PATENTS: KEYS FOR UNDERSTANDING

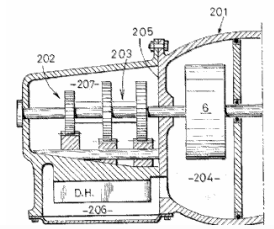
CONTENT

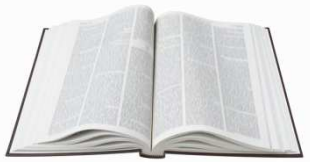
1

GENERAL INFORMATION

A. Overview of industrial property

Legal right	What for?	How?
Patents	New inventions	Application and examination
Copyright	Original creative or artistic forms	Exists automatically
Trade marks	Distinctive identification of products or services	Use and/or registration
Registered designs	External appearance	Registration*
Trade secrets	Valuable information not known to the public	Reasonable efforts to keep secret





Patents: it is a give and take system

Extrait du livre « Innover grâce au brevet », Y. de Kermadec, Insep Consulting Editions

B. Roles of the patent system

Encourage technological innovation by rewarding intellectual creativity

- in providing protection for the invention to the patent owner, patents provide incentives to individuals by offering them recognition for their creativity and the possibility of obtaining financial rewards if they commercialize or exploit their inventions

Promote competition and investment

- in developing new or improved products or processes by encouraging research and development

Encourage dissemination of information

- because information disclosed in patents is published and that may be of benefit to society

Promote technology transfer

- because anyone can find patented technologies that they may want to get access to and use themselves

C. Rights conferred by a patent

- Prevent others from **making, using, offering for sale, selling or importing infringing products** in the country where the patent was granted.

  ↳ **LIMITED MONOPOLY**

- The patent does **not grant the right to use** the invention!

  PATENT = RIGHT TO FORBID, NOT TO EXPLOIT

- For **up to 20 years** from the date of filing of the patent application.

- Right to assign or transfer ownership of a patent and to conclude licensing contracts.

- **Presumption of validity** of a granted patent until it is challenged in a court.

2

PATENTABILITY REQUIREMENTS

A. What cannot be patented (1/2)?

- The following are not considered to be inventions for the purposes of granting patents (notably in Europe):

  - Discoveries, scientific theories and mathematical methods;
  - Aesthetic creations;
  - Schemes, rules and methods for performing mental acts, playing games or doing business, and programs for computers;
  - Presentations of information.

A. What cannot be patented (2/2)?

- Inventions whose commercial exploitation would be contrary to **"ordre public"** or **morality.**
- **Plant or animal varieties** or essentially biological processes for the production of plants or animals.
- **Methods for treatment** of the human or animal body **by surgery or therapy** and **diagnostic methods** practised on the human or animal body.
- This applies only if the patent claim relates to that subject-matter or activities "**as such**".
- A patent claim that includes a mix of both patentable, technical, and excluded, non-technical, subject-matter **can** be regarded as an invention and may be patented after all.

B. What can be patented?

- Patents are granted for any invention whether the invention is a product or a process, e.g. process of manufacturing something, in "all fields of technology".

- **An invention is a technical solution to a technical problem.**

- Provided that said invention is compliant with the 3 conditions of patentability which are:
  - Novelty / *anticipation (US terminology)*
  - Inventive step / *non-obviousness*
  - Industrial application / *utility*

- 2 additional conditions:
  - Enablement
  - Clarity / d*efiniteness*

C. Novelty

- In Europe and in the main countries, an invention must be **new at the date of filing a patent application** (**absolute novelty**). An invention shall be considered **"new" if it does not form part of the "state of the art".**

- "**State of the art**" means everything made available to the public (written or oral description, by use, or in any other way) **before the filing date** of the patent application.

- There must have been no public disclosure of an invention before the filing date of the patent application.

So keep your invention confidential!

