Internal distribution code:

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

Datasheet for the decision of 11 June 2024

Case Number: T 2115/21 - 3.3.10

Application Number: 10723402.3

Publication Number: 2550030

IPC: A61L27/34, A61L29/08, A61L31/10, A61L29/16, A61L31/16, A61L27/54

Language of the proceedings: EN

Title of invention:
DRUG RELEASING COATINGS FOR MEDICAL DEVICES

Patent Proprietor:
Lutonix, Inc.

Opponent:
MEDTRONIC INC.

Headword:

Relevant legal provisions:
EPC Art. 100(a), 100(b), 100(c)
RPBA 2020 Art. 13(2)

Keyword:
Grounds for opposition - added subject-matter (no) - insufficiency of disclosure (no) - lack of patentability (no)
Amendment after summons - exceptional circumstances (no)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

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

Case Number: T 2115/21 - 3.3.10

D E C I S I O N
of Technical Board of Appeal 3.3.10
of 11 June 2024

Appellant: (Patent Proprietor)	Lutonix, Inc. 9409 Science Center Drive New Hope, MN 55428 (US)
Representative:	Hoffmann Eitle Patent- und Rechtsanwälte PartmbB Arabellastraße 30 81925 München (DE)
Respondent: (Opponent)	MEDTRONIC INC. 710 Medtronic Parkway Minneapolis, MN 55432 (US)
Representative:	Zimmermann & Partner Patentanwälte mbB Postfach 330 920 80069 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 12 October 2021 revoking European patent No. 2550030 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	P. Gryczka
Members:	M. Kollmannsberger
	L. Basterreix

Summary of Facts and Submissions

I. The patent proprietor (appellant) appealed the Opposition Division's decision to revoke EP 2 550 030 under Articles 101(2) and 101(3)(b) EPC.

II. The patent had been opposed under Articles 100(a)(b)(c) EPC for lack of novelty (Article 54 EPC), lack of inventive step (Article 56 EPC), insufficient disclosure (Article 83 EPC) and unallowable amendments (Article 123(2) EPC).

In its decision the Opposition Division rejected the objections under Articles 100(b) and 100(c) EPC. However, it concluded that claim 1 of the granted patent lacked novelty over D1. The auxiliary requests pending before it either contravened Article 123(3) EPC, were not admitted under Rule 80 EPC or lacked an inventive step starting from D1. Thus, the patent was revoked.

III. Claim 1 of the granted patent reads as follows:

"A balloon catheter for delivering a therapeutic agent to a tissue, the balloon catheter comprising a layer overlying an exterior surface of the balloon catheter, the layer comprising a therapeutic agent, butylated hydroxyanisole ("BHA"), and an additive,
and wherein the additive comprises a hydrophilic part and a drug affinity part, wherein the drug affinity part is at least one of a hydrophobic part, a part that has an affinity to the therapeutic agent by hydrogen bonding, and a part that has an affinity to the

therapeutic agent by van der Waals interactions, wherein the additive is water-soluble, wherein the additive is at least one of a surfactant and a chemical compound, and wherein the chemical compound has one or more hydroxyl, amino, carbonyl, carboxyl, acid, amide or ester groups."

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

D1: AU 2009/201214

D2: US 2005/0037048

D3: WO 2009/051614

D9: Process Loss Study (1): IN.PACT Admiral Paclitaxel-Coated PTA Balloon Catheter US Process Loss Report, Medtronic, 16 pages

D10: Process Loss Study (2): S9 Resolute Process Loss, Medtronic, 24 pages

V. The appellant, in the statement setting out the grounds of appeal, contested the Opposition Division's conclusions on novelty over D1. Regarding inventive step of the granted claims it was argued that D3 should be seen as the closest prior art to the claimed invention. The claims were inventive over D3 due to the unexpectedly favourable stabilizing effect of the butylated hydroxyanisole ("BHA") on the therapeutic agent when sterilising the device. This effect was not disclosed in any of the cited prior art documents.

