relevant medical field for defining the skilled person is not limited to phlebology or to the treatment of venous insufficiency. It is the broader field of the use of optical radiation-emitting instruments in medicine. The skilled person is therefore (as it will be explained below) an expert in optics with experience or specialisation in medical applications of optical devices, assisted, where necessary, by a medical practitioner familiar with the relevant treatment. Prior-art instruments cannot be excluded from consideration for the purposes of assessing novelty and inventive step merely because they originate from a different medical specialty, provided that their optical, structural and functional characteristics make them objectively suitable for the claimed endoluminal treatment of venous insufficiencies.

SKILLED PERSON

35. The Court of Appeal has clarified that claim interpretation is a matter of law for the Court (*Insulet v EOFlow*, UPC_CoA_768/2024, Order of 30 April 2025, paras. 79–81 and headnotes 1–2). The skilled person is a notional entity, not any real individual in the relevant technical field. What matters is the general specialist knowledge customary in that field and the average knowledge, experience and abilities within it. For inventive step, the skilled person has no inventive skills or imagination and generally requires a pointer or motivation leading from a realistic starting point to the claimed solution (*Meril v Edwards*, UPC_CoA_464/2024 et al., Decision of 25 November 2025, para. 133; see also paras. 127–132).

36. LGO submits that the skilled person is a medical-technology engineer or physicist experienced in optics and in devices using electromagnetic radiation to treat body cavities and blood vessels, working with a medical doctor. The fictitious individual is not limited to phlebology; the team would consider laser-based devices used across different medical fields.

37. BIOLITEC accepts a multidisciplinary approach but argues for a narrower team: an engineer working with a phlebologist familiar with vein treatment. In its view, that definition follows from the technical problem addressed by the patent, namely the treatment of venous insufficiencies.

38. The Court defines the skilled person as a team comprising an engineer or physicist experienced in optics and in the development of medical ablation devices, working with a medical practitioner familiar with laser-based treatments, including vascular applications. The team is not confined to phlebology and would take account of analogous ablation technologies used in other medical fields.

39. The Court therefore regards laser medicine not as an autonomous medical discipline, but as a cross-disciplinary field encompassing the use of laser instruments for medical treatment across different clinical specialties.

COMMON GENERAL KNOWLEDGE

40. Furthermore, in light of the technical and medical background discussed above, the skilled person's common general knowledge at the relevant date included the basic laws governing optical fibers and laser–tissue interaction: total internal reflection, refraction at interfaces, numerical aperture, beam divergence, scattering and diffusion, and the influence of distal-tip geometry on the direction and distribution of emitted radiation. It also included the fact that tissue response depends on wavelength, power, energy density and exposure time; the distinction between absorption, reflection, transmission and scattering in biological tissue; and the fact that increasing emitted energy may produce coagulation, carbonisation, vaporisation or ablation. In the endovenous context, that knowledge further encompasses the fact that laser power and pullback rate may be selected, the role of tumescent anesthesia in compressing and protecting the vein, and the routine use of catheters, introducers, guide wires and the Seldinger technique for vascular access and probe placement.

OBJECTIVE PROBLEM

41. The Court of Appeal set out the general approach to identifying the technical or objective problem in *Meril Italy Srl, Meril GmbH and Meril Life Sciences Pvt Ltd v Edwards Lifesciences Corporation*, Decision of 25 November 2025, UPC_CoA_464/2024 and joined appeals, headnotes 7–9 and paras. 127–129. The Court stated: "*It first has to be established what the object of the invention is, i.e. the objective problem. This must be assessed from the perspective of the person skilled in the art, with their common general knowledge, as at the application or priority date (also referred to as the effective date) of the patent. This must be done by establishing what the invention adds to the state of the art, not by looking at the individual features of the claim, but by comparing the claim as a whole in the context of the specification and the drawings, thus also considering the inventive concept underlying the invention (the technical teaching), which must be based on the technical effect(s) that the person skilled in the art, on the basis of the application, understands is (are) achieved with the claimed invention.*" The Court further held: "*In order to avoid hindsight, the objective problem should not contain pointers to the claimed solution.*"

42. Paragraphs [0015]-[0017] of the patent list the drawbacks of prior art ELA techniques. In particular, prior-art endoluminal laser ablation techniques delivered laser energy only axially (i.e. only in a forward, longitudinal direction) through a small flat fiber tip. As a result, laser energy was delivered in a highly localized manner, such that only a very limited portion of the blood and/or vein wall was irradiated at any given time and no substantial radial or lateral emission occurred. To achieve effective vein closure under these conditions, high energy levels were required, leading to elevated temperatures, increased pain, and thermal damage to surrounding tissues, with associated risks of bruising and nerve injury (paresthesia). The localized concentration of energy further increases the risk of vein wall perforation and necessitates the use of large amounts of anesthetic, typically tumescent anesthesia, thereby increasing procedural time, complexity, and stress for both the patient and the physician. According to paragraphs [0018]–[0019], US 6,986,766 provides positional markings to know the position of the fiber relative to the introducer sheath; however, it does not enable control of fiber pullback speed, while US 2004/0199151, although introducing pullback-speed control, continues to emit laser radiation primarily in a longitudinal direction from a flat fiber tip.

43. The patent seeks to overcome these complications. See paragraph [0020]*: "it is an object of the present invention to overcome one or more of the above-described drawbacks and/or disadvantages of the prior art."*

44. Paragraphs [0033]-[0037] describe the asserted advantages of the disclosed devices and methods. By distributing radiation laterally and annularly across the vessel wall at lower power densities, the device is said to reduce the risks of perforation, collateral tissue damage, pain, bruising and nerve injury. Certain embodiments may also permit safe and effective treatment without general, local or tumescent anesthesia, or with substantially smaller anesthetic volumes. Further claimed benefits include extended or multiple emission points, faster and more reliable procedures, and greater safety and comfort for patients and physicians.

45. The objective problem addressed by the patent is thus how to deliver laser energy to the wall of an insufficient vein in a sufficiently uniform, painless and effective manner, while avoiding the disadvantages associated with prior-art fibers that emitted radiation mainly forwards through a small, flat tip. The patent therefore seeks to provide a safer and more efficient endoluminal treatment at relatively low power density (paragraphs [0020]-[0021]).

CLAIMS

46. The proposed solution to the objective problem is the emission of a laser beam laterally and annularly towards a broader portion of the surrounding vessel wall, thereby distributing the energy more uniformly and reducing local energy concentration, see paragraphs [0033]-[0035] and [0041]-[0042].

47. The patent comprises one independent claim and fifteen dependent claims numbered 2-16.

48. Claim 1 can be broken down according to the following feature analysis (adopted by both parties):

Feature No.	Claim 1
1	A device for endoluminal treatment of venous insufficiencies, comprising:
2	a flexible waveguide (100, 200, 500, 600, 800, 900)
3	defining an elongated axis,
4	a proximal end optically connectable to a source of radiation (424), and
5	a distal end receivable within the blood vessel and
6	including a radiation emitting surface (110, 210, 510, 610)
7	adapted to emit radiation from the radiation source (424)
8	laterally with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900)
9	and annularly from the waveguide (100, 200, 500, 600, 800, 900) onto an angularly extending portion of the surrounding vessel wall,
10	wherein the spread of the annular beam is defined by an angle within the range of about 30° to about 40°,

11	the device further comprising a cover (106, 206, 506, 606, 906)
12	that is fixedly secured to the waveguide (100, 200, 500, 600, 800, 900) and sealed with respect thereto,
13	substantially transparent with respect to the emitted radiation,
14	that encloses the emitting surface (110, 210, 510, 610) therein,
15	and that defines a gas-waveguide interface that refracts emitted radiation laterally with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900) onto the surrounding vessel wall.

The following dependent claims read:

2. The device according to claim 1, wherein the emitting surface (110, 210, 510, 610) is angled with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900), wherein the emitting surface (110, 210, 510, 610) is oriented at an acute angle with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900) and wherein the emitting surface (110, 210, 510, 610) defines an arcuate surface contour.

3. The device according to claim 1 or 2, wherein the emitting surface (110, 210, 510, 610) is substantially conical shaped.

4. The device according to any one of claims 1 to 3, further comprising a reflecting surface (112, 212, 512, 612) distally spaced relative to and facing the emitting surface (110, 210, 510, 610) for reflecting forwardly directed radiation laterally with respect to the elongated axis of the waveguide (100, 200, 500, 600, 900).

5. The device according to claim 4, wherein the reflecting surface (112, 212, 512, 612) defines an arcuate surface contour oriented at an acute angle with respect to the elongated axis of the waveguide (100, 200, 500, 600, 900).

6. The device according to claim 5, wherein the reflecting surface (112, 212, 512, 612) is substantially conical shaped.

7. The device according to any one of claims 1 to 6, wherein the approximate center of the beam is oriented at an angle within the range of about 70° to about 90° relative to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900).

8. The device according to any one of claims 1 to 7, further comprising a lateral radiation emitting distal region (204, 504, 604) defined by a plurality of radiation emitting surfaces (208, 210, 508, 510, 608, 610) axially spaced relative to each other along a distal region of the waveguide (200, 500, 600, 900), wherein a first radiation emitting surface (210, 510, 610) is formed at the distal tip of the waveguide (200, 500, 600, 900), and a plurality of second radiation emitting surfaces (208, 508, 608) proximally is located with respect to the first radiation emitting surface (210, 510, 610) and axially spaced relative to each other.

9. The device according to claim 8, further comprising an axially-extending cover (206, 506, 606, 906) that encloses the lateral radiation emitting distal region (204, 504, 604), forms a gas interface at each of the plurality of radiation emitting surfaces (208, 210, 508, 510, 608, 610) that is sealed with respect to the exterior of the waveguide (200, 500, 600, 900), and cooperates with the angled arcuate surface

contour of at least a plurality of the radiation emitting surfaces (208, 210, 508, 510, 608, 610) to deflect radiation laterally with respect to the elongated axis of the waveguide (200, 500, 600, 900).

10. The device according to any one of claims 1 to 9, further comprising a sleeve (946) slidably mounted over the waveguide (900) and defining an internal radiation reflective surface for reflecting laterally emitted radiation inwardly and controlling the axial length of the lateral radiation emitting distal region, and/or further comprising a radiation source (424), a temperature sensor (426) thermally coupled to a distal region of the waveguide (420) for monitoring a temperature within the blood vessel and transmitting signals indicative thereof, and a control module (428) electrically coupled to the temperature sensor (426) for regulating the power output of the radiation source (424) based thereon, and/or further comprising a pullback actuator (430) drivingly coupled to the waveguide (420) for controlling the pullback speed of the waveguide (420), and wherein the control module (428) is electrically coupled to the pullback actuator (430) for regulating the pullback speed of the waveguide (420) based on the temperature at the distal region of the waveguide(420), and/or further comprising a guide wire (534, 634) detachably coupled to the waveguide (500, 600) and including a distal portion extending distally beyond the distal tip of the waveguide (500, 600) for guiding the waveguide (500, 600) through the blood vessel.

11. The device according to any one of claims 1 to 10, wherein the waveguide is an optical fiber (100, 200, 500, 600, 900) and wherein the cover is a cap (106, 206, 506, 606, 906) that is fused to the fiber.

12. The device according to claim 11, wherein the cap (106, 206, 506, 606, 906) is fused to the fiber core.

13. The device according to any one of claims 1 to 12, further comprising at least one laser source (424) that provides laser radiation of about 1470 nm +/- about 30 nm or about 1950 nm +/- about 30 nm, wherein the proximal end of the waveguide (100, 200, 500, 600, 800, 900) is optically coupled to the at least one laser source (424).

14. The device according to claim 13, wherein said at least one laser source (424) provides laser radiation of at least one of about 980 nm, about 1470 nm and about 1950 nm, each +/- about 30 nm, at a power of less than or equal to about 10 W or less than 5 W, wherein the proximal end of the waveguide (100, 200, 500, 600, 800, 900) is optically coupled to the at least one laser source (424), and wherein the emitting surface (110, 210, 510, 610) of the waveguide (100, 200, 500, 600, 800, 900) emits radiation laterally with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900) in an axially-extending, annular pattern onto the surrounding vessel wall.

15. The device according to any one of claims 1 to 14, further comprising an electric pullback device (430) drivingly coupled to the waveguide (100, 200, 500, 600, 800, 900) and configured to pullback the waveguide (100, 200, 500, 600, 800, 900) through the blood vessel while delivering laser radiation at an energy delivery rate of less than about 50 J/cm, 40 J/cm, 30 J/cm, 20 J/cm or 10 J/cm on average to the blood vessel wall.

16. The device according to any one of claims 1 to 15, wherein the device is arranged for a method for endoluminal treatment of a vein, comprising the following steps:

(i) introducing a waveguide (100, 200, 500, 600, 900) defining an elongated axis into the vein;

(ii) transmitting radiation through the waveguide (100, 200, 500, 600, 900); and (iii) emitting radiation laterally with respect to the elongated axis of the waveguide (100, 200, 500, 600, 900) onto an angularly extending portion of the surrounding vein wall while pulling the waveguide (100, 200, 500, 600, 900) back from the vein.

CLAIM CONSTRUCTION

49. The Court of Appeal has stated the governing principles of claim construction in *10x Genomics, Inc. and President and Fellows of Harvard College v NanoString Technologies Inc. and others*, Order of 26 February 2024, UPC_CoA_335/2023, App_576355/2023, headnote 2, as rectified by the Order of 11 March 2024: "*The patent claim is not only the starting point, but the decisive basis for determining the protective scope of a European patent under Art. 69 EPC in conjunction with the Protocol on the Interpretation of Art. 69 EPC. The interpretation of a patent claim does not depend solely on its exact wording in the linguistic sense. Rather, the description and the drawings must always be used as explanatory aids for the interpretation of the patent claim and not only to resolve any ambiguities in the patent claim. This does not mean, however, that the patent claim merely serves as a guideline and that its subject matter also extends to what, after examination of the description and drawings, appears to be the subject matter for which the patent proprietor seeks protection. The patent claim must be interpreted from the point of view of a person skilled in the art. In applying these principles, the aim is to combine adequate protection for the patent proprietor with sufficient legal certainty for third parties. These principles for the interpretation of a patent claim apply equally to the assessment of infringement and validity.*" The Court of Appeal reaffirmed that approach in *Insulet Corporation v EOFlow Co., Ltd.*, Order of 30 April 2025, UPC_CoA_768/2024, paras. 79–81 and headnotes 1–2, holding that claim interpretation is a matter of law for the Court and must be carried out through the eyes of the skilled person, using the description and drawings as explanatory aids while preserving the claim as the decisive basis of the inquiry.

Feature 1. A device for endoluminal treatment of venous insufficiencies, comprising:

50. Feature 1 is a purpose-related limitation of an apparatus claim, not a claim to a medical use.

51. The Court of Appeal has held that means-plus-function features encompass any means suitable for performing the stated function (*Abbott Diabetes Care v Sibio Technology*, UPC_CoA_382/2024, 14 February 2025, headnote and para. 47) and has confirmed that functional and purpose-related wording defines a product through its suitability for the stated purpose (*Grundfos v Hefei*, UPC_CoA_622/2025 and UPC_CoA_623/2025, 27 May 2026, para. 41). Claim 1 is directed to an instrument. Its suitability must therefore result objectively from its construction and operation; neither the manufacturer's or operator's intended use nor the medical indication assigned to it is decisive. This corresponds to the established interpretation of "*apparatus for*" claims: a known apparatus suitable for the stated purpose is relevant in the assessment of novelty and inventive step even if that purpose was not previously mentioned, because the claimed subject matter is the apparatus rather than its use.

52. The device of claim 1 is for the endoluminal treatment of *venous insufficiencies*, not solely of varicose veins. As paragraph [0004] of the patent explains, "*Valvular failure, usually referred to as venous insufficiency, is a chronic disease that can lead to skin discoloration, varicose veins, pain, swelling and*

ulcerations." Varicose veins are thus one of several possible clinical manifestations of the broader pathological condition identified in the claim.