What not to do when considering filing a patent application

- No publication prior to filing

  e.g. no article, press release, conference presentation/poster/proceedings or blog entry

- No sale of products incorporating the invention prior to filing, no samples

- No lecture or presentation prior to filing

  except under a **non-disclosure agreement** (NDA)

- File before others do!

Source: EPO web site

D. Inventive step and utility

Inventive step

- An invention must be inventive, i.e. it must:
  - **Bring a solution to a technical problem**
  - **Not be obvious for the man skilled in the art**

For any invention there is a man skilled in the art.

Utility

- An invention must be capable of industrial application (utility), i.e., it is must be made or used in any type of industry.
  - This condition avoid patenting theories.

3

FORMAL REQUIREMENTS

A. Structure of a patent

- A patent application must comprise:

  - Bibliographic information:

    - inventor, patent assignee, date of filing, technology class, etc.

  - Abstract:

    - around 150 words as a search aid for other patent applications.

  - Description comprises:

    - a summary of prior art (i.e. the technology known to exist);
    - the problem that the invention is supposed to solve;
    - an explanation and at least one way of carrying out the invention.

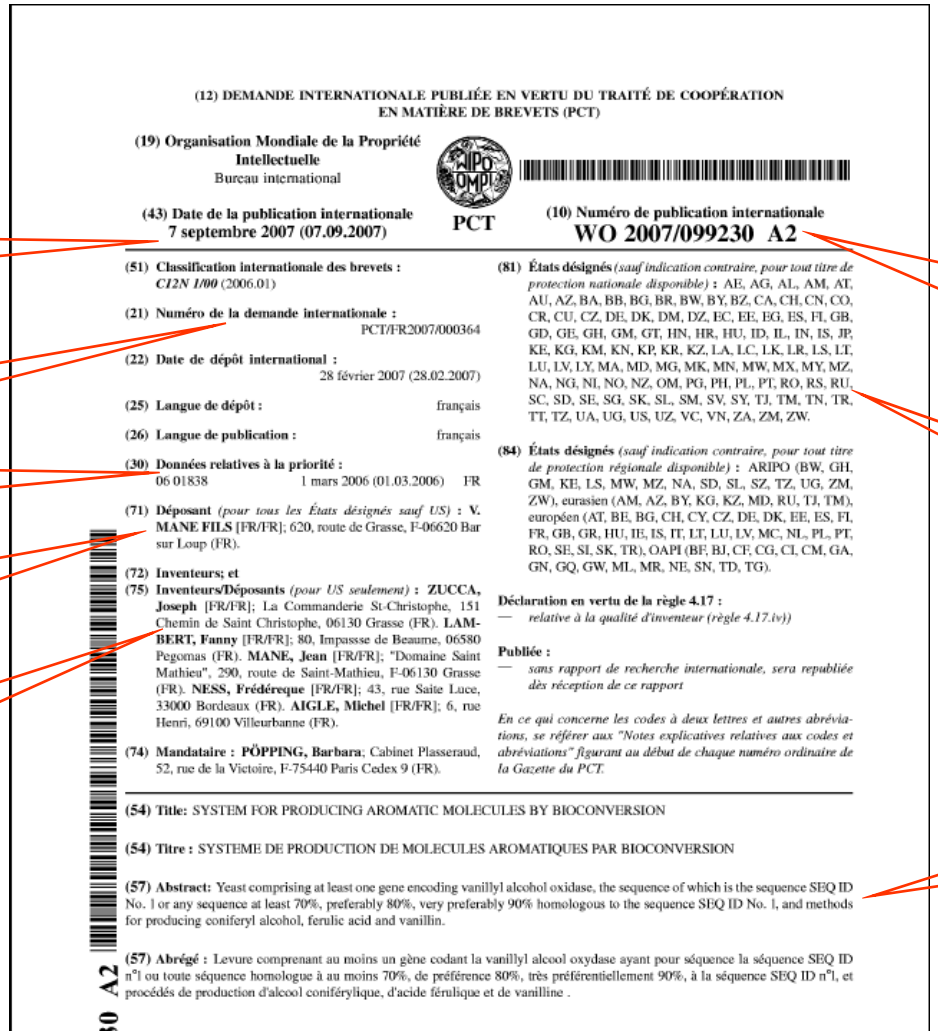
  - Claims:

    - to define the scope of the aimed patent protection.