VI. The respondent (opponent), in its reply to the appellant's statement, maintained its objections under

Articles 100(b) and 100(c) EPC raised in opposition proceedings. It submitted that the Opposition Division was right to find the granted claims to lack novelty over D1. Regarding inventive step it considered that each of documents D1-D3 could be considered to represent the closest state of the art for the claimed balloon catheters and that the claims lacked an inventive step starting from either of these documents.

VII. The Board summoned the parties to oral proceedings to be held on 11 June 2024. In a communication under Article 15(1) RPBA the Board informed the parties of its preliminary opinion. According to the preliminary opinion of the Board the objections under Articles 100(b) and 100(c) EPC were unconvincing. The Board indicated that it may not follow the Opposition Division's conclusion on novelty over D1, and that it considered D3 to represent the closest prior art for the inventive step discussion of the granted claims.

VIII. On 10 June 2024 the respondent submitted a new line of argument regarding novelty over D1.

IX. Oral proceedings were held on 11 June 2024. All objections under Articles 100(a) and 100(b) EPC were discussed.

X. The final requests of the parties were the following:

The appellant requested the appealed decision to be set aside and the patent to be maintained as granted. As an auxiliary request the appellant requested the patent to

be maintained in amended form based on any of the auxiliary requests 1-17 filed together with the statement setting out the grounds of appeal.

The respondent requested the appeal to be dismissed.

XI. The decision was announced at the end of the oral proceedings.

Reasons for the Decision

1. The appeal is admissible.

The appellant's main request - granted patent

2. Amendments (Articles 100(c) and 123(2) EPC).

2.1 The respondent objected to the restriction of claim 1 to balloon catheters (from "*medical device*" in original claim 1) and BHA (from "*antioxidant*") in original claim 1). It was argued that this combination is only obtainable by selecting these two features from long lists. In this way a previously undisclosed combination would have been created.

2.2 However, this combination was already disclosed in the original application documents. BHA is mentioned as one of two preferred antioxidants in paragraph [0183]. Balloon catheters are the medical devices to which the original application relates "*in particular*", see paragraph [0002]. A combination of such preferred features does not generate originally undisclosed subject-matter and does thus not go beyond the original

disclosure. The Opposition Division's conclusion on added subject-matter is correct.

3. Sufficiency (Articles 100(b) and 83 EPC)

3.1 The respondent argued that a skilled person would not be in a position to find suitable combinations of therapeutic agents and "additives" as defined in claim 1, at least not so that the balloon catheter would be suitable for delivering a therapeutic agent to a tissue.

The Board does not agree.

The additives are defined in the claim as comprising a hydrophilic part and a drug affinity part. Such additives are described in paragraphs [0107] to [0150] of the description and may be chosen from a large variety of compounds. The examples disclose a selection of additives that may be used for different therapeutic agents.

The respondent pointed in particular to paragraphs [0018] and [0113] in the general part of the description. There it was mentioned that the additive should be selected so as to not contribute to the degradation of the active agent during heat, humidity and oxidizing conditions during sterilisation. Also paragraph [0145] explained that some of the surfactants used as additives may react with the drug under certain conditions. Paragraph [0150] stated that a combination of L-ascorbic acid and diethanol amine would react with paclitaxel and would thus be unsuitable as additives. This being an example of a non-working embodiment, a

skilled person would not know how to achieve tissue delivery in such a case.

However, the passages cited by the respondent contain instructions for a skilled person which combinations of active agents and additives may lead to problems and which won't. This provides help to the skilled person in selecting suitable combinations rather than the contrary. Even if some combinations may lead to unworkable embodiments this does not mean that the claimed balloons are generally insufficiently disclosed. Moreover, it has to be kept in mind that the patent is not about combining active agents and additives. This has already been done in the prior art, D3, in the same way; paragraph [0145] corresponds e. g. word-by-word to paragraph [0149] of D3. The patent's teaching is that if BHA is added to the layer containing the active agent and the additive it will be more resistant to sterilisation. No arguments have been brought forward why a skilled person should not be able to add BHA to a balloon catheter otherwise known e. g. from D3.