53. Feature 1 requires only those inherent characteristics that make the probe objectively capable of endoluminal treatment of venous insufficiencies, a pathological condition, characterized inter alia by valvular failure, that may also lead to the development of varicose veins (paragraph [0004]). This distinction is relevant to the assessment of objective suitability, because venous insufficiency may exist before, and without yet producing, the enlargement, twisting and loss of elasticity characteristic of varicose veins.

54. Against this background, the Court considers irrelevant the patentee's arguments concerning the diameter of the laser probe, the thickness of the cap and length of its distal end, insofar as those parameters are calibrated solely by reference to varicose (and twisted) veins. As mentioned above, varicose veins form a narrower category than venous insufficiencies, since a varicose vein is a possible manifestation or complication of an insufficient vein, so that the characteristics specific to varicose veins cannot be elevated into the governing benchmark for assessing suitability under feature 1.

55. Apart from this argument, the person skilled in the art knows that vein dimensions vary and finds in the patent no mandatory probe diameter, rigid distal-section length, cap-wall thickness, degree of flexibility, beam intensity or treatment duration; its drawings are schematic, and the description permits different radiation sources, powers and ancillary components, see paragraphs [0020]-[0026], [0031], [0079]. The skilled person understands that those features are non-selective. Those parameters may affect the selection or operation of a probe in an individual treatment, but they are not selective limitations of claim 1. A prior-art instrument is therefore excluded by feature 1 only if its structure or operation makes the claimed endoluminal use impossible or it is inherently capable of performing the claimed function only with substantial structural modification; suitability is excluded only where its construction makes that use technically impossible or necessarily unsafe—for example because it cannot pass through a vessel or would necessarily perforate it—not merely because it was designed, marketed or previously used for another medical purpose.

Feature 2. a flexible waveguide (100, 200, 500, 600, 800, 900)

56. LGO submits that "flexible" is neither defined nor quantified in EP'303 and must therefore be construed broadly. The claim does not require uniform flexibility over the entire waveguide; indeed, the rigid distal cap necessarily limits bending in the enclosed portion.

57. BIOLITEC replies that flexibility must be assessed in the context of the claimed apparatus: the waveguide must be capable of following the course of a vein, although the patent sets no numerical threshold. It adds that the waveguide remains flexible as a component even where the cap creates a rigid distal section, provided that section is not so long as to prevent insertion.

58. Consistently with the construction of feature 1, the skilled person interprets feature 2 as an objective structural requirement, not by reference to the intended treatment in a particular case. The waveguide must possess sufficient inherent flexibility to permit vascular insertion and passage; a device that cannot bend to that extent is not suitable for the claimed use. However, neither the claim nor the description requires a quantified degree of flexibility, uniform flexibility along the whole waveguide, or continued flexibility within the rigid cap. Feature 2 is therefore selective only at that functional threshold and does not import any further limitation concerning the degree or distribution of flexibility.

Feature 3. defining an elongated axis,

59. Feature 3 introduces the elongated axis of the waveguide. The position of this axis is not defined in more detail in EP'303.

60. Paragraphs [0027] and [0028] of the patent clarify that the elongated axis is functional to insertioninto the blood vessel and that the waveguide is able to slide back and forth in the blood vessel and be retracted once the blood vessel is treated. The skilled person will understand the elongated axis to be the axis of the waveguide that corresponds to the direction of its greatest extension in the longitudinal direction. In the opinion of the skilled person, the longitudinal axis represents an approximate axis of symmetry of the waveguide. Consequently, the skilled person understands the center axis shown in the figures of EP'303 to be the elongated axis. This feature is not disputed by the parties.

Feature 4. a proximal end optically connectable to a source of radiation (424), and

61. According to feature 4, the proximal end of the device must be suitable for an optical connection to a radiation source. This feature is to be understood as meaning that the device can be coupled to the radiation source, in particular a laser source, in such a way that the radiation can be transmitted through the waveguide. This feature is also not disputed by the parties.

Feature 5. a distal end receivable within the blood vessel, and

62. Feature 5 requires the distal end to be receivable within "the blood vessel". The skilled person understands this expression, consistently with BIOLITEC's submission and with the claim as a whole, as referring to the particular blood vessel into which the probe must necessarily be inserted during use; in that sense, "the blood vessel" means a blood vessel capable of receiving the distal end and, in the context of feature 1, normally a vein. This is an objective suitability requirement: the distal end must be structurally capable of vascular insertion without necessarily damaging the vessel. It does not, however, require the distal end to be dimensioned or otherwise tailored to one specific vessel such as i.e. the GSV (Great Saphenous Vein). Blood vessels and veins vary in diameter and geometry, and neither the claim nor the description defines a mandatory vessel size or corresponding probe diameter. Feature 5 therefore requires general receivability in at least one suitable blood vessel, not adaptation to a predetermined individual vessel.

Feature 6. including a radiation emitting surface (110, 210, 510, 610)

63. Feature 6 requires the distal end of the waveguide to include a "radiation emitting surface". In the embodiment shown in Figures 1a and 1b, paragraph [0041] identifies surface 110 as the emitting surface.

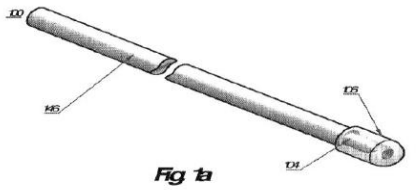


Fig 1a

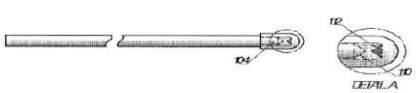


Fig 1b

64. BIOLITEC distinguishes that surface from the reflecting surface 112. The Court agrees that the two surfaces perform different optical functions in the illustrated embodiment but considers that the expression "*radiation emitting surface*" is functional and cannot be confined in the abstract to a transmissive interface. The skilled person knows that a surface may satisfy feature 6 where, by transmission, refraction or reflection, it causes radiation to leave the waveguide.

65. This reading is supported by the description. It expressly contemplates embodiments comprising "*a radiation reflective surface*" facing the emitting surface and configured to reflect forwardly directed radiation laterally with respect to the elongated axis, in a substantially annular pattern onto the surrounding vessel wall (paragraph [0026]). The detailed embodiment likewise describes a reflecting surface distally spaced from and facing the emitting surface, which receives radiation initially directed forwards and redirects it laterally towards the vessel wall (paragraph [0041]). The patent further explains that the resulting configuration produces substantially radial emission and contrasts that lateral or radial annular beam with the forward conical beam of a flat, bare fiber tip (paragraph [0042]). Feature 6 does not exclude that the radiation emitting surface may cooperate with another element. Thus, within the patent's own terminology, radiation may emerge from the device in the claimed lateral direction as the result of reflection, even though the reflecting surface remains structurally distinct from the transmissive emitting surface illustrated in Figures 1a and 1b.

Feature 7. adapted to emit radiation from the radiation source (424)

66. Feature 7 is another statement of purpose/suitability feature, since it requires the radiation emitting surface to be adapted to emit radiation from a radiation source which is not part of the scope of protection of claim 1. This feature is undisputed.

Feature 8. laterally with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900)

67. BIOLITEC submits that feature 8 requires lateral, rather than axial or forward, emission. It relies on the patent's distinction between the claimed configuration and the flat, bare fiber tip of Navarro et al., which emits radiation axially and forwards, see paragraphs [0013] and [0015] of the patent: "*only a very small, localized portion of the blood and/or vein wall in front of the flat emitting face directly receives the emitted laser energy at any one time"*. On that basis, BIOLITEC argues that lateral emission cannot encompass a substantial forward-directed conical beam.

68. LGO replies that the claim does not require exclusively lateral emission. In its view, the wording "*adapted to emit … laterally*" is satisfied whenever the device produces a lateral component, even if radiation is also emitted in another direction. LGO further relies on dependent claim 4, which provides for forwardly directed radiation to be reflected laterally, as confirmation that claim 1 permits a forward component.

69. The two definitions mostly overlap.

70. From the perspective of the skilled person, feature 8 requires the radiation to include a component transverse to the elongated axis but does not exclude an additional axial or forward component. The Court therefore adopts the interpretation that the skilled person would give to this feature in light of the claim language and of the patent as a whole. The presence of a residual axial component neither defeats the claimed lateral emission nor, as such, prevents the device from performing the intended ablation or coagulation. This interpretation is consistent with paragraph [0042], which states that

"*substantially all radiation is radially emitted*" and contrasts the lateral or radial annular beam with the forward conical beam of a flat, bare-tipped fiber. "*Substantially all*" does not mean "*all*" and therefore does not impose exclusive lateral emission.

Feature 9. and annularly from the waveguide (100, 200, 500, 600, 800, 900) onto an angularly extending portion of the surrounding vessel wall,

71. Feature 9 requires radiation to be emitted annularly from the waveguide onto an angularly extending portion of the surrounding vessel wall. This wording is supported by paragraph [0026], which describes radiation emitted substantially radially with respect to the elongated axis and in a substantially annular pattern onto the vessel wall, including embodiments in which forwardly directed radiation is reflected laterally into that pattern. Paragraph [0041] likewise describes the embodiment of Figures 1a and 1b as emitting radiation laterally and annularly onto the surrounding vessel wall, while paragraph [0042] characterises the resulting output as substantially radial and distinguishes it from the forward conical beam of a flat, bare fiber tip.

72. Read in that context, the skilled person would understand the annular emission required by feature 9 as a beam principally directed laterally in a ring-shaped pattern around the waveguide so as to irradiate an angularly extending portion of the vessel wall. Neither the claim language nor paragraphs [0026], [0041] and [0042] require every emitted ray to follow that pattern or exclude a residual axial or forward component. Nor do they require the annular beam to strike the vessel wall strictly orthogonally. Consistently with the construction of feature 8, the Court therefore considers feature 9 satisfied where the predominant emission is lateral and annular, even if some forward radiation remains.

73. Nor does the annular shape require the emitted intensity to be identical around the entire circumference of the annulus. Just as a residual forward component may coexist with predominantly lateral emission, the relative contribution of emission, refraction or scattering may vary azimuthally, producing local differences in intensity along the annular corolla. Feature 9 defines the overall ring-shaped geometry of the radiation pattern, not a perfectly uniform circumferential intensity distribution. Accordingly, a corolla-shaped emission may also fall within feature 9, provided that its overall radiation pattern is substantially annular around the waveguide.

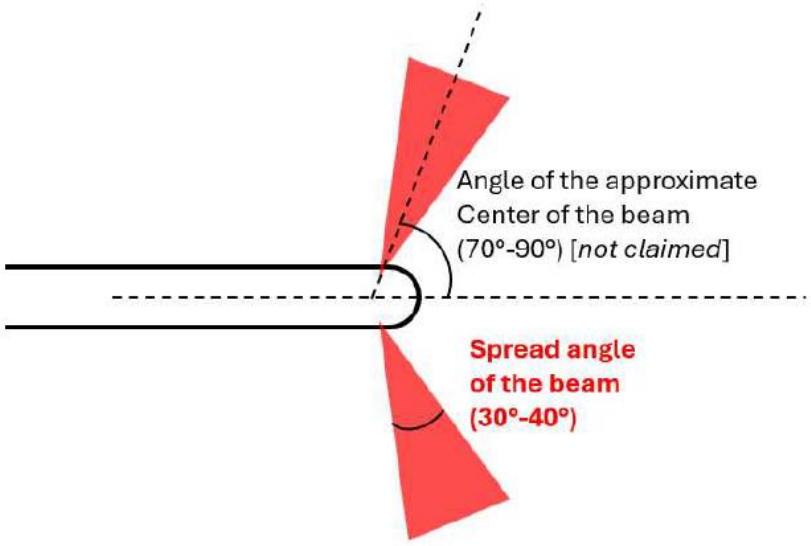
Feature 10. wherein the spread of the annular beam is defined by an angle within the range of about 30° to about 40°

74. Feature 10 requires the spread of the annular beam to be defined by an angle of about 30° to about 40°. Although the expression "the annular beam" has no express antecedent in claim 1, the skilled person would understand it as referring to the lateral and annular radiation defined by features 7 to 9.

75. Read together with features 6 to 9, feature 10 concerns the angular spread of the beam after the relevant optical interaction has caused radiation to leave the device laterally and annularly towards the surrounding vessel wall. As explained in relation to feature 6, the emitted radiation may be produced by transmission, refraction and/or reflection. The claimed spread is therefore not tied to a purely transmissive surface or to the direction in which radiation initially propagates within the waveguide. In the Court's view, feature 10 is functional and selective. Emission at the specified angular spread provides an optimal distribution of radiation over the inner wall of the vein, while allowing the radiation to be fully absorbed by the surface to be treated and avoiding the increased risk of perforation that would arise if the beam were excessively concentrated. It provides for the sufficient amount of energy

conveyed to the vein wall while the probe is moving in a specific amount of time. This understanding is supported by paragraphs [0015] and [0033]–[0037] of the patent, which link concentrated energy delivery to vein wall perforation and describe the advantages of distributing radiation laterally and annularly at lower power density.

76. Other passages of the description further support that reading. Paragraph [0026] contemplates both direct lateral emission and the lateral redirection of forwardly emitted radiation by a reflecting surface. Paragraphs [0041]-[0042] describe the cooperation of the emitting and reflecting surfaces in producing substantially radial and annular radiation onto the vessel wall. Paragraph [0041] further states that the annular beam extends through an arc—identified as its spread—defined by the numerical aperture of the fiber and gives a range of about 30° to about 40°, while placing the approximate center of the beam at about 70° to about 90° relative to the elongated axis. See the following illustration taken from LGO's SfR:



77. LGO submits, however, that EP'303 does not disclose the technical parameters needed to obtain or determine that spread across the full scope of claim 1. In particular, where the lateral and annular output results from a shaped distal surface, including a conical or reflective surface, the final beam geometry depends not only on the fiber's numerical aperture but also on the geometry and orientation of the distal optical surfaces and on the relevant refractive indices. LGO argues that the patent neither specifies those parameters nor explains their functional relationship with the claimed 30° to 40° spread.

78. BIOLITEC replies that paragraph [0041] links the beam spread to the numerical aperture of the fiber. Relying on Snell's law, optical-fiber theory and the reversibility of optical paths, BIOLITEC submits that the skilled person can calculate the angular spread Δβ = β+ − β− by taking account of the fiber parameters and the geometry of the distal tip (DtR, pp. 43–49).

$$\beta_{\pm} = \arcsin\left(n_{core}\sin\left(3\phi - 90° \pm \arcsin\left(\frac{NA}{n_{core}}\right)\right)\right)$$

79. According to BIOLITEC, the numerical aperture NA defines the range of angles over which an optical fiber can accept or emit light. The same optical principle applies at the end output end, while the final

direction of the beam is determined by the interaction between that angular range and the distal emitting or reflecting geometry. With this approach, feature 10 is not confined to an angle measured inside the device or at a single interface, but concerns the spread of the resulting annular output.

80. LGO does not dispute the general optical principles or the calculations as such (RtD, 4.22–4.25; Rej., p. 18), but maintains that they confirm its objection: numerical aperture alone does not determine the claimed spread. It relies on US 6,423,055 (LGO's Exhibit 033) and post-published Ta et al., Optics & Laser Technology 192:113660, 2025 (LGO's Exhibit 033bis) to show that different conical tip angles produce different output angles and beam divergences. LGO therefore argues in their insufficiency attack that the claimed spread cannot be reproduced without information on the distal geometry and relevant refractive indices, and that the patent gives no practical method for assessing or measuring it (SfR, 5.129–5.145). This issue will be addressed in a specific section below.

81. The Court considers that feature 10 must be construed from the perspective of the skilled person and consistently with features 6 to 9. The relevant angle is the spread of the annular beam emitted from the device towards the surrounding vessel wall, after the radiation has undergone the transmission, refraction or reflection responsible for its lateral and annular output. Nothing in the claim or in paragraphs [0026] and [0041]–[0042] supports limiting the feature to an angle measured internally within the device or immediately at a transmissive emitting surface. On the contrary, paragraph [0041] mentions that "*the radiation is emitted laterally and annularly onto the surrounding vessel wall, and the annular beam of radiation extends throughout an arc (i.e., the spread of the beam)*" and in the next sentence that "*the spread of the annular beam is defined by an angle within the range of about 30° to about 40°*". The spread angle thus clearly applies to the emission onto the surrounding vessel wall; it does not necessarily characterize the shape of the beam emerging from the radiation emitting surface itself. Holding otherwise would also be inconsistent with the functional construction of feature 6, under which the emitting function may be achieved together with a reflecting surface, and with features 7 to 9, which define the resulting radiation by its lateral and annular direction rather than by the particular optical mechanism producing it.