  - Drawings:

    - to illustrate the claims and description.

B. Bibliographic information and abstract



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(81) États désignés *(sauf indication contraire, pour tout titre de protection nationale disponible)* : AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) États désignés *(sauf indication contraire, pour tout titre de protection régionale disponible)* : ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), eurasien (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), européen (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Déclaration en vertu de la règle 4.17 :
— *relative à la qualité d'inventeur (règle 4.17.iv))*

Publiée :
— *sans rapport de recherche internationale, sera republiée dès réception de ce rapport*

En ce qui concerne les codes à deux lettres et autres abréviations, se référer aux "Notes explicatives relatives aux codes et abréviations" figurant au début de chaque numéro ordinaire de la Gazette du PCT.

(54) **Title:** SYSTEM FOR PRODUCING AROMATIC MOLECULES BY BIOCONVERSION

(54) **Titre :** SYSTEME DE PRODUCTION DE MOLECULES AROMATIQUES PAR BIOCONVERSION

(57) **Abstract:** Yeast comprising at least one gene encoding vanillyl alcohol oxidase, the sequence of which is the sequence SEQ ID No. 1 or any sequence at least 70%, preferably 80%, very preferably 90% homologous to the sequence SEQ ID No. 1, and methods for producing coniferyl alcohol, ferulic acid and vanillin.

(57) **Abrégé :** Levure comprenant au moins un gène codant la vanillyl alcool oxydase ayant pour séquence la séquence SEQ ID n°1 ou toute séquence homologue à au moins 70%, de préférence 80%, très préférentiellement 90%, à la séquence SEQ ID n°1, et procédés de production d'alcool coniférylique, d'acide férulique et de vanilline .

A2

Publication date

Filing number

Priority date

Assignee

Inventors and inventors/applicant in the US

Publication number and status

Potential geographical scope

Abstract

Patent status classification

Keep in mind:
- A = patent appli.
- B = granted patent

A documents	
A1	European patent appl. published with search report
A2	European patent appl. published without the search report (not available at the publication date)
A3	Separate publication of the European search report
A4	Supplementary search report
Corrected A documents	
A8	Corrected title page of an A document, i.e. A1 or A2
A9	Complete reprint of an A document, i.e. A1, A2 or A3
B documents	
B1	European patent specification (granted patent)
B2	New European patent specification (amended specification of a granted patent)
B3	European patent specification after a limiting procedure
Corrected B documents	
B8	Corrected title page of a B document, i.e. B1 or B2 document
B9	Complete reprint of a B document, i.e. B1 or B2 document

C. Description of a patent application (1/7)

- **Description of a patent application comprises at least:**
  - Part 1: identification of the prior art disclosed before the date of filing;
  - Part 2: statements about the technical problem to be solved by the invention;
  - Part 3: disclosure of the invention generally and in details, with the best mode. Must be done in the right way because if not, the claims might be not supported by the patent specification;
  - Part 4: Examples. Description of at least one detailed embodiment of the invention that will allow the man skilled in the art to reproduce the invention. But one example is often insufficient;
  - Part 5: the claims, i.e. the aimed scope of protection of the invention. Almost the more important part of a patent. Claims must be clear, concise and supported by the patent specification.
- Drawings are optional.

C. Description of a patent application (2/7)

- Part 1: identification of the prior art disclosed before the date of filing;
- Part 2: statements about the technical problem to be solved by the invention;
- Part 3: disclosure of the invention generally and in details, with the best mode. Must be done in the right way because if not, the claims might be not supported by the patent specification;
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Drawings are optional.

