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EPI WEBINAR

e-Mock EQE paper A

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Overview

PART 1

- Paper A solution strategy
- Drafting main claims
- Drafting dependent claims

PART 2

- Requirements for introductory part
- Drafting the introductory part

Basic aspects

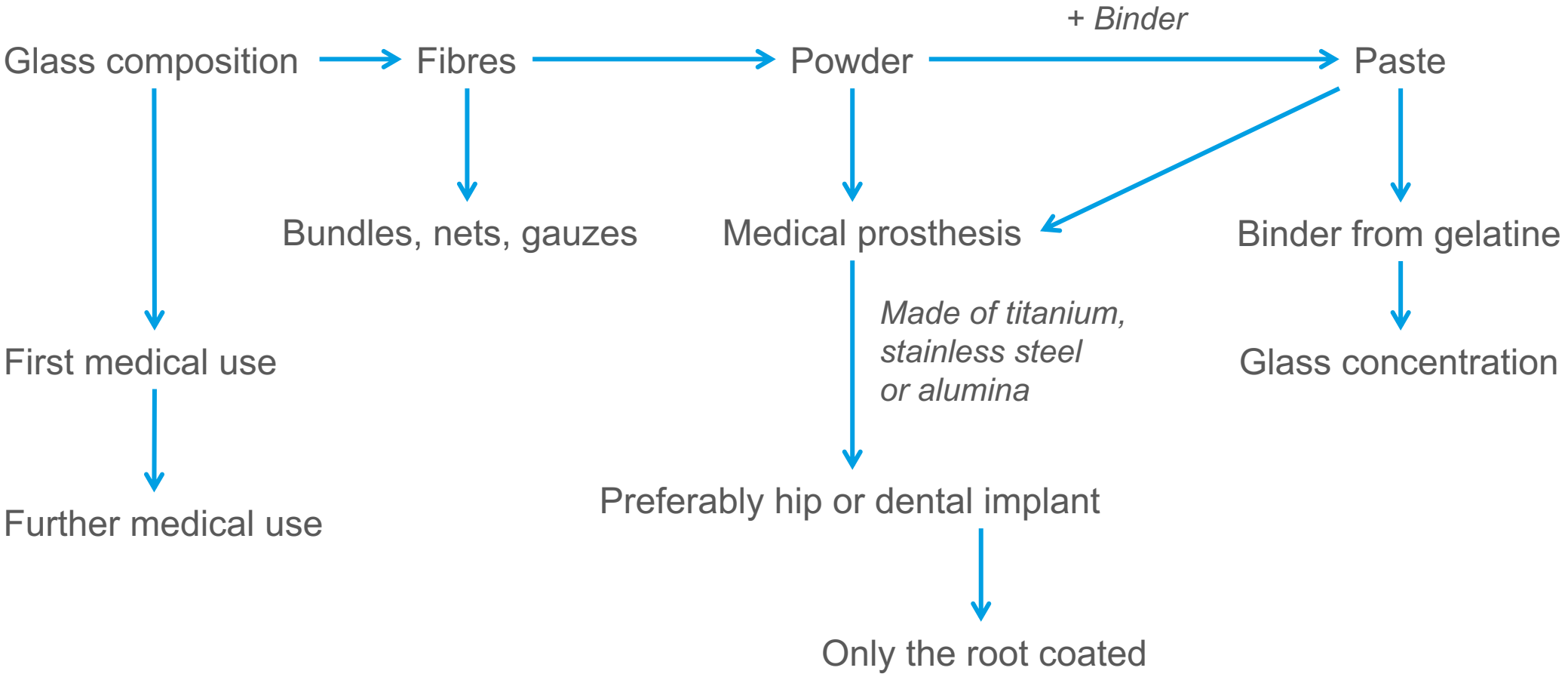
- **Start from the main claims**:
  - What should be claimed?
  - Find all essential features
  - Take client comments into consideration
  - Check prior art
  - Decide the type of claim (product, method, product by method…)
  - Respect patent vocabulary (i.e. “consisting of” vs “comprising”)
  - Check ranges, compositions and other potential traps

- **Observations** :
  - Observe tables and figures in examples
  - Spot effects
  - Spot guiding words “essential”, “preferred” …)

Client requirements

- *"However, we would nevertheless like you to draft claims in such a way that such products will also be covered".*
- *"Please note that for financial reasons we will not pay any claim fees for this patent application." so no more than 15 claims."*
- *"Please make sure that all our products are protected, as well as methods of treatment (therapy), in particular methods of regenerating bone tissue, using our compositions."*

Schematic representation of the claims



Claim 1 logic:

- The composition of prior art is the same with D1.
- The composition of the client's invention is disclosed in D2. So the glass composition of the client is not novel since it is disclosed in D2.
- A product by method is not possible.
- The difference with D1 is the composition. The difference with D2 is that in D2 the glass composition is disclosed while the client's invention refers to glass fibres. So we need to claim glass fibres with the D2 composition.
- We could include the term bioactive glass fibres. It is not limiting but it means suitable for bioreactive applications. Due to the request from the client in [02] "*However, we would nevertheless like you to draft claims in such a way that such products will also be covered*", the invention could be claiming "glass fibre".