82. Since, as explained in relation to feature 9, the annular beam does not exclude residual forward emission or weaker peripheral emission associated with a corolla-shaped pattern, a measured angular-intensity profile will ordinarily take the form of a curve in which the intensity is greater within the claimed spread and appreciably lower, but not necessarily absent, outside that spread. The claimed spread therefore identifies the principal energy-carrying portion of the beam rather than the absolute outer limits of every detectable emission.

83. Accordingly, the 30° to 40° range concerns the angular width of the resulting annular beam, not its central orientation and not the complete absence of forward radiation. The latter matters are addressed separately: features 8 and 9 permit a residual axial or forward component, while dependent claim 7 specifies that the approximate center of the beam may be oriented at about 70° to about 90° relative to the elongated axis. Dependent claim 4 likewise confirms that initially forward-directed radiation may be reflected laterally.

Feature 11. the device further comprising a cover (106, 206, 506, 606, 906)

84. Feature 11 requires the claimed device to comprise a cover. Features 12 to 15 further define the structural and optical characteristics of that cover. The parties do not dispute the meaning of feature 11 as such.

Feature 12. that is fixedly secured to the waveguide (100, 200, 500, 600, 800, 900) and sealed with respect thereto,

85. BIOLITEC points out that, in view of the purpose of the device, the term "*sealed*" must be interpreted as referring to "*gas tight*" so that the included gas defining the gas-waveguide interface is fully protected from the environment. LGO maintains that feature 12 requires a functional seal against the immediate environment of the vein: the cover must prevent blood or other bodily fluids from reaching the gas–waveguide interface and impairing its operation. Therefore, absolute isolation from the exterior of the device is not required.

86. The patent does not provide a more precise definition of "*sealed*" or require absolute isolation from every external environment. In the absence of more specific information derivable from the claims, description or drawings, the Court adopts the broader interpretation that corresponds to the technical function of the feature. The seal must be sufficient to keep the cover attached to the fiber and to preserve the gas–waveguide interface during the claimed endoluminal use, in particular by preventing detachment. Feature 12 therefore requires functional fluid-tightness with respect to the environment of the treated vessel, but not necessarily an absolute hermetic seal against every external environment.

Feature 13. substantially transparent with respect to the emitted radiation,

87. Feature 13 requires that the cover is substantially transparent with respect to the emitted radiation. This feature is essentially redundant, since the cover encloses the emitting surface, which in turn emits radiation from the waveguide onto the vessel wall, implying that the radiation must pass through the cover. The cover must consequently be substantially transparent to the emitted radiation. The parties do not dispute this feature.

Feature 14. that encloses the emitting surface (110, 210, 510, 610) therein,

88. Feature 14 recites that the cover encloses the emitting surface therein, a feature that needs no further explanation.

Feature 15. and that defines a gas-waveguide interface that refracts emitted radiation laterally with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900) onto the surrounding vessel wall.

89. Feature 15 requires the cover to define a gas–waveguide interface that causes the emitted radiation to be directed laterally with respect to the elongated axis onto the surrounding vessel wall. Consistently with the construction of feature 6 and with the claim as a whole, the feature is concerned with the resulting macroscopic lateral output and is not confined to a particular optical label. It may therefore be satisfied where the gas–waveguide interface and the distal optical arrangement produce that output by refraction, including in cooperation with reflection, provided that the claimed lateral radiation onto the vessel wall results. A merely diffuse output that does not produce the claimed lateral direction would not satisfy the feature.

INSUFFICIENCY

90. Under Article 83 EPC, read with Articles 65(2) UPCA and 138(1)(b) EPC, the patent must disclose the invention sufficiently clearly and completely for it to be carried out by the skilled person. Sufficiency is assessed based on the patent as a whole—claims, description and drawings—from the perspective of the skilled person, using common general knowledge at the filing or priority date (*Amgen v Sanofi and Regeneron*, UPC_CoA_528/2024 and UPC_CoA_529/2024, Decision of 25 November 2025, headnotes 5–9).

91. The relevant question is whether the skilled person can reproduce the claimed subject matter without inventive effort and without undue burden. It is sufficient that the patent discloses at least one way of performing the invention or, for a functional feature, one technical concept that enables it. The patent need not provide specific instructions for every conceivable embodiment within a functional definition, provided that the skilled person can obtain suitable embodiments within the scope of the claim. A reasonable amount of trial and error does not amount to undue burden. The burden of presentation and proof lies on the party alleging insufficiency (*Amgen v Sanofi and Regeneron*, cited above, headnotes 6–9).

92. LGO's objection concerns feature 10 of claim 1, which requires the annular beam to have a spread of about 30° to about 40°. It submits that this is an essential result-to-be-achieved feature, because it defines the extent of lateral irradiation and is relied upon for the alleged distribution of energy over the vessel wall. The patent must therefore enable the skilled person both to obtain that range and to determine whether a given device falls within it.

93. According to LGO, paragraph [0041] of the patent merely states that the spread is defined by the numerical aperture of the fiber. It does not disclose the combination of optical and geometrical parameters required to produce the claimed output, including the numerical aperture (NA), the refractive indices, the geometry and angle of the distal tip, the nature of the material, and any reflective surface. LGO argues that numerical aperture alone does not determine the final annular beam after refraction or reflection. The skilled person would therefore have to vary several interdependent parameters by trial and error without practical guidance.

94. LGO further submits that the patent does not define how the spread is to be measured. Different acknowledged criteria, including different intensity thresholds, may produce different angular values. In its view, the absence of a defined measurement method is not merely a question of claim clarity: it prevents the skilled person from reliably reproducing the claimed range and from knowing whether it has been achieved.

95. BIOLITEC replies that the objection is based on an incorrect and overly isolated reading of feature 10. Paragraph [0041] expressly links beam spread to the numerical aperture, while the patent discloses embodiments comprising the relevant fiber, emitting surface, gas interface and cover. The skilled person knows Snell's law, the relationship between numerical aperture and propagation angles, the reversibility of optical paths, and the effect of distal geometry. Those principles permit the skilled person to calculate or determine the resulting spread and to adjust routine parameters without inventive effort.

96. BIOLITEC also relies on its calculations and technical evidence, including the affidavit submitted by the claimant (LGO's Exhibit 036), as confirmation of those common optical principles. It argues that at

least one disclosed embodiment can be carried out without undue burden and that Article 83 EPC does not require the patent to teach every geometry or every measurement convention. Any uncertainty at the boundaries of the claimed range concerns the scope of the claims or the assessment of prior art, not the reproducibility of the invention. BIOLITEC further submits that LGO has not provided evidence of failed attempts or of any concrete technical obstacle to obtaining the claimed spread.

97. The Court considers the attack unsuccessful.

98. Feature 10 must be read together with the remaining optical features of claim 1 and with the patent as a whole. Paragraph [0041] identifies the numerical aperture as governing the spread of the annular beam, while the description discloses the optical fiber, distal emitting geometry, gas–waveguide interface and cover through which lateral and annular emission is produced. The patent therefore supplies a technical concept for obtaining the claimed output, rather than stating only an unexplained result.

99. The Court accepts that the final beam geometry depends on more than numerical aperture alone. It may also depend on refractive indices and the geometry and orientation of the distal optical surfaces. Those dependencies, however, are governed by established optical principles, mastered by the skilled person. Given the definition of the skilled person adopted above, their application falls within common general knowledge. The patent is not required to reproduce the governing formulae or to prescribe every parameter where the skilled person can select and adjust them by routine calculation and a reasonable amount of testing. LGO's Exhibit 036 (Lützler affidavit) corroborates this conclusion by applying the established optical relationships to the relevant fiber and distal geometry and showing that the resulting emission angle can be calculated. It therefore confirms that the skilled person can design and implement an arrangement producing the required angular spread without undue burden, even though the precise output depends on the selected parameters.

100. LGO, on the contrary, has not established that obtaining a spread within the claimed range requires an inventive contribution or an undue experimental burden. Nor has it identified evidence that the disclosed embodiments cannot be implemented or that routine variation of the relevant optical parameters would fail. The fact that several parameters interact, or that optimisation may be required, does not by itself establish undue burden.

101. The absence of a single prescribed measurement convention does not alter that conclusion. Possible differences between acknowledged methods may affect whether a particular device lies at the boundary of the claim and may therefore be relevant to claim construction, novelty (see § 152 ff.) or infringement. They do not show that the skilled person is unable to produce an annular beam within the claimed range. Article 83 EPC concerns the ability to carry out the invention, not the elimination of every uncertainty in determining the precise boundary of the claim.

102. The patent, read with the skilled person's common general knowledge, provides at least one workable technical concept for producing the claimed lateral and annular beam. The requirements of Article 83 EPC are therefore satisfied.

ADDED MATTER

103. There is added matter where the subject matter of the granted claim extends beyond the content of the application as filed. Under the so-called "*gold standard*", the Court must determine what the skilled person, using common general knowledge and viewed objectively at the filing date, would derive directly and unambiguously from the application as a whole. Implicit disclosure is included only where it is a clear and unambiguous consequence of what is expressly disclosed (Abbott Diabetes Care v Sibio Technology, UPC_CoA_382/2024, Order of 14 February 2025, para. 52). The assessment is not confined to passages identified during examination but requires those passages to be read in the context of the entire application (para. 53). The claim need not reproduce the exact wording of the application, provided that the claimed combination of features is directly and unambiguously derivable from the disclosure as a whole (para. 68). When a feature is omitted from a specific embodiment, the question is whether the omitted feature is inextricably linked to the retained features or necessary for the object and technical effect of the disclosed invention (paras. 70–79).

104. For a patent resulting from a divisional application, the same test applies to each earlier application. The claimed subject matter must therefore be directly and unambiguously derivable both from the application as filed for the patent in suit and from every relevant earlier application (*expert e-Commerce and expert Klein v Seoul Viosys*, UPC_CoA_764/2024 and UPC_CoA_774/2024, Decision of 2 October 2025, headnote). Articles 123(2) and 76(1) EPC thus apply the same substantive standard to the application as filed and to the chain of divisional applications.

105. At page 55 of the Statement of revocation, LGO advances its first request for revocation of EP'303 on the ground of added matter of:

Claim 1

106. LGO submits that EP'303 derives from a divisional application initially filed without claims and that the claims later introduced are amendments subject to Articles 123(2) and 76(1) EPC. LGO's objections based on the application as filed are similar to those based on the earlier applications.

107. LGO then refers to the patent application published as EP 4458303 A2 and in particular, to the changes made during examination proceedings. The main basis for claim 1 in this application would be "*enumerated example embodiment 1*" (EEE 1) in paragraph [0081]:

EEE 1:	A device for endoluminal treatment of a blood vessel, comprising: a flexible waveguide defining an elongated axis, a proximal end optically connectable to a source of radiation, and a distal end receivable within the blood vessel and including a radiation emitting surface that emits radiation from the radiation source laterally with respect to the elongated axis of the waveguide onto an angularly extending portion of the surrounding vessel wall.

108. In view of this main basis, LGO's objections concern: (i) the replacement of the reference to a "*blood vessel*" with "*venous insufficiencies*" in feature 1 (addressed in §§ 112–114); (ii) the replacement of "*emits*" with "*adapted to emit*" in feature 7, whereas an active feature was substituted for a passive one (addressed in §§ 115–117 below), (iii) an unallowable intermediate generalization in relation to the annular emission in feature 9 (§§ 118–125 below), (iv) an unallowable intermediate generalization in

relation to the angular spread in feature 10 (§ 126), and (v) the introduction of a "*cap*" instead of a "*cover*" in features 11-15 (§ 127).

109. In its statement for revocation, LGO refers to several paragraphs of the application as filed and provides a correspondence with paragraph numbers in the published application EP 4458303 A2. Since the application as actually filed at the EPO was not submitted by either of the parties (see §13), and since neither the paragraph numbering correspondence nor the identity between the description of the application as filed and the description of the published application was disputed by BIOLITEC, the Court will refer to the text of the published application.

110. Of particular importance for the discussion is paragraph [0057] of the application as filed, which corresponds to paragraph [0041] of the application as published: "*As shown FIGS. 1a and 1b, a first embodiment of an optical fiber set is indicated generally by the reference numeral 100. The optical fiber 100 comprises a cladding 146, a core 140, and a quartz cap 106. An optical fiber tip preferably defines a substantially conical-shaped emitting surface 110 for achieving 360° radial emission. A preferably substantially conical-shaped reflective surface 112 is axially spaced relative to and faces the emitting surface 110 for enhancing efficiency and designed distribution within a zone of radial emission. As can be seen, the emitting and reflecting surfaces assembly is hermetically sealed within a quartz cap 106 that is fixedly secured to the end of the fiber and defines an air or other gas interface at the emitting surface to achieve radial/annular emission. Accordingly, due to the angle of the emitting surface 110 and the differences of the indices of refraction of the emitting face 110 and air or other gas interface provided within the sealed cap 106, the laser radiation is emitted radially (i.e., transverse to or laterally with respect to the elongated axis of the fiber) and annularly from the fiber directly onto the surrounding vessel wall. Preferably, the emitting surface 110 is oriented at an acute angle with respect to the elongated axis of the fiber that is set for substantially total refraction of the emitting radiation laterally with respect to the elongated axis of the fiber. In some embodiments, the radiation is emitted laterally and annularly onto the surrounding vessel wall, and the annular beam of radiation extends throughout an arc (i.e., the spread of the beam) defined by the numerical aperture of the fiber. In some embodiments, the spread of the annular beam is defined by an angle within the range of about 30° to about 40°. In addition, the approximate center of the beam is preferably oriented at an angle within the range of about 70° to about 90° relative to the elongated axis of the fiber*."

111. The claimant also submitted a comparative table setting out the amendments made in relation to the main basis for claim 1, namely EEE 1. In that table, deleted passages appear struck through, while newly added passages appear in bold.

N.	Claim 1 of EP'303 in a marked-up version with respect to EEE 1
1	*A device for endoluminal treatment of* ~~***a blood vessel***~~ ***venous insufficiencies,*** *comprising:*
2	*a flexible waveguide* ***(100, 200, 500, 600, 800, 900)***
3	*defining an elongated axis,*

4	*a proximal end optically connectable to a source of radiation* ***(424)****, and*
5	*a distal end receivable within the blood vessel, and*
6	*including a radiation emitting surface* ***(110, 210, 510, 610)***
7	~~***that emits***~~ ***adapted to emit*** *radiation from the radiation source* ***(424)***
8	*laterally with respect to the elongated axis of the waveguide* ***(100, 200, 500, 600, 800, 900)***
9	***and annularly from the waveguide (100, 200, 500, 600, 800, 900)*** *onto an angularly extending portion of the surrounding vessel wall,*
10	***wherein the spread of the annular beam is defined by an angle within the range of about 30° to about 40°,***
11	***the device further comprising a cover (106, 206, 506, 606, 906)***
12	***that is fixedly secured to the waveguide (100, 200, 500, 600, 800, 900) and sealed with respect thereto,***
13	***substantially transparent with respect to the emitted radiation,***
14	***that encloses the emitting surface (110, 210, 510, 610) therein,***
15	***and that defines a gas-waveguide interface that refracts emitted radiation laterally with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900) onto the surrounding vessel wall.***

112. (i) LGO accepts that treatment of venous insufficiencies is mentioned in paragraph [0055] of the original disclosure (paragraph [0040] of the application as published) but argues that it is disclosed together with further structural features of the distal end. It further submits that replacing the broader reference to a blood vessel with venous insufficiencies introduces a different concept (a disease condition rather than an anatomical structure). BIOLITEC replies that paragraph [0055] presents treatment of venous insufficiencies as a general application of the device, not as a feature inseparably linked to one embodiment.