L'industrie des parfums et arômes est toujours à la recherche de composés organoleptiques nouveaux, présentant un pouvoir olfactif intense, tout en ayant des coûts de production les plus limités possibles. Certains types de composés organoleptiques sont plus difficiles à obtenir que d'autres, comme par exemple les composés ayant des notes marines et/ou ozoniques.

Parmi les composés décrits dans l'art antérieur comme ayant des notes marines et/ou ozoniques, on trouve, parmi les plus utilisés, les dérivés de type benzodioxepinone (Helvetica Chimica Acta, 2007, 90, 1245-1265) comme la Calone®, ou encore comme l'Azurone® (Givaudan) ou la 7-(3-méthylbutyl)benzo[B][1,4]dioxepin-3-one (brevet EP1136481).

Certains composés de la famille des aldéhydes sont également connus pour présenter ce type de notes marines et ozoniques. Citons par exemple, le Melozone® (hexahydro-1-carboxaldéhyde-4,7-méthanoindane, brevet DE19817042) qui associe en plus des notes marines et

C. Description of a patent application (3/7)

- Part 1: identification of the prior art disclosed before the date of filing;
- Part 2: statements about the technical problem to be solved by the invention;
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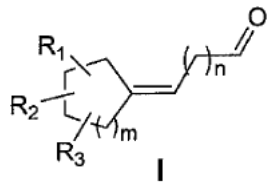
Drawings are optional.

Cependant, les composés de l'art antérieur possédant une note marine ou ozonique originale, ont comme principal inconvénient leur coût de production élevé, lié notamment au nombre d'étapes de synthèse, ou encore au coût des matières premières. A titre d'illustration, le procédé de synthèse du 7-méthyl-3,4-dihydro-2H-1,5-benzodioxepin-3-one décrit dans le brevet US 3517031, comporte trois étapes, ce qui est conséquent. En outre, le substrat de départ, le pyrocatéchol, est une matière première au coût significativement élevé. De même, le procédé de synthèse du 3-méthyl-6-(2,2,3-triméthylcyclopentyl)-hexanal (décrit comme marin, ozonique dans la demande de brevet EP1930317) comporte cinq étapes de synthèse à partir de l'aldéhyde campholénique.

Afin de surmonter les inconvénients de l'art antérieur, la Demanderesse, a de manière surprenante découvert que des aldéhydes cycloalcaniques répondant à la formule générale (I) suivante,



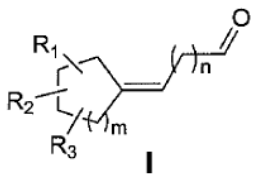
I

C. Description of a patent application (4/7)

- Part 1: identification of the prior art disclosed before the date of filing;
- Part 2: statements about the technical problem to be solved by the invention;
- Part 3: disclosure of the invention generally and in details, with the best mode.
- Part 4: description of at least one detailed embodiment of the invention that will allow the man skilled in the art to reproduce the invention. But one example is often insufficient;
- Part 5: the claims, i.e. the aimed scope of protection of the invention. Almost the more important part of a patent. Claims must be clear, concise and supported by the patent specification.

Drawings are optional.

La présente invention a donc pour premier objet un composé de formule générale (I) suivante :



I

dans laquelle :

- R1, R2 et R3 représentent chacun indépendamment un atome d'hydrogène ou un groupement alkyle en C1-C5 saturé ou insaturé, ramifié ou non ramifié ;
- m est un nombre entier compris entre 1 et 4 ;
- n est un nombre entier compris entre 2 et 4 ;

caractérisé en ce que le cycle est saturé et comprend de 5 à 8 carbones, que le nombre total de carbones du cycle et des radicaux R1, R2 et R3 est compris entre 7 et 11

et étant entendu que ledit composé de formule (I) n'est pas :