3.2 The respondent objected that a skilled person would be at loss how to obtain the functional feature "*delivering the therapeutic agent to the tissue in about 0,1 to 2 minutes*" defined in claim 7. In particular, indications as to which combinations of additives, therapeutic agents and BHA in which relative amounts are suitable to achieve this result were missing.

The Board does not consider this to be the case. It is clear that the release dynamics and the delivery may, among other things, depend on the active agent and on the components of the coating. However, there are no

technical arguments on file why a skilled person would not be able to achieve the release and delivery as defined in the claim. The respondent's submission does not go beyond mere allegation.

The Board also notes that claim 7 is a dependent claim. Thus, it covers some of the balloons defined in claim 1, i. e. the ones that achieve the release kinetics defined therein. That the kinetics may in principle be achieved by a selection of the balloons defined in claim 1 was not disputed. A skilled person does not need to find combinations of each and every possible active agent with additives for this purpose.

3.3 In summary, a skilled person is well in the position to prepare a catheter balloon as claimed.

4. Novelty (Articles 100(a) and 54 EPC)

4.1 The opposition decision discusses two novelty attacks, namely based on Experiment 5 of D1 (points 1.1.3 to 1.3.5) and based on a combination of claims 1 and 3 of D1 (points 1.3.6 to 1.3.16). While the Opposition Division dismissed the former, the latter was successful. Furthermore, on the day before the oral proceedings before the Board, the respondent submitted a further novelty objection, likewise based on example 5 of D1.

4.2 Novelty over claims 1 and 3 of D1

4.2.1 The appellant argued that this objection should not have been admitted into the opposition proceedings. It is argued that this specific objection was late filed, namely during oral proceedings before the Opposition

Division; previous objections allegedly related to other parts of D1. Moreover, the objection was not *prima facie* relevant.

4.2.2 However, the Board can see no error of discretion in the Opposition Division admitting the second novelty objection. The Opposition Division may, under Article 114(2) EPC, decide not to take late filed objections into account, however, it is not barred from admitting them either, in particular not if it considers them to be valid so that the outcome of the proceedings is changed. This was the case here. Whether the novelty assessment of the Opposition Division was correct in substance is object of the appeal proceedings.

4.2.3 In the Board's view D1 does not directly and unambiguously disclose all features of claim 1 in combination.

The novelty objection is based on claims 1 and 3, figures 111A and 111B with the respective description on page 29, Experiment 3 on page 247 and the list of antioxidants on page 248.

A combination of claims 1 and 3 may lead to a balloon coated with a solution containing rapamycin as therapeutic agent and vitamin E TPGS as additive. On the other hand, Experiments 3-5 and the reference to figures 111A/B described in this context relate to balloons coated with paclitaxel from a solution containing PEG 400 as additive, not vitamin E TPGS, as required by claim 1 of D1. Thus, these examples of D1 are not covered by claims 1 and 3 of D1. None of claims 1-3, Experiments 3-5 or figures 111A/B specifically relates to BHA, the antioxidant required by claim 1 of the patent. BHA is mentioned in a list of antioxidants

described in relation with Experiment 5 on page 248. The second paragraph on this page states that antioxidants are useful in particular for "implantable medical devices" containing rapamycin, but this paragraph neither specifically relates to balloon catheters nor is BHA used in any of the test protocols summarized in tables 17 to 23 depicted in following pages.

Thus, in order to arrive at subject-matter falling under claim 1 of the patent the features of this claim have to be assembled from different, not necessarily related, parts of D1.

4.2.4 The respondent submitted during oral proceedings that it was in fact enough to combine claims 1 and 3 with the general description on page 245, lines 14-16, to arrive at subject-matter falling into the claim. A combination of claims 1 and 3 disclosed a balloon catheter coated with rapamycin and vitamin E TGPS, i. e. an active agent and an additive. That the balloon may further be coated with BHA as an antioxidant was disclosed in the cited passage of the description.