113. The Court's view is that this first attack should be rejected. The reference to venous insufficiencies appears directly and unambiguously derivable from the original disclosure in the application as filed when read as a whole and in the light of common general knowledge of the skilled person. Paragraph [0002] of the application as published reads: "*The present invention relates to laser endovascular treatments, and more particularly, to the treatment of vascular pathologies, such as venous insufficiency, with laser energy using an optical fiber*". This paragraph provides a general context which is directly and unambiguously applicable to the entirety of the subsequent description.

114. Furthermore, the category of "*venous insufficiencies*" is narrower than "*blood vessel*". It denotes a particular pathological condition affecting blood vessels and is further confined to veins, as opposed to arteries. The skilled person, who also possesses medical knowledge, understands that venous insufficiencies constitute a subcategory of pathological conditions affecting blood vessels and therefore regards them as necessarily encompassed by that broader category, in particular as they are expressly identified as a particularly relevant subcategory in paragraph [0002].

115. (ii) LGO argues that changing "*that emits*" to "*adapted to emit*" converts an active limitation into a mere suitability requirement. BIOLITEC considers this a drafting adjustment from method-type language to appropriate apparatus language, without any change in technical meaning. BIOLITEC points out that the amendment was introduced by the EPO examiner and that this is a mere reformulation without any change of meaning, which was already found allowable in section 3.2.2 of board of appeal decision T 1888/22 in connection with parent application 1.

116. The Court's view is that this added-matter argument should also be rejected. As regards feature 7, the skilled person understands that the radiation is generated and supplied – even in the application as filed – by the source of radiation, not by the emitting surface itself. The latter is structurally adapted to allow or direct the radiation supplied by that source to leave the waveguide. LGO itself acknowledges it at point 3.22 RtD, where it characterizes the laser probe as a means for transporting radiation from the laser source to the treatment site.

117. Replacing "*emits*" with "*adapted to emit*" therefore expresses in appropriate apparatus language the same technical teaching already disclosed, and the skilled person derives the amended wording directly and unambiguously from the original formulation.

118. (iii) LGO states that the annular emission is disclosed in paragraph [0057] of the application as filed, corresponding to paragraph [0042] of the application as published, but only in conjunction with other features that have not been included in claim 1. LGO in particular refers to the presence of an optical fiber having a core and a cladding, of a quartz cap, of a conically-shaped emitting surface, and to the numerical aperture of the fiber. This omission results in an intermediate generalization.

119. In its response, BIOLITEC also points to paragraph [0027] of the PCT application, which the Court understands, based on the passage reproduced in BIOLITEC's submissions, also corresponds to paragraph [0027] of the application as published. The relevant text passage reads: "*Some embodiments further comprise the step of emitting radiation substantially radially with respect to the elongated axis of the waveguide in <u>a substantially annular pattern (</u>*Ed.'s underlining) *onto the surrounding vessel wall. Some embodiments further comprise the step of reflecting forwardly emitted radiation laterally with respect to the elongated axis in <u>a substantially annular pattern</u>* (Ed.'s underlining) *onto the surrounding vessel wall*". LGO replies that this paragraph relates to a method step and not a device feature, and that there is an inextricable link between this feature and the more complete disclosure in paragraph [0042].

120. The Court disagrees with LGO. Whether the teaching relating to the annular emission is formulated in terms of a method or a device is irrelevant, since implementation of the disclosed method necessarily requires a device suitable for producing that pattern. This conclusion is consistent with the above-mentioned Court of Appeal's approach to added matter. An intermediate generalisation is unallowable where the omitted features have a clearly recognizable structural or functional relationship with the retained feature, in particular where they are inextricably linked or essential to the technical effect (*Sibio Technology v Abbott Diabetes Care*, UPC_CoA_884/2025, Decision of 13 August 2026, headnotes 1–2), which is not the case here.

121. Paragraph [0027] (reproduced above) discloses annular emission as a general technical teaching, independently of the detailed construction of the embodiment disclosed in paragraph [0042] in connection with figures 1a and 1b.

122. In conclusion, paragraph [0027] of EP 4458303 A2 clearly discloses a device having an annular emission pattern regardless of the tip, the cladding, core, quartz cap, conical emitting surface and numerical-aperture details mentioned by LGO.

123. These attributes just describe one way of implementing that teaching, but they are not presented as structurally or functionally indispensable to the annular pattern itself. Their omission therefore does not convey new technical information, and feature 9 is directly and unambiguously derivable from the original disclosure.

124. (iv) Concerning feature 10, LGO argues that the 30°-40° angular beam spread was only disclosed in paragraph [0057] of the application as filed, corresponding to paragraph [0042] of the published application, in conjunction with other features, and in particular again the presence of cladding, core, quartz cap and conical-shaped emitting surface, the spread of the annular beam being defined by the numerical aperture NA of the optical fiber. However, in paragraph [0042] of the published patent application, the beam-spread range is presented as a standalone feature. As mentioned above concerning (iii), the application does disclose an annular emission independently from the constructional details of the embodiment of paragraph [0042]. This paragraph mentions an example of spread beam angle (30-40°) but does not tie it to the specific configuration of the embodiment of figures 1a and 1b. There is no apparent reason why specifically this range of 30-40° would be achievable only with this particular configuration, although the application discloses an annular emission in general terms. In other terms, also for feature 10 the Court does not identify any unallowable intermediate generalization.

125. (v) For features 11 to 15 of claim 1, LGO argues that the relevant original disclosure in EEE 15 and EEE 16 refers to a specific type of cover, namely a cap. In LGO's view, reciting a "*cover*" instead of a "*cap*" in granted claim 1 constitutes a further intermediate generalisation. BIOLITEC replies that a cover is mentioned in EEE 15 and that it is implicit that this cover must be substantially transparent with respect to the emitted radiation, as recited in feature 13.

126. Also here, the Court is not convinced by LGO's objection. Not only has LGO not established a different technical meaning between the words "*cover*" and "*cap*", but, as rightly pointed out by BIOLITEC, original paragraph EEE 15 does disclose a "*cover*" and the requirement that the cover should be transparent with respect to the emitted radiation is not linked with the fact that the cover is a cap. Besides, this requirement is anyway necessary in view of the emission pattern recited in the other claim features.

Dependent claim 7

127. LGO submits that the angular orientation of about 70° to about 90° recited in granted claim 7 is disclosed in paragraph [0057] of the original disclosure (paragraph [0041] of the application as published) only in conjunction with the embodiment of Figures 1a and 1b, and therefore constitutes an unallowable intermediate generalization (SfR, 5.249–5.251). The Court rejects the objection for the same reasons given in relation to feature 10 of claim 1. Paragraph [0057] presents the orientation of the beam centre as a preferred characteristic rather than as a feature inseparably linked to the other details of the embodiment. Claim 7 therefore does not add subject matter.

Dependent claim 8.

128. LGO submits that claim 8 is inconsistent with claim 1 (SfR, 5.249–5.251). In relation to AR 12, it further argues that radiation from the axially spaced emitting surfaces overlaps along the distal region and forms an elongated, substantially cylindrical distribution, rather than a beam having a spread of 30° to 40° (RtD, 5.196–5.198). BIOLITEC relies on original claims 18 and 19 (the Court understands, based on BIOLITEC's explanations, and as not disputed by LGO, that the original claims in the PCT application are reflected in the enumerated example embodiments of paragraph [0081] of the publication EP 4458303 A1) and distinguishes the angular spread of the beam emitted by the first, conical emitting surface from the extended emission zone formed by the plurality of second emitting surfaces (DtR, p. 74; Rej., pp. 118–119). The Court accepts that distinction. Figures 2a–2c disclose grooves forming an extended emission zone together with a distal conical tip of the type described in paragraph [0057] (paragraph [0042] of the application as published), including the 30° to 40° beam-spread range. Claim 8 therefore does not contain added matter.

Dependent claim 9.

129. LGO argues that claim 9 generalizes the concept of a "*cover*" by omitting structural and material constraints allegedly disclosed as essential (SfR, 5.253–5.255). BIOLITEC relies on original claim 21 (DtR, p. 74). The objection is not sufficiently substantiated and does not identify which omitted constraints are inextricably linked to the claimed cover. The Court therefore finds no added matter in claim 9.

Dependent claim 10.

130. LGO objects to the use of "*and/or*" in claim 10, arguing that it creates combinations not disclosed in the original application (SfR, 5.256–5.258). BIOLITEC relies on original claims 23 to 26 (DtR, p. 74), which the Court understands correspond to enumerated example embodiments EEE 23 to EEE 26 in paragraph [0081] of the application as published.

131. Although original claims 23 to 26 do not all depend on one another, the skilled person would understand them as optional features addressing distinct aspects of the device and capable of being combined where appropriate. Their combination does not convey new technical information. The Court therefore finds no added matter in claim 10.

Dependent claim 11

132. LGO alleges an intermediate generalisation in dependent claim 11, submitting that the original disclosure in paragraph [0033] of the application as published only states that the cap is fused to the *fiber core*, not to the *fiber* generally, and that extending fusion to the fiber adds subject matter. LGO also relies on the assessment reached in parallel EPO opposition proceedings and on a procedural order of the Munich Local Division concerning the patent based on parent application 0 (UPC_CFI_714/2024, UPC_CFI_155/2025, order dated 2 April 2026).

133. BIOLITEC replies that, although "*fused*" is expressly mentioned only in relation to the fiber core, the skilled person derives directly and unambiguously from paragraph [0033] of EP 4458303 A2 that fusing is, alongside bonding, one of the alternatives encompassed by the broader expression "fixedly secured". According to BIOLITEC, the first part of paragraph [0033] thus discloses the manner in which the cap is fused or bonded, fusion and bonding being conventional methods for securing the probe to the fiber. In BIOLITEC's view, the reference to fusion to the fiber core appears only in an exemplary

embodiment introduced by "*In some embodiments*", whereas the first sentence of paragraph [0033] (numbered as such both in the PCT application and in EP 4458303 A2) generally discloses that the cap is fixedly secured—by fusion or bonding—to the distal end of the fiber, without limiting the attachment to the fiber core.

> **[00033]** In some embodiments, the device includes a cap fixedly secured to a distal end of the fiber. In some such embodiments, the distal end of the fiber includes a flat emitting face and the cap encloses the emitting face. In other embodiments, the distal end of the fiber includes a radially-emitting surface, such as a conical surface, and a reflecting surface, and the cap encloses both emitting and reflective surfaces. In some embodiments, the cap is made of quartz or other radiation transparent material that is fused, bonded or otherwise fixedly secured to the fiber core for protecting the core and emitting surfaces thereof and transmitting the emitted and reflected radiation therethrough. In other embodiments, the cap is made of a relatively flexible, transparent material, such as polymeric Teflon PFA or Teflon AF, in order to achieve a relatively long, flexible emission zone. In the case of relatively low absorbed wavelengths, the cap can be made of an opaque material in order to transform all or part of the emitted energy into heat. In some embodiments the cap and/or fiber includes means for controlling the temperature within the vein and/or for regulating the power input and/or the pullback speed of the fiber.

134. BIOLITEC further relies on paragraph [0071] of the original application, which the Court understands corresponds to paragraph [0056] of the published application. With reference to Fig. 10, this passage notably mentions: "*In one embodiment, the cap 1106 is made of quartz and is adhesively bonded to the fiber core as described above; however, if desired the cap may be made of any of numerous different materials, and may be fixedly secured to the distal end of the fiber in any of numerous different ways that are currently known, or that later become known*." BIOLITEC also relies on paragraph [0094] of the original application, which the Court understands corresponds to paragraph [0079] of the A2 application, whereby "*The protective radiation transparent caps of the currently preferred embodiments may be manufactured and assembled to the fiber in accordance with the teachings of commonly assigned U.S. patent application serial no. 11/592,598, filed 3 November 2006, entitled "Side Fire Optical Fiber For High Power Applications", which is hereby expressly incorporated by reference in its entirety as part of the present disclosure*".

135. BIOLITEC argues that that document, especially referred to in the patent application, discloses a cap fused to the fiber but more specifically to the fiber cladding, not the fiber core. At the oral hearing, BIOLITEC referred to document WO 2007/058891 (LGO's Exhibit 052) as corresponding to the same document.

136. However, although WO 2007/058891 (filed as PCT/US2006/043647) claims priority to US 11/592,598, there is no indication that the content of the two documents is the same. Therefore, whether the citation of a document which allegedly discloses fusing a cap to fiber cladding in paragraph

[0079] is sufficient to consider that the concept of fusing the cap to the fiber (in general) is directly and unambiguously disclosed can be left open, because in the present case the cited document is not on file so that BIOLITEC has not properly substantiated and proved its argument.

137. Furthermore, in the Court's view, the first part/sentence of paragraph [0033] clarifies that the cap is secured to the fiber at its distal end. The subsequent passage/part then specifies *how* that attachment can be achieved, namely by fusing, bonding or otherwise fixedly securing the cap to the fiber core. This is not presented as an alternative arrangement, regardless of the specific characteristics of the different embodiments, but as the sole manner of attachment applicable within the disclosure of that paragraph.

138. The skilled person would therefore understand that the cap is attached at the distal end and that the subsequent passage defines the permitted manner and specific structural point of attachment. No other interpretation is reasonably available from the clear sequence of the disclosure. Fusing the cap to the fiber core is technically a specific method of attachment. There is no suggestion in the paragraph that the fusing technique may also be employed to attach the cap to a portion of the fiber other than the fiber core. Treating the general reference to the distal end as support for fusion to the fiber as a whole would derive that teaching only with knowledge of the granted claim and would therefore amount to hindsight. This assessment is not modified in view of paragraph [0056] of the published application also relied upon by BIOLITEC. The generic, boilerplate statement in this paragraph according to which the cap may be fixedly secured to the distal end of the fiber in "*any of numerous different ways*" does not directly and unambiguously imply the concept of *fusing* the cap to *the fiber*. Dependent claim 11 consequently contains added matter. The Court will revert to this topic in the section assessing the auxiliary requests.

Dependent claim 12

139. LGO challenges claim 12 without presenting a detailed reasoning (SfR, 5.263). BIOLITEC relies on original claim 36 and on paragraph [0033] as support for dependent claim 12 (DtR, p. 74). The Court considers that the objection is unfounded, as claim 12 does specify that the cap is fused to the fiber core, and not to the fiber in general.

Dependent claim 14

140. LGO states that the emission pattern of claim 14 is based on EEE 37 in the application as filed, corresponding to claim 37 of the original disclosure, but only in strict association with an endoluminal laser ablation device, and not in combination with a device for endoluminal treatment of venous insufficiencies, with annular emission (SfR, 5.264-5.266). BIOLITEC relies on original claims 37 and 55 (corresponding to EEE 37 and EEE 55 in the published application) together with paragraph [0093] of the original disclosure as support for dependent claim 14 (DtR, p. 74). The Court finds that there is no added matter. The wavelength and power features of claim 14 were originally disclosed in the A2 publication and appear to be usable in the context of the treatment of venous insufficiencies and with an annular emission pattern.

Dependent claim 15

141. LGO states that the energy delivery rates per unit length were originally disclosed only in paragraph [0075] of the original disclosure, corresponding to paragraph [0060] of the application as published, in the context of method steps and operating conditions, not as properties of the device *per se* (SfR, 5.249-5.251). BIOLITEC relies on claim 38 of the original disclosure as support for dependent claim 15 (DtR, p.

74). The Court considers that LGO's objection is not convincing. Technical features relating to method steps can be reformulated as features relating to a device suitable for implementing these method steps.

Dependent claim 16

142. LGO states that claim 16 mentions a specific surgical method, but that the original disclosure separately discloses devices and methods (SfR, 5.270-5.272). BIOLITEC indeed relies on claim 51 in combination with paragraph [0063] of the original disclosure as support for dependent claim 16 (DtR, p. 74). The Court considers that LGO's objection is not convincing. Technical features relating to method steps can be reformulated as features relating to a device suitable for implementing these method steps.

EXCLUSION FROM PATENTABILITY

143. LGO argues that claim 16 of the patent as granted is excluded from patentability under article 53(c) EPC as it is directed to a method of treatment.