- le 6-cycloheptylidènehexanal
- le 4-(4-méthylcyclohexylidène)-butanal
- le 4-(4-tert-butylcyclohexylidène)-butanal
- le 4-(3,3,5-triméthylcyclohexylidène)-butanal

C. Description of a patent application (5/7)

- Part 1: identification of the prior art disclosed before the date of filing;
- Part 2: statements about the technical problem to be solved by the invention;
- Part 3: disclosure of the invention generally and in details, with the best mode. Must be done in the right way because if not, the claims might be not supported by the patent specification;
- Part 4: the examples. Description of at least one detailed embodiment of the invention that will allow the man skilled in the art to reproduce the invention.
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Drawings are optional.

Exemple 3 : Préparation du 4-(2,4,4-triméthylcyclopentylidène)-butanal

Le 4-(2,4,4-triméthycyclopentylidène)-butanal est préparé selon le protocole décrit en Exemple 1 en utilisant la 2,4,4-triméthylcyclopentanone à la place de la 2-pentylcyclopentanone. Le produit brut constitué de deux isomères du 4-(2,4,4-triméthycyclopentylidène)-butanal en proportions (70:30), est distillé sous pression réduite : sa température d'ébullition est de 70 °C sous 0,4 torr.

Le 4-(2,4,4-triméthycyclopentylidène)-butanal ainsi obtenu présente les caractéristiques spectrales suivantes :

Isomère majoritaire (70 %) :

^{1}H-NMR (200 MHz, $CDCl_3$): δ (ppm) 1,02 (s, 6H), 0,91-1,06 (d superposés, 3H), 1,10-1,15 (m, 1H), 1,64-1,86 (m, 2H), 2,02-2,47 (m, 5H), 2,62-2,80 (m, 1H), 5,07-5,12 (m, 1H), 9,76 (t, J = 1,6 Hz, 1H).

^{13}C-NMR (50 MHz, $CDCl_3$): δ (ppm) 21,34, 21,43, 26,83, 28,81, 33,85, 37,69, 44,15, 48,96, 50,00, 118,90, 149,58, 202,49.

MS [e/m (%)]: 180 (M+, 1), 162 (18), 147 (41), 137

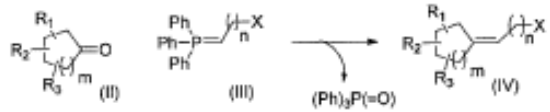
C. Description of a patent application (6/7)

- Part 1: identification of the prior art disclosed before the date of filing;
- Part 2: statements about the technical problem to be solved by the invention;
- Part 3: disclosure of the invention generally and in details, with the best mode. Must be done in the right way because if not, the claims might be not supported by the patent specification;
- Part 4: description of at least one detailed embodiment of the invention that will allow the man skilled in the art to reproduce the invention. But one example is often insufficient;
- Part 5: the claims, i.e. the aimed scope of protection of the invention.

Drawings are optional.

9. Procédé selon la revendication 8 caractérisé en ce qu'il comprend les étapes de :

i) addition d'un ylure de phosphore de formule (III) sur une cycloalcanone de formule (II), selon une réaction de Wittig :



R1, R2, R3, n et m étant tels que définis à la revendication 1, et

X représentant une fonction nitrile, ester carboxylique ou alcool ; et

ii) conversion de la fonction X du composé (IV) obtenu en aldéhyde, par réduction et/ou oxydation.

10. Utilisation d'au moins un composé de formule (I) tel que défini dans l'une des revendications 1 à 5 en tant qu'agent ou composé fragrant.

11. Utilisation d'au moins un composé de formule (I) tel que défini dans l'une des revendications 1 à 5 en tant qu'agent masquant d'une odeur ou neutralisant d'une odeur.

12. Utilisation, selon l'une des revendications 10 ou 11, d'au moins un composé de formule (I) seul ou en combinaison avec au moins un autre ingrédient aromatisant ou parfumant, et/ou au moins un solvant, et/ou au moins un adjuvant.