The appellant argued that a combination of claims 1 and 3 did not necessarily define a balloon catheter, and that there was no specific disclosure of a balloon catheter in which the balloon was coated with an active agent, an additive and BHA.

The Board does not consider the cited passages of D1 to provide a direct and unambiguous disclosure of the claimed features in combination. Firstly, it is not clear whether a combination of claims 1 and 3 requires the coating to be on the surface of the balloon. Claim 3 requires that the expandable member "*includes a*

balloon". This definition may also relate to e. g. a drug coated stent pressed against the inner walls of a blood vessel by expanding a balloon which itself is uncoated, as depicted in figure 2. The respondent argued that it could be inferred from the structure of the claims that claim 3 defined in fact a balloon catheter, since it was claim 2 which related to a stent. However, even if this appears possible, it is not an unambiguous disclosure. Secondly, the passage cited on page 245, lines 14-16 defines "*other excipients that may be used in creating a liquid formulation and coating of a medical device*", among which BHA is mentioned. As outlined above, this passage does not specifically relate to balloon catheters. When read together with the previous paragraph likewise defining excipients it is not even clear whether the excipients of the cited passage are meant to be used in addition, or alternatively to the ones defined before.

4.3 Novelty over example 5 of D1

4.3.1 The Opposition Division considered claim 1 of the patent novel over Experiment 5 of D1 because the relevant solution used to coat the balloon, which is solution 4 in table 15 on page 242, contained paclitaxel and PEG 400 only, but no Vitamin E TGPS, being a surfactant and thus corresponding to the additive in claim 1. Since PEG 400 was not a surfactant, the claim was novel over this example. This conclusion was not contested in the respondent's initial submission in appeal.

4.3.2 On 10 June 2024, i. e. one day before the date of the oral proceedings, the respondent submitted that although PEG 400 may not be a surfactant, it was nevertheless an additive in the sense of claim 1. This

argument was based on paragraph [0071] of the patent, where the term "*poly(ethylene glycol) oligomers*" is part of a list of suitable additives. A similar disclosure could be found in claim 11 as originally filed.

4.3.3 According to Article 12(2) RPBA a parties appeal shall be directed to the "*requests, facts, objections, arguments and evidence on which the decision under appeal was based*". It was undisputed that this objection was not raised in opposition proceedings and corresponds thus to an amendment of the respondent's appeal case. Under Article 13(2) RPBA, at the time it was made, this amendment shall in principle not be taken into account unless there are "*exceptional circumstances, justified by cogent reasons*", by the party concerned.

4.3.4 The respondent submitted that it was unfortunate that they discovered these facts only when preparing the oral proceedings. However, since the objection was *prima facie* highly relevant, it should be nevertheless admitted.

4.3.5 The appellant argued that discovering an objection only when preparing the oral proceedings was clearly not an exceptional circumstance covered by Article 13(2) RPBA. Moreover, the objection was also not convincing in substance.

4.3.6 Late preparation of a case by a party does not fall under the exceptional circumstances covered by Article 13(2) RPBA. This is not an unforeseeable situation. The new objection is neither a reaction to developments in the appeal proceedings or is based e. g. on evidence that, for whatever reason, may have been unavailable

before. Thus, this new objection is not admitted into the appeal proceedings under Article 13(2) RPBA.

4.3.7 The respondent argued that a relevant novelty objection should always be admitted in order to not unjustly maintain invalid patents. In the Board's view such an automatism is not derivable from the EPC. Article 114(2) EPC explicitly foresees that late filed facts or evidence may be left aside, and the Rules of Procedure of the Boards of Appeal implement this provision in Articles 12 and 13 as regards appeal proceedings. In any case the Board follows the appellant in that it does not consider the objection to be *prima facie* relevant. From the description of Experiment 5 on page 248 it is not even clear whether any balloon has been coated with BHA, and if yes, which one.

