

THE PATENT, A TOOL AT THE SERVICE OF INNOVATION

Enrico Priori

Industrial Property Attorney

European Patent Attorney

enrico.priori@atoutpi-laplace.com

Cécile Joubert

Industrial Property Attorney)

European Patent Attorney

cecile.joubert@atoutpi-laplace.com

Let me introduce myself



Enrico Priori, PhD

- Electrical Engineer – PoliMi & ECP (1999)
- PhD, Ultrafast optics (PoliMi 2003)
- Patent Law Diploma (CEIPI, Strasbourg University 2005)
- European Patent Attorney 2006
- French Patent Attorney 2009

Managing partner of Atout PI Laplace (Groupe Vidon) – formerly Marks & Clerk France

- 21 (40) patent engineers
- 4 (19) TM lawyers
- 48 (117) total staff

We have handled quantum technology patent cases for **CNRS**, **CEA**, **INRIA**, **THALES** (QKD, quantum networks, spin qubits, superconductor qubits, single photon / entangled photon pairs sources, superconducting parametric amplifiers...)

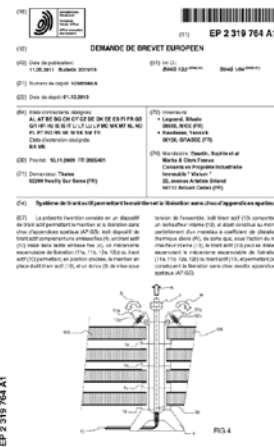
THE MULTIPLE DIMENSIONS OF A PATENT

A legal document,
with a legal
purpose
(confer a right)



Obtaining of the right
Exploitation of the right

Patent



A technical document with a
technical content
(description of the invention)



Technical content

A hybrid document

Claims
Criteria for patentability

DEFINITION OF A PATENT

GENERAL DEFINITION OF A PATENT

An exclusive right granted by (or on behalf of) a state to an inventor or their successor in title for a limited time in exchange for the disclosure of the invention

AN EXCLUSIVE RIGHT

A patent confers on its proprietor:

- A **right to prohibit** anyone else from reproducing the invention without its agreement i.e. a right to exclude others
- Acts prohibited: the manufacture, use, sale, offering for sale, or import ...
 - ❖ Exceptions: for experimental purposes;
 prior personal possession



It does not amount to a right to exploit the invention that is the subject of the invention

E.g: Existence of a dominant patent

Invention = improvement of an already patented invention

GRANTED

- The grant is the culmination of a series of acts and steps :
 - ❖ Filing of a patent application
 - ❖ Procedure – Examination of the patent application
 - ❖ Grant of the patent
 - ❖ Post-grant procedures

Different from copyright: right comes into being upon the creation of the protected work

BY A STATE

- There is no worldwide patent
- National patents: right limited to a given country
- Regional patents:
 - ❖ European Patent Convention:
 - Centralised filing and examination but...
 - After grant, conversion into separate, independent national rights
 - ❖ **Coming soon: the UNITARY PATENT** - 1st June 2023
- “International” applications: PCT

TO an INVENTOR or their successor in title

- INVENTOR

≠ Author of a scientific paper

- SUCCESSOR IN TITLE:

- ❖ Assignee

Assignment: - of a patent application that has already been filed
- of the right to file a patent application

- ❖ Heir

- ❖ Employer of the inventor

FOR A LIMITED TIME

- Term: 20 years from the date of filing of the patent application
 - ❖ subject to payment of (annual) renewal fees
- Additional period for drugs