144. Claim 16 relates to the device according to any one of the preceding claims, wherein the device is arranged for a method for endoluminal treatment of a varicose vein, comprising steps numbered as (i) to (iii). According to article 53(c) EPC, European patents shall not be granted in respect of methods for treatment of the human or animal body by surgery or therapy and diagnostic methods practised on the human or animal body. Claim 16 is not a claim directed to a method of treatment; it is a device claim. To what extent the method steps recited in the claim are limiting or not on this device is irrelevant and only comes into play when assessing novelty and inventive step. Therefore, claim 16 does not contravene the provisions of article 53(c) EPC.

NOVELTY

145. The claimant advances six novelty attacks based on the following prior art documents:

- D7 – Heinze 1990 (LGO's Exhibit 020),
- D5 – DE 19703208 A1 (LGO's Exhibit 025),
- D11 – Sottini et al. 1989 (LGO's Exhibit 028),
- D20 – US 6,423,055 (LGO's Exhibit 033),
- US 5,537,499, hereafter Brekke (LGO's Exhibit 035),
- D4 – US 4,842,390 (LGO's Exhibit 024).

146. The Court has already stated, in its order under R. 105 RoP, that it will not consider Exhibit 024 in combination with Exhibit 028. Exhibit 024 will not be considered, since LGO relied on it solely to supplement the disclosure of Exhibit 028 and not as an autonomous novelty attack. In assessing novelty, the Court must determine whether a single embodiment of each prior-art document directly and unambiguously discloses all the features of the claimed combination. A combination of two different embodiments for assessing novelty amounts to the contention that neither of them, considered individually, is novelty-destroying. It is therefore insufficient that the annular beam spread of about 30° to about 40° and the cover fixed and sealed to the waveguide, defining a gas-waveguide interface, are disclosed in separate embodiments or alternative configurations. Those limitations must be disclosed

cumulatively in the same technical teaching. Features taken from distinct embodiments may not be combined unless the document itself clearly directs the skilled person to that combination.

147. The first attack relies on D7, namely Heinze et al., "*Modified fiber tips for light application to hollow organs*", published in 1990 in SPIE Vol. 1201, Optical Fibers in Medicine V. The document is, thus, prior art.

148. D7 proposes several modified fiber tips for treatment in hollow organs. In particular, it describes increased-divergence tips for axial coagulation, a radially radiating probe intended to achieve circumferentially complete coagulation of cylindrical organs, radiators for photodynamic therapy, and conical fiber tips for more isotropic radiation.

149. The claimant submits that D7 anticipates all features of the main claim, based in particular on section 2.2 together with Fig. 3 and 4. The defendant disputes the disclosure of features 1, 10 and 15. Under Rule 171.2 RoP, the disclosure of the remaining features is therefore not in dispute.

Feature 1: a device for treatment of venous insufficencies

150. As regards feature 1, the defendant submits that D7 belongs to a different technical field. D7 concerns the treatment of hollow organs and, in particular, section 2.2 relates to the treatment of tracheoesophageal fistulae in newborns, with experiments on dissected rat esophagi. According to the defendant, the irradiation power, beam characteristics, accuracy and dimensions of the probe differ materially from those required for venous treatment. Since the probe was adapted to approximately two-thirds of the fistula diameter, it could contact and damage venous walls or valves.

151. The Court has already held, when construing the claim and explaining the technical field, that feature 1 requires a device *objectively* suitable for endoluminal treatment of venous insufficiency. The prior-art instrument need not have been developed for the same therapeutic indication. It is sufficient that its disclosed structural and functional properties render it objectively suitable for the claimed use.

152. D7 describes a flexible light guide introduced into a hollow organ (fistulae are hollow structures in a fluid-filled environment) and used to coagulate in situ tissue by laser irradiation. The document relates to "*optimization of laser treatment in cylindrical hollow organs*". The Court notes that, like the esophagus, a vein is a hollow anatomical structure. D7 further expressly teaches circumferential coagulation by a radially radiating probe. The probe in D7 is made of an all-silica fiber with a conical distal end and a protecting fused silica tube. There would be no risk of perforation, as maintained by BIOLITEC. Additionally, in D7, suitable outer diameters of the probe range from 500 µm to 2 mm.

153. The D7 probe is conclusively objectively suitable from the perspective of the skilled person also for insertion into venous vessels, including veins clearly smaller than the great saphenous vein (GSV), which BIOLITEC identifies as the principal target vessel for endoluminal treatment (and which according to BIOLITEC has a diameter from 3 to 22 mm). Laser power does not play any role here. Different laser settings may be selected according to the tissue and the intended thermal effect as a simple adjustment. Those differences do not, without more, establish structural unsuitability for endoluminal venous use.

154. The defendant's reliance on the dimensions selected for the newborn fistula experiment is, therefore, not decisive. Nor does the different type of tissue involved play any role. The dimensions reflect the particular experimental setting and not the insertion into the vein lumen. The same applies to the tissues. They do not establish that the disclosed probe, considered as technical teaching, would

necessarily damage a venous wall. The rounded distal geometry shown in D7 (see picture below on the left) also points away from an unavoidable perforation risk and does not differ from the distal end in the patented embodiment (see pictures below on the right, Figure 1b). The Court therefore finds that feature 1 is directly and unambiguously disclosed by D7.

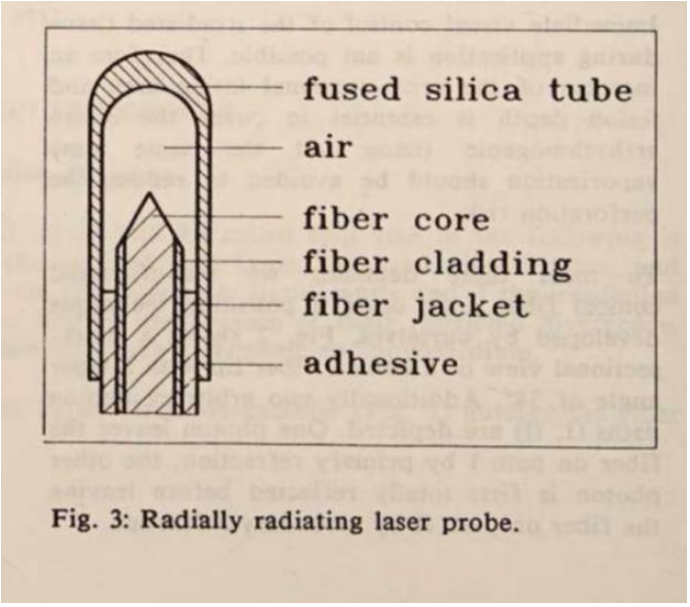
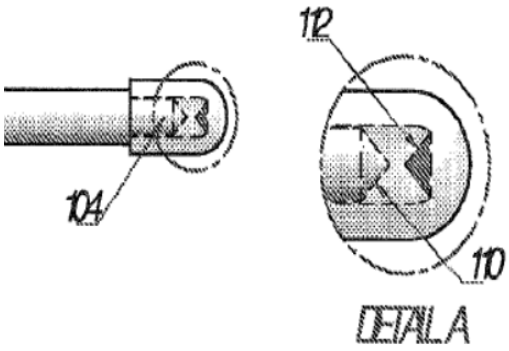


Fig. 3: Radially radiating laser probe.

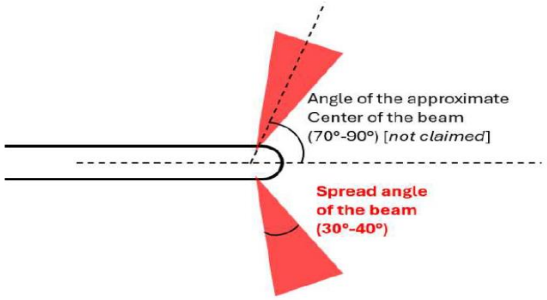


Feature 10: wherein the spread of the annular beam is defined by an angle within the range of about 30° to about 40°

155. As regards feature 10, the defendant disputes a disclosure in D7 of an annular beam spread of about 30° to about 40°. It submits that the drawing in fig. 4 does not reliably show that range and that the measured intensity distribution may be broader than the effective beam. The Court disagrees.

156. D7 discloses a radiated beam described as a hollow cone with the wall thickness increasing with the distance to the fiber tip. This means that the beam is an angle-shaped one, narrower towards the tip and thicker on the irradiation area.

157. At least 95% of the output power is radiated within this cone. This conical emission pattern disclosed in D7 corresponds to the lateral and annular emission recited in features 8 and 9 of claim 1 (this is not disputed by the defendant). It therefore remains to determine whether D7 also anticipates the claimed beam-spread angle of about 30° to about 40°. See the following illustration taken from LGO's SfR schematically showing the beam-spread angle:



158. Fig. 4 of D7 shows the "*Angular light distribution of a conical fiber tip as shown in Fig. 3*" (caption). The claimant argues that, based on this figure, the beam-spread angle can be measured to be between about 30° and about 40°.

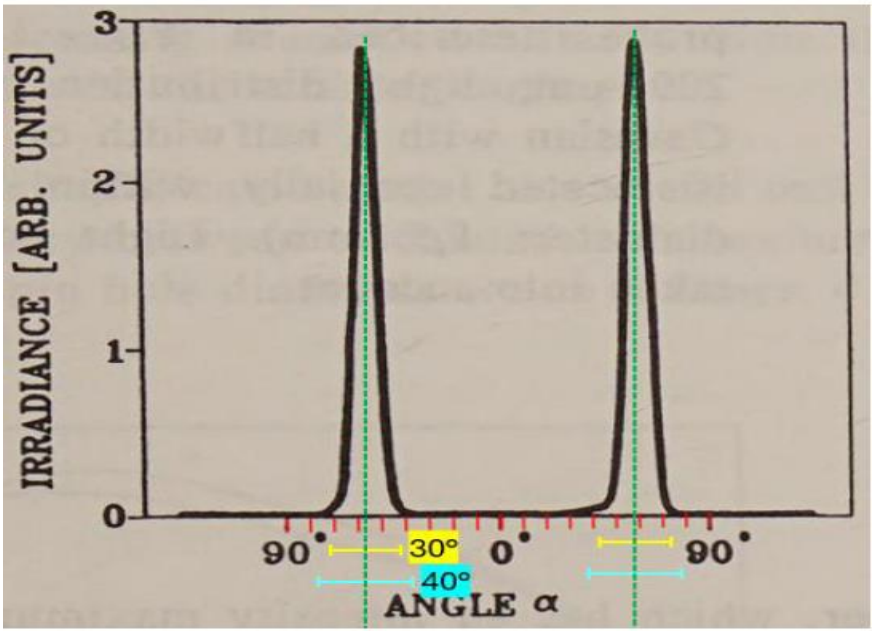
159. The defendant replies that Fig. 4 is a schematic drawing only, that the curve is relatively thick, making any accurate determination impossible; and that if Fig. 4 shows the result of a measurement, the angular resolution of the detector is unknown, which may lead to overestimating the beam-spread angle.

160. The Court is of the opinion that Fig. 4 contains a clear technical teaching concerning the angular distribution of the emitted radiation, which corresponds to a measurement in view of the drawing showing the measuring setup on the right-hand side of Fig. 4. The thickness of the curve does not prevent one from drawing conclusions from the diagram. Neither does the fact that the angular resolution of the detector is not mentioned.

161. The patent prescribes no particular method and gives no instruction as to how a measurement of a beam-spread angle is to be performed. But it is nevertheless clear that the spread angle of the beam (like all optical properties) must be measurable, contrary to what was assumed by BIOLITEC during the oral hearing. The fact that the beam-spread angle depends on structural properties of the probe, such as in particular the numerical aperture of the waveguide does not imply that it cannot also be measured when the device is in use. Any technically recognised method may therefore be used, provided that it is applied coherently and yields a measurement capable of determining whether the emitted beam falls within the claimed spread. The Court is satisfied that Fig. 4 of D7 shows such a method.

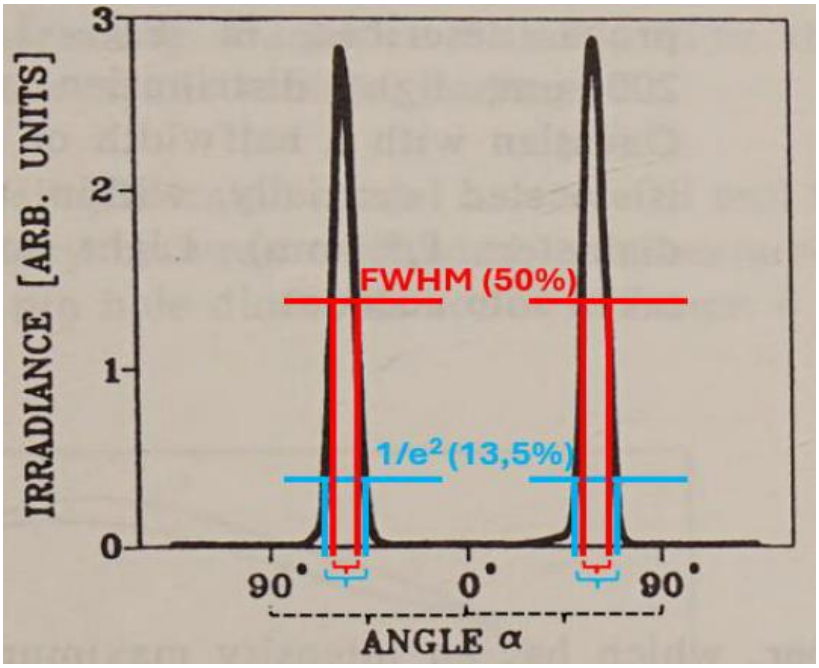
162. Fig. 4 of D7 shows the distribution of irradiance (Y-axis) as a function of the angle α (X-axis) relative to the longitudinal axis of the fiber. This figure shows two irradiance peaks at approximately +60° and -60°. The spread-beam angle corresponds to the width of the peaks. The claimant provided two annotated versions of Fig. 4 and offered different possible methods for determining the peak width.

163. The first annotated version of Fig. 4 is reproduced below:



164. Based on this annotated drawing, and as clarified by the claimant during the oral hearing, the angular extension of each peak taken at the bottom thereof is slightly more than 30° (the claimant announced of value of 33° in the SfR).

165. The second annotated version of Fig. 4 provided by LGO is reproduced below:



166. This version shows the width of the peaks measured according to two conventional criteria: the full width at half maximum (FWHM) criterion (wherein the beam width is measured between the two angular positions at which the intensity has fallen to one half of its peak value) and the $1/e^2$ criterion (wherein the width is measured between the positions at which the intensity has fallen to approximately 13.5% of its peak value). It is apparent that both criteria lead to a determination of the beam-spread angle below 30°, although the $1/e^2$ criterion leads to a determination of the beam-spread angle which is closer to 30° and could therefore be considered as being "*about 30°*" (pursuant to the wording of feature 10). However, this question can be left open, as already the first measurement proposed by LGO and shown on the first annotated version results in a beam-spread angle between about 30° and about 40°.

167. In this respect, the Court deems that it is allowable to rely on any of the possible determination methods proposed by LGO because the patent prescribes no particular measurement method or intensity threshold for the determination. Furthermore, BIOLITEC has not taken a position as to the various measurements discussed by LGO and has not stated that only one of them would be valid for the skilled person. Instead, BIOLITEC has relied on the argument that Fig. 4 of D7 is technically unreliable, which the Court does not accept. For the purpose of assessing novelty, where several technically reasonable methods are available to measure a claim parameter, and where the patent does not designate one in particular, it is sufficient that at least one of them, applied coherently to the prior-art disclosure, leads directly and unambiguously to the claimed result.