4.4 Thus, the granted patent claims are novel over the disclosure of D1.

5. Inventive step (Articles 100(a) and 56 EPC)

5.1 Closest state of the art

5.1.1 The patent claims are directed to balloon catheters for delivering a therapeutic agent to a tissue. The balloons are coated with the therapeutic agent, an additive and butylated hydroxyanisole (BHA). The problem the patent tries to solve is to stabilize the active agent against oxidation and hydrolysis especially during sterilisation and device storage prior to use, see par. [0018].

D1 deals with coated stents and other drug delivery devices, such as balloons. D1 is concerned with drug/

drug combinations and their targeted delivery for the prevention or treatment of vascular injury, thrombosis or restenosis. The focus lies on delivery of the drugs, elution rates etc., see page 7 line 12 to page 15 line 20. D1 does address storage stability in the experimental part, see e. g. page 181 lines 8-10, but does not deal with the behaviour of the devices during sterilisation.

D2 deals with stabilisation of therapeutic agents used in coatings of medical devices against oxidation by means of addition of an antioxidant. Balloon catheters are mentioned in paragraph [0020] in a rather exhaustive list of implantable or insertable medical devices. D2 does not mention sterilisation processes at all.

D3 deals with coated balloon catheters. The coating contains in particular a therapeutic agent and an additive defined in the same way than in the disputed patent. Also the examples of D3 are directed to coated balloon catheters. The idea of D3 is to improve the drug release and uptake by means of the additive, see paragraph [0019]. Problems with some of the combinations upon sterilisation of the device are mentioned e. g. in paragraphs [0153] and [0181].

5.1.2 The Board considers D3 to represent the closest prior art, since it is mainly focused on balloon catheters and additionally refers to sterilisation processes and the problems that some of the additives or surfactants may encounter. Also the coated balloon catheters of the examples of D3 undergo a sterilisation process.

D1 is not concerned with the stability of active agents or additives during sterilisation processes. In any

case, since the differentiating feature is the same, the result of a problem solution approach starting from D1 must be the same as when starting from D3. This is also the respondent's own position stated in its reply to the appellant's grounds of appeal, see page 11 there.

D2 discusses stabilization of active agents against oxidative degradation during shelf life, but does not mention sterilisation processes. Moreover, D2 does not primarily deal with balloon catheters. D2 does not contain a single example directed to a drug coated balloon catheter. A skilled person, trying to prevent drug degradation upon sterilisation of balloon catheters would have had no reason to start from a document such as D2.

5.1.3 It is undisputed that the claims of the patent differ from the disclosure of D3 in that the coating contains BHA as an antioxidant. The coating used in D3 contains a drug and an additive, but no antioxidants.

5.2 Technical problem and its solution

5.2.1 A stabilizing effect of BHA is described in example B of the patent. This example shows BHA to be more effective in stabilizing rapamycin upon sterilisation of a coated balloon catheter than BHT (butylated hydroxytoluene); leaving out the antioxidants leads to an even worse result.

5.2.2 Thus, starting from D3, the appellant defined the objective technical problem to be solved as the provision of drug-coated balloon catheters that can better withstand the harsh sterilisation procedures. This problem was, in its view, solved by the claimed

balloon catheters which are characterized by the presence of BHA in the coating layer.

5.2.3 The respondent disputed that the addition of BHA had any specific technical effect. At least no such effect was established over the scope of claim 1.

The respondent submitted that the single test made in example B of the patent was not suitable to support the alleged effect for the scope of claim 1, i. e. for all kinds of active agents and additives. It was also submitted that experimental details were missing and that a recovery rate of 100%, as reported there, for the composition containing BHA, was unrealistic.