IN EXCHANGE FOR THE DISCLOSURE OF THE INVENTION

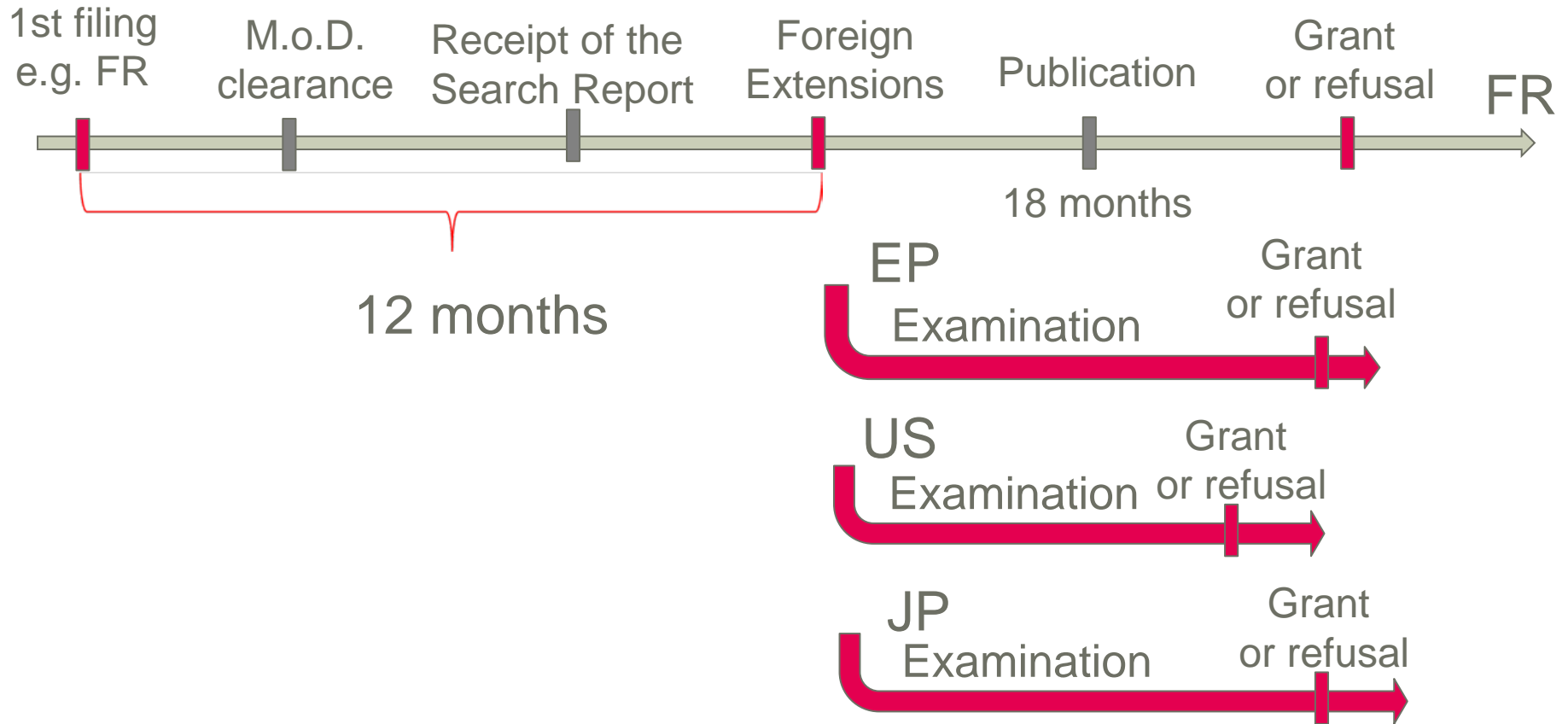
- Publication of the patent application 18 months after the date of filing
 - ❖ Databases accessible on the web, e.g. espacenet
- The invention shall be disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art
 - ❖ Average level of skill

OBTAINING THE RIGHT - PROCEDURE

OBTAINING THE RIGHT - PROCEDURE

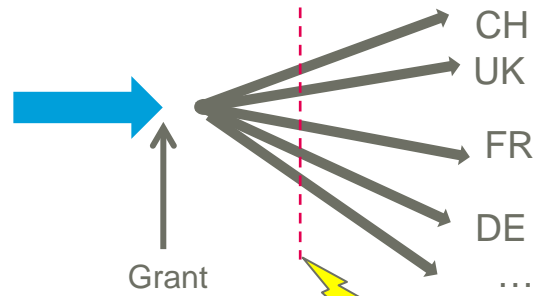
- Filing: National IP Office or EPO → attribution of a filing date
- Formal examination
- Search: identification of relevant documents
- Publication: patent application + search report
- Examination: is the invention described in the patent application patentable? (criteria)
 - ❖ Notifications – written responses
 - ❖ Oral proceedings
- Grant or refusal
 - ❖ Appeal