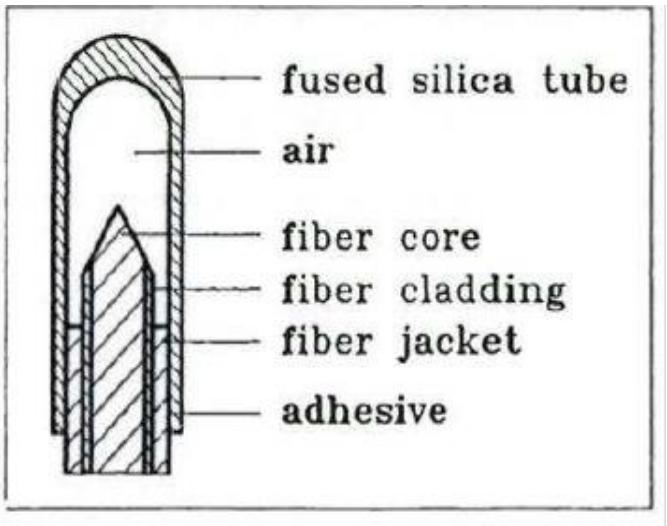
168. As a consequence, the Court concludes that feature 10 is directly and unambiguously disclosed by D7.

Feature 15: defines a gas-waveguide interface that refracts emitted radiation laterally with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900) onto the surrounding vessel wall.

169. As regards feature 15, D7 does not expressly state that the adhesive extends around the entire circumference between the fiber and the silica cover, nor does it expressly describe the cover as hermetically sealed. The disclosure is, however, in the Court's view, implicit. See UPC_CoA_473/2025 et alii Fujifilm v Kodak, decision of 13 July 2026, para. 152: "*A feature may also be disclosed implicitly, but this requires that that the skilled person would objectively consider such feature to be necessarily implied in the explicitly disclosed content, i.e. matter that is a clear and unambiguous consequence of what is explicitly mentioned, shall also be considered as part of its content. Knowledge that a skilled person only acquires as a result of further deliberation beyond this cannot be considered a direct and unambiguous disclosure*." That decision confirms that an implicit feature belongs to the prior-art disclosure only where it follows necessarily from the express teaching, rather than representing merely one possible implementation. A functional or structural attribute that is immediately apparent to the skilled person likewise forms part of the state of the art.

170. In the present case, the skilled person understands from the disclosed geometry that the fiber is cylindrical, the fiber cladding is cylindrical and the fiber jacket is likewise cylindrical. In that structural context, the adhesive interposed between those concentric cylindrical elements is implicitly understood as forming a corresponding cylindrical, circumferential layer. The sectional representation is also clearly consistent with application of the adhesive around the circumference: although only the sectioned portions are visible, the skilled person reads the drawing as a cross-section of a rotationally symmetrical assembly. Applying the principles set out in CoA_473/2025, those converging structural indications disclose a circumferential adhesive bond directly and unambiguously.

Feature 15 is therefore implicitly disclosed by D7.



171. Accordingly, D7 discloses features 1, 10 and 15 and anticipates the complete combination of features of the main claim.

172. Claim 1 of EP'303 is therefore not novel over D7. Since the first novelty attack is successful, the Court considers it unnecessary to examine the subsequent attacks.

INVENTIVE STEP

173. LGO deems that, if claim 1 of EP'303 were considered novel, it would at least lack inventive step over the documents relied upon in connection with novelty, namely D7, D5, D11, D4, D20 and Brekke. LGO also raises further objections of lack of inventive step starting from document US 2005/131400 referred to as D8 (LGO's exhibit 029).

174. The Court has found that claim 1 of EP'303 lacks novelty over D7, so that these various inventive step objections do not need to be examined in detail. However, for the sake of completeness, the Court agrees with the claimant that even if it were considered that claim 1 of EP'303 was novel over D7 due to feature 10, this claim would at least lack inventive step based on this very document.

175. More precisely, the technical problem addressed by the invention has been discussed in detail above and can be summarized as providing a safer and more efficient endoluminal treatment at relatively low power density. Within the context of this technical problem, D7 objectively appears to be a reasonable starting point, disclosing almost all features of the claimed invention. The fact that D7 is not specifically directed to the treatment of venous insufficiencies does not place it outside the relevant technical field or beyond the skilled person's consideration, since claim 1 is directed to a device *per se*, so that the objective suitability of the probe disclosed in D7 for the envisaged treatment is sufficient to make it of interest for the skilled person.

176. Even assuming that D7 disclosed a spread-beam angle which is not between about 30° and about 40° (for example based on the FWHM determination method or any other determination method), then it would be within the skilled person's abilities, as a next step, to vary the structural properties of the probe and thus modify the configuration of the radiation beam, including its angular spread.

177. On the one hand, D7 does not teach that the illustrated distribution of irradiance is critical; there would therefore be no reason why the skilled person implementing the overall teaching of D7 would necessarily keep exactly the same spread-beam angle disclosed in Fig. 4. On the contrary, the skilled person would naturally be interested in providing several possible implementations of the concept of D7, with varying irradiance patterns. On the other hand, BIOLITEC has not demonstrated that a spread-beam angle of about 30° to about 40° provides any surprising advantage in comparison with a spread-beam angle of less than about 30° or of more than about 40°. The patent is silent in this respect. BIOLITEC has referred to the post-published thesis by Ms. Burgmeier (BIOLITEC's Exhibit W05) as evidence, but this thesis does not contain any data showing that, for a lateral annular emission pattern, the specific choice of a range of about 30° to about 40° for the beam-spread angle provides any benefit over another possible angle, all things being otherwise equal.

178. In this context, the skilled person *would* (and not simply *could*) achieve laser probes as disclosed in D7 with various annular emission patterns, including with a spread-beam angle of about 30° to about 40°, namely (at least) a very close angle to what is explicitly illustrated in D7. *The boards have repeatedly established that the simple act of arbitrarily selecting one among equally obvious alternative variations is devoid of any inventive character (*Case Law of the Boards of Appeal of the European Patent Office, 11th edition 2025, section I.D.9.21.9.a)

AUXILIARY REQUESTS

179. The finding that claim 1 as granted lacks novelty over D7 makes it necessary to consider BIOLITEC's auxiliary requests in their proposed order. Where the main claim is invalid and the patent proprietor seeks to preserve the patent through a set of auxiliary requests, but a dependent claim contained in those requests is invalid for added matter, the Court, pursuant to Rule 50.2 RoP, will consider only those auxiliary requests that, as a whole, contain valid subject-matter.

180. Among the auxiliary requests, only AR 10 and AR 11 are capable of substantive examination without the added-matter defect identified above in §§ 133–138: the other requests retain the wording of dependent claim 11 that mentions fusion to the fiber generally, whereas AR 10 and AR 11 restore fusion specifically to the fiber core.

181. On 13 October 2026, shortly before the oral hearing held on October 16th, BIOLITEC filed ten additional auxiliary requests. In each of them, the wording referring to a cap fused generally to the fiber was deleted and replaced by a requirement that the cap be fused to the fiber core.

As an example, the Court sets out claims 11 and 12 of the newly filed Auxiliary Request 1B:

11. The device according to any one of claims 1 to 10,
~~wherein the waveguide is an optical fiber (100, 200, 500, 600, 900) and~~ wherein the cover is a cap (106, 206, 506, 606, 906) that is fused to the fiber core.

~~12. The device according to claim 11,~~
~~wherein the cap (106, 206, 506, 606, 906) is fused to the fiber core.~~

whereas claims 11 and 12 of Auxiliary request 1 read:

11. The device according to any one of claims 1 to 10,
~~wherein the waveguide is an optical fiber (100, 200, 500, 600, 900) and~~ wherein the cover is a cap (106, 206, 506, 606, 906) that is fused to the fiber.

12. The device according to claim 11,
wherein the cap (106, 206, 506, 606, 906) is fused to the fiber core.

182. BIOLITEC justified those amendments as follows: "*First, the deletion of dependent claim 11 does not lead to any change in the subject matter of the defended claims. It merely constitutes a waiver of a defence, following an attack by claimant. Both the subject matter of independent claim 1 as well as the subject matter of the dependent claims remain unchanged. Second, there is no adverse effect on claimant's conduct of the action whatsoever. The deletion merely removes one point of dispute and therefore leads to more efficient, simplified proceedings which is in the interest of all parties (CD Paris, 26. December 2024 UPC CFI 338/2023 – Advanced Bionics / MED-EL). The arguments on the feature "fused to the optical fiber" remain unchanged in regard to auxiliary request AR 9*".

183. The Court does not share BIOLITEC's interpretation and considers the filed amendments inadmissible.

184. Whilst it is true that this Central Division has already established the principle that the patent proprietor may, at any stage of the proceedings, unilaterally "*limit*" part of the claims by means of a waiver (see UPC_CFI_1587/25, CD Milan, Decision of 9 October 2026), it is also necessary to draw a line between claim deletion and claim amendment. Claim deletion occurs where part of the claim set is simply removed. In that event, the opposing party can only take note of the proprietor's decision to abandon a dependent claim. By contrast, when an amendment under Rule 50 RoP results in a reformulated claim set, including where dependent claims are concerned, this remains subject to the Court's assessment as to clarity, added matter and validity pursuant to R.50.2 RoP and also to observations by the opposing party under the adversarial principle. In the above-mentioned case UPC_CFI 1587/25, the waiver was unconditional and a dependent claim was definitively deleted.

185. Conversely, in the case at hand, BIOLITEC did not apply for an unconditional mere cancellation of dependent claim 11 but rather filed a (still) conditional limitation in which dependent claims 11 and 12 were merged and where dependent claim 12 ("*cap is fused to the fiber core*") was incorporated in granted dependent claim 11 ("*fused to the fiber*"). Although the amendment has almost the same effect as a deletion, it does not, in fact, constitute a mere deletion.

186. This adjustment marks a significant change in the procedural strategy of BIOLITEC. Just a few days before the hearing, they addressed an issue in the dependent claim of which the defendant was well aware, which had been raised from the outset of these proceedings (see SfR § 5.259- 5.262) and which was found relevant both by the EPO in a parallel case concerning parent application 0 and by the LD Munich also in a parallel case concerning parent application 0 (UPC_CFI_714/2024, UPC_CFI_155/2025, order dated 2 April 2026). Moreover, in respect of dependent claim 11 the defendant had expressly stated that any added-matter issue was unfounded and did not take it as motivation to make any amendments ("With regard to dependent claims 11 and 12, the claimant refers to a decision of an Opposition Division in a parallel case. This decision is currently under appeal, as the defendant considers that the Opposition Division's decision is incorrect for reasons set out in more detail below in connection with auxiliary request 9", see. p. 29, BIOLITEC's Rejoinder). This choice has implications on the counterparty's right of defense since it obliterates all arguments spent by LGO in this regard and presents LGO with a new procedural scenario just days before the oral hearing.

187. The procedural decision to re-shape or amend dependent claims 11 and 12 is therefore relevant from the perspective of the timeliness of the application and of the opposing party's right of defence. Under Rule 30.1 RoP, patent amendments must be made in the first defensive submission according to the front-loaded spirit of UPC proceedings. The other party must have the possibility to react to amendments that reshape the dependent claims by combination or merger of dependent claims.

188. The relevant legal standard is set in Meril Italy Srl, Meril GmbH and Meril Life Sciences Pvt Ltd v Edwards Lifesciences Corporation, Court of Appeal, Decision of 25 November 2025, UPC_CoA_464/2024 and joined appeals, headnote 2 and paras. 87–96: "*Under Rules 49.2 and 50.2 in conjunction with Rule 30.2 RoP, a subsequent request to amend the patent may be admitted only with the permission of the Court. In deciding whether to admit it, the Court must take account of all relevant circumstances, including whether the party seeking the amendment can justify that the amendment could not have been made with reasonable diligence at an earlier stage and that it will not unreasonably hinder the other party in the conduct of the action. The Court of First Instance has a margin of discretion in that assessment, so appellate review is limited*". Therefore, a subsequent request to amend may be admitted

where, having regard to all the circumstances, the proprietor shows that the amendment could not reasonably have been made earlier and that it will not unreasonably hinder the other party in the conduct of the action.

189. The same conclusion follows from the decision invoked by BIOLITEC in support of the proposition that dependent claims may be freely modified at any stage. In UPC_CoA_473/25, § 60, the Court of Appeal expressly distinguished the mere defence of dependent claims, including combinations already encompassed by the granted claims, from amendments that introduce claim wording or combinations not contained in the patent as granted: "*An Application to amend the patent is only required if the patentee wishes to maintain its patent with amended wording, i.e. deviating from the wording of the claims as granted, or proposes combinations of dependent claims not explicitly included therein, thereby limiting the scope of the patent as granted. This is not the case where a patentee merely defends the dependent claim(s), including combination(s) already encompassed thereby*".

190. In the present case, BIOLITEC reformulated the claim sets by combining the limitations of dependent claims 11 and 12 together, maintaining claim 11 in an amended form, thereby introducing amended wording in order to address the added-matter objection.

191. Admitting those requests only two days before the oral hearing would have required LGO to take a specific position on newly reformulated claim combinations and, if necessary, to adjust its validity case and would have possibly required a postponement of the oral hearing. It would therefore have unreasonably hindered LGO in the conduct of the action and impaired its effective right to be heard and would have been detrimental to the Court's schedule. In the absence of any persuasive justification for the late filing, the requirements for admission under Rule 30.2 RoP are not satisfied. The objection of added matter of dependent claim 11 had been raised from the outset of the proceedings, had already been debated by the parties and was also known from the parallel EPO opposition proceedings. BIOLITEC has not shown why, acting with reasonable diligence, the amendment could not have been filed earlier. The new set of auxiliary requests is therefore not admitted into the proceedings.

192. Against this background, the only ARs which are not affected by the added matter problem discussed above with respect to the main request are the originally proposed ARs 10 and 11.

193. The Court will therefore turn to the first of these ARs according to the order proposed by the patentee.

Claim 1 of AR 10 reads:

1a. A device for endoluminal treatment of *varicose veins*, comprising:
2a a flexible *optical fiber* (100, 200, 500, 600, 800, 900)
3 defining an elongated axis,
4 a proximal end optically connectable to a source of radiation (424), and
5a a *rounded* distal end receivable within the *vein* and
6a including a radiation emitting surface (110, 210, 510, 610), *which is conical shaped and*

7 adapted to emit radiation from the radiation source (424)
8a laterally with respect to the elongated axis of the *optical fiber* (100, 200, 500, 600, 800, 900)
9a and annularly from the *optical fiber* (100, 200, 500, 600, 800, 900) onto an angularly extending portion of the surrounding *vein* wall,
10a wherein the spread of the annular beam is *defined by the numerical aperture of the optical fiber and* defined by an angle within the range of about 30° to about 40°,
11 the device further comprising a cover (106, 206, 506, 606, 906)
12a that is fixedly secured to the *optical fiber* (100, 200, 500, 600, 800, 900) and sealed with respect thereto,
13 substantially transparent with respect to the emitted radiation,
14 that encloses the emitting surface (110, 210, 510, 610) therein,
15a and that defines a gas *optical fiber* interface that refracts emitted radiation, laterally with respect to the elongated axis of the *optical fiber* (100, 200, 500, 600, 800, 900) onto the surrounding vessel wall
15.1a *wherein the cover is a cap (106, 206, 506, 606, 906) that is fused to the fiber core*

194. Furthermore, in AR 10, claims 2, 3, 11 and 12 are deleted, and the wording and numbering of the remaining dependent claims is adapted. The Court considers this AR complying with the requirements of clarity (art. 84 EPC) and not containing added subject-matter Art. 76(1) and 123 (2) and (3).

195. The Court recalls that, as regards added subject matter, the only relevant reference is the A2 application as filed.

196. The subject matter of AR 10 is fully and directly disclosed in the A2 application.

197. The treatment of varicose veins (feature 1a) is disclosed in various sections of the original application, for example in paragraphs [0005], [0006], [0032], [0079], and [0080], as the prime example of treatment of venous insufficiencies.

198. Additionally, paragraph [0002] discloses an optical fiber (features 2a, 8a and 15a) as the sole example of a waveguide to be used within veins and paragraphs [0056], [0057], [0059] and [0072] as well as EEE 33 in paragraph [0081] disclose a rounded distal end (feature 5a) receivable in the vein.

199. Conical-shaped emitting surfaces (feature 6a) are disclosed in paragraph [0024] of the application A2: "*In some embodiments the device emits pulsed or continuous laser energy radially through an optical fiber end with a substantially conical shaped emitting surface for 360°radial emission. Some embodiments of the device further include a substantially conical shaped reflective surface axially spaced relative to and facing the conical emitting surface for enhancing radial emission efficiency by reflecting radially and/or circumferentially remnant or designed forwardly transmitted energy*". Reference may also be made to at least paragraph [0042] and EEE 8 in paragraph [0081].