The respondent moreover pointed to documents D9 and D10. Both documents showed that BHA was not needed, or was not leading to any particularly favourable results. From the study carried out on a balloon catheter in D9 it concluded that paclitaxel, an active agent frequently used in coatings of medical devices, did not degrade upon sterilisation of medical devices. D10 relates to the investigation of coronary stents. The study reported there concluded that the therapeutic agent in the coating, zotarolimus, may be protected from oxidation during sterilisation by the use of BHT. The choice of BHA in the claims was thus arbitrary.

5.2.4 The Board considers the stabilizing effect of BHA on rapamycin under sterilisation conditions to be proven and also to be representative for the claim of the granted patent.

Example B of the patent describes such an effect. It is correct that this example does not specify all experimental details, e. g. the sterilisation

conditions. However, the respondent did not submit any data or convincing technical explanation why the choice of experimental details would change the outcome of the experiment. From the data on file it can only be concluded that BHA stabilizes rapamycin in a balloon coating upon sterilisation, and it does so to a higher extent than BHT.

The Board also considers that, in the absence of any counter-evidence, such a conclusion may be generalized to claim 1 of the patent. The respondent argued that for different therapeutic agents no such effect may occur, or that it may occur to a lesser extent. However, there is no data or convincing technical explanation on file why the conclusions drawn from example B of the patent, i. e. that BHA provides a stabilizing effect and that the effect provided by BHA is more pronounced than the one provided by BHT, would not apply when using different therapeutic agents or additives as well.

The respondent pointed to the results of the process loss studies reported in D9 and D10.

The study in D9 investigates a balloon catheter coated with paclitaxel and an additive, urea. The study shows that under the conditions chosen, paclitaxel does not degrade during ethylene oxide sterilisation. The Board does not dispute that sterilisation conditions may be found under which a therapeutic agent does not degrade. This is the very goal of D9, since the balloons of D9 do not include any antioxidant in the coating. However, the results of D9 do not contradict the conclusions drawn from example B of the patent. The results in D9 do not show that under conditions where paclitaxel would degrade, BHA would not provide a remedy or that

its stabilizing effect would not be better than when using BHT.

D10 shows that BHT is able to stabilize a therapeutic agent, zotarolimus, against oxidative degradation during sterilisation of a coronary stent coated with it. The Board has no reason to doubt these results. However, this does not allow to draw any conclusions about the relative efficacy of BHA with respect to BHT, as in example B of the patent.

5.2.5 Thus, starting from D3 the problem to be solved was the provision of drug-coated balloon catheters that can better withstand the harsh sterilisation procedures. This problem is solved by the claimed balloon catheters which are characterized by the presence of BHA in the coating layer.

5.3 Obviousness of the claimed solution

D3 itself does not contain any teaching relating to the degradation of the therapeutic agent. D1 discloses the use of antioxidants for increasing the shelf life of the coated device, see e. g. page 113 lines 17-21. D1 also includes experiments testing various antioxidants for their ability to prevent degradation of the drug, see pages 248-259. However, this drug degradation is not related to a sterilisation process during manufacture of the device. Also D2 discloses the use of antioxidants to increase the shelf life of coated devices, but does not mention sterilisation processes.

Thus, a skilled person, starting from D3, would not have found any hint in D1-D3 that the use of BHA would

be particularly useful in preventing drug degradation upon sterilisation of coated balloon catheters.

5.4 Even the respondent did not argue that the addition of BHA in order to improve drug stability during sterilisation was rendered obvious by the cited documents. The respondent's main arguments were that (i) BHA did not in fact achieve such an effect and that (ii) D2 and (iii) D3 were equally valid starting points for carrying out a problem solution approach. These arguments have been addressed above.

5.5 In summary, the claimed balloon catheters are not obviously derivable from the cited prior art.

6. Since none of the grounds of opposition invoked under Articles 100(a), 100(b) and 100(c) EPC prejudices the maintenance of the patent as granted, the opposition against it is to be rejected, Article 101(2) EPC.

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The patent is maintained as granted.

The Registrar: The Chairman:

C. Rodríguez Rodríguez P. Gryczka

Decision electronically authenticated