OBTAINING THE RIGHT – MECHANISM OF THE RIGHT OF PRIORITY



OBTAINING THE RIGHT – European Patents & Unitary EP

The “classical” EP: a multiple-warhead rocket



Grant

Opposition

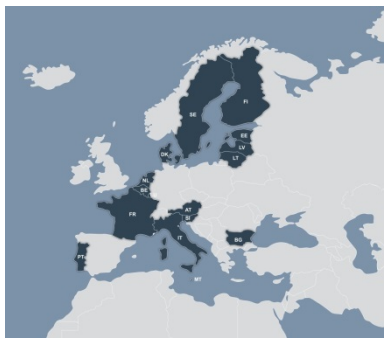
The UNITARY EP



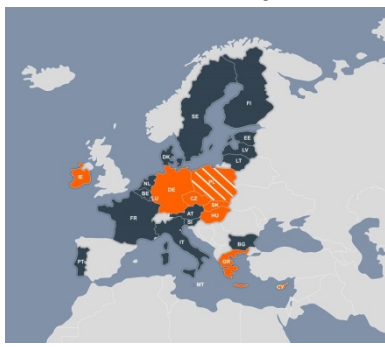
Grant

Opposition

Today: 16 countries



... Tomorrow: up to 24



OBTAINING THE RIGHT – PCT INTERNATIONAL APPLICATION

1st filing
 e.g. FR

PCT filing

Grant
 or refusal

FR

12 months

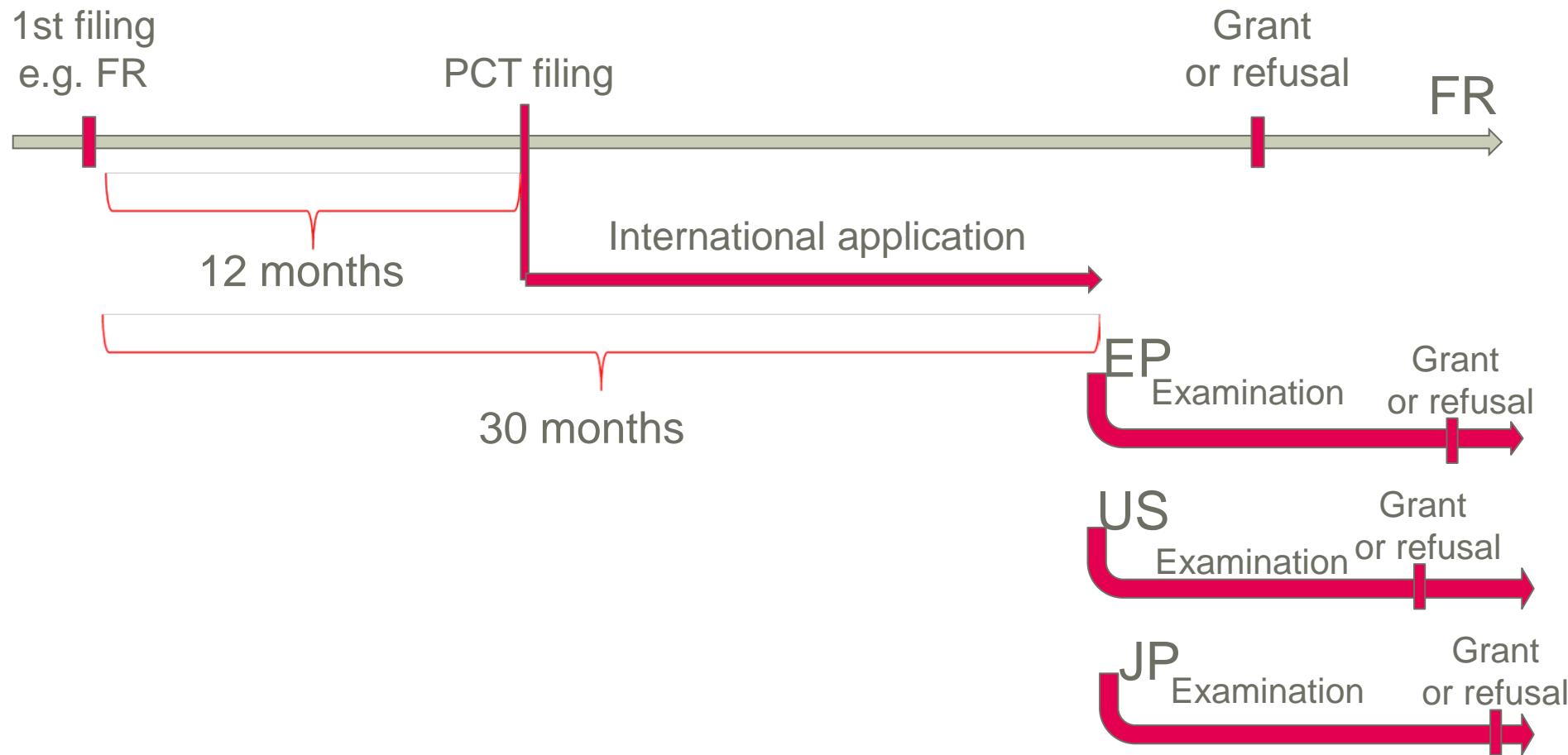
International application

30 months

EP
 Examination Grant
 or refusal

US
 Examination Grant
 or refusal

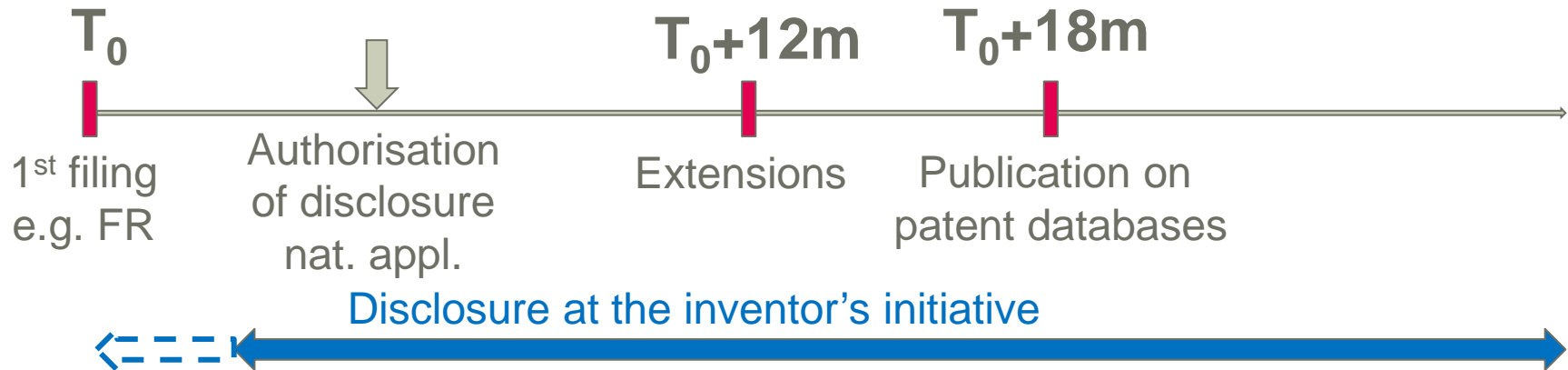
JP
 Examination Grant
 or refusal



PATENT AND PUBLISH: yes, it's possible 😊

• 1 File a patent application

- 1 to 2 months
- Draft an invention description
 - Discussion with the patent attorney
 - Drafting of the application by the patent attorney
 - Filing of the application: **T₀ filing date**



• 2 Publish: after the date T_0

PATENT AND PUBLISH: pitfalls ☹️

- No grace period in Europe!
 - Unlike US, JP...
- **Provisional applications: DANGER!**
- Publication before extension may block you from broadening the scope of the protection
 - **1st Filing:** readout method for trapped ions qubits
 - **Publication:** readout method for trapped ions qubits
 - **Extension:** r.-o. method for trapped ion or neutral atoms qubits → priority partly invalid, publication is prior art for neutral atoms

EXPLOITATION OF THE RIGHT

EXPLOITATION OF THE RIGHT– Defending your patent right

- **Infringement** is the exploitation of a third party’s patent without their authorisation
- To protect yourself against this: **action before the courts**
 - ❖ **Proprietor**: can act before the *Tribunal Judiciaire* (First-Instance Court) of Paris **or the new Unified Patent Court** (from 1st June 2023) – for EP
 - ❖ **Alleged infringer**: invalidity counterclaim
- **Sanctions** for infringement
 - ❖ Injunction (Prohibition on continuing the infringement)
 - ❖ Payment of damages to compensate for the loss suffered
 - ❖ Confiscation of the articles found to be infringing

EXPLOITATION OF THE RIGHT – A patent for what purpose?