200. The spread of the annular beam defined by the numerical aperture of the optical fiber in feature 10a is disclosed by paragraph [0042]: "*In some embodiments, the radiation is emitted laterally and annularly onto the surrounding vessel wall, and the annular beam of radiation extends throughout an arc (i.e., the spread of the beam) defined by the numerical aperture of the fiber. In some embodiments, the spread of the annular beam is defined by an angle within the range of about 30° to about 40°*".

201. Paragraph [0033] discloses a glass optical fiber that refracts radiation where the cover is a cap which is fused to the fiber core. This argument was already addressed by the Court in the paragraphs above. Although LGO alleged that these various amendments are based on impermissible intermediate generalizations, the Court has not identified any missing feature inextricably linked to the amendments.

202. The subject-matter of the amended claim thus does not extend beyond the content of the application as filed (or of any of the earlier applications as filed).

203. LGO mentioned that AR 1 lacks clarity (RtD, 5.18). To the extent that this objection may also concern AR 10 which incorporates the modifications of AR 1, it does not need to be considered by the Court as it was not substantiated at all; furthermore, BIOLITEC has complied with R.30.1(b) RoP regarding the requirement that the patent proprietor shall give an explanation as to why the amendments satisfy the requirements of Art. 84 and 123(2), (see UPC_CoA_678/25 §26-27). Conclusively, the Court does not see any lack of clarity in the claims of AR 10.

INVENTIVE STEP OF AR 10

204. LGO did not challenge novelty of AR 10. Paragraph 5.182 of the RtD does mention a lack of novelty but without even explaining over which prior art document(s).

205. On the other hand, LGO formally raised objections of lack of inventive step, in the following terms: "*In any event, the added feature is disclosed in Exh. 035/Brekke, as already pleaded in the Statement for Revocation with respect to granted claim 12. AR10 is therefore at least not inventive over Brekke. In the alternative, even if one were to start from any of the other prior-art documents relied upon against claim 1 as granted or claim 1 of AR3, the added feature would in any event be obvious. The skilled person seeking to provide a secure and stable connection between the transparent cap and the optical fiber would have used fusing to the fiber core as a known technical measure. Brekke expressly teaches that solution*" (RtD, 5.180–5.181).

206. With respect to inventive step of AR 3, which is referred to in the above statement, and taking into account that claim 1 of AR 10 builds upon claim 1 of AR 3, LGO stated the following: "*The inventive-step attack based on Exh. 025/D5 set out above in relation to AR1 applies equally to AR3. The further amendment introduced by AR2, namely the reference to the numerical aperture, does not add any distinguishing feature over Exh. 025/D5, since optical fibers necessarily have a numerical aperture and AR2 does not define any specific numerical value thereof. Likewise, the only additional feature introduced by AR3 — the conical-shaped radiation-emitting surface — cannot provide any inventive contribution, since Exh. 025/D5 itself already discloses a conical distal tip geometry for generating lateral annular emission. For the same reason, also the inventive-step attack based on Exh. 020/D7 and the inventive-step attack based on the combination of Exh. 29/D8 with Exh. 030/D15 (or Exh. 31/D16) set out above in relation to claim 1 of the main request and to AR1 applies equally to AR3*" (RtD, 5.40,

5.41). Finally, with respect to inventive step of granted claim 12, which is also referred to in LGO's statements concerning AR 10, LGO stated the following: "*Document US5537499 (Brekke, 1996) (Exhibit 035) discloses fusion of the cap to the core of the optical fiber. The fusion of the cap specifically to the core of the optical fibre is therefore known to the person skilled in the art and consequently neither claim 12 can confer inventive step to the invention of EP'303.* (SfR, 5.524-5.525)".

207. In view of the above statements, LGO formally raised the following inventive step attacks against AR 10: (i) starting from Brekke; (ii) starting from D5, D7 or D8, in combination with Brekke. However, concerning (i), since AR 10 incorporates the limitations of AR 3, and since Brekke was not mentioned as a starting point in connection with AR 3 or even AR 1, this inventive step attack was not properly substantiated. Concerning (ii), LGO provided no relevant explanation and in particular did not explain why and how the skilled person would modify any of D5, D7 and D8 to achieve feature 15.1a. Therefore, also these inventive step attacks were not properly substantiated. In summary, the Court has not been presented with any properly substantiated inventive step attack concerning AR 10.

208. This Court wishes to provide a general overview of the principles governing the submission and challenge of auxiliary requests.

209. Under Rule 50.2 RoP, the Defence to the revocation may include an Application by the proprietor of the patent to amend the patent (see R. 30 RoP). Within two months of service of a Defence to Revocation containing an application to amend the patent, the claimant (R. 51 RoP) may lodge a Defence to the Application to amend the patent, setting out whether he opposes the Application to amend the patent.

210. Within one month of service, the patentee may lodge (R. 52 RoP) a Reply to the Defence to an Application to amend the patent pursuant to Rules 43.3 and 55 RoP.

211. Under Rule 32.3 RoP, the defendant to the application to amend the patent may – within one month of the service of the Reply – lodge a Rejoinder to the Reply to the application to amend. The Rejoinder shall be limited to the matters raised in the Reply.

212. BIOLITEC filed a "Reply to the Defence to an Application to amend the patent" (also named Rej. above) on 24 July 2026.

213. LGO could have filed a Rejoinder to the Reply to the Application to Amend the patent by 24 August 2026. Having established that no such submission had been lodged, the Court closed the written procedure and opened the interim procedure on the following day, the 25th of August 2026.

214. This observation is not merely formalistic. In *Meril Italy Srl, Meril GmbH and Meril Life Sciences Pvt Ltd v Edwards Lifesciences Corporation*, UPC_CoA_464/2024 and joined appeals, Decision of 25 November 2025, headnotes 7–13 and paras. 127–133, the Court of Appeal made clear that the assessment of inventive step proceeds through successive analytical stages:

- The first step is to identify the object of the invention, namely the objective problem. This requires determining what the invention (in the case at hand in the amended form) adds to the state of the art by considering the claim as a whole, in the context of the description and drawings, and the inventive concept or technical teaching underlying it. The assessment must be based on the technical effects that the skilled person understands from the application to be

achieved by the claimed invention. To avoid hindsight, the objective problem must not contain pointers to the claimed solution (Meril v Edwards, headnotes 8–9; Amgen v Sanofi/Regeneron, headnotes 11–12).

- The next step is to identify one or more realistic starting points in the prior art within the relevant field of technology. That field includes the field relevant to the objective problem and any other field in which the same or a similar problem arises and of which the skilled person may be expected to be aware. A starting point is realistic where its teaching would have been of genuine interest to the skilled person seeking to solve the objective problem at the relevant date, for example because it discloses several features similar to those of the claimed invention or addresses the same or a similar underlying problem. There may be more than one realistic starting point, and the claimed invention must involve an inventive step when assessed from each of them (Meril v Edwards, headnotes 10–11; Amgen v Sanofi/Regeneron, headnotes 13–15).
- The decisive question is whether the skilled person, starting from such a realistic starting point and wishing to solve the objective problem, would—not merely could—have arrived at the claimed solution.

215. At each stage, the party advancing the objection must set out the corresponding arguments and, where necessary, submit the supporting evidence. A general assertion of invalidity based on a combination of two documents cannot, in the Court's view, replace the reasoned analysis required at each step of the inquiry.

216. LGO was therefore required to set out the specific analytical route by which the skilled person, starting from any of the cited prior art, would have arrived at the subject matter of claim 1 of AR 10 by identifying the objective problem and a logical argument leading from the starting point to the patent in its amended form.

217. It did not do so, as is apparent from the statements reproduced above. In its Reply to the Defence to an Application to amend the patent, BIOLITEC commented on inventive step starting from Brekke and correctly noted that, based on LGO's submissions, "*It is not apparent, what the underlying problem should be and how the skilled person would arrive at the claimed subject-matter without an inventive step*" (p.114). BIOLITEC also pointed to insufficiencies in LGO's reasoning starting from D8 (p.114-115).

218. LGO failed to provide the missing explanations. In fact, LGO even chose not to file a Rejoinder to Reply to Application to Amend the Patent.

219. The Court is mindful that inventive-step objections to auxiliary requests arise at a procedural stage at which challenges initially formulated in general terms in the Statement of Claim must be adapted to the amended claim sets. The additional written submission available to the claimant in revocation proceedings (i.e. the Reply to Defence) serves precisely that purpose, enabling the validity of the amended claims to be properly addressed in the written phase and properly argued during the interim procedure and at the oral hearing. This does not contradict the front-loaded nature of UPC proceedings. 'Front-loaded' means at the earliest possible opportunity. Failure to lodge such substantiation in the written phase is therefore not a merely formal omission: it affects the equality of arms and must be taken into account when assessing the admissibility of the attack. In its decision issued on 9 October

2026 (UPC_CFI_1587/25) this Court has already observed that "*Procedural fairness under recital 5 of the Preamble to the RoP requires each party to plead its grounds of challenge clearly and with sufficient specificity. The Court can neither cure deficiencies in those grounds nor supplement them of its own motion, since doing so would substitute the Court for the challenging party and compromise its impartiality".*

220. This interpretation is consistent with the case law of the Court of Appeal: "*the party alleging lack of inventive step must establish the facts supporting the realistic starting point, the relevant pointer or motivation, and the skilled person's reasonable expectation of success. Where the patent proprietor identifies concrete uncertainties or practical or technical difficulties, the challenger must sufficiently substantiate why those matters would not have prevented the skilled person from expecting success*" (Meril v Edwards, headnote 6; Amgen v Sanofi/Regeneron, headnotes 9 and 17–22).

221. The Court holds the inventive-step attack on AR 10 lacking in that regard.

222. Nevertheless, in order to provide a complete basis in case, in the event an appeal were filed, the CoA were to find the attack as sufficiently substantiated, the Court will carry out a supplementary examination of the inventive step of AR 10 on the assumption that D7 (Heinze) is the starting point and in light of the teaching of Brekke. This supplementary examination is undertaken solely in the interest of procedural efficiency and does not entail any reconsideration of the Court's conclusion that the attack was originally unsubstantiated. The supplementary examination below is undertaken solely to show that, in any event, the attack would be unsuccessful even following an *ex officio* assessment (which is not required).

223. As noted above, D7 (Heinze) appears to be a reasonable starting point, disclosing all features of the claimed invention as claimed by the granted claims. Even the patentee in their letter to EPO dated 19 September 2024 (BIOLITEC's Exhibit W20) submitted "*Heinze A. et al: Modified fiber tips for light application in hollow organs. In: Proc. SPIE 1201, optical fibers in medicine V, 1. Juli 1990, S. 304-312*" underlining that "*this document, in particular section 2.2., might be relevant for assessing the inventive step of the claimed invention*".

224. It is not disputed by LGO that D7 fails to disclose at least feature 15.1a, namely the requirement that the cap be fused to the fiber core.

225. Brekke is the only prior art document which was mentioned by LGO as disclosing feature 15.1a. It should therefore be examined whether the skilled person starting from D7 would achieve feature 15.1a in view of Brekke.

226. Under Article 56 EPC, inventive step is assessed objectively from the perspective of the skilled person, equipped with common general knowledge but with no inventiveness, at the application or priority date. The Court of Appeal consolidated the UPC approach in Meril v Edwards Lifesciences, UPC_CoA_464/2024 and joined appeals, decision of 25 November 2025, headnotes 4–13, and in Amgen v Sanofi/Regeneron, UPC_CoA_528/2024 and UPC_CoA_529/2024, decision of 25 November 2025, headnotes 10–22. The framework develops the approach already applied in NanoString v 10x Genomics, UPC_CoA_335/2023, App_576355/2023, order of 26 February 2024.

227. A claimed solution is ordinarily obvious where the skilled person would have achieved it as a next step in the expectation of finding the envisaged solution to the objective problem (which can be

summarized in the present case as providing a safer and more efficient endoluminal treatment at relatively low power density).

228. Brekke (LGO's Exhibit 035) is US 5,537,499, entitled "*Side-firing laser optical fiber probe and method of making same*", granted in 1996 and claiming German priority of 30 January 1991. It relates to medical laser-fiber probes ("*laser catheters*") in which laser radiation is transmitted through a flexible optical fiber and redirected at the distal end to provide lateral ("*side*-firing") emission for therapeutic procedures, including endoscopic surgery, and diagnostic procedures. A silica capillary surrounds the distal end and forms a sealed air chamber. The capillary and fiber may be joined by localised fusion. Reference may be made for example to figures 10, 28 and 33:

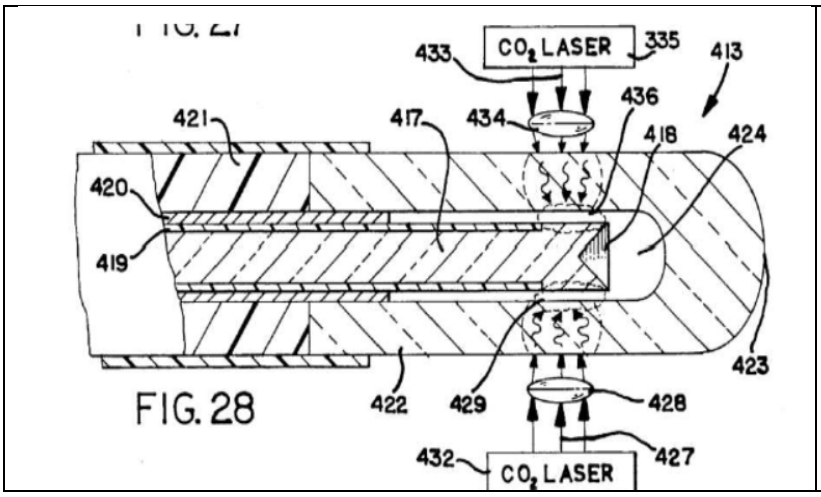


FIG. 28

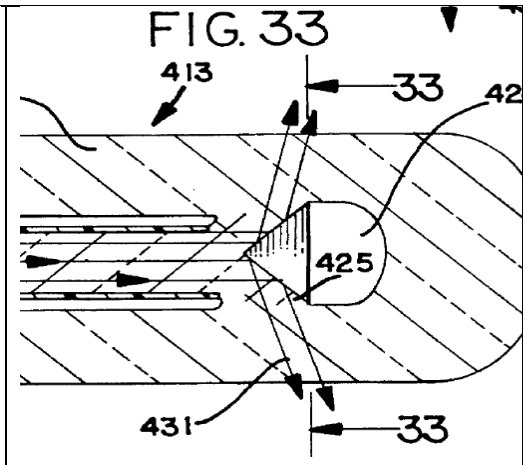
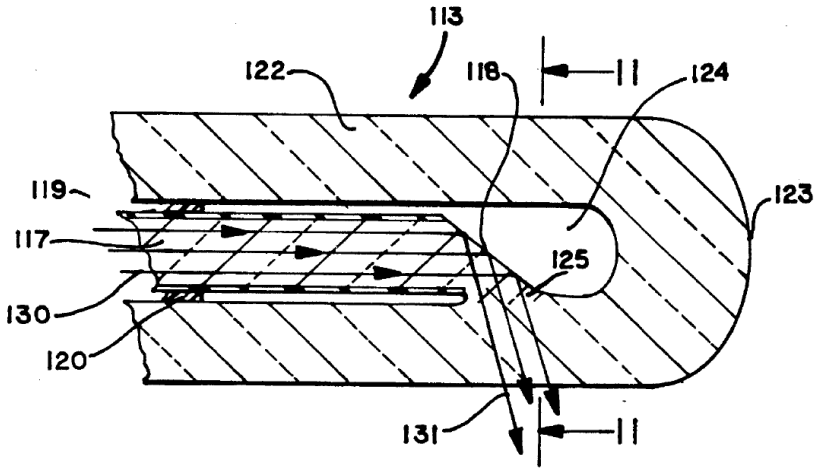


FIG. 33



229. Brekke might be relevant in particular to the sealing and attachment arrangement. It describes a tubular silica capsule with a closed end surrounding the distal portion of the fiber (terminating in an inclined surface) and forming a sealed air chamber.