Claim 1 logic:

- Looking for “essential” elements to achieve the object of the invention we find in [019] “The small diameter of the filaments or fibres of below 50 µm is **essential** to ensure that they are completely absorbed” so this feature should be included in the claim.
- The glass fibre composition is different of the prior art in [012] by using potassium oxide instead of sodium. How much?
- [013] …potassium oxide **is used instead** of some of the sodium oxide, the glass can be kept in an amorphous…., [014] The presence of potassium oxide in a bioactive glass is beneficial for the bioactivity, [015]…one cannot continue to increase the potassium oxide concentration, because increasing the amount of potassium oxide over 9 % by weight …, [017] In order to be able to draw fibres from the composition, the composition needs between 2 and 9 wt.% of potassium oxide” so this range is **essential and must be included**.
- So if potassium oxide 2-9wt% replacing part of the sodium oxide up to 30%, the sodium oxide is up to 28wt%.

→ Claim 1

Glass fibre, the fibre having a diameter of less than 50 µm and comprising the following components:

sand 40 – 55 wt.%
phosphorus oxide 4-8 wt.%
quicklime 10-40 wt%
sodium oxide up to 28 wt%
potassium oxide 2-9 wt.%.

Alternatively (even better):
sodium oxide and potassium oxide up to 30 wt.%, with potassium oxide in total 2-9 wt.%.

Claim 2

Claim 2 logic:

The use of boron oxide has an advantageous effect [030] "*The presence of boron oxide widens the temperature range within which the composition can be drawn into fibres without becoming crystalline to between 800°C and 1050°C. Boron oxide is useful* ***in amount of 2 to 7 weight percent****.*" However, it is not essential to enter in claim 1.

Therefore, a **dependent** claim:

→ **Claim 2:**
Fibre according to claim 1 which also contains boron oxide
in an amount of 2-7 wt.%.

Claim 3

Claim 3 logic:

We need to claim different forms of the glass fibres: [018] "*A **bundle of fibres of the described composition can be used as an implant** …., the mechanical strength of the bone is much higher than in the prior art", [020] "The fabrics, particularly the nets and gauzes, produced from the glass fibres of the invention,…. but enable the growth of bone in several preferred directions*"

→ Claim 3:

Fibre bundle, net or gauze consisting of the fibres according to claim 1

It is preferred to protect a product than its use.

Claim 4

Claim 4 logic: We need to claim the powder made from the glass fibres: [016] *"…. Furthermore, powders can be made by cutting the fibres into lengths* ***of at most 100 µm****. At present, it is not technically possible to cut fibres to a length shorter than* ***10 µm****…", [019] "The small diameter of the filaments or fibres of below 50 µm is essential to ensure that they are completely absorbed….", [022] "Preferably, a powder made from the glass composition according to the invention is intended to be applied as a coating to a permanent prosthesis…be very uniform. This results in much better anchorage to the surrounding bone*".

It is better defined by a product by process because it is characterized better by the production method.

→ Claim 4:
Powder obtainable by chopping the fibres of claim 1 into a length of 10-100 µm.

The lower limitation is not necessary.

Alternatively: defining the powder as having particles with diameter of up to 50 µm and length of 10-100 µm

Claim 5

Claim 5 logic:

We need to protect the paste which is applied on the bones: [021] *"A particulate product obtained by cutting the fibres and optionally made into **a paste with a binder**…., As the powder is made of uniformly sized small particles, it degrades and is completely replaced by bone tissue over a period of time"*

The client's description guides to a product with an effect.

→ Claim 5:
Paste containing the powder of claim 4 and a binder.

Claim 6

Claim 6 logic: We need a dependent claim as a fallback position for the paste.

[021] A **particulate** product obtained by cutting the fibres and **optionally** made into a paste with a binder, can be implanted using known techniques. ….. A suitable binder may preferably be formed by a **solution of gelatine in water**, ….. The paste is made by adding the bioactive glass to this solution of gelatine in water. Gelatine must be used in a **concentration of 0.5 g/ml** water to **2.0 g/ml** water.

The client's description guides to a product with an effect.
"As the powder is made of uniformly sized small particles, it degrades and is completely replaced by bone tissue over a period of time".

→ Claim 6:
Paste according to claim 5 wherein the binder is gelatine dissolved in water at a concentration of 0.5 to 2.0 g/ml water.