- **EXPLOIT IT YOURSELF**

Guarantee yourself a monopoly status

- **HAVE IT EXPLOITED BY OTHERS**

Develop a licence policy: “lend” your patent

- **FACILITATE TECHNICAL COLLABORATIONS**

Enter into Consortium Agreements

- **RAISE FUNDS in the context of startup creation**

- **COMMUNICATE**

EXPLOITATION OF THE RIGHT – Patent strategies

- **Do you really want to patent it?**
 - Differentiating factor?
 - Detectable?
 - Easy to design around?
 - Do you want to assert your presence in the market?
 - “Balance of terror”?
 - Cross-licensing agreements (with competitors)?
 - Generate revenue by way of royalties

- **Where do you want to patent it?**
 - Competitors (manufacturing)
 - Targeted markets (sales)
 - Unitary patent? Pros & Cons
 - PCT, to “buy” time

- **BUDGET: lifetime cost of a patent (renewal fees)**
 - Advantages and drawbacks of unitary patent (great geographic scope / cost ratio, but loss of flexibility)

CONTENT OF A PATENT APPLICATION

CONTENT OF A PATENT APPLICATION

- **A description of the invention**

- ❖ The prior art
- ❖ The problem set
- ❖ The solution: the invention

Detailed description of the invention with at least one embodiment and figures

The advantages of the invention

- **The claims**

- ❖ Define the extent of the protection
- ❖ Listing of the essential features of the invention
- ❖ Numbered and linked to each other; claim 1 is the most general

THE CLAIMS

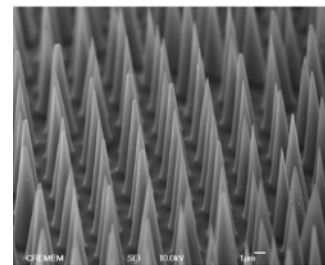
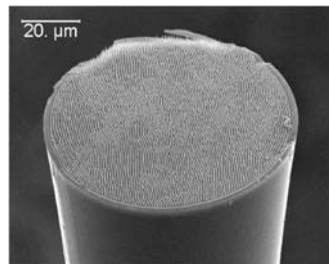
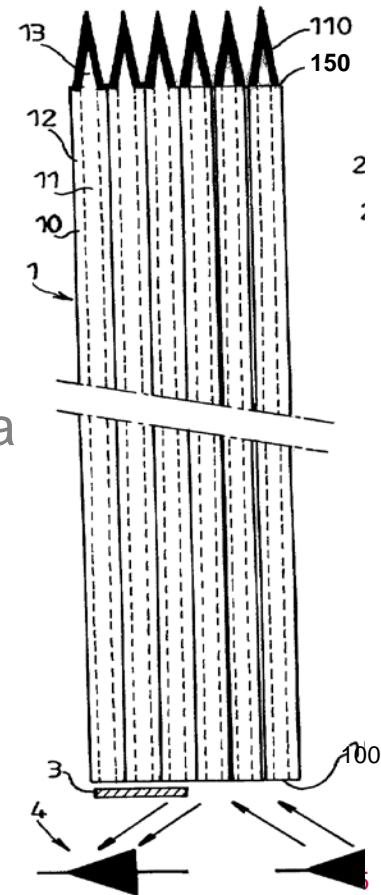
- It is not a **Result** that is claimed but rather the **Technical Means** for obtaining it

- Two types of claims:
 - ❖ Device/system/product
 - ❖ elements constituting the device **and their interaction**

 - ❖ Method/process
 - ❖ steps (actions) of the method

CLAIMS – DEVICE example

1. Surface-enhanced Raman spectroscopy imaging device comprising a bundle (1) of optical fibres (10) having a first end, referred to as proximal (100), and a second end, referred to as distal (150), said distal end having a structured surface which has a sub-micronic scale and is coated with a thin metallic layer (110), *characterised in that* said structured surface, which has a sub-micronic scale, forms a network of spikes (13), each formed by a core (11) of an optical fibre (10) of the bundle.



CLAIMS – Method example

- 1 ~~*A method which allows taking pictures of bones inside a living body.*~~

- 1 *A method of taking pictures of bones inside a living body comprising the steps of*
 - *Generating a beam of X-rays;*
 - *Directing said beam toward said body;*
 - *Using an imaging detector to perform spatially-resolved detection of X-rays having traversed said body.*



CRITERIA FOR PATENTABILITY

CRITERIA FOR PATENTABILITY

CRITERIA +

- INVENTION
- NOVEL
- INVENTIVE
- CAPABLE OF INDUSTRIAL APPLICATION

CRITERIA -

- EXCEPTIONS TO PATENTABILITY

CRITICION: INVENTION

- No legal definition of invention
- ... but a (non-exhaustive) list of “non-inventions”
 - ❖ Scientific theories, discoveries
 - ❖ Aesthetic creations
 - ❖ Presentations of information
 - ❖ “Business models” and games
 - ❖ Programs for computers