C. Description of a patent application (7/7)

- Part 1: identification of the prior art disclosed before the date of filing;
- Part 2: statements about the technical problem to be solved by the invention;
- Part 3: disclosure of the invention generally and in details, with the best mode. Must be done in the right way because if not, the claims might be not supported by the patent specification;
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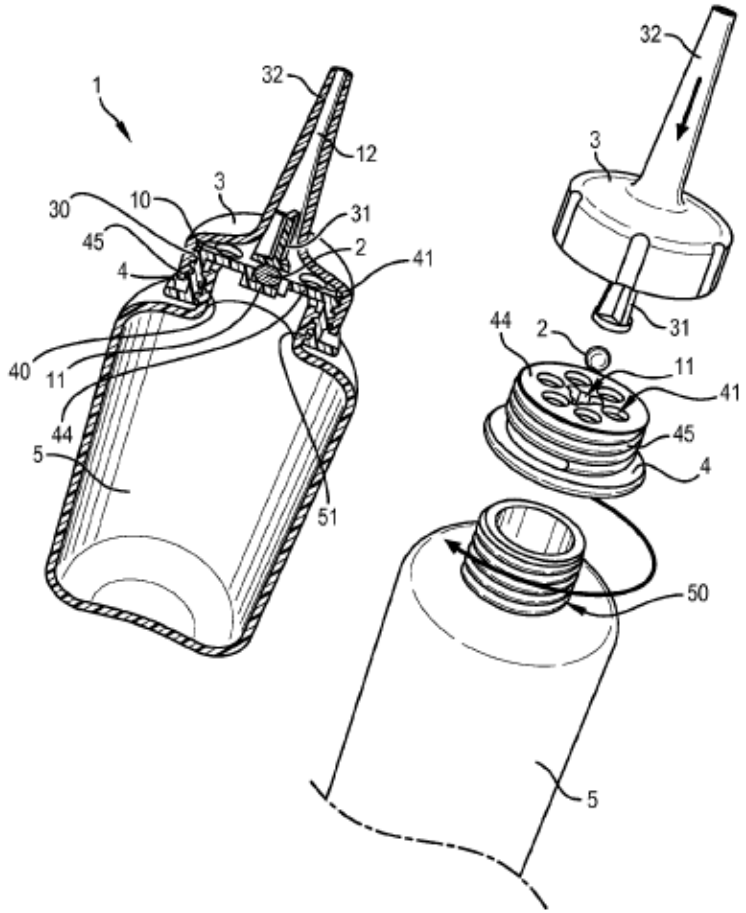
Drawings are optional.

FIG. 1



4

PATENT PROCEDURE FOR GRANTING

A. Where to file a patent application?

- **There are different routes to patent protection:**
  - **National patent offices**

    - National patent **valid only in the country where it is granted**
    - Non-nationals can also apply for a patent
    - One year of "priority" for subsequent applications
  - **European Patent Office (EPO)**

    - A "European patent" is equivalent to national patents in the countries for which it was granted
    - The applicant chooses the countries
    - The cost depends on the number of countries designated
  - **Patent Cooperation Treaty (PCT)**

    - Just one initial application for more than 140 contracting states
    - After the international phase, the international application leads to multiple national patent examination procedures
    - Costly patenting decisions can be delayed by up to 30-31 months after filing
    - No international patent, but an international patent application procedure
    - PCT application can be filed at a national patent office, EPO or WIPO

B. European patent procedure for granting

Examination on filing and formalities examination

- Check of the formal requirements, attribution of a filing date and filing number.

Search report

- Drawing up of a search report that allows an appreciation of the patentability of the invention (novelty and inventive step) 9 months after application filing. Classification of the prior art documents as X (novelty), Y (inventive step), A (technological background)…

Publication of application and search report

- Publication 18 months after the patent filing date (or priority date).