Claim 7

Claim 7 logic:

A further dependent claim can be added for the paste based on the previous claim.

[021] „*The paste is made by adding the bioactive glass to this solution of gelatine in water. Gelatine must be used in a concentration of 0.5 g/ml water to 2.0 g/ml water. To 1 g of such a solution about 1 g of bioactive glass is usually added, but this can be varied slightly dependent on the use. Bioactive glass can be added in* ***amounts of 0.5 to 1.5 g*** *per gram of gelatine solution.*“

→ Claim 7:

Paste according to claim 6 wherein the glass is used at a concentration of 0.5 to 1.5 g/l of the gelatine solution.

Claim 8

Claim 8 logic:

[022] *"Preferably, a powder made from the glass composition according to the invention is intended to* ***be applied as a coating to a permanent prosthesis****…."*

This defines a product which is a medical prosthesis coated with the powder of the invention.

→ Claim 8:
Medical prosthesis coated with a powder as defined in claim 4.

Claim 9

Claim 9 logic:
In the client's description two specific applications for medical prosthesis are presented as examples.

[022] *"Preferably, a powder made from the glass composition according to the invention is intended to be applied as a coating to a permanent prosthesis. (…) For example,* ***a hip prosthesis*** *made of titanium is coated with the glass composition. (…) This results in much better anchorage to the surrounding bone."*

[023] *"The composition can also be used to make* ***implants for dental surgery****…"*

→ Claim 9:
Medical prosthesis according to claim 8 characterised in that
the prosthesis is a dental implant or hip implant.

"Hip prosthesis" could be an alternative to "hip implant" in the claim.

Claim 10

Claim 10 logic:

In the client's description a dental application is to coat the root of a dental implant.

[022] *"A very useful dental application is to **coat the root** of a dental implant with the composition."* So this guides to a claim dependent on claim 9.

→ Claim 10:

Medical prosthesis according to claim 9 in which the dental implant is coated at its root only.

Claim 11

Claim 11 logic:

A dependent claim based on the material of the prosthesis is a proposed fallback position.

[004] „*It is well known* ***that stainless steel, titanium and alumina are used for prostheses*** *or for the attachment of prostheses to the bone. These materials do not achieve bone bonding and are, therefore, prone to infection. These materials are also known as bio-inert materials*“

→ Claim 11:
Medical prosthesis according to claims 8 or 9 in which
the prosthesis is made of titanium, stainless steel or alumina.

Claim 12

Claim 12 logic:

Since the client wants protection for all the methods, we have to protect the application of the powder to the prosthesis.

[022] *"Preferably, a powder made from the glass composition according to the invention is intended to be applied as a coating to a permanent prosthesis. Such a coating can, for example, be applied by plasma spraying, or alternatively, by applying the paste described above. (…)"*

→ Claim 12:

Process for making a prosthesis according to claim 8 comprising coating a paste as defined in claim 5 or plasma spraying a powder as defined in claim 4 onto a prosthesis.

Claim 13

Claim 13 logic: The client requests protection for methods of treatment. The claims must be formulated in line with Art. 54(4) EPC and Art. 54(5) EPC!

We need an independent claim directed to a substance for use in a first medical indication. We don't need the fibres because this composition was not disclosed in D2 for use in medicine.

→Claim 13:

Glass composition comprising the following components:

sand 40 – 55 wt.%
phosphorus oxide 4-8 wt.%
quicklime 10-40 wt%
sodium oxide up to 28 wt%
potassium oxide 2-9 wt.%

for use in medicine.

Claim 14

Claim 14 logic:

We need an independent claim directed to a substance for use in a second or further medical indication. We don't need again the fibres because this composition was not disclosed in D2 for use in medicine.

→ Claim 14:

Glass composition comprising the following components:

sand 40 – 55 wt.%
phosphorus oxide 4-8 wt.%
quicklime 10-40 wt%
sodium oxide up to 28 wt%
potassium oxide 2-9 wt.%
for use in a method of regenerating bone tissue.

Introduction

It is the part of the description before the examples and the description/explanation of the drawings.

- Keep it short and to the point
- Adopt a good structure
- Follow provisions of R42(1) EPC
- Include parts of the paper and of the prior art documents
- Respect and use the vocabulary of the paper
- Formulate it during the second study of the paper and after the identification of the main claims

How to write the introduction

- **Specify the technical field to which the invention belongs based on claim categories**:

  The present invention relates to bioactive glass compositions and their fibres that are very good for in vivo creation of bones, i.e. the generation of bone tissue in the body.