... as such

NON-INVENTION vs INVENTION

Non-patentable discovery	Patentable invention
Natural substance	Use of the substance, for example as herbicide The isolated and purified substance for which an application has been identified
Stimulated emission	Particular type of laser
Fourier transform	Image/signal processing method which uses the FT

- Programs for computers:
 - ❖ protected by copyright
 - ❖ algorithm can be protected by a patent on condition that it is implemented in a specific application

EXCEPTIONS TO PATENTABILITY

- Contrary to *ordre public* and to morality
 elements of the human body; biotech method applied to the human
 e.g. cloning
- Plant varieties and animal varieties, and essentially biological
 methods for obtaining these varieties
 microbiology/genetic engineering not affected
- Methods
 - of therapeutic treatment ≠ product for use in these methods
 - of surgical treatment: comprises an intrusive step, intervention into
 the body which requires medical expertise
 - of diagnosis on humans and animals
 but: imaging or analysis methods preceding or supplementing a diagnosis
 are patentable

CRITERIA FOR PATENTABILITY - NOVELTY

- The invention is novel if it does not form part of the **prior art**

Prior art: everything made available to the **public**,
in any way,
before the date of filing (priority date) of the invention

- **Public:** person not under an obligation to maintain secrecy
The invention must not have been disclosed to persons not under an obligation to maintain secrecy before the date of filing
➡ Be careful with pre-filing disclosures: a legal framework is necessary, e.g. NDA
- **Any way:**
 - ❖ Journal publication
 - ❖ Internet publication
 - ❖ Oral presentation
 - ❖ Public use, sale, etc.
- Anywhere in the world

CRITERIA FOR PATENTABILITY - INVENTIVE STEP

- An invention involves an inventive step if, for a **person skilled in the art**, it is not obvious from the prior art

- **Person skilled in the art:** ordinary practitioner aware of what was common general knowledge in the art on the date of filing

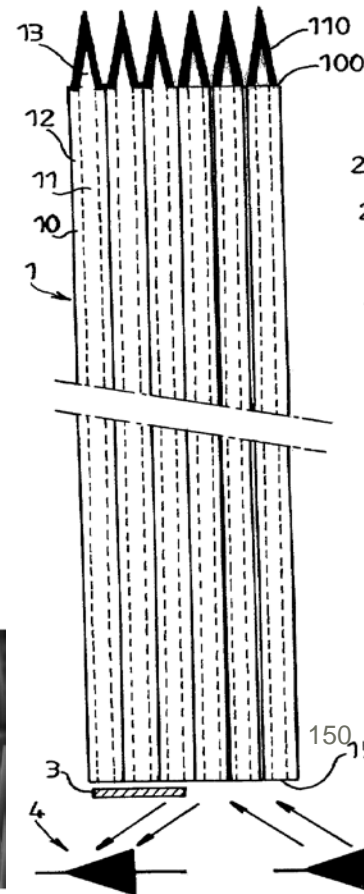
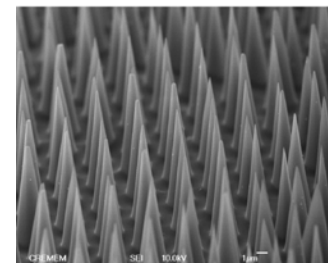
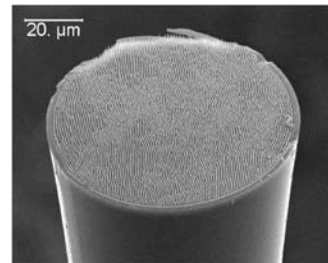
- **Problem/solution approach**
 - ❖ Identify the closest prior art (CPA)
 - ❖ Establish the objective technical problem solved by the invention
 features of the invention that are different from CPA – technical effect
 how to modify CPA to obtain the technical effect
 - ❖ Establish obviousness – generally by combining two documents
 no *a posteriori* assessment

SERS EXAMPLE

1. Surface-enhanced Raman spectroscopy imaging device comprising a bundle (1) of optical fibres (10) having a first end, referred to as proximal (100), and a second end, referred to as distal (150), said distal end having a structured surface which has a sub-micronic scale and is coated with a thin metallic layer (110),