230. It further discloses attachment to the sheath and localized fusion between the fiber and the capsule: "*localized heat fuses the end of the fiber opposite the inclined surface to the capsule thereby eliminating secondary light reflections*" (abstract).

231. More specifically, heat is applied to unite a portion of the distal end of the optical fiber, opposite the inclined surface, with the capsule. The adjacent portions of the fiber and capsule melt and fuse together, thereby eliminating the fiber–air–capsule interfaces that would otherwise give rise to undesirable reflected light. Light from the inclined surface is then reflected laterally through the combined silica materials without producing unwanted reflected or refracted light.

232. In certain embodiments, the fused region extends over approximately 100° of the circumference. In another embodiment, it extends through 360°, thereby forming a complete annular joint. Brekke thus expressly discloses both a sealed chamber and, in the 360° embodiment, a circumferentially complete fused connection.

233. Brekke would have been of genuine interest to the skilled person. It lies within the same technical field in the sense relevant to the assessment of inventive step, it concerns optical instruments for medical use in which laser radiation is conveyed through a flexible optical fiber and redirected laterally at its distal end, and it addresses endoluminal procedures by means of a laser catheter. Its teaching therefore falls both within the broader field of laser-based medical optical instruments and within the more specific field of endoluminal treatments. Accordingly, the fact that Brekke's probe is described for endoscopic surgery rather than specifically for the treatment of varicose veins does not place it outside the relevant technical field or beyond the skilled person's consideration.

234. However, the skilled person tasked with making non-inventive improvements or modifications to D7, would not arrive at the subject-matter of claim 1 of AR 10 in view of Brekke. Integrating the cap with the fiber jacket is essential to D7 (see Fig. 3 again reproduced on the side). In addition, fusing the cap to the fiber core would *prima facie* impair refraction from the fiber core to the air. Without a pointer / motivation into that direction, there is nothing to prompt a skilled person to make this modification.

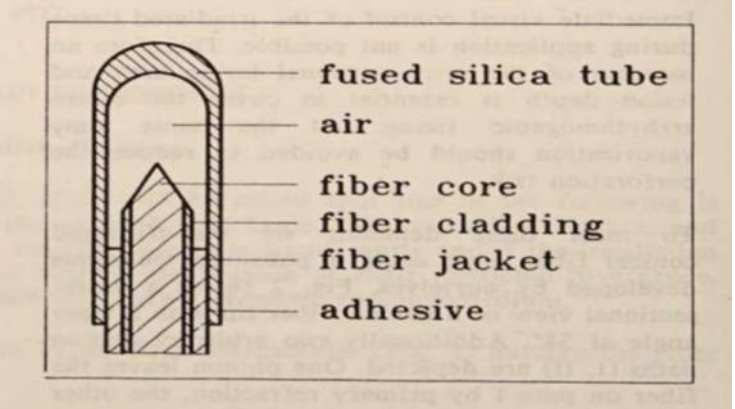


Fig. 3: Radially radiating laser probe.

235. Furthermore, Brekke concerns an optical arrangement based on reflection and not on refraction through air. Reflection is achieved by means of a coating material (paragraph [0226]), such as a metallic or dielectric film bonded to the surface (paragraph [0218]); the metallic film may consist of gold, silver or another light-reflective metal. See Fig. 14 and 15 reproduced below:

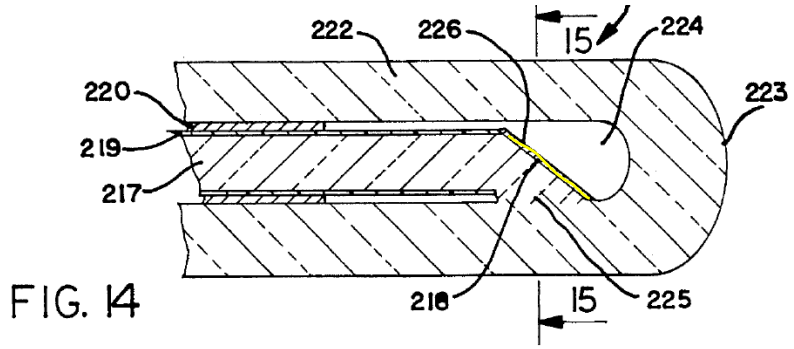


FIG. 14

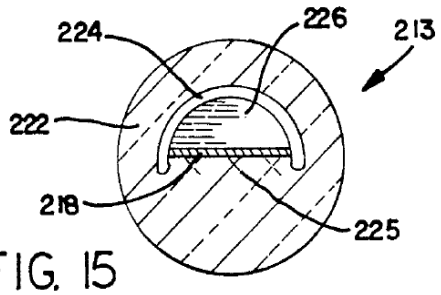


FIG. 15

236. Brekke does not provide a direct pointer to the claimed solution, which is still in the domain of laser refraction. Although it expressly teaches fusion of the silica fiber to the capsule and identifies the resulting optical effect, its lateral emission is produced by reflection and thus in a different optical arrangement. It contains no teaching that refraction is the mechanism responsible for lateral irradiation; on the contrary, it states that "*The light from the inclined surface is reflected laterally through the combined materials*" (col.1, l.61-62).

237. Starting from D7, and seeking to provide an alternative arrangement for securing the cap to the optical fiber in the refractive device of AR 10, the skilled person could therefore have consulted Brekke but would have had no pointer to adopt/consider the attachment arrangement disclosed in this document.

238. Feature 15.1a therefore contributes to an inventive step.

CONCLUSIONS

239. The patent as amended in accordance with AR 10 satisfies the requirements of novelty and inventive step and, as regards the amendments made, those concerning added matter and clarity.

240. The revocation action must therefore be dismissed insofar as the patent is maintained in the amended form annexed to this decision.

COSTS

241. The Claimant has succeeded in its novelty and added-matter challenges. The Defendant has nevertheless avoided revocation by successfully defending the patent in the amended form of AR 10.

242. In those circumstances, the Court considers it equitable that each party bear its own costs and that the court fees be borne equally. BIOLITEC shall therefore reimburse LGO for one half of the court fees paid in respect of the revocation action pursuant to Article 69 UPCA.

FOR THESE REASONS

- The revocation action is dismissed insofar as EP 4458303 is maintained in the amended form under AR 10 annexed to this decision with effect for the Federal Republic of Germany, the Kingdom of Belgium, the Republic of Bulgaria, the Kingdom of Denmark (excluding the Faroe Islands and Greenland), the Republic of Estonia, the Republic of Finland, the French Republic (excluding New Caledonia and French Polynesia), the Italian Republic, the Republic of Latvia, the Republic of Lithuania, the Grand Duchy of Luxembourg, the Republic of Malta, the Kingdom of the Netherlands (excluding Aruba), the Republic of Austria, the Portuguese Republic, the Kingdom of Sweden, and the Republic of Slovenia .
- Parties shall bear their own costs.
- BIOLITEC Holding GmbH & Co. KG shall reimburse by 30 November 2026 Light Guide Optics International for one half of the court fees paid in respect of the revocation action.
- The value of the proceedings is set at EUR 1,000,000.

Issued in Milan on 11 November 2026

Presiding judge / judge-rapporteur Andrea Postiglione	ANDREA POSTIGLIONE 2026.11.11 17:17:01 +01'00'
Legally qualified judge Anna-Lena Klein	ANNA-LENA KLEIN Firmato digitalmente da ANNA-LENA KLEIN Data: 2026.11.11 15:27:43 +01'00'
Technically Qualified Judge Renaud Fulconis	Renaud, Patrick, Raymond Fulconis 2026.11.11 15:44:52 +01'00'
For the Deputy Registrar Valeria Molinari	VALERIA MOLINARI Firmato digitalmente da VALERIA MOLINARI Data: 2026.11.11 15:15:23 +01'00'

INFORMATION ABOUT APPEAL

An appeal against the present Decision may be lodged at the Court of Appeal, by any party which has been unsuccessful, in whole or in part, in its submissions, within two months of service of the decision (Art. 73(1) UPCA, R. 220.1(a), 224.1(a) RoP).

INFORMATION ABOUT ENFORCEMENT

Art. 82 UPCA, Art. 37(2) UPCS, R. 118.8, 158.2, 354, 355.4 RoP: An authentic copy of the enforceable decision will be issued by the Deputy-Registrar upon request of the enforcing party, R. 69 RegR.

INSTRUCTION TO THE REGISTRY

A certified copy of the decision shall be sent to the European Patent Office as soon as the decision on the revocation action has become legally binding.

Auxiliary Request 10

Claims:

1. A device for endoluminal treatment of ~~venous insufficiencies~~varicose veins, comprising: a flexible ~~waveguide~~ optical fiber (100, 200, 500, 600, 800, 900) defining an elongated axis, a proximal end optically connectable to a source of radiation (424), and a rounded distal end receivable within the ~~blood vessel~~vein and including a radiation emitting surface (110, 210, 510, 610), which is conical shaped and adapted to emit radiation from the radiation source (424) laterally with respect to the elongated axis of the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900) and annularly from the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900) onto an angularly extending portion of the surrounding ~~vessel~~ vein wall, wherein the spread of the annular beam is defined by the numerical aperture of the optical fiber and defined by an angle within the range of about 30° to about 40°, the device further comprising a cover (106, 206, 506, 606, 906) that is fixedly secured to the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900) and sealed with respect thereto, substantially transparent with respect to the emitted radiation, that encloses the emitting surface (110, 210, 510, 610) therein, and that defines a gas-~~waveguide~~optical fiber interface that refracts emitted radiation laterally with respect to the elongated axis of the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900) onto the surrounding ~~vessel~~vein wall, wherein the cover is a cap (106, 206, 506, 606, 906) that is fused to the fiber core.

~~2. The device according to claim 1,~~
~~wherein the emitting surface (110, 210, 510, 610) is angled with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900), wherein the emitting surface (110, 210, 510, 610) is oriented at an acute angle with respect to the elongated axis of the waveguide (100, 200, 500, 600, 800, 900) and wherein the emitting surface (110, 210, 510, 610) defines an arcuate surface contour.~~

~~3. The device according to claim 1 or 2,~~
~~wherein the emitting surface (110, 210, 510, 610) is substantially conical shaped.~~

42. The device according to ~~any one of claims 1 to 3~~claim 1, further comprising a reflecting surface (112, 212, 512, 612) distally spaced relative to and facing the emitting surface (110, 210, 510, 610) for reflecting forwardly directed radiation laterally with respect to the elongated axis of the ~~waveguide~~optical fiber (100, 200, 500, 600, 900).

~~53~~. The device according to claim ~~42~~, wherein the reflecting surface (112, 212, 512, 612) defines an arcuate surface contour oriented at an acute angle with respect to the elongated axis of the ~~waveguide~~optical fiber (100, 200, 500, 600, 900).

~~64~~. The device according to claim ~~53~~, wherein the reflecting surface (112, 212, 512, 612) is substantially conical shaped.

~~75~~. The device according to any one of claims 1 to ~~64~~, wherein the approximate center of the beam is oriented at an angle within the range of about 70° to about 90° relative to the elongated axis of the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900).

~~86~~. The device according to any one of claims 1 to ~~75~~, further comprising a lateral radiation emitting distal region (204, 504, 604) defined by a plurality of radiation emitting surfaces (208, 210, 508, 510, 608, 610) axially spaced relative to each other along a distal region of the ~~waveguide~~optical fiber (200, 500, 600, 900), wherein a first radiation emitting surface (210, 510, 610) is formed at the distal tip of the ~~waveguide~~optical fiber (200, 500, 600, 900), and a plurality of second radiation emitting surfaces (208, 508, 608) proximally is located with respect to the first radiation emitting surface (210, 510, 610) and axially spaced relative to each other.

~~97~~. The device according to claim ~~86~~, further comprising an axially-extending cover (206, 506, 606, 906) that encloses the lateral radiation emitting distal region (204, 504, 604), forms a gas interface at each of the plurality of radiation emitting surfaces (208, 210, 508, 510, 608, 610) that is sealed

with respect to the exterior of the ~~waveguide~~optical fiber (200, 500, 600, 900), and cooperates with the angled arcuate surface contour of at least a plurality of the radiation emitting surfaces (208, 210, 508, 510, 608, 610) to deflect radiation laterally with respect to the elongated axis of the ~~waveguide~~optical fiber (200, 500, 600, 900).

~~10~~8. The device according to any one of claims 1 to ~~9~~7,

further comprising a sleeve (946) slidably mounted over the ~~waveguide~~optical fiber (900) and defining an internal radiation reflective surface for reflecting laterally emitted radiation inwardly and controlling the axial length of the lateral radiation emitting distal region, and/or

further comprising a radiation source (424), a temperature sensor (426) thermally coupled to a distal region of the ~~waveguide~~optical fiber (420) for monitoring a temperature within the ~~blood vessel~~vein and transmitting signals indicative thereof, and a control module (428) electrically coupled to the temperature sensor (426) for regulating the power output of the radiation source (424) based thereon, and/or

further comprising a pullback actuator (430) drivingly coupled to the ~~waveguide~~optical fiber (420) for controlling the pullback speed of the ~~waveguide~~optical fiber (420), and wherein the control module (428) is electrically coupled to the pullback actuator (430) for regulating the pullback speed of the ~~waveguide~~optical fiber (420) based on the temperature at the distal region of the ~~waveguide~~optical fiber(420), and/or

further comprising a guide wire (534, 634) detachably coupled to the ~~waveguide~~optical fiber (500, 600) and including a distal portion extending distally beyond the distal tip of the ~~waveguide~~optical fiber (500, 600) for guiding the ~~waveguide~~optical fiber (500, 600) through the ~~blood vessel~~vein.

~~11. The device according to any one of claims 1 to 10,~~

~~wherein the waveguide is an optical fiber (100, 200, 500, 600, 900) and wherein the cover is a cap (106, 206, 506, 606, 906) that is fused to the fiber.~~

~~12. The device according to claim 11,~~

~~wherein the cap (106, 206, 506, 606, 906) is fused to the fiber core.~~

~~13~~9. The device according to any one of claims 1 to ~~12~~8,

further comprising at least one laser source (424) that provides laser radiation of about 1470 nm +/- about 30 nm or about 1950 nm +/- about 30 nm, wherein the proximal end of the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900) is optically coupled to the at least one laser source (424).

~~14~~10. The device according to claim ~~13~~9,

wherein said at least one laser source (424) provides laser radiation of at least one of about 980 nm, about 1470 nm and about 1950 nm, each +/- about 30 nm, at a power of less than or equal to about 10 W or less than 5 W, wherein the proximal end of the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900) is optically coupled to the at least one laser source (424), and wherein the emitting surface (110, 210, 510, 610) of the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900) emits radiation laterally with respect to the elongated axis of the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900) in an axially-extending, annular pattern onto the surrounding ~~vessel~~ vein wall.

~~15~~11. The device according to any one of claims 1 to ~~14~~10,

further comprising an electric pullback device (430) drivingly coupled to the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900) and configured to pullback the ~~waveguide~~optical fiber (100, 200, 500, 600, 800, 900) through the ~~blood vessel~~vein while delivering laser radiation at an energy delivery rate of less than about 50 J/cm, 40 J/cm, 30 J/cm, 20 J/cm or 10 J/cm on average to the ~~blood vessel~~vein wall.

~~16~~12. The device according to any one of claims 1 to ~~15~~11,

wherein the device is arranged for a method for endoluminal treatment of a varicose vein, comprising the following steps:

(i) introducing an ~~waveguide~~optical fiber (100, 200, 500, 600, 900) defining an elongated axis into the vein;

(ii) transmitting radiation through the ~~waveguide~~optical fiber (100, 200, 500, 600, 900); and

(iii) emitting radiation laterally with respect to the elongated axis of the ~~waveguide~~optical fiber (100, 200, 500, 600, 900) onto an angularly extending portion of the sur-

rounding vein wall while pulling the ~~waveguide~~optical fiber (100, 200, 500, 600, 900) back from the vein.