- **Acknowledge the prior art in the client's letter so the invention to be understandable. Indicate the problems, the prior art solves and the weak points they have**
  - *Include parts of the paragraphs [004]-[010]*
  - *Acknowledgment of D1 so " Document D1 discloses that……"*
  - *Acknowledgment of D2 so " Document D2 discloses that……"*

How to write the introduction

Document D1 discloses

- bioactive glass compositions used for bone treatment. Prosthesis coated with bioactive glass are less rejected by the body.
- Paste for prosthesis coatings made from bioactive glass powder using gelatine
- Use of the bioactive glass coatings for hip prosthesis and for medical implants.

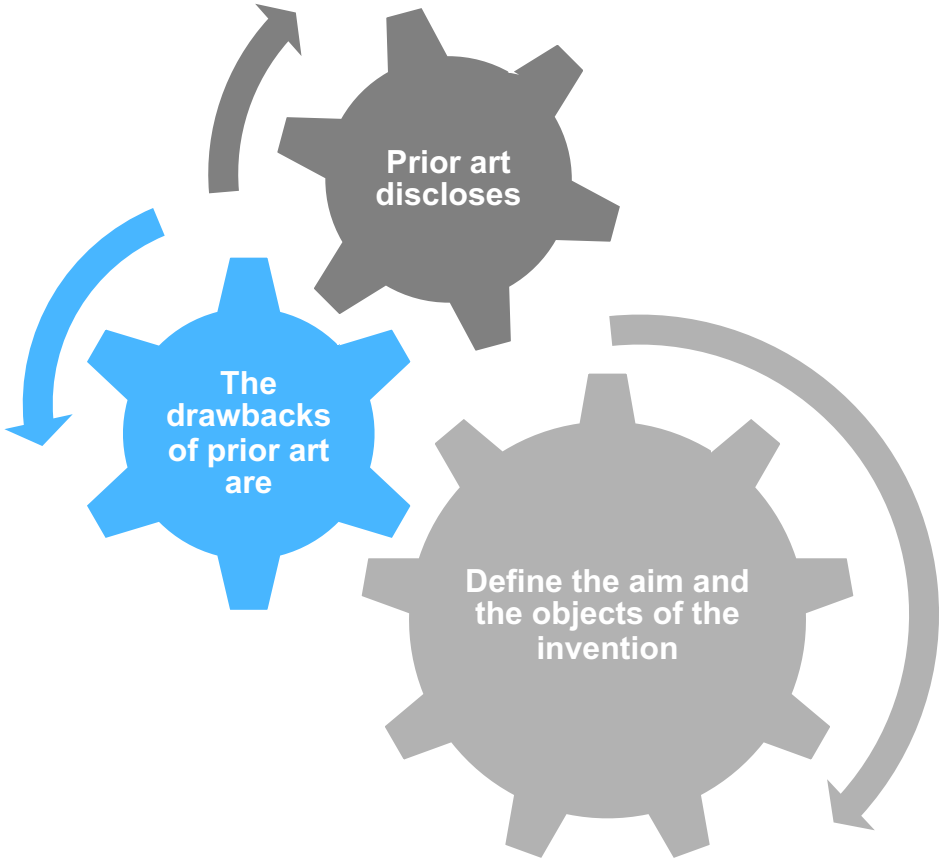
D1 doesn't disclose glass compositions comprising potassium oxide.

Document D2 discloses

glass compositions comprising both sodium oxide and potassium oxide but no use of them is indicated

How to write the introduction

- We need to develop the **objective technical problem**
- **D1 is closest prior art** because it refers to the same purpose of bioactive glasses for medical uses. D2 refers to glass compositions, but does not offer any use directed to the same purpose as the invention.
- **D1 has the drawback that** the particles of the powder are far from uniform in size and some are too large. The largest particles are not absorbed or degraded during the ossification process resulting in weaker bones with higher fracture risk **(from [008], [009], [010], [035], [038], [039] of the client letter)**



How to write the introduction

Define the aim of the invention.

The aim of the objection is to improve absorbability of glass components and to provide homogeneity in the bone regeneration during the ossification process and so to reduce the chance that the implant will be lost by the patient.

The aim is achieved by replacing part of sodium oxide by potassium oxide which results in improvement of bioactivity and in an amorphous character of fibres facilitating their uptake by the body.

One object of the invention are the glass fibres of claim 1.

How to write the introduction

Provision of the solution with reference to independent product claims and underlying effects according to the client's letter.

"The technical problem solved by the invention vis-a-vis D1 is to improve absorbability of glass components and to provide homogeneity in the bone regeneration by using bioactive glass compositions with the composition according to claim1."

How to write the introduction

We make reference to the other independent claims

"Another object of the invention is to further provide medical prosthesis coated with powder of the disclosed glass composition according to claim 8 and indication of first and second medical use according to claims 13 and 14…"

Marking Summary

Independent claims	
Glass fibre	*25*
Derived products	*29*
Process	*6*
Medical uses	*10*
Dependent claims	15
Description	15
Total	**100**

Thank you
for your attention!