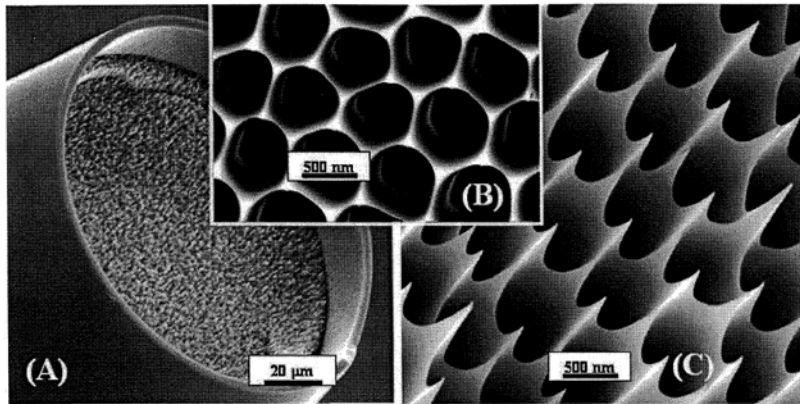
characterised in that

said structured surface which has a sub-micronic scale forms a network of spikes (13), each formed by a core (11) of an optical fibre of the bundle.



1. Surface-enhanced Raman spectroscopy imaging device comprising a bundle (1) of optical fibres (10) having a first end, referred to as proximal (100), and a second end, referred to as distal (150), said distal end having a structured surface which has a sub-micronic scale and is coated with a thin metallic layer (110), *characterised in that* said structured surface which has a sub-micronic scale forms a network of spikes (13), each formed by a core (11) of an optical fibre (10) of the bundle.

Known PRIOR ART: document D1



Laser illumination of the end

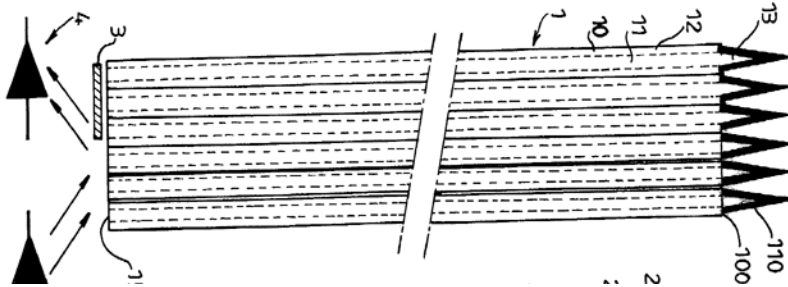
Collection of the backscattered light

Silver coating

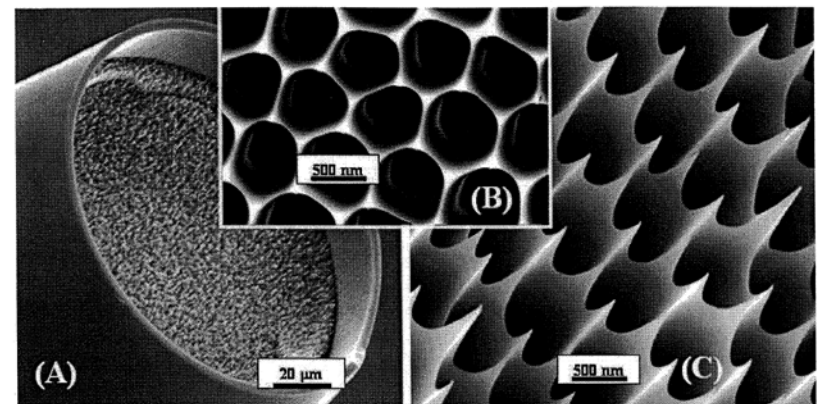
OBJECTIVE TECHNICAL PROBLEM

- Technical difference
 - Spikes formed by the cores of the fibres
- Technical effect
 - The fibres can transport the excitation light
- Technical problem
 - To provide a more compact sensor while avoiding external illumination

Invention



D1



Prima facie, good chance of success for the purposes of defending the patentability

1. Surface-enhanced Raman spectroscopy imaging device comprising a bundle (1) of optical fibres (10) having a first end, referred to as proximal (100), and a second end, referred to as distal (150), said distal end having a structured surface which has a sub-micronic scale and is coated with a thin metallic layer (110), characterised in that said structured surface which has a sub-micronic scale forms a network of spikes (13), each formed by a core (11) of an optical fibre (10) of the bundle.