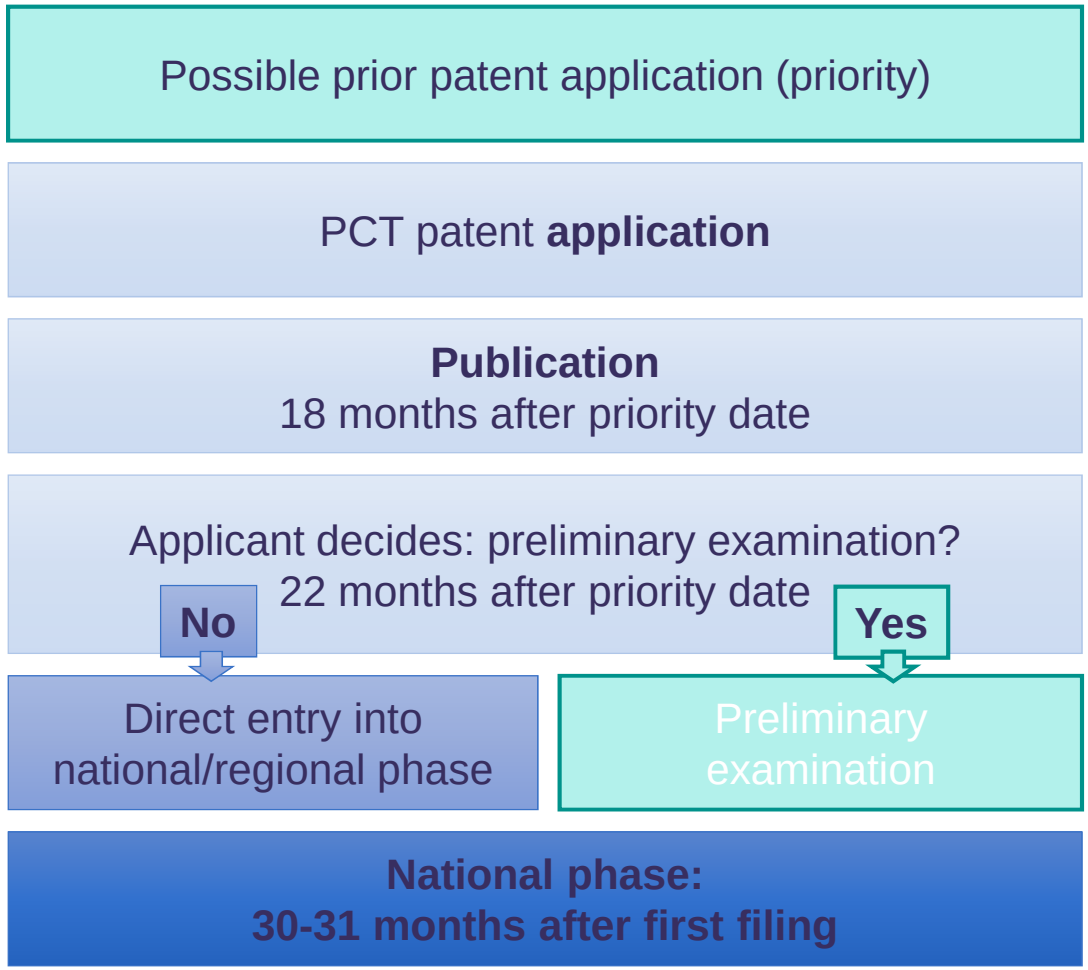
Substantive examination

- Examination by the patent office by an Examiner. Discussion about the patentability of the claimed invention.

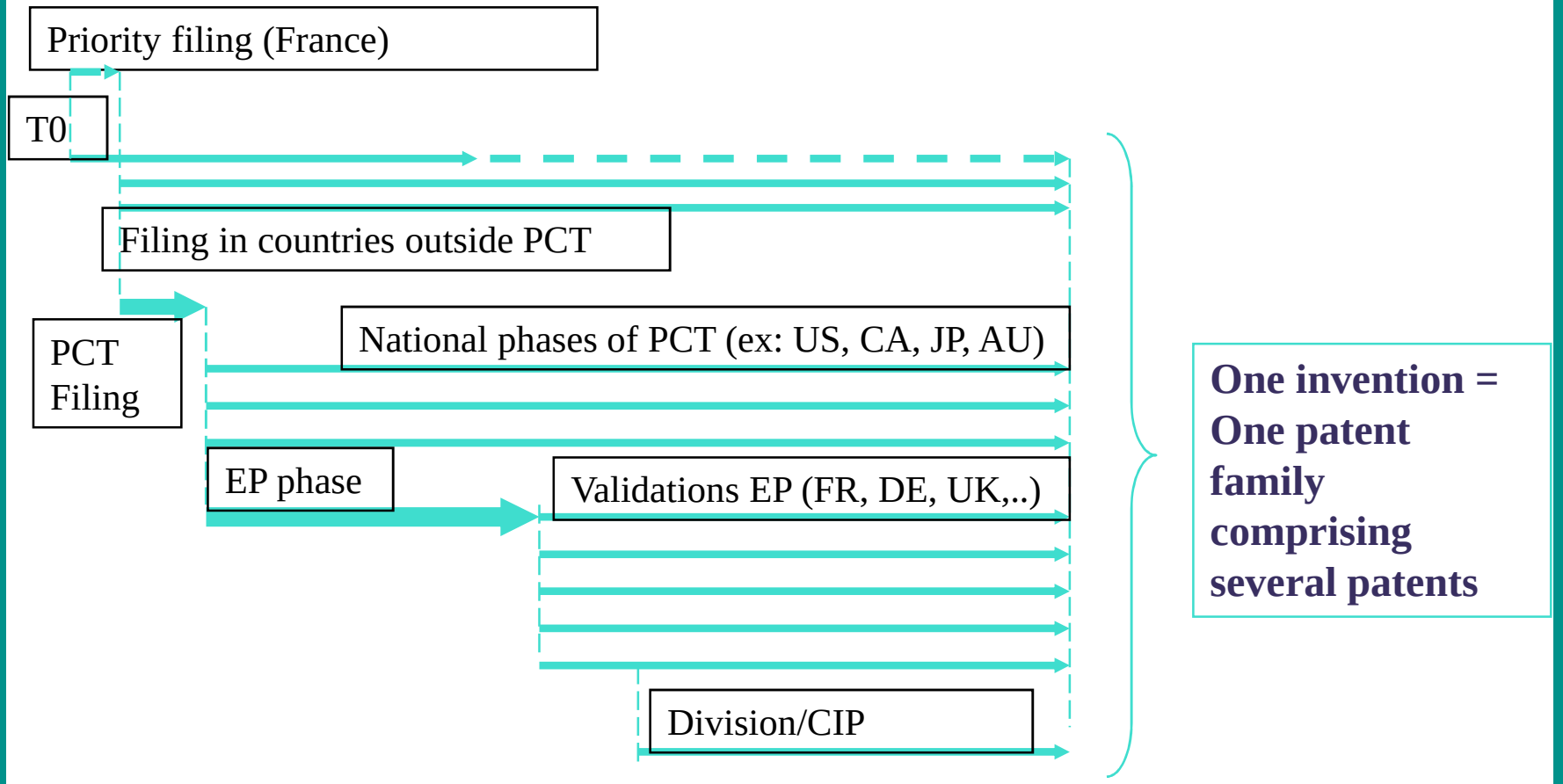
Grant of the patent and validation

- Choice of the countries where protection is effectively aimed between the 35 European countries.

C. The PCT procedure



D. General overview of the procedure for one invention



Thanks !