Newly found PRIOR ART (search report): Document D2

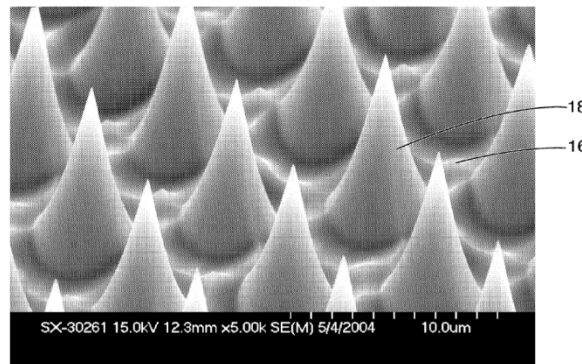
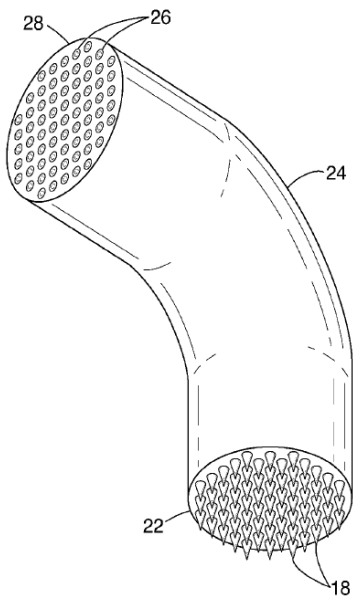
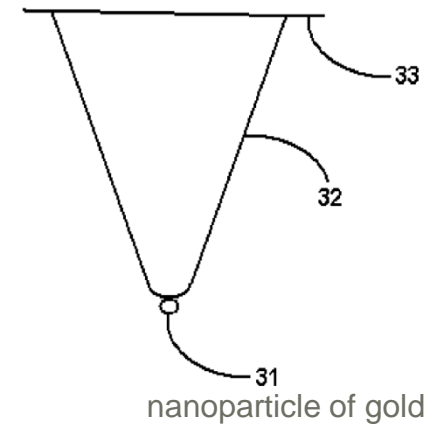


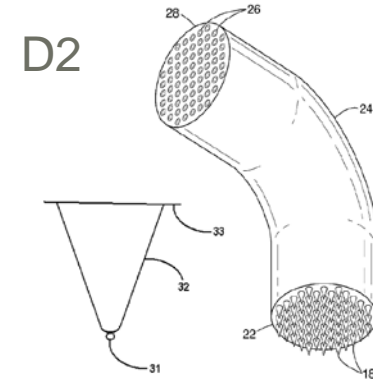
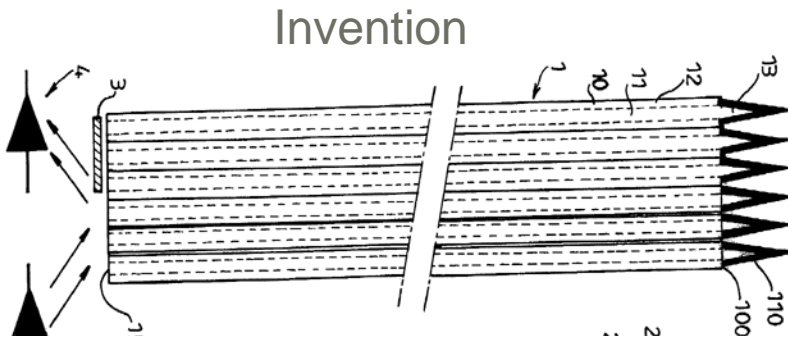
FIG. 1

§ [0034] SERS application



OBJECTIVE TECHNICAL SOLUTION

- Technical difference ○ Metallic layer
- Technical effect ○ Same technical effect as nanoparticles
- Technical problem ○ Simpler manufacturing



D2 is the closest prior art

Claim 1 is amended in view of D2

1. Surface-enhanced Raman spectroscopy imaging device comprising a bundle (1) of optical fibres (10) having a first end, referred to as proximal (100), and a second end, referred to as distal (150), said distal end having a structured surface which has a sub-micronic scale ~~and is coated with a thin metallic layer (110), characterised in that~~ **wherein** said structured surface which has a sub-micronic scale forms a network of spikes (13), each formed by a core (11) of an optical fibre (10) of the bundle, **characterized in that said structured surface which has a sub-micronic scale is coated with a continuous, thin metallic layer (110).**

Patentability analysis

- Invention ✓
- Industrial application ✓
- Novelty ✓
- Inventive step ?
 - Difference wrt D2: continuous coating vs single nanoparticle
 - Technical problem solved: simpler manufacturing
 - Obvious?
 - Known from D1 ☹️
 - Same technical field, similar technology ☹️
 - Not necessarily obvious compatibility 😊

Thank you